# Request for Proposal

New Bedford Marine Commerce Terminal
Phase 3 Bulkhead Replacement (Site 4)

NOVEMBER 11, 2025

Proposals Due: Not later than 12:00 PM on DECEMBER 11, 2025

**All proposals must be submitted electronically as described in Section I. of this Request for Proposal**

# Request for Proposal

## New Bedford Marine Commerce Terminal
## Phase 3 Bulkhead Replacement (Site 4)
## New Bedford, Massachusetts

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- Order of Conditions SE 49-0973 (New Bedford Conservation Commission, issued September 3, 2025)
- Individual Permit No.: NAE-2022-01807 (U.S. Army Corps of Engineers, dated September 29, 2025)
- Approval for Stormwater Management Permit No. SMP-25-3 for Parcel ID: 031-0263 (City of New Bedford, September 3, 2025)
- Approval for PCB Cleanup and Disposal for 18 and 54 Wright Street (U.S. Environmental Protection Agency, July 24, 2025)

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**Attachment 8:** State Enhanced Remedy Work Plan (Foth Infrastructure & Environment, LLC, August 22, 2025)

**Attachment 9** 72-inch Storm Drain and Manhole Inspection Using a Remotely Operated Vehicle (ASI Marine L.P., September 3, 2025)

**Attachment 10** Letter – Drainage Manhole Bearing Capacity for Proposed Shuster Bulkhead (Civil & Environmental Consultants, Inc., October 1, 2025)

**Attachment 11** Project Memorandum - Preliminary Soil Investigation for Shuster Bulkhead (Civil & Environmental Consultants, Inc., March 8, 2024)

**Attachment 12** Letter Report - Soil Characterization for Potential Disposal/Reuse for Shuster Bulkhead (Civil & Environmental Consultants, Inc., August 14, 2024)

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**Attachment 18** Release Abatement Measure Plan/EPA Self-Implementing Plan (Civil & Environmental Consultants, Inc., March 31, 2025)
NOTE: Attachment 18 is provided as a separate PDF.

**Attachment 19** Phase 3 Bulkhead Replacement Data Package (Foth Infrastructure & Environment, LLC, November 6, 2025
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## I. SUMMARY & GENERAL REQUIREMENTS

The Massachusetts Clean Energy Technology Center ("MassCEC" or "Owner") seeks proposals from qualified contractors ("Bidders") for Contract No. MACEC-FY26-02, New Bedford Marine Commerce Terminal: Phase 3 Bulkhead Replacement (Site 4) (the "Project"), which will take place at the New Bedford Marine Commerce Terminal located at 4 Wright Street, New Bedford, Massachusetts ("Terminal"), which is a multi-purpose marine cargo facility and part of the Terminal expansion.

**BIDDERS TAKE NOTE:** MassCEC is funding the Project entirely from its Climatetech Investment Fund and/or Offshore Wind Industry Investment Fund. As provided by MassCEC's enabling statute, G.L. c. 23J, ss. 9A(c) and/or 15(c), this procurement is exempt from the requirements of the Massachusetts public bidding laws, including both G.L. c. 30, s. 39M and G.L. c. 149, ss. 44 et seq.

Therefore, Bidders are advised that this Project is not being awarded as a "lowest bidder" contract under the Massachusetts public bidding laws. As permitted by M.G.L. c. 23J, this is a "best value" procurement by which MassCEC will award the Project using the selection procedures described in Section VIII. of this Request for Proposal (RFP). Pursuant to that process, there will be no public opening of proposals. By submitting a proposal, bidders affirm (i) they understand these procurement procedures, including basis for selection, and (ii) that MassCEC will select the proposal it determines will provide the best total value for the Project and may not necessarily include the lowest price. The reference in this RFP to "Bidders" or "Bids" is for convenience only and does not connote a "lowest price" selection process.

## II. SCOPE OF WORK

The Project consists of site work at the Terminal.

The Scope of Work, as described in **Attachment 1 of the RFP** and defined in the Project Specifications and Contract Drawings provided in **Attachments 2 and 4 of the RFP**, respectively, generally includes site demolition work (utilities, structures, existing cellular coffer dam structures, and pavements); marine infrastructure construction (bulkhead, pile-supported relieving platform and other structural construction), dredging and disposal; miscellaneous earthwork excavation, grading, and erosion control; miscellaneous utility work, site fencing, and erosion control and track out controls, and construction permitting coordination.

Bidders should be aware that this property is part of an active Massachusetts Department of Environmental Protection (MassDEP) environmental disposal site (release tracking number 4-0050261). In the event of soil disturbance due to building construction or utility work, the Contractor shall consult with the property owner before soils are handled. Soils should be managed in accordance with the Release Abatement Measure Plan/EPA Self-Implementing Plan (RAM Plan/SIP) and the Soil Management Plan, which are provided as **Attachments to the RFP,** respectively. Refer to Section 2.12 of Section 00700, General Conditions, and applicable Reference Documents attached to the RFP (see Section VII below).

Soils may be re-used on site but not removed from the site. If excess soils will be generated during construction, the Contractor shall consult with the property owner to determine an appropriate area for the stockpiled soils, while staging and covering the stockpile in accordance with the Soil Management Plan.

All work at the Terminal is to be performed within 475 days of Notice to Proceed with completion anticipated in Spring 2027, as the Owner will have another subsequent terminal expansion project anticipated to commence in Spring 2027.

Bidders hereby certify as part of their Bid submission that they are able to furnish labor that will work to the extent required, with all other resources and elements of labor employed or to be employed on the Work.

The Bidder selected for Contract award will be required to execute and comply with all provisions and requirements set forth in the "American Rescue Plan Act (ARPA) Contract Addendum," which contains additional federal requirements applicable to the Project (funded using ARPA grants), including Equal Employment Opportunity (EEO) requirements and other restrictions placed on the Work. The selected Contractor shall be required to separately acknowledge these obligations by signing the certification in the ARPA Contract Addendum as well as the Anti-Lobbying Certification included in the ARPA Addendum. By submitting a Bid in response to this RFP, Bidders certify that they are able and intend to comply with all of the requirements and obligations set forth in the ARPA Addendum and attached certification, which is provided as an **Attachment to the Owner-Contractor Agreement (Section 00525).**

This Contract is subject to prevailing wage rates applicable in the Commonwealth of Massachusetts as well as all other applicable labor laws. Contractors are responsible for ascertaining any updates to the Prevailing Wage Rate Schedule and for paying current Prevailing Wage rates. The current Prevailing Wage Rate Schedule is provided as **Attachment 3 to the RFP.**

Each Bid must be accompanied by bid security in the amount of five percent (5%) of the value of the total Bid, in the form of (i) Cash, (ii) Cashier's or Treasurer's Check issued by a responsible bank or trust company, or (iii) a Bid Bond (a) submitted on the form included with the Bidding Documents, (b) issued by a surety company qualified to do business in the Commonwealth and satisfactory to MassCEC and (c) conditioned upon the faithful performance by the principal of the agreements contained in the Bid.

The successful Bidder shall be required to furnish a Performance Bond, and a Labor and Materials Payment Bond. Each bond shall be written with a penal sum in the amount of the Contract Price. Section 00610, Performance Bond, and Section 00614, Payment Bond, are provided in **Attachment 1 of the RFP** and shall be written by a qualified surety company licensed by the Commonwealth of Massachusetts Division of Insurance and whose name appears on United States Treasury Department Circular 570. Refer to Section 00200, Instructions for Bidders (see **Attachment 1 of the RFP**), for further information.

MassCEC reserves the right in its sole discretion to reject any or all Bids, to waive informalities, to advertise for new Bids or proceed to do the Work otherwise or take any other action as may be deemed to be in the best interests of MassCEC.

## II. ABOUT MASSCEC

MassCEC is a quasi-state economic development agency dedicated to accelerating the growth of the clean energy sector across the Commonwealth to spur job creation, deliver statewide environmental benefits and to secure long-term economic growth for the people of Massachusetts. MassCEC works to increase the adoption of clean energy while driving down costs and delivering financial, environmental, and economic development benefits to energy users and utility customers across the state.

MassCEC's mission is to accelerate the clean energy and climate solution innovation that is critical to meeting the Commonwealth's climate goals, advancing Massachusetts' position as an international climate leader while growing the state's clean energy economy. MassCEC is committed to creating a diverse, equitable, and inclusive organization where everyone is welcomed, supported, respected, and valued. We are committed to incorporating principles of diversity, equity, inclusion, and environmental justice in all aspects of our work in order to promote the equitable distribution of the health and economic benefits of clean energy and support a diverse and inclusive clean energy industry. MassCEC strives to lead and innovate in equitable clean energy and climate solutions.

## III. PROJECT GOALS AND DESCRIPTION

The objective of the Project is to complete the bulkhead replacement necessary for its forthcoming use as a staging area for the assembly of wind turbines, which includes heavy-lift operations and related activity.

## IV. ELIGIBILITY

Qualified Contractors with demonstrated experience in successfully completing civil infrastructure projects, similar to the description set forth in the Contract Documents and Technical Specifications provided in **Attachments 1 and 2 of the RFP,** respectively.

## V. ESTIMATED TIMELINE

| | |
|---|---|
| Release Request for Proposal | November 11, 2025 |
| Pre-bid Meeting *(non-mandatory & Virtual)* | November 18, 2025, at 10:00 AM eastern time |
| Site Visits *(site/building open for Contractors)* | November 18, 2025, from 11:00 AM – 12:00 PM<br>(The Engineers intend to be on-site.) |
| RFI Questions due *(to Quest CDN Site)* | November 25, 2025, at midnight eastern time |
| RFI Questions answered | December 3, 2025 |
| Bid Proposals due *(to Quest CDN Site)* | December 11, 2025, at 12:00 PM eastern time |
| Contractor Down select (short-list) | December 12, 2025 |
| Contractor Interviews *(virtual)* | December 16, 2025<br>(times slots are: 7:30 AM, 8:30 AM, 9:30 AM for 30-45 min. each) |
| Notice of Award *(anticipated)* | December 23, 2025 |

| | |
|---|---|
| "Partial" Notice to Proceed for SER Work Plan Preparation *(anticipated)* | December 23, 2025 |
| Contractor submits Work Plan to State Enhanced Remedy (SER) Project Manager | |
| Approval of Work Plan by SER Project Manager *(anticipated)* | |
| "Full" Notice to Proceed *(anticipated)* | January 20, 2026 |
| Substantial Completion | 475 calendar days |
| Final Completion | 30 calendar days later |

## VII. HOW TO APPLY

Bidding Documents (Plans and Specifications) may be downloaded from QuestCDN.com for $22.00 (**Quest eBidDoc #9953056**) on or after **NOVEMBER 11, 2025**. Bidders will be charged a fee of $42.00 to submit their proposal electronically through QuestCDN.com. All interested parties are required to be registered Planholders for this Project such that they will receive corresponding communications including, but not limited to, addenda, responses to Bidder questions, or revisions to the Project Plans and Specifications.

Please contact QuestCDN at (952) 233-1632 or info@questcdn.com for assistance in free membership registration, downloading, working with this digital project information. and bid submittal assistance.

Prospective Bidders are urged to register with the designated website as a planholder, even if Bidding Documents are obtained from another source other than the designated website in either electronic or paper format. The designated website will be updated periodically with addenda, lists of registered planholders, reports, and other information relevant to submitting a proposal for the Project. All official notifications, addenda, and other Bidding Documents will be offered only through the designated website. Neither Owner nor Engineer will be responsible for Bidding Documents, including addenda, if any, obtained from sources other than the designated website.

A **non-mandatory, Virtual Pre-bid Meeting** will be held on **NOVEMBER 18, 2025, at 10:00 AM eastern time.** The meeting can be accessed via Microsoft Teams at:

**Click here to join the meeting**
Meeting ID: 214 181 060 140 63
Passcode: Hf6p5Sg3

Project team representatives will be present to discuss the Project.

**Proposals** shall be submitted through QuestCDN.com vBid Online Bidding not later than **DECEMBER 11, 2025, at 12:00 PM eastern time**.

- Under no circumstances will MassCEC accept proposals past the Bid Proposal Due Date.
- No Bidder may withdraw its bid for a period of 30 work days after the Bid Proposal Due Date.
- See **Attachment 1**, Contract Documents, in particular, Section 00200, Instructions to Bidders.

- The Bidder shall submit the required documents/forms, as stated in Section 00439, Bidder's Checklist, as part of their formal bid (see **Attachment 1**).
- See **Attachment 2** for Technical Specifications.
- See **Attachment 3** for the Prevailing Wage Rates for the Project.
- See **Attachment 4** for the Contract Drawings.

## REFERENCE DOCUMENTS

The following reference documents are included as Attachments to this RFP. They contain technical data and information furnished for the Contractor's information. Neither the Owner nor the Engineer shall be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor. The conditions represented in the reference documents prevailed at the time the investigations and surveys were conducted. Before commencing work at the Site, the Contractor shall verify the conditions indicated on the investigations and surveys, as well as on the drawings and specifications, and perform all other surveys as needed or as required in the Contract Documents:

- See **Attachment 5:** Project Permits
    - Project License and Permit Requirements
    - Chapter 91 - Minor Project Modification to DPW License No. 5579 (Massachusetts Department of Environmental Protection, dated May 23, 2024)
    - Order of Conditions SE 49-0973 (New Bedford Conservation Commission, issued September 3, 2025)
    - General Permit Authorization File Number: NAE-2022-01807 (U.S. Army Corps of Engineers, dated September 29, 2025)
    - Approval for Stormwater Management Permit No. SMP-25-3 for Parcel ID: 031-0263 (City of New Bedford, September 3, 2025)
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- See **Attachment 6:** Department of Public Infrastructure Construction Standards and Specifications (City of New Bedford, March 2025)
- See **Attachment 7:** State Enhanced Remedy Performance Standards
- See **Attachment 8:** State Enhanced Remedy Work Plan (Foth Infrastructure & Environment, LLC, August 22, 2025)
- See **Attachment 9**: 72-inch Storm Drain and Manhole Inspection Using a Remotely Operated Vehicle (ASI Marine L.P., September 3, 2025)
  NOTE: Two inspection videos are available upon request.
- See **Attachment 10:** Letter – Drainage Manhole Bearing Capacity for Proposed Shuster Bulkhead (Civil & Environmental Consultants, Inc., October 1, 2025)
- See **Attachment 11**: Project Memorandum - Preliminary Soil Investigation for Shuster Bulkhead (Civil & Environmental Consultants, Inc., March 8, 2024)
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  NOTE: **Attachment 19** is provided as a separate PDF.

## VIII. INSURANCE REQUIREMENTS

The selected Bidder and its subcontractors will be required to comply in all respects with the insurance requirements described in Article 5.04 of the Contract's General Conditions (Section 00700), which are included in **Attachment 1 to this RFP**. In preparing their proposals, Bidders should carefully review those insurance requirements, including scope and duration of coverages, policy types, minimum coverage limits, additional insureds, deductible requirements, etc., and confirm before submitting their proposals that they are able to provide all required coverages as stated in Article 5.04 and maintain compliance with all other requirements therein listed.

**Massachusetts Clean Energy Technology Center and Foth Infrastructure & Environment, LLC** shall be named as additional insureds, on a primary and non-contributory basis, under the Commercial General Liability, Automobile Liability, Umbrella, Pollution Liability, and Builder's Risk Insurance Policies.

## IX. SELECTION CRITERIA

As noted above, because MassCEC is funding 100% of the Project from its Climatetech Investment Fund and/or Offshore Wind Industry Investment Fund, the Project is exempt from the requirements of Massachusetts public bidding laws. MassCEC accordingly is procuring all construction services for this project pursuant to M.G.L. c. 23J, Sections 9A(c) and/or 15(c) using the selection procedures described herein, which take into account price, quality and schedule, qualifications of the Bidder and its team, and quality of plan for executing the work. MassCEC will select the Proposal that it determines provides the best overall value for the Project, even if the selected bid is not the lowest bid received. Following receipt of bids, MassCEC will evaluate the bids using the specified criteria to select a short list of Bidders for interviews. In connection with such interviews, MassCEC reserves the right to request that the shortlisted Bidders submit such additional information as MassCEC shall require in order to aid its final review and selection of proposals.

### CONTRACTOR SELECTION PROCESS

MassCEC is seeking comprehensive construction services and will be evaluating qualifications, capabilities, and representative experience from the Bidders to deliver the Scope of this Project as described on the Contract Drawings and in the Technical Specifications. All proposals and responses must be responsive to the requirements outlined in this RFP.

### A. Evaluation & Selection Criteria

Upon initial receipt of responses, MassCEC will evaluate each response for completeness and tabulate the bid prices received from the respondents. MassCEC will then create a subset, or "short list" of candidates to be interviewed based on the specified criteria, including completeness of their responses and the bid prices provided.

The following criteria will then be used by the selection committee to evaluate proposals of the short-listed contractors after their interviews are completed. (Maximum of 100 points available.)

| Criteria | Selection Criteria Category | Rating Points |
|---|---|---|
| 1 | Understanding of the Scope of Work | 20 |
| 2 | Qualifications & Experience | 20 |
| 3 | Work Plan & Schedule | 15 |
| 4 | Safety | 10 |
| 5 | Communication and Preparedness (during interview) | 15 |
| 6 | Bid Price | 20 |
| | **Available Total Rating Points After Interviews** | **100** |

### B. Contractor Interview

MassCEC and the Foth Infrastructure & Environment, LLC (Foth or Engineer) Team will interview the "short listed" Contractors. Key members from the Contractor's construction team (the "Construction Team") are expected to participate in the interview including the Principal-in-Charge, Project Manager, Project Superintendent from the General Contractor, and/or other individuals outlined and envisioned to play key roles in the construction of the Project. The interview will be held virtually and consist of a question-and-answer format. MassCEC will complete an evaluation scoring of each short-listed proposer's Bid after the interview under Evaluation & Selection Criteria and select a Contractor from the short-listed candidates.

**MassCEC has provided the attached Contract Documents and Technical Specifications in a format similar to an Invitation for Bid solely for the ease of use, familiarity, and convenience of potential Bidders; and references to "Bids" and "Bidders" throughout this RFP are solely for the Bidder's convenience.**

## X. CONTACT INFORMATION FOR QUESTIONS

Bidders are encouraged to submit any requests for clarifications of the Bidding Documents through QuestCDN.com, not later than **NOVEMBER 25, 2025, at midnight eastern time.** Verbal requests for clarifications or interpretations of the Bidding Documents will **not** be taken or given consideration. Responses to requests for interpretation of the Bidding Documents shall be included in Addenda, which shall become part of the Contract Documents, in accordance with the timeline indicated in this RFP. The Addenda will be uploaded to all registered Planholders via QuestCDN.com.

## XI. GENERAL REQUEST FOR PROPOSALS CONDITIONS

### NOTICE OF PUBLIC DISCLOSURE

As a public entity, MassCEC is subject to Massachusetts' Public Records Law, codified at Chapter 66 of the Massachusetts General Laws. Thus, any documentary material, data, or other information received by MassCEC from a Bidder is a public record subject to disclosure. Bidders shall not send MassCEC any confidential or sensitive information in response to this RFP. If confidential information is submitted as part of the application and not clearly marked as confidential, such information may be made publicly available by MassCEC without further notice to the Bidder.

### DISCLAIMER, REJECTION OF PROPOSALS & WAIVER AUTHORITY

This RFP does not commit MassCEC to award any funds or pay any costs incurred in preparing a proposal. MassCEC reserves the right to accept or reject any or all proposals received in its sole discretion, waive minor irregularities in submittal requirements, modify the anticipated timeline, request modification of the proposals, negotiate with all qualified Bidders, cancel or modify the RFP in part or in its entirety, or change the application guidelines, when it is in its best interests.

This RFP has been posted publicly on MassCEC's web portal for the solicitation of proposals and all documents related to this procurement such as addenda and responses to Bidder questions will be posted at QuestCDN.com, as described above. MassCEC accepts no liability and will provide no accommodation to Bidders who submit a proposal based on an out-of-date RFP document.

MassCEC reserves the right to consider as unqualified any Bidder who does not regularly and customarily perform with its own forces the primary portions of the work required by the Contract Documents.

MassCEC also reserves the right to not award the contract to any Bidder who, at the time of the award, is ineligible for such contract under the provisions of any applicable regulations issued by the Secretary of Labor, U.S. Department of Labor, or is not qualified under applicable state and local laws and regulations.

### CONTRACT REQUIREMENTS

Upon MassCEC's authorization to proceed with the proposal, MassCEC and the awarded Bidder(s) will execute a contract, substantially in the Owner-Contractor Agreement (Section 00525), General Conditions (Section 00700), and Supplementary Conditions (Section 00800), included in **Attachment 1 of the RFP,** which will set forth the respective roles and responsibilities of the parties.

**LIQUIDATED DAMAGES: The Contract will impose liquidated damages of $2,000 per calendar day that Substantial Completion of the Work is not achieved, starting on the first calendar day after the deadline for Substantial Completion under the Project Schedule (subject to any approved adjustments). Refer to the Owner-Contractor Agreement (Section 00525) in Article 5, and General Conditions (Section 00700) in Article 6, both included in Attachment 1 of the RFP.**

The Contractor, its subcontractors and all other personnel working at the Project site will be required to comply with specific Terminal security requirements and procedures. Your attention is directed to Section 01 11 00, Summary of Work, "Section 1.6 Security," which summarizes those requirements and procedures.

# ATTACHMENT 1: CONTRACT DOCUMENTS

SECTION 00200

INSTRUCTIONS TO BIDDERS

## ARTICLE 1 - INTERPRETATION OF BASIC ESTIMATED QUANTITIES

1.1 Bids will be compared based on the estimated quantities of work to be done, as shown on Section 00400, Bid Form.

A. Quantities on the Bid Form are approximate and are provided for purposes of bid comparison only. The Massachusetts Clean Energy Technology Center ("MassCEC") does not expressly or by implication agree that actual quantities will correspond therewith but reserves the right to increase or decrease the amount of any class or portion of the Work, as may be deemed necessary or expedient by MassCEC.

1.2 Bidders shall submit their Bids upon the following express condition, which shall apply to and become part of every Bid received.

A. An increase or decrease in the estimated quantity for any item shall not be regarded as cause for an increase or decrease in the applicable Contract Price, nor in the time allowed for the completion of the Work, except as may otherwise be provided in the Contract Documents.

B. If any item of the Work or the total Contract Price is let on the basis of a lump sum, Bidders by submitting a bid are assumed to have obtained, and will be responsible for, the data upon which the Bidders base their lump sum Bids. **The Bidders shall not be entitled to any additional compensation for lump sum items where the quantities of work actually performed to fulfill the Contract and complete the Work are different from estimated quantities.**

## ARTICLE 2 - EXAMINATION OF BIDDING DOCUMENTS AND SITE OF WORK

2.1 Before submitting a Bid, each prospective Bidder shall do the following:

A. Examine the Bidding Documents thoroughly.

B. Visit and inspect the site to become familiar with observable conditions that may in any manner affect cost, progress, or performance of the Work. Bidders shall satisfy themselves as to the condition under which the work is to be performed and gain complete knowledge of the scope of the work. No allowances shall subsequently be made for any extra expense incurred by a Bidder due to failure to make such examination and to include the required materials and labor in its Bid. Bidders shall be responsible for having examined the premises before submitting the Bid for the work and to have knowledge as to the existing conditions under which the work is to be accomplished.

C. Examine all reference documents provided as Attachments to the Request for Proposal (RFP).

D. Familiarize themselves with Federal, state, and local laws, ordinances, rules, and regulations that may in any manner affect cost, progress, or performance of the Work.

E. Study and correlate information thus determined with the Bidding Documents.

2.2 A **non-mandatory, virtual** Pre-bid Meeting will be hosted by the Massachusetts Clean Energy Technology Center (MassCEC) at the date and time specified in the RFP, with a Microsoft Teams link provided therein.

2.3 In addition to visiting the site for the purposes specified above, Bidders shall visit the site to ascertain pertinent local conditions readily determined by inspection and inquiry, such as the location, accessibility, traffic conditions and general character of the site, labor conditions, the character and extent of existing work within or adjacent thereto, and any other work being performed.

2.4 Statements as to the condition under which the Work is to be performed, including Plans, surveys, measurements, dimensions, calculations, estimates, borings, etc., are made solely for informational purposes only, and MassCEC does not guarantee or represent that they are correct. The Bidders must satisfy themselves by their own investigation and research regarding all conditions affecting the Work to be done and labor and material needed and make its bid in sole reliance thereon. Bidders must familiarize themselves with the location and site of the Work. All necessary information shall be verified in the field before the fabrication of new products/material. No claim for extra cost will be allowed by MassCEC because of the successful Bidder's unfamiliarity with site conditions.

2.5 By submitting a Bid, each Bidder represents that they have complied with every requirement of this Article 2 and that the Bidding Documents are sufficient in scope and detail to indicate and convey an understanding of all terms and conditions for performance of the Work at the prices contained in their Bids.

## ARTICLE 3 - <NOT USED>

## ARTICLE 4 - PREPARATION OF BIDS

4.1 Bid Prices

A. Bidders shall submit their Bids using the online Bid Form through QuestCDN.com vBid Online Bidding website. The Bid Form, along with the Schedule of Bid Prices, the Bid Guaranty, the forms specified in the Bid Form, certification, and documents constitute the Bid.

1. All blank spaces for Bid prices in the Schedule of Bid Prices shall be filled in with a unit price or a lump sum as applicable to the item.

2. The total amount of the Bid shall be obtained by adding the dollar amounts of the individual Bid items as shown in the Schedule of Bid Prices.

3. The system will not publish the Bid if there are errors or if the Bid Form is incomplete. A red error message will appear and the number of instances that need correcting will be shown.

B. The price for any item, unless otherwise noted or specified, shall include full compensation for all products/materials equipment, tools, labor, testing and incidental work necessary to complete the item to the satisfaction of the Engineer. Prices, without exception, shall be net, not subject to discount, and shall include all royalties and costs arising from patents, trademarks and copyrights in any way involved in the Work.

C. The Schedule of Bid Prices, which is included in the Bid Form, will be used for the indicating of the Bid Price information specified above.

4.2 Non-Collusion

A. Bidders shall certify that to the Bidder's best knowledge, they have not, either directly or indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free and competitive bidding in connection with the Bid.

4.3 Addenda

A. Bidders shall confirm receipt of all Addenda both on the Bid Form and in the designated section of the Quest bidding site. Failure to acknowledge receipt of Addenda shall per se render a Bid non-responsive.

4.4 Signatures

A. Bids shall be signed by electronic signature, as applicable, in the proper place provided as follows.

1. If the Bid is made by an individual, that person's name and mailing address shall be stated.

2. If the Bid is made by a firm, partnership, limited liability company or corporation it shall be signed by a person having such legal authority from such firm, partnership or corporation and the person so signing the Bid shall give their own name and title, if any, in addition to the name and address of the firm, partnership or corporation. If the Bid is made by a firm or

partnership, the names and addresses of the individual members shall be given.

3. If the Bid is made by a firm, partnership, limited liability company or corporation, the name of the state under the laws of which the business entity was chartered or organized, and the names and titles of the president, treasurer and secretary or clerk of the corporation shall be given.

4. If the Bid is made by two or more individuals, partnerships, limited liability companies or corporations, or any combination thereof, each party joining to make the Bid shall submit, attach to, and make a part of the Bid, information and signatures in compliance with the foregoing provisions applicable to an individual, firm, partnership or corporation. In addition, if any members of the joint venture are a corporation, an attested copy of the vote of the corporation authorizing such joint venture shall be attached to the Bid.

4.5 Bidder's Checklist

A. Bidders shall complete Section 00439, Bidder's Checklist, and submit it with their Bid.

## ARTICLE 5 - DELIVERY OF BIDS

5.1 Prior to the deadline set for receiving Bids, Bidders shall submit their Proposals through QuestCDN.com vBid Online Bidding according to the instructions provided in the RFP. For this project, Bids will only be received and accepted via the online electronic Bid service. Bidders shall submit their Bid Form, Bid Guaranty and all other documents required for submission. Bids received after the stated time for receipt of Bids will not be accepted.

## ARTICLE 6 - BID GUARANTY REQUIRED

6.1 In order to ensure the faithful fulfillment of its term, each Bid shall be accompanied by a Bid Guaranty. The Bid Guaranty shall be in the amount stated in the RFP on the form specified therein; if submitting a Bid Bond, it shall be of an acceptable form issued by a surety or insurance company authorized to do business in the Commonwealth of Massachusetts and satisfactory to MassCEC.

## ARTICLE 7 - WITHDRAWAL OF BIDS

7.1 A Bidder may withdraw its Bid provided the request is in writing and is in the hands of MassCEC **prior to the deadline for receipt of Bids.**

## ARTICLE 8 – NO PUBLIC OPENING OF BIDS

8.1 Bids will not be publicly opened. MassCEC will review and evaluate Bids according to the criteria and timelines set forth as provided in the RFP.

## ARTICLE 9 - REJECTION OF BIDS

9.1 Bids that are incomplete, conditional or obscure, or contain additions/deletions not called for, erasures, alterations or irregularities of any kind or in which errors occur, or that contain abnormally high or abnormally low prices for any class or item of work may be rejected.

9.2 More than one Bid from the same Bidder, whether or not the same name or different names appear on the signature page, will not be considered. Reasonable proof for believing that a Bidder is interested in more than one Bid for the Work contemplated will cause the rejection of all Bids made by the Bidder directly or indirectly.

9.3 Any or all Bids may be rejected if there is reason for believing that collusion exists among Bidders.

9.4 Bidders are advised that the Bid Form's Schedule of Bid Prices shall include a Bid price for each of the items listed in the Schedule of Bid Prices. The omission of a Bid price for any of the items is cause for rejection of all Bid prices in the Bid and the Bid itself.

9.5 No contract will be awarded except to Bidders capable of performing the class of work contemplated. Before the award of the Contract, any Bidder may be required by MassCEC to submit information in writing, in such form as MassCEC may require, showing that the Bidder has the skill, ability and integrity necessary to the faithful performance of the Work, and that the Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.

## ARTICLE 10 - DISQUALIFICATION OF BIDDERS

10.1 Bidders whose Bids have been rejected because of evidence of collusion will not be considered in future Bids for the same work and such Bidders may be disqualified from bidding on future work.

## ARTICLE 11 - MATERIAL GUARANTY

11.1 Bidders may be required to furnish, at no additional cost to MassCEC, a complete statement of the origin, composition and manufacture of any or all products/materials proposed to be used in the construction of the Work, together with samples that may be subject to testing as determined by MassCEC to determine the quality and fitness of the products/materials.

## ARTICLE 12 - CONSIDERATION OF BIDS

12.1 MassCEC reserves the right to reject any or all Bids, to waive informalities, to advertise for new Bids, or proceed to do the Work as may be deemed to be in the best interests of MassCEC.

## ARTICLE 13 - AWARD OF CONTRACT

13.1 Subject to the reservations set forth in these Instructions to Bidders and applicable law, MassCEC shall award the Contract to the Bidder whose proposal MassCEC deems provides the best overall value for the Project – based on the criteria described in the RFP. Following the receipt of Bids, MassCEC will first identify and select a short list of Bidders to be interviewed by MassCEC and its Project Team. In connection with such interviews, MassCEC reserves the right to request that the shortlisted Bidders submit such additional information as MassCEC shall require in order to evaluate such Bids. After completion of the interview process, MassCEC will finalize its evaluations of the shortlisted Bidders, in accordance with the procedures described in the RFP, and select one proposal for Contract award.

13.2 The successful Bidder will be notified in writing that their Bid has been accepted and that the Contract has been awarded.

13.3 The award of the Contract is predicated upon the availability of funds for the Project. The Contract will not be awarded if funds are not available to MassCEC for the Project.

13.4 MassCEC shall issue its Notice of Award of the Contract within 14 days after the completion of all interviews.

## ARTICLE 14 - CANCELLATION OF AWARD

14.1 MassCEC reserves the right, to be exercised in its sole discretion, to cancel the award of the Contract at any time before the execution of the said Contract by all parties thereto. In the event that MassCEC exercises this right, it shall have no liability for any costs or damages incurred by any Bidder and alleged to arise out of or related to such cancellation.

## ARTICLE 15 - RETURN OF BID GUARANTY

15.1 The Bid Guaranty in the form specified in Article 6 will be returned within 7 calendar days following the deadline for submission of Bids, except for the Bid Guaranty of any Bidders "shortlisted" by MassCEC or, as the case may be, the single Bidder MassCEC has selected for award of the Contract.

15.2 The Bid Guaranties of any shortlisted Bidders or (as the case may be) of the Bidder MassCEC selects for award will be retained by MassCEC until execution of the Contract.

15.3 If after 90 days from the opening of the Bids the Contract is not awarded by MassCEC, any or all of the shortlisted Bidders (if applicable) may request in writing that their Bid

Guaranty be returned. Bidders whose Bid Guaranties are returned will not be considered for the awarding of the Contract.

## ARTICLE 16 - PAYMENT AND PERFORMANCE BONDS REQUIRED

16.1 The successful Bidder shall provide a Performance Bond with a penal sum in the full amount of the Contract Price.

16.2 The successful Bidder shall provide a Labor and Materials Payment Bond with a penal sum in the full amount of the Contract Price.

A. The Labor and Materials Payment Bond shall remain in force until the validity of all claims is determined and if valid, are paid by the successful Bidder or its surety.

16.3 The name of the agency or agent writing these bonds shall be identified with or on the bond.

A. The bonds shall be written on a form substantially similar to the form enclosed with the RFP, or otherwise acceptable to MassCEC in its sole discretion, and furnished by a surety authorized to do business in the Commonwealth of Massachusetts.

B. All modifications, extensions of time, extra work and other changes authorized under the Contract Documents may be made without obtaining the consent of the surety.

## ARTICLE 17 – EXECUTION OF THE CONTRACT

17.1 The successful Bidder shall execute and deliver the Contract and furnish the required Agreement, Payment and Performance Bonds, American Rescue Plan Act Contract Addendum (Contractor's Certification), and applicable Certificates of Liability Insurance to MassCEC within 7 calendar days after the Notice of Award is issued.

17.2 The Contract shall consist of the Agreement, General Conditions, and Supplementary Conditions included in **Attachment 1 of the RFP**. By submitting a Bid, the Bidder acknowledges its agreement, if selected for the Project, to enter into this form of Contract and its obligation to comply with the terms and conditions therein. The Contract shall be executed in the number of copies required by MassCEC.

17.3 One (1) fully executed copy of the Contract will be delivered to the Contractor.

## ARTICLE 18 – FAILURE TO EXECUTE CONTRACT

18.1 Should the successful Bidder fail to execute the Contract as provided herein, an unaltered Contract with its contained terms or conditions along with the furnish Payment and Performance Bonds and Certificate of Liability Insurance within the time stipulated, MassCEC may, at its option, determine that the Bidder has abandoned the Contract and thereupon the Notice of Award shall be null and void and the Bid Guaranty accompanying

the Bid will be retained and collected by MassCEC not as a penalty but as liquidated damages to compensate MassCEC for all additional costs and damages incurred by MassCEC due to the failure of the Bidder to execute the Contract as required by the Bidding Documents.

## ARTICLE 19 - INTERPRETATION OF BIDDING DOCUMENTS

19.1 Bidders shall submit requests for interpretation and clarification of the Bidding Documents as specified in the RFP.

19.2 Obvious discrepancies in Bidding Documents that are not addressed by a Bidder in accordance with the above procedure will be construed against the successful Bidder should a dispute arise.

19.3 Responses to requests for interpretation will be included in addenda and will be issued electronically to all registered Planholders on QuestCDN.com. All addenda, so issued, will become part of the Bidding Documents.

## ARTICLE 20 - MASSACHUSETTS SALES AND USE TAX LAW OF 1967

20.1 The attention of the Bidders is directed to the Massachusetts Sales Tax, Chapter 64H, Section 6 and the Massachusetts Use Tax, Chapter 64I, Section 7, which states that these taxes are not applicable to the sales of construction materials and supplies incorporated, consumed, employed or expended in construction projects of the Commonwealth, any political subdivision thereof or any of their respective agencies, including MassCEC. This exemption is also applicable to rental charges for construction vehicles, equipment, and machinery rented, specifically for use on the site of MassCEC's construction projects. Bidders are directed to exclude any allowance for Sales or Use Tax from their Bid Form as said tax would relate to the foregoing specific categories.

## ARTICLE 21 – EQUAL EMPLOYMENT OPPORTUNITY

21.1 Bidders shall comply with all Equal Employment Opportunity requirements of the Contract Documents.

## ARTICLE 22 – NOT USED

## ARTICLE 23 - CERTIFICATION PERTAINING TO INELIGIBLE CONTRACTORS

23.1 Bidders are advised that the Certification Pertaining to Ineligible Contractors, included in the Bid Form, must be completed in its entirety and submitted with the Bid.

23.2 Failure to comply fully and submit the required certification may render the Bid non-responsive.

## ARTICLE 24 - BIDDER STATUS IDENTIFICATION

24.1 The Bidder's attention is directed to the Bid Form and information to be furnished regarding status identification (Corporation, Partnership, Individual, Individual Doing Business Under a Firm Name and Joint Venture).

24.2 Bidders are advised that the applicable section regarding status identification shall be complete in its entirety.

24.3 Failure to comply fully and submit the required status identification information may render the Bid non-responsive.

## ARTICLE 25 - NON-COLLUSION AFFIDAVIT

25.1 Bidders are advised that the Non-Collusion Affidavit included in the Bid Form shall be completed in its entirety and submitted with the Bid.

25.2 Failure to comply fully and submit the required affidavit may render the Bid non-responsive.

## ARTICLE 26 - RIGHT-TO-KNOW LAW CERTIFICATION

26.1 Bidders are advised that the Right-to-Know Law Certification included in the Bid Form shall be completed in its entirety and submitted with the Bid.

26.2 Failure to comply fully and submit the required certification may render the Bid non-responsive.

## ARTICLE 27 - CERTIFICATION OF DUMPING FACILITIES

27.1 Bidders are advised that the Certification of Dumping Facilities included in the Bid Form shall be completed in its entirety and submitted with the Bid.

27.2 Failure to comply fully and submit the required certification may render the Bid non-responsive.

## ARTICLE 28 – ARPA COMPLIANCE

28.1 Bidders also should note that funding for this Project contains certain federal funding made available to MassCEC through the American Rescue Plan Act of 2021 (ARPA). Your attention is directed to the "ARPA Contract Addendum" made part of the Contract forms as an **Attachment to the Agreement (Section 00525)**. The selected Bidder must comply with all terms and conditions in the ARPA Contract Addendum and will be required to separately execute that document in signing the Contract. By submitting a Bid, Bidders certify that they have reviewed these requirements and are able to comply with them if selected for the Project.

## ARTICLE 29 - INFORMATION TO BE PROVIDED BY BIDDERS

29.1 Along with their Bids, all Bidders shall submit to MassCEC a list of references. The list of references shall include the following:

A. Business References

1. Submit three (3) business references. The business references shall include the following information:
   a. Name
   b. Title
   c. Company name
   d. Company address
   e. Telephone number
   f. Relationship to Bidder

B. Project References and Project Contacts

1. Submit three (3) project references with their respective project contacts. The projects shall have been completed within the last five (5) years and shall have been of a similar type of work, scope and construction contract dollar value. The contacts shall have been involved in the project as part of the Owner's project team and have knowledge of the overall project.
   a. The project references shall include the following information:
      i. Name of Owner
      ii. Address of Owner
      iii. Name of project
      iv. Address of project
      v. Type of project
      vi. Construction contract dollar value
      vii. Start and end dates of the Work
      viii. Summary of change orders (number and total change in project cost), for each contract and a brief explanation of the basis of each change order that resulted in a change of 1% or greater in the Total Contract Price for the project.

   b. The project contacts shall include the following information:
      i. Name of contact
      ii. Title
      iii. Project responsibility
      iv. Address of contact
      v. Telephone number

C. Qualifications and Experience

1. Provide written references for at least five (5) earthwork, soil remediation and disposal, sitework, marine structures, grading and drainage projects completed in the past (5) years similar in size and scope to this Project.

2. Provide written documentation regarding your company's environmental compliance on previous projects. Provide a summary of fines for violation of environmental permit conditions, and/or commendations for exceeding permit conditions.

3. Provide written documentation regarding your company's Health and Safety program, and your company's EMR index for the past five (5) years. Provide a summary of OSHA recordable incidences.

4. Provide documentation regarding your company's management, labor resources and equipment/fleet capabilities. Identify the specific resources that will be dedicated to this project, and their specific experience.

5. Provide a narrative of your implementation plan to comply with the project schedule. Describe your planning efforts for contingencies.

6. Bidders must clearly demonstrate within their proposal the capability to successfully complete all technical aspects of the Work.

7. Provide any additional information regarding your company's resources and capabilities which are pertinent to this solicitation.

END OF SECTION

# SECTION 00400

# BID FORM

Note: This Bid Form must be submitted (along with Section 00439, Bidder's Checklist) as part of Bidder's proposal.

BIDDER'S COMPANY NAME: _____

CONTRACT NO.: _____

The undersigned Bidder hereby declares that it has carefully examined the Bidding Documents and the sites upon which the Project Work is to be performed.

The undersigned proposes to furnish all labor, products/materials, testing and equipment required for Massachusetts Clean Energy Technology Center ("MassCEC") Contract No. MACEC-FY26-02, New Bedford Marine Commerce Terminal Phase 3 Bulkhead Replacement (Site 4), for MassCEC, in accordance with the Bidding Documents for (as applicable) the unit price, lump sum and allowance prices specified in the Schedule of Bid Prices, subject to additions and deductions according to the terms of the Bidding Documents.

Accompanying this Bid Form is a Bid Guaranty in the amount of five percent (5%) of the total Bid Price that shall become the property of MassCEC if the undersigned fails to execute the Contract following receipt of MassCEC's Notice of Award and to furnish such bonds, certificates and other documents as may be required by the Bidding Documents.

The undersigned also hereby declares that it is the only Bidder interested in this Bid; that it is made without any connection with any other Bidder making any Bid for the same Work; that no person acting for, or employed by, MassCEC is directly or indirectly interested in this Bid, or in any contract which may be made under it, or in expected profits to arise therefrom; and it is made without directly or indirectly influencing or attempting to influence any other person or corporation to Bid or to refrain from bidding or to influence the Bid of any other person or corporation and that this Bid is made in good faith, without collusion or connection with any person bidding for the same work; and that this Bid is made with distinct reference and relation to the Bidding Documents prepared for this project and herein mentioned. The undersigned declares that in regard to the conditions affecting the work to be done and the labor and materials to be provided, this Bid is based solely on its own investigation and research and not in reliance upon any plans, surveys, measurements, dimensions, calculations, estimates or representations of any employee, officer, or agent of the MassCEC.

If the Bidder is a foreign corporation, it agrees, in case this Bid is accepted, to comply with the applicable provisions of Massachusetts General Laws, Chapter 156D, before the time for execution of the Contract occurs.

The undersigned Bidder proposes and agrees that within 7 days of receiving MassCEC's Notice of Award, the Bidder shall execute the Contract and furnish a Performance Bond and Payment

Bond each with a penal sum in the full amount of the Contract Price, substantially similar to the forms of bonds included in the Bidding Documents.

If this Bid is accepted, the undersigned agrees to commence Work within 7 days from the date of the mailing of the executed Contract to the Contractor unless otherwise directed in writing by MassCEC; and it shall complete the entire Work, fully and acceptably, in accordance with all obligations, terms and conditions set forth in Section 00525, Agreement.

The undersigned covenants that it has not employed or retained any company or person (other than a full-time bona fide employee working for the Contractor) to solicit or secure this Contract, and that it has not paid or agreed to pay any company or person (other than such an employee) any gift, fee, contribution, percentage, or brokerage fee contingent upon or resulting from the award of this Contract.

The Bidder warrants, represents and agrees that during the time this Contract is in effect, neither it nor any affiliated company, as hereinafter defined, shall participate in or cooperate with an international boycott, as defined in Section 999 (b) (3) and (4) of the Internal Revenue Code of 1954, as amended, or engage in conduct declared to be unlawful by Section 2 of Chapter 151E, Massachusetts General Laws. If there shall be a breach in the warranty representation and agreement contained in this paragraph, then without limiting such other rights as it may have, MassCEC shall be entitled to rescind this Contract. As used herein, an affiliated company shall be any business entity of which at least 51% of the ownership interests are directly or indirectly owned by the Bidder or by a person or persons or business entity or entities directly or indirectly owning at least 51% of the ownership interests of the Bidder, or which directly or indirectly owns at least 51% of the ownership interest of the Bidder.

This Bid includes the following ADDENDA:

_____ Date: _____

_____ Date: _____

(Bidder shall list additional ADDENDA by number and date, as necessary.)

The TOTAL BASE BID PRICE based upon the Schedule of Base Bid Prices is:

_____ Dollars
(Total Amount of Base Bid in Words)

$ _____
(Total Amount of Base Bid in Figures)

_____
(Name and Address of Bidder)

USE BLACK INK OR TYPEWRITER TO COMPLETE BID FORM, THE SCHEDULE OF BID PRICES, AFFIDAVIT, AND CERTIFICATIONS.

# SCHEDULE OF BID PRICES

| Item No. | Description | Unit | Estimated Quantity | Unit Price[2] | Estimated Total Cost |
|---|---|---|---|---|---|
| **SECTION 01 - GENERAL** | | | | | |
| 1 | MOBILIZATION / DEMOBILIZATION | LS | 1 | | $ - |
| 2 | TRAFFIC CONTROL | LS | 1 | | $ - |
| **SECTION 02 - SITE PREPARATION** | | | | | |
| 3 | SITE PREPARATION AND DEMOLITION | LS | 1 | | $ - |
| 4 | EROSION CONTROL | LS | 1 | | $ - |
| 5 | TURBIDITY CURTAIN | LS | 1 | | $ - |
| 6 | DEWATERING (DURATION OF PROJECT) | LS | 1 | | $ - |
| 7 | BYPASS PUMPING, STORM DRAIN (DURATION OF PROJECT) | LS | 1 | | $ - |
| 8 | BUILDING INSPECTIONS (PRE/POST-CONSTRUCTION PER SPEC) | LS | 1 | | $ - |
| 9 | VIBRATION MONITORING | LS | 1 | | $ - |
| 10 | CONSTRUCTION STAGING & SITE ACCESS (GRADING, SURFACING AND CONSTRUCTION PHASE MAINTENANCE) | LS | 1 | | $ - |
| **SECTION 03 - SITE CIVIL & UTILITIES** | | | | | |
| 11 | DENSE GRADED AGGREGATE (FURNISH AND INSTALL) | TON | 2400 | | $ - |
| 12 | PREPARATION OF SUBGRADE | SY | 282 | | $ - |
| 13 | GEOGRID - TENSAR INTERAX NXF GEOGRID (FURNISH AND PLACE) | SY | 230 | | $ - |
| 14 | GEOTEXTILE – TENSAR INTERAX NXF FILTERGRID (FURNISH AND PLACE) | SY | 480 | | $ - |
| 15 | GEOTEXTILE - MIRAFI 140 N (FURNISH AND PLACE) | SY | 388 | | $ - |
| 16 | WATERPROOFING MEMBRANE & MIRAFI SER G DRAINAGE COMPOSITE (FURNISH AND INSTALL) | SY | 1567 | | $ - |
| 17 | STEEL SHEET PILE, AZ19-700 (FURNISH AND INSTALL) | LF | 1172 | | $ - |
| 18 | SHEET PILE CAP, CAST IN PLACE CONCRETE (3'-0" x 2'-6") (FURNISH AND INSTALL) | CY | 19 | | $ - |
| 19 | STORM DRAIN MANHOLE - PILE SUPPORTED CAST-IN-PLACE CONCRETE MANHOLE (FURNISH AND INSTALL) | LS | 1 | | $ - |

For Reference Only

| Item No. | Description | Unit | Estimated Quantity | Unit Price[(2)] | Estimated Total Cost |
|---|---|---|---|---|---|
| 20 | STORM DRAIN PIPE REPLACEMENT (72-IN DIA. CLASS 4 RCP) | LS | 1 | | $ - |
| 21 | UNDERDRAIN MANHOLE - CIRCULAR LEACHING PIT (48-IN ID PRECAST W/ H-25 FRAME AND LID) | LS | 1 | | $ - |
| 22 | LATERAL UNDERDRAIN AGGREGATE - 1-1/2" WASHED CRUSHED STONE (FURNISH AND PLACE) | TON | 154 | | $ - |
| 23 | WATER SYSTEM MODIFICATIONS | LS | 1 | | $ - |
| 24 | CHAIN LINK FENCE, 8 FT SECURITY - TEMPORARY CONSTRUCTION (FURNISH AND INSTALL) | LF | 150 | | $ - |
| 25 | CHAIN LINK FENCE, 8 FT SECURITY - BLACK VINYL COATED ON CONCRETE CAP (FURNISH AND INSTALL) | LF | 126 | | $ - |
| **SECTION 04 - SITE EXCAVATION & DREDGE DISPOSAL** | | | | | |
| 26 | SITE EXCAVATION & SOIL MANAGEMENT | LS | 1 | | $ - |
| 27 | DISPOSAL OF UNSUITABLE SOIL (ENVIRONMENTAL PCBS <1 PPM) | TON | 500 | | $ - |
| 28 | DREDGE (MOBILIZATION / DEMOBILIZATION) | LS | 1 | | $ - |
| 29 | EXCAVATION & DISPOSAL AT CAD CELL NO.3 (RELIEVING PLATFORM LEVEL - ABOVE EL 5.0) | CY | 1,365 | | $ - |
| 30 | DREDGE & DISPOSAL AT CAD CELL NO.3 (BELOW EL 5.0 AND EXISTING CELLULAR COFFERDAMS) | CY | 9,110 | | $ - |
| 31 | MECHANICAL TREATMENT - DREDGING OF ROCK & DISPOSAL AT CAD CELL NO.3 | CY | 100 | | $ - |
| **SECTION 05 - COMBI WALL BULKHEAD (NORTH/SOUTH)** | | | | | |
| 32 | STEEL PIPE KING PILE, 30-INCH X 1-INCH WALL ROCK SOCKETED (FURNISH AND INSTALL) | EA | 25 | | $ - |
| 33 | STEEL SHEET PILE, AZ17-770 (SHEETING, WALES, AND CAP) (FURNISH AND INSTALL) | LS | 1 | | $ - |
| 34 | HP12X89 SUPPORT PILES, ROCK SOCKETED AT 72-INCH STORM DRAIN PENETRATION (FURNISH AND INSTALL) | EA | 2 | | $ - |
| 35 | DRILLED ROCK ANCHOR ASSEMBLY (FURNISH AND INSTALL) | EA | 15 | | $ - |

For Reference Only

| Item No. | Description | Unit | Estimated Quantity | Unit Price[(2)] | Estimated Total Cost |
|---|---|---|---|---|---|
| 36 | STAINLESS STEEL PONTOON FLAP GATE AT 72-INCH STORM DRAIN (FURNISH AND INSTALL) | LS | 1 | | $ - |
| 37 | GROUT PLUG (CLOSURE OF MUDLINE TO TOP OF EXISTING SOUTH TERMINAL MAJOR CELL) | LS | 1 | | $ - |
| 38 | TEMPORARY SHEET PILE WALLS - EXISTING RELIEVING PLATFORM DEMOLITION (FURNISH, INSTALL AND REMOVE) | LS | 1 | | $ - |
| **SECTION 06 - COMBI WALL BULKHEAD (EAST/WEST)** | | | | | |
| 39 | W14X311 ROCK SOCKETED KING PILES (FURNISH AND INSTALL) | EA | 7 | | $ - |
| 40 | STEEL SHEET PILE, AZ17-770 (FURNISH AND INSTALL) | LF | 994 | | $ - |
| 41 | BULKHEAD TOE PINS (FURNISH AND INSTALL) | LS | 1 | | $ - |
| 42 | SHEET PILE CAP, CAST IN PLACE CONCRETE (FURNISH AND INSTALL) | CY | 15 | | $ - |
| 43 | CAST IN PLACE CONCRETE BEAM (18-IN x 18-IN) (FURNISH AND INSTALL) | CY | 8 | | $ - |
| 44 | INFILL GRATING COVER ASSEMBLY (FURNISH AND INSTALL) | SF | 530 | | $ - |
| **SECTION 07 - MINOR CELL CLOSURE SHEET PILE AND RETAINING WALL** | | | | | |
| 45 | BURIED CLOSURE WALL, CAST IN PLACE CONCRETE AT EXISTING RELIEVING PLATFORM (FURNISH AND INSTALL) | LS | 1 | | $ - |
| 46 | W14X311 ROCK SOCKETED KING PILES (FURNISH AND INSTALL) | EA | 1 | | $ - |
| 47 | 24-INCH X 1-INCH ROCK SOCKETED PIPE PILE WITH REINFORCED CONCRETE PILE CONNECTIONS (FURNISH AND INSTALL) | EA | 1 | | $ - |
| 48 | STEEL SHEET PILE, AZ17-770 WITH TOE PINS (FURNISH AND INSTALL) | LF | 237 | | $ - |
| 49 | GROUT PLUG (CLOSURE BETWEEN WEST-END OF RETAINING WALL AND COMBI WALL) | LS | 1 | | $ - |
| 50 | STRUCTURAL CLOSURE OF MINOR CELL (FURNISH AND INSTALL) | LS | 1 | | $ - |
| 51 | GROUT PLUG (TOE CLOSURE SEAL AT BOTTOM OF SHEETPILES) | LS | 1 | | $ - |
| 52 | STRUCTURAL CLOSURE BACKFILL (SANDY FILL) OF MINOR CELL TO EL 5.0 (FURNISH AND INSTALL) | CY | 88 | | $ - |

For Reference Only

| Item No. | Description | Unit | Estimated Quantity | Unit Price[(2)] | Estimated Total Cost |
|---|---|---|---|---|---|
| 53 | SHEET PILE CAP, CAST IN PLACE CONCRETE AT MINOR CELL CLOSURE (4'-0" x 4'-3") (FURNISH AND INSTALL) | CY | 12 | | $ - |
| 54 | RETAINING WALL, CAST IN PLACE CONCRETE (FURNISH AND INSTALL) | CY | 32 | | $ - |
| 55 | STRUCTURAL BACKFILL (GRAVEL BORROW) AT RETAINING WALL (FURNISH AND INSTALL) | CY | 59 | | $ - |
| 56 | PORTLAND CEMENT CONCRETE PAVEMENT, 5-IN AT RETAINING WALL (FURNISH AND INSTALL) | SY | 35 | | $ - |
| **SECTION 08 - RELIEVING PLATFORM STRUCTURE** | | | | | |
| 57 | 30-INCH X 1-INCH WALL ROCK SOCKETED PIPE PILES AT ROWS A & B (FURNISH AND INSTALL) | EA | 22 | | $ - |
| 58 | 30-INCH X 1-INCH WALL PIPE PILES AT ROWS C, D, E, AND F (FURNISH AND INSTALL) | EA | 32 | | $ - |
| 59 | 30-INCH X 1-INCH WALL ROCK SOCKETED PIPE PILES AT ROWS C, D, AND E (FURNISH AND INSTALL) | EA | 12 | | $ - |
| 60 | 30-INCH X 1-INCH WALL PIPE PILES AT ROWS H AND I (FURNISH AND INSTALL) | EA | 12 | | $ - |
| 61 | 30-INCH X 1-INCH WALL PIPE PILES AT ROW G (FURNISH AND INSTALL) | EA | 17 | | $ - |
| 62 | PRECAST PILE CAP SUPPORT PLATE ASSEMBLIES (FURNISH AND INSTALL) | EA | 66 | | $ - |
| 63 | REINFORCED CONCRETE PILE CONNECTIONS FOR 30-INCH DRIVEN PIPE PILES – ROWS C, D, E AND F (FURNISH AND INSTALL) | EA | 32 | | $ - |
| 64 | REINFORCED CONCRETE PILE CONNECTIONS FOR 30-INCH ROCK SOCKETED PIPE PILES – ROWS A, B, C, D, E, AND F (FURNISH AND INSTALL) | EA | 34 | | $ - |
| 65 | REINFORCED CONCRETE PILE CONNECTIONS FOR 30-INCH DRIVEN PIPE PILES – ROW G (FURNISH AND INSTALL) | EA | 17 | | $ - |
| 66 | REINFORCED CONCRETE PILE CONNECTIONS FOR 30-INCH DRIVEN PIPE PILES – ROW H AND I (FURNISH AND INSTALL) | EA | 12 | | $ - |
| 67 | PRECAST PLANKS (PCP) – TYPE 1, TYPE 2, TYPE 3, AND TYPE 4 (FURNISH AND INSTALL) | LS | 1 | | $ - |

For Reference Only

| Item No. | Description | Unit | Estimated Quantity | Unit Price[(2)] | Estimated Total Cost |
|---|---|---|---|---|---|
| 68 | PRECAST PILE CAPS BEAMS TYPE PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, PC-10, AND PC-11 (FURNISH AND INSTALL) | LS | 1 | | $ - |
| 69 | CAST IN PLACE CONCRETE EAST/WEST BEAMS - ROW 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, AND 11 (FURNISH AND INSTALL) | CY | 500 | | $ - |
| 70 | CAST IN PLACE CONCRETE NORTH/SOUTH BEAMS - ROW A (FURNISH AND INSTALL) | CY | 265 | | $ - |
| 71 | CAST IN PLACE CONCRETE NORTH/SOUTH BEAMS - ROW B, C, D, E, AND F (FURNISH AND INSTALL) | CY | 515 | | $ - |
| 72 | CAST IN PLACE CONCRETE NORTH/SOUTH BEAMS - ROW G (FURNISH AND INSTALL) | CY | 236 | | $ - |
| 73 | CAST IN PLACE CONCRETE NORTH/SOUTH BEAMS - ROW I (FURNISH AND INSTALL) | CY | 94 | | $ - |
| 74 | CAST IN PLACE CONCRETE PLATFORM SLAB (FURNISH AND INSTALL) | CY | 750 | | $ - |
| 75 | CAST IN PLACE CONCRETE BOLLARD PADS (FURNISH AND INSTALL) | CY | 19 | | $ - |
| 76 | CAST-IN-PLACE CONCRETE UTILITY TRENCH - EAST/WEST (FURNISH AND INSTALL) | LF | 86 | | $ - |
| 77 | CAST-IN-PLACE CONCRETE UTILITY TRENCH - NORTH/SOUTH (FURNISH AND INSTALL) | LF | 182 | | $ - |
| **SECTION 09 - MISCELLANEOUS** | | | | | |
| 78 | CATHODIC PROTECTION SYSTEM / ALUMINUM ANODES (KING PILES AND SHEETS) FOR NORTH/SOUTH BULKHEAD (FURNISH AND INSTALL) | LS | 1 | | $ - |
| 79 | CATHODIC PROTECTION SYSTEM / ALUMINUM ANODES (KING PILES AND SHEETS) FOR EAST/WEST BULKHEAD AND NORTH CLOSURE (FURNISH AND INSTALL) | LS | 1 | | $ - |
| 80 | CATHODIC PROTECTION SYSTEM FOR RELIEVING PLATFORM PIPE PILES (FURNISH AND INSTALL) | LS | 1 | | $ - |

For Reference Only

| Item No. | Description | Unit | Estimated Quantity | Unit Price(2) | Estimated Total Cost |
|---|---|---|---|---|---|
| 81 | DENSO SEASHIELD 2000HD© ANTI-CORROSION PROTECTION SYSTEM AT PILE ROW A - INSTALLED LENGTH BOTTOM OF PRECAST PILE CAP TO 10-FEET BELOW MLLW (FURNISH AND INSTALL) - 30" DIA PILES | EA | 11 | | $ - |
| 82 | DENSO SEASHIELD 2000HD© ANTI-CORROSION PROTECTION SYSTEM AT PILE ROWS A - INSTALLED LENGTH BOTTOM OF PRECAST PILE CAP TO 10-FEET BELOW MLLW (FURNISH AND INSTALL) - 24" DIA PILES | EA | 3 | | $ - |
| 83 | DENSO SEASHIELD SERIES 70© FIBERGLASS PILE WRAP SYSTEM - PILE ROWS A, B, C, D, E, AND F INSTALLED LENGTH BOTTOM OF PRECAST PILE CAP TO 1-FOOT BELOW MUDLINE (FURNISH AND INSTALL) | VF | 1592 | | $ - |
| 84 | UTILITY TRENCH GRATING COVER ASSEMBLY - EAST/WEST (FURNISH AND INSTALL) | SF | 556 | | $ - |
| 85 | UTILITY TRENCH GRATING COVER ASSEMBLY - NORTH/SOUTH (FURNISH AND INSTALL) | SF | 971 | | $ - |
| 86 | ZALDA SC-1150 SER PANEL FENDER ASSEMBLY, HDPE FACED (FURNISH AND INSTALL) | EA | 6 | | $ - |
| 87 | ZALDA SBD-1 (200-225 METRIC TON) MOORING BOLLARDS (FURNISH AND INSTALL) | EA | 3 | | $ - |
| 88 | SLOPE PROTECTION - ARMORFLEX© 70L CONCRETE MATTRESS SYSTEM (FURNISH AND INSTALL) | LS | 1 | | $ - |
| 89 | SLOPE PROTECTION - RIP RAP ARMOR STONE (FURNISH AND INSTALL) | TON | 136 | | $ - |
| 90 | SAFETY LADDERS (FURNISH AND INSTALL) | EA | 2 | | $ - |
| 91 | SILT CURTAINS AND PILES AT CAD CELL NO.3 (FURNISH, INSTALL, MAINTAIN & DISPOSAL) | LS | 1 | | $ - |
| 92 | CONSTRUCTION PERMITTING (ALLOWANCE) | LS | 1 | $25,000.00 | $25,000.00 |

For Reference Only

**NOTES: Schedule of Bid Prices**

(1) Identified quantities are estimates for comparison purposes only. Actual quantities will be determined in accordance with Section 01 22 00, Measurement and Payment. All volumes based on as constructed and completed quantities.

(2) Bidders' unit prices listed herein are assumed to include all costs of labor, materials, and equipment necessary to complete the full scope of work required by the Contract Documents for the corresponding Bid Item, even where actual quantities differ substantially from the estimated quantities listed herein.

The Bidder agrees that it shall be a condition of its Bid, and shall be made a condition of each subcontract entered into pursuant to the Bid, that the Bidder and any of its subcontractors shall not require any laborer or mechanic employed in performance of the Work to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous to its health or safety, as determined under construction safety and health standards (Title 29, Code of Federal Regulations, Part 1518, published in the Federal Register on April 17, 1971) promulgated by the United States Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act, (83 Stat. 96).

The undersigned hereby certifies that it is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.

The Bidder certifies herein, under penalty of perjury, that the information contained within its bid is accurate and complete.

Full name and address of the individual or concern submitting this Bid:

Date: _____, 20 ____

Name of Bidder: _____

Signed: _____

Title: _____

Address: _____

NOTICE: The Bid Form should be signed by a person having proper legal authority, and the person's title should be given, such as "owner" in the case of an individual, "partner" in the case of a general partnership, "president," "treasurer" or other authorized officer in the case of a Corporation.

NOTE: BIDDER MUST SET FORTH ACCURATE AND COMPLETE INFORMATION AS REQUIRED BY THIS SOLICITATION. FAILURE TO DO SO MAY RENDER THE OFFER NON-RESPONSIVE OR UNACCEPTABLE.

**NOTE: A BIDDER WILL NOT BE ELIGIBLE FOR AWARD OF THIS CONTRACT UNLESS SUCH BIDDER HAS TRUTHFULLY COMPLETED AND SUBMITTED AS A PART OF ITS BID ALL OF THE FOLLOWING CERTIFICATIONS, WHICH WILL BE DEEMED A PART OF THE RESULTING CONTRACT.**

# BIDDER STATUS IDENTIFICATION

NOTE: IF THE BIDDER IS A CORPORATION, INDICATE STATE OF INCORPORATION; IF A PARTNERSHIP, GIVE FULL NAMES AND ADDRESSES OF ALL PARTNERS; IF AN INDIVIDUAL, GIVE RESIDENTIAL ADDRESS IF DIFFERENT FROM BUSINESS ADDRESS; AND IF JOINT VENTURES, GIVE NAMES AND ADDRESSES OF ALL FIRMS OF THE JOINT VENTURE.

If a CORPORATION:

Incorporated in what State: _____

President: _____

Treasurer: _____

Secretary: _____

If a PARTNERSHIP (Name all Partners):

Name of Partner: _____

Residence: _____

Name of Partner: _____

Residence: _____

If an INDIVIDUAL:

Name: _____

Residence: _____

If an INDIVIDUAL DOING BUSINESS UNDER A FIRM NAME:

Name of Firm: _____

Name of Individual: _____

Business Address: _____

Residence: _____

If a JOINT VENTURE:

Name of Venture: _____

Business Address: _____

Name of Firm or Corporation: _____

Address: _____

Name of Firm or Corporation: _____

Address: _____

Name of Firm or Corporation: _____

Address: _____

Name of Firm or Corporation: _____

Address: _____

If any of the joint ventures is a corporation, a copy of the vote of the corporation authorizing the joint venture should be attached hereto.

The proposed Surety on the bond to be given is:

Name: _____

Home office Address: _____

Massachusetts Address (If Different): _____

# CERTIFICATION PERTAINING TO INELIGIBLE CONTRACTORS

Date: _____ , 20 _____

A. The _____
(Name and Address of Bidder)

hereby certifies that it is not included on the Commonwealth of Massachusetts - EOAF/DCPO - List of Debarred or Suspended Contractors, the Concerns on Debarment List from the Massachusetts Attorney General's Fair Labor and Business Practices Division, and is not subject to debarment or proposed debarment notice from any federal agency or official.

_____
(Signature of Authorized Representative of Bidder)

_____
(Title)

# CERTIFICATION PERTAINING TO UNDOCUMENTED WORKERS

As evidenced by the signature of the Bidder's authorized representative below, the Bidder certifies under the pains and penalties of perjury that the Bidder shall not knowingly use undocumented workers in connection with the performance of any MassCEC contract; that pursuant to federal and state requirements, the Bidder shall verify the immigration status of all workers assigned to such contracts without engaging in unlawful discrimination; and that the Bidder shall not knowingly or recklessly alter, falsify, or accept altered or falsified documents from any such worker(s). The Bidder understands and agrees that breach of any of these terms during the period of each contract may be regarded as a material breach, subjecting the Bidder to sanctions, including but not limited to monetary penalties, withholding of payments, contract suspension or termination.

_____

Bidder Authorized Signature

_____

Printed Name

_____

Date

Title_____ Telephone:_____

Email:_____

# NON-COLLUSION AND TAX COMPLIANCE FORM

## CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club or other organization, entity or group of individuals.

_____

Signature of individual submitting bid

_____

Name of business/organization

## TAX COMPLIANCE CERTIFICATION

Pursuant to M.G.L. c. 62C, §49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I am in compliance with all laws of the Commonwealth relating to taxes reporting of employees and contractors, and withholding and remitting child support.

_____

Signature of person submitting bid

_____

Name of business

# RIGHT-TO-KNOW LAW CERTIFICATION

The Bidder hereby certifies that, if awarded this Contract, it will fully comply with the Massachusetts Right-to-Know Law, c. 470 of the Acts of 1983 (the Act). In addition, it shall:

1. Obtain a Safety Data Sheet (SDS), for all substances or mixtures of substances which appear on the Massachusetts Substance List that it or any of its subcontractors brings to or uses on the work site and will keep a copy of that SDS on the work site of this Contract.

2. Label each container of a substance or mixture of substances on the Massachusetts Substance List as required in §7 of the Act.

3. Provide the same training and non-technical instruction that it is required to provide under §15 of the Act to all Massachusetts Clean Energy Technology Center (MassCEC) representatives and their authorized representatives who are exposed to the substance or to the mixture of substances. Training shall include instruction on the nature and effects of any substance or mixture of substances listed on the Massachusetts Substance List which the Bidder or any of its subcontractors brings to or uses on the work site. Training and non-technical instruction shall be provided to all MassCEC representatives and its authorized representatives, at no additional cost to the MassCEC.

4. Provide to the MassCEC representatives and its authorized representatives on the work site the same protective equipment that the Bidder or any of its subcontractors provides to its employees. Equipment shall be provided to all MassCEC representatives and its authorized representatives, at no additional cost to the MassCEC.

Date: _____ , 20 _____

_____
Signature of Authorized Representative of Bidder

_____
Name and Address of Bidder

# OSHA CERTIFICATION REQUIREMENT

I, _____, as _____, of the
(Print Name) (Position with the entity submitting bid)

joint venture/corporation/partnership or other legal entity submitting this bid for a project, do hereby certify that any and all employees found on my worksite for this project have, or will have by the start of their work on the project, successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration (OSHA) that was at least 10 hours in duration.

A copy of the OSHA completion cards for each employee must be submitted to the Massachusetts Clean Energy Technology Center before work on this project is to begin and must be supplemented as new employees are hired or contracted to work on this project.

_____, as
Signature

_____, of
Position

_____, on
Company/Corporation/Joint Venture/Partnership/etc.

_____
Date

## CERTIFICATION OF CONSTRUCTION EQUIPMENT STANDARD COMPLIANCE

The _____
(Name and Address of Bidder)

hereby certifies that all diesel construction equipment used in this Contract has emission control devices installed, such as oxidation catalysts or particulate filters on the exhaust system side of the diesel combustion engine equipment.

Date: _____ , 20 _____

_____
Signature of Authorized Representative of Bidder

_____
Name and Address of Bidder

# CERTIFICATION OF DUMPING FACILITIES

I, _____

_____
(Name and Address of Bidder)

certify that I have adequate dumping facilities available at:

_____

_____
(Name and Address of Disposal Site)

and that these facilities are to be used in connection with work undertaken on this Contract and that such use is to be in a manner compliant with federal, state and local requirements.

Date: _____ , 20 _____

_____
Signature of Authorized Representative of Bidder

_____
Name and Address of Bidder

END OF SECTION

# SECTION 00430

# BID BOND (PENAL SUM FORM)

| | |
|---|---|
| **Bidder**<br>Name: **[Full formal name of Bidder]**<br>Address *(principal place of business)*:<br>**[Address of Bidder's principal place of business]** | **Surety**<br>Name: **[Full formal name of Surety]**<br>Address *(principal place of business)*:<br>**[Address of Surety's principal place of business]** |
| **Owner**<br>Name: **[Full formal name of Owner]**<br>Address *(principal place of business)*:<br>**[Address of Owner's principal place of business]** | **Bid**<br>Project *(name and location)*:<br>**[Owner project/contract name, and location of the project]**<br><br>Bid Due Date: **[Enter date bid is due]** |
| **Bond**<br>Penal Sum: **[Amount]**<br>Date of Bond: **[Date]** | |
| Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative. | |
| Bidder<br><br>*(Full formal name of Bidder)*<br>By: _____<br>*(Signature)*<br>Name: _____<br>*(Printed or typed)*<br>Title: _____<br><br>Attest: _____<br>*(Signature)*<br>Name: _____<br>*(Printed or typed)*<br>Title: | Surety<br><br>*(Full formal name of Surety) (corporate seal)*<br>By: _____<br>*(Signature) (Attach Power of Attorney)*<br>Name: _____<br>*(Printed or typed)*<br>Title: _____<br><br>Attest: _____<br>*(Signature)*<br>Name: _____<br>*(Printed or typed)*<br>Title: |
| *Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.* | |

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1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
   3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
   3.2. All Bids are rejected by Owner, or
   3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

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10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term “Bid” as used herein includes a Bid, offer, or proposal as applicable.

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SECTION 00 43 36

TABULATION OF SUBCONTRACTORS/SUPPLIER

The following subcontractors will be utilized for portions of the project work. Changes shall not be made subsequent to the bid unless the change(s) is approved by the Owner.

| Subcontractor/Supplier | Classification of Work | Estimated Dollar Amount |
|---|---|---|
| | | $ |
| | | $ |
| | | $ |
| | | $ |
| | | $ |
| | | $ |
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| | | $ |
| | | $ |
| | | $ |
| | | $ |

END OF SECTION

SECTION 00439

BIDDER'S CHECKLIST
(Submit this Checklist with your Bid Submittal)

_____
**(Bidder/Company Name)**

_____
**(Date/Time Bid Received)**

| Submittal Items with Bid | Section/Page(s) | | Check if Present |
|---|---|---|---|
| | Requirement | Form | |
| Bid Form with Valid Signature | 00200-3,4 | 00400-5 | |
| Acknowledgement of all Addenda | 00200-3 | On Quest | |
| Bid Guaranty (Bid Bond) | 00200-4 | 00430 | |
| Bidder Status Identification | 00200-9 | 00400-8,9 | |
| Certification Pertaining to Ineligible Contractors | 00200-8 | 00400-10 | |
| Certification Pertaining to Undocumented Workers | (refer to form) | 00400-11 | |
| Non-Collusion and Tax Compliance Form | 00200-3,5,9 | 00400-12 | |
| Right-to-Know Law Certification | 00200-9 | 00400-13 | |
| OSHA Certification Requirement | 00200-10 (refer to form) | 00400-14 | |
| Certification of Construction Equipment Standard Compliance | 00200-10 | 00400-15 | |
| Certification of Dumping Facilities | 00200-9 | 00400-16 | |
| Business References | 00200-9 | (Contractor) | |
| Project References | 00200-9,10 | (Contractor) | |
| Labor Resources/Major Equipment | 00200-10 | (Contractor) | |
| Qualifications/Experience/Safety Record | 00200-10 | (Contractor) | |
| Plant and Equipment Schedule | 01 60 00-1 | (Contractor) | |
| Deviations from Technical Specifications (if applicable) | | (Contractor) | |
| Implementation Plan with Project Schedule | 00200-10 | (Contractor) | |

SECTION 00525

AGREEMENT BETWEEN OWNER AND GENERAL CONTRACTOR

THIS AGREEMENT, entered into this ____ day of _____, 20_____, between the "Owner": MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER

Mailing Address: 294 Washington Street, Suite 1150, Boston, MA 02108

and _____,
(hereinafter the "Contractor"):

Mailing Address: _____

Representative:_____

For the following Project:

Contract No. **MACEC-FY26-02**, for construction of the project known as the New Bedford Marine Commerce Terminal Phase 3 Bulkhead Replacement (Site 4) (hereinafter the "Project").

The Owner and Contractor agree as follows:

**ARTICLE 1 – THE WORK**

1.01 The Contractor agrees to furnish all equipment, machinery, tools and labor, to furnish and deliver all materials required to be furnished and delivered in and about the improvement and to do and perform all work for construction of the Project in strict conformity with the Contract Documents as herein defined.

**ARTICLE 2 – THE PROJECT**

2.01 The Project for which the Work is to be performed under the Contract Documents is the New Bedford Marine Commerce Terminal Phase 3 Bulkhead Replacement (Site 4).

**ARTICLE 3 – THE ENGINEER**

3.01 The Project Drawings indicate the firm and responsible professional whose stamp contained therein for Engineering on this project.

## ARTICLE 4 – THE CONTRACT TIME

4.01 Time is of the essence of the Contract, including with respect to all time limits and completion dates for Substantial Completion and Final Completion and readiness for final payment as stated in the Contract Documents.

4.01.1 The Owner anticipates the Notice to Proceed to be issued for start of construction activities within 30 calendar days of the Notice of Award.

Issue Notice of Award: **December 23, 2025** (anticipated)
Issue Notice to Proceed: **January 20, 2026** (anticipated)

4.02 Dates of Commencement, Substantial Completion, and Final Payment

4.02.1 The Contractor shall commence the Work in accordance with Article 3.11 of the General Conditions. The Contractor shall Substantially Complete the Work within **475 calendar days** from the issuance of the Notice to Proceed, subject to adjustments to the Contract Time in accordance with the Contract Documents.

4.02.2 Final Acceptance shall occur **30 calendar days** following satisfactory completion of Owner submitted punch list items, as approved by the Owner.

## ARTICLE 5 – DELAYS; LIQUIDATED DAMAGES

5.01 Time is of the essence of the Contract. Subject only to Section 5.06 below, Contractor's remedies for delays to the Work are governed by Article 6 of the General Conditions.

5.02 In the event of Contractor Delays to Substantial Completion of the Work, damages will be assessed not as a penalty, but as liquidated compensatory damages, in the amount of **$2,000.00 per calendar day**, in accordance with Article 6.02 of the General Conditions.

5.03 Notice to Proceed Condition

5.03.1 If the Notice to Proceed is issued subsequent to the date specified in the Contract Documents, liquidated damages will be adjusted accordingly on a day-for-day basis if the delay is caused by the Owner. If the Contractor causes the delay, no adjustment will be made in completion dates. Any approval issued by the Owner will not be considered as a basis for attributing cause for the delay to the Owner.

5.03.2 All other delays to the Work are subject to Article 6 of the General Conditions and applicable related provisions of the Contract Documents.

## ARTICLE 6 – THE CONTRACT PRICE

6.01 The Owner shall pay the following as full and complete consideration to the Contractor for the performance of all Work required by the Contract Documents, including all obligations, terms, and conditions therein, subject only to additions or deductions which are set forth in properly executed Change Orders as provided for in the General Conditions, or additions or deductions in connection with the Owner's rights as set forth in the Contract Documents.

Total Contract Price:_____(dollars)

($_____)

Schedule(s) of Prices (if applicable): The Schedule(s) of Prices are as set forth in the Contractor's Bid dated: _____.

6.02 Unit Pricing

6.02.1 When compensation for any matter is based on unit pricing, the Owner shall pay only based on the actual quantities used or constructed in accordance with the Contract Documents. As provided in Article 7 of the General Conditions, the Owner will determine the actual quantities and classifications of unit price work, and pricing for unit price work shall include all costs. The Contractor shall execute a Change Order to account for any variations in the actual quantities or classifications of unit price work.

6.02.2 Contractor shall not be entitled to compensation for increased costs due to quantity increases or decreases relative to the estimated quantities listed in the Project bid documents except as provided in Article 2.05 of the General Conditions. Contractor shall be compensated only at the unit pricing contained in Contractor's bid multiplied by the actual quantities as determined by the Owner in accordance with the Contract Documents.

6.03 Extra Work

6.03.1 The Total Contract Price shall only be modified by a Change Order. No compensation will be paid for any new, additional, or extra work unless set forth in a Change Order. The Owner has the right, and without notice to any surety, to modify or amend the Contract Documents and the Total Contract Price by enlarging or restricting the scope of the Work.

6.04 No Compensation for Escalation Costs

6.04.1 Contractor shall not be entitled to compensation for any claimed additional costs related to escalation including but not limited to increased costs of materials, labor, deliveries, or other claimed cost increases due to unusual market conditions, however caused, including tariffs on imported or exported goods or materials that may be imposed by the United States government or other countries.

## ARTICLE 7 – THE CONTRACT DOCUMENTS

7.01 The Contract Documents consist of the following, as amended:

1. Executed Change Orders or duly signed, mutual modifications
2. Supplementary Conditions
3. General Conditions
4. Issued for Construction Drawings and Specifications
5. This Agreement
6. Bid Form/Proposal
7. Request for Proposal (including Addenda and attachments)
8. Performance Bond
9. Payment Bond

7.02 The order of precedence of the Contract Documents is set forth in Article 9 of the General Conditions.

## ARTICLE 8– OWNER'S AND CONTRACTOR'S REPRESENTATIVES

8.01 The Owner's Representative is:

Jeannie Houde - Terminal Manager
Massachusetts Clean Energy Technology Center
jhoude@MassCEC.com
774-226-0066

8.02 The Program/Project Manager is:

Doug Ernst - Project Director
Foth Infrastructure & Environment, LLC
doug.ernst@foth.com
515-491-8852

WITNESS WHEREOF, Owner and Contractor have entered into this Agreement under seal as of the day and year first written above.

| Owner: | Contractor: |
| --- | --- |
| MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER | _____ |
| _____ | _____ |
| Signature | Signature |
| _____ | _____ |
| By: Name & Title | By: Name & Title |
| _____ | _____ |
| Date | Date |

# VOTE OF CORPORATION AUTHORIZING EXECUTION OF CONTRACT

At a meeting of the Board of Directors of _____ duly called and held on _____ at which a quorum was present and acting throughout, the following vote was duly adopted.

VOTED: That _____ _____ of the corporation be and hereby is authorized to sign the contract and deliver in the name and on behalf of corporation a contract with:

**MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER**

For performing services, all in such form and on such terms and conditions as he/she, by the execution thereof, shall deem proper.

A true copy:

(Affix Corporate Seal)

_____

Clerk of the Corporation

END OF SECTION

# AMERICAN RESCUE PLAN ACT CONTRACT ADDENDUM
## (Contractor's Certification)

**American Rescue Plan Act (ARPA) Contract Addendum**

The contract to which this addendum is attached ("Contract") is funded with federal assistance provided to the Commonwealth of Massachusetts by the U.S. Department of Treasury ("Treasury") under the American Rescue Plan Act ("ARPA Funds"), Sections 602(b) and 603(b) of the Social Security Act, Pub. L. No. 117-2. As a result, the Contract is subject to certain provisions of the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards in 2 C.F.R. Part 200, other than such provisions as Treasury has determined or may determine are inapplicable to the ARPA Funds. In addition, pursuant to 2 C.F.R. §200.327, the Contract must include applicable provisions described in Appendix II to 2 C.F.R. Part 200, each of which is contained in this Addendum.

The following terms and conditions apply to you (the "Contractor" or "Vendor"), as a Contractor of the Massachusetts Clean Energy Technology Center, and are hereby made part of the Contract.

**A. Equal Employment Opportunity**. During the performance of this Contract, Contractor agrees as follows:

1. Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. Contractor will, in all solicitations or advertisements for employees placed by or on behalf of Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

3. Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or

action, including an investigation conducted by the employer, or is consistent with Contractor's legal duty to furnish information.

4. Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

5. Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

6. Contractor will furnish to the Administering Agency (as specified in 41 C.F.R. §60-1.3) and the Secretary of Labor all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Administering Agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

7. In the event of Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended, in whole or in part, and Contractor may be declared ineligible for further government contracts or Federally Assisted Construction Contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965. Such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

8. Contractor will include the portion of the sentence immediately preceding paragraph A.1. of this section and the provisions of paragraphs A.1. through A.7. in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor

or vendor. Contractor will take such action with respect to any subcontract or purchase order as the Administering Agency may direct as a means of enforcing such provisions, including sanctions for noncompliance.

Provided, however, that in the event Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Administering Agency, Contractor may request the United States to enter into such litigation to protect the interests of the United States.

9. MassCEC agrees that it will assist and cooperate actively with the Administering Agency and the Secretary of Labor in obtaining the compliance of Contractor and any subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor; that it will furnish the Administering Agency and the Secretary of Labor such information as they may require for the supervision of such compliance; and that it will otherwise assist the Administering Agency in the discharge of the agency's primary responsibility for securing compliance.

10. MassCEC further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a Contractor debarred from, or who has not demonstrated eligibility for, Government contracts and Federally Assisted Construction Contracts pursuant to the Executive Order and that it will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon Contractor and any subcontractors by the Administering Agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the MassCEC agrees that if it fails or refuses to comply with these undertakings, the Administering Agency may take any or all of the following actions: cancel, terminate, or suspend, in whole or in part, this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

**B. Copeland "Anti-Kickback" Act.** Contractor and any subcontractors performing work under the contract shall comply with 18 U.S.C. §874. The MassCEC shall report all suspected or reported violations to Treasury.

**C. Suspension and Debarment.**

1. This Contract is a covered transaction for purposes of 2 CFR §180.210 and 31 CFR §19.2103000. Therefore, this Contract is a lower-tier covered transaction for purposes of 2 C.F.R. Part 180 and 31 C.F.R. Part 19 if (1) the amount of this Contract is greater than or equal to $25,000 (2 C.F.R. § 180.220(b)(1); 31 C.F.R. § 19.220(b)(1)); (2) the Contract requires the consent of an official of the Department of the Treasury (2 C.F.R. § 180.220(b)(2); 31 C.F.R. § 19.220(b)(2)); or (3) this Contract is for federally required audit services (2 C.F.R. § 180.220(b)(3); 31 C.F.R. § 19.220(b)(3)).

2. As such, the Contractor is required to verify that Contractor's principals (defined at 2 CFR § 180.995) or its affiliates (defined at 2 CFR § 180.905) of both Contractor and Contractor's principals are not excluded (defined at 2 CFR § 180.935) and are not disqualified (defined at 2 CFR § 180.935). If any of the foregoing persons are excluded or disqualified and the Secretary of the Treasury has not granted an exception pursuant to 31 C.F.R. §19.120(a) (a) this Contract shall be void; (b) MassCEC shall not make any payments of federal financial assistance to Contractor; and (c) MassCEC shall have no obligations to Contractor under this Contract.

3. The Contractor must comply with 2 CFR pt. 180, subpart C and 31 CFR pt. 19, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into. This certification is a material representation of fact relied upon by MassCEC and all liability arising from an erroneous representation shall be borne solely by the Contractor.

4. If it is later determined that the Contractor did not comply with 2 CFR pt. 180, subpart C and 31 CFR pt. 19, in addition to remedies available to MassCEC, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

**D. Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352, as amended.**

1. Contractor certifies that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. §1352. Contractor shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier, up to the recipient who in turn will forward the certification(s) to the awarding agency. This certification is a material representation of fact upon which MassCEC has relied when entering into this contract, and all liability arising from an erroneous representation shall be borne solely by Contractor.

2. ***Contractors must sign the certification on the last page of this addendum and shall cause any subcontractors with a subcontract (at any tier) exceeding $100,000 to file with the tier above it the same certification.**

**E. Access to Records.**

1. Contractor agrees to provide MassCEC, the U.S. Department of Treasury, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, investigations and transcriptions. The Contractor agrees to permit any of the foregoing parties to reproduce by any means or to copy excerpts and transcriptions as reasonably needed, and agrees to cooperate with all such requests. No language in this contract is intended to prohibit audits or internal reviews by the Treasury Department or the Comptroller General of the United States.

2. Contractor agrees to retain all records covered by this section through December 31, 2031, or such longer period as is necessary for the resolution of any litigation, claim, negotiation, audit or other inquiry involving the contract.

**F. Rights to Inventions Made Under a Contract or Agreement.**

1. The Government reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use for "Government purposes," any subject data or copyright described below. "Government purposes" means use only for the direct purposes of the Government. Without the copyright owner's consent, the Government may not extend its federal license to any other party.

   (a) Any subject data developed under the contract, whether or not a copyright has been obtained, and

   (b) Any rights of copyright purchased by Contractor using federal assistance funded in whole or in part by the Department of the Treasury.

2. Unless Treasury determines otherwise, a Contractor performing experimental, developmental, or research work required as part of this contract agrees to permit Treasury to make available to the public either (a) Treasury's license in the copyright to any subject data developed in the course of the Contract or (b) a copy of the subject data first produced under the contract for which a copyright has not been obtained. If the experimental, developmental, or research work which is the subject of this contract is not completed for any reason whatsoever, all data developed under the contract shall

become subject data as defined herein and shall be delivered as the Government may direct.

3. Unless prohibited by North Carolina law, upon request by the Government, Contractor agrees to indemnify, save, and hold harmless the Government, its officers, agents, and employees acting within the scope of their official duties against any liability, including costs and expenses, resulting from any willful or intentional violation by Contractor of proprietary rights, copyrights, or right of privacy arising out of the publication, translation, reproduction, delivery, use, or disposition of any data furnished under the contract. Contractor shall be required to indemnify the Government for any such liability arising out of the wrongful act of any employee, official, or agent of the Contractor.

4. Nothing contained in this clause shall imply a license to the Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Government under any patent.

5. Data developed by Contractor and financed entirely without using federal assistance provided by the Government that has been incorporated into work required by the underlying contract is exempt from the requirements herein, provided that Contractor identifies that data in writing at the time of delivery of the contract work. Contractor agrees to include these requirements in each subcontract for experimental, developmental, or research work financed in whole or in part with federal assistance.

6. For the purposes of this section "subject data" means "recorded information, whether or not copyrighted, . . . that is delivered or specified to be delivered as required by the contract." Examples of "subject data" include, but are not limited to, "computer software, standards, specifications, engineering drawings and associated lists, process sheets, manuals, technical reports, catalog item identifications, and related information, but do not include financial reports, cost analyses or other similar information used for performance or administration of the contract."

**G. Contract Work Hours and Safety Standards Act (40 U.S.C. §§ 327 through 333) (applies only to purchases over $100,000, when laborers or mechanics are used.)** Where applicable, all contracts in excess of $100,000 that involve the employment of mechanics or laborers shall include a provision for compliance with 40 U.S.C. §3702 and §3704 of the Contract Work Hours and Safety Standards Act, as supplemented by Department of Labor regulations (29 CFR part 5). Under §3702 of the Act, each Contractor shall be required to compute the wages of every mechanic and laborer on the basis of a standard workweek of 40 hours. Work in excess of the standard workweek is permissible provided that the worker is compensated at a rate of not less than 1 1/2 times the basic rate of pay for all hours worked in excess of 40 hours in the workweek. The requirements of 40 U.S.C. §3704 are applicable to construction work and provides that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of

supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

**H. Clean Air Act & Federal Water Pollution Control Act (applies to purchases of more than $150,000).**

1. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

2. The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. §1251 et seq.

3. The Contractor agrees to report each violation of the Clean Air Act and the Water Pollution Control Act to MassCEC of Gastonia and understands and agrees that MassCEC will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

4. Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance.

**I. Prohibition on Contracting for Covered Telecommunications Equipment or Services.**

1. Definitions. Unless otherwise defined in this contract, capitalized terms used in this section shall have the meanings ascribed thereto in this section.

   (a) "Backhaul" means intermediate links between the core network, or backbone network, and the small subnetworks at the edge of the network (e.g., connecting cell phones/towers to the core telephone network). Backhaul can be wireless (e.g., microwave) or wired (e.g., fiber optic, coaxial cable, Ethernet).

   (b) "Covered Foreign Country" means the People's Republic of China.

   (c) "Covered Telecommunications Equipment or Services" means (i) telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities); (ii) for the purpose of public safety, security of Government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities); (iii) telecommunications or video surveillance services provided by such entities or using such equipment;

or (iv) telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a Covered Foreign Country.

(d) "Critical Technology" means (i) defense articles or defense services included on the United States Munitions List set forth in the International Traffic in Arms Regulations under subchapter M of chapter I of title 22, Code of Federal Regulations; (ii) items included on the Commerce Control List set forth in Supplement No. 1 to part 774 of the Export Administration Regulations under subchapter C of chapter VII of title 15, Code of Federal Regulations and controlled (a) pursuant to multilateral regimes, including for reasons relating to national security, chemical and biological weapons proliferation, nuclear nonproliferation, or missile technology, or (b) for reasons relating to regional stability or surreptitious listening; (iii) specially designed and prepared nuclear equipment, parts and components, materials, software, and technology covered by part 810 of title 10, Code of Federal Regulations (relating to assistance to foreign atomic energy activities); (iv) nuclear facilities, equipment, and material covered by part 110 of title 10, Code of Federal Regulations (relating to export and import of nuclear equipment and material); (v) select agents and toxins covered by part 331 of title 7, Code of Federal Regulations; part 121 of title 9 of such Code; or part 73 of title 42 of such Code; or (vi) emerging and foundational technologies controlled pursuant to §1758 of the Export Control Reform Act of 2018 (50 U.S.C. §4817).

(e) "Interconnection Arrangements" means arrangements governing the physical connection of two or more networks to allow the use of another's network to hand off traffic where it is ultimately delivered (e.g., connection of a customer of telephone provider A to a customer of telephone company B) or sharing data and other information resources.

(f) "Roaming" means cellular communications services (e.g., voice, video, data) received from a visited network when unable to connect to the facilities of the home network either because signal coverage is too weak or because traffic is too high.

(g) "Substantial or Essential Component" means any component necessary for the proper function or performance of a piece of equipment, system, or service.

(h) "Telecommunications Equipment or Services" means telecommunications or video surveillance equipment or services, such as, but not limited to, mobile phones, land lines, internet, video surveillance, and cloud services.

2. Prohibitions.

(a) Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of an executive agency on or after August 13, 2020, from obtaining or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons.

(b) Unless an exception in applies, Contractor and any subcontractors may not use grant, cooperative agreement, loan, or loan guarantee funds (including, without limitation, Fiscal Recovery Funds) received from a federal government to:

i. Procure or obtain any equipment, system, or service that uses Covered Telecommunications Equipment or Services as a Substantial or Essential Component of any system or as Critical Technology of any system;

ii. Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses Covered Telecommunications Equipment or Services as a Substantial or Essential Component of any system or as Critical Technology of any system;

iii. Enter into, extend, or renew contracts with entities that use Covered Telecommunications Equipment or Services as a Substantial or Essential Component of any system or as Critical Technology as part of any system; or

iv. Provide, as part of its performance of this contract, any subcontract; any other contractual instrument; or any equipment, system, or service that uses Covered Telecommunications Equipment or Services as a Substantial or Essential Component of any system or as Critical Technology as part of any system.

3. Exceptions.

(a). This clause does not prohibit Contractor or subcontractors from providing:

i. A service that connects to the facilities of a third party, such as Backhaul, Roaming, or Interconnection Agreements, or

ii. Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.

(b). By necessary implication and regulation, the prohibitions also do not apply to:

i. Covered telecommunications equipment that:

(a) Is not used as a Substantial or Essential Component of any system and

(b) Is not used as Critical Technology of any system.

ii. Other telecommunications equipment or services that are not considered Covered Telecommunications Equipment or Services.

4. Reporting Requirement.

(a). In the event Contractor identifies, during contract performance, covered Telecommunications Equipment or Services used as a Substantial or Essential Component of any system or as Critical Technology as part of any system, or if Contractor is notified of such by a subcontractor at any tier or by any other source, Contractor shall report the information in paragraph 4(b) of this section to MassCEC, unless procedures for reporting the information are established elsewhere in this contract.

(b). Contractor shall report the following information to MassCEC pursuant to paragraph 4(a) of this section:

i. Within one business day from the date of such identification or notification: contract number; order number(s), if applicable; supplier name; supplier unique entity identifier (if known); supplier Commercial and Government Entity (CAGE) code (if known); brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended.

ii. Within ten business days of submitting the information in paragraph 4(b)(i) of this section, any further available information about mitigation actions undertaken or recommended. In addition, Contractor shall describe (1) the efforts it undertook to prevent use or submission of Covered Telecommunications Equipment or Services and (2) any additional efforts that will be incorporated to prevent future use or submission of Covered Telecommunications Equipment or Services.

5. SubContractor. Contractor shall cause to be inserted into all subcontracts and other contractual instruments relating to the performance of this contract the substance of this Section I, including this paragraph 5.

**J. Domestic preference for certain procurements using federal funds**. Contractor should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other

manufactured products). The requirements of this section must be included in all sub-awards including all contracts and purchase orders for work or products under this award. For purposes of this section:

1. "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

2. "Manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

**K. Procurement of Recovered Materials.**

1. This section shall apply if (1) this contract involves the purchase of an item designated by the Environmental Protection Agency ("EPA") in 40 C.F.R. Part 247 that exceeds $10,000 or (2) the total value of such designated items acquired during MassCEC's preceding fiscal year exceeded $10,000.

2. In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired:

    a. Competitively within a timeframe providing for compliance with the contract performance schedule;

    b. Meet contract performance requirements; or

    c. Be acquired at a reasonable price.

3. Information about this requirement, along with the list of EPA- designated items, is available at EPA's Comprehensive Procurement Guidelines website. The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

**L. Minority and Women Business Enterprises.** Contractor hereby agrees to comply with the following when applicable: The requirements of Executive Orders 11625 and 12432 (concerning Minority Business Enterprise), and 12138 (concerning Women's Business Enterprise), ***when applicable.*** Accordingly, the Contractor hereby agrees to take affirmative steps to assure that women and minority businesses are utilized when possible as sources

of supplies, equipment, construction and services. Affirmative steps shall include the following:

1. Including qualified women's business enterprises and small and minority businesses on solicitation lists;

2. Assuring that women's enterprises and small and minority businesses are solicited whenever they are potential sources;

3. When economically feasible, dividing total requirements into smaller tasks or quantities so as to permit maximum participation by small and minority business, and women's business enterprises;

4. Where the requirement permits, establishing delivery schedules which will encourage participation by women's business enterprises and small and minority business; and

5. Using the services and assistance of the Small Business Administration, and the U.S. Office of Minority Business Development Agency of the Department of Commerce; and the North Carolina Office for Historically Underutilized Businesses.

For the purposes of these requirements, a Minority Business Enterprise (MBE) is defined as an enterprise that is at least 51 percent owned and controlled in its daily operation by members of the following groups: Black, Hispanic, Asian or Pacific Islander, American Indian, or Alaskan Natives. A Women Business Enterprise (WBE) is defined as an enterprise that is at least 51 percent owned and controlled in its daily operation by women. Additionally, an MBE or WBE qualifies if it is currently certified as a North Carolina "historically underutilized business" under N.C.G.S. §143-128.4(a) and qualifies as a "small business" if it is independently owned and operated and is qualified under the Small Business Administration criteria and size standards at 13 C.F.R. Part 21.

**M. Assurances of Compliance with Title VI of the Civil Rights Act of 1964**. Contractor and any subcontractor, or the successor, transferee, or assignee of Contractor or any subcontractor, shall comply with Title VI of the Civil Rights Act of 1964, which prohibits recipients of federal financial assistance from excluding from a program or activity, denying benefits of, or otherwise discriminating against a person on the basis of race, color, or national origin (42 U.S.C. §§ 2000d *et seq*.), as implemented by the Department of the Treasury's Title VI regulations, 31 C.F.R. Part 22, which are herein incorporated by reference and made a part of this contract. Title VI also provides protection to persons with "Limited English Proficiency" in any program or activity receiving federal financial assistance, 42 U.S.C. §§ 2000d *et seq*., as implemented by Treasury's Title VI regulations, 31 C.F.R. Part 22, and herein incorporated by reference and made a part of this contract.

**N. Conflicts of Interest; Gifts and Favors.**

1. Contractor certifies to MassCEC that as of the date hereof, to the best of its knowledge after reasonable inquiry, no employee, officer, elected official, or agent of MassCEC involved in the selection, award, or administration of this contract (each a "Covered Individual"); no member of a Covered Individual's immediate family; no partner of a Covered Individual; and no organization (including Contractor) which employs or is about to employ a Covered Individual has a financial or other interest in, or has received a tangible personal benefit from, Contractor. Should Contractor obtain knowledge of any such interest or any tangible personal benefit described in the preceding sentence after the date hereof, Contractor shall promptly disclose the same to MassCEC in writing.

2. Contractor certifies to MassCEC that it has not provided, nor offered to provide, any gratuities, favors, or anything of value to an officer, employee, elected official or agent of MassCEC. Should Contractor obtain knowledge of the provision, or offer of any provision, of any gratuity, favor, or anything of value to an officer, employee, elected official or agent described in the preceding sentence after the date hereof, Contractor shall promptly disclose the same to MassCEC in writing.

**CONTRACTOR:**
*The undersigned, as Contractor's duly authorized representative, hereby certifies under the pains and penalties of perjury that Contractor is in compliance with all certifications required in this Addendum.*

By: _____

Name: _____

Title: _____

**Acknowledged by MassCEC:**

By: _____

Name: _____

Title: _____

***- This form is required only for purchases of more than $100,000 –***

**31 CFR Part 21 – New Restrictions on Lobbying –**
**CERTIFICATION REGARDING LOBBYING**

The undersigned certifies, to the best of their knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all sub awards at all tiers (including subcontracts, sub grants, and contracts under grants, loans, and cooperative agreements) and that all Contractors shall certify and disclose accordingly.

4. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Ch. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

_____
Signature of Contractor's authorized official

Date: _____

_____
(Print name and title of person signing above)

# SECTION 00610

# PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we, _____, as Contractor, of _____, and _____, hereinafter called the "Surety," are held and firmly bound unto the Massachusetts Clean Energy Technology Center, hereinafter called the "Owner," and to such persons, firms and corporations which may furnish materials for or perform labor on the Work, construction, or improvements contemplated in the Agreement hereinafter mentioned, or which may have any suits or claims for injury or damage to persons or property resulting from or arising out of the Work done under this Agreement in the penal sum of Dollars ($_____) (lawful money of the United States of America) for the payment whereof the Contractor and the Surety or Sureties bind themselves and their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, WHEREAS THE Contractor has by means of a written agreement dated on the _____day of _____, 20_____ (the Agreement) entered into a written contract with the Owner for the New Bedford Marine Commerce Terminal Phase 3 Bulkhead Replacement and Terminal Heavy-Lift Expansion Project, and related work and other incidentals (the Project) for the sum of approximately ($_____) Dollars.

NOW, THEREFORE, the condition of this obligation is such that if the Contractor shall faithfully perform the Agreement on its part and during the life of any guarantee or warranty, including warranty for defective materials and workmanship required under this Agreement, and satisfy all claims and demands incurred for the same, including without limitation any claim for liquidated damages for delay; and shall fully indemnify and save harmless the Owner from all cost and damage which may suffer by reason of failure to do so, and shall fully reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any such fault, and shall promptly make payment to all persons supplying labor or materials for use in the prosecution of the Work provided for in said Agreement; and shall indemnify and save harmless the said Owner, its officers, agents, employees, and directors from any and all suits or claims for injury or damage to persons or property resulting from or arising out of work done under this Agreement, including without limitation reasonable attorney's fees and expenses incurred in any proceeding to enforce Owner rights under this Bond, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

PROVIDED, HOWEVER, THAT (except as to the Owner) no suit, action, or proceeding, by reason of any default whatever shall be brought on this Bond after two years from the day on which the final payment under the Agreement falls due.

AND PROVIDED, that any alterations which may be made in the terms of the Agreement or in the Work to be done under it, or any assignment, transfer, or subletting of any part of the Work, or the giving by the Owner of any extension of time for the performance of the Agreement or any other forbearance on the part of either the Owner or the Contractor to the other, shall not in any way release the Contractor and the Surety or Sureties, either or any of them, their heirs, executors, administrators, successors or assigns from their liability hereunder, notice to the Surety or Sureties of any such alterations, assignments, transfer, subletting, extension or forbearance being hereby waived.

AND PROVIDED FURTHER, the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Agreement, the Work to be performed thereunder or the Specifications accompanying the same shall in any way affect its obligations on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Agreement, the Work, or to the Specifications.

AND PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, where claim may be satisfied.

IN WITNESS WHEREOF, said Contractor and Surety have hereunto set their respective names this _____ day of _____, 20_____.

WITNESSES/ATTESTATION:

(Contractor Name) [Seal]
PRINCIPAL

_____ _____

Name: Title:

(Surety Name) [Seal]
SURETY

_____ _____

Name: Title:_____
Attorney-in-fact

[NOTARY REQUIRED]

## POWER OF ATTORNEY

Any attorney-in-fact who signs Contract Bonds must file with each Bond a certified copy of their power of attorney to sign said Bonds.

NOTE: The date of the BOND must not be before the date of the Agreement. If Contractor is a Partnership, all partners should execute Bonds.

IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the Commonwealth of Massachusetts.

END OF SECTION

SECTION 00614

PAYMENT BOND

BOND NO. _____

**KNOW ALL MEN BY THESE PRESENTS:**

That we,_____**,** as **Principal**, and

_____, as **Surety**,

are held and firmly bound unto the Massachusetts Clean Energy Technology Center, New Bedford, Massachusetts (MA), as **Obligee,** in the sum of _____**dollars**

**($_____)**

to be paid to the Obligee, for which payments, well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

**WHEREAS,** the said **Principal** has made a contract with the **Obligee,** bearing the date of _____ ___, 20_____ for the _____ in New Bedford, MA.
PROJECT TITLE

**NOW** the conditions of this obligation are such that if the **Principal** and all subcontractors under said contract shall pay for all labor performed or furnished and for all materials used or employed in said contract and in any and all duly authorized modifications, alterations, extensions of time, changes or additions to said contract that may hereafter be made, notice to the **Surety** of such modifications, alterations, extensions of time, changes or additions being hereby waived, the foregoing to include any other purposes or items set out in, and to be subject to, provisions of M.G.L. c.30 §39A, and M.G.L. c.149 §29, as amended, then this obligation shall become null and void; otherwise it shall remain in full force and virtue.

**IN WITNESS WHEREOF**, the **Principal** and **Surety** have hereunto set their hands and seals this:

_____Day of _____20____

**PRINCIPAL** _____ **SURETY** _____

By:_____ By:_____

**SEAL** **ATTORNEY-IN-FACT**

**Attest:** _____ **Attest:**_____

The rate for this bond is: _____% for the first $_____ and ____% for the next $_____

The total premium for this bond is: $ _____

# APPLICATION AND CERTIFICATE FOR PAYMENT

AIA DOCUMENT G702

**TO OWNER:** Massachusetts Clean Energy Technology Center

**PROJECT:** NBMCT - Phase 3 Bulkhead Replacement (Site 4)

APPLICATION NO.: 1

PERIOD TO:

APPLICATION DATE:

Distribution to:
- ☐ OWNER
- ☐ ENGINEER
- ☐ CONTRACTOR
- ☐
- ☐

**FROM CONTRACTOR:**

**Via:**
Foth Infrastructure & Environment, LLC
15 Creek Road
Marion, MA 02738

## CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
Continuation Sheet is attached.

| | | | |
|---|---|---|---|
| 1. | **ORIGINAL CONTRACT SUM** | $ | - |
| 2. | **Change Orders** | | **$0.00** |
| 3. | **CONTRACT SUM TO DATE (Line 1 + 2)** | $ | - |
| 4. | **TOTAL COMPLETED & STORED TO DATE** (Column J - Sheet 2) | $ | **25,000.00** |
| 5. | **RETAINAGE:** | | |
| | a. 5% of Completed Work | $ | **1,250.00** |
| | b. 0% of Stored Material | | |
| | Total retainage (Line 5a + 5b) | $ | **1,250.00** |
| 6. | **TOTAL EARNED LESS RETAINAGE** (Line 4 less Line 5 Total) | $ | **23,750.00** |
| 7. | **LESS PREVIOUS CERTIFICATES FOR PAYMENT** (Line 6 from prior Certificate) | | |
| 8. | **CURRENT PAYMENT DUE** | $ | **23,750.00** |
| 9. | **BALANCE TO FINISH, INCLUDING RETAINAGE** (Line 3 less Line 6) | $ | **(23,750.00)** |

| CHANGE ORDER SUMMARY | Eligible | Ineligible |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| TOTALS | | - |
| NET CHANGES by Change Order | $0.00 | |

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By:_____ Date:

State of: Massachusetts
County of: Bristol

Subscribed and sworn to before me this_____day of_____,_

Notary Public:
My Commission expires:

## ENGINEER'S RECOMMENDATION

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Engineer recommends to the Owner that to the best of the Engineer's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT RECOMMENDED

**AMOUNT RECOMMENDED** **$** **23,750.00**

Attached explanation if amount recommended differs from the amount applied for. Initial all figures on this Application and on the Continuation Sheet that are changed to conforms to the amount recommended.

Engineer -

By:_____ Date:_____

By _____ _____

This Certificate is not negotiable. The AMOUNT RECOMMENDED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

**OWNERS APPROVAL:** In accordance with the contract documents, the Owner hereby approves this application for Payment. The amount of this payment is amount certified by the Engineer unless signified in writing differently by Owner.

OWNER: Massachusetts Clean Energy Technology Center

By_____ Date:_____

**CONTRACTOR:** _____ **PAY REQ. No.** 1

**THRU PERIOD:**

| Item No. | Description | Unit | Qty. | Unit Price | Extended Amount | Previous Quantity | Previous Total Amount | Quantity This Period | Amount This Period | Total Quantities to Date | Total Amount to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MOBILIZATION / DEMOBILIZATION | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 2 | TRAFFIC CONTROL | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 3 | SITE PREPARATION AND DEMOLITION | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 4 | EROSION CONTROL | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 5 | TURBIDITY CURTAIN | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 6 | DEWATERING (DURATION OF PROJECT) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 7 | BYPASS PUMPING, STORM DRAIN (DURATION OF PROJECT) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 8 | BUILDING INSPECTIONS (PRE/POST-CONSTRUCTION PER SPEC) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 9 | VIBRATION MONITORING | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 10 | CONSTRUCTION STAGING & SITE ACCESS (GRADING, SURFACING AND CONSTRUCTION PHASE MAINTENANCE) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 11 | DENSE GRADED AGGREGATE (FURNISH AND INSTALL) | TON | 2,400 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 12 | PREPARATION OF SUBGRADE | SY | 282 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 13 | GEOGRID - TENSAR INTERAX NXF GEOGRID (FURNISH AND PLACE) | SY | 230 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 14 | GEOTEXTILE – TENSAR INTERAX NXF FILTERGRID (FURNISH AND PLACE) | SY | 480 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 15 | GEOTEXTILE - MIRAFI 140 N (FURNISH AND PLACE) | SY | 388 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 16 | WATERPROOFING MEMBRANE & MIRAFI SER G DRAINAGE COMPOSITE (FURNISH AND INSTALL) | SY | 1,567 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 17 | STEEL SHEET PILE, AZ19-700 (FURNISH AND INSTALL) | LF | 1,172 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 18 | SHEET PILE CAP, CAST IN PLACE CONCRETE (3'-0" x 2'-6") (FURNISH AND INSTALL) | CY | 19 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 19 | STORM DRAIN MANHOLE - PILE SUPPORTED CAST-IN-PLACE CONCRETE MANHOLE (FURNISH AND INSTALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 20 | STORM DRAIN PIPE REPLACEMENT (72-IN DIA. CLASS 4 RCP) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 21 | UNDERDRAIN MANHOLE - CIRCULAR LEACHING PIT (48-IN ID PRECAST W/ H-25 FRAME AND LID) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 22 | LATERAL UNDERDRAIN AGGREGATE - 1-1/2" WASHED CRUSHED STONE (FURNISH AND PLACE) | TON | 154 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 23 | WATER SYSTEM MODIFICATIONS | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 24 | CHAIN LINK FENCE, 8 FT SECURITY - TEMPORARY CONSTRUCTION (FURNISH AND INSTALL) | LF | 150 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 25 | CHAIN LINK FENCE, 8 FT SECURITY - BLACK VINYL COATED ON CONCRETE CAP (FURNISH AND INSTALL) | LF | 126 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 26 | SITE EXCAVATION & SOIL MANAGEMENT | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |

**CONTRACTOR:** _____ **PAY REQ. No.** 1

**THRU PERIOD:**

| Item No. | Description | Unit | Qty. | Unit Price | Extended Amount | Previous Quantity | Previous Total Amount | Quantity This Period | Amount This Period | Total Quantities to Date | Total Amount to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | DISPOSAL OF UNSUITABLE SOIL (ENVIRONMENTAL PCBS <1 PPM) | TON | 500 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 28 | DREDGE (MOBILIZATION / DEMOBILIZATION) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 29 | EXCAVATION & DISPOSAL AT CAD CELL NO.3 (RELIEVING PLATFORM LEVEL - ABOVE EL 5.0) | CY | 1,365 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 30 | DREDGE & DISPOSAL AT CAD CELL NO.3 (BELOW EL 5.0 AND EXISTING CELLULAR COFFERDAMS) | CY | 9,110 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 31 | MECHANICAL TREATMENT - DREDGING OF ROCK & DISPOSAL AT CAD CELL NO.3 | CY | 100 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 32 | STEEL PIPE KING PILE, 30-INCH X 1-INCH WALL ROCK SOCKETED (FURNISH AND INSTALL) | EA | 25 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 33 | STEEL SHEET PILE, AZ17-770 (SHEETING, WALES, AND CAP) (FURNISH AND INSTALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 34 | HP12X89 SUPPORT PILES, ROCK SOCKETED AT 72-INCH STORM DRAIN PENETRATION (FURNISH AND INSTALL) | EA | 2 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 35 | DRILLED ROCK ANCHOR ASSEMBLY (FURNISH AND INSTALL) | EA | 15 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 36 | STAINLESS STEEL PONTOON FLAP GATE AT 72-INCH STORM DRAIN (FURNISH AND INSTALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 37 | GROUT PLUG (CLOSURE OF MUDLINE TO TOP OF EXISTING SOUTH TERMINAL MAJOR CELL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 38 | TEMPORARY SHEET PILE WALLS - EXISTING RELIEVING PLATFORM DEMOLITION (FURNISH, INSTALL AND REMOVE) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 39 | W14X311 ROCK SOCKETED KING PILES (FURNISH AND INSTALL) | EA | 7 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 40 | STEEL SHEET PILE, AZ17-770 (FURNISH AND INSTALL) | LF | 994 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 41 | BULKHEAD TOE PINS (FURNISH AND INSTALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 42 | SHEET PILE CAP, CAST IN PLACE CONCRETE (FURNISH AND INSTALL) | CY | 15 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 43 | CAST IN PLACE CONCRETE BEAM (18-IN x 18-IN) (FURNISH AND INSTALL) | CY | 8 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 44 | INFILL GRATING COVER ASSEMBLY (FURNISH AND INSTALL) | SF | 530 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 45 | BURIED CLOSURE WALL, CAST IN PLACE CONCRETE AT EXISTING RELIEVING PLATFORM (FURNISH AND INSTALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 46 | W14X311 ROCK SOCKETED KING PILES (FURNISH AND INSTALL) | EA | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 47 | 24-INCH X 1-INCH ROCK SOCKETED PIPE PILE WITH REINFORCED CONCRETE PILE CONNECTIONS (FURNISH AND INSTALL) | EA | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 48 | STEEL SHEET PILE, AZ17-770 WITH TOE PINS (FURNISH AND INSTALL) | LF | 237 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 49 | GROUT PLUG (CLOSURE BETWEEN WEST-END OF RETAINING WALL AND COMBI WALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 50 | STRUCTURAL CLOSURE OF MINOR CELL (FURNISH AND INSTALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 51 | GROUT PLUG (TOE CLOSURE SEAL AT BOTTOM OF SHEETPILES) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 52 | STRUCTURAL CLOSURE BACKFILL (SANDY FILL) OF MINOR CELL TO EL 5.0 (FURNISH AND INSTALL) | CY | 88 | | $ - | | $ - | | $ - | 0.00 | $ - |

**CONTRACTOR:** _____ **PAY REQ. No.** 1

**THRU PERIOD:**

| Item No. | Description | Unit | Qty. | Unit Price | Extended Amount | Previous Quantity | Previous Total Amount | Quantity This Period | Amount This Period | Total Quantities to Date | Total Amount to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 53 | SHEET PILE CAP, CAST IN PLACE CONCRETE AT MINOR CELL CLOSURE (4'-0" x 4'-3") (FURNISH AND INSTALL) | CY | 12 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 54 | RETAINING WALL, CAST IN PLACE CONCRETE (FURNISH AND INSTALL) | CY | 32 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 55 | STRUCTURAL BACKFILL (GRAVEL BORROW) AT RETAINING WALL (FURNISH AND INSTALL) | CY | 59 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 56 | PORTLAND CEMENT CONCRETE PAVEMENT, 5-IN AT RETAINING WALL (FURNISH AND INSTALL) | SY | 35 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 57 | 30-INCH X 1-INCH WALL ROCK SOCKETED PIPE PILES AT ROWS A & B (FURNISH AND INSTALL) | EA | 22 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 58 | 30-INCH X 1-INCH WALL PIPE PILES AT ROWS C, D, E, AND F (FURNISH AND INSTALL) | EA | 32 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 59 | 30-INCH X 1-INCH WALL ROCK SOCKETED PIPE PILES AT ROWS C, D, AND E (FURNISH AND INSTALL) | EA | 12 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 60 | 30-INCH X 1-INCH WALL PIPE PILES AT ROWS H AND I (FURNISH AND INSTALL) | EA | 12 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 61 | 30-INCH X 1-INCH WALL PIPE PILES AT ROW G (FURNISH AND INSTALL) | EA | 17 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 62 | PRECAST PILE CAP SUPPORT PLATE ASSEMBLIES (FURNISH AND INSTALL) | EA | 66 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 63 | REINFORCED CONCRETE PILE CONNECTIONS FOR 30-INCH DRIVEN PIPE PILES – ROWS C, D, E AND F (FURNISH AND INSTALL) | EA | 32 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 64 | REINFORCED CONCRETE PILE CONNECTIONS FOR 30-INCH ROCK SOCKETED PIPE PILES – ROWS A, B, C, D, E, AND F (FURNISH AND INSTALL) | EA | 34 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 65 | REINFORCED CONCRETE PILE CONNECTIONS FOR 30-INCH DRIVEN PIPE PILES – ROW G (FURNISH AND INSTALL) | EA | 17 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 66 | REINFORCED CONCRETE PILE CONNECTIONS FOR 30-INCH DRIVEN PIPE PILES – ROW H AND I (FURNISH AND INSTALL) | EA | 12 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 67 | PRECAST PLANKS (PCP) – TYPE 1, TYPE 2, TYPE 3, AND TYPE 4 (FURNISH AND INSTALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 68 | PRECAST PILE CAPS BEAMS TYPE PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, PC-10, AND PC-11 (FURNISH AND INSTALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 69 | CAST IN PLACE CONCRETE EAST/WEST BEAMS - ROW 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, AND 11 (FURNISH AND INSTALL) | CY | 500 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 70 | CAST IN PLACE CONCRETE NORTH/SOUTH BEAMS - ROW A (FURNISH AND INSTALL) | CY | 265 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 71 | CAST IN PLACE CONCRETE NORTH/SOUTH BEAMS - ROW B, C, D, E, AND F (FURNISH AND INSTALL) | CY | 515 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 72 | CAST IN PLACE CONCRETE NORTH/SOUTH BEAMS - ROW G (FURNISH AND INSTALL) | CY | 236 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 73 | CAST IN PLACE CONCRETE NORTH/SOUTH BEAMS - ROW I (FURNISH AND INSTALL) | CY | 94 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 74 | CAST IN PLACE CONCRETE PLATFORM SLAB (FURNISH AND INSTALL) | CY | 750 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 75 | CAST IN PLACE CONCRETE BOLLARD PADS (FURNISH AND INSTALL) | CY | 19 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 76 | CAST-IN-PLACE CONCRETE UTILITY TRENCH - EAST/WEST (FURNISH AND INSTALL) | LF | 86 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 77 | CAST-IN-PLACE CONCRETE UTILITY TRENCH - NORTH/SOUTH (FURNISH AND INSTALL) | LF | 182 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 78 | CATHODIC PROTECTION SYSTEM / ALUMINUM ANODES (KING PILES AND SHEETS) FOR NORTH/SOUTH BULKHEAD (FURNISH AND INSTALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |

**CONTRACTOR:** _____ **PAY REQ. No.** 1

**THRU PERIOD:**

| Item No. | Description | Unit | Qty. | Unit Price | Extended Amount | Previous Quantity | Previous Total Amount | Quantity This Period | Amount This Period | Total Quantities to Date | Total Amount to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 79 | CATHODIC PROTECTION SYSTEM - ALUMINUM ANODES (KING PILES AND SHEETS) FOR EAST/WEST BULKHEAD AND NORTH CLOSURE (FURNISH AND INSTALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 80 | CATHODIC PROTECTION SYSTEM FOR RELIEVING PLATFORM PIPE PILES (FURNISH AND INSTALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 81 | DENSO SEASHIELD 2000HD© ANTI-CORROSION PROTECTION SYSTEM AT PILE ROW A - INSTALLED LENGTH BOTTOM OF PRECAST PILE CAP TO 10 FEET BELOW MUDLINE (FURNISH AND | EA | 11 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 82 | DENSO SEASHIELD 2000HD© ANTI-CORROSION PROTECTION SYSTEM AT PILE ROWS A - INSTALLED LENGTH BOTTOM OF PRECAST PILE CAP TO 10 FEET BELOW MUDLINE (FURNISH AND | EA | 3 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 83 | DENSO SEASHIELD SERIES 70© FIBERGLASS FILL WRAP SYSTEM - PILE ROWS A, B, C, D, E, AND F INSTALLED LENGTH BOTTOM OF PRECAST PILE CAP TO 1 FOOT BELOW MUDLINE (FURNISH AND | VF | 1,592 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 84 | UTILITY TRENCH GRATING COVER ASSEMBLY - EAST/WEST (FURNISH AND INSTALL) | SF | 556 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 85 | UTILITY TRENCH GRATING COVER ASSEMBLY - NORTH/SOUTH (FURNISH AND INSTALL) | SF | 971 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 86 | ZALDA SC-1150 SER PANEL FENDER ASSEMBLY, HDPE FACED (FURNISH AND INSTALL) | EA | 6 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 87 | ZALDA SBD-1 (200-225 METRIC TON) MOORING BOLLARDS (FURNISH AND INSTALL) | EA | 3 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 88 | SLOPE PROTECTION - ARMORFLEX© 70L CONCRETE MATTRESS SYSTEM (FURNISH AND INSTALL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 89 | SLOPE PROTECTION - RIP RAP ARMOR STONE (FURNISH AND INSTALL) | TON | 136 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 90 | SAFETY LADDERS (FURNISH AND INSTALL) | EA | 2 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 91 | SILT CURTAINS AND PILES AT CAD CELL NO.3 (FURNISH, INSTALL, MAINTAIN & DISPOSAL) | LS | 1 | | $ - | | $ - | | $ - | 0.00 | $ - |
| 92 | CONSTRUCTION PERMITTING (ALLOWANCE) | LS | 1 | | $ - | | $ - | | $ - | $ 25,000.00 | $25,000.00 |
| | **TOTALS** | | | | **$ -** | | **$ -** | | **$ -** | | **$ 25,000.00** |

SECTION 00636

CHANGE ORDER

CHANGE ORDER NO._____

DATE:_____

The Contract shall be amended as described below (include reference to or attach specific exhibits necessary to describe the agreed-upon Change):

**CONTRACT PRICE.** The aggregate of the change in Contract Price by this Change Order is a net [ADDITION/DEDUCTION] of **$ _____.**

| | |
|---|---|
| The original Contract Price was | $_____ |
| The net change by previously approved Change Orders | $_____ |
| The Contract Sum prior to this Change Order | $_____ |
| The Contract Sum will be [increased/decreased] by this Change Order in the amount of | $_____ |
| The new Contract Price including this Change Order will be | $_____ |

**Breakdown of Change Order:**

| | |
|---|---|
| Materials | $_____ |
| Labor | $_____ |
| Equipment | $_____ |
| Administration | $_____ |
| Subtotal | $_____ |
| Overhead and Profit | $_____ |
| **TOTAL** | **$_____** |

**CONTRACT TIME.** The Contract Time for completion will be [increased/decreased] by [X] days as follows:

New Date for Substantial Completion: _____

New Date for Final Completion: _____

It is hereby mutually agreed upon the execution of this agreement that the sums and change in Contract Time provided herein are complete, whole, fair and reasonable, and that the Contractor hereby releases the Owner from any additional claims, demands, liabilities, payments, added compensation, or time extensions arising from, growing out of or in any way connected with Contractor's request for this Change Order or the work described herein. All other terms and conditions or provisions of the Contract Documents shall remain in full force and effect and shall be binding on the parties of this Contract.

APPROVED by
**OWNER'S REPRESENTATIVE:**

_____

By: _____

Title:_____

Date:_____

RECOMMENDED by
**PROJECT/PROGRAM MANAGER:**

_____

By: _____

Title:_____

Date:_____

RECOMMENDED by **ENGINEER:**

_____

By: _____

Title:_____

Date:_____

AGREED by **CONTRACTOR**:

_____

By: _____

Title:_____

Date:_____

SECTION 00700

GENERAL CONDITIONS

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SECTION 00700

GENERAL CONDITIONS

## ARTICLE 1 - DEFINITION OF TERMS

### 1.01 DEFINITION OF TERMS

A. Wherever in the Bid or Contract Documents the following terms, or pronouns in place of them, are used, the intent and meaning shall be as follows:

1. Acceptance: Formal written acceptance by MassCEC of the completed Work.

2. Addenda: Written interpretation of and/or revisions to the Bid Documents issued by MassCEC prior to opening of Bids.

3. Alteration: A change or substitution in the form, character, or detail of the Work done or to be done within the original scope of the Contract.

4. Award: Award by MassCEC of a Contract

5. Bid: Offer of the Bidder for the Work when submitted on the prescribed Bid Form, properly signed, dated, and guaranteed, and which includes the Schedule of Bid Prices. Also referred to as a "Proposal."

6. Bid Bond: The Bidder's Bond accompanying the Bid submitted by the Bidder, as a guaranty that the Bidder will enter into a Contract with MassCEC for the performance of the Work and furnish acceptable bonds and insurance if the Contract is awarded to the Bidder.

7. Bid Documents: Documents provided by MassCEC for the purpose of soliciting Bids for the Work. Bid Documents will include, as applicable, Notice to Bidders, Instructions to Bidders, Contract Specifications, Contract Drawings, Geotechnical Data Reports, and Addenda.

8. Bid Form: Form(s) issued by MassCEC for the submittal of a Bid for a specific project and includes the Schedule of Bid Prices, certifications, affidavits and other forms.

9. Bidder: An individual, firm, partnership, corporation, or combination thereof, submitting a Bid for the Work on the prescribed Bid Form. Also may be referred to as a Proposer.

10. Change Order: A document executed and issued to the Contractor by MassCEC amending the Contact.

11. Commonwealth: Commonwealth of Massachusetts

12. Contract or "Agreement": The Form of Agreement, General Conditions, Supplementary Conditions, and any attachments, addenda, all exhibits thereto, and all documents incorporated by reference therein. Also referred to as the "Agreement."

13. Contract Administrator: The Massachusetts Clean Energy Technology Center designee.

14. Contract Bonds:

    a. Performance Bond: A bond executed by the Contractor and the Contractor's Sureties in the full amount of the Contract to ensure the faithful performance of the Contract.

    b. Labor and Materials Payment Bond: A bond executed by the Contractor and the Contractor's Sureties in the full amount of the Contract to ensure the payment of labor, materials, and rental of equipment.

15. Contract Documents: As defined in the Form of Agreement and Article 9 of these General Conditions.

16. Contract Drawings (Drawings): Plans, profiles, typical cross sections, general cross sections, elevations, and details referenced in the Contract Documents, or Addenda thereto, and shop drawings approved by the Engineer, all of which show locations, character, dimensions, and details of the Work.

17. Contract Item: A specifically described unit of work for which a price is provided in the Contract.

18. Contract Price: The sum payable by MassCEC to the Contractor for completion of the Work in accordance with the Contract Documents as stated in the Form of Agreement subject to adjustment under the terms of the Contract Documents.

19. Contract Specifications: A set of documents issued by MassCEC for the intended Work which includes the Bid Form, Contract Forms, Contract Bonds, General Conditions, Supplementary Conditions, technical provisions including Divisions 01 through 33, and other requirements, forms and exhibits identified therein.

20. Contract Time: Number of calendar days allowed or specified date(s) for completion of the Contract.

21. Contract Unit Price: Price for portions of the Work to be performed on the basis of unit prices as set forth in the Bid Form.

22. Contract Lump Sum Price: Price for portions of the Work to be performed on a lump sum basis as set forth in the Bid Form.

23. Contractor: The individual, firm, partnership, corporation, or combination thereof, private, municipal or public, including joint ventures, which, as an independent contractor, has entered into a Contract with MassCEC, as Party or Parties of the Second Part, and who is referred to throughout the Contact Documents by singular number.

24. Days: Every day shown on the Calendar, Saturdays, Sundays and holidays included.

25. Director: Executive Director of the Massachusetts Clean Energy Technology Center.

26. Engineer: The Massachusetts Clean Energy Technology Center designee acting with the authority of the Owner, within the scope of the particular duties entrusted to this person, as outlined within the Contract Documents.

27. Engineer's Estimate of Quantities: List of quantities of work estimated to be performed as contained in the Schedule of Bid Prices in the Bid Form.

28. Extra Work: Work which is not included in the Contract Documents as awarded but found to be necessary for the satisfactory completion of the Contract within its intended scope; and bears a reasonable subsidiary relation to the full execution of the Work originally described in the Contract.

29. Extra Work Order: An order in writing issued by the Engineer to the Contractor prior to performing the Extra Work, setting forth the Extra Work to be done, the basis of payment and time adjustments, if any. Following the issuance of an Extra Work Order, a Change Order will be executed to amend the Contract Documents.

30. Form of Agreement: The written "Agreement Between Owner and General Contractor," as Section 00525 of the Contract Documents.

31. General Terms: Wherever the words "required," "determined," "directed," "specified," "authorized," "ordered," "given," "designated," "considered

necessary," "deemed necessary," "permitted," "reserved," "suspended," "established," "approval," "approved," "disapproved," "acceptable," "unacceptable," "suitable," "accepted," "satisfactory," "unsatisfactory," "sufficient," "insufficient," "rejected," "condemned," or words with like import are used, they shall be understood to imply "by the Engineer" or "to the Engineer," unless the context clearly indicated a different meaning.

32. Indicated: A term meaning as shown on the Contract Drawings (Drawings), as described in the Specifications, or as required by other Contract Documents.

33. Instructions to Bidders: Explanation of procedures to be followed in preparing and submitting Bids.

34. MassCEC: The Massachusetts Clean Energy Technology Center. Also referred to as the "Owner."

35. Notice to Bidders: Advertisement for Bids for a specific Contract. Notice to Bidders will indicate time and place for submitting Bids, location of the Work, a brief description of the Work to be provided, and bid security required.

36. Notice to Proceed: Written notice from MassCEC to the Contractor to proceed with the Work.

37. Owner: The Massachusetts Clean Energy Technology Center or MassCEC.

38. Owner's Representative: The Massachusetts Clean Energy Technology Center designee acting with the authority of the Owner, within the scope of the particular duties entrusted to this person, as outlined within the Contract Documents.

39. Project: The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

40. Provide: In reference to Work to be performed by the Contractor, "provide" means furnish, install, and (as applicable) test complete in place.

41. Reference Utility Standards: Drawings and specifications, published by municipalities, utility companies, railroads and other responsible agencies/entities which are included or referenced in the Contract Documents.

42. Specifications: Directions, provisions, and requirements contained in the Contract Specifications.

43. Subcontractor: The individual, firm, partnership, corporation, vendor, supplier, or combination thereof to whom the Contractor, with written approval of MassCEC, sublets any part of the Contract. Such Subcontractor does not constitute a "Subcontractor" within the meaning of G.L. c. 30, section 39F, as this Project has not been awarded pursuant to G.L. c. 149, section 44 or G.L. c. 30, section 39M.

44. Substantial Completion: The term Substantial Completion, as applied to all or a part of the Work, shall mean either that the Work required by the Contract Documents has been completed except for Work having a Contract price of less than 1 percent of the then adjusted total Contract Price, or substantially all of the Work has been completed and is being or is ready to be used/occupied for its intended purpose, by MassCEC or an operating contractor except for minor incomplete or unsatisfactory Work items that do not materially impair the usefulness of the Work required by the Contract Documents.

45. Supplementary Conditions: Supplements and additions to the General Conditions.

46. Surety: Corporate body bound with and for the Contractor for the full and complete performance of the Contract and for the payment of all legal debts pertaining to the Work, and who executed the Contract Bonds.

47. Value Engineering: The systematic application of recognized techniques which identify the function of a product or service and provide the necessary function or service reliably at lower overall cost.

48. Work: All the construction, materials, equipment, and contractual requirements as specified, shown, or indicated in the Contact Documents, including all alterations, amendments, or extensions thereto made by authorized changes.

49. Shop Drawings: Supplementary drawings or similar data which the Contractor is required to submit to the Engineer for approval, including but not necessarily limited to erection, falsework, and formwork drawings; dewatering; bending diagrams and bar schedules for reinforcing steel; calculations; and manufacturers' catalog information and data.

**END OF ARTICLE 1**

## ARTICLE 2 - SCOPE OF WORK

### 2.01 INTENT OF THE CONTRACT

A. Intent of the Contract is to provide all items necessary or reasonably inferable from the Contract Documents for the proper completion of the Work. Items omitted from the Contract shall be considered as included within the scope of the Work if they are required by applicable law, regulation, or code, if they are reasonably inferable from the intent of the Agreement or if they are necessary to produce the intended results. The Contractor shall complete the Work to the satisfaction of the Engineer at the prices set forth and agreed upon. Where portions of the Work are described in general terms, but not in complete detail, the best general practice shall be followed. Only materials and workmanship of best standard quality shall be used. The Contractor shall, unless otherwise specified, furnish all labor, superintendence, materials, tools, equipment and incidentals necessary to complete the Work in a proper, thorough, and workmanlike manner.

B. The Contractor shall remove all obstructions from within the limits of work; and shall do such additional, extra, and incidental work as may be considered necessary to complete the Work in a substantial and acceptable manner and within the time specified; and when it is so completed, shall leave the Work in a neat and finished condition.

All Work shall be done and furnished strictly pursuant to, and in conformity with the Contract Documents, and also, in accordance with the directions of the Engineer as given from time to time during the progress of the Work pursuant to the terms of the Contract Documents.

The Work shall include grading and drainage work, where indicated outside the limits of the Work, and other miscellaneous work as shown in the Contract Documents and as directed.

C. In the event that the Contractor discovers any apparent error or discrepancy in the Contract Documents, the Contractor shall call immediately upon the Engineer for its interpretation, and such interpretation or decision shall be final.

D. No action or failure to act by the Owner shall constitute a waiver of any right or duty afforded to it under this Agreement, nor shall any such action or failure to act constitute an approval of or acquiescence to any breach under this Agreement except as may be explicitly agreed to in writing by the Owner. The Contractor is not entitled to rely on waivers, consents, approvals or instruments received directly or indirectly from the Owner unless said waivers, consents, approvals or instructions are given in writing.

## 2.02 CHANGES IN THE WORK

A. MassCEC reserves the right at any time during the progress of the Work to make alterations to, deviations from, additions to, and deletions from the Contract Documents. Such changes shall not invalidate the Contract nor release the Surety. The Contractor agrees to accept the Work as changed, the same as if it had been a part of the original Contract. Such changes will be authorized in writing by the Engineer.

B. Wherever an alteration, deviation, addition, or deletion involves a change in the nature of design or in the type of construction which increases or decreases the cost of performance of the Work or requires the Contractor to furnish materials or provide work of a kind not susceptible of classification for payment under any of the items scheduled in the Bid, MassCEC and the Contractor may enter into a Change Order covering the Work to be done and the manner and method of payment therefore.

C. Changes to the Contract Price or the Contract Time shall only be effective upon execution of a Change Order by the Owner.

D. Where Contactor seeks additional compensation or time for claimed changes to the work, Contractor must submit a proposed Change Order in accordance with Section 5.19.

E. Payment for approved Change Orders shall be made in accordance with Article 7.04.

F. In the event of a disputed Extra Work Order, Contractor shall proceed with promptly performing the Work under protest, on a time and materials basis, while the parties negotiate cost or the Contractor submits a Claim under Article 5.19.

## 2.03 EXTRA WORK

A. The Contractor shall do any work not herein provided for when and as ordered in writing by the Engineer (via an Extra Work Order), such written order to contain particular preference to this Article and to designate the Work to be done as Extra Work.

B. Unless specifically noted in the Extra Work Order, Extra Work will not extend the time of completion of the Contract as stipulated in Article 6.08.A.6.

C. Determination of the Engineer will be final upon all questions concerning the amount and value of Extra Work, except as provided in Article 5.19.

D. Payment for Extra Work will be in accordance with Article 7.04.

E. Where all terms of the Extra Work including scope and cost are mutually agreed upon, a Change Order will be issued reflecting such terms. Otherwise, disputed Extra Work Order will be subject to Contractor Claims, if properly made in accordance with Article 5.19.

F. In the event of a disputed Extra Work Order, Contractor shall proceed with promptly performing the Work under protest, on a time and materials basis, while the parties negotiate cost or work to resolve a Contractor Claim under Article 5.19.

## 2.04 VALUE ENGINEERING - CONTRACTOR COST REDUCTION PROPOSALS

A. This Article defines the conditions and requirements that apply to Value Engineering Cost Reduction Proposals (VECRP) that are initiated, developed and submitted by the Contractor to change the Contract Documents. The purpose of a VECRP is to encourage the Contractor to submit recommended changes to the requirements specified in the Contract Documents, based on the Contractor's experience and knowledge of alternative cost reducing means, methods, materials and technologies.

Value Engineering is the systematic application of recognized techniques that identify the function of a product or service, establish a value for that function, and provides the necessary function reliability at the lowest practical life-cycle cost.

A VECRP submitted under the Contract shall require a change to the Contract Documents. As described in paragraph D, the incentive to the Contractor provided under this Article is to share the net savings resulting from acceptance of a VECRP on the basis of 50 percent for the Contractor and 50 percent for MassCEC. In order to be considered for acceptance under this Article, each VECRP shall:

1 Be identified by the Contractor as a VECRP at the time of submittal to the Engineer as submitted pursuant to this Article.

2. Yield a net savings as defined in paragraph D, in excess of $10,000.

3. Maintain the specified items' required functions as to service life, reliability, economy of operation, ease of maintenance, and necessary standardized features and appearance.

4. Shall not require an unacceptable extension of Contract Time(s) or Contract Milestone(s).

B. A VECRP the Contractor submits shall be in sufficient detail to clearly define the proposed change. The Contractor's failure to provide material of the type, detail and in a format acceptable to the Engineer, and necessary to facilitate the Engineer's review, will be sufficient cause for rejection of the VECRP. Information provided by the Contractor shall include, but not be limited to, the following:

1. A description of the difference between the existing Contract requirements and the proposed Contract requirements, and the comparative advantages and disadvantages of each.

2. Contract requirements recommended to be changed if the VECRP is accepted.

3. A detailed estimate of the amount of anticipated gross savings resulting from, and the Contractor's costs incurred in, implementing and developing the VECRP, as defined in paragraph D.

4. Changes in the Contract Time(s) or Contract Milestone(s) that will result from acceptance of the VECRP.

5. A statement of the time by which the VECRP must be accepted so as to obtain the maximum price reduction, noting any effect upon Contract Time(s) or Contract Milestone(s).

C. The Engineer may accept or reject part or all of a VECRP by giving the Contractor written notice thereof. However, approval of the VECRP does not occur until a modification in the form of a Change Order incorporating the VECRP is issued by MassCEC. Until such Change Order is issued, the Contractor shall remain obligated to perform the Work in accordance with the terms of the Contract Documents. The VECRP will be processed expeditiously. MassCEC shall not be held liable for any delay in acting upon a VECRP submitted pursuant to this Article. The decision of the Engineer as to acceptance of a VECRP shall be final.

The Contractor has the right to withdraw part or all of a VECRP at any time prior to acceptance by the Engineer. The withdrawal of a VECRP by the Contractor shall be made in writing to the Engineer. The Contractor shall state the period of time from the date of submittal of the VECRP that the VECRP shall remain valid. Revision of this validity period shall be allowed only by mutual agreement of the Contractor, MassCEC and the Engineer. If the Contractor desires to withdraw the VECRP prior to the expiration of the validity period, the Contractor shall be liable for the costs incurred by MassCEC in reviewing the VECRP. The cost incurred by MassCEC will be recovered by the issuance of a Change Order to reimburse MassCEC from monies due the Contractor and payable to the Contractor as shown on the monthly payment application.

If the Contractor withdraws the VECRP, MassCEC reserves the right to proceed with the VECRP or any portion of the VECRP as a normal change and the Contractor waives any and all rights to share in net savings hereunder. For purposes of this provision, expiration of the time established by the Contractor for approval shall be considered as withdrawal by the Contractor if MassCEC requests an extension of that time and the Contractor does not provide a written extension.

D. When a VECRP submitted pursuant to this Article is accepted by the Engineer the following will occur:

1. A Change Order, covering an equitable adjustment in the Contract Price and modifications to other affected provisions of the Contract will be issued.

2. Any net savings in the cost of the VECRP to MassCEC, as determined by the Engineer, resulting from the VECRP will be shared between the Contractor and MassCEC on the basis of 50 percent for the Contractor and 50 percent for MassCEC.

3. Net savings in the cost of the VECRP will be determined by deducting from the estimated gross savings:

   a. The Contractor's costs of developing the proposal for the accepted VECRP.

   b. MassCEC's estimated additional costs incurred by processing and accepting the VECRP that includes, but is not limited to, anticipated increased costs to MassCEC on other contracts and anticipated follow-on increased costs to MassCEC.

   Estimated gross savings is the difference between the cost of implementing the requirements of the VECRP and the accepted changes. Gross savings shall include the Contractor's labor, material, equipment, overhead, profit and bonds. The Contractor's cost shall include additional costs including, but not limited to, amounts attributable to a subcontractor, such as preparation of design documents, incurred in developing and implementing the VECRP. MassCEC's costs will include, but not be limited to, additional costs incurred by the Engineer and its subconsultants or subcontractors in processing, reviewing and incorporating the VECRP into the Contract, all anticipated increased costs to MassCEC on other contracts and anticipated follow-on increased costs to MassCEC. MassCEC's costs may also include, but not be limited to, implementation, inspection, related items and MassCEC furnished material. The Contractor's share in the net savings to the Contract shall be affected by a change in the Contract Price that shall be reduced by the amount of MassCEC's share of the net savings and MassCEC's costs.

   Upon review of the VECRP, MassCEC and the Engineer may determine that the VECRP has sufficient merit that requires further development in order to permit a final approval or disapproval. In such instances MassCEC may request that the Contractor provide further development and/or design information. MassCEC, at its sole discretion, may decide to share in up to one-half of the Contractor's reasonable and actual development costs, but

only for costs expressly preapproved by MassCEC in writing, incurred to provide the additional development and/or design information. If the VECRP is approved, such development costs shall be included in the net savings calculation. If the VECRP is not approved by MassCEC, MassCEC will not require reimbursement for the share of development and/or design information costs it incurred.

Approval of the VECRP does not occur until a modification to the Contract Documents incorporating the VECRP is issued by MassCEC in the form of a Change Order. The estimated net savings determination, conditions placed on the VECRP by MassCEC, or the VECRP design or any other aspect of the VECRP may be changed at any time prior to approval, without obligation of MassCEC. If additional design development or additional time or cost impact analysis will be required after approval, the VECRP shall be included in the Contract Documents by Change Order, and it shall include statements identifying that the estimated net savings and the final design is subject to adjustment. If changes are required during the final design development that impact the estimated net savings, the net savings calculation shall be reviewed and adjusted. Increases to the net savings will be shared equally between MassCEC and the Contractor. Decreases in the net savings will also be shared equally, except the Contractor's share of decreased net savings will be limited to its share of the initially estimated total net savings.

4. The Contractor is entitled to share in VECRP savings only to the full extent provided for in this Article. The Contractor does not share in savings on follow-on contracts or in savings other than those of the VECRP, except to the extent such savings may decrease follow-on costs to MassCEC. For purposes of sharing under paragraph D.1, the term VECRP shall not include Change Orders to or other modifications to the Contract Documents, executed subsequent to acceptance of the particular VECRP, by which MassCEC increases the quantity of any item or adds any item of work.

E. The Contractor shall use its best efforts to include VECRP arrangements in subcontracts, which in the Contractor's judgement, appears to offer sufficient VECRP potential.

F. A VECRP identical to one submitted under any other contract, by this Contractor or any other contractor may be submitted under this Contract.

G. The Contractor may restrict MassCEC’s right to use any portion of the Contractor’s VECRP by marking it with the following statement:

This data furnished pursuant to Article 2.04 of the General Conditions of Contract No. MACEC-FY25-01 may not be duplicated, used or disclosed, except as required by the Massachusetts Public Records Law, in whole or

in part, for any purpose except for evaluation, unless the VECRP is accepted by MassCEC. This restriction does not limit MassCEC's right to use information contained in this data if it is or has been obtained, or is otherwise available, from the Contractor or from another source, without limitations. When this VECRP is accepted by MassCEC, MassCEC will have the right to duplicate, use, and disclose any data in any manner and for any purpose whatsoever, and have others do so whether under this or any other MassCEC contract.

## 2.05 INCREASED OR DECREASED CONTRACT QUANTITIES

A. When the accepted quantities of unit price Work vary from the quantities in the Bid Form, the Contractor shall accept as payment in full, so far as Contract Items are concerned, payment at the original Contract Unit Prices for the accepted quantities of Work done. An adjustment in any Contract Unit Price, as determined by the Engineer, will be made by means of a Change Order to credit MassCEC with any reduction in cost or to compensate the Contractor for any increase in cost resulting from such change in quantity only when the accepted quantities of work vary by an amount equal to or greater than plus 25 percent or minus 25 percent from the quantities in the Bid Form.

B. The Engineer may order omitted from the Work any items or portions of Work. Such omission shall not operate as a waiver of any conditions of the Contract nor invalidate any of the provisions thereof, nor shall the Contractor have any claim for lost profit on any part of the Work not performed. Also, see Article 7.05.

C. Except as specified herein, no allowance will be made for any increased expenses, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly or indirectly from such increased or decreased quantities or from unbalanced allocation, among the Contract Items of overhead expenses on the part of the Contractor and subsequent loss of expected reimbursement therefore, or from any other cause.

D. This section shall not apply to Lump Sum bid items, which are not subject to increases or decreases regardless of variations between actual quantities encountered in the performance of the Work and estimated or assumed quantities on which the lump sum bid price may have been based.

## 2.06 RIGHTS IN THE USE OF MATERIALS FOUND ON THE WORK

A. The Contractor, only with prior written approval of the Engineer, may take suitable ledge, gravel, sand, loam, clay, or other material from within the location lines of the Contract and use it on the same Contract for other purposes than for forming embankments. If such use necessitates securing additional material for forming embankments, the Contractor shall replace, at no additional expense to MassCEC, material of at least similar quality. The Contractor shall not excavate or remove

any material that is not within the excavation as indicated by the Contract Documents without written approval. Excavated material suitable for use shall not be wasted, unless otherwise directed.

## 2.07 ARCHEOLOGICAL AND PALEONTOLOGICAL SALVAGE

A. The Contractor's attention is directed to the United States Department of Transportation, Federal Highway Administration, Federal Aid Highway Program Manual, Volume 7, Chapter 7, Section 4, subject "Archaeological and Paleontological Salvage", incorporating Policy and Procedure Memorandum 20-7, dated March 31, 1979, and to the Commonwealth of Massachusetts, Acts of 1973, Chapter 1155.

B. In compliance with these procedures and legislation, the Contractor shall exercise special care during their operations to avoid injury to underground prehistoric and historic archaeological remains or paleontological remains. Should any archaeological or paleontological remains be encountered during any phase of construction, the Contractor shall immediately suspend all work in the area and shall notify the Engineer. The Engineer shall immediately notify the State Archaeologist and the Massachusetts Historical Commission. All construction work in that area will be temporarily delayed while the State Archaeologist and representatives of Massachusetts Historical Commission inspect the site to determine the importance of the discovery. Areas of prehistorical, historical, or paleontological significance shall be carefully protected in accordance with the above referenced manual and shall not be disturbed by the Contractor until so directed by the Engineer.

C. Contractor shall receive no extra compensation for such special care, unless said compensation is authorized in writing by the Engineer as provided for in Article 7.04. Material from such areas shall be carefully protected, and if necessary to remove specimens, the Contractor shall do so only at the Engineer's direction, and after an authorized agent has witnessed or otherwise referenced their locations.

## 2.08 WARRANTY OF WORK

A. Neither final acceptance, final payment nor any provision in the Contract Documents nor partial or entire operation or occupancy of the Work by MassCEC shall constitute an acceptance of the Work not done in accordance with the Contract Documents or relieve the Contractor of liability with respect to any express warranties or responsibility for faulty materials or workmanship.

B. Except where longer periods of warranty are specified for certain items, the Contractor warrants all Work done under the Contract to be free from faulty materials and workmanship for a period of one (1) year from MassCEC's final acceptance of the Work and for such longer times for specific parts of the work as may be required by the Contract Documents or applicable law.

C. Upon receipt of written notification from MassCEC during the warranty period described in Article 2.08B, the Contractor, at its sole cost, shall immediately correct or cause to be corrected all defective or improperly performed Work. If repairs or replacement are not started within ten (10) days from the date of notification and prosecuted to completion, MassCEC reserves the right to employ others to complete the Work. The Contractor agrees, upon demand, to pay MassCEC all amounts that it expends for such repairs or replacements.

D. All defective Work repaired or replaced by the Contractor pursuant to Article 2.08 shall carry the same warranty period as the original Work starting with the date of acceptable replacement or repair.

E. The warranty in this Section 2.08 shall not be exclusive and shall be in addition to all warranties and remedies otherwise available at law and equity, including but not limited to the Owner's right to recover damages and other remedies for defective or nonconforming work discovered after the warranty period but within applicable statutes of limitations and/or repose.

## 2.09 CHANGED CONDITIONS

A. If during the progress of the Work, the Contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those indicated in the Contract Documents either the Contractor or MassCEC may request an equitable adjustment in the Contract Price of the Contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a Contractor, or upon its own initiative, MassCEC will make an investigation of such physical conditions, and, if they differ substantially or materially from those indicated in the Contract Documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents and are of such a nature as to cause an increase or decrease in the cost of performance of the Work or a change in the construction methods required for the performance of the Work which results in an increase or decrease in the cost of the Work, MassCEC will make an equitable adjustment in the Contract Price and the Contract will be modified in writing accordingly.

1. Filing, investigation, and settlement of all claims made under this Section shall be as follows:

a. The Contractor shall promptly, and before such conditions are disturbed, notify the Engineer in writing describing in full detail the subsurface or latent physical conditions at the site where it is maintained, that conditions differ substantially or materially from

those conditions indicated in the Contract Documents. The Engineer will promptly investigate the conditions and will promptly submit a written report of its findings and determinations to the Contractor, and if it is found that such conditions as have been described in detail by the Contractor do exist and in fact do so differ materially or substantially, an equitable adjustment will be made and the Contract modified in writing accordingly. No such claim of the Contractor will be allowed unless the Contractor has given the detailed notice specified, nor shall it be allowed if such conditions are disturbed prior to their investigation by the Engineer.

b. No adjustment or allowance of any kind except as provided in Article 6.08 will be made to the Contractor due to delay or suspension of the Work or any portion thereof where the actual subsurface or latent physical conditions encountered at the site differ substantially and materially from those indicated in the Contract Documents.

c. No claim will be approved, and no adjustment or allowance made when encountering subsurface or latent physical conditions at the site that differ substantially and materially from those indicated in the Contract Documents unless such conditions were in existence at the time of the Award of the Contract.

d. Any dispute concerning a question of changed conditions under this Article that is not disposed of by agreement shall be decided by the Engineer. The decision of the Engineer shall be final.

e. If as provided in "a" of this Subsection an equitable adjustment is to be made or contemplated, the Contractor shall submit promptly in writing to the Engineer an itemized statement of the details and amount of work together with their estimated costs for the same and the Engineer shall require the Contractor to keep actual costs and certify the same to MassCEC in writing. In no event shall Contractor be entitled to recover overhead or profit as part of any equitable adjustment under this Section.

B. If the Contractor and MassCEC fail to agree on an equitable adjustment to be made under this Article, then the Contractor shall accept as full payment for the Work in dispute an amount determined in accordance with Article 7.03.B.

## 2.10 INTENTIONALLY OMITTED

## 2.11 COMMUNITY RELATIONS

A. The Contractor shall establish and maintain a continuing liaison with persons residing or doing business in the vicinity of the Project site, for the purpose of minimizing inconveniences resulting from construction, and shall appoint a representative, acceptable to the Engineer, for community relations. The representative shall have the authority to act directly, or through the Contractor's approved Superintendent, regarding all valid requests or complaints. Information as to their disposition by the Contractor shall be furnished to the Engineer. The name and telephone number of the Contractor's community relations representative shall be furnished to those residents or business owners in the community who might reasonably be expected to be affected by the construction. The Contractor shall promptly inform MassCEC of any material complaints received from a resident or business owner in the community.

## 2.12 REMOVAL AND DISPOSAL OF STRUCTURES AND OBSTRUCTIONS

A. Existing structures found within the limits of the Work, which are to be replaced or rendered useless by new construction, shall be removed by the Contractor at its own expense whether or not indicated on the Plans as existing unless otherwise provided in the Contract Documents. When such structures are situated so as not to interfere with the Work, the removal shall not be undertaken until the new replacement structures are ready for use or until the Engineer shall permit.

All material in existing structures requiring removal shall be removed as directed by the Engineer.

Unless otherwise provided, the material from any existing structures may be used temporarily by Contractor during construction. All discarded material, rubbish, or debris shall be removed from the Work area and MassCEC's property and properly disposed of (according to all laws, ordinances, regulations, orders and decrees) at the Contractor's expense. No foreign material or debris, except as directed within the Contract, shall be permitted to enter a waterway or drainage system.

## 2.13 FINAL CLEANING UP

A. Upon completion of the Work and before acceptance and final payment, the Contractor shall remove, at its own expense, from the Work area, from adjoining property, and from the Contractor's staging areas on MassCEC's property, all temporary structures and all surplus material and rubbish which may have accumulated during the prosecution of the Work and shall leave the Work in a neat and orderly condition. The Contractor shall insure that neither soil nor ground water have become contaminated from its activities. In the event of a "release to the environment", the Contractor shall ensure that appropriate notifications to the Engineer and the Massachusetts Department of Environmental Protection and other agencies with jurisdiction are made aware immediately and that all appropriate and required remedial actions are undertaken by the Contractor at its expense.

No equipment shall be left at the site of the Work or in the vicinity of the Work without the written permission of the Engineer.

**END OF ARTICLE 2**

## ARTICLE 3 - CONTROL OF WORK

### 3.01 AUTHORITY OF THE ENGINEER

A. The Engineer will decide all questions relating to interpretation of the Contract Documents, and may alter, adjust, and approve same when necessary; all questions relating to quality, quantity, value, and acceptability of materials to be furnished and work provided or to be provided; all questions relating to progress of the Work and need for and manner of correcting same, and also the need for and time frames of delay and suspensions; all questions relating to the need for and terms of Extra Work; all questions relating to the supervision, control and director of Work on the site and the use thereof; and all questions as to the acceptable fulfillment of the Contract by the Contractor.

B. Attention of the Contractor is directed to the following limitations on the scope of the duties entrusted to the Engineer.

1. Engineer will not supervise, direct, control or have authority over or be responsible for the Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the Contractor to comply with laws and regulations applicable to the furnishing or performance of the Work. Engineer will not be responsible for the Contractor's failure to perform or furnish the Work in accordance with the Contract Documents.

### 3.02 CONTRACT DRAWINGS

A. Contract Drawings showing the general arrangement and such details as necessary to give a comprehensive idea of the construction contemplated will be furnished by MassCEC. As work progresses, the Contract Drawings may be supplemented by the Engineer as required to amplify or control the Work. The Contractor shall perform the work required by such supplements without additional compensation, except as provided by the Contract Documents.

B. Approved drawings, details, profiles and sections on file in the office of the Engineer will show the location, details, and dimensions of the Work contemplated, and all Work shall be in strict conformity therewith and with the Specifications.

Supplemental, detail, and working drawings as required in the Specifications and furnished by the Contractor shall upon approval become a part of the complete Drawings. Such approval of supplemental, detail, and working drawings, however, shall not operate to relieve the Contractor of any of its responsibilities under the Contract Documents for the satisfactory completion of the Work, nor for the accuracy of the dimensions, details or quantities.

The detail drawings shall be of the same size as the original contract drawings, with margins and titles conforming thereto. When submitting detail drawings for approval, Contractor shall furnish an electronic copy (PDF) to the Engineer, who will review and either approve, reject, or provide comment with corrections marked thereon. Once final approval has been obtained by the Engineer, the Contractor shall furnish a PDF of the final corrected and approved As-Built Drawings to the Engineer. No changes shall be made in the approved drawings without the written consent of the Engineer.

The Contract Price shall include the cost of furnishing all working drawings and the Contractor will be allowed no extra compensation therefore.

Any work done or materials furnished by the Contractor prior to the approval of the working drawings shall be at its own risk. The words "approved as noted" or words of similar import placed by the Engineer on a contract or shop drawing submittal mean that all items and details of the drawing submitted are fully approved with the exception of those items or details that are specifically marked for further action. The withholding of an unqualified approval by the Engineer with respect to any contract drawing or shop drawing in its entirety shall under no circumstances constitute a basis for delay in arranging for and proceeding with the manufacturing, fabricating, delivering and installing, in accordance with the Contract Documents, of those items or details on such drawing which have been approved as aforesaid.

C. The Contractor shall maintain at the site, a set of Contract Drawings on which to record the as-built conditions. These As-Built Drawings shall be updated on a daily basis, as the Work progresses, showing what was actually constructed, the dimensions and grades of all Work, located horizontally and vertically to the nearest 0.1 of a foot, indicating thereon all exposed features uncovered during the Work and all other construction Work items completed under this Contract. The Contractor shall require the Subcontractors to participate daily in the As-Built Drawing updates, which shall show all Work, as it was built or discovered, including the Work of all Subcontractors. As-Built Drawings of hidden features shall be based upon measurements taken by the Contractor before covering them. These As-Built Drawings shall be kept current and available for review by the Engineer and MassCEC at all times.

The Contractor shall forward a copy of the current As-Built Drawings with each payment requisition to the Engineer. At the sole discretion of MassCEC, Contractor’s application for payment may either be withheld or modified unless accompanied by complete and updated As-Built Drawings. At a minimum, for underground utilities (uncovered, existing or installed) the As-Built Drawings shall show the type of feature, material, size, elevation (top and/or flow line) and horizontal position by the project datum (northing, easting and elevation) at every change in direction and minimally every 50 feet.

D. Prior to final acceptance and payment by MassCEC, the Contractor must submit to the Engineer final As-Built Drawings. Each final As-Built Drawing must include the Contractor's certification that the Drawing completely and accurately represents the final as-built conditions. The Contractor's certification shall state: "This Drawing reflects As-Built Conditions as certified by (insert Contractor's name)." The Consultant shall then update the As-Built Drawings to provide electronic AutoCAD base Drawing files, along with Contractor final As-Built Drawings.

The Engineer will then deliver to MassCEC the certified As-Built Drawings.

## 3.03 CONFORMITY WITH CONTRACT DOCUMENTS

A. No willful and substantial deviation from Contract Documents shall be made unless directed in writing by the Engineer duly authorized by MassCEC to approve such deviation. Such deviation may be authorized by a written order of the Engineer authorized to approve such deviation, and that within 30 days thereafter such written order shall be confirmed by a certificate of MassCEC.

B. All Work provided and all materials furnished shall be in conformity with the lines, grades, cross sections, dimensions, details, gradations, physical, and chemical characteristics of materials and other specific requirements of the Contract.

C. Where definite tolerances are specified in the Contract, such tolerances shall fix the limits of conformity. Where tolerances are not specified in the Contract Documents, the Engineer will determine the limits of conformity in each individual case and such determination shall be final and conclusive and mutually accepted by all parties.

D. If materials or the finished product in which the materials are used are not within conformity with the Contract Documents, but acceptable work has been produced, the Engineer will make a determination whether the work shall be accepted and remain in place. The Engineer will document the basis of acceptance by Contract modification that will provide for an appropriate adjustment in the Contract Price for such work or materials as the Engineer deems necessary to conform to their determination based on engineering judgment, and in accordance with current construction practices.

E. If the Engineer finds the materials, or the finished product in which the materials are used or the Work provided, are not in conformity with the Contract Documents and have resulted in an inferior or unsatisfactory product, the Work or materials shall be removed and replaced or otherwise corrected by the Contractor, at no additional cost to MassCEC.

F. Deviations from the Contract Drawings and approved shop or working drawings that may be required by the need of the Work, will be determined and authorized by the Engineer in writing.

G. The Contractor shall, without extra cost, make necessary modifications to prevent conflicts with the existing work of others or as necessary to ensure a proper installation. This may require the preparation of composite drawings that are drawn to suitable scale and that show the necessary work to be done.

## 3.04 COORDINATION OF CONTRACT DRAWINGS AND CONTRACT SPECIFICATIONS

A. Contract Drawings, Contract Specifications and all other Contract Documents are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. The Contract Documents are intended to be complementary and to describe and provide for a complete Work. In the event of any discrepancy between a Drawing and figures written thereon, the figures, unless obviously incorrect, are to govern over scaled dimensions. Contract Drawings will govern over Contract Specifications. Where Work is to be accepted by a municipality, utility company, railroad or responsible agency/entity the Reference Utility Standards that apply to their materials and workmanship will govern.

B. The Contractor shall take no advantage of any apparent error or omission in the Contract Documents. The Contractor shall provide immediate written notice to the Engineer of any errors or omissions in the Contract Documents. The Engineer will then make such corrections and interpretations as may be deemed necessary to fulfill the intent of the Contract Documents.

## 3.05 COOPERATION BY CONTRACTOR

A. The Contractor will be given an electronic copy (PDF) of the Contract Documents. The Contractor shall have the Contract Documents available for reference at all times during the prosecution of the Work. Hard copies of the Contract Documents may be requested by the Contractor and will be furnished by MassCEC at the expense of the Contractor.

B. Prior to starting Work the Contractor shall designate in writing the name, title, qualifications, and experience of its proposed representative (job superintendent) who, upon approval by MassCEC, shall have complete authority to represent and to act for the Contractor. A facsimile of the authorized representative's signature shall be furnished to the Engineer. The authorized representative or a substitute acceptable to the Engineer shall be present at the work site at all times while work is actually in progress on the Project. Arrangements for responsible supervision acceptable to the Engineer shall be made for emergency work that may be required during periods when Work is suspended. The Contractor shall notify the Engineer,

in writing, of any proposed change of their representative, and shall provide identical information for approval of the new representative.

1. The job superintendent shall have the following minimum qualifications and experience:

   a. A Commonwealth of Massachusetts, Department of Public Safety, License for Construction Supervisor without any restrictions.
   b. A minimum of 10 years of related construction experience.

   The requirements for a licensed construction supervisor and the number of years of related construction may be waived or modified only by the Executive Director of MassCEC.

C. The Contractor shall ensure that the materials and workmanship are in accordance with the Contract Documents. The Contractor shall preserve baseline monuments, benchmarks, and other controls for the Work.

D. The Contractor shall perform the Work under the direction of the Engineer such that representatives of utility owners, state, or municipal departments may enter on the work site without interference to make changes in their facilities which may be affected by the Work. The Contractor shall have no claim for, or because of any delay that may be due to or result from work of utility owners, state or municipal departments. No allowance of any kind will be made except as provided in Article 6.08. Nothing contained herein shall be construed to hold the Contractor responsible for any acts or omissions by such utility owners, state or municipal departments, or their contractors.

E. At the Contractor's discretion, the Owner will designate an area near the Project site if the Contractor wishes to maintain and staff a field office from the time of commencement of the Work under this Contract until such time as the Work has been completed and finally accepted. The Contractor is solely responsible for set up and take down with no expense to the Owner.

F. The Contractor shall confine its equipment, the storage of materials and the operation of their workforce to limits shown on the Contract Documents, established by law, ordinances, permits or directions of the Engineer. The Contractor shall not unreasonably encumber the project site with their materials. All flammable or combustible materials shall be properly stored using OSHA approved containers to prevent, by effective measures, fire.

G. This Contract is expected to be proceeding concurrently with others in the vicinity and within the limit of the Contract. The Contractor shall cooperate fully with the other contractors in expediting the work of all. The Contractor shall secure and anchor the work and avoid damage to the work of the other contractors.

## 3.06 ADJACENT CONTRACTS

A. MassCEC reserves the right at any time to contract for and perform other or additional work on or near the Work covered by the Contract Documents. The intent of this Article is to provide for the cooperation of contractors where MassCEC deems it expedient or necessary and in the best interest of MassCEC to let separate contracts for the performance of other work on or near the location of the Work being performed under the Contract Documents, but it is not intended to indicate an intention on the part of MassCEC to let separate contracts for work within the scope of or necessary for the successful completion of the Work.

B. When separate contracts are let within the limits of any one project (either prior to award of Contract, as specified in the Bid, or as specified above), each contractor shall conduct its work so as not to interfere with or hinder the progress or completion of the work being performed by other contractors.

1. Contractors working within the same area shall cooperate with each other as directed and shall coordinate work schedules through the Engineer to minimize conflicts.

C. Each contractor involved shall assume all liability, financial or otherwise, in connection with its contract and shall protect and save harmless MassCEC from any and all damages or claims that may arise because of inconvenience, delay, or loss experienced because of the presence and operations of other contractors working within the limits of the same project. No allowance of any kind will be made except as provided in Article 6.08.

1. Work beyond the limits of the Project site that is reasonably related to or inferred from the Work required by the Contractor that is due to the work of adjacent contractors within the limits of the project shall be performed by the Contractor, at no additional cost to MassCEC.

D. The Contractor shall arrange the Work and shall place and dispose of the materials being used so as not to interfere with the operations of other contractors within the limits of the Project site. The Contractor shall join the work with that of others in an acceptable manner and perform the Work in proper sequence to that of others.

E. To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless MassCEC from and against all claims, costs, losses and damages (including, but not limited to, fees and charges of architects, attorneys, and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any separate contractor to the extent said claim is based on or arises out of an act or omission of the Contractor in the performance of the Work.

## 3.07 LINE AND GRADE

A. The Contractor will be responsible to provide benchmark and basic control points on or near the construction site for the primary vertical and horizontal control as shown in the Contract Documents. The Contractor shall be required to set all base lines and grade stakes from these basic control points and benchmarks. The Contractor shall employ a surveyor or engineer registered in the Commonwealth of Massachusetts for this purpose. The Contractor shall be responsible for the preservation of these control points and if they are destroyed or disturbed the Contractor shall replace them, at no additional cost to MassCEC. The Contractor shall also establish field ties to the critical points of the base line in order that these can be reproduced after the subgrade work is complete. Information on the field ties shall be submitted to the Engineer. Monuments, stakes, and marks set by MassCEC shall be preserved by the Contractor. If such monuments, stakes, or marks are destroyed or damaged, they may be replaced by MassCEC. The Contractor will be charged the cost of replacing monuments, stakes, or marks destroyed or damaged by reason of its operations. The replacement cost will be deducted from amounts otherwise due and payable to the Contractor for the Work.

B. The Contractor shall proceed from the controls established by MassCEC to make all surveys and layouts necessary to conform all of the work to the requirements of the Contract Documents; shall provide qualified engineering and other personnel for the purpose; and shall be solely responsible for the accuracy of the line and grade features of their Work.

C. MassCEC will make such checks, as necessary, of the control work established by the Contractor as the Work progresses. The Contractor will be informed of results of such checks, but MassCEC by so doing will in no way relieve the Contractor of responsibility for accuracy of the Contract control. The Contractor shall provide such assistance, at no cost to MassCEC, as may be required for checking purposes when requested by MassCEC.

D. The Contractor shall notify MassCEC a reasonable time in advance of their needs, of the time and place the Contractor plans to provide the Work for which such primary control will be needed. MassCEC will furnish the Contractor with such primary lines, grades, and elevations as it deems necessary by such time so as not to delay the Contractor's operations. MassCEC, however, will not be held responsible for any delay resulting from lack of such information if the Contractor fails to notify MassCEC sufficiently in advance of the Contractor's needs.

## 3.08 AUTHORITY AND DUTIES OF ENGINEER'S ASSISTANTS

A. The Engineer may appoint assistants and representatives. The assistants and representatives are authorized to inspect work and materials, to give directions pertaining to the Work or to the safety and convenience of the public, to approve or reject materials and to make measurements of quantities.

B. In case of any dispute arising between the Contractor and the Engineer's assistants, as to materials furnished or the manner of providing work, the Engineer's assistants are authorized to reject materials or to suspend work until the dispute is referred to and decided by the Engineer.

C. The Engineer's assistants are not authorized to revoke, alter, enlarge, relax, or release any requirements of these Specifications nor to issue instructions contrary to the Contract Drawings and Specifications.

D. The Engineer's assistants will not act as foremen or perform other duties for the Contractor.

E. MassCEC will not accept responsibility whatsoever for Extra Work performed for which there is no specific proper written authorization.

## 3.09 INSPECTION OF WORK

A. All materials and each part or detail of the Work shall be subject to inspection by the Engineer. The Engineer shall at all times have access to the Work and be furnished with information and assistance by the Contractor as required, at no additional cost to MassCEC, to make a complete and detailed inspection.

B. The Contractor, if requested by the Engineer, shall before acceptance of the Work, remove or uncover such portions of the finished work as directed. After examination, the Contractor shall restore said work to the standard required by the Contract Documents. Should work exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be paid for as Extra Work. Should work exposed or examined prove unacceptable, the uncovering or removing and the replacing of the covering or making good of the parts removed, will be at no additional cost to MassCEC.

C. The Engineer may order that any Work done or materials used not in conformance with the requirements of the Contract Documents be removed and replaced, at no additional cost to MassCEC.

D. The Contractor shall furnish written information to the Engineer stating the original sources of supply of all materials manufactured away from the Work site. This information shall be furnished at least two weeks (or as otherwise required by the Engineer) in advance of the incorporation in the Work of such materials.

E. When any unit of government or political subdivision is to pay a portion of the cost of the Work, its respective representatives shall have the right to inspect the Work. Such inspection shall in no sense make any unit of government or political subdivision a party to this Contract and shall in no way interfere with the rights of either party hereunder.

F. Inspection of Work shall not relieve the Contractor of any of their obligations to fulfill the requirements of the Contract Documents.

G. Failure to reject any defective work or materials shall not in any way prevent later rejection when such defect is discovered, nor obligate MassCEC to make final acceptance.

H. The Contractor shall give prior notice to the Engineer when work on the various items is to be performed by them or their subcontractors. If work is suspended on any item, prior notice shall be given to the Engineer before resumption of such work. Except in the case of an unforeseen emergency, neither the Contractor nor any subcontractor shall perform any Work requiring inspection at hours other than during the normal work day without prior approval of the Engineer.

## 3.10 REMOVAL OF DEFECTIVE OR UNAUTHORIZED WORK

A. The Contractor shall immediately repair, remove and replace, at no cost to MassCEC, any Work found to be defective notwithstanding that such Work has previously been inspected and approved or estimated for payment.

B. Work performed beyond the lines and grades shown on the Contract Documents or established by the Engineer, and Extra Work done without written authorization, will be considered unauthorized Work and the Contractor will receive no compensation therefor. If required by the Engineer, unauthorized Work shall be remedied, removed, or replaced, at no additional cost to MassCEC.

C. Upon failure of the Contractor to remedy, remove, or replace defective or unauthorized Work, or to comply promptly with any requirement of the Engineer made under this Article, MassCEC may cause defective or unauthorized work to be remedied, removed, or replaced by others and deduct the costs thereof from any monies due or to become due the Contractor.

## 3.11 SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE

A. Upon Substantial Completion of the Work, the Contractor shall present to MassCEC and the Engineer its written certification that the Work has been Substantially Completed. Within 10 days thereafter, the Engineer shall inspect the Work and present to the Contractor and MassCEC either a written declaration that the Work has been Substantially Completed ("Declaration of Substantial Completion"), or else shall present to Contractor an itemized list of incomplete, defective, or unsatisfactory Work items that must be completed or corrected before the Work can be deemed Substantially Completed. The Engineer may include with such list a notice setting forth a reasonable time, which shall not in any event be prior to the Contract completion date, within which the Contractor must achieve Substantial Completion of the Work. If based on this inspection, the Engineer

issues a Declaration of Substantial Completion and MassCEC fails to approve or reject the Declaration in writing within 10 days of receipt, the Work shall be effectively deemed to have been Substantially Completed. Any such rejection shall be accompanied by an itemized list of incomplete, defective, or unsatisfactory Work items that MassCEC determines are not sufficiently resolved to warrant the Declaration of Substantial Completion.

B. Following the inspection described in Article 3.11A, if the Engineer determines that the Work is not Substantially Complete and provides to the Contractor an itemized list of incomplete, defective, or unsatisfactory Work that must be completed or corrected before Substantial Completion, the Contractor shall immediately commence and continue to complete and correct those items of the Work within the time specified by the Engineer. MassCEC may, without further notice and without in any way affecting the Contract, make such other arrangements as may be considered necessary to insure satisfactory completion of the Contract. The cost of completing such Work will be deducted from any money due or which may become due to the Contractor under the Contract.

C. Within10 days of the effective Declaration of Substantial Completion, MassCEC shall present to the Contractor a list of incomplete and defective Work that must be completed or corrected before final acceptance of the Work ( the "Punch List"). MassCEC, with the assistance of the Engineer shall assign a reasonable value to the items on the Punch List in an amount up to 150% of the estimated cost to MassCEC to complete or correct such items. Unless otherwise agreed by MassCEC and the Contractor, the Contractor shall complete all items of Work on the Punch List within 14 days of the date of the approved (whether explicit or effective pursuant to Article 3.11 A.) Declaration of Substantial Completion. If the Contractor fails or neglects to complete the Punch List in such time, MassCEC may provide written notice of such failure or neglect to the Contractor. If the Contractor fails to commence and continue to perform the Punch List work within 7 days of such written notice, MassCEC may complete the Punch List itself or through separate contractors at the Contractor's expense.

D. Also, see Article 5.24.

E. Also, see Article 7.09.

**END OF ARTICLE 3**

## ARTICLE 4 - CONTROL OF MATERIALS

### 4.01 TRADE NAMES AND ALTERNATIVES

A. An item equal to that named or described in the Contract Documents may be furnished by the Contractor, and the naming of any commercial name, trademark, or other identification shall not be construed to exclude any item or manufacturer not mentioned by name or as limiting competition but shall establish a standard of equality only. An item will be considered equal to the item so named or described if all of the following requirements are met:

1. It is at least equal in quality, durability, appearance, strength, safety, reliability, operability, maintainability, and design.

2. It will perform at least equally the function imposed by the general design for the Work being contracted for.

3. It conforms substantially, even with deviations, to the detailed requirements for the item specified.

B. For each item of material, the specifications shall provide for either a minimum of three brands of material or a description of material which can be met by a minimum of three manufacturers or producers, and for the equal of any one of said named or described materials.

C. Burden of proof as to the quality and suitability of alternatives shall be upon the Contractor. The Contractor shall furnish, in writing, all information necessary as required by the Engineer, at no additional cost to MassCEC. Requests for review of alternative materials will not be accepted by the Engineer from anyone other than the Contractor. The Engineer will be the sole judge as to the quality and suitability of alternative materials and the Engineer's decision will be final.

D. Information furnished shall state whether or not acceptance of the alternative material for use in the Work will require a change in the Contract Documents to adapt the design to the alternative and whether or not incorporation or use of the alternative in connection with the Work is subject to payment of any license fee or royalty. MassCEC does not pay license fees and royalties. Where use of an alternative material involves redesign of or changes to other parts of the Work, the cost and the time required to affect such redesign or changes will be considered in evaluating the suitability of the alternative material and the Contractor shall pay charges incurred by MassCEC for such redesign or change.

E. No tests nor action relating to the approval of alternative materials will be made until the request for substitution is made in writing by the Contractor accompanied by complete data as to the equality of the materials proposed. Such request shall

be made in ample time to permit approval without delaying the Work, but such requests need not be made less than 30 days after receipt of Notice to Proceed.

F. Whenever classification, rating, or other certification by a body, such as Underwriters Laboratories, Inc. (UL), or National Electrical Manufacturers Association (NEMA) is a part of the specification for any material, proposals for use of alternative materials shall be accompanied by reports from the listed or equivalent independent testing laboratory indicating compliance with specification requirements.

G. The Contractor shall pay costs of testing required to prove equality of the material proposed.

H. Approval of an alternative material shall be only for the characteristics or use named in such approval and shall not be used to change or modify any Contract requirement, or to establish a basis for subsequent approval for material to be used on any other phase of the Work.

## 4.02 CERTIFICATE OF COMPLIANCE

A. The use of certain products/materials on the basis of a notarized Certificate of Compliance may be allowed under the following conditions:

Before such products/materials are incorporated into the Work, the Contractor shall submit to the Engineer, for approval, copies of the manufacturers or supplier's statement for each kind of such product/material furnished. The statement shall contain the following information:

1. Contract to which the product/material is consigned.

2. Name of the Contractor to which the product/material is supplied.

3. Kind of product/material supplied.

4. Quantity of product/material represented by the certificate.

5. Means of identifying the consignment including, but not limited to, labeling, marking or seal number.

6. Date and method of shipment.

7. Statement to the effect that the product/material has been tested and found in conformity with the pertinent parts of the Contract.

8. Results of all required tests including the chemical analysis in the case of metal; or in lieu of furnishing the results a statement that the results of all

required tests pertinent to the certificate and not submitted shall be maintained and available by the undersigned for a period of not less than 3 years from date of final acceptance.

9. Signature of a person having legal authority to bind the manufacturer or supplier.

B. If the Contractor has new products/materials purchased for use on a previous MassCEC contract which have never been used and which comply with the Contract Documents, these products/materials may be furnished and installed in the Work provided the Contractor submits their own sworn statement certifying that such products/materials were purchased for use on a previous contract (name and identifying such contact) and that Certificates of Compliance were furnished for such products/materials on the previous contract, to which reference can be made.

1. Costs involved in furnishing the certificates shall be borne by the Contractor.

2. Products/materials used on the basis of a Certificate of Compliance may be sampled and tested at any time. The fact that a product/material is used on the basis of a Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating products/materials in the Work which conforms to the requirements of the Contract Documents and Specifications any such products/materials not conforming to such requirements will be subject to rejection, whether in place or not.

3. The Engineer reserves the right to refuse to permit the use of products/materials on the basis of a Certificate of Compliance alone.

## 4.03 MassCEC FURNISHED MATERIALS

A. Materials furnished by MassCEC will be available at locations designated in Supplementary Conditions or, if not so designated, they will be delivered to the Work site or such other place as the parties may agree. MassCEC furnished materials shall be stored and transported to the place of use by the Contractor at the Contractor's expense, including all necessary loading and unloading. The Contractor's costs of storing, handling, and installing MassCEC furnished material are included in the Contract Price.

B. Contractor shall be responsible for all materials furnished by MassCEC and shall pay all demurrage and storage charges as a result of the Contractor's failure to take delivery of MassCEC furnished material. The Contractor shall be liable to MassCEC for the cost of replacing or repairing MassCEC furnished material lost or damaged from any cause whatsoever after receipt by the Contractor. Such costs will be deducted from any amounts due or to become due the Contractor, except those amounts covered under insurance policies furnished by MassCEC. In the

event that such amounts are covered by an insurance policy furnished by MassCEC, the Contractor shall be responsible for paying any deductible.

## 4.04 DEFECTIVE MATERIALS

A. Contractor furnished materials not conforming to the requirements of the Contract Documents will be rejected, whether in place or not. Rejected material shall be removed immediately from the site of the Work unless otherwise permitted by the Engineer. No rejected material, the defects of which have been subsequently corrected, shall be used in the Work unless approved in writing by the Engineer. If the Contractor fails to comply promptly with a request by the Engineer, made under the provisions of this Article, the Engineer may cause the removal and replacement of rejected material and the cost thereof will be deducted from any moneys due or to become due the Contractor.

## 4.05 ASBESTOS MATERIALS

A. The Contractor shall not furnish or install asbestos or materials containing asbestos under this Contract.

## 4.06 BANNED MATERIALS

A. Lead Paint

1. The Contractor shall not furnish or apply lead containing paint on surfaces within the limits of the Contract.

a. A lead containing paint is defined by the Consumer Product Safety Commissions' Lead Containing Paint Poisoning Prevention Act of 1979 as any coating whose dried film contains greater than 0.06 percent by weight of lead.

## 4.07 IDENTIFICATION OF MATERIAL AND EQUIPMENT

A. No materials manufactured or produced by convict labor shall be used on Work financed, either wholly or in part, with federal funds.

B. The source of supply of each material shall be approved in writing by the Engineer before delivery is started. Materials furnished by the Contractor which do not conform to the Contract Documents at the time of incorporation into the Work shall not be deemed acceptable simply because they were obtained from a source of supply that had been approved by the Engineer.

C. The Contractor shall furnish all materials required for the Work specified in the Contract Documents and said materials shall meet the requirements of the Specifications for the kind of work involving their use.

D. Only new and first quality materials, conforming to the requirements of the Contract Documents and approved by the Engineer, shall be used in the Work. If it is found that approved sources of supply do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish material from other approved sources approved by the Engineer.

E. The Contractor shall give a preference in the purchase of supplies and materials, other considerations being equal, in favor, first, of supplies and materials manufactured and sold within the Commonwealth, and second, of supplies and materials manufactured and sold within the United States.

F. The Contractor may be required to furnish sworn certificates as to quality and quantity of material before said materials are incorporated in the Work.

G. All electrical, mechanical and HVAC equipment shall be properly identified including manufacturer's name plates, serial number, model, capacity, size, etc. as appropriate for the equipment. Contractor shall also furnish the manufacturer's operating instructions and preventive maintenance manual and recommendations.

H. Where products or materials are specified by the manufacturers' name, or catalog reference, the words "or approved equal" shall be understood to follow. An item shall be considered equal to the item so named or described if: (1) It is at least equal in quality, durability, appearance, strength, and design; (2) It performs at least equal to the function imposed by the general design for the work; and (3) It conforms substantially, even with deviations, to the detailed requirements for the item as indicated by the Specifications. The Contractor's proposal, however, shall be based on the use of any products or material specified, and where two or more products or materials are specified, the choice of these shall be optional with the Contractor.

I. All materials, services, equipment, and workmanship furnished shall be guaranteed for a period of one year after the date of acceptance unless otherwise specified elsewhere in the Contract Documents. All Work rejected must be redone at the Contractor's expense.

## 4.08 DELIVERY AND STORAGE OF MATERIALS

A. Materials and equipment shall be delivered to the site so that there will be neither delay in the progress of the Work nor an accumulation of material that is not to be used within a reasonable time. Stockpiling of materials and storage of any construction equipment shall be as far away from the edge of any body of water as is practical, however, in any case, it should not be within one hundred (100) feet of wetlands or the edge of any body of water.

B. Materials shall be stored at the expense of the Contractor so as to ensure the preservation of their quality and fitness for the Work. When considered necessary

by the Engineer, they shall be placed on wooden platforms or other hard clean surfaces, and not on the ground, and shall be placed under cover when directed. The ground and ground water shall be protected by the Contractor in order to avoid contamination, the Contractor's expense, to the satisfaction of the Engineer. Stored materials shall be located to facilitate prompt inspection.

**END OF ARTICLE 4**

## ARTICLE 5 - LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

### 5.01 LAWS TO BE OBSERVED

A. The Contractor shall keep fully informed concerning all requirements of law, including all state and federal laws, county and municipal ordinances, and regulations which in any manner affect those engaged or employed in the Work, or the materials used, in the Work, or such orders and decrees of bodies or tribunals having jurisdiction or authority over the same. The Contractor shall at all times observe and comply with and shall cause all agents and employees to observe and comply with, all such existing and future laws, ordinances, regulations, orders and decrees. The Contractor shall protect, indemnify and hold harmless MassCEC and the Engineer, and all of their officers, agents, and employees against all claims and liabilities arising from or based on the violation of any such requirement of law whether by the Contractor, their employees, agents, or subcontractors. If any discrepancy or inconsistency is discovered in the Contract Documents in relation to any such requirements of law, the Contractor shall immediately report the facts to the Engineer in writing. The Contract shall be governed by the laws of the Commonwealth.

B. The Contractor, if a foreign corporation (a corporation established, organized, or chartered under laws other than those of the Commonwealth) shall comply with the provisions of Chapter 156D of the General Laws as amended. The Contractor shall file with MassCEC a certificate of the State Secretary stating that such corporation has complied with Chapter 156D and the date of such compliance.

C. Other out-of-state business organizations, such as individual proprietorship, partnership and joint ventures, shall appoint an agent in this Commonwealth for the service of legal process and furnish a copy of such appointment to the State Secretary prior to the issuance of a contract by MassCEC.

D. Work shall be in accordance with the Massachusetts State Building Code.

1. The Contractor shall protect and indemnify MassCEC and its representatives against any claim or liability arising from or based on the violation of any law, ordinance, safety code, regulation, order or decree whether caused by the Contractor, its employees or its subcontractors employed on the Project.

2. Such laws, ordinances, codes, regulations, orders, or decrees may restrict and limit the Contractor’s working hours or use of certain types of equipment on the Project. The Contractor acknowledges and agrees that it is familiar with such restrictions and limitations which shall not be the grounds for an increase in the Contract Price.

3. The Contractor shall give all necessary notices, obtain all permits as required and pay all government taxes, fees, and other costs in connection with the Work. The Contractor shall file all necessary drawings, prepare all documents, and obtain all necessary approvals of all governmental departments that have jurisdiction. The Contractor shall obtain all required Certificates of Inspection prior to acceptance and final payment for the Work. Compensation for conforming to all provisions of this Article, except as may be provided otherwise in Supplementary Conditions, is included in the Contract Price.

E. Without limiting the Contractor's responsibility for ascertaining and complying with all applicable laws, ordinances, regulations, orders, and decrees, the Contractor's attention is called particularly to the requirements stated in the Sections of Division 1, General Requirements, specifying the general requirements for furnishing, installing and operating temporary controls during construction.

F. The Contractor shall comply with the following legal requirements for any and all employees to be employed in the Project who are required to be listed in the certified payroll reports for the Project:1) Federal Department of Homeland Security Requirements in hiring such employees including, but not limited, to the faithful completion of the Federal Department of Homeland Security Form I-9 process by Contractor; 2) proper classification of individuals employed on the project; 3) all laws concerning workers' compensation insurance coverage, unemployment insurance, social security taxes, and income taxes; and 4) all laws concerning hospitalization and medical benefits that meet the minimum requirements of the connector board established in chapter 176Q of the General Laws. The Contractor shall execute a Workforce Certification form with the execution of its contract. The Contractor shall require each of its subcontractors and sub subcontractors to execute and provide to Contractor such Workforce Certification form with the execution of each subcontract, and Contractor shall immediately provide a copy to the Owner. Contractor acknowledges that with the weekly workforce reports that must be submitted on a weekly basis, in the form and format required by the Owner, including but not limited to, by electronic reporting, Contractor and all of its subcontractors are required to certify that the Form I-9 process was faithfully completed and that all other legal requirements related to its workforce referenced above were followed for all employees listed on each certified payroll report when submitted. The Contractor and all of its subcontractors must: comply with the legal requirements of this section; must not knowingly use undocumented workers in connection with the performance of this contract; pursuant to federal requirements must verify the immigration status of all workers assigned to the contract without engaging in unlawful discrimination; and must not knowingly or recklessly alter, falsify, or accept altered or falsified documents from any such worker. Breach of any of the terms of the Workforce Certification legal requirements during the period of the Contract may be regarded as a material breach, subjecting the Contractor and its subcontractors to sanctions, including but not limited to monetary penalties, withholding of payments, contract suspension or

termination. Contractor must require each of its subcontractors to execute and provide to Contractor a Workforce Certification form with the execution of each subcontract, and Contractor must require each subcontractor to forward a copy of each such Workforce Certification to the Construction Manager for filing with the Owner.

G. The Contractor shall comply with M.G.L. c. 149, § 26- 27H. The Prevailing Wage Schedule lists the prevailing minimum wage rates that must be paid to all workers employed in the Work. The Owner is not responsible for any errors, omissions, or misprints in the said schedule. Such Schedule shall continue to be the minimum rate wages payable to workers employed in the Work throughout the term of this Contract, subject to the exceptions provided in M.G.L c.149, § 26-27H. The Contractor shall not have any claim for extra compensation from the Owner if the actual wages paid to workers employed in the Work exceeds the rates listed on the schedule or as otherwise provided by law. The Contractor shall cause a copy of said Schedule to be kept in a conspicuous place at the Site during the term of the Contract. If reserve police officers are employed by the Contractor, they shall be paid the prevailing wage of regular police officers. (See M.G.L c.149, § 34B) Mass General Laws c. 149, section 27 as amended on August 8, 2008, requires annual updates to prevailing wage schedules for all public construction projects lasting longer than one year. The Contractor is required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The Contractor and all subcontractors are required to anticipate such annual updated prevailing wage schedules and neither the Contractor nor any subcontractors shall be entitled to claim additional compensation for base contract work due to updated prevailing wage schedules.

H. The Contractor shall comply and shall cause its Subcontractors to comply with Massachusetts General Law c. 149, § 27B, which requires that a true and accurate record be kept of all persons employed on the project for which the prevailing wage rates have been provided. The Contractor and all Subcontractors shall keep these records and preserve them for a period of three years from the date of completion of the Contract. Such records shall be open to inspection by any authorized representative of the Owner at any reasonable time, and as often as may be necessary. The Contractor shall, and shall cause its Subcontractors to, submit weekly copies of their weekly payroll records to the Owner. In addition, the Contractor and each Subcontractor shall furnish to the Executive Department of Labor within 15 days after completion of its portion of the Work a signed statement in the form required by the Owner.

I. If the Director of the Department of Labor and Workforce Development has established a Schedule of wage rates to be paid to the operators of trucks, vehicles or equipment for the Work, the Contractor shall be obligated to pay such operators at least the minimum wage rate contained on such Schedule. (See M.G.L. c.149, § 26-27H).

J. The Contractor shall comply with and shall cause its Subcontractors to comply with M.G.L. c. 149, § 148 which requires the weekly or biweekly payment of employees within six days of the end of the pay period during which wages were earned if employed for five or six days of a calendar week, and within other periods of time under certain circumstances as set forth therein.

K. The use by the Contractor of trucks or other motor vehicles hired from either common or contract motor carriers in the course of performance of this Contract is subject to such minimum rates and charges, and rules and regulations as may from time to time be promulgated by the Department of Public Utilities of the Commonwealth of Massachusetts or other agency of the State of Federal government which may be authorized by law to set rates or otherwise regulate the use of such vehicles. The Contractor expressly assumes the risk of any additional expense that may arise by reason of any change in such minimum rates and charges, and rules and regulations, and shall be entitled to no additional compensation or reimbursement by reason thereof.

## 5.02 PERMITS AND LICENSES

A. The Contractor shall give all notices necessary and due in connection with the lawful prosecution of the Work, shall procure all permits and licenses from Federal, State and local authorities as MassCEC may deem necessary or appropriate and shall pay all expenses, charges, and fees in connection therewith. No work shall be undertaken or materials ordered without obtaining such permits, licenses and approvals. Proof of acceptance by the above authorities shall be submitted by the Contractor to MassCEC upon completion of the Work. Originals of these documents shall be submitted to MassCEC for permanent retention, with a copy of each available at the project site.

B. Contractor must consult with the local authority having jurisdiction to confirm local permitting requirements, including those that may be more stringent than state and/or federal requirements.

C. Permits and licenses shall be in the name of MassCEC, where applicable.

## 5.03 MOTOR VEHICLES

A. Motor vehicles (except vehicles used solely for transporting employees to and from the Work site) used wholly or in part within the Commonwealth by the Contractor or a subcontractor, or by a person directly or indirectly employed by them in the execution of the Contract, shall be registered in the Commonwealth and bear Massachusetts registration plates.

B. Motor vehicles used solely for transporting employees to and from the Contract location shall be registered as required under Chapter 90, Section 3, of the General Laws of the Commonwealth, as amended.

C. A vehicle shall not be driven on any way, as defined in Section 1 of Chapter 90 of the General Laws of the Commonwealth, unless it is constructed or loaded so as to prevent any of its load from dropping, shifting, leaking, or otherwise escaping therefrom, except that sand may be dropped for the purpose of securing traction, or water or other substance may be sprinkled on such a way in cleaning or maintaining the same. (Chapter 85, Section 30, of the General Laws of the Commonwealth as amended.)

D. All diesel construction equipment shall have emission control devices installed, such as oxidation catalysts or particulate filters on the exhaust system side of the diesel combustion engine equipment.

## 5.04 INSURANCE REQUIREMENTS

A. The Contractor shall purchase and maintain, and shall cause any subcontractor to purchase and maintain in amounts not less than the Minimum Insurance Limits set forth below during all times that the Contractor is performing the Work, including any Work performed prior to the date hereof, and for a minimum of six (6) years following the latest of substantial completion of Work or expiration or termination of this Agreement:

i. Commercial General Liability Insurance for personal injury, bodily injury and property damage with limits not less than $2,000,000 per occurrence, $4,000,000 aggregate per project; $4,000,000 products completed operation; $2,000,000 personal and advertisement injury covering Bodily Injury, Property Damage, Personal Injury, and Completed Operations.

B. Commercial General Liability insurance shall be written on an Occurrence form issued on the most recent edition of the ICO CG 00 01 form with terms and conditions acceptable to Owner. Such policy shall include Blanket contractual liability insurance covering all liabilities assumed under the Contract Documents, including, but not limited to, the Contractor's obligations under all indemnity provisions of the Contract Documents and shall not be subject to any exclusion or limitation for liability resulting from "your work" as defined by the ISO CG form. Such policy shall be endorsed to have the General Aggregate on a per project basis and include Owner and other entities otherwise defined as Additional Insureds on a primary and non-contributory basis. Products and Completed Operations insurance shall be maintained for a minimum period equal to six (6) years after Substantial Completion of the Work.

C. Automobile Liability Insurance

1. Commercial Automobile Liability in the amount of $1,000,000 per occurrence Covering Bodily Injury and Property Damage.

Commercial Automobile Liability insurance coverage is required for Owned, Non-owned, or Hired Vehicles if vehicles are used in the provision of services under this Agreement. Loading and unloading of any motor vehicle must be covered.

For Transporters of Hazardous Materials (whether Contractor or Subcontractor), if vehicles are used for transporting hazardous materials, Contractor's Automobile Liability insurance, or the insurance carried by Contractor's hazardous waste transporter shall meet, at minimum limits of $5,000,000 "each accident" – Combined Single Limit for Property Damage and Bodily Injury. Such policy shall be endorsed to provide pollution liability broadened coverage (endorsement CA 99 48) and also include an MCS-90 endorsement.

D. The Contractor shall carry Worker's Compensation Insurance, including Employers Liability Insurance as provided by Chapter 152, as amended, of the General Laws of the Commonwealth covering all work performed by them under the Contract. The Worker's Compensation Liability insurance shall be compliant with the jurisdiction in which the accident occurs, the jurisdiction in which any employee resides and any other states which may claim jurisdiction and in amounts not less than those required by law and Employer's Liability insurance in an amount not less than $1,000,000 bodily injury by accident – each accident, $1,000,000 bodily injury by disease – each employee, and $1,000,000 bodily injury by disease - policy limit, or such greater amounts as may be required by Contractor's umbrella or excess liability policy in order to affect such coverage.

Such insurance shall be endorsed to include Longshore and Harbor Workers' Compensation Act Coverage and Jones Act Coverage, if applicable, and shall cover all operations of Contractor. Such insurance shall be endorsed to include Other States Coverage and to include a Waiver of Our Right to Recover from Others Endorsement in favor of the Owner.

E. The Contractor shall carry Umbrella Excess Liability Coverage with limits of not less than $10,000,000 per occurrence, covering all work performed by them under this Contract in excess of Commercial General Liability, Auto Liability and Employer's Liability. The Contractor must provide follow form coverage for each of the underlying policies and each of the policies which fall under the umbrella must be listed on the Certificate of Insurance.

F. The Contractor shall carry Professional Liability with limits of not less than $1,000,000 per claim and in the aggregate. (including contractual liability coverage).

G. The Contractor shall carry Pollution Liability with limits of not less than $10,000,000 per incident/Aggregate. The Contractor and any and all

subcontractor(s) shall maintain such policy to cover any sudden and gradual pollution incidents that may arise out of, under, or in connection with this Agreement including any and all Work and/or Services to be performed by or on behalf of Contractor, including but not limited to: (a) bodily injury, sickness, disease, mental anguish or shock sustained by any person, including death; (b) property damage including physical injury or destruction of tangible property including resulting loss of use thereof, natural resource damages, and the loss of use of tangible property that has not be physically injured or destroyed; (c) environmental damages requiring clean-up; and (d) defense including costs, charges and expenses incurred in the investigation, adjustment or defense of claims for such compensation damages. There should be no exclusions or coverage restrictions related to asbestos, lead paint, silica, per- and polyfluoroalkyl substances (PFAS), polychlorinated biphenyls (PCB), or mold/fungus/legionella. Such policy shall be continuously maintained as to completed operations coverage with respect to liability arising out of the Work or services for a minimum period of not less than the greater of three (3) years after final completion of the Work or services or the greater time under which a claim may be properly asserted under the applicable statute of limitations or repose and shall include coverage for loss of, damage to, or loss of use of property directly or indirectly arising out of the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, any liquid or gas, waste materials or other irritants, contaminants or pollutants, into or upon the project, any other land, the atmosphere, or any water course or body of water (collectively, a "Release"), whether such Release is gradual or sudden and accidental.

If Contractor's work includes the treatment, storage, transportation and disposal of contaminants, then in addition to the Contractor's Pollution Liability (CPL) requirement above, the policy shall also include enhancements for Pollution Legal Liability (if applicable), Transportation Pollution Liability, and Owned/Non-Owned Disposal Site Liability. If treatment, storage, transportation, or disposal of contaminants does not apply to the scope of work of Contractor, then Contractor would only be required to evidence a CPL policy.

Should coverage(s) be written on a claims-made form, the retroactive date shall be no later than the effective date of this Agreement, and Contractor and/or its subcontractors shall maintain coverage continuously for the duration of this Agreement and for at least six (6) years after Substantial Completion or applicable state statute of repose.

I. The Contractor shall carry property insurance written on a Builder's Risk "all-risk" or equivalent policy form in the amount of the replacement cost of the Project, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis with a deductible not exceeding $5,000. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are

beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.2 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

1. Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured-loss. The Owner's property insurance will not cover hoists, tools, or other equipment belonging to the Contractor or any Subcontractor.

2. The Contractor shall be responsible for the deductible portion of all losses covered by its property insurance.

3. The Contractor's property insurance will cover portions of the Work stored off-site and in transit, with sub limits of $100,000.

4. Upon request, the Contractor will furnish the Owner a certificate evidencing the Contractor's property insurance. Property insurance for losses to materials or equipment stored off-site or in transit in excess of the coverage provided by the Contractor's property policy shall be procured by the Contractor at its cost. The Contractor and Subcontractors waive all rights they may have against the Owner for damage to tools, equipment, materials, supplies, temporary structures or other property owned or rented by the Contractor or Subcontractors which is not to be incorporated in the Work, and any policies of insurance covering the Contractor's or Subcontractors' own tools, equipment, facilities and other property against loss by physical damage shall include provisions or endorsements providing that the underwriters waive their rights of subrogation against the Owner.

5. In lieu of the Contractor providing Property Insurance, Owner may elect to provide Property Insurance substantially in conformance with the terms and conditions of this Section.

J. Contractor shall provide Payment and Performance Bonds in the forms required by the Owner and in the amount of 100% of the Contract Price, as adjusted by any approved Change Orders. Contractor shall also provide a Lien Prevention Bond upon request by Owner.

K. The required insurance coverages hereinbefore specified shall be placed with insurance companies licensed by the Massachusetts Division of Insurance to do business in the Commonwealth of Massachusetts and having a Best's rating of A

or better, shall be taken out before the Contract is commenced and be kept in full force and effect throughout the term of the Contract, shall be primary to and non-contributory to any coverages maintained by MassCEC, and shall require that MassCEC be given at least 30 days advance written notice in the event of any cancellation or materially adverse change in coverage. All such required insurance, shall be written on an occurrence basis form, as opposed to a claims-made basis form. **MassCEC and Foth Infrastructure & Environment, LLC shall be named as additional insureds**, on a primary and non-contributory basis, under the Commercial General Liability, Automobile Liability, Umbrella, Pollution Liability, and Builder's Risk Insurance Policies. The standard for the AI Form shall be ISO CG20 10 ed. 10/01 or its equivalent. The Workers' Compensation, Automobile Liability Insurance, Commercial General Liability, and Employers' Liability Insurance Policies shall include a waiver of subrogation in favor of MassCEC. All such insurance as is required of the Contractor shall be provided by or in behalf of all subcontractors to cover their operations performed. The Contractor shall be held responsible for any modifications, deviations or omissions in the compliance with these requirements by the subcontractors. At the inception date of the Contract and throughout the term of the Contract, MassCEC shall be provided with certificates of insurance evidencing that such insurance policies are in place and provide coverage as required. The following statement affirming that coverage completely complies with contract requirements shall be included in the special items section of the certificate or in an attached special items addendum page:

> The aforementioned insurance coverages completely comply with Article 5.04, Insurance Requirements, paragraphs A through J, inclusive, of Massachusetts Clean Energy Technology Center Contract No. MACEC-FY26-01

L. In the event it is determined during excavation or construction that an asbestos condition does exist, a licensed asbestos specialist shall be employed by the Contractor to perform the asbestos containment and abatement work. Prior to asbestos containment and abatement work, the Contractor shall, through the licensed asbestos specialists, obtain insurance in amounts and types specified by MassCEC, on a primary and non-contributory basis as its interest appears under this Contract. Payment for this work will be made in accordance with Article 7.04.

M. BEFORE COMMENCING PERFORMANCE OF THE WORK AND PRIOR TO THE RENEWAL OF EACH RESPECTIVE POLICY, CONTRACTOR SHALL FURNISH CERTIFICATES OF INSURANCE EVIDENCING INSURANCE COVERAGE AS REQUIRED HEREIN, TOGETHER WITH EVIDENCE THAT ALL PREMIUMS FOR SUCH INSURANCE HAVE BEEN PAID TO THE OWNER AND THE OWNER'S REPRESENTATIVE.

Contractor must provide 30 days written notice of cancellation, non-renewal, material changes to Owner and all other such entities as may be reasonably requested. Upon receipt of notice from the Contractor, the Owner shall, unless the

lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage. A waiver of subrogation endorsement in favor of Owner and Additional Insureds shall be attached to all policies required herein with the exclusion of professional liability, and the Certificate of Liability Insurance shall reflect that such waivers of subrogation are in place. A copy of the additional insured coverage endorsement must be attached to the Certificate of Liability Insurance. The Certificate of Liability Insurance shall show Owner as the Certificate Holder and shall be delivered to Owner seven (7) days after receiving the Notice of Award. Prior to expiration of such required insurance, and otherwise as requested by Owner, renewal certificates and endorsements will be provided to Owner, at no expense to Owner, until such insurance is no longer required pursuant to the terms of the Agreement. At the Owner's request, the Contractor shall furnish redacted copies of the insurance policies including all endorsements required to provide the coverage set forth in the Contract Documents.

N. Additional Insureds. The policies of insurance required hereunder shall be endorsed to name the Owner and such and other such entities required herein and hereafter as may be reasonably requested by Owner, as additional insureds (hereinafter "Additional Insureds") on the Comprehensive General Liability, Automobile Liability, umbrella and/or excess policies. Owner requires a copy of the Additional Insured endorsement. Said Additional Insured coverage shall be primary and non-contributory insurance as respects the Additional Insureds and any insurance maintained by the Additional Insureds shall be excess or contingent and shall not contribute with it. The Contractor shall waive all rights and shall cause its Subcontractors of all tiers to waive all rights against the Additional Insureds, Owner and its officers, directors, employees and those for whom they are liable, for any damage or loss to the extent covered by insurance (except professional liability insurance), and to the extent of actual recovery of insurance proceeds. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity has an insurable interest in the property damaged. In the event that the Contractor maintain limits greater than set forth herein, Owner and the Additional Insureds shall be included therein as additional insureds to the fullest extent of all such insurance in accordance with all terms and provisions herein. Any language with respect to 'the limitation of coverage to the limits required' must be removed.

O. Deductibles. Maximum deductible on any policy required herein shall not exceed $25,000 per occurrence, incident or event, unless otherwise approved in writing by Owner. Owner and Additional Insureds will not be responsible for any deductible or self-insured retention amounts and the same will in no event be deemed a cost of the Work. The Contractor's deductible or self-insurance retentions applicable to

any insurance required to be provided by the Contractor must be listed below or on the certificates of insurance required herein:

Amount of Deductible or Self-Insured Retention: _____

The Contractor shall be completely responsible for the proper care, protection, and (where necessary) repair of the Work. The Contractor shall be responsible for all at fault losses within the deductible specified above, and the Contractor shall promptly, and in any event so as not to delay the progress of the Work, replace any damaged property or reimburse the Owner for any damaged property including to the extent the loss or damage to such property is within the deductible.

## 5.05 PATENTED DEVICES, MATERIAL AND PROCESSES

A. The Contractor shall indemnify and save harmless MassCEC and all persons acting for or on behalf of MassCEC from all claims and liability of any nature or kind, and all damages, cost and expenses, including attorney's fees, arising from or occasioned by an infringement or alleged infringement of any patents or patent rights on any invention, process, material, equipment, article, apparatus, or any part thereof, furnished and installed by the Contractor, or arising from or occasioned by the use of manufacture thereof, including their use by MassCEC. In case such materials, equipment, devices, or processes are held to constitute an infringement and their use enjoined, the Contractor, at their expense, shall:

1. Secure for MassCEC the right to continue using said materials, equipment, devices, or processes by suspension of the injunction or by procuring a license or licenses;

2. Replace such materials, equipment, devices, or processes with non-infringing materials, equipment, devices, or processes; or

3. Modify them so that they become non-infringing, or remove the enjoined materials, equipment, devices, or processes and refund the sums paid therefore without prejudice to any other rights of MassCEC or the Engineer.

## 5.06 RESTORATION OF SURFACES OPENED BY PERMIT

A. Contractor shall not allow any party to make an opening in a street or highway for any purpose except upon the direction of the Engineer and the presentation of a duly authorized permit or other instrument. The holder of such a permit or instrument shall be considered in the same class as a contractor on an adjacent contract and the provisions of Articles 3.05 and 3.06 shall apply.

## 5.07 SANITARY PROVISIONS, PUBLIC SAFETY, AND TRAFFIC MANAGEMENT

A. The Contractor shall provide and maintain in a neat and sanitary condition such accommodations for the use of its employees as may be necessary to comply with

the requirements of the Department of Public Health, local health officials or of other authorities having jurisdiction.

B. The Contractor shall be responsible for the maintenance of traffic over, through, or around the Work included in its Contract with the maximum of safety and practicable convenience to such traffic during the life of the Contract, and whether or not work thereon has been suspended temporarily. The Contractor shall take all precautions for preventing injuries to persons or damage to property in or about the Work. If the Contractor constructs temporary bridges or provides temporary crossings of streams, its responsibility for accidents shall include the roadway approaches as well as the structures of such crossings.

The Work shall be carried on in such a manner as to provide safe passage at all times for public travel and with least obstruction to traffic. The Contractor shall provide and maintain at its own expense (except as otherwise provided herein) in a safe and passable condition, such temporary by-passes and temporary bridges as may be necessary to accommodate traffic. Roads shall be closed to travel only as directed by the Engineer. The Contractor shall so carry on its work that travel will not be obstructed. The Contractor shall at all times so conduct the Work that the abutters shall have reasonable access to their property as directed by the Engineer. When it is necessary to leave materials and equipment upon the site of the Work or in the vicinity thereof, they shall be placed so as to cause the least possible obstruction to pedestrians and other travel.

C. The Contractor shall, at its own expense, provide, place, and erect all barricades and warning signs, and furnish and keep lighted all lights that are necessary in the opinion of the Engineer to protect the Work from traffic, pedestrians and animals and to assure public convenience and safety. The Contractor shall also furnish at its own expense a sufficient number of watchmen at all times to protect the Work.

D. When, in the opinion of the Engineer, it is necessary that uniformed police be used to protect and control pedestrian traffic, to direct vehicular traffic during construction and to keep the traffic off any part of the work, or to protect the public safety, the Contractor will obtain a police detail for this purpose.

All customary expenses for uniformed police required for the protection and control of pedestrian and vehicular traffic during construction, or to provide protection of the health and safety of persons or property from routine and anticipated construction activities, shall be assumed by the Contractor.

All expenses for uniformed police required for the protection of persons and property arising out of activities not ordinarily encountered by the Contractor during construction, including, but not limited to, labor difficulties, crowd control, etc., shall be at the sole cost of the Contractor.

## 5.08 INTENTIONALLY OMITTED

## 5.09 USE OF EXPLOSIVES

A. Explosives, when necessary for use in the Work, shall not be brought within the Contract limits or onto property under the jurisdiction of MassCEC, without the prior approval of MassCEC.

B. Explosives shall be stored safely under lock and key. The storage places shall be marked conspicuously DANGEROUS - EXPLOSIVES and be in the care of a competent watchman at all times. Storage, handling, and use of explosives shall conform to the regulations of the Massachusetts Department of Public Safety, federal regulations and local ordinances relating thereto.

C. The Contractor shall be responsible for all damages resulting from the use of explosives. The Contractor shall exercise care not to endanger life and property, including new Work. When directed, the number and size of the charges shall be reduced. Flagmen shall be provided, when directed, to warn and keep traffic from the danger area. All persons within the danger area shall be warned and given time to withdraw.

D. Prior to start of the blasting, the Contractor shall give at least a 48 hour notice and a schedule of their operations thereof to the operating official, company, or companies leasing, owning, or responsible for pipes, conduits, poles, wires, railroad tracks, or any other public or private utility which may be endangered by the blasting in order that a representative of said owner or lessee may be present at the site. The Contractor shall take proper precautions to prevent injury to said properties during all blasting operations.

## 5.10 PROTECTION AND RESTORATION OF PROPERTY

A. Compensation for conforming to all provisions of this Article, unless compensation is authorized in writing by the Engineer, as specified in Article 2.03, or as may be provided otherwise in the Supplementary Conditions, shall be considered as included in the Contract Price and no additional compensation will be allowed therefor.

B. Prior to commencing Work, the Contractor shall record the existing condition of abutting property. The Contractor shall obtain the necessary permission for entry and cause a detailed examination to be made of such abutting property as the Contractor deems necessary, as required in the Supplementary Conditions, or as directed by the Engineer. The Contractor shall invite MassCEC, in writing by certified mail with return receipt, to be present during the examination. A representative of MassCEC shall also be invited. A complete report of the existing conditions, including photographs and video tapes, if required, shall be made in triplicate, and signed by the Contractor. One copy shall be delivered to the owner, one to MassCEC, and one shall be retained by the Contractor. If at any time

thereafter a claim for damages or alleged damages is filed by the owner or tenant, the Contractor shall make further detailed examinations. A representative of MassCEC shall be invited to attend. All facts as to changes between the then existing conditions of said property and those which existing at time of the original examination shall be noted and recorded in triplicate. One copy of this report shall be delivered to the owner, one to MassCEC, and one shall be retained by the Contractor.

1. In the event that the Contractor cannot obtain from the owner of such abutting property permission to enter upon the property for such examination, the Contractor shall immediately notify MassCEC.

2. For these detailed examinations, the Contractor shall employ an independent person who has had previous experience in examining or surveying the conditions of the property and who shall be approved by MassCEC.

C. The Contractor shall confine their movements and operations insofar as possible to the area within the limits of the Work, and the area outside the limits of the Work shall not be disturbed except as directed.

D. The Contractor shall, at no additional cost to MassCEC, preserve and protect from injury all property either public or private along and adjacent to the proposed Work. The Contractor shall be responsible for and shall repair, at no additional cost to MassCEC, any and all damage and injury thereto, arising out of or in consequence of any act or omission, neglect or misconduct in the execution of the Work, or in consequence of the non-execution thereof by the Contractor or their employees or subcontractors in the performance of the Work covered by the Contract prior to completion and acceptance thereof. The Contractor shall be solely responsible for any trespass upon adjacent property or injury thereto, resulting from or in connection with their operations. The Contractor shall be liable for any claims that may be made on account of the felling of trees or the deposit of debris of any kind upon private property. Special care shall be exercised during blasting operations to avoid injury to underground structures and utilities.

E. Although the Contract Documents may indicate the approximate location of existing subsurface utilities in the vicinity of the Work, accuracy and completeness of the information is not guaranteed by MassCEC. Before commencing any work or operations that may endanger or damage subsurface structures, the Contractor shall carefully locate all such structures and conduct their operations in such manner as to avoid damage thereto. When necessary, the Contractor shall cooperate with representatives of public service and utility companies in order to avoid damage to their structures by furnishing and erecting suitable supports, props, shoring, or other means of protection. The Contractor shall not interrupt live services until new services have been provided. All abandoned services shall be plugged or otherwise made safe and secure.

F. If the Contractor desires to temporarily relocate a utility, other than those contemplated by MassCEC, they shall make the necessary arrangement with the appropriate utility company and make reimbursement for the cost thereof, at no additional cost to MassCEC.

G. Access to fire hydrants and fire alarm boxes shall be maintained by the Contractor throughout the prosecution of the Work. Hydrants, alarm boxes, and standpipe connections shall be kept clear of obstructions and kept visible at all times. If visibility cannot be maintained, the Contractor shall provide clearly visible signs and lights showing the locations of fire hydrants, fire alarm boxes, or standpipe connections. Utility companies and municipal agencies having facilities within the limits of the Work shall have access to their facilities at all times for inspection and repair.

H. All equipment used by the Contractor which could create potential fire hazard such as steam-generating or steam-operated machinery, heaters, gas generators, and the like shall be equipped with spark arresters and/or other safety devices and utmost precaution will be exercised by the Contractor in the use of such equipment.

I. Land monuments and property marks shall be carefully protected by the Contractor and if necessary to remove the same, they shall do so only at the Engineer's direction and after a registered land surveyor has witnessed or otherwise referenced their location. If land monuments and/or property marks are removed by the Contractor, they shall be replaced by a registered land surveyor.

1. All costs associated with the removal, witnessing and replacement of land monuments and/or property marks shall be borne by the Contractor, at no additional cost to MassCEC.

J. The Contractor shall protect and preserve natural surroundings and roadside growth either within or adjacent to the project site from damage or injury due to these operations. The Contractor shall not, except by written permission of the Engineer, remove, destroy, or trim roadside trees or shrubs. Trees or landscape features carelessly scarred or damaged by the Contractor's operations shall be removed and replaced or neatly trimmed and restored to their original condition as required by the Engineer. The Contractor shall be responsible for all damage to roadside growth due to their operations and shall, without compensation, satisfactorily repair or replace all such damaged growth. Scars on trees shall be painted as soon as possible with an approved tree paint.

K. The Contractor shall protect existing structures, shall provide lights and fences and take all other precautions that may be necessary to protect life and property, at no additional cost to MassCEC. The Contractor shall carry on all operations and use equipment of such types that noise resulting from construction operations will be kept to a minimum. Barriers and bridges shall be provided for the protection and

use of the public and for the protection of the Work as necessary. The Contractor shall provide and maintain access for occupant and customer entrance to and exit from all adjacent buildings and property at all times. All temporary facilities required for the general protection of the public and the Work shall be subject to approval of MassCEC.

L. Written notice shall be given by the Contractor to all utility owners or officials and to all others concerned with or having charge of public or private owned utilities, of their intention to commence operations affecting such utilities at least 1 week in advance of the beginning of such operations. The Contractor shall at the same time file a copy of said notices with the Engineer.

M. The Contractor shall confine its operations to the actual work sites, access routes, and storage areas designated by MassCEC or the Engineer. The Contractor shall have sole responsibility for providing all materials, equipment, or tools and any storage required will be at the Contractor's own risk. MassCEC will not assume responsibility for any loss of materials, equipment, or tools stored on its property.

N. All roads and haul routes used by the Contractor shall be maintained and kept clean during the course of the work. Any damage to existing surfaces, caused by the Contractors operations shall be repaired and the areas involved restored to their previous condition, without cost to MassCEC.

O. The Contractor is responsible for controlling dust at all times during this Contract, including all work shifts, non-working hours, weekends, and holidays. Fugitive dust shall be controlled through wetting, sweeping, and other suppression techniques. The Contractor shall maintain on-site water trucks. Trucks hauling materials shall be covered.

P. Designated wash-down areas shall be established by the Contractor on site for the control of dust tracking from vehicles leaving the site. All trucks or other vehicles leaving the site shall be hosed and washed clean of mud clinging to the wheels.

Q. The Contractor shall ascertain boundaries of site within which Work must be confined and agree to said limits with MassCEC prior to starting any Work.

## 5.11 PROTECTION OF PUBLIC LANDS

A. In the execution of any Work within or adjacent to any state or national forest, park, or other public or private lands, the Contractor shall comply with all of the regulations of the appropriate authorities having jurisdiction over such forest, park, or lands. The Contractor shall keep the areas in their construction operations in an orderly condition and properly dispose of all refuse and discarded materials.

B. The Contractor shall obtain construction permits that may be required for Contract operations, not a part of the Contract, in accordance with the requirements of the regulations of the appropriate authorities.

C. The Contractor shall take all reasonable precautions to prevent and suppress open fires in any area involved in their construction operations or occupied by them as a result of such operations. The Contractor shall cooperate with the proper authorities of the state and federal governments in reporting, preventing, and suppressing any open forest fires.

## 5.12 PROTECTION OF FENCES

A. By constructing temporary fences, or by other adequate means, the Contractor shall restrain stock from leaving the lands wherein they are confined or from trespassing which would be made possible by, or which might result from, the removal or destruction of existing fences or the carrying out of any part of the Work under the Contract. The Contractor shall be responsible for all loss, injury, or damage that may result from the Contractor's failure to restrain stock as above provided. Compensation for erecting and maintaining temporary fences and for otherwise providing for the restraint of stock shall be considered as included in the prices for the various Contract Items and no additional compensation will be allowed therefor.

B. If the Contractor is ordered by the Engineer to construct new right-of-way fences or to move and reconstruct existing fences, such Work shall be paid for at the unit price bid for same, or as Extra Work.

C. The Contractor shall use care to avoid damaging existing fences. The Contractor shall repair or replace, at no additional cost to MassCEC, and to the satisfaction of the Engineer, all fences that are in any way damaged by Contract operations.

D. Tearing down and removal of fences occurring within the right-of-way limits shall be considered to be a part of the clearing and grubbing work as set forth in the Contract Specifications, and payment therefor included in the payment for clearing and grubbing.

## 5.13 SAFEGUARDING OF EXCAVATIONS

A. Contractor shall provide safeguards and protections around and in the vicinity of excavations necessary to prevent and avoid the occurrence of damage, loss, injury, and death to property, animals, and persons because of such excavations. Liability for any such damage, loss, injury, or death shall rest with the Contractor.

## 5.14 DISPOSAL OF MATERIALS OUTSIDE THE WORK SITE

A. Unless otherwise specified in the Contract Specifications, the Contractor shall make their own arrangements for disposing of waste and excess materials outside the work site, at no additional cost to MassCEC.

B. Prior to disposing of material outside the Work site, the Contractor shall obtain written permission from the owner on whose property the disposal is to be made. The Contractor shall file with the Engineer the permit, or a certified copy thereof, together with a written release from the property owner absolving MassCEC from any and all responsibility with the disposal of material on said property.

C. Unless otherwise provided in the Contract Specifications, full compensation for all costs involved in disposing of materials as above specified, including all costs of hauling, shall be considered as included in the price paid for the Contract Item involving such materials and no additional compensation will be allowed therefor.

D. In the disposal of excavated material, and other waste and excess materials, the Contractor shall adhere to all applicable laws of the Commonwealth of Massachusetts and to municipal and local ordinances and regulations. All routes to be used by the Contractor for hauling excavated and other materials shall be approved in advance by applicable agencies having jurisdiction. Excess excavated material stockpiled at the site after the demands of this Contract have been fulfilled shall be removed from the site by the Contractor and legally disposed of off-site. The Contractor shall restore the site to its original condition, prior to stockpiling, subject to direction by the Engineer, at no additional cost to MassCEC.

## 5.15 SAFETY AND FIRST AID REQUIREMENTS

A. The Contractor shall adhere to all precautions necessary to the safety and health of the work crew in accordance with provision of Federal Regulation 29 CFR Parts 1926.58 and 1910.1001, and Massachusetts Regulations 453 CMR 6.00.

B. The Contractor's safety program shall be submitted in writing to the Engineer for review within five (5) days after receipt of a Notice of Award. The proposed safety program shall include the name, experience, and qualifications of the Contractor's proposed safety representative. No work at the job site shall begin until the Engineer has reviewed the Contractor's safety program and safety representative. Implementation and enforcement of the safety program for the forces of the Contractor and all subcontractors shall be the responsibility of the Contractor.

C. The Contractor's full-time safety representative shall have a thorough knowledge of construction safety and OSHA regulations. If, in the opinion of the Engineer, the Contractor's safety representative is not effective in carrying out the duties assigned and as described below, the Engineer may request, in writing, that the Contractor replace the safety representative.

D. The duties of the safety representative shall include maintenance of the Contractor's safety program, enforcement of safe practices, and the use of safety equipment and personal protection equipment, and other such activities as may be required by OSHA to maintain job safety and accident prevention. The safety representative shall not be changed, terminated, nor reassigned without the written approval of the Engineer.

E. The Contractor shall not require any laborer or mechanic employed in performance of the Contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to health or safety, as determined under construction safety and health standards (Title 29, Code of Federal Regulations, Part 1518, Published in the Federal Register on April 17, 1971) promulgated by the United States Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (83 Stat. 96). The Contractor shall ensure that the language set forth in this Article 5.15E is included in all agreements between the Contractor and any of its Subcontractors.

F. MassCEC may stop any work that it considers to be unsafe, in its sole discretion.

G. The Engineer and Program Manager reserves the right, at no additional costs to MassCEC, to stop work, if in the opinion of the Engineer, the Contractors observed means and methods in the performance of their work, produces a result that is, or may result, or cause a significant risk of damage to adjacent structures, utilities, roadways and other facilities. Nothing provided herein relieves the Contractor of site safety and the full and complete responsibility for the protection of adjacent structures, utilities, roadways and other facilities and any liability for any losses resulting in a breech hereto.

## 5.16 INDEMNIFICATION

A. To the fullest extent permitted by law, the Contractor shall indemnify, defend, and hold harmless MassCEC and all its managers, officers, directors, representatives, agents, and employees from and against claims, damages, losses and expenses, including but not limited to attorneys' fees and court costs, (a) arising out of or resulting from performance of the Work, including but not limited to claims for damage, loss, or expense attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder; (b) any claims, damages, losses and expenses caused by or alleged to be caused by a breach of any duty owed by the Contractor to the Owner under this agreement, or (c) citations, fines, penalties, assessments, or other levies made against the Owner as a result of the Contractor's failure to observe any applicable law, regulations or applicable permits, including any failure of the Contractor to comply with the terms and conditions of the Contract Documents,

and, including further without limitation any breach of the warranties set forth herein. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this provision.

B. The Contractor shall be held responsible for and shall indemnify and hold MassCEC harmless from and against, any and all claims for damage to underground structures and utilities arising out of the operations of the Contractor or any of its Subcontractors.

C. In claims against any person or entity indemnified under this Article 5.16 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligations under Article 5.16 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts regardless of any provisions of the applicable workers' compensation laws, and in particular regardless of the exclusive remedy and/or employees' immunity provisions of those laws, all of which are hereby expressly waived.

D. These provisions of Section 5.16 shall survive the termination of this Agreement and shall apply to Liabilities to the extent not paid to Owner by insurance carried by Contractor or by project-specific professional liability or wrap-up insurance covering the Project, if any, and shall not be limited by the amount of types of damages, compensation or benefits payable by the Contractor under workers' compensation. The Owner shall have no indemnity obligation, whatsoever, to the Contractor.

## 5.17 CLAIMS AGAINST CONTRACTOR FOR PAYMENT OF LABOR AND MATERIALS

A. The Contractor shall be responsible for prompt payment for all services, labor, equipment, and materials furnished by or through the Contractor for purposes of the Contract.

1. Forthwith after the Contractor receives payment for a periodic estimate, the Contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the Contractor. By submitting a periodic payment application, Contractor certifies that all payments to Subcontractors are current for work performed to date as a condition precedent to receiving further payment.

2. Owner has the right to pay Subcontractors directly in the event Contractor has failed to make timely payment, and in such event, Owner will offset any such Subcontractor payments against amounts otherwise owed to Contractor. Contractor shall indemnify and hold harmless Owner for all costs, including attorneys' fees, incurred in resolving or addressing claims for payment made by Subcontractors, including mechanic's liens, where such claims are due to Contractor's failure to pay amounts properly due, or in connection with any lien filed by a Subcontractor that Contractor fails to resolve as required by the Contract Documents.

3. Where a Subcontractor files a mechanic's lien (unperfected or otherwise), Contractor shall promptly cause the lien to be discharged, through payment to the Subcontractor and filing of a statutory dissolution of lien or by bonding off the lien. Contractor's indemnity obligations set forth in Article 5.17 2. shall apply to costs Owner incurs in connection with such liens.

## 5.18 PAYMENT OF TAXES

A. The Contract Price paid for the Work shall include full compensation for all taxes which the Contractor is required to pay whether imposed by federal, state, or local government, including, without being limited to, federal excise tax.

1. Fines and penalties, including interest, are the responsibility of the Contractor and all costs associated therewith shall be borne by the Contractor, at no additional cost to MassCEC.

B. The Massachusetts Sales Tax, Chapter 64H, Section 6 and the Massachusetts Use Tax, Chapter 64I, Section 7, states that these taxes are not applicable to the sales of construction materials and supplies incorporated, consumed, employed or expended in construction projects of MassCEC. This exemption is also applicable to rental charges for construction vehicles, equipment, and machinery rented, specifically for use on the site of MassCEC's construction projects. Bidders are directed to exclude any allowance for Sales or Use Tax from their Bid Form as said tax would relate to the foregoing specific categories.

## 5.19 CLAIMS OF CONTRACTOR FOR COMPENSATION

A. No person or corporation, other than the Contractor, now has any interest hereunder, and no claim shall be made or be valid; and neither MassCEC nor any member, agent, or employee thereof, shall be liable for, or be held to pay, any money except as provided in Articles 2.02, 2.03, 2.04, 2.05, 7.02 and the Agreement.

B. Contractor shall notify Owner in detail in writing of any and all claims within ten (10) calendar days of the occurrence of any event, circumstance or condition which Contractor claims as the basis for an increase in the Contract Price or the time for

performance or both, or such claim shall be waived. In addition, any claim for concealed or unforeseen conditions shall be made before such condition is disturbed and while it can still be viewed by the Owner. Such written statement shall contain a description of the nature of the work provided or damage sustained; and the Contractor, shall on or before the fifteenth day of the month succeeding that in which such work is performed or damage sustained file with the Engineer an itemized statement of the details and amount of such work or damage. Unless such statement shall be made as required, the claim for compensation shall be forfeited, waived and invalidated, and the Contractor shall not be entitled to payment due to any such work or damage. Such notice by the Contractor and the keeping of costs by the Engineer shall not in any way be construed as proving the validity of the claim. The provisions of this paragraph shall not apply to changes in quantities as provided under Article 2.05, or to Extra Work ordered by the Engineer in writing, but shall otherwise apply to claims for an increase in the Contract price or time for completion that Contractor alleges are due to changes in the work for which it is not responsible and which are not part of an Extra Work Order.

C. On the basis of information provided in writing by the Contractor's employees, servants, or agents, the Contractor shall certify, in writing, that the work for which it is claiming payment, other than as provided for in the Contract Documents, is work actually performed, and the costs as shown are the amounts legally due for providing such work for which payment is claimed.

D. The Engineer will determine all questions as to the amount and value of such work, and the fact and extent of such damage and will notify the Contractor in writing of this determination.

E. Acceptance by the Contractor of the final payment made under the provisions of Article 7.09 shall operate as and shall be a release to MassCEC and every member, agent, and employee thereof, from all claim and liability to the Contractor for anything done or furnished for, or relating to, the Work, or for any act or neglect of MassCEC or of any person relating to or affecting the Work except the claim against MassCEC for the remainder, if any there be, of the amounts kept or retained as provided in Article 5.17. For claims for extensions of time, see Article 6.08.

F. No payment, final or otherwise, shall operate to release the Contractor or its sureties from any obligations under this Contract or the Performance Bond, or under applicable law or in equity.

## 5.20 OPENING PORTIONS OF CONTRACT FOR OPERATION OR OCCUPANCY

A. Any portion of the Work which is in acceptable condition for operation or occupancy may be opened for operation or occupancy as directed in writing by MassCEC, but such operation or occupancy shall not be construed as an acceptance of the Work or part thereof, nor shall it act as a waiver of any of the provisions of the Contract Documents; provided, however, that on such portions of the Work as

are opened for such use, the Contractor shall not be required to assume any expense entailed in maintaining that portion of the Work opened for operation or occupancy. MassCEC will be responsible for maintenance and any damage to the Work caused solely by the operation or occupancy of any portion of the Work which has been opened to operations or occupancy as stipulated above, and it may order the Contractor to repair or replace such damage, whereupon the Contractor shall make such repairs at Contract Unit Prices so far as the same are applicable, or as Extra Work under the provisions of Article 2.03, if there are no applicable items in the Contract.

B. If the Contractor is dilatory in completing shoulders, drainage structures or other similar items of the Work, the Engineer may order all or a portion of the Work open to traffic, but in such event the Contractor shall not be relieved of their liability and responsibility during the period the Work is so opened prior to final acceptance. The Contractor shall conduct the remainder of their construction operations so as to cause the least obstruction to traffic. Additional costs incurred by the Contractor in conducting the remainder of their operations due to them being dilatory with parts of the Work shall be assumed by the Contractor, at no additional cost to MassCEC.

## 5.21 CONTRACTOR'S RESPONSIBILITY FOR THE WORK

A. Until final written acceptance of the Work, the Contractor shall have the charge and care of the Work. The Contractor shall take every necessary precaution against injury or damage to the Work by action of the elements, or from any other cause, whether arising from the execution of the non-execution of the Work, and especially when blasting is to be done.

B. Except as provided in Article 2.09, the Contractor shall bear all losses resulting from or due to the amount or the character of the Work or because the nature of the land in or on which the Work is done is different from that which was estimated or expected, or due to bad weather or other causes.

C. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the Work occasioned by any cause before its completion and final acceptance, including damage to the Work due to war, whether or not declared, civil war, insurrection, rebellion or revolution, or to any act or condition incident to any of the foregoing, or to "Acts of God" (limited to hurricane, tornado, cyclone and earthquake as classified by the United States Weather Bureau for the particular locality and for the particular season of the year, and in addition thereto, damages resulting directly from flooding from any of the aforementioned "Acts of God") (collectively, "Force Majeure Events"). The Contractor shall bear the expense of injuries and damages to the Work caused by its acts or omissions, or the acts or omissions of those for whom the Contractor is responsible. In any case in which the estimate for replacing such Work or repairing such damage caused by one or more Force Majeure Events results in a change of such magnitude as to be

incompatible with competitive bid status including where the replacement cost for such damage exceeds 30% of the initial Contract Price, MassCEC reserves the right to terminate the Contract and to call for new bids and award a new Contract for such Work. In the event a Contract is terminated for such reason, MassCEC will pay the Contractor such sum as may be due for Work performed up to the date of the "Act of God," or of damage directly due to war, whether or not declared, civil war, insurrection, rebellion or revolution, or to any act or condition incident to any of the foregoing and will also take over and pay for any material stored at the site of the Work provided said material was intended to be and could have been incorporated into the Work; MassCEC will also take over and pay for any material which was being especially fabricated for incorporation into the Work, provided, however, that as a condition precedent to MassCEC's liability for such material, the Contractor is legally liable therefore and the material was intended to be and could have been incorporated in the Work.

D. Issuance of an estimate of any part of the Work done will not be construed as final acceptance of any Work completed up to that time.

E. Should the Contractor fail to take prompt action whenever conditions make it necessary, MassCEC will make emergency repairs or cause the same to be made, with the stipulation that the costs for such repairs shall be charged against the Contractor and deducted from money due the Contractor.

F. In case of suspension of Work from any cause whatever, the Contractor shall be responsible for the Contract and shall take such precautions as may be necessary to prevent damage to the Work, provide suitable drainage, and shall erect any necessary temporary structures, signs, or other facilities, at no additional cost to MassCEC. The Contractor shall also maintain in an acceptable growing condition all living material in newly established plantings, seedings, and soddings furnished under the Work, and take adequate precautions to protect new tree growth and other important vegetative growth against injury.

G. The Contractor shall reimburse MassCEC for all expenses, losses or damages, as determined by the Engineer, incurred by or in consequence of any defect, act, omission or mistake of the Contractor or any Subcontractor.

H. The Contractor will be held responsible for any and all claims for damage to underground structures such as water or gas mains, pipes, conduits, manholes, or catch basins, due to the Contractor's operation or to the operations of any of its Subcontractors.

I. The Contractor shall not discontinue the service of water, electricity, steam, gas or any other utility, without first obtaining the approval in writing of the Engineer and the manager of the facility where the Work is being performed, and the Contractor shall cause the resumption of said service at the earliest practicable time. Approval

of the Engineer shall not be necessary in case of an emergency, but the Contractor shall notify the Engineer of any discontinuance and resumption of service.

## 5.22 CONFLICT OF INTEREST

A. It is understood and agreed that no gift, loan, or other thing of value has been or shall be given to any employee, agent, or officer of MassCEC in connection with the award or performance of the Contract. Also, no employment shall be given to and no renting, leasing, or purchasing of equipment, supplies, or materials shall be arranged or made with or through any employee, agent, or office of MassCEC by the Contractor.

B. No board member, officer or employee of MassCEC, officer or employee of any independent authority, political subdivision of the Commonwealth of Massachusetts, officer, employee or elected official or any city, county, or town authority within the Commonwealth of Massachusetts, during their tenure and for 1 year thereafter shall have any interest, direct or indirect, in this Contract or the proceeds thereof.

C. No member of or delegate to the Congress of the United States shall be admitted to any share or part of this Contract or to any benefit arising therefrom.

## 5.23 PERSONAL LIABILITY OF MASSCEC OFFICIALS

A. In carrying out any of the provisions of the Contract Documents, or in exercising any power or authority granted to them by or within the scope of the Contract, there shall be no liability upon the Executive Director of MassCEC, any director of MassCEC, Engineer, or their authorized representatives, either personally or as officials of MassCEC, it being understood that in all such matters they act solely as agents and representatives of MassCEC.

## 5.24 NO WAIVER OF LEGAL RIGHTS

A. MassCEC shall not be precluded or estopped by any measurement, estimate, or certificate made either before or after the completion and acceptance of the Work and payment therefor, from showing the true amount and character of the Work provided and materials furnished by the Contractor, nor from showing that any such measurement, estimate, or certificate is untrue or is incorrectly made, nor that the Work or materials do not in fact conform to the Contract. MassCEC shall not be precluded or estopped, notwithstanding any such measurement, estimate, or certificate and payment in accordance therewith, from recovering from the Contractor or the Contractor's Surety, or both, such damage as it may sustain by reason of the Contractor's failure to comply with the terms of the Contract Documents. Neither the acceptance by MassCEC, or any representative of MassCEC, nor any payment for or acceptance of the whole or any part of the Work, nor any extension of time, nor any possession taken by MassCEC, shall operate as

a waiver of any portion of the Contract Documents or of any power herein reserved, or of any right to damages. A waiver of any breach of the Contract shall not be held to be a waiver of any other or subsequent breach. Any remedy provided in the Contract Documents shall be taken and construed as cumulative, that is, in addition to each and every other remedy herein provided; and MassCEC shall also be entitled as of right to writ of injunction against any breach of any of the provisions of the Contract Documents.

## 5.25 LABOR, LODGING, BOARD, MAXIMUM HOURS OF EMPLOYMENT, KEEPING OF PAYROLL RECORDS

A. No laborer, workman, mechanic, foreman, or inspector working within this Commonwealth, in the employ of the Contractor, subcontractor, or other person doing or contracting to do the whole or a part of the Work contemplated by the Contract, shall be required or permitted to work more than 8 hours in any one day or more than 48 hours in any one week, or more than six days in any one week, except in cases of emergency. MassCEC or the Contractor or any subcontractor may employ laborers, work men and women, mechanics, foremen, and inspectors for more than 8 hours in any day in the work to be done or under the Contract when, in the opinion of the Director of the Department of Labor and Workforce Development, public necessity so requires.

B. Upon request of the Engineer or the Massachusetts Department of Labor and Industries, the Contractor shall furnish certified copies of any or all payrolls for the Contract, showing the name, address, and occupational classification of each employee on said Works, and the hours worked by, and the wages paid to each such employee. Such payroll shall also include the rates paid for rented trucks or rental equipment of any kind used on the Work. This requirement shall also apply to the work of any subcontractor, having a subcontract for any of the Work performed on the Contract. Such records shall be kept in such manner as the Director of the Department of Labor and Workforce Development shall prescribe and shall be open to inspection by MassCEC or the Engineer or any authorized representative of the Department of Labor and Workforce Development at any reasonable time and as often as may be necessary.

C. The Contractor and all its Subcontractors shall keep true and accurate registers of all mechanics, teamsters, chauffeurs, and laborers employed thereon, showing the name, address, and occupational classification of each employee on the Work, the hours worked by, and the wages paid to each such employee, and shall furnish each week to the Engineer a true statement of the same covering the previous week.

D. The Contractor and all of its Subcontractors shall comply with Federal Department of Homeland Security Requirements in hiring any and all “Employees” to be employed on the Work who are required to be listed in the certified payroll reports required to be submitted under this Contract. Such compliance shall include, but not be limited to, the faithful completion of the Federal Department of Homeland

Security Form I-9 and processed by the Contractor and all of their Subcontractors for each of their employees.

## 5.26 RECORDS AND AUDITING

A. The words defined below shall have the meaning stated whenever they appear in this subsection:

1. "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract.

2. "Contract" means any contract awarded or executed.

3. "Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

4. "Independent Certified Public Accountant" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of this person's residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.

5. "Audit", when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

6. "Accountant's Report", when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which they made and sets forth their opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefor shall be stated. An accountant's report shall include as a part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the Contractor.

7. "Management", when used herein, means the chief executive officers, partners, principals or other person or persons primarily responsible for the financial and operational policies and practices of the Contractor.

8. Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

B. The following requirements shall apply:

1. The Contractor shall make, and keep for at least 6 years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the Contractor,

2. Until the expiration of 6 years after final payment, the awarding authority, and the office of inspector general shall have the right to examine any books, documents, papers or records of the Contractor or their subcontractors that directly pertain to, and involve transactions relating to, the Contractor or their subcontractors,

3. If the agreement is a contract as defined herein, the Contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the awarding authority, including in their description the date of the change and reasons therefore, and shall accompany said description with a letter from the Contractor's independent certified public accounting approving or otherwise commenting on the changes,

4. If the agreement is a contract as defined herein, the Contractor has filed a statement of management on internal accounting controls as set forth in paragraph "C" below prior to the execution of the contract, and

5. If the agreement is a contract as defined herein, the Contractor has filed prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in paragraph "D" below.

C. Every Contractor awarded a contract shall file with the awarding authority a statement of management as to whether the system of internal accounting controls of the Contractor and its subsidiaries reasonably assures that:

1. Transactions are executed in accordance with management's general and specific authorization.

2. Transactions are recorded as necessary:

a. To permit preparation of financial statements in conformity with generally accepted accounting principles, and
b. To maintain accountability for assets;

3. Access to assets is permitted only in accordance with management's general or specific authorization; and

4. The recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Every Contractor awarded a contract shall also file with the awarding authority a statement prepared and signed by an independent certified public accountant, stating that they have examined the statement of management on internal accounting controls, and expressing an opinion as to

5. Whether the representation of management in response to this paragraph and paragraph "B" above are consistent with the result of management's evaluation of the system of internal accounting controls; and

6. Whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

D. Contractor shall annually file with the awarding authority during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report.

Note: The record retention aspects of this subsection apply to all contracts awarded by MassCEC regardless of value. The requirements relative to the internal auditing and management controls, including the filing of an annual statement, apply to contracts awarded with a value greater than $100,000.

**END OF ARTICLE 5**

## ARTICLE 6 - PROSECUTION AND PROGRESS

### 6.01 SUBLETTING OR ASSIGNMENT OF CONTRACT

A. The Contractor shall continuously attend to the faithful prosecution of the Work, shall keep the same under its personal control, and shall not assign by power of attorney or otherwise, or sublet, the Work or any part thereof without the previous written consent of MassCEC and shall not, either legally or equitably, assign any of the money payable under the Contract, or its claim thereto, unless by and with the like consent of MassCEC. The Contractor's failure to obtain the previous written consent of MassCEC shall constitute a waiver of payment for the Work or any part thereof that may be furnished without such previous written consent. The Contractor shall be responsible for the acts and omissions of its subcontractors, if any, and of all persons directly or indirectly employed by the Contractor or its subcontractors in connection with the Work.

B. The Contractor shall not sublet, sell, transfer, assign, or otherwise dispose of the Contract or any portion thereof, or of the Contractor’s right, title, or interest therein, without written consent of MassCEC. If consent is given, the Contractor shall be permitted to sublet a portion thereof, but shall provide with the Contractor’s own organization, Work amounting to not less than 30% of the original total Contract amount. No subcontracts, or transfer of contract, shall in any case release the Contractor from liability under the Contract and bonds.

C. Consent to sublet any part of the Work shall not be construed to be an approval of the said subcontract or of any of its terms but shall operate only as an approval of the making of a subcontract between the Contractor and subcontractor.

D. A subcontractor (vendor, or supplier) will be recognized only in the capacity of an employee or agent of the Contractor, and the subcontractor’s removal may be required as in the case of an employee.

E. As soon as practicable after execution of the Contract, the Contractor shall submit to MassCEC applications for approval of subcontractors for any part of the Work it is proposed to subcontract. In addition to stating the name and address of the proposed subcontractor, each application shall give the items, or any portions thereof, proposed to be sublet by item number and description, and the total value of the Work proposed to be sublet based on the primary Contract Unit Prices where established, or, where not established, on the approved breakdown estimate of a lump sum price required under Article 7.06 and not on the amount of the subcontract. The application shall also show pertinent information in order to enable MassCEC to ascertain whether the proposed subcontractor is reliable and able to perform the work.

F. The Contractor shall direct the attention of subcontractors to the requirements of:

1. Article 5.04 regarding insurance requirements, the minimum wage rates as determined by the Division of Occupational Safety of the Department of Labor and Workforce Development, and the provisions of Articles 5.25 and 5.26.

2. Chapter 156D of the General Laws of the Commonwealth requires foreign corporations to appoint the Secretary of the Commonwealth as an attorney for service of process and requires foreign corporations to file certain documents with the Secretary of State which will permit them to do business in Massachusetts.

G. The Contractor shall direct the attention of subcontractors and all suppliers of material to the requirements of Article 3.09.

H. By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by the Contract Documents, assumes toward the Owner and Engineer. Each subcontract agreement shall preserve and protect the rights of the Owner and Engineer under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with sub-Subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed sub-Subcontractors.

## 6.02 PROSECUTION OF WORK/CONTRACT TIME/LIQUIDATED DAMAGES

A. Notice to Proceed/Contract Time. Following the Contractor's execution of the Contract, MassCEC shall issue a written Notice to Proceed with the Work. Alternatively, MassCEC may issue a Partial Notice to Proceed, applicable to a portion of the Work as may be required to accommodate the completion of precedent work performed by others. The Contractor shall commence and continue performance of the Work within seven (7) days of its receipt of MassCEC's written Notice to Proceed with the Work unless otherwise ordered in writing by MassCEC. The Contractor shall achieve Substantial Completion of all Work within the timeframe specified in the MassCEC's Notice to Proceed.

B. Liquidated Damages

1. Prior to commencing the Work, the Contractor shall provide the Owner with a Project Schedule reflecting all Milestone Dates (if applicable), Substantial

Completion, and Final Completion, which shall become the Project schedule. The Owner shall review and, if acceptable, approve the Project schedule. In the performance of the Work, the Contractor shall adhere to the Project schedule as it may from time to time be adjusted with the written approval of the Owner. The Contractor shall make no adjustment to the Project Schedule that alters the Contract Times (or Milestone Dates) except by a Change Order.

2. MassCEC and the Contractor agree that time is of the essence of the Contract. Contractor shall continuously perform the Work in accordance with the Project Schedule, as such schedule may be modified, if applicable, by approval of the Owner.

3. The Contractor acknowledges that it will be difficult to quantify the amount of damage and loss to MassCEC that will result from the Contractor's failure to achieve Substantial Completion of the Work within the Contract Time, due to various factors including other scheduled significant project(s) that take place concurrently at the Project location. Since delay of completion of the Work puts MassCEC at risk for substantial financial losses and costs if the Project site is not usable by the scheduled completion date, which costs are difficult to quantify as of the time of execution of this Contract, Contractor shall pay to MassCEC as Liquidated Damages and not as penalty, the sum of **Two Thousand and 00/100 Dollars ($2,000) per calendar day** that Substantial Completion of the Work is delayed commencing on the calendar day after the scheduled date of Substantial Completion as adjusted by any approved time extensions. The Contractor agrees that MassCEC may deduct such Liquidated Damages from any sums that may be otherwise due and payable to Contractor.

## 6.03 REMOVAL OR DEMOLITION OF BUILDINGS AND LAND TAKINGS

A. When the removal or demolition of buildings within the Work limits is done under other and separate contracts, the provisions of Article 3.06 ("Adjacent Contracts") shall apply. MassCEC will not be held liable for any expense to the Contractor due to any delay or interference with its Work, due to removal or demolition of the buildings, or due to any failure to remove or demolish any buildings, or due to the necessary land takings.

B. No allowance of any kind will be made except as provided in Article 6.08.

## 6.04 LIMITATIONS OF OPERATIONS

A. The Contractor shall conduct the Work at all times in such a manner and in such sequence as will assure the least interference with vehicular, marine, and pedestrian traffic, operations of railroads, and occupant and consumer entrance to and exit from adjacent buildings and property. The Contractor shall have due regard to the location of detours and to the provisions for handling traffic. The Contractor shall not open up work to the prejudice or detriment of work already started.

B. Public ways shall be maintained clean and clear of spillage from trucks hauling concrete, excavated material, fill, and other construction materials to and from the construction site. Demolition materials, excavation, and other materials hauled to and from the site shall be contained in enclosed vehicles that will prevent spillage onto streets.

1. The Contractor shall make maximum effort to minimize the amount of traffic to and from the site, which may include scheduling of deliveries, maximizing loads per delivery or other measures as may be required to avoid public nuisance.

2. Maintain the existing pedestrian crosswalks and pedestrian sidewalk circulation.

C. MassCEC reserves the right to limit the prosecution of the Work to such points and in such order as the Engineer may direct.

## 6.05 CHARACTER OF WORK MEN AND WOMEN, METHODS AND EQUIPMENT

A. The Contractor shall at all times employ sufficient labor and equipment to prosecute the several classes of work to full completion in the manner and time required by the Contract Documents.

B. The Contractor shall provide all cutting, fitting, and patching of the work that may be required to make its several parts fit together properly, and shall not endanger any work by cutting, excavating, or otherwise altering the work in any part thereof.

C. The Contractor shall employ only competent persons and subcontractors to do the Work. In addition, the Contractor shall hire persons, who, in the opinion of the Engineer are well qualified to direct, advise or perform certain specialized types of work as described in the Specifications.

D. All work men and women shall have sufficient skill and experience to perform the Work assigned to them. Work men and women engaged in special work or skilled work shall have sufficient experience in such work and in the operations of the equipment required to perform all work properly and satisfactorily.

E. Any person employed by the Contractor or by any subcontractor who, in the Engineer's judgment, does not perform the work in a proper and skilled manner or is intemperate or disorderly or otherwise unsatisfactory or not employed in accordance with the provisions of Article 5.25, shall at the written request of MassCEC or the Engineer, be removed by the Contractor or subcontractor employing such person, and shall not be employed again in any portion of the Work without the approval of the Engineer.

F. Should the Contractor fail to take the necessary action to remove such person or persons as required above or fail to furnish suitable and sufficient personnel for the proper prosecution of the Work, the Engineer may suspend the Work by written notice until such orders are complied with.

G. The Contractor shall employ engineers registered in the Commonwealth of Massachusetts, qualified superintendents, foremen, and other supervisory employees to plan all construction operations and to represent the Contractor at all of the several parts of the Work and they shall be present at all times while the Work entrusted to them is in progress and shall be informed thoroughly regarding the Work.

H. All equipment used on the Work shall be of sufficient size and in such mechanical condition as to meet the requirements of the Work and to produce Work in accordance with the Contract Documents. Equipment used on any portion of the Work shall be such that no injury to city streets, highways, or adjacent property will result from its use.

I. When methods and equipment to be used by the Contractor in accomplishing the construction are not prescribed in the Contract, the Contractor may use any methods or equipment that demonstrate to the satisfaction of the Engineer the ability to accomplish the Work in conformity with the requirements of the Contract.

J. When the Contract Documents specify the means, methods and equipment by which the construction shall be performed, such means, methods and equipment shall be used unless otherwise authorized in writing by the Engineer. If the Contractor desires to use a method or type of equipment other than that specified, such approval should be requested in writing from the Engineer. The request shall include a full description of the means, methods and equipment proposed to be used as an explanation of the reasons for desiring to make the change. If written approval is given, it will be on the condition that the Contractor shall be fully responsible for producing construction work in conformity with the Contract requirements. If after trial use of the substituted methods or equipment, the Engineer determines that the Work produced does not meet Contract Documents, the Contractor shall discontinue the use of the substitute means, methods or equipment and shall complete the remaining construction with the specified methods and equipment. The Contractor shall remove the deficient Work and replace it with Work of specified quality or take such other corrective action as the Engineer may direct.

No changes will be made in basis of payment for the construction items involved nor in Contract Time as a result of authorizing a change in methods or equipment under these provisions.

K. In the employment of labor, the Contractor and their Subcontractors shall give preference to qualified individuals who are citizens of the United States, Citizens of the Commonwealth of Massachusetts, and Citizens of the City of New Bedford.

L. All equipment furnished by the Contractor shall be maintained in good condition and shall be subject to the approval of the Engineer prior to and during its use in connection with the Work.

M. The Contractor shall submit each week to the Engineer, on a form approved by the Engineer, a listing of all equipment (other than small tools) used in or charged to the Work during the previous week, including equipment rented by the Contractor from others, which listing shall include the following information as to each piece of equipment:

1. Identification thereof by the number assigned and by the firm name appearing on the equipment;

2. Designation of the equipment's capacity and weight (and, when deemed applicable by the Engineer, such other information, e.g. size, number of wheels, etc., as may be helpful in defining the equipment's reasonable rental rate);

3. Hours used on the Contract, and hours idle;

4. Hours down for repairs or for maintenance;

5. Whether it was rented from others or is owned by the Contractor or a Subcontractor, and, if rented, from whom.

## 6.06 DELAY OF COMMENCEMENT AND SUSPENSION OF WORK

A. The Engineer has the authority to delay the commencement of the Work and delay or suspend any portion thereof, for such period or periods as it may be deemed necessary, because of conditions beyond the control of MassCEC or the Contractor, for the failure of the Contractor to correct conditions unsafe for the general public; for failure to carry out provisions of the Contract; for failure to carry out orders; for causes and conditions considered unsuitable for the prosecution of the Work; for acts of third persons not a party to the Contract; or for any other cause, condition, or reason deemed to be in the public interest.

B. Upon receipt of written order of the Engineer, the Contractor shall immediately delay the commencement of the Work or delay or suspend any portion thereof in

accordance with said order. Work shall not be suspended or delayed without prior written approval or order of the Engineer. The work shall be resumed when conditions warrant or deficiencies have been corrected and the conditions of the Contract satisfied as ordered or approved in writing by the Engineer. The Contractor's attention is also directed to the requirements of Article 5.21 and the public safety and convenience requirements of Sections of Division 1, General Requirements, that shall govern during any period of temporary or partial suspension of work.

## 6.07 CLAIM FOR DELAY OR SUSPENSION OF WORK

A. The Contractor shall have no claim for damages of any kind due to any delay in commencement of the Work or any delay or suspension of any portion thereof, except as hereinafter provided.

B. Subject to the other provisions of this Section, if the Contractor is delayed at any time in the progress of the Work by (1) a negligent act or omission by of the Owner or Architect, an employee of either, or by a Separate Contractor; (2) changes ordered in the Work; (3) area-wide labor disputes not directed expressly at Contractor or any Subcontractor, fire, extraordinary delay in deliveries, unavoidable casualties, or Force Majeure Events (as defined in Section 5.21 C.); (4) delay authorized by the Owner; (5) delays caused solely by public or private utility owners or municipal departments (see Article 3.05); or (6) other causes that the Contractor reasonably asserts, and the Engineer determines, justify delay; and provided that the Contractor has given timely notice of such delay as set forth in this Section and otherwise in accordance with the requirements of the Contract Documents, then the Contract Time shall be extended by Change Order or Construction Change Directive for such reasonable time not to exceed the period of delay so caused, net of any delay caused by or attributable to the acts or omissions of the Contractor, any Subcontractor or others for whom they are responsible.

1. The Contractor acknowledges and agrees that (a) no adjustments to the Contract Time shall be made unless the events described above shall have the effect of actually delaying completion of components of the Work on the critical path indicated in the Schedule and (b) adjustments to any Milestone Dates and/or the Contract Time will be permitted in connection with any such delay only to the extent Contractor demonstrates with data and documentation that such delay (i) is not caused, or could not have been avoided, by the Contractor, (ii) could not be limited or avoided by the Contractor's timely notice to the Owner of the delay, (iii) has an impact to the critical path of at least one (1) day and (iv) has no concurrent or contributing cause for which the Contractor would not be entitled to an extension of the Contract Time.

2. Notwithstanding anything to the contrary, the Contractor shall not be entitled to any extension in the Contract Time for delays in receiving

required licenses, permits, inspections or approvals unless the Owner is required to provide or obtain such licenses, permits, inspections or approvals. Any extension of the Contract Time shall be granted only to the extent that the effect of such delay cannot be (or could not have been) avoided or mitigated by the exercise of all reasonable precautions, efforts and measures (including planning, scheduling and rescheduling), whether before or after the occurrence of the cause of delay. No extension of the Contract Times shall be granted for delays affecting portions of the Work that are not critical activities or not on the critical path of the latest Project Schedule.

3. Subject to the following sentence, no extension shall be granted for any delay (a) which, in whole or in part, results from or arises out of the breach or negligence of the Contractor or of those for whom the Contractor is responsible, or (b) for which the Contractor is not entitled to an extension of the Contract Times hereunder. In the event the Contractor is responsible for a delay that does not entitle it to an extension of the Contract Time, but which is concurrent with another delay that would otherwise entitle the Contractor to an extension thereof ("Concurrent Delay"), the Contractor shall be entitled to an extension of the Contract Time for the amount of the demonstrated concurrency period, but no increase to the Contract Sum, for such concurrency period or otherwise. Any extension of the Contract Time allowed hereunder shall be net of the Contractor-caused delay and any "float" time included in the Project Schedule.

4. **No Damages for Delay.** The Contractor hereby agrees that the Contractor shall have no claim for increase in the Contract Sum or additional direct or indirect costs or damages of any kind against the Owner or the Engineer on account of any delay in the commencement of the Work, and/or any claim based on alleged delay, hindrance, loss of productivity, acceleration including but not limited to Catch-Up Work (except as specified in Section 6.07 C below), or suspension of any portion of the Work ("Delay"), whether such Delay is caused in whole or in part by the Owner, the Engineer, or otherwise. The Contractor acknowledges that the Contractor's sole remedy for any such Delay will be an extension of time as provided in this Section.

5. Notwithstanding any provision in the Contract Documents to the contrary, Contractor shall not be entitled to any extension of time because of the impacts of any pandemic known or knowable as of the Date of Commencement of the Work, tariffs imposed on United States imports or exports, seasonal variations in temperature, humidity or precipitation, which conditions shall be wholly at the risk of the Contractor, whether occurring within the time originally scheduled for completion or within the period of any extension granted. There shall be no increase in the Contract Sum on account of any additional costs of operations or conditions resulting therefrom.

a. The probable slow-down or curtailment of Work during inclement weather and winter months has been taken into consideration in determining the total time required to complete the Contract; hence no extension of time will be allowed due to this reason. No extension of time will be allowed for winter conditions and weather conditions, unless they qualify as a Force Majeure Event.

C. If the Engineer determines that the rate of progress of the Work has been delayed and it appears that the Work or any portion thereof will not progress to completion in accordance with the approved Project Schedule, the Owner shall have the right, but not the obligation, to require the Contractor to take all necessary action to recover or to prevent such delay ("Catch-Up Work"). In such case, Owner may direct Contractor to increase the force, equipment, and plant, or any of them, employed on the whole or any part of the Work, stating the amount of increase required; and unless the Contractor shall, within five (5) days after such notice, increase such force, equipment, and plant to the extent required therein, and maintain and employ the same from day to day until the completion of the Work or such part thereof or until the conditions as to the rate of progress shall, in the Engineer's judgment, be fulfilled, or unless the Contractor submits and receives approval of a revised Critical Path Method (CPM) indicating the Work being completed on time, MassCEC may employ and direct the labors of such additional force, equipment, and plant as may, in the Engineer's judgment, be necessary to insure the completion of the Work or such part thereof within the time specified, or at the earliest possible date thereafter, and charge the expense thereof to the Contractor. Where Contractor performs Catch-Up Work for a delay that does not otherwise entitle the Contractor to an extension of the Contract Time, all costs associated with such Catch-Up Work shall be borne by the Contractor. In the event that any such delay entitles the Contractor to an extension of the Contract Time, the Owner shall reimburse Contractor for all costs associated with such Catch-Up Work, but only to the extent of Owner's approval of a valid and properly substantiated Claim submitted by the Contractor pursuant to all applicable provisions of these General Conditions.

D. An extension of time will not be granted for any excusable delay or any suspension of the Work if a written request for an extension of time on account of delay due to any of the causes described in this Article 6.07 is not filed within 15 days of the date of the commencement of the delay, together with data and documentation substantiating the claimed period of recoverable delay. Notwithstanding any provision in these provisions or the Contract Documents to the contrary, no extension of time will be granted if the request is based on any claim that the Contract Time as originally established was inadequate.

## 6.08 DETERMINATION AND EXTENSION OF CONTRACT TIME FOR DELAYS TO COMMENCEMENT OF THE WORK

A. The Contract Time for completion shall be adjusted for delays to the commencement of the Work, if applicable, as follows:

B. If the Contract is not awarded as contemplated by the Instructions to Bidders, then the number of days allowed for the completion of the Work will be computed from the date of transmission (by electronic mail) of the executed Contract to the Contractor or the date on which the Contractor was directed to commence Work whichever is later. If the Contract specifies a specific calendar date for completion and the Contract is not awarded as contemplated by the Instructions to Bidders, then the Contractor will be entitled to an extension of time equivalent to the number of days elapsed from 60 days (45 days if Federal funds are involved) after the opening of bids up to and including the day of mailing of the executed Contract by MassCEC or the date on which the Contractor was directed to commence Work whichever is later.

C In case commencement of Work is delayed or any part thereof is delayed or suspended by MassCEC (except for unsuitable weather, winter months, or reasons caused by the fault or neglect of the Contractor), the Contractor will be granted an extension of time in which to complete the Work or any portion of the Work required under the Contract equivalent to the duration of the delay or suspension less a reasonable period of time within which the Contractor could have done necessary preliminary work.

## 6.09 FAILURE TO COMPLETE WORK ON TIME – NO WAIVER

A. Permitting the Contractor to continue and finish the Work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall not operate as a waiver on the part of MassCEC of any of its rights under the Contract.

## 6.10 TERMINATION OF CONTRACT

A. Should Contractor at any time: (i) fail to supply the labor, materials, equipment, supervision and other things required of it in sufficient quantity to perform the Work with the skill, conformity, promptness, and diligence required hereunder, (ii) cause stoppage or unreasonable delay of or interference with the Work, (iii) become insolvent, or (iv) materially fail in the performance or observance of any of the covenants, conditions, or other terms of this Contract, then in any such event, each of which shall constitute a default hereunder by the Contractor, MassCEC shall, after giving Contractor notice of default and seven (7) days within which to cure, have the right to remedy the default by terminating the Contractor and/or completing the Work or any portion of the Work. Contractor shall be liable for all damages to MassCEC caused by such default.

B. If a termination by MassCEC for default under Section 6.10 A is determined to be unjustified then such a termination shall be deemed a termination for convenience pursuant to Section 6.11.

C. In the event of termination, whether of this Contract or of an Assignment, the Contractor shall promptly deliver to the Owner all documents, work papers, studies, calculations, computer programs, data, drawings, plans, specifications and other tangible work product or materials pertaining to the Work performed under this Contract or Assignment, as applicable to the time of termination, and shall assist the Owner in the orderly transition of the work. Thereupon the Owner shall pay to the Contractor any unpaid and undisputed balance owing for Work rendered prior to the date of termination. Any termination of this Contract shall not affect or impair the right of the Owner to recover damages occasioned by any default of the Contractor or to set off such damages against amounts otherwise owed to the Contractor.

D. If the Contractor shall be adjudged bankrupt, or make a general assignment for the benefit of creditors, or if a receiver shall be appointed of the Contractor's property, or if the work to be done under the Contract shall be abandoned, or if the Contract or any part thereof shall be sublet without the previous written consent of MassCEC, or if the Contract or any claim thereunder shall be assigned by the Contractor otherwise than an herein specified, or at any time the Engineer certifies in writing to MassCEC that the Work, or any part thereof, is unnecessarily or unreasonably delayed, or that the Contractor has violated any of the provisions of the Contract, MassCEC may, by written notice, instruct the Contractor to discontinue the Work, or any part thereof, and thereupon the Contractor shall discontinue such Work or such part thereof, as MassCEC may designate, and MassCEC will require the Surety or Sureties to complete the Contract.

E. Neither a notice under Article 6.02 B. from MassCEC to the Contractor to perform Catch-Up Work nor MassCEC's employment of such additional force, equipment, or plant pursuant to that Article shall be held to waive or prevent a subsequent notice of termination from MassCEC under the provisions this Article 6.10, for the reasons prompting the notice or action by MassCEC under Article 6.02 B. or otherwise.

F. MassCEC may exercise the rights under this paragraph to rectify adverse conditions described in Article 3.10 and Article 4.04, and/or notify the Contractor's surety to take the necessary appropriate action to remedy the situation.

G. All expenses incurred by MassCEC in exercising its rights under this Article may be deducted from any amounts then due or to become due the Contractor under the Contract Documents. If MassCEC's expenses are less than the sum which would have been payable under the Contract Documents, the Contractor will be entitled to receive the difference; and in case such expenses shall exceed the said sum, the Contractor shall pay the amount of the excess to MassCEC upon completion of the Work without further demand being made therefor.

## 6.11 TERMINATION FOR CONVENIENCE

A. MassCEC may in its sole discretion and without cause notify the Contractor to discontinue all work, or any part thereof. Such notice shall be given to the Contractor in writing and thereupon the Contractor shall discontinue such work, or such part thereof, as MassCEC may designate.

B. If MassCEC notifies the Contractor to discontinue all work, or any part thereof pursuant to this Section, MassCEC shall pay and the Contractor shall accept, as full payment for all work done and materials provided, the following sums:

1. For all completed and approved items of work that the Contract provides are payable by unit prices:

   a. The original Contract Unit Prices.

2. For all partially completed work items to the date of termination:

   a. A sum agreed to by the Contractor and the Engineer; or

   b. The sum of the following items i through vi.:
      i. The actual cost for direct labor, materials (less salvage value, if any) and use of equipment plus 10 percent of this total for overhead.

      ii. The actual cost for Worker's Compensation and Employer's Liability Insurance, Health, Welfare and Pension Benefits, Social Security Deduction, and Employment Security Benefits.

      iii. Six (6) percent of the total of i and ii for profit.

      iv. The estimated proportionate cost of surety bonds.

      v. The actual cost to the Contractor for approved work performed by a subcontractor plus 10 percent of such cost.

      vi. No allowance will be made for general superintendence and the use of small tools and manual equipment.

3. For costs of settlement as:

   a. Reasonable and necessary storage, transportation and other costs incurred for the preservation, protection or disposition of the discontinued work.

   b. When requested by MassCEC, the Contractor shall furnish itemized statements of the cost of the work performed and shall give

MassCEC access to all accounts, bills and vouchers relating thereto and unless the Contractor, when requested, shall furnish such itemized statements and access to all accounts, bills and vouchers, they shall not be entitled to payment for the work for which such information is sought by MassCEC.

b. The Contractor shall not be paid, shall not have, and waives unconditionally any claims for any consequential damages, for loss of anticipated profits (on this or any other Project), and for loss of expected reimbursement or for any increased expenses resulting directly or indirectly from the discontinuance of any or all work except as stated in this article with respect to work completed as of the date of termination.

d. The Contractor shall incorporate the provisions of this Article and provisions in its contracts with each of its subcontractors.

## 6.12 MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES

A. MassCEC and the Contractor waive claims against each other for consequential damages arising out of or relating to the performance of the Work. This mutual waiver includes damages incurred by MassCEC for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons, and damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work. This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with the Contract Documents. Nothing contained in this Paragraph 6.12 A shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

**END OF ARTICLE 6**

## ARTICLE 7 - MEASUREMENT AND PAYMENT

### 7.01 MEASUREMENT OF QUANTITIES

A. Quantities of various items of work that are payable as unit prices pursuant to the Contract Documents shall be determined, for purposes of payment, by the Engineer and by the Contractor. Measurements will be made according to United States standard units of measurement.

B. Upon completion of the Work and before final payment is made the Engineer will make final measurements to determine quantities of various items of work performed as the basis for final settlement. Measurements will be made according to United States standard units of measurement.

C. Method of measurement and computations to be used in determination of quantities of material furnished and of work provided under the Contract will be those methods generally recognized as conforming to good engineering practice.

D. The Contractor shall provide assistance to the Engineer, as requested by the Engineer, for the purpose of the measurement of quantities, at no additional cost to MassCEC.

E. Where Work done under modification to the Contract is to be paid for by units of length, area, or volume, only the net amount of work actually done, as it shall appear in the finished Work, and measured as hereinafter specified, shall be paid for, local customs to the contrary notwithstanding.

F. All materials, which are specified for measurement by weight, shall be weighed on standard scales furnished by and at the expense of the Contractor. Such scales shall be sealed at the expense of the Contractor as often as is necessary to ensure their accuracy. A sworn weigher as provided under Section 85, Chapter 41 of the General Laws of the Commonwealth of Massachusetts shall weigh all materials required to be weighed as above provided. If materials are shipped by rail or truck, the car weights or quarry weights may be accepted, but scales shall be used as above, if so directed.

G. This Section shall not apply to items of Work performed pursuant to a lump sum bid price that was derived from estimated quantities of such items indicated in the Bid Form for bid comparison purposes only, as set forth in the Bid Form.

### 7.02 SCOPE OF PAYMENTS

A. Owner shall pay to Contractor for the satisfactory performance and completion of the Work and all the duties, obligations and responsibilities of Contractor under this Contract, the compensation as set forth above as the Contract Price which shall be deemed to include all Contractor's costs, overhead and profit for the performance

of the Work. The Contract Price shall be full compensation for all Work provided by Contractor and is conclusively presumed to cover all costs, expenses or damages arising out of the nature of the Work.

B. For all lump sum payment items, the Contract Price includes payment for all actual quantities of materials encountered by Contractor on the Project regardless of whether those quantities vary substantially from the estimated quantities used in the Request for Proposal's Bid Form and Contractor's Proposal, which were for bid comparison purposes only. Contractor is presumed to have accounted for the possibility and potential magnitude of any such quantity variation in preparing its Proposal, and the Contract Price for lump sum items of work calculated based on estimated unit quantities shall not be changed or modified on account thereof.

C. **No Compensation for Cost Escalation.** Notwithstanding anything in these General Conditions or the Contract Documents to the contrary, Contractor shall have no right to additional compensation for labor or material escalation or costs related to market volatility, the potential for which is deemed to have been fully accounted for in Contractor's Proposal and the agreed Contract Price set forth in the Agreement. Costs for labor or material escalation (including but not limited to building materials, products and supplies required to be furnished under the Agreement, and equipment rental costs), whether due to unusual market forces, geopolitical events or issues, or any other cause, including tariffs imposed or to be imposed on United States imports or exports, shall be at the risk of the Contractor. Contractor shall include a provision to the same effect in all agreements with its subcontractors.

D. Prior to submission of the first Progress Payment, the Contractor shall deliver to the Owner, for review and approval, a detailed breakdown of the Contract Price showing a Schedule of Values for the various parts of the Work, including any reimbursable expenses agreed to by the Owner. Once accepted, this Schedule of Values will be used as a basis for payment of the Contractor's monthly requisition. The Owner will accept the Schedule of Values if it is prepared with sufficient detail to serve as the basis for progress payments and is supported by such data necessary to substantiate its accuracy as Owner may reasonably require.

E. Payment of any current estimate or any retainage percentage shall in no way constitute an acknowledgement of the acceptance of the Work or in no way or degree prejudice or affect the obligation of the Contractor, at their own cost and expense, to repair, correct, renew or replace any defects and imperfections in the construction of, or in the strength of, or quality of materials used in or about the construction of the Work under Contract and its appurtenances, as well as damages due or attributable to such defects; which defects, imperfections or damages shall have been discovered on or before the expiration of the guaranty period specified in Article 2.08. The Engineer shall be the sole judge of such defects, imperfections, or damages and the Contractor shall be responsible for the cost to correct the same. Also, see Article 5.24.

F. If the requirements of the Measurement and Payment Part or Article in the Contract Specifications relating to any price in the Schedule of Bid Items requires that said price cover and be considered compensation for certain work or material essential to the item, this same work or material will not also be measured or paid for under any other pay item which may appear elsewhere in the Contract Specifications.

G. Except as specifically provided otherwise, no separate payment will be made for any work in fulfillment of the requirements specified in the Sections of Division 01, General Requirements, and all costs thereof shall be included in the various prices bid or the pay items shown in the Schedule of Bid Items.

## 7.03 UNIT PRICE ITEMS – COMPENSATION FOR ALTERED QUANTITIES

A. When the accepted quantities of Work (that is payable by Unit Price and not on a lump sum basis pursuant to the Contract Documents) vary from the estimated quantities set forth in the Contract, and whether or not there have been any changes to the Contract Documents, the Contractor shall accept as payment in full, so far as Contract items are concerned, payment at the original Unit Price for the accepted quantities of work done. No allowance or other adjustment except as provided in Article 2.05 shall be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly from such alterations or indirectly from unbalanced allocation among the Contract items of overhead expense on the part of the Contractor and subsequent loss of expected reimbursements therefor or from any other cause except the said payment for the actual quantity done at the original Contract Unit Price.

B. Alteration of quantities or changes to the character of the Work that are subject to Extra Work Orders as provided in Article 2.02 and 2.03 will be paid for at the prices for such items set forth therein. If prices cannot be agreed upon, the Contractor shall proceed with the performance of the work on a force account basis in accordance with Article 7.04.B.

C. This section shall not apply to items of work that are payable on a lump sum basis, whether or not their bid price was calculated based on estimated quantities listed in the Bid Form for bid comparison purposes.

## 7.04 PAYMENT FOR CHANGED OR EXTRA WORK

A. Payment for work for which there is a Contract Unit Price:

1. Where the Contract provides that the work is payable by specified Unit Price and the Engineer orders Extra Work for work of the same kind as other work contained in the Contract and it is provided under similar physical

conditions, the Contractor shall accept full and final payment at the Contract Unit Prices for the accepted quantities of Extra Work done.

2. No allowance will be made for any increased expenses or any damages incurred by the Contractor on account of the changes in quantities except as may otherwise be set forth in the Contract Documents.

B. Work performed will be paid for based on expended labor, equipment, and materials plus overhead and profit, neither of which are to exceed the amounts specified in paragraph "C" below.

C. Work performed will be paid for in an amount equal to the following:

1. Unless Owner and Contractor agree upon unit prices or a lump sum change in the Contract Price, the Contract Price shall be adjusted by the net amount of any direct savings and actual direct additional costs plus overhead and profit to Contractor of no more than a total of 10% as described in Section 2.02 D. If the changes, in the opinion of the Engineer, are of sufficient magnitude as to require additional time to complete the Contract, such time adjustment may be made in accordance with the provisions of Article 6.08.

2. For Extra Work or Change Orders where the work is self-performed by Contractor, it shall be entitled to a total mark-up for overhead and profit of 10% of its actual cost for the performance of such extra work. For extra work or Change Order work that is not self-performed by Contractor, it shall be entitled to a total mark-up for overhead and profit of 5% of the actual cost for the performance of such Change Orders. Subcontractors shall be entitled to a mark-up on Change Orders of 10% for overhead and profit for self-performed work and 5% for non self-performed work. In no circumstances shall the mark-ups by the Contractor and all of the Subcontractors and vendors exceed 20% in the aggregate.

3. No allowance shall be made for general superintendence and the use of small tools, incidental items and manual equipment.

The Contractor shall only be entitled to additional compensation for changed work if the Owner has ordered such changes in writing prior to the commencement of the changed work by the Contractor.

Requests for a Change Order shall be made on the Change Order Request Form agreed to by the parties and provided in **Attachment 1 (Contract Documents) of the Request for Proposal**. Likewise, agreed upon changes shall be reflected on the Change Order Request Form agreed to by the parties.

The Contractor shall furnish such information as to the cost of such Extra or changed work as the Engineer may request. The Contractor shall also, upon request

by the Engineer, give the Engineer access to and copies of accounts, bills and vouchers relating to such work (all of which shall be kept in a manner satisfactory to the Engineer), and if the Contractor shall not do so, it shall not be entitled to payment for any items of such work concerning which the Engineer's request has not been granted.

Prior to the commencement of such work, the Contractor shall submit to the Engineer a written certificate showing the rates or percentages of all assessments against wages paid by the Contractor, including Federal Social Security and state unemployment compensation assessments, insurance, health and welfare payments and other assessments which the Contractor actually pays as an employer pursuant to contractual obligation upon the basis of such wages. The determination of the Engineer shall be final upon all questions as to the amount or value of extra work.

## 7.05 OMITTED ITEMS

A. Should any item or items of the Work be determined unnecessary for the proper completion of the Work, MassCEC may, upon written notice to the Contractor, eliminate such item or items from the Contract and allowance will not be made for such items so eliminated in making final payment to the Contractor, except for such actual Work as shall be done and materials purchased, including the cost of moving in and out the special equipment necessary for Work on the eliminated item or items, prior to notification of the elimination of such item or items. The amount of the credit to MassCEC shall be determined in a similar manner as described in Article 7.04.

## 7.06 PARTIAL PAYMENTS

A. Monthly, the Engineer will make an estimate in writing of the total amount of the work done to the date of such estimate and the value thereof, including advance payments on products/materials stored or on hand but not yet incorporated in the Work which may be made as provided in Article 7.07. MassCEC will retain the following from these payments:

1. Five (5) percent of the approved amount of the payment as retainage to secure satisfactory performance of the Contract Work.

2. An amount sufficient to cover claims it has against the Contractor.

3. Five (5) percent of the value of all items to be planted in the ground.

4. Any amounts that may be subject to validly disputed payment claims by subcontractors, pending satisfactory resolution of such dispute.

MassCEC will pay monthly to the Contractor while carrying on the Work the balance not retained as hereinbefore provided. No such estimates or payment shall

be required to be made when, in the Engineer's judgement, the Work is not proceeding in accordance with the provisions of the Contract, or when in the Engineer's judgement the total value of the Work done since the last estimate amounts to less than $500.00.

B. MassCEC may, at its option, after 50 percent of the Work has been completed and (1) if the Work is proceeding in accordance with the approved CPM Construction schedule submitted under the requirements specified in the Sections of Division 01, General Requirements, and (2) is being performed in accordance with the Contract Documents, not retain the 5 percent to secure satisfactory performance of the Contract Work as provided in Article 7.06.A on any subsequent payments. However, if MassCEC does not retain these monies, it will reimpose this 5 percent retainage on all subsequent payments should the Contractor fail to maintain progress in accordance with the Contract and approved schedule or fail to execute the Work as required by the Contract Documents. Retainages withheld under Articles 7.06.A.2 and 7.06.A.3 will remain in effect throughout the Contract Work period as detailed therein. Retainage withheld under Article 7.06.A.4 for plantings will be retained until Final Acceptance (see Article 7.09).

C. Partial payments will be made on lump sum contracts and on lump sum items of a contract if the Contractor requests partial payment of such an item, in accordance with a schedule of the quantities and unit prices for the major components of a lump sum contract or of the lump sum items of a contract to be submitted by the Contractor and approved by the Engineer prior to making partial payments for such contract or for such items.

1. For lump sum contracts, this schedule of major components shall approximate the activities shown on the CPM Construction Plan required under the Sections of Division 01, General Requirements.

2. Each component part shall be considered as including all its concomitant parts so that the total cost listed for the components is the contract cost for the item.

3. Approval of the schedule by the Engineer shall not be considered as a guarantee to the Contractor that the quantities shown on the schedule are the approximate quantities actually included in the lump sum item.

4. The schedule is only for the purpose of estimating partial payments and it shall not affect the Contract terms in any way.

D. The Contractor shall certify in writing by means of a Certification of Work that the work for which payment is included in the estimate in question has in fact been done. The Certification of Work form shall be developed by the Contractor and approved by the Engineer. The Certification of Work form shall be completed and

signed by an authorized representative of the Contractor, and it shall be submitted to MassCEC with each payment request.

E. Whenever the Work is substantially complete, MassCEC may, if it considers the amount retained to be in excess of the amount adequate for its protection, at its discretion, release to the Contractor all or a portion of such excess amount and may cause the Contractor to be paid such portion of the retainage as it deems prudent.

F. When the first partial payment estimate is prepared, the Contractor shall submit to the Engineer a cash drawdown forecast indicating the estimated amount of each partial payment by month, projected through completion of the project. The Contractor shall, with each succeeding partial payment estimate, submit updated cash drawdown forecasts to the Engineer. The forecast is for the purpose of estimating cash requirements.

G. The Contractor shall develop a Statement of Payment to Subcontractor Form and the Engineer shall approve the form. The Statement of Payment to Subcontractor Form shall be completed and signed by an authorized representative of the Contractor and it shall be submitted to MassCEC with each payment request.

## 7.07 PAYMENT FOR PRODUCTS/MATERIALS STORED ON OR OFF SITE

A. When requested in writing by the Contractor allowance may be made on partial payments for certain products/materials stored at the Work site, but not incorporated in the Work, subject to the following terms and conditions:

1. Upon presentation to the Engineer by the Contractor of copies of paid invoices, advance payments may be made for acceptable reinforcing steel, structural steel, piles, pipe, guard rail, precast concrete items, costly machinery items and other similar non-perishable products/materials purchased expressly for the Work and delivered to and stored in the approved storage places at the site, but which products/materials are not considered as installed, erected or complete in place under the terms of the Contract and for which partial payment would not otherwise be made until such items were installed, erected or complete in place.

2. The amount to be included in the estimate will be the value of the products/materials as shown on the certified copies of paid invoices including transportation and handling costs. However, the Engineer may limit payment for such products/materials when payment is based upon a standard unit of measure. When Contract payments are made on the basis of estimated quantities, payment for products/materials stored or on hand may be limited to an amount not to exceed the value of 90% of the estimated quantity.

3. Before any advance on products/materials is made as hereinbefore provided, MassCEC will require, as security for the incorporation of the products/materials in the Work, documents from the Contractor transferring to MassCEC the absolute legal title to such products/materials.

4. However, the transfer of title and the partial payment for such products/materials shall not in itself constitute acceptance of same nor void the right to reject products/materials subsequently found unsatisfactory as provided in Article 4.04, nor in any way relieve the Contractor of their responsibility for satisfactorily furnishing and installing/placing the products/materials in the Work in accordance with the terms of the Contract.

5. In the event any of such products/materials subsequently becomes lost, stolen, impaired or damaged the monetary value of the lost, stolen, impaired or damaged products/materials as may have been paid for in a current estimate will be deducted from the next estimate and no further payment will be made therefor until such products/materials have been satisfactorily replaced with products/materials conforming to the Contract Documents.

6. If it is impossible due to lack of area on the site or other valid reason, the Contractor may request in writing permission from the Engineer to store products/materials off the site and still have the products/materials paid for as products/materials on hand and the Engineer may approve payment. However, no advance payment for products/materials stored off the site will be made until written approval of the Engineer has been given. This request will state the reason(s) for the request, location of the storage area(s), and shall also state the methods that will be employed to ensure that the products/materials are properly protected, and the products/materials will be used on the Contract that the request is made for. The amount to be included in the estimate for products/materials stored off site will be limited to 80% of the value of the products/materials as shown by the certified copies of paid invoices including transportation and handling costs.

7. In the case of property not owned or controlled by MassCEC, the Contractor shall also lease, or procure a lease, free from encumbrances to MassCEC, such lease to be in a form approved by MassCEC and to contain provisions for the protection and indemnification by the Contractor of MassCEC, its employees and agents, against all claims by reason of such lease or by reason of anything done or permitted in or upon the leased site(s). The Contractor shall also take such steps as MassCEC may require for the purpose of security and assuring MassCEC the control of such products/materials, particularly the right to enter upon the property, take possession of such products/materials and use the same.

    a. No advance payment for products/materials stored or on hand, but not incorporated in the Work, will be made in an estimate when the

value therefore amounts to less than $10,000 per Contract Bid Item and represents the value of at least 50% of the estimated quantity involved as shown on the Schedule of Bid Items or as determined by the Engineer.

b. Deductions at rates and in amounts that are equal to the advance payments will be made under the appropriate Contract Pay Items in estimates as the products/materials are incorporated in the Work.

## 7.08 SEMI-FINAL ESTIMATE

A. A semi-final estimate may be made, at the discretion of MassCEC, under the following conditions:

1. If, after final inspection has been made, there are any payments or Extra Work items that are still in dispute between the Contractor and MassCEC, either as to the quantity or value of Work provided thereunder, such items or claims may be excluded from the final estimate, and payment for such disputed items may be deferred until such time as agreement has been reached between the Contractor and MassCEC or until such claim has been adjudicated. In such case, a semi-final estimate shall be prepared within a period of 65 days after Substantial Completion of the Work covering the value of Work provided and retained percentage on items of the Contract that are not in dispute and with disputed items or claims excluded but subject to deduction and retention of a sum sufficient to satisfy any and all outstanding claims or liens that have been duly filed by subcontractors and materialmen against the Contractor, or to cover amount of such claims or liens that may have been paid by MassCEC directly to others for the Contractor's account , and subject to deduction and retention from such payment any other amounts to be deducted and retained in accordance with the terms of the Contract Documents.

2. In the event the Work has been Substantially Completed and the Work has been opened for operation or occupancy as directed in writing by MassCEC, but final acceptance of the Work is subject to delay because of minor uncompleted items which do not impair the usefulness of the Contract, a semi-final estimate shall also be prepared within a like period of 65 days after the Work has been Substantially Completed and opened for operation or occupancy. Such semi-final estimate shall include an estimate of the value of all Work provided in accordance with the terms of the Contract Documents, including the amount of retained percentage withheld by MassCEC from previous periodic payments, but excluding (a) the same deductions and retainage sufficient to cover subcontractors' and materialmens' claims and other amounts to be deducted and retained in accordance with the terms of the Contract Documents as provided by the first paragraph of this Article; (b) an amount equal to the estimated value of

the work remaining to be performed; and (c) any items or claims for Extra Work, or parts thereof, that may be in dispute; and payment for such excluded items or portions thereof, may be deferred until such remaining Work has been satisfactorily completed, or in the case of disputed items or claims until such time as agreement has been reached thereon or such claims have been adjudicated.

## 7.09 FINAL ACCEPTANCE AND FINAL PAYMENT

A. When all of the Work covered by the Contract, including those items of Work set forth on the Punch List (see Article 3.11), has been completed and accepted, MassCEC will inform the Contractor in writing of the date of such final acceptance.

B. The Engineer shall, as soon as practicable after the satisfactory completion of the Work including the Punch List, make a final estimate of the amount of non-Punch List Work done thereunder and the value of such Work. Within 65 days from and after the date the Work has been accepted by the Engineer, MassCEC will forward to the Contractor a copy of the final estimate or semi-final estimate, which will include an agreement form for the Contractor's acceptance. This estimate will be the balance due the Contractor minus a one percent retention for final completion of Project deliverables, plus the reasonably estimated value of amounts to cover any outstanding claims. After such acceptance has been filed with the Engineer, payments of the estimate will be made, so found to be due thereunder after deducting therefrom all previous payments and all amounts to be kept and all amounts to be retained under the provisions of the Contract. All prior partial estimates and payments will be subject to correction in the final estimate and payment. If within six (6) months from the date the final estimate is forwarded to the Contractor, the Contractor has not filed a valid, as determined by the Engineer, written reason(s) for not accepting the final estimate, the final estimate will be considered acceptable to the Contractor and payment of final estimate made.

C. Acceptance by the Contractor of the final payment shall operate as and will be a release to MassCEC and every member, agent and employee thereof, from all claims and liability to the Contractor for anything done or furnished for, or relating to, the Work, or for any act or neglect of MassCEC or of any person relating to or affecting the Work, except the claim against MassCEC for the remainder if any there be, of the amounts kept or retained to satisfy liens or claims pending against the Contractor.

**END OF ARTICLE 7**

## ARTICLE 8 – DISPUTE RESOLUTION

### 8.01 CHOICE OF LAW; REFERRAL OF DISPUTES TO SENIOR MANAGEMENT

A. This Agreement is to be construed in accordance with the laws of the Commonwealth of Massachusetts without regard to its conflict of laws rules. This Agreement is intended to incorporate by reference all applicable provisions of law which by law are required to be incorporated into the Agreement.

B. Claims, disputes, or other matters in controversy arising out of or related to the Agreement, except those waived as provided in the Agreement, shall be subject to the following procedures as conditions precedent to litigation.

C. The parties shall first attempt to resolve any dispute arising out of or relating to a Claim under the Agreement through negotiations between senior executives or other principals of the parties, who have authority to settle the same, with such negotiations to take place within 15 days of either party providing the other with a request for direct discussions (which request shall be submitted within seven (7) days of the other party's rejection of the Claim) ("Senior Management Negotiations").

### 8.02 MEDIATION

A. The parties further agree that any claim, dispute or other matter arising out of or related to this Agreement, which is not resolved by Senior Management Negotiations, shall be subject to non-binding mediation, at the sole election of Owner as described in this Section 8.02.

B. If the dispute has not been settled by Senior Management Negotiations within fifteen (15) days of a request for direct discussions, at the sole election of the Owner, the parties shall endeavor to resolve their Claims by mediation using a third party mediator mutually approved by the parties. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The parties shall endeavor in good faith to settle the dispute in an amicable manner within 45 days of submission to mediation.

C. The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in Boston, Massachusetts, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

### 8.03 VENUE; WAIVER OF JURY TRIAL

A. All disputes arising out of or in connection with the Agreement that are not resolved by Senior Management Negotiations or, where the Owner has so elected, mediation, shall be brought in the Massachusetts Superior Court in Bristol County,

Massachusetts, or in federal court in Boston, Massachusetts. Owner and Contractor agree to expressly waive their rights to a trial by jury regarding any disputes arising out of the Agreement as the disputes would, in most instances, be too complex for presentation to a jury and would be best served by a jury-waived proceeding.

## 8.04 WORK UNDER PROTEST

A. Pending final resolution of any dispute between the parties, including disputes over the scope of Work or payment for proposed but unapproved Change Orders or Extra Work, the Contractor shall proceed diligently with the performance and completion of the Work (including Extra Work directed by the Owner but disputed by Contractor), and record all work and costs on a time and materials basis or other method approved by the Owner, and the Owner shall continue to make payment of undisputed amounts for approved Work in accordance with the provisions of the Agreement. Contractor's failure to comply with this "work under protest" requirement shall constitute a material breach of the Agreement.

**END OF ARTICLE 8**

## ARTICLE 9 – ENTIRE AGREEMENT; PRIORITY OF CONTRACT DOCUMENTS

### 9.01 AGREEMENT

The Agreement, including all Attachments and Exhibits, represent the entire and integrated Agreement between the Owner and the Contractor with respect to the subject matter hereof and supersedes all prior negotiations, representations, proposals or agreements, either written or oral. The Agreement may be amended only by written instrument signed by both the Owner and Contractor. The Contract Documents shall not be construed to create a contractual relationship of any kind between any persons or entities other than the Owner and the Contractor.

### 9.02 PRIORITY OF CONTRACT DOCUMENTS

The following list comprises the Contract Documents. In the event of conflicts or discrepancies among the provisions of the Agreement and any other Contract Documents, the documents shall be interpreted on the basis of the following priorities:

(1) Executed Change Orders/Modifications - later date to take precedence

(2) Supplemental Conditions, if any

(3) General Conditions, as amended, including any Contract Addenda added by the Supplemental Conditions or otherwise

(4) Plans and Specifications

(6) Contractor’s Proposal

(7) Request for Proposals/Invitation to Bid

END OF SECTION

SECTION 00800

SUPPLEMENTARY CONDITIONS

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SECTION 00800

SUPPLEMENTARY CONDITIONS

## GENERAL

A. Further supplementing the General Conditions, the following Supplementary Conditions will apply.

B. References to Article Numbers in the following Supplementary Conditions unless otherwise stated are to the General Conditions. In case of conflict between these Supplementary Conditions and the General Conditions, these Supplementary Conditions will take precedence and shall govern. Otherwise, these Supplementary Conditions are in addition to, and shall not supersede, the relevant provisions of the General Conditions.

C. The Supplementary Conditions are included herein to augment the General Conditions, with additional requirements/information that is applicable to the Work.

D. The enforcement of the requirements of any of the following Supplementary Conditions shall not be construed as waiving any of the rights of Massachusetts Clean Energy Technology Center ("MassCEC") contained elsewhere in the Contract Documents.

## ARTICLE 1 - DEFINITION OF TERMS

### 1.01 DEFINITION OF TERMS

A. Add the following terms to the list of definitions:

26.a. Owner's Representative: The MassCEC designee, acting on their behalf, as the Owner's Representative for New Bedford Marine Commerce Terminal Phase 3 Bulkhead Replacement (Site 4) is: **Jeannie Houde – Terminal Manager, Massachusetts Clean Energy Technology Center, 4 Wright Street, New Bedford, MA 02740**

26.b. Program & Project Manager: The Program & Project Manager for the construction of the New Bedford Marine Commerce Terminal Phase 3 Bulkhead Replacement (Site 4) is: **Doug Ernst – Project Director, Foth Infrastructure & Environment, LLC, 15 Creek Road, Marion, MA 02738**

26.c. Design Engineer & Engineer of Record: The Design Engineer & Engineer of Record for the New Bedford Marine Commerce Terminal Phase 3 Bulkhead Replacement (Site 4) is set forth within the plan set for each of the components of work to be constructed.

2. USEPA: United States Environmental Protection Agency

3. Remedial Project Manager (RPM) for the USEPA: A representative from USEPA most responsible for administration of the Work for the USEPA. Contractor shall note that the RPM is not the Owner, nor the Owner's Representative. The RPM provides regulatory oversight for the project under Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The terms "RPM", "EPA RPM", or "EPA RPM, or their designee" are interchangeable with the term "Remedial Project Manager for the USEPA".

4. State Enhanced Remedy Project Manager (SER PM): Representative from Massachusetts Department of Environmental Protection (MassDEP), who as the lead regulatory authority for the SER enhancement, will provide oversight and review of the project documents, inspections and audit functions, interpretation and coordination with other resource agencies and serve as technical liaison relative to State or Federal agencies. MassDEP will have overall approval authority for the projects conducted by MassCEC under the SER and will also have stop-work authority for actions that it interprets are in conflict with any and all provisions set for in the contract documents, the Performance Standards, or the Federal and State laws and/or regulations. MassDEP will name a SER PM, who will coordinate communications, approvals and oversight with MassDEP, other appropriate State and Federal agencies as required by the Memorandum of Understanding between MassDEP and USEPA. The Contractor shall note that the SER PM is not the Owner nor the Owner's Representative. The terms "SER PM", "DEP PM", or their designee" are interchangeable with the term "State Enhanced Remedy Project Manager for the DEP".

5. "Performance Standards" include water quality, waterways and noise standards for the project as part of the State Enhanced Remedy (SER).

## ARTICLE 2 - SCOPE OF WORK

## 2.02 - CHANGES IN THE WORK

Add the following new paragraph:

G. The Change Order Form, provided in the Contract Documents (**Attachment 1 of the Request for Proposal)**, will be used by MassCEC for Change Orders.

## ARTICLE 3 - CONTROL OF WORK

### 3.06 - ADJACENT CONTRACTS

Add the following new paragraphs:

F. Listing of Adjacent Construction Contracts and Contracts Requiring Coordination

1. The Contractor's attention is drawn to adjacent construction contracts that may be on going simultaneously with the Work. These ongoing Contracts are as follows:

| Contract Name and Number | Description |
|---|---|
| Phase 3 Terminal Heavy-Lift Expansion Project (Site 1), Contract #: MACEC-FY25-02 | Final project construction and punch-list items for heavy-lift site work at the New Bedford Marine Commerce Terminal and at a parcel of land with an address of 18 and 54 Wright Street. |
| New Bedford Port Authority's Leonard's Wharf Rehabilitation & Extension | Bulkhead Improvements with Dredging & Disposal in CAD Cell No. 4. Dredging and Disposal expected completion in May 2026. |
| New Bedford Port Authority's CAD Cell No. 2 Berm Construction | Construction of Containment Berm at CAD Cell No. 2. Access to CAD Cell No. 4 access channel will be restricted during the construction of the CAD 2 Berm. Construction completion expected prior to June 30, 2026. |
| New Bedford Port Authority's Homer's Wharf Rehabilitation | Bulkhead Improvements with Dredging & Disposal in CAD Cell No. 4. Schedule to be determined. |

2. In addition to the above contracts, MassCEC may put out for bid while the Work is being performed, other contracts to be coordinated with this Contract, including but not limited to, the following:

| Contract Name and Number | Description |
|---|---|
| Phase 3 Vertical Building Demolition (Site 3), Contract #: MACEC-FY27-01 | Demolition includes hazardous material abatement, utility disconnects, building demolition and disposal and other miscellaneous construction. Project is programmed for Fall 2026 and located on 4 Wright Street parcel. |
| Phase 3 Terminal Heavy-Lift Expansion Project (Site 3), Contract #: MACEC-FY27-02 | Site work construction includes soil remediation and disposal; earthwork related site filling, grading and erosion control; installation of drainage utilities, site fencing, and erosion control and miscellaneous construction. Project is programmed to start construction in Spring 2027 and located on 4 Wright Street parcel. |

G. The Contractor shall attend weekly coordination meetings with the Contractors of the adjacent contracts and contracts requiring coordination. The weekly coordination meetings will be held in conjunction with the weekly construction meeting(s). The purpose of these meetings is to inform each Contractor of the upcoming work by other Contractors and to coordinate the overall maintenance and protection of pedestrian and vehicular traffic in the project area(s). The content of these meetings will include the following:

1. An overview of the progress of each contract and the anticipated major items of work to occur in the upcoming months.

2. Maintenance of pedestrian and vehicular traffic, including existing and proposed lane closing and detours, hauling routes, and other related issues.

3. Other items of concern to the Contractors, MassCEC, and other interested parties.

## ARTICLE 5 - LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

### 5.01 – LAWS TO BE OBSERVED

Add the following new paragraph:

M. The Contractor shall execute and comply with all provisions and requirements set forth in the **"American Rescue Plan Act (ARPA) Contract Addendum,"** which contains additional federal requirements applicable to the Project, including Equal Employment Opportunity (EEO) requirements. In addition, the Contractor shall execute and cause all applicable Subcontractors to execute the Anti-Lobbying Certification, included in the ARPA Addendum, for all purchases of materials

exceeding $100,000 in value. The ARPA Addendum is provided as an **Attachment to the Owner-Contractor Agreement (Section 00525).**

## 5.10 - PROTECTION AND RESTORATION OF PROPERTY

A Add the following new subparagraph to paragraph L:

1. The written notice to be served to utility owners or officials and to all others concerned with or having charge of public or private owned utilities shall include, but not be limited to, the following:

UTILITIES, DIGSAFE

1-800-344-7233
1-800-DIGSAFE

TELECOMMUNCIATIONS

Verizon
1116 Shawmut Avenue, 2nd Floor
New Bedford, MA 02746

EVERSOURCE (Electric and Gas)

180 Macarthur Dr.
New Bedford, MA 02740

WATER – SEWER - HIGHWAYS

City of New Bedford
Department of Public Infrastructure
1105 Shawmut Avenue
New Bedford, MA 02746

BUILDING DEPARTMENT

City of New Bedford
Department of Inspectional Services
133 William Street, Room 308
New Bedford, MA 02746

The Contractor is responsible to repair any utilities that are damaged as a result of its activities (negligent or otherwise) within four (4) hours of the damage occurring, or within a period as determined by, or otherwise negotiated with, MassCEC and/or the City of New Bedford. Should MassCEC and/or the City of New Bedford deem it necessary to repair the damaged utility – either because the Contractor cannot or will not respond

and/or otherwise repair the damage within the allotted or determined time frame, or because the City of New Bedford and/or MassCEC represents either a safety or environmental hazard and/or represents an emergency condition – the City of New Bedford and/or MassCEC may act to repair the damage utilizing either its own personnel and equipment or an independent Contractor of the City of New Bedford's or MassCEC's choosing. Should MassCEC and/or the City of New Bedford find it necessary to take such action to repair or otherwise respond to the damage incident (including overseeing or inspecting the Contractor's investigation and repair), the Contract shall reimburse the City of New Bedford and/or MassCEC for an amount not less than two times (2x) the City of New Bedford's and/or MassCEC's cost (including the cost of City labor, equipment, subcontractors, and any other direct costs associated with the incident).

B. Add the following new paragraphs:

R. The Contractor shall assure that no exits from adjacent buildings are obstructed, that appropriate safety barriers are established to prevent access, and that work areas are kept neat, clean and safe.

S. The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.

T. All surrounding work including, but not limited to, fixtures, sewers, drains, water pipes, telephone lines, signal lines, gas pipes, electrical conduit and utilities that are to remain in place shall be carefully protected and, if disturbed or damaged, shall be repaired or replaced as directed by the Engineer, at no additional cost to MassCEC.

U. Existing (exposed or concealed) sewers, drains, water and gas pipes, signal, telephone and electric conduits and wires, or similar utilities of every description which are disturbed or damaged due to the performance of the Work of the Contractor shall be repaired or replaced to original conditions, at no additional cost to MassCEC.

V. Any damage which occurs to structures, walls, ceilings, floors, furnishings or items as a result of the Contractor's work shall be repaired as directed by the Engineer, at no additional cost to MassCEC.

## 5.18 - PAYMENT OF TAXES

A. Add the following new paragraph:

C. The MassCEC's Sales Tax Exemption Number is 263-851-659.

## 5.27 – PERFORMANCE STANDARDS

A. Add the following new article:

### 5.27 PERFORMANCE STANDARDS

A. The Contractor shall comply with the Performance Standards for this project and other restrictions and requirements placed on the Work. Refer to Section 01 35 43, Environmental Procedures.

## ARTICLE 7 - MEASUREMENT AND PAYMENT

## 7.06 - PARTIAL PAYMENTS

A. Add the following new paragraphs.

H. An Application and Certification for Payment Form, provided by MassCEC, will be used for payment application and certification of work.

I. Field notes, bills of lading, photographs, and other supporting field documentation slides and videotapes shall be submitted with each payment application.

1. The Engineer will review the Contractor's survey records as-built drawings for completeness to date and the procedures being used to show changes.

2. If the field notes, bills of lading, photographs, and other supporting field documentation are not submitted with the payment application, the Engineer will not approve the payment application and MassCEC will not approve and process the payment application for payment.

3. The requirement for the submittal of the field notes, bills of lading, photographs, and other supporting field documentation may be waived by MassCEC, at its discretion, on a monthly basis.

## ATTACHMENT 2: TECHNICAL SPECIFICATIONS

# SECTION 01 00 00

# BIDDING SCHEDULE

## PART 1 - GENERAL

### 1.1 INSTRUCTIONS

The Bidder shall submit the following information as listed below:

A. Complete all information to be provided by bidders as described in Section 00200, Instructions to Bidders.

B. Submit all forms included in Section 00400, Bid Form.

C. Provide the additional information requested below.

D. Ensure your bid submission is complete by using Section 00439, Bidder's Checklist, to verify all items. Remember to include the checklist with your Bid.

### 1.2 ADDITIONAL INFORMATION

The following information is to be submitted with the bid (see also Section 00200, Instructions to Bidders):

A. Contractor Qualifications and Experience as per Article 28 of Section 00200, Instructions to Bidders:

1. Summary of your company’s experience including details of representative projects specifically, preparation and installation of similar specified products in a similarly situated facility including the total number and type along with overall construction cost, type and amount of all change orders and date of completion. Provide any other ancillary information relative to overall firm qualifications specific to the work contemplated within this project.
2. Qualifications of personnel assigned to this project, if awarded to your company.
3. All other qualifications and experience information required in Section 00200, Instructions to Bidders, with written references.

END OF SECTION

# SECTION 01 11 00

# SUMMARY OF WORK

## PART 1 - GENERAL

### 1.1 SUMMARY

A. The "Work" or "work" that is required by this Contract is set forth in the following documents:

1. Technical specifications titled:

   NEW BEDFORD MARINE COMMERCE TERMINAL PHASE 3 – BULKHEAD REPLACEMENT (SITE 4), CONTRACT NO. MACEC-FY26-02

2. Contract Drawings titled:

   NEW BEDFORD MARINE COMMERCE TERMINAL PHASE 3 – BULKHEAD REPLACEMENT (SITE 4), CONTRACT NO. MACEC-FY26-02

   A complete list of the Construction Drawing Set is provided in the Table of Contents.

3. Bid addenda shall take precedence over specifications and Contract Drawings. Contract Drawings shall take precedence over specifications, except where noted on the Contract Drawings.

4. The Contractor shall furnish all supervision, plant, labor, equipment, appliances and materials, and carry out all operations, including monitoring and other field engineering, as necessary to accomplish the Work, complete. The Contractor shall perform the Work in strict accordance with these specifications and the Contract Drawings, and subject to the terms and conditions of the Contract and all applicable permits, certifications, codes and regulations and in accordance with the schedules for completion set forth herein.

B. General Description of the Work

1. The general description below is given to indicate the approximate scope of this project only. It does not limit the work required under the project Drawings and specifications. For reference, the word "Site" shall mean the New Bedford Marine Commerce Terminal and the adjacent water (specifically work at 4 Wright Street for this project), in New Bedford, MA.

2. The scope of work generally includes dredging and disposal of the fill that was placed in 1970-1971within the cellular cofferdams, three major and three minor cells. This is a critical aspect of the required marine infrastructure reconstruction

due to the current condition of the cells, which are deteriorated with numerous holes, this tidally influenced area is losing fill material into the harbor, causing sinkholes, and significantly reducing the site's allowable load capacity. The dredging of the cells and berth, and replacement of the cellular cofferdam system with a bulkhead landward (to the west) of the existing cells and a pile-supported relieving platform will provide a structurally stable facility with increased load capacity and resilience against storm surges and sea level rise. The structures will be authorized through traditional permitting.

3. The scope of work includes civil structures and utilities, heavy-lift ground improvements and miscellaneous site works at 4 Wright Street located in New Bedford, MA.

4. Bidders should be aware that this property is part of an active Massachusetts Department of Environmental Protection (MassDEP) environmental disposal site (release tracking number 4-0050261). In the event of soil disturbance due to building construction or utility work, the Contractor shall consult with the property owner before soils are handled. Soils should be managed in accordance with the Release Abatement Measure Plan/EPA Self-Implementing Plan (RAM Plan/SIP) and the Soil Management Plan, which are provided as **Attachments to the Request for Proposal (RFP)**, respectively. Refer to Section 2.12 of the specification Section 00700, General Conditions, and applicable Reference Documents attached to the RFP.

5. Soils may be re-used on site but not removed from the site. If excess soils will be generated during construction, the Contractor shall consult with the property owner to determine an appropriate area for the stockpiled soils, while staging and covering the stockpile in accordance with the Soil Management Plan.

6. A more detailed breakdown of individual tasks can be found in 01 22 00, Measurement and Payment and within Section 00400 Bid Form.

## 1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00, Submittal Procedures:

A. Progress Schedule

In accordance with the requirement of Section 01 32 16, Construction Progress Schedule, the Contractor shall, within 10 days after receipt of Notice to Proceed or as otherwise determined by the Owner's Representative, submit for approval a progress schedule showing in detail how the Contractor plans to prosecute the work within the time set for Final Completion. The schedule shall include the work of all trades necessary for construction of the Project and be sufficiently complete and comprehensive to enable progress to be monitored on a day-by-day basis. The information for each activity shall include at a minimum the activity description, duration, start date and completion date. If changes are authorized that result in

contract time changes, the Contractor shall submit a modified chart for approval by the Owner's Representative.

B. Contractor Work Plan

In accordance with the Plans and Specifications, within 10 days after receipt of the Notice to Proceed, or as otherwise determined by the Owner's Representative, the Contractor shall submit for approval, a detailed Work Plan outlining and narrating the approach the Contractor will undertake relative to performance of the project, clearly demonstrating in words how the Work Plan fully aligns with the Contractor's submitted schedule and the overall performance days for project completion.

The Work Plan shall describe the extent of anticipated soil disturbance, confirm how such soils will be handled in compliance with the RAM Plan/SIP and Soil Management Plan, and identify location for anticipated stockpiling of potential excess soils. The Contractor shall note any deviations, comments, and/or additional materials sampled that differ from any of the plans or reports, or other Reference Documents provided herein; demonstrate how Contractor proposes to address such deviations; and indicate whether and to what extent there will be any impact to the Project Schedule.

1.3 PROJECT/SITE CONDITIONS

A. Physical Data

Data and information furnished or referred to below is for the Contractor's information. Neither the Owner nor the Engineer shall be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

1. Site and Building Conditions: The indications of physical conditions on the Drawings and in the specifications, including soils and subsurface conditions indicated in the Reference Documents, which are provided as **Attachments to the RFP** are the result of limited site investigations and surveys. The conditions represented prevailed at the time the investigations and surveys were made. Before commencing work at the Site, the Contractor shall verify the conditions indicated in the Reference Documents and other investigations and surveys, as well as on the Plans and specifications, and perform all other surveys as needed or as required in the Contract documents.

2. Weather Conditions: The monthly normal mean temperature and the monthly normal mean precipitation for the site may be obtained by the Contractor from the nearest U.S. National Weather Service Office.

3. Transportation: The Contractor shall make his own investigation on the use of municipal, State and Federal highways, roads, bridges, railroads and water transport. Absent Contractor's objection, all such infrastructure shall be deemed sufficient to accomplish the work as set forth herein.

4. Height Limitations: The Contractor shall coordinate his construction activities with the FAA and New Bedford Airport Operations Unit as necessary. Height limitations of crane booms, hoisting equipment or other equipment used by the Contractor to complete the work shall conform to the ceiling heights established by the FAA. The FAA may require the Contractor to stop work in the event declining weather conditions hinder visibility to the extent that the Contractor's equipment becomes a hazard to flying aircraft.

## 1.4 SEQUENCING AND SCHEDULING

### A. Hours of Operations

1. The Contractor may be allowed to perform operations Monday through Friday from 6:00 AM through 6:00 PM. The Contractor may request written permission from the Owner to expand these operations. Refer to other sections of these specifications for environmental requirements and for temporary suspension of the work, if required.

2. Dredging may commence on/after June 30, 2026. The Contractor shall coordinate dredging schedule with the New Bedford Port Authority prior to scheduling disposal events with the existing CAD Cell area. There are other projects that are currently in construction in the CAD Cell area which may require additional coordination for scow access into CAD Cell No. 4 to get access into CAD Cell No. 3. See Section 00800, Supplementary Conditions, for additional information for other ongoing projects in New Bedford Harbor. The proposed Contractor’s sequence of operations shall be presented, discussed, and agreed upon at the Pre-Construction Meeting.

### B. Weekly Progress Schedules

1. Weekly progress schedules shall be in the form of a chart graphically indicating the sequence proposed to accomplish each work feature or operation. Contractor shall indicate on the chart a 3-week look ahead of the important work features or operations that are critical to the timely overall completion of the project. Key dates for such important work features and portions of work features are milestone dates and shall be so indicated on the chart. This schedule will be the medium through which the timeliness of the Contractor's construction effort is appraised. Anticipated adverse weather delay days shall be included in the schedule. Preparation of the weekly progress schedules shall be completed in accordance with Section 01 32 16, Construction Progress Schedule. Progress meetings with the Owner’s Representative are anticipated to occur once weekly (at a minimum) in order to go over problems, issues, questions, etc.

### C. Organization at the Site

1. General: The Contractor shall employ ample personnel and sufficient equipment to accomplish the Work within the timeframes specified herein.

2. Work Limits: The work shall be restricted to the areas as shown on the Contract Drawings.

## 1.5 COORDINATION

The Owner may, from time to time, contract with an outside firm to conduct work on the site that is outside of the scope of this project. The Owner will give the Contractor at least 48 hours' notice prior to the arrival of any firm hired to conduct work at the site. The Contractor shall coordinate its activities as appropriate. Coordination of its activities with an outside firm shall not be a basis for a change in price or schedule for the Work.

## 1.6 SECURITY

A. Equipment Security

The Contractor will be responsible for security of building, plant and equipment while that equipment is onsite. This includes 24-hour security for all equipment. The security measures required include:

1. Lighting must meet OSHA requirements for safe working conditions and safe egress;

2. At all times, the Contractor is responsible to ensure that public access to the site and related equipment is precluded, except for authorized personnel.

B. Electronic Security

The Contractor shall implement and maintain such security measures and programs so as to protect its own electronic data and that of Owner's and Owner's Representative or Engineer during the course of the Project. Upon receipt of Owner's written request, the Contractor shall provide the Owner and the Engineer or Owner's Representative with a complete written description of its information technology systems including any and all security measures that it employs in the operation and maintenance of such systems. The Contractor, upon receipt of Owner's written request, shall provide reasonable access to its information technology systems to allow Owner's staff, consultants, agents or designees the opportunity to inspect and audit the Contractor's systems.

# PART 2 - PRODUCTS (NOT USED)

# PART 3 - EXECUTION (NOT USED)

END OF SECTION

# SECTION 01 13 50

# WATER QUALITY MONITORING AND CONTROL

## PART 1 - GENERAL

### 1.1 APPLICABLE REGULATORY STANDARDS

As part of the State Enhanced Remedy (SER), Performance Standards were established as part of the Work Plan which follows the guidelines of the Massachusetts Department of Environmental Protection (MassDEP) Water Quality Program Standards. The Performance Standards are included as an **Attachment to the Request for Proposal.**

### 1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00, Submittal Procedures:

A. Enclosed Bucket Performance Data

Submit demonstrated capability of the enclosed bucket to meet the specified water quality performance standards.

B. Contingency Plan

The Contractor shall submit for review and approval a Contingency Plan as specified in this section and which meets the requirements of the Performance Standards and Contract Documents. The Plan shall address mitigation measures to be taken if water quality performance standards are exceeded during either dredging or disposal operations. The Contingency Plan shall detail specific actions to be taken by the Contractor, and the order in which they shall be employed in the event of a water quality exceedance. Such actions shall be in addition to the controls required by the Contract Documents. Contingency measures may consist of additional operational controls, alternate procedures and equipment, modification of the timing of disposal events, or combinations thereof, as necessary to achieve water quality criteria. The submittal shall include a written description of each contingency measure as well as a proposed layout plan, if appropriate. The submittal shall include details of materials, equipment, and operational controls required for each contingency measure. The contingency plan will be submitted to the Owner's Representative for review and approval prior to initiation of dredging activity. The Contractor shall amend the contingency plan to take account of any recommended modifications.

### 1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Additional requirements relative to water quality monitoring and control including the submittal of a Dredge Plan are specified in Section 35 24 00, Dredging and Disposal.

B. Additional requirements relative to water quality monitoring and control are specified in Section 01 35 50, Environmental Procedures.

## 1.4 GENERAL

The Performance Standards established as part of the Work Plan, under the SER, are set forth in this and other sections of these specifications. The Work Plan is included as an **Attachment to the Request for Proposal**. The referenced documents shall not be relied on for Contract requirements. In the event a discrepancy is discovered in the Work Plan, the Specifications, or the Contract Drawings, the Contractor shall notify the Owner's Representative for clarification. The Owner's Representative will rely on requirements and conditions of the Performance Standards to resolve perceived conflicts.

## 1.5 SCOPE OF WORK

A. General Requirements

The Contractor shall perform all dredging and disposal activities required by this contract in such a manner as to minimize adverse impacts to water quality. The Contractor shall plan dredging and disposal activities and select and operate equipment in such a manner as to minimize the re-suspension of silt, clay, oil, grease, and other fine particulate matter. This may include changes in dredging and disposal operations such as delaying disposal activities until certain tide conditions occur.

B. Division of Responsibilities

1. General
The Contractor is solely responsible for maintenance of water quality criteria established in this specification while prosecuting the Work required by the Contract.

2. Water Quality Monitoring
The Owner’s Representative will be responsible for water quality sampling and testing required for monitoring the Contractor's dredge and disposal activities. The Contractor shall provide access to the work and fully cooperate in every way with these activities. The Owner’s Representative will independently tabulate, plot and interpret the monitoring data and laboratory test results. The data acquired by the Owner’s Representative will be made available to the Contractor in a timely manner for their independent assessment. At no cost to the Owner, the Contractor may observe the Owner's Representative's sampling activities, and may take supplementary samples and perform independent testing. The Contractor shall obtain additional data as the Contractor may consider necessary to monitor construction performance and safety aspects of the work, at no cost to the Owner.

3. Contract Administration Actions
Except as otherwise specified in this section, the Owner's Representative (in concert with the MassDEP's SER Project Manager), will be responsible for contract administration actions relative to water quality monitoring. The Owner's Representative will require the initiation of the mitigation measures by the Contractor found in the contingency plan if water quality criteria are exceeded. The Contractor is required to have all materials, equipment and labor necessary for implementation of mitigation measures detailed in the approved contingency plan, available at the job site in advance of commencement of dredging activities. Contractor failure to implement the contingency plan when directed by the Owner's Representative (and/or the MassDEP SER Project Manager) shall result in issuance of a stop work order, which will continue in effect until such time as mitigation measures are employed. Issuance of a stop work order shall not relieve the Contractor of their obligations to achieve Mandatory Schedule Milestones and associated liquidated damages related to the same.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 DREDGING REQUIREMENTS

A. Enclosed Bucket

The dredge bucket shall be designed to completely enclose the dredged sediment and water captured. The dredge bucket shall demonstrate the capability of meeting the water quality performance standards specified in this section. A conventional bucket may be used, after approval by the MassDEP SER Project Manager to dredged material if it can be demonstrated that water quality performance standards are not exceeded when using a conventional bucket. An enclosed bucket must be maintained at the site in the event of water quality exceedances.

B. Bucket Control

The Contractor shall demonstrate that the dredge operator has sufficient control over bucket depth in the water and bucket closure so that sediment re-suspension from bucket contact with the bottom and due to bucket over-filling can be minimized at the same time minimizing the amount of free water contained in the bucket.

C. Silt Curtains

Silt-curtains and absorbent booms shall be deployed to enclose all dredging and disposal areas in order to minimize adverse impacts to water quality. Plans and a written description indicating layout and details of equipment and procedures for

deployment of silt curtains and oil absorbent booms shall be submitted as part of the work plan as specified in Section 01 35 50, Environmental Procedures.

D. Debris Management Plan

The Contractor shall follow an approved Debris Management Plan as specified in Section 35 24 00, Dredging and Disposal. Where pilings or other debris is found to interfere with the enclosed bucket closure or equipment operation, a conventional bucket may be used to extract the pilings/debris. Abandoned piles shall be cut or broken off rather than extracted. Sediment removal during such activity shall be minimized to the greatest extent practicable.

E. Release of Oily Material

All and every reasonable attempt must be made by the Contractor to minimize the release of oily material from the sediment during dredging. All oily material released during dredging or other project activity shall be promptly collected and disposed of at a licensed facility.

F. Discharge of Sediment

All barges or scows used shall be in good operating condition and shall completely contain the sediment and water placed in them to prevent discharge of sediment or water. Deck barges shall not be used to contain dredged sediments unless the barge has been modified to provide for complete containment of the sediments and associated free water.

## 3.2 WATER COLUMN MONITORING - REFERENCE DATA

Reference water column data will be collected by the Owner's Representative prior to initiation of dredging activities. Samples will be collected from the reference locations and analyzed for the following parameters: dissolved metals (arsenic, cadmium, copper, chromium, lead, mercury, nickel, zinc) and polychlorinated biphenyls (PCB), as well as total suspended solids (TSS), turbidity, and dissolved oxygen (D.O). Results will be made available to the Contractor for their independent assessment. The Contractor may obtain supplementary samples and laboratory analyses at the Contractor's discretion, at no additional cost to the Owner.

## 3.3 WATER COLUMN MONITORING - DREDGING OPERATIONS

A. Turbidity monitoring will be performed by the Owner's Representative during the dredging operation as stated in the Performance Standards included as an attachment to Section 00 73 00, Supplementary Conditions.

## 3.4 WATER COLUMN MONITORING - DISPOSAL OPERATIONS

### A. Turbidity Monitoring

Turbidity monitoring will be performed by the Owner's Representative during the disposal operation at each of the following locations. The Contractor shall coordinate its activities and movements in the area with the water quality monitoring personnel.

1. Monitoring Location #1 will be obtained at a point outside the influence (e.g., up-gradient) of the disposal plume;
2. Monitoring Location #2 will be obtained at a point approximately 500 feet down current of the disposal site at the time that the peak concentration of the plume would pass through this monitoring point.

Turbidity will be measured at three depths within the water column at each location: near the surface, mid-depth, and near the bottom. The three measurements will be averaged together to obtain a single representative value for comparison. Turbidity monitoring data will be used as a trigger for collection of samples for analysis of additional parameters. Turbidity measured at the down-current location (Monitoring Location #3) which exceeds the up-current reference location (Monitoring Location #1) by more than 30% in two consecutive monitoring events shall be considered an exceedance and will trigger collection of water column samples for analysis, as described below.

### B. Exceedance Sample Locations and Depths

1. Disposal Monitoring Locations
   If turbidity is in exceedance of the permissible turbidity increase, sampling will be performed by the Owner's Representative for water column monitoring of the disposal operation. Two sample sites will be selected for each sampling round. Samples will be obtained from a reference location outside the influence of the dredging and disposal plume (Monitoring Location #1). Samples will also be obtained from the mixing zone approximately 500 feet down current of the disposal site (Monitoring Location #2). One water sample, composited over the entire water column, will be collected at each sampling location and submitted for analysis.

### C. Sample Frequency and Analytical Parameters

1. Disposal Operations Monitoring Locations
   The Contractor shall provide to the Owner’s Representative the details for each disposal event a minimum of 24 hours prior to disposal of material into the CAD Cells. The Contractor shall be prepared to coordinate disposal activities to meet the requirements of the monitoring. Water column turbidity monitoring of the disposal operation shall be conducted during the weekly water quality monitoring for dredging events, or as determined by the Owner’s Representative.

a. Additional monitoring of the disposal operations will occur if any changes to disposal procedures, equipment, and/or discharge quantity is planned, or periodically, as determined by the Owner's Representative.

Scheduling the monitoring activities will be determined by the Owner's Representative in consideration of the Contractor's proposed daily schedule of operations and progress of work. Frequency of subsequent monitoring will be established by the Owner's Representative based on review of monitoring and sampling data and compliance with water quality criteria.

If required based on a turbidity exceedance, the Contractor shall manage free liquid discharge, and adjust dredging operations prior to water column samples collection by the Owner's Representative. Confirmatory samples will be submitted for analysis at a certified laboratory and analyzed for TSS, dissolved oxygen, total petroleum hydrocarbon (TPH), pH, PCBs and dissolved and/or total metals.

## 3.5 EXCEEDANCES OF WATER QUALITY PROGRAM STANDARDS

### A. Water Quality Program Standards

In consideration of the elevated levels of contaminants of concern present in the sediment within the project site, the Work Plan under the SER has established site-specific water quality criteria as a dredging performance standard. Dredging performance relative to water quality will be evaluated by comparing laboratory analytical data for the individual parameters of concern from the down current samples with the reference, or up current sample data for each sampling round.

An exceedance of project water quality standards shall be attributed to project activities when the sample concentration obtained down-current from the project activity is at least 30% higher than the appropriate up-current reference sample concentration. Turbidity measured at the down-current location of the operation which exceeds the up-current reference by more than 30% shall be considered an exceedance.

### B. Project Turbidity Standards

For dredging and disposal events, an exceedance of the project turbidity standard shall be attributed to project activities when the average turbidity at the monitoring site exceeds the average reference site turbidity plus the permissible turbidity increase, as outlined in the following table:

| Reference Site Turbidity (NTUs) | Permissible Turbidity Increase |
|---|---|
| <10 | Reference plus 20 NTUs |
| 11-20 | Reference plus 15 NTUs |
| >21 | Reference plus 30% of reference |

C. Dredge Material Free Liquid Discharge Monitoring

In the event of turbidity exceedances, standing water or free liquid removed from scows before disposal shall be pumped through an approved (by the Owner's Representative) sand media filter (or equivalent) prior to discharge into the harbor. The discharge liquid from the filter will be tested for turbidity periodically by the Owner's Representative. It is the Contractor's responsibility to assure that the discharge liquid has a turbidity level that is compliant with the Performance Standards. The Owner's Representative will perform turbidity monitoring on discharge liquid during the first discharge event and subsequently as determined by the Owner's Representative. Contractor must provide a sampling port in the discharge stream to facilitate Owner's Representative sampling. Monitoring of the discharge liquids will also occur if any changes to the discharge procedures and/or equipment is planned. If the turbidity monitoring of the discharge liquid is in exceedance of the Performance Standards, the Contractor will stop discharge until the turbidity is within required limits.

D. Confirmatory Samples

If water samples collected as described above fail to meet water quality standards and this effect is the result of project activities as specified above, confirmatory samples shall be obtained by the Owner's Representative under similar conditions within 24 hours after the laboratory obtains the results of the first set of samples. The confirmatory samples shall be analyzed for the parameter(s) of concern and for TSS, dissolved oxygen, TPH, pH, PCBs and dissolved and/or total metals.

E. Implementation of Contingency Plan

If any of the confirmatory water samples collected in accordance with paragraph, "Confirmatory Samples" (above) fails to meet water quality performance standards as specified in paragraph, "Exceedances of Water Quality Standards Attributable to Project Activities" (above), the Contractor shall immediately implement the mitigation measures included in the Contingency Plan as appropriate and as pre-approved by the Owner's Representative. If the Contingency Plan is not immediately implemented, dredging and/or disposal activities shall cease in the affected work area until an alternative proposal is provided to and approved, which shall then be immediately implemented.

END OF SECTION

# SECTION 01 22 00

# MEASUREMENT AND PAYMENT

## PART 1 - GENERAL

### 1.0 SUBMITTALS

Submittals shall be in accordance with Section 01 33 00, Submittal Procedures.

### 1.1 LUMP SUM PAYMENT ITEMS

Payment items for the Work for which contract Lump Sum payments will be made are listed in Section 00400, Bid Form, and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed item most closely associated with the work involved. The Lump Sum price and payment made for each item listed shall constitute full and final compensation for furnishing all supervision, plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

### 1.2 CONSTRUCTION STANDARDS AND SPECIFICATIONS

The following building code standard specifications shall apply to construction on this project: 780 CMR, Tenth addition of the MA State Building Code (2021 International Building Code with MA amendments), All noted state and federal codes listed in the front-end sheets of each construction discipline, and the City of New Bedford Building Department requirements ("Standard Specifications"). Provided that, in the event of any conflict or inconsistency between the Standard Specifications and the Contract Documents for this Project (including but not limited to the General Conditions, Supplemental Conditions, Plans and Specifications), the terms and conditions of these Contract Documents shall control and take precedence.

### 1.3 GENERAL WORK ITEMS

If there is a specific Work Item for any of the following items, then the work item shall be included with that specific Item. The Bidder is to include any and all pricing to perform the work in the Bid Items. Additional compensation will not be afforded to the Bidder. Each of the Bid Items shall reasonably estimate the Bidders costs, plus overhead and profit to perform the Bid Items of work. Bidders, at the request of the project Owner, will provide documentation and substantiation on any and all costs presented. Unbalanced bids are subject to rejection by the Owner. If there is not a unit line item, the work shall be considered as incidental to the Contract, such as but not limited to:

A. Maintenance, protection, replacement and/or repair of facilities not designated for alteration on the Site.

B. Maintenance, protection, replacement and/or repair of facilities and utilities not designated for alteration on the Site.

C. Removal and disposal of surplus equipment and materials, including but not limited to utilities and structures to a legally approved disposal facility.

D. Utility exploration and locating, as required for project construction, perform exploratory locating, potholing and trenching including backfilling to locate unknown and discovered utilities. Surface Restoration - turf establishment surface restoration and trees and bushes damaged during construction.

E. Maintenance, protection, replacement and/or repair of facilities not designated for alteration on the Site.

F. Site access requirements including temporary material, equipment or diversions as required for local traffic access.

G. If crossing or undermining of existing public or private utility, then include maintaining the utility in service, replacing of existing utilities, if damaged and providing support and bedding material, as required.

H. Protection of construction site from erosion.

I. Ground freeze protection measures.

J. Compaction or stabilization of the site for Contractor’s equipment use.

K. Management of odors and noise, as necessary.

L. Dust control and suppression of dust onsite (construction site and adjacent streets).

M. Erosion control including permitting, monitoring and agency coordination.

N. Traffic control.

O. Easement and right-of-way requirements.

P. Regulatory requirements.

Q. Construction surveys, staking, and other field survey work (not provided by Owner, Owner’s Representative and Owner’s Engineer), including as-built record drawing surveys.

R. Quality assurance and quality control testing and inspections (by independent third-party contractor).

S. Shop Drawings and other submittals.

T. Temporary facilities and utilities.

U. Excavation sheeting, shoring, falsework and formwork.

V. Special protection and shoring for any existing structures, including protection of disturbance of adjacent properties.

W. Final cleanup and restoration of project site to preconstruction conditions.

X. Project close-out requirements including but not limited to warranties, operational manual's, close-out inspections and building occupancy permits.

# SECTION 01 - GENERAL

## 1.0 ITEM 1 – MOBILIZATION / DEMOBILIZATION

A. WORK COVERED

1. This item includes all costs associated with Contractor's mobilization and demobilization for the Work.
2. This item shall include all costs in connection to all preparatory actions associated with work designated on plans including but not limited to: obtaining any necessary permits and approvals not already in place for the work specified in accordance with the Contract, full reimbursement for the premiums actually paid for Performance and Payment Bonds, all costs connected with the mobilization and coordination of the Contractor's equipment (excavation equipment, cranes, barges, floating platforms, etc.) submittals, materials and equipment furnished for this project moving the Contractor's equipment to the site, accomplishing the work required by the Permits with respect to protection of the environment, and the coordination with the regulatory agencies.
3. Mobilization shall include the completion of pre-construction submittals, obtaining any necessary permits and approvals not already in place for the work specified, all costs connected with the mobilization of the Contractor's plant(s) and equipment, barges, scows, coordination, submittals and preparation for access to the offloading area(s) as required; support equipment or vessels (including all equipment needed for debris handling, separation and disposal), procurement of materials needed for construction, temporary facilities, installation of security measures, and registration/training of project personnel, compliance with on-site security measures, and construction of environmental controls required by the Permits with respect to protection of the environment; and the coordination with the regulatory agencies, and any other work that is necessary.
4. Demobilization shall include complete restoration of all areas disturbed by the Contractor's operations to their pre-construction conditions, submittal of a complete set of record As-built Drawings and removal of all equipment and temporary construction facilities from the site.
5. There will be only one (1) construction mobilization, and one (1) construction demobilization paid. If for any other reason, the Contractor must shut down and remove their equipment from the site, then remobilize; then the Owner will not be

responsible for payment of any additional costs associated with such work or any remobilization costs. Demobilization shall include general preparation for transfer of equipment to its home base, restoration as required from the Contractor's operations, and preparation of record drawings/as-builts.

6. This item includes all onsite work not covered within another Base Bid Item. Costs include, but are not limited to:
   a. Oversight and security.
   b. Safety and site training as required by Owner for Contractor terminal access, maintaining access for Owner operations
   c. Coordination of construction with Owner's Terminal Manager, tenants and licensed users of the New Bedford Marine Commerce Terminal, as well as abutters and New Bedford Port Authority.
   d. Management of odors and noise, as necessary.
   e. Construction Survey - perform all construction survey control network establishment, field staking, all form/grade/quantity verifications, and providing all measurements and field markers for record survey of constructed facility showing horizontal and vertical location of buried utilities, structures, and other features. Includes all as-built grades and elevations of structures, finish surface grading, and providing a complete as-built record drawing for the project.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Mobilization and demobilization will be measured as the LUMP SUM to include compensation for project preparations, procurement and assembly of all plant equipment, erosion controls, materials, supplies, permits, labor and bonds required for the prosecution of the work not otherwise included in other pay items and upon completion of the work as specified and directed, the clean-up of the work areas, removal of equipment, materials and supplies from the work area.
3. Payment will be made for costs associated with mobilization and demobilization for operations including all incidental work described in the specifications and Contract Documents.
4. Payment of 60% of the lump sum price for mobilization/demobilization unit will be paid to the Contractor upon completion of their mobilization of all major equipment for combi-wall construction. 30% will be paid upon completion of demobilization and the remaining 10% will be paid upon submission of accepted As-built Drawings for the project. Payment for this item will be limited to 5% of the Total Contract Price or the Sub-Total of the Base Bid Items, whichever is lower. In the event that the Owner considers the lump sum price for the bid item does not bear a reasonable relationship to the cost of the work in this contract, the Owner may require the Contractor to produce cost data to justify the price bid to the satisfaction of the Owner. If the Contractor fails to substantiate the price bid, then payment will be made for actual mobilization and demobilization costs as determined by the Owner. Payment for this item will be considered full compensation for all labor, materials, off-site disposal, and other fees, equipment, supervision, and supplies required for the work. Payment for this item shall be

made on the percentage of lump sum of work completed, as determined by the Engineer.

5. Payment for this item will be limited to 10% of the Total Contract Price or the Sub-Total of the Base Bid Items, whichever is lower. Mobilization and demobilization will be measured as the lump sum to include compensation for project preparations, procurement and assembly of all equipment, materials, supplies and labor and bonds required for the prosecution of the work not otherwise included in other pay items and upon completion of the work as specified and directed, the clean-up of the work areas, removal of equipment, materials and supplies from the work area. Payment will be made for costs associated with mobilization and demobilization for operations including all incidental work described in the specifications and contract documents. Mobilization shall include the completion of pre-construction submittals, placement and transportation of all equipment to the site, support equipment purchase of materials needed for construction, temporary facilities, and construction of environmental controls.
6. If in the sole opinion of the Project Engineer, the Contractor's price for Mobilization appears unbalanced, the Project Engineer may request that the Contractor provide a detailed breakdown of all mobilization costs. If the Contractor cannot justify their mobilization costs based on standard cost accounting procedures, the Owner will only be obligated to make a mobilization payment equal to the accepted detailed costs, plus an amount of 20% for the Contractor's overhead and profit.
7. If, for any other reason, the Contractor must shut down and remove his equipment from the site, then remobilize, Owner will not be responsible for payment of additional costs associated with such work. Demobilization shall include general preparation for transfer of equipment to its home base, removal of equipment, and environmental restoration as required from construction, earthwork, and utility construction.

## 1.1 ITEM 2 – TRAFFIC CONTROL

A. WORK COVERED

1. The Contract price includes all costs associated with providing all required traffic control measure for the project construction and will be measured as Lump Sump. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.
2. Construction access and traffic control shall be in accordance with local jurisdiction, Massachusetts Department of Transportation (MassDOT) and current Manual on Uniform Traffic Control Devices (MUTCD).
3. The contract price shall include all coordination activities, temporary signing and barricades necessary to control traffic during construction, including maintaining facility operations access, construction material and equipment deliveries, construction personnel and all traffic safety entering/existing public streets. This includes periodic adjustments, minor/major modifications and temporary flagging

necessary to safely maintain construction access and traffic control throughout the duration of the project.

4. Includes written traffic control plan and procedure, forms, and contact lists for notification of stakeholders, public notifications/communications per City of New Bedford requirements.
5. Provide all coordination activities, temporary signing and barricades necessary to control traffic during construction, including maintaining facility operations access, construction material and equipment deliveries, construction personnel and all traffic safely entering/exiting Wright Street. This item also includes periodic adjustments, minor/major modifications and temporary flagging necessary to safely maintain construction access and traffic control throughout the duration of the project.
6. All traffic control shall be in accordance with City of New Bedford requirements, including Massachusetts Department of Transportation (MassDOT) standards and the current Manual on Uniform Traffic Control Devices (MUTCD).

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. This item will be measured as the LUMP SUM to include compensation for the work covered by contract price.
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

# SECTION 02 - SITE PREPARATION

## 1.2 ITEM 3 - SITE PREPARATION AND DEMOLITION

A. WORK COVERED

1. This item includes all work and costs associated with Contractor's Site Preparation and Demolition. Costs shall include, but are not limited to, work shown on the Contract Drawings and described in the specifications herein.
2. Site Preparation shall include but is not limited to, maintaining access for Owner terminal operations, the general preparation and maintenance of the site for construction, coordination of temporary electrical service during construction, maintenance of temporary security fence, final site cleanup/restoration, and all other miscellaneous work obviously required to complete the project but not covered by individual items in the contract.
3. Site Preparation shall also include all site investigation work to identify site conditions including but not limited to exploration trenches, progress hydrographic surveys, subsurface utility investigations and locating, and all other existing utility investigations.
4. Demolition shall include ALL required structural demolitions, site/utility demolitions, chain link fence demolition, excavations, and disposal required for

construction of the project, including all site investigation work to identify site conditions including, but not limited to, the location of existing utilities.

5. Includes suppression of dust onsite as necessary, management of odors and noise, final site cleanup/restoration, and all other miscellaneous work obviously required to complete the project but not covered by individual items in the Contract.
6. Site Preparation and Demolition shall include all miscellaneous clean up required to restore the Project Site to pre-construction conditions.
7. This Bid Item includes all adjacent work areas (terminal and adjacent property) surface restoration to restore areas to original condition; including all necessary labor, equipment and materials such as seed, loam and mulch, granular surfacing, curb & gutter, asphalt/concrete pavement replacement.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. This item will be measured as the LUMP SUM to include compensation for the work covered by contract price.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for installation of this bid item in accordance with the Contract Documents.

## 1.3 ITEM 4 - EROSION CONTROL

A. WORK COVERED

1. This item includes all costs associated with Contractor's erosion control activities as required for management of surface runoff and groundwater,.
2. Provide all erosion control in accordance with federal, state and local regulatory requirements per the secured construction permits for the project, including all coordination, inspections, documentation and required construction period activities to maintain onsite construction compliance. Includes preparation of the contractors site-specific Stormwater Pollution Prevention Plans (SWPPP) documenting the Contractor's strategies to prevent pollutants from entering stormwater runoff from construction, as well as National Pollutant Discharge Elimination System (NPDES) Permit preparation/submittal.
3. The work shall include all land and water side construction activities, installation and maintenance of tracking pads and other construction activity loading areas, maintain truck routes for cleanliness and dust, installation and maintenance of typical erosion and sediment control features to satisfy management practices, installation and maintenance of inlet protection, removal and legal disposal of all erosion control measures post-construction.
4. The work shall include, but is not limited to, the furnishing, installation and maintenance of erosion and sedimentation controls, installation and maintenance of environmental controls required by the Permits; staging area/stockpile management, suppression of dust onsite as necessary, management of odors and noise, final site cleanup/restoration, and all other miscellaneous work obviously

required to complete the project, but not covered by individual items in the contract.

5. Includes inlet protection (silt socks), silt fence, trackout control pads (stabilized construction entrance and all other necessary erosion control measures, including maintenance/replacement through the duration of construction.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. This item will be measured as the LUMP SUM to include compensation for the work covered by contract price.
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

## 1.4 ITEM 5 - TURBIDITY CURTAIN

A. WORK COVERED

1. This item includes all costs associated with Contractor's activities for a turbidity curtain to maintain erosion control to satisfy best management practices and specific permit requirements.
2. The Contractor is responsible for in-water construction activities use turbidity (silt) curtains that meet the technical specifications and ensure effective sediment containment. Install, routinely inspect, and maintain the turbidity curtain for the entire duration of the construction period. The turbidity curtain shall encompass any open overwater work and shall remain operational during all work hours, or when any potential for sediment discharge occurs into the waterway (such as from dewatering operations).
3. Work shall include, but is not limited to, installation of turbidity curtains consisting of geotextile skirts, bottom anchors, top flotation, routine inspection and maintenance, especially after storms and accumulated sediment.
4. Contractor is responsible for removal and legal disposal of all Erosion Control measures.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. This item will be measured as the LUMP SUM to include compensation for the work covered by contract price.
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

## 1.5 ITEM 6 – DEWATERING (DURATION OF PROJECT)

A. WORK COVERED

1. This item includes all costs associated with Contractor's dewatering for all work activities for the duration of the project.
2. The Contractor is responsible for designing, installing, operating, and maintaining systems to remove water from a construction site, ensuring a dry and stable work area. The Contractors duties include site assessment, system installation, regulatory compliance, water treatment, system removal, and ongoing monitoring to prevent soil collapse and improve excavation conditions.
3. Work shall include, but is not limited to, pumps, back pumps for redundancy, generator, plugs to block the original flow (inlet/outlet), temporary piping to carry diverted flow and discharge point. Also includes engineering, NPDES permitting, dewatering pumping plan with BMPs and safety/environmental monitoring.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. This item will be measured as the LUMP SUM to include compensation for the work covered by contract price.
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

## 1.6 ITEM 7 – BYPASS PUMPING, STORM DRAIN (DURATION OF PROJECT)

A. WORK COVERED

1. This item includes all costs associated with Contractor's activities for bypass pumping of the existing storm drain system for the duration of the project.
2. The Contractor is responsible for designing, installing, operating, and maintaining systems to bypass pump the existing large diameter storm drain system to prevent backup and construction site issues. The Contractors duties include site assessment, system installation, regulatory compliance, water treatment, system removal, and ongoing monitoring to prevent soil collapse and improve excavation conditions.
3. Work shall include, but is not limited to, pumps, back pumps for redundancy, generator, plugs to block the original flow (inlet/outlet), temporary piping to carry diverted flow and discharge point. Also includes engineering, NPDES permitting, bypass pumping plan with BMPs and safety/environmental monitoring.
4. Bypass pumping requirements shall include a pump system with enough capacity for peak flow events (10-year storm event), a backup pump system equal to the primary capacity and automatic controls like float switches and variable frequency drives (VFDs).
5. The bypass system must also be self-priming, meet noise and dry-running requirements, and have a comprehensive plan submitted for approval that addresses flow capacity, backup systems, site logistics, and restoration.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. This item will be measured as the LUMP SUM to include compensation for the work covered by contract price.
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

## 1.7 ITEM 8 – BUILDING INSPECTIONS (PRE/POST-CONSTRUCTION PER SPEC)

A. WORK COVERED

1. This item includes pre- and post-construction building inspections in accordance with the Contract Documents.
2. Work shall include, but is not limited to, full compensation providing and the furnishing of all labor, supervision, materials, tools, and equipment for a pre-construction visual inspection and photographic documentation of existing building conditions, written condition reports with annotated photos and location references, coordination with property owners and stakeholders, post-construction re-inspection and comparison with baseline data, final report summarizing findings and any observed changes, and all other incidental work necessary to complete the work as specified.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Measurement shall not be made for this Item.
3. Payment shall be for all labor, materials, equipment, reporting, and incidentals necessary to complete the work as specified.
4. The first payment shall constitute 50% of the pre-construction building inspection fee for the baseline report. The second and final payment shall constitute 50% of the post-construction survey fee for the report compiling all data gathered during construction.

## 1.8 ITEM 9 - VIBRATION MONITORING

A. WORK COVERED

1. This item includes vibration monitoring of adjacent structures for the full duration of vibration producing activities in accordance with the Contract Documents.
2. Work shall include, but is not limited to all labor, supervision, and equipment for installation of vibration monitoring equipment, calibration and verification of sensors, continuous monitoring during construction, real-time alert system for threshold exceedance, inspections, daily logs and summary reports, coordination with project team and stakeholders, removal of equipment and restoration of

monitoring locations and all other incidental work necessary to complete the work as specified.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Measurement shall not be made for this Item.
3. Payment shall be for all labor, materials, equipment, data acquisition, reporting, and incidentals necessary to complete the work as specified.

### 1.9 ITEM 10 - CONSTRUCTION STAGING & SITE ACCESS (GRADING, SURFACING AND CONSTRUCTION PHASE MAINTENANCE)

A. WORK COVERED

1. This item includes all costs associated with Contractor's activities for Construction Staging and Site Access, including new access crossing from construction staging area to terminal heavy-lift access.
2. Work shall include, but is not limited to, supplemental DGA surfacing material, periodic surface regarding and maintenance (monthly minimum) throughout the duration of construction and final project closeout grading to return all staging, access drives, and work areas to pre-construction condition.
3. Contractor shall provide maintenance surfacing material (included in this bid item and not paid separately), including labor and equipment for placement and compacting staging areas, access drives and work areas.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. This item will be measured as the LUMP SUM to include compensation for the work covered by contract price.
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

# SECTION 03 - SITE CIVIL & UTILITIES

### 1.12 ITEM 11 – DENSE GRADED AGGREGATE (FURNISH AND INSTALL)

A. WORK COVERED

1. The Contract price includes all costs associated with preparation of subgrade, placement and compaction to the thickness shown on the drawings, maintenance until project closeout.

2. Conform to requirements of MassDOT Standard Specification gradation requirements for processed gravel for subbase aggregate as specified in Table M1.03.1-1.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: TON (TON)
2. Measurement will be per TON of dense graded aggregate to include compensation for the work covered by contract price. Measurement for payment will be the actual amount of material required and incorporated in the work verified by submitting to the Engineer delivery tickets provided with each load showing the weight measured on a certified scale, type of material, the date delivered and the project name.
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

## 1.13 ITEM 12 – PREPARATION OF SUBGRADE

A. WORK COVERED

1. The Contract price includes all costs associated with preparation of the subgrade under the proposed aggregate heavy-lift section area and will be measured as Square Yards. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.
2. Work shall include, but is not limited to, a uniform composition of at least 12 inches below the top of subgrade under the new aggregate section, plus 2 feet on each side to compaction requirements as specified. Includes, but is not limited to, excavating, manipulating, replacing, compacting, and trimming to the proper grade.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: SQUARE YARD (SY)
2. Measurement will be per SQUARE YARD of the preparation of subgrade to include compensation for the work covered by contract price.
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

## 1.14 ITEM 13 – GEOGRID – TENSAR INTERAX NXF GEOGRID (FURNISH AND PLACE)

A. WORK COVERED

1. The Contract price includes all costs associated with placement and installation of geogrid for subgrade reinforcement and will be measured as Square Yards. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: SQUARE YARD (SY)
2. Measurement will be per SQUARE YARD of geogrid to include compensation for the work covered by contract price. The actual square yards installed per manufacturer's product specifications (not including overlap).
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

## 1.15 ITEM 14 – GEOTEXTILE – TENSAR INTERAX NXF FILTERGRID (FURNISH AND PLACE)

A. WORK COVERED

1. The Contract price includes all costs associated with placement and installation of geotextile for subgrade reinforcement and will be measured as Square Yards. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: SQUARE YARD (SY)
2. Measurement will be per SQUARE YARD of geotextile to include compensation for the work covered by contract price. The actual square yards installed per manufacturer's product specifications (not including overlap).
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

## 1.16 ITEM 15 – GEOTEXTILE - MIRAFI 140 N (FURNISH AND PLACE)

A. WORK COVERED

1. The Contract price includes all costs associated with placement and installation of geotextile for subgrade reinforcement and will be measured as Square Yards. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: SQUARE YARD (SY)

2. Measurement will be per SQUARE YARD of geotextile to include compensation for the work covered by contract price. The actual square yards installed per manufacturer's product specifications (not including overlap).
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

## 1.17 ITEM 16 – WATERPROOFING MEMBRANE & MIRAFI SER G DRAINAGE COMPOSITE (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes all work and costs associated with, including but not limited to, furnishing all labor, supervision, materials, equipment, and any other incidentals for supply and installation of ethylene propylene diene monomer (EPDM) membrane in accordance with manufacturer specifications to the limits and extents indicated on the Contract Drawings.
2. EPDM membrane by Firestone, Carlisle, GenFlex, Roofing Products International, Inc or approved equal. The membrane shall be a minimum of 0.060 mil fully adhered to the concrete. Membrane shall meet or exceed all of the requirements of ASTM D 4637-04, Type I vulcanized rubber membrane. Membrane shall have a 20-year warrantee.
3. This item includes all work and costs associated with, including but not limited to, furnishing all labor, supervision, materials, equipment, and any other incidentals for supply and installation of MIRAFI® SER G Drainage Composite in accordance with manufacturer specifications to the limits and extents indicated on the Contract Drawings.
4. Work shall include, but is not limited to, all labor, labor, supervisions, procurement of all materials, storage, transportation, handling, surface preparation, installation of drainage composite including overlaps, anchoring, and protection, integration with adjacent drainage systems or structures as required, quality control and verification of installation, and disposal of packaging and excess materials.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: SQUARE YARD (SY)
2. Measurement will be per SQUARE YARD of waterproofing membrane and drainage composite to include compensation for the work covered by contract price. The actual square yards installed per manufacturer's product specifications (not including overlap).
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

## 1.18 ITEM 17 – STEEL SHEET PILE, AZ19-700 (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes the furnishing and complete installation of steel sheet pile bulkhead, including the steel sheeting and any other incidentals necessary for complete installation of the steel bulkhead in accordance with the Contract Documents.
2. Work shall include, but is not limited to, all supervision, labor, procurement of all materials, storage, transportation, handling, survey, tools, connections, custom fabricated closures, welding, cutting, templates, temporary bracing and shoring, cutting sheets to final elevation, sheet pile penetrations, patching of lifting holes, protective coatings and any coating touch-up, grout plugs, and all other incidental work necessary for complete installation of the east/west steel combination wall bulkhead.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LINEAR FOOT (LF)
2. Measurement will per LINEAR FOOT for steel sheet pile at North Closure upland installed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.19 ITEM 18 - SHEET PILE CAP, CAST IN PLACE CONCRETE (3'-0” x 2'-6") (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete sheet pile cap.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will be per CUBIC YARD of reinforced, cast-in-place concrete placed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

## 1.10 ITEM 19 – STORM DRAIN MANHOLE - PILE SUPPORTED CAST-IN-PLACE CONCRETE MANHOLE (FINISH AND INSTALL)

A. WORK COVERED

1. This item includes all work and costs associated with, including but not limited to, furnishing all labor, supervision, materials, equipment, and any other incidentals for complete installation of the pile supported cast-in-place concrete manhole cover.
2. Work shall include all supervision, labor, materials and equipment as required for the complete installation of the manhole cover support piles to the depth and capacity indicated on the Contract Drawings including, furnishing all HP pile materials, protective coatings, survey, pile driving templates, falsework design designed and stamped by a Professional Engineer, lifting, driving logs, inspections, testing, and any other incidentals as required for complete installation. Driving through any obstructions, if encountered, shall be considered incidental to the pile installation.
3. Work shall also include, but is not limited to all supervision, labor, materials, equipment, transportation, compaction, forming, finishing, and furnishing all 5000 psi structural concrete, steel reinforcement, headed reinforcement, dowels, couplers, lifting attachments, tie wire, spacers, curing, finishing, testing, and any other incidentals as required to satisfactory installation of the cast-in-place concrete manhole.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Measurement shall be made as a LUMP SUM for all work associated with complete installation of the pile supported cast-in-place concrete manhole cover.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, inspections, testing, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.11 ITEM 20 – STORM DRAIN PIPE REPLACEMENT (72-IN DIA. CLASS 4 RCP)

A. WORK COVERED

1. This item includes all work and costs associated with, including but not limited to, furnishing all labor, supervision, materials, equipment, and any other incidentals for the complete replacement of the storm drainpipe.
2. Work shall include, but is not limited to, excavation and removal of existing storm drain pipe (typical RCP westerly setion and outlet RCP encased in concrete box outlet to east of existing MH to be replaced/relocated), existing manhole structure removal and complete pipe replacement, including reinforced concrete collar for connections to existing pipe section (per drawing details on sheet S-002)

and at combi wall penetration (per drawing details on sheet SR302) as shown on the Drawings.

3. Furnish and install all materials as shown on Drawings and as described in the specifications. This item shall include all required ancillary materials, including but not limited to, excavation and trenching, sheeting and shoring, crushed stone bedding and backfill material (1-ft above top of pipe), backfill and trench compaction, gaskets, tied joint connectors, fittings and adaptors for connections, installation certification and testing and all other incidentals as required for complete installation.
4. Requires an external concrete pipe joint wrap seal for all pipe joints. Pipe joint wrap shall be an extruded butyl adhesive tape designed to provide high strength, watertight seals on properly primed concrete surfaces.
5. Bid item includes supplying replacement Reinforced Concrete Pipe (RCP), Class 4 load rating with rubber gasket O-ring joints

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Measurement shall be made as a LUMP SUM for all work associated with complete replacement of the storm drainpipe.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, inspections, testing, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.12 ITEM 21 – UNDERDRAIN MANHOLE - CIRCULAR LEACHING PIT (48-IN ID PRECAST W/ H-25 FRAME AND LID)

A. WORK COVERED

1. This item includes all work and costs associated with, including but not limited to, furnishing all labor, supervision, materials, equipment, and any other incidentals for the complete installation of an underdrain manhole.
2. Work shall include all supervision, labor, materials and equipment as required for the complete installation of the underdrain manhole as detailed in the drawings.
3. This item shall include all required ancillary materials, including but not limited to, excavation and trenching, sheeting and shoring, crushed stone bedding and backfill material, backfill and trench compaction, gaskets, fittings and adaptors for connections, installation certification and testing and all other incidentals as required for complete installation.
4. Includes 12-inch diameter HDPE pipe (ADS N-12 Dual Wall) connection to the new cast-in-place pile supported storm drain manhole.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)

2. Measurement shall be made as a LUMP SUM for all work associated with complete installation of the pile supported cast-in-place concrete manhole cover.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, inspections, testing, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.13 ITEM 22 - LATERAL UNDERDRAIN AGGREGATE - 1-1/2" WASHED CRUSHED STONE (FURNISH AND PLACE)

A. WORK COVERED

1. This item includes all work and costs associated with, including but not limited to, furnishing all labor, supervision, materials, equipment, and any other incidentals for lateral underdrain aggregate.
2. This item shall include all required ancillary materials, including but not limited to, excavation and trenching, crushed stone material and all other incidentals as required for complete installation.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: TON (TON)
2. This item will be measured per TON for all work associated with the lateral underdrain aggregate.
3. Measurement for payment will be the actual amount of material required and incorporated in the work verified by submitting to the Engineer delivery tickets provided with each load showing the weight measured on a certified scale, type of material, the date delivered, and the project name
4. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, inspections, testing, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.14 ITEM 23 - WATER SYSTEM MODIFICATIONS

A. WORK COVERED

1. This item includes all work and costs associated with, including but not limited to, furnishing all labor, supervision, materials, equipment, and any other incidentals for water system modifications.
2. Work shall include, but is not limited to, all required ancillary materials, including but not limited to, excavation and trenching, sheeting and shoring, crushed stone bedding and backfill material, backfill and trench compaction, caps, blowoff, gaskets, fittings and adaptors for ductile iron water main disconnections (abandonment section) and all other incidentals as required for modifications as noted in the Drawings.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Measurement shall be made as a LUMP SUM for all work associated with water system modifications.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, inspections, testing, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.15 ITEM 24 - CHAIN LINK FENCE, 8 FT SECURITY - TEMPORARY CONSTRUCTION (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes all work and costs associated with, including but not limited to, furnishing all labor, supervision, materials, equipment, and any other incidentals for the complete installation of a chain link fence.
2. Work shall include all supervision, labor, materials and equipment as required for the complete installation of a chain link fence.
3. Temporary construction fencing, item shall include installation of a new chain link (8-foot height) including new posts, rails, bracing and fittings/couplings, including industrial chain link fence panel barrier base for connecting two panels and include four (4) 50 lb. sandbags placed on each base.
4. Fence panels (10 gauge) shall be 12’ x 8’ with top/bottom rails with one vertical and one horizontal brace, including 3-strand barb wire (outward facing) affixed to the top.
5. Installation and maintenance shall meet New Bedford Marine Commerce Terminal security protocol.
6. Contractor shall furnish and install new industrial chain link temporary fence that shall be the property of the Owner following project closeout.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LINEAR FEET (LF)
2. Measurement will be on the installed LINEAR FEET measured at the installed length accepted by the Engineer.
3. Payment shall be for all costs including but not limited furnishing all labor, materials, equipment, and incidentals as required for complete installation.

## 1.16 ITEM 25 – CHAIN LINK FENCE, 8 FT SECURITY - BLACK VINYL COATED ON CONCRETE CAP (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the complete installation black vinyl coated chain link fence

located on top of the north closure bulkhead concrete cap to the limits indicated on the Contract Drawings.

2. For black vinyl chain link fencing permanent reinstallation, this item includes supply and installation of the site security fencing as defined in Section 32 31 13, Chain Link Fences and Gates, and otherwise indicated on the Contract Drawings.
3. The work shall include all materials, labor, and equipment including, but not limited to, field measuring for layout, fence post materials, industrial chain link fencing materials, bracing and fittings/couplings, fence panel barrier base plates, access gates, hardware, locks, connections to the concrete cap, accessories, and any other incidental work required for the complete installation of the galvanized chain link fence assembly in accordance with Contract Documents. All fence panels (9 gauge) shall be 12’ x 8’ with top/bottom rails with one vertical and one horizontal brace. All security fencing shall include three-strand barb wire (outward facing) to match existing terminal fencing.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LINEAR FEET (LF)
2. Measurement will be on the installed LINEAR FEET measured at the installed length accepted by the Engineer.
3. Payment shall be for all costs including but not limited furnishing all labor, materials, equipment, and incidentals as required for complete installation.

# SECTION 04 – SITE EXCAVATION & DREDGE DISPOSAL

## 1.17 ITEM 26 – SITE EXCAVATION & SOIL MANAGEMENT

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for all site excavation and soil management activities as indicated on the Contract Drawings.
2. This work shall include, but is not limited to, special handling, stockpiling, dewatering solidification, erosion control, testing/characterization, runoff containment, material loading, and disposal of waste excavated materials. The furnishing, installation and maintenance of the construction site staging area, access drives, work area, temporary stockpile management, suppression of dust onsite as necessary, management of odors and noise, final site cleanup/restoration, and all other miscellaneous work obviously required to complete the project but not covered by individual items in the Contract.
3. Excavation (if needed) for purposes of construction staging and sequencing in connection to the existing South Terminal in accordance with Contract Documents, includes temporary excavation, stockpiling (separate stockpiled material dense graded aggregate and subsoils) and reinstallation per specifications.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. This item will be measured as the LUMP SUM to include compensation for the work covered by contract price.
3. Payment shall be for all costs including but not limited furnishing all labor, materials, equipment, and incidentals as required for complete site excavation and soil management.

## 1.18 ITEM 27 – DISPOSAL OF UNSUITABLE SOIL (ENVIRONMENTAL PCBs <1 PPM)

A. WORK COVERED

1. The Contract price includes all costs associated with the removal and disposal of unsuitable soils and will be measured as Ton. Payment shall be made for all cost, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this Bid Item.
2. The Contractor shall dispose of material (as directed within the Contract Documents and otherwise directed by the Owner's Representative) at the least expensive disposal option that will accept the material (subject to review and approval by the Owner's Representative), based on pre-disposal characterization to be conducted by the Contractor as stipulated under Section 02 11 10, Excavation and Handling of Contaminated Material.
3. The Contract price per ton for this item shall include all cost of removal of all material that requires excavation and offsite disposal deemed geotechnically unsuitable by the Owner's Representative. Contaminated material shall be handled as specified in Section 02 11 10, Excavation and Handling of Contaminated Material. Contractor shall particularly note the holding time, and process for sampling and analysis required for "upper existing material" that is deemed geotechnically unsuitable for reuse and that must be disposed offsite. Transportation and disposal offsite shall be handled as stipulated in Section 02 11 10, Excavation and Handling of Contaminated Material, and related sections. This item includes all costs, direct and indirect, associated with the incidental to, excavation and removal of the material, segregation of debris unsuitable for offsite disposal, environmental protection, meeting the relevant permitting standards, segregation and appropriate stockpiling of the material, dewatering of the material, and treatment of dewatering fluids. Protective measures to protect existing structures and utilities shall be included.
4. Bid quantity includes 225 CY of contingency unsuitable soil disposal for unknown excavated soils as part of upland construction work as authorized by the Project Engineer.
5. Contractor shall note that all excavated soils for the relieving platform (east of the combi wall) and misc. associated work (rock socketed piles and rock anchors) for bulkhead/pile installation shall be disposed of in CAD cell no.3.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: TON (TON)
2. Measurement shall be made as a TON for the total amount of material removed and paid for under the contract for this item, will be measured by the ton as measured by the scale of the disposal facility.
3. Payment shall be for all costs including but not limited furnishing all labor, materials, equipment, and incidentals as required for complete disposal of unsuitable soil.

## 1.19 ITEM 28 – DREDGE (MOBILIZATION / DEMOBILIZATION)

A. WORK COVERED

1. This item includes all costs associated with Contractor's mobilization and demobilization for the EXCAVATION & DISPOSAL AT CAD CELL NO.3 (RELIEVING PLATFORM LEVEL - ABOVE EL 5.0), DREDGE & DISPOSAL AT CAD CELL NO.3 (BELOW EL 5.0 AND EXISTING CELLULAR COFFERDAMS), and MECHANICAL TREATMENT & DREDGING OF ROCK portions of the Work.
2. Mobilization shall include all costs for operations accomplished prior to commencement of actual construction operations and all work to identify site conditions including but not limited to: transfer of materials and equipment to site including, but not limited to barges, scows, support equipment or vessels, and all equipment needed for debris handling, separation and disposal; coordination and submittals as required; notifications; preparation needed for sediment, rock, and debris handling (including all equipment needed for debris handling, separation, hauling and disposal): coordination with the regulatory agencies; obtaining any necessary permits and approvals not already in place for the work specified; construction of environmental controls required by the Permits with respect to protection of the environment; procurement of materials needed for construction; installation and maintenance of work area fencing, security measures, traffic controls, and temporary facilities; maintaining access for Owner operations; establishing horizontal and vertical control for all proposed work; registration/ training of project personnel and compliance with on-site Health and Safety and security measures and any other work that is necessary in advance of the actual construction operations.
3. Demobilization shall include general p reparation for transfer of plant to its home base, removal of equipment, and site restoration of all areas disturbed by the Contractor's operations to their pre-construction conditions, preparation and submittal of a complete set of Record "As-Built" Drawings and any additional project close-out submittals as required, and removal of all equipment and temporary construction facilities from the site.
4. There will be only one (1) dredging mobilization, and one (1) dredging demobilization paid. If for any other reason, the Contractor must shut down and remove their equipment from the site, then remobilize; then the Owner will not be responsible for payment of any additional costs associated with such work or any remobilization costs. Demobilization shall include general preparation for transfer

of equipment to its home base, restoration as required from the Contractor's operations, and preparation of record drawings/as-builts.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Mobilization and demobilization will be measured as the LUMP SUM to include compensation for project preparations, procurement and assembly of all plant equipment, erosion controls, materials, supplies, permits, labor and bonds required for the prosecution of the work not otherwise included in other pay items and upon completion of the work as specified and directed, the clean-up of the work areas, removal of equipment, materials and supplies from the work area.
3. Payment will be made for costs associated with mobilization and demobilization for operations including all incidental work described in the specifications and Contract Documents.
4. If in the sole opinion of the Project Engineer, the Contractor's price for Mobilization appears unbalanced, the Project Engineer may request that the Contractor provide a detailed breakdown of all mobilization costs. If the Contractor cannot justify their mobilization costs based on standard cost accounting procedures, the Owner will only be obligated to make a mobilization payment equal to the accepted detailed costs, plus an amount of 20% for the Contractor's overhead and profit.

## 1.20 ITEM 29 – EXCAVATION & DISPOSAL AT CAD CELL NO.3 (RELIEVING PLATFORM LEVEL – ABOVE EL 5.0)

A. WORK COVERED BY CONTRACT PRICE

1. The Contract price per cubic yard for this item shall include all costs of removal and disposal of all Sediment Dredging Material from within the project site, as defined and specified in Section 35 24 00, Dredging and Disposal, and otherwise indicated on the Contract Drawings. Disposal includes all costs, direct and indirect, associated with and incidental to, excavation, dredging and removal of the material, segregation of materials as required for disposal at the disposal site, CAD Cell management including any required bed leveling, environmental protection, including but not limited to adherence to relevant permitting standards, timing of work as necessary, relocation of moorings and other temporary structures as applicable, maneuvering around any temporary or permanent structures, barge or scow transport of the material, removal of standing water/free liquids, and disposal of the material at disposal site. Protective measures to protect existing structures and utilities shall be included.
2. This item shall include all costs associated with dredging the project to the required depth, including any necessary over dredging to allow equipment floatation or additional dredging to compensate for; inaccuracies inherent in the dredging process (such as shoaling or "fluffing"), water level allowances, water control, disposal site operation and maintenance, CAD Cell management, manpower, fueling, maintenance, operation, progress surveys, field engineering,

environmental protection, and all other work incidental to the dredging and disposal operations.

3. Payments to the Contractor will be made for the actual quantities of the Contract items performed and accepted in accordance with the Contract Documents. Upon completion of the construction, if these actual quantities show either an increase or decrease from the quantities as provided in Section 00400, Bid Form, the Contract unit prices will still prevail, except as otherwise provided. The payment of any partial estimate or of any retained percentage except by and under the approved final invoice, in no way shall affect the obligation of the Contractor to repair or renew any defective parts of the construction or to be responsible for all damage due to such defects.
4. Work shall include all water control, towing, scow placement and anchoring, dredge positioning, calibration, environmental restoration, and all other items incidental to the dredging in accordance with the Contract Documents and permits issued for this project. Disposal includes all water control, CAD Cell management including any required bed leveling, loading, rehandling, hauling, unloading, placement, environmental restoration, and all other items incidental to the disposal in accordance with the Contract Documents and permits issued for this project.
5. Full compensation for all documents and submissions; for complying with the requirements of the regulatory permits and the requirements of any other agencies with jurisdiction over these matters shall be included in the Contract unit price for dredging and no additional payment will be made.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: IN-PLACE CUBIC YARD (CY)
2. The total amount of material removed and paid for under the Contract for this Item, will be measured by the cubic yard in place by computing the volume between the bottom surface shown by soundings of the Owner's pre-dredge survey made immediately before dredging, and the material surface shown by the soundings of the Owner's post-dredge survey made as soon as practicable after the removal of the material (as described in Section 01 71 23, Field Engineering). Surveys will utilize the standards established by the U.S. Army Corps of Engineers' (USACE) Hydrographic Surveys Manual EM-1110-2-1003 (dated November 2013).
3. Payment is limited to the dredge limits shown on the Contract Drawings and authorized by permits, and within the vertical tolerances of the dredge limits allowable overdepth as described in Section 35 24 00, Dredging and Disposal, paragraph DESIGN DEPTH, OVERDEPTH, SIDE SLOPES AND EXCESSIVE DREDGING, less any deductions that may be required for excessive dredging and/or misplaced material described in paragraph MISPLACED MATERIAL.
4. The Contract Drawings are believed to accurately represent conditions existing on the date of the last survey shown on the Drawings, but the depths shown thereon will be verified and corrected by soundings taken by the Owner's Engineer immediately before dredging. Determination of quantities removed, and the deductions made to determine quantities after having been made by the Owner's

Engineer, will not be re-considered, except on evidence of collusion, fraud, or obvious error.

5. Partial payments will be based on approximate quantities determined by Contractor quality control surveys as described in Section 01 71 23, Field Engineering.

## 1.21 ITEM 30 – DREDGE & DISPOSAL AT CAD CELL NO.3 (BELOW EL 5.0 AND EXISTING CELLUAR COFFERDAMS)

A. WORK COVERED BY CONTRACT PRICE

1. The Contract price per cubic yard for this item shall include all costs of removal and disposal of all Sediment Dredging Material from within the project site, as defined and specified in Section 35 24 00, Dredging and Disposal, and otherwise indicated on the Contract Drawings. Disposal includes all costs, direct and indirect, associated with and incidental to, excavation, dredging and removal of the material, segregation of as required for disposal at the disposal site, CAD Cell management including any required bed leveling, environmental protection, including but not limited to adherence to relevant permitting standards, timing of work as necessary, relocation of moorings and other temporary structures as applicable, maneuvering around any temporary or permanent structures, barge or scow transport of the material, removal of standing water/free liquids, and disposal of the material at disposal site. Protective measures to protect existing structures and utilities shall be included.
2. This item shall include all costs associated with dredging the project to the required depth, including any necessary over dredging to allow equipment floatation or additional dredging to compensate for; inaccuracies inherent in the dredging process (such as shoaling or “fluffing”), water level allowances, water control, disposal site operation and maintenance, CAD Cell management, manpower, fueling, maintenance, operation, progress surveys, field engineering, environmental protection, and all other work incidental to the dredging and disposal operations.
3. Payments to the Contractor will be made for the actual quantities of the Contract items performed and accepted in accordance with the Contract Documents. Upon completion of the construction, if these actual quantities show either an increase or decrease from the quantities as provided in Section 00400, Bid Form, the Contract unit prices will still prevail, except as otherwise provided. The payment of any partial estimate or of any retained percentage except by and under the approved final invoice, in no way shall affect the obligation of the Contractor to repair or renew any defective parts of the construction or to be responsible for all damage due to such defects.
4. Work shall include all water control, towing, scow placement and anchoring, dredge positioning, calibration, environmental restoration, and all other items incidental to the dredging in accordance with the Contract Documents and permits issued for this project. Disposal includes all water control, CAD Cell management including any required bed leveling, loading, rehandling, hauling, unloading, placement, environmental restoration, and all other items incidental to

the disposal in accordance with the Contract Documents and permits issued for this project.

5. Full compensation for all documents and submissions; for complying with the requirements of the regulatory permits and the requirements of any other agencies with jurisdiction over these matters shall be included in the Contract unit price for dredging and no additional payment will be made.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: IN-PLACE CUBIC YARD (CY)
2. The total amount of material removed and paid for under the Contract for this Item, will be measured by the cubic yard in place by computing the volume between the bottom surface shown by soundings of the Owner's pre-dredge survey made immediately before dredging, and the material surface shown by the soundings of the Owner's post-dredge survey made as soon as practicable after the removal of the material (as described in Section 01 71 23, Field Engineering). Surveys will utilize the standards established by the U.S. Army Corps of Engineers' (USACE) Hydrographic Surveys Manual EM-1110-2-1003 (dated November 2013).
3. Payment is limited to the dredge limits shown on the Contract Drawings and authorized by permits, and within the vertical tolerances of the dredge limits allowable overdepth as described in Section 35 24 00, Dredging and Disposal, paragraph DESIGN DEPTH, OVERDEPTH, SIDE SLOPES AND EXCESSIVE DREDGING, less any deductions that may be required for excessive dredging and/or misplaced material described in paragraph MISPLACED MATERIAL.
4. The Contract Drawings are believed to accurately represent conditions existing on the date of the last survey shown on the Drawings, but the depths shown thereon will be verified and corrected by soundings taken by the Owner's Engineer immediately before dredging. Determination of quantities removed, and the deductions made to determine quantities after having been made by the Owner's Engineer, will not be re-considered, except on evidence of collusion, fraud, or obvious error.
5. Partial payments will be based on approximate quantities determined by Contractor quality control surveys as described in Section 01 71 23, Field Engineering.

## 1.1 ITEM 31 – MECHANICAL TREATMENT - DREDGING OF ROCK & DISPOSAL AT CAD CELL NO. 3

A. WORK COVERED BY CONTRACT PRICE

1. The Contract price per cubic yard for this item shall include all costs of the mechanical treatment, removal, and disposal of all Rock Dredging Material from within the project site, as defined and specified in Section 35 24 00, Dredging and Disposal, and otherwise indicated on the Contract Drawings. Disposal includes all costs, direct and indirect, associated with and incidental to, mechanical treatment as determined by the Contractor's means and methods of weathered and intact

bedrock, equipment modifications and changes, transitions between treatment methodologies, excavation, dredging and removal of the material, CAD Cell management including any required bed leveling, segregation as required for disposal at the disposal site, environmental protection, including but not limited to adherence to relevant permitting standards, timing of work as necessary, relocation of moorings and other temporary structures as applicable, maneuvering around any temporary or permanent structures, barge or scow transport of the material, removal of standing water/free liquids, and disposal of the material at disposal site. Protective measures to protect existing structures and utilities shall be included.

2. This item shall include all costs associated with mechanical treatment and rock dredging to the required depth, including any necessary over dredging to allow equipment floatation or additional dredging to compensate for; inaccuracies inherent in the dredging process (such as shoaling or "fluffing"), water level allowances, water control, disposal site operation and maintenance, CAD Cell management, manpower, fueling, maintenance, operation, progress surveys, field engineering, environmental protection, and all other work incidental to the dredging and disposal operations.
3. Payments to the Contractor will be made for the actual quantities of the Contract items performed and accepted in accordance with the Contract Documents. Upon completion of the construction, if these actual quantities show either an increase or decrease from the quantities as provided in Section 00400, Bid Form, the Contract unit prices will still prevail, except as otherwise provided. The payment of any partial estimate or of any retained percentage except by and under the approved final invoice, in no way shall affect the obligation of the Contractor to repair or renew any defective parts of the construction or to be responsible for all damage due to such defects.
4. Work shall include all water control, towing, scow placement and anchoring, dredge positioning, calibration, environmental restoration, and all other items incidental to the dredging in accordance with the Contract Documents and permits issued for this project. Disposal includes all water control, CAD Cell management including any required bed leveling, loading, rehandling, hauling, unloading, placement, environmental restoration, and all other items incidental to the disposal in accordance with the Contract Documents and permits issued for this project.
5. Full compensation for all documents and submissions; for complying with the requirements of the regulatory permits and the requirements of any other agencies with jurisdiction over these matters shall be included in the Contract unit price for dredging and no additional payment will be made.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: IN-PLACE CUBIC YARD (CY)
2. The total amount of material removed and paid for under the Contract for this Item, will be measured by the cubic yard in place by computing the volume between the bottom surface shown by soundings of the Owner's pre-dredge survey made immediately before dredging, and the material surface shown by the

soundings of the Owner's post-dredge survey made as soon as practicable after the removal of the material (as described in Section 01 71 23, Field Engineering). Surveys will utilize the standards established by the U.S. Army Corps of Engineers' (USACE) Hydrographic Surveys Manual EM-1110-2-1003 (dated November 2013).

3. Payment is limited to the dredge limits shown on the Contract Drawings and authorized by permits, and within the vertical tolerances of the dredge limits allowable overdepth as described in Section 35 24 00, Dredging and Disposal, paragraph DESIGN DEPTH, OVERDEPTH, SIDE SLOPES AND EXCESSIVE DREDGING, less any deductions that may be required for excessive dredging and/or misplaced material described in paragraph MISPLACED MATERIAL.
4. The Contract Drawings are believed to accurately represent conditions existing on the date of the last survey shown on the Drawings, but the depths shown thereon will be verified and corrected by soundings taken by the Owner's Engineer immediately before dredging. Determination of quantities removed, and the deductions made to determine quantities after having been made by the Owner's Engineer, will not be re-considered, except on evidence of collusion, fraud, or obvious error.
5. Partial payments will be based on approximate quantities determined by Contractor quality control surveys as described in Section 01 71 23, Field Engineering.

# SECTION 05 - COMBI WALL BULKHEAD (NORTH/SOUTH)

## 1.1 ITEM 32 – STEEL PIPE KING PILE, 30-INCH X 1-INCH WALL ROCK SOCKETED (FURNISH AND INSTALL)

### A. WORK COVERED

1. This price and payment shall include furnishing and installation of the 30-inch x 1-inch wall, drilled and grouted rock socketed steel pipe king piles to the minimum required socket depth as shown in the Contract Documents.
2. Work shall include, but is not limited to, all supervision, labor, materials and equipment as required for the complete installation of the rock socketed king piles to the minimum required socket depth including, but not limited to, furnish of the 30-inch diameter king piles with sheet pile connectors, protective coatings, work plan for installation of the king piles to the required tolerances, survey for king pile location/alignment, pile driving templates, falsework design designed and stamped by a Professional Engineer, drilling, cleaning, grouting, welding, cutting, splicing (only if approved), lifting, driving /drilling logs, inspections, and any other incidentals as required for complete installation. Driving through any obstructions, if encountered, shall be considered incidental to the pile installation.

### B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)

2. Measurement for payment will be on complete installation of EACH 30-inch x 1-inch wall drilled and rock socketed steel pipe king pile.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.2 ITEM 33 – STEEL SHEET PILE, AZ17-770 (SHEETING, WALES, AND CAP) (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes the furnishing and complete installation of steel sheet pile bulkhead, including the steel sheeting, the complete upper and lower hydraulic steel structures (HSS) 12x12 wale assemblies, the continuous steel cap, and any other incidentals necessary for complete installation of the steel bulkhead in accordance with the Contract Documents.
2. Work shall include, but is not limited to, all supervision, labor, materials and equipment, storage, transportation, handling, survey, tools, connections, custom fabricated closures, steel caps, wales, seat plates, gusset/stiffener plates, welding, cutting, templates, temporary bracing and shoring, cutting sheets to final elevation, sheet pile penetrations, patching of lifting holes, protective coatings and any coating touch-up, and all other incidental work necessary for complete installation of the north/south steel combination wall bulkhead.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Measurement shall not be made for this Item.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.3 ITEM 34 – HP12X89 SUPPORT PILES, ROCK SOCKETED AT 72-INCH STORM DRAIN PENETRATION (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnishing and installation of the HP12X89, drilled and rock socketed 72-inch reinforced concrete pipe (RCP) storm drain penetration support piles to the minimum required socket depth as shown in the Contract Documents.
2. Work shall include, but is not limited to, all supervision, labor, materials and equipment as required for the satisfactory for procurement and installation of the rock socketed HP piles to the minimum required socket depth including, but not limited to, furnish of the HP support piles with sheet pile connectors, protective coatings, work plan for installation of the socketed HP piles to the required

tolerances, survey for pile location/alignment, pile driving templates, falsework design designed and stamped by a professional engineer, drilling, cleaning, grouting, welding, cutting, splicing (only if approved), lifting, driving /drilling logs, inspections, and any other incidentals as required for complete installation. Driving through any obstructions, if encountered, shall be considered incidental to the pile installation.

3. All rock socketed pipe pile spoils shall be disposed of at CAD Cell No.3.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement for payment will be on complete installation of EACH drilled and rock socketed steel HP 12X89, 72-inch RCP storm drain penetration support pile.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.4 ITEM 35 –DRILLED ROCK ANCHOR ASSEMBLY (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes all work and costs associated with, including but not limited to, furnishing all labor, materials, equipment, and any other incidentals for complete installation of the drilled rock anchors assemblies.
2. Work shall include, but is not limited to furnishing all labor, materials, equipment, and any incidentals required to for complete installation of the drilled rock anchor assembly, all survey, layout, templates, bracing, drilling and grouting equipment and procedures, stressing equipment and calibration thereof and mill test results for pre-stressing steel wire, strand or bars, anchorage head materials, bearing/ jacking plates, trumpets, epoxy coatings, grout, sheathing, corrosion inhibitors, and any other miscellaneous metal fabrications are considered part of or incidental to this Bid item.
3. A detailed design with supporting calculations to achieve the specified ultimate stress, as shown on the Contract Drawings, shall be provided/submitted by the Contractor, certified by a Professional Engineer licensed in the Commonwealth of Massachusetts.
4. The item also includes all submittal of testing procedures, calibration, proof testing, performance (verification) testing, and test reporting in accordance with Professional Testing (PTI) and as specified in accordance with the Contract Documents.
5. All rock socketed pipe pile spoils shall be disposed of at CAD Cell No.3.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)

2. This item will be measured per EACH drilled rock anchor complete in-place to include compensation for the work covered by the contract price.
3. Payment shall be made for all costs, including but not limited to, mobilization, furnishing all labor, supervision materials, equipment, calculations, tools, testing, and any other incidentals as required to install the drilled ground anchors in accordance with the Contract Documents. No additional payment will be made for: damaged, rejected, or misplaced anchors; withdrawn anchors; or other excesses beyond the design anchor length for which the Contractor is responsible.

## 1.5 ITEM 36 – STAINLESS STEEL PONTOON FLAP GATE AT 72-INCH STORM DRAIN (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes all costs associated with furnishing all labor, materials, equipment, and incidentals for complete in-place installation of the stainless-steel pontoon flap gate at the outlet of RCP storm drain.
2. The product shall be Series 452 Rectangle Flap Gate (90”x 90”) with metal flap manufactured by Whipps, Inc.
3. This work shall include all but is not limited to procurement of materials, delivery, installation, mounting hardware, frames, hinges, fasteners, seals, lifting lug, accessories, welding, testing, technical information, warranties, and any other items necessary for complete installation of the stainless-steel pontoon flap gate.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Measurement shall be made as a LUMP SUM for all work associated with procurement, delivery, and complete installation of the stainless-steel pontoon flap gate.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment testing, inspections, warranties and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.6 ITEM. 37 – GROUT PLUG (CLOSURE OF MUDLINE TO TOP OF EXISTING SOUTH TERMINAL MAJOR CELL)

A. WORK COVERED

1. This item includes all costs associated with furnishing all labor, materials, equipment, and incidentals for complete in-place installation of the grout plug closure.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)

2. Measurement shall be made as a LUMP SUM for all work associated with procurement, delivery, and complete installation of the grout plug.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment testing, inspections, warranties and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

### 1.20 ITEM 38 – TEMPORARY SHEET PILE WALLS – EXISTING RELIEVING PLATFORM DEMOLITION (FURNISH, INSTAL AND REMOVE)

A. WORK COVERED

1. This item includes furnishing and installation of the temporary steel sheet pile walls to protect the excavation (if needed) for purposes of construction staging and sequencing in connection to the existing South Terminal in accordance with the Contract Documents.
2. Work shall include, but is not limited to, all supervision, labor, procurement of all materials, storage, transportation, handling, survey, tools, connections, templates, temporary bracing and shoring, and all other incidental work necessary for installation of the temporary sheet pile wall bulkhead along the South Terminal cell.
3. Work shall also include removal of the temporary sheets once work is complete.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Measurement shall not be made for this Item.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and any other incidentals as required for temporary installation and removal of this bid item in accordance with the Contract Documents.

# SECTION 06 - COMBI WALL BULKHEAD (EAST/WEST)

### 1.21 ITEM 39 – W14X311 ROCK SOCKETED KING PILES (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnish and installation of the W14X311, drilled and grouted rock socketed steel king piles to the minimum required socket depth as shown in the Contract Documents.
2. Work shall include, but is not limited to, all supervision, labor, materials and equipment as required for the complete installation of the rock socketed king piles including, but not limited to, furnish of the W14X311 king piles with sheet pile

connectors, protective coatings, work plan for installation of the king piles to the required tolerances, survey for king pile location/alignment, pile driving templates, falsework design designed and stamped by a professional engineer, drilling, cleaning, grouting, welding, cutting, splicing (only if approved), lifting, driving /drilling logs, inspections, and any other incidentals as required for complete installation. Driving through any obstructions, if encountered, shall be considered incidental to the pile installation.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement for payment will be on complete installation of EACH W14X311 wall drilled and rock socketed steel king pile.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.22 ITEM 40 – STEEL SHEET PILE, AZ17-770 (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes the furnishing and complete installation of steel sheet pile bulkhead, including the steel sheeting and any other incidentals necessary for complete installation of the steel bulkhead in accordance with the Contract Documents.
2. Work shall include, but is not limited to, all supervision, labor, procurement of all materials, storage, transportation, handling, survey, tools, connections, custom fabricated closures, welding, cutting, templates, temporary bracing and shoring, cutting sheets to final elevation, sheet pile penetrations, patching of lifting holes, protective coatings and any coating touch-up, grout plugs, and all other incidental work necessary for complete installation of the east/west steel combination wall bulkhead.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LINEAR FOOT (LF)
2. Measurement will per LINEAR FOOT for steel sheet pile at North Closure installed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 0.4 ITEM 41 – BULKHEAD TOE PINS (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes all costs associated with, but not limited to furnishing all labor, materials, equipment, and incidentals for installation of toe pins at each location specified on the Contract Drawings.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure – LUMP SUM (LS)
2. Measurement shall not be made for this Item.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, drilling, engineering, inspections, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.23 ITEM 42 – SHEET PILE CAP, CAST IN PLACE CONCRETE (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete sheet pile cap.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will be per CUBIC YARD of reinforced, cast-in-place concrete placed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

## 1.24 ITEM 43 – CAST IN PLACE CONCRETE BEAM (18-IN x 18-IN) (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete to support infill grating.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will be per CUBIC YARD of reinforced, cast-in-place concrete placed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

## 1.25 ITEM 44 – INFILL GRATING COVER ASSEMBLY (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the complete installation of the east/west combination wall bulkhead infill grating cover assemblies to the tolerances indicated on the Contract Drawings.
2. All platform deck steel grating shall be galvanized 19-W-4 bar grating (2-1/2” x 3/8”) installed per manufacturers specifications.
3. The work shall include all materials, field measuring, panel layout, cutting, utility penetrations, support angles, seats, banding plates, connections, hold-downs, protective coatings, and any other incidental work required for the complete installation of the deck trench cover assemblies in accordance with Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: SQUARE FEET (SF)
2. Measurement will be on the installed SQUARE FEET measured as the installed length of trench accepted by the Engineer.
3. Payment shall be for all costs including but not limited furnishing all labor, materials, equipment, and incidentals as required for complete utility trench assembly installation.

# SECTION 07 – MINOR CELL CLOSURE SHEET PILE AND RETAINING WALL

## 1.26 ITEM 45 – BURIED CLOSURE WALL, CAST IN PLACE CONCRETE AT EXISTING RELIEVING PLATFORM (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the complete installation of the cast-in-in-place, reinforced concrete closure wall as indicated in the Contract Documents.
2. The work shall include but is not limited to all labor, materials, transportation, excavation, temporary shoring, survey, forming, steel reinforcement, dowels, surface preparation at interfaces between new and existing structures, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing and supervision, in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure – LUMP SUM (LS)
2. Measurement shall not be made for this Item.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, drilling, engineering, inspections, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.27 ITEM 46 – W14X311 ROCK SOCKETED KING PILES (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnish and installation of the W14X311, drilled and grouted rock socketed steel king piles to the minimum required socket depth as shown in the Contract Documents.
2. Work shall include, but is not limited to, all supervision, labor, materials and equipment as required for the complete installation of the rock socketed king piles including, but not limited to, furnish of the W14X311 king piles with sheet pile connectors, protective coatings, work plan for installation of the king piles to the required tolerances, survey for king pile location/alignment, pile driving templates, falsework design designed and stamped by a professional engineer, drilling, cleaning, grouting, welding, cutting, splicing (only if approved), lifting, driving /drilling logs, inspections, and any other incidentals as required for complete installation. Driving through any obstructions, if encountered, shall be considered incidental to the pile installation.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement for payment will be on complete installation of EACH W14X311 wall drilled and rock socketed steel king pile.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.28 ITEM 47 – 24-INCH X 1-INCH ROCK SOCKETED PIPE PILE WITH REINFORCED CONCRETE PILE CONNECTIONS (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnish and installation of the 24-inch x 1-inch socketed pipe pile at North Closure as shown in the Contract Documents.
2. Work shall include, but is not limited to, full compensation for all supervision, labor, materials and equipment, furnish of the 24-inch support piles, protective coatings, work plan for installation of the socketed piles to the required tolerances, survey for pile location/alignment, pile driving templates, falsework design designed and stamped by a professional engineer, drilling, cleaning, grouting, welding, cutting, splicing (only if approved), lifting, driving /drilling logs, inspections, and any other incidentals as required to perform the work. Driving through any obstructions, if encountered, shall be considered incidental to the pile installation.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement will per EACH 24-inch x 1-inch socketed pipe pile at North Closure installed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.29 ITEM 48 – STEEL SHEET PILE, AZ17-770 WITH TOE PINS (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes the furnishing and complete installation of steel sheet pile bulkhead, including the steel sheeting and any other incidentals necessary for complete installation of the steel bulkhead in accordance with the Contract Documents.
2. Work shall include, but is not limited to, all supervision, labor, procurement of all materials, storage, transportation, handling, survey, tools, connections, custom fabricated closures, welding, cutting, templates, temporary bracing and shoring,

cutting sheets to final elevation, sheet pile penetrations, patching of lifting holes, protective coatings and any coating touch-up, grout plugs, and all other incidental work necessary for complete installation of the east/west steel combination wall bulkhead.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LINEAR FOOT (LF)
2. Measurement will per LINEAR FOOT for steel sheet pile at North Closure installed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.30 ITEM 49 - GROUT PLUG (CLOSURE BETWEEN WEST-END OF RETAINING WALL AND COMBI WALL)

A. WORK COVERED

1. This price and payment shall include furnish and installation of the grout plug as shown in the Contract Documents.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure – LUMP SUM (LS)
2. Measurement shall not be made for this Item.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, drilling, engineering, inspections, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.31 ITEM 50 – STRUCTURAL CLOSURE OF MINOR CELL (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnish and installation of the structural backfill (Sandy Fill) at North Closure as shown in the Contract Documents.
2. Work shall include, but is not limited to, full compensation for all supervision, labor, materials and equipment, furnishing, placement and compacting of structural backfill material.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LUMP SUM)
2. Measurement will per LUMP SUM for structural backfill at North Closure installed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.32 ITEM 51 - GROUT PLUG (TOE CLOSURE SEAL AT BOTTOM OF SHEETPILES)

A. WORK COVERED

1. This item includes all costs associated with furnishing all labor, materials, equipment, and incidentals for complete in-place installation of the grout plug closure.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure – LUMP SUM (LS)
2. Measurement shall not be made for this Item.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, drilling, engineering, inspections, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.33 ITEM 52 – STRUCTURAL CLOSURE BACKFILL (SANDY FILL) OF MINOR CELL TO EL 5.0 (FURNISH ANED INSTALL)

A. WORK COVERED

1. This price and payment shall include furnish and installation of the structural backfill (Sandy Fill) as shown in the Contract Documents.
2. Work shall include, but is not limited to, full compensation for all supervision, labor, materials and equipment, furnishing, placement and compacting of structural backfill material.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will per CUBIC YARD for structural backfill installed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.34 ITEM 53 – SHEET PILE CAP, CAST IN PLACE CONCRETE AT MINOR CELL CLOSURE (4'-0" x 4'-3") (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete sheet pile cap.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will per CUBIC YARD for steel pile cap cast in place concrete at North Closure installed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.35 ITEM 54 – RETAINING WALL, CAST IN PLACE CONCRETE (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the complete installation of the cast-in-in-place, reinforced concrete closure wall as indicated in the Contract Documents.
2. The work shall include but is not limited to all labor, materials, transportation, survey, temporary shoring, excavation to required footing depth, procurement and placement of bedding stone, forming, steel reinforcement, dowels, surface preparation at interfaces between new and existing structures, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will be per CUBIC YARD of reinforced, cast-in-place concrete placed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all material, labor, equipment, bedding stone, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

## 1.36 ITEM 55 – STRUCTURAL BACKFILL (GRAVEL BORROW) AT RETAINING WALL (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnish and installation of the structural backfill (Gravel Borrow) at retaining wall as shown in the Contract Documents.
2. Work shall include, but is not limited to, full compensation for all supervision, labor, materials and equipment, furnishing, placement and compacting of structural backfill material.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will per CUBIC YARD for structural backfill at retaining wall installed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.37 ITEM 56 – PORTLAND CEMENT CONCRETE PAVEMENT, 5-IN AT RETAINING WALL (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnish and installation of the Portland Cement Concrete Pavement at 5 inches depth at the Retaining Wall as shown in the Contract Documents.
2. Concrete pavement shall be reinforced with either a double-layer A252wire mesh or fiber mesh mixed into the concrete and include a sealed ¾ inch fiber board expansion joint material around the perimeter. Maximum sawcut control joint spacing shall be 10 feet.
3. Work shall include, but is not limited to, full compensation for all supervision, labor, materials and equipment, furnishing of concrete, compaction, subgrade preparation, finishing, curing, saw cutting joints, perimeter expansion joint material and sealing.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: SQUARE YARD (SY)
2. Measurement will per SQUARE YARD for Portland Cement Concrete Pavement installed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

# SECTION 08 - RELIEVING PLATFORM STRUCTURE

## 1.7 ITEM 57 – 30-INCH X 1-INCH WALL ROCK SOCKETED PIPE PILES AT ROWS A & B (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnishing and installation of the 30-inch x 1-inch wall concrete platform support pipe piles driven to sound rock at Rows A and B, as shown in the Contract Documents.
2. Work shall include, but is not limited to, all supervision, labor, materials and equipment as required for furnish and installation of the 30-inch pipe piles to sound rock including, but not limited to, furnish of the pipe piles, protective coatings, work plan for pile installation to the required tolerances, survey for pile location/alignment, pile driving templates, falsework design designed and stamped by a Professional Engineer, welding, cutting, splicing (only if approved), lifting, driving /drilling logs, inspections, and any other incidentals as required to for complete installation. Driving through any obstructions, if encountered, shall be considered incidental to the pile installation.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement for payment will be on complete installation of EACH 30-inch x 1-inch wall platform support pipe pile driven to sound rock.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.8 ITEM 58 – 30-INCH X 1-INCH WALL PIPE PILES AT ROWS C, D, E, AND F (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnishing and installation of the 30-inch x 1-inch-wall concrete platform support pipe piles driven to sound rock at Rows C, D, E, and F, as shown in the Contract Documents.
2. Work shall include, but is not limited to, all supervision, labor, materials and equipment as required for furnish and installation of the 30-inch pipe piles to sound rock including, but not limited to, furnish of the pipe piles, protective coatings, work plan for pile installation to the required tolerances, survey for pile location/alignment, pile driving templates, falsework design designed and stamped by a Professional Engineer, welding, cutting, splicing (only if approved), lifting, driving /drilling logs, inspections, and any other incidentals as required to for complete installation. Driving through any obstructions, if encountered, shall be considered incidental to the pile installation.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement for payment will be on complete installation of EACH 30-inch x 1-inch wall platform support pipe pile driven to sound rock.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.9 ITEM 59 – 30-INCH X 1-INCH WALL ROCK SOCKETED PIPE PILES AT ROWS C, D, AND E (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnishing and installation of the 30-inch x 1-inch wall, drilled and rock socketed platform support pipe piles, to the minimum required socket depth at Rows C, D and E, as shown in the Contract Documents.
2. Work shall include, but is not limited to, full compensation for all supervision, labor, materials and equipment, furnish of the platform support piles, protective coatings, work plan for installation of the socketed piles to the required tolerances, survey for pile location/alignment, pile driving templates, falsework design designed and stamped by a Professional Engineer, drilling, cleaning, grouting, welding, cutting, splicing (only if approved), lifting, driving /drilling logs, inspections, and any other incidentals as required to perform the work. Driving through any obstructions, if encountered, shall be considered incidental to the pile installation.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement for payment will be on complete installation of EACH drilled and rock socketed platform support pile.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.10 ITEM 60 – 30-INCH X 1-INCH WALL PIPE PILES AT ROWS H AND I (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnishing and installation of the 30-inch x 1-inch wall concrete platform support pipe piles driven to sound rock at Rows H and I, as shown in the Contract Documents.

2. Work shall include, but is not limited to, all supervision, labor, materials and equipment as required for furnish and installation of the 30-inch pipe piles to sound rock including, but not limited to, furnish of the pipe piles, protective coatings, work plan for pile installation to the required tolerances, survey for pile location/alignment, pile driving templates, falsework design designed and stamped by a professional engineer, welding, cutting, splicing (only if approved), lifting, driving /drilling logs, inspections, and any other incidentals as required to for complete installation. Driving through any obstructions, if encountered, shall be considered incidental to the pile installation.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement for payment will be based on complete installation of EACH 30-inch x 1-inch wall driven platform support pipe pile.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.11 ITEM 61 – 30-INCH X 1-INCH WALL PIPE PILES AT ROW G (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnishing and installation of the 30-inch x 1-inch wall concrete platform support pipe piles driven to sound rock at Row G, as shown in the Contract Documents.
2. Work shall include, but is not limited to, all supervision, labor, materials and equipment as required for furnish and installation of the 30-inch pipe piles to sound rock including, but not limited to, furnish of the pipe piles, protective coatings, work plan for pile installation to the required tolerances, survey for pile location/alignment, pile driving templates, falsework design designed and stamped by a professional engineer, welding, cutting, splicing (only if approved), lifting, driving /drilling logs, inspections, and any other incidentals as required to for complete installation. Driving through any obstructions, if encountered, shall be considered incidental to the pile installation.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement for payment will be based on complete installation of EACH 30-inch x 1-inch wall driven platform support pipe pile.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.12 ITEM 62 – PRECAST PILE CAP SUPPORT PLATE ASSEMBLIES (FURNISH AND INSTALL)

A. WORK COVERED

1. This price and payment shall include furnishing and installation of the pile cap support plate assemblies welding to the platform support piles as shown in the Contract Documents.
2. The work shall include, but is not limited to, all supervision, labor, materials and equipment as required for furnish and installation of the precast pile cap support plate assemblies including, but not limited, to fabrication of gusset and seat plates, proper storage, transportation, survey, preparation, protective coating, field fit up, temporary shoring for erection, coating touch-up, and all other incidental work necessary to complete installation of the precast pile cap support plate assemblies.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement for payment will be on complete installation of EACH precast pile cap support plate assembly to platform support piles.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, engineering, inspections, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.1 ITEM 63 – REINFORCED CONCRETE PILE CONNECTIONS FOR 30-INCH DRIVEN PIPE PILES – ROWS C, D, E, AND F (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall include furnishing and installation of the reinforced concrete pile connections for the 30-inch diameter pipe piles driven to sound rock at Rows C, D, E, and F, as indicated on the Contract Drawings.
2. Work shall include, but is not limited to, all supervision, labor, materials, equipment, transportation, compaction, forming, finishing, and furnishing all 5000 psi structural concrete fill, steel reinforcement, headed reinforcement, dowels, couplers, lifting attachments, temporary supports, plug plates, tie wire, spacers, curing, finishing, testing, and any other incidentals as required to satisfactory placement of reinforced concrete pile connections in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement will be based on complete installation of EACH reinforced concrete pile connection.

3. Payment shall be for all costs including but not limited to furnishing all labor, materials, equipment, forming, curing, testing, inspections, and any other incidentals as required for complete installation of this item in accordance with the Contract Documents.

## 1.38 ITEM 64 – REINFORCED CONCRETE PILE CONNECTIONS FOR 30-INCH ROCK SOCKETED PIPE PILES – ROWS A, B, C, D, AND E (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall include furnishing and installation of the reinforced concrete pile connections for the 30-inch diameter rock socketed pipe piles at Rows A, B, C, D, and E, and as indicated on the Contract Drawings.
2. Work shall include, but is not limited to, all supervision, labor, materials, equipment, transportation, compaction, forming, finishing, and furnishing all 5000 psi structural concrete fill, steel reinforcement, headed reinforcement, dowels, couplers, lifting attachments, temporary supports, plug plates, tie wire, spacers, curing, finishing, testing, and any other incidentals as required to satisfactory placement of reinforced concrete pile connections in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement will be based on complete installation of EACH reinforced concrete pile connection.
3. Payment shall be for all costs including but not limited to furnishing all labor, materials, equipment, forming, curing, testing, inspections, and any other incidentals as required for complete installation of this item in accordance with the Contract Documents.

## 1.39 ITEM 65 – REINFORCED CONCRETE PILE CONNECTIONS FOR 30-INCH DRIVEN PIPE PILES – ROW G (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall include furnishing and installation of the reinforced concrete pile connections for 30-inch diameter pipe piles driven to sound rock at Row G, as indicated on the Contract Drawings.
2. Work shall include, but is not limited to, all supervision, labor, materials, equipment, transportation, compaction, forming, finishing, and furnishing all 5000 psi structural concrete fill, steel reinforcement, headed reinforcement, dowels, couplers, lifting attachments, temporary supports, plug plates, tie wire, spacers, curing, finishing, testing, and any other incidentals as required to satisfactory placement of reinforced concrete pile connections in accordance with the Contract Documents.

B. MEASUREMENT

1. Unit of Measure: EACH (EA)
2. Measurement will be based on complete installation of EACH reinforced concrete pile connection.
3. Payment shall be for all costs including but not limited to furnishing all labor, materials, equipment, forming, curing, testing, inspections, and any other incidentals as required for complete installation of this item in accordance with the Contract Documents.

## 1.40 ITEM 66 – REINFORCED CONCRETE PILE CONNECTIONS FOR 30-INCH DRIVEN PIPE PILES – ROW H AND I (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall include furnishing and installation of the reinforced concrete pile connections for the 30-inch diameter pipe piles driven to sound rock at Rows H and I, as indicated on the Contract Drawings.
2. Work shall include, but is not limited to, all supervision, labor, materials, equipment, transportation, compaction, forming, finishing, and furnishing all 5000 psi structural concrete fill, steel reinforcement, headed reinforcement, dowels, couplers, lifting attachments, temporary supports, plug plates, tie wire, spacers, curing, finishing, testing, and any other incidentals as required to satisfactory placement of reinforced concrete pile connections in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: EACH (EA)
2. Measurement will be based on complete installation of EACH reinforced concrete pile connection.
3. Payment shall be for all costs including but not limited to furnishing all labor, materials, equipment, forming, curing, testing, inspections, and any other incidentals as required for complete installation of this item in accordance with the Contract Documents.

## 1.41 ITEM 67 – PRECAST PLANKS (PCP) – TYPE 1, TYPE 2, TYPE 3, AND TYPE 4 (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall include furnishing and installation of the Type 1, Type 2, Type 3, and Type 4 permanent precast formwork system to the required dimensional tolerances indicated on the Contract Drawings.
2. Work shall include, but is not limited to, all supervision, labor, materials, and equipment, forming, fabrication, steel reinforcement, embedded items, ties,

chairs, lifting anchors, spacers, grouts, epoxy adhesives, finishing, curing, testing, proper transportation storage, handling, survey, layout, temporary shoring/support and supervision during erection, and any other incidentals necessary to complete the work as shown in the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Measurement shall not be made for this Item.
3. Payment shall be for all costs including but not limited to furnishing all labor, materials, equipment, forming, curing, testing, inspections, and any other incidentals as required for complete installation of this item in accordance with the Contract Documents.

## 1.42 ITEM 68 – PRECAST PILE CAPS BEAMS TYPE PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, PC-10, AND PC-11 (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall include furnishing and installation of the Type PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, PC-10, and PC-11 precast pile caps to the required dimensional indicated on the Contract Drawings.
2. Work shall include, but is not limited to, all supervision, labor, materials, and equipment, forming, block outs in precast for fender mounting plate, steel reinforcement, embedded items, ties, chairs, lifting anchors, spacers, grouts, epoxy adhesives, finishing, curing, testing, proper transportation, delivery, storage, handling, survey, layout, temporary shoring/support, supervision during erection, and any other incidentals necessary to complete the work as shown in the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Measurement shall not be made for this Item.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, testing, transportation, delivery, and all other and all other incidentals as required to furnish and install this item in accordance with the Contract Documents.

## 1.43 ITEM 69 – CAST IN PLACE CONCRETE EAST/WEST BEAMS - ROW 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, AND 11 (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete North/South Beams along Row 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will be per CUBIC YARD of reinforced, cast-in-place concrete placed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

## 1.44 ITEM 70 – CAST IN PLACE CONCRETE NORTH/SOUTH BEAMS - ROW A (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete, East/West Beams along Row A.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will be per CUBIC YARD of reinforced, cast-in-place concrete placed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

## 1.45 ITEM 71 – CAST IN PLACE CONCRETE NORTH/SOUTH BEAMS – ROW B, C, D, E, AND F (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete, East/West Beams along Row B, C, D, E and F.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will be per CUBIC YARD of reinforced, cast-in-place concrete placed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

## 1.46 ITEM 72 – CAST IN PLACE CONCRETE NORTH/SOUTH BEAMS – ROW G (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete, East/West Beams along Row G.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will be per CUBIC YARD of reinforced, cast-in-place concrete placed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

## 1.47 ITEM 73 – CAST IN PLACE CONCRETE NORTH/SOUTH BEAMS - ROW I (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete, East/West Beams along Row I.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will be per CUBIC YARD of reinforced, cast-in-place concrete placed complete.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

## 1.48 ITEM 74 – CAST IN PLACE CONCRETE PLATFORM SLAB (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete platform slab.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will be per CUBIC YARD of reinforced, cast-in-place concrete placed complete.
3. Payment shall be inclusive and shall include but not be limited to, furnishing all labor, materials, equipment, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

## 1.49 ITEM 75 – CAST IN PLACE CONCRETE BOLLARD PADS (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete bollard pads.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: CUBIC YARD (CY)
2. Measurement will be per CUBIC YARD of reinforced, cast-in-place concrete placed complete.
3. Payment shall be inclusive and shall include but not be limited to, furnishing all labor, materials, equipment, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

## 1.50 ITEM 76 – CAST-IN-PLACE CONCRETE UTILITY TRENCH - EAST/WEST (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete east/west utility trench.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LINEAR FOOT (LF)
2. Measurement will be per LINEAR FOOT of reinforced, cast-in-place concrete placed complete.
3. Payment shall be inclusive and shall include but not be limited to, furnishing all labor, materials, equipment, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

### 1.51 ITEM 77 – CAST-IN-PLACE CONCRETE UTILITY TRENCH - NORTH/SOUTH (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the satisfactory placement of the cast-in-place, reinforced concrete north/south utility trench.
2. The work shall include but is not limited to all labor, materials, transportation, forming, steel reinforcement, embedded items, ties, chairs, spacers, grouts, epoxy adhesives, finishing, curing, testing, and supervision in accordance with the Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LINEAR FOOT (LF)
2. Measurement will be per LINEAR FOOT of reinforced, cast-in-place concrete placed complete.
3. Payment shall be inclusive and shall include but not be limited to furnishing all labor, materials, equipment, reinforcement, embedded items, formwork, finishing, curing, inspections, testing, and all other incidentals as required for complete placement of concrete placed in accordance with the Contract Documents.

## SECTION 09 - MISCELLANEOUS

### 1.52 ITEM 78 – CATHODIC PROTECTION SYSTEM / ALUMINUM ANODES (KING PILES AND SHEETS) FOR NORTH/SOUTH BULKHEAD (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes all costs associated with, but not limited to furnishing all labor, materials, equipment, and incidentals for complete in-place installation of the passive cathodic protection system (aluminum anodes) at the north/south combination wall king piles and steel sheets.
2. This work shall include all work necessary for procurement of materials and complete installation of the cathodic protection system including but not limited to, aluminum anodes, marine protective coating on brackets, welding, coating touch-up and hardware, testing, and any other item necessary for the installation of the cathodic protection system.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)

2. Measurement shall be made as a LUMP SUM for all work associated with design, procurement and complete installation of the passive cathodic protection system (aluminum anodes).
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, inspections, testing, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.53 ITEM 79 – CATHODIC PROTECTION SYSTEM / ALUMINUM ANODES (KING PILES AND SHEETS) FOR EAST/WEST BULKHEAD AND NORTH CLOSURE (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes all costs associated with, but not limited to furnishing all labor, materials, equipment, and incidentals for complete in-place installation of the passive cathodic protection system (aluminum anodes) at the east/west bulkhead and north closure wall king piles and steel sheets.
2. This work shall include all work necessary for procurement of materials and complete installation of the cathodic protection system including but not limited to, aluminum anodes, marine protective coating on brackets, welding, coating touch-up and hardware, testing, and any other item necessary for the installation of the cathodic protection system.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Measurement shall be made as a LUMP SUM for all work associated with design, procurement and complete installation of the passive cathodic protection system (aluminum anodes).
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, inspections, testing, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.54 ITEM 80 – CATHODIC PROTECTION SYSTEM FOR RELIEVING PLATFORM PIPE PILES (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes all costs associated with, but not limited to furnishing all labor, materials, equipment, and incidentals for complete in-place installation of the passive cathodic protection system (aluminum anodes) at the relieving platform pipe piles. Includes all 30-in dia and 24-in dia pipe piles.
2. This work shall include all work necessary for procurement of materials and complete installation of the cathodic protection system including but not limited to, aluminum anodes, marine protective coating on brackets, welding, coating

touch-up and hardware, testing, and any other item necessary for the installation of the cathodic protection system.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. Measurement shall be made as a LUMP SUM for all work associated with design, procurement and complete installation of the passive cathodic protection system (aluminum anodes).
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, inspections, testing, and any other incidentals as required for complete installation of this bid item in accordance with the Contract Documents.

## 1.55 ITEM 81 – DENSO SEASHIELD 2000HD© ANTI-CORROSION PROTECTION SYSTEM AT PILE ROW A - INSTALLED LENGTH BOTTOM OF PRECAST PILE CAP TO 10-FEET BELOW MLLW (FURNISH AND INSTALL) - 30" DIA PILES

A. WORK COVERED BY CONTRACT PRICE

1. This item includes all costs associated with, but not limited to furnishing all labor, materials, equipment, and incidentals for complete installation of the Denso Seashield Series 2000HD© Anti-Corrosion Protection System, or approved equal, installed 10 feet above and 10 feet below MLLW at Row A piles, as shown on the Contract Drawings. Piles shall be coated in accordance with the Contract Documents prior to installation of the Denso Corrosion Protection System.
2. This work shall include but is not limited to the Denso Seashield Series 2000HD© Anti-Corrosion Protection System including Denso marine piling tape, Denso HDPE outer cover/jackets, and Denso Seashield GRFP 2000HD or stainless steel 316 fasteners, Denso Seashield Inspection Ports, with one inspection port located at the top of the scour protection assembly, one at average mid-depth, and one at the top of the pile jacket, in addition to any excavation as required, shoring, seals, all costs associated with coordination of work within the tidal cycles, water level control, cleaning, containment and cleanup of the debris, and all other incidental work necessary for complete installations shown on the Contract Drawings. Surface preparation and product installation for all components shall be in accordance with manufacturer’s recommendations.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure – EACH (EA)
2. Measurement will per EACH complete anti-corrosion protection system installed.
3. Payment will be made for costs associated with this Bid Item including all incidental work described in the specifications and Contract Documents.

## 1.56 ITEM 82 - DENSO SEASHIELD 2000HD© ANTI-CORROSION PROTECTION SYSTEM AT PILE ROW A - INSTALLED LENGTH BOTTOM OF PRECAST PILE CAP TO 10-FEET BELOW MLLW (FURNISH AND INSTALL) - 24" DIA PILES

A. WORK COVERED BY CONTRACT PRICE

1. This item includes all costs associated with, but not limited to furnishing all labor, materials, equipment, and incidentals for complete installation of the Denso Seashield Series 2000HD© Anti-Corrosion Protection System, or approved equal, installed 10 feet above and 10 feet below MLLW at Row A, as shown on the Contract Drawings. Piles shall be coated in accordance with the Contract Documents prior to installation of the Denso Corrosion Protection System.
2. This work shall include but is not limited to the Denso Seashield Series 2000HD© Anti-Corrosion Protection System including Denso marine piling tape, Denso HDPE outer cover/jackets, and Denso Seashield GRFP 2000HD or stainless steel 316 fasteners, Denso Seashield Inspection Ports, with one inspection port located at the top of the scour protection assembly, one at average mid-depth, and one at the top of the pile jacket, in addition to any excavation as required, shoring, seals, all costs associated with coordination of work within the tidal cycles, water level control, cleaning, containment and cleanup of the debris, and all other incidental work necessary for complete installations shown on the Contract Drawings. Surface preparation and product installation for all components shall be in accordance with manufacturer's recommendations.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure – EACH (EA)
2. Measurement will per EACH complete anti-corrosion protection system installed.
3. Payment will be made for costs associated with this Bid Item including all incidental work described in the specifications and Contract Documents.

## 1.57 ITEM 83 - DENSO SEASHIELD SERIES 70© FIBERGLASS PILE WRAP SYSTEM AT PILE ROWS C, D, E, AND F INSTALLED LENGTH BOTTOM OF PRECAST PILE CAP TO 10-FEET BELOW MLLW (FURNISH AND INSTALL)

A. WORK COVERED BY CONTRACT PRICE

1. This item includes all costs associated with, but not limited to furnishing all labor, materials, equipment, and incidentals for installation of the Denso Seashield Series 70© fiberglass pile wrap system assembly, or approved equal, installed 10 feet above and 10 feet below MLLW at Rows A, B, C, D, E and F, as shown on the Contract Drawings. Piles shall be coated in accordance with the Contract Documents prior to installation of the Denso fiberglass pile wrap system assembly.

2. This work shall include but is not limited to the Denso Seashield Series 70© fiberglass pile wrap system including Denso marine piling tape and Denso marine glass outerwrap, in addition to any shoring, seals, all costs associated with coordination of work within the tidal cycles, water level control, cleaning, containment and cleanup of the debris, and all other incidental work necessary for complete installations shown on the Contract Drawings. Surface preparation and product installation shall be in accordance with manufacturer's recommendations.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure – VERTICAL FEET (VF)
2. Measurement will per VF complete fiberglass pile wrap system installed.
3. Payment will be made for costs associated with this Bid Item including all incidental work described in the specifications and Contract Documents.

## 1.58 ITEM 84 – UTILITY TRENCH GRATING COVER ASSEMBLY - EAST/WEST (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the complete installation of the East/West Utility Trench grating cover assemblies to the tolerances indicated on the Contract Drawings.
2. The work shall include all materials, field measuring, panel layout, cutting, utility penetrations, support angles, seats, banding plates, connections, hold-downs, protective coatings, and any other incidental work required for the complete installation of the deck trench cover assemblies in accordance with Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: SQUARE FEET (SF)
2. Measurement will be on the installed SQUARE FEET measured as the installed length accepted by the Engineer.
3. Payment shall be for all costs including but not limited furnishing all labor, materials, equipment, and incidentals as required for complete utility trench assembly installation.

## 1.59 ITEM 85 – UTILITY TRENCH GRATING COVER ASSEMBLY - NORTH/SOUTH (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall constitute full compensation for all supervision, labor, materials, and equipment for the complete installation of the North/South Utility Trench grating cover assemblies to the tolerances indicated on the Contract Drawings.

2. The work shall include all materials, field measuring, panel layout, cutting, utility penetrations, support angles, seats, banding plates, connections, hold-downs, protective coatings, and any other incidental work required for the complete installation of the deck trench cover assemblies in accordance with Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: SQUARE FEET (SF)
2. Measurement will be on the installed SQUARE FEET measured as the installed length accepted by the Engineer.
3. Payment shall be for all costs including but not limited furnishing all labor, materials, equipment, and incidentals as required for complete utility trench assembly installation.

## 1.60 ITEM 86 – ZALDA SC-1150 SER PANEL FENDER ASSEMBLY, HDPE FACED (FURNISH AND INSTALL)

A. WORK COVERED

1. This work shall include furnishing all supervision, materials, transportation, labor, equipment for complete installation of the Zalda, HDPE faced panel fenders.
2. The work shall include, but is not limited to layout, survey, hardware, anchorage, connection plates in place, padeyes, chains, HDPE fender panel facing, welding, and any other incidentals as required for the complete installation of the Zalda SC-1150 SER HDPE faced panel fenders as shown in the Contract Documents.

B. MEASUREMENT AND PAYMENT

3. Unit of Measure: EACH (EA)
4. Measurement will per EACH complete fender assembly installation.
5. Payment shall be for all costs including but not limited furnishing all labor, materials, equipment, and incidentals as required for complete fender assembly installation.

## 1.61 ITEM 87 – ZALDA SBD-1 (200-225 METRIC TON) MOORING BOLLARDS (FURNISH AND INSTALL)

A. WORK COVERED

1. This item includes all costs associated with, but not limited to all materials, transportation, labor, supervision, equipment, and incidentals for complete installation of the Zalda SBD-1 (200-225 Ton) mooring bollards at locations shown on the Contract Drawings.
2. This work shall include, but is not limited to, survey, layout, mooring bollard equipment, base plates, protective coating/paint, capacity marking, anchorage, hardware, grouting, and any other item necessary for the complete installation of

the mooring bollards in accordance with Contract Documents and manufacturer recommendations.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure – EACH (EA)
2. Measurement will per EACH complete mooring bollard installation.
3. Payment shall be for all costs including but not limited furnishing all labor, materials, equipment, and incidentals as required for complete mooring bollard installation.

## 1.62 ITEM 88 - SLOPE PROTECTION – ARMORFLEX© 70L CONCRETE MATTRESS SYSTEM (FURNISH AND INSTALL)

A. WORK COVERED BY CONTRACT PRICE

1. This item includes all costs associated with, but not limited to furnishing all materials, transportation, storage, labor, equipment, and incidentals for complete installation of the ArmorFlex© Concrete Mattress Slope Protection System, or approved equal to the lines, limits, and grades, as shown on the Contract Drawings.
2. This work shall include but is not limited to survey, slope preparation to the lines and grades indicated on the Contract Drawings, geotextile fabric, filter stone layer, ArmorFlex© concrete mattresses/articulating concrete blocks, anchors, grout, and any other incidentals as required for complete installation in accordance with the product manufacturer's installation recommendations.
3. The work shall also include the 4000 psi concrete plug at the slope interface with the combination wall.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure – LUMP SUM (LS)
2. Measurement shall not be made for this Item.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, testing, and all other and all other incidentals as required to furnish and install this item in accordance with the Contract Documents.

## 1.63 ITEM 89 - SLOPE PROTECTION – RIP RAP ARMOR STONE (FURNISH AND INSTALL)

A. WORK COVERED BY CONTRACT PRICE

1. This item includes all costs associated with, but not limited to furnishing all materials, transportation, storage, labor, equipment, and incidentals for complete installation of the rip rap armor stone, or approved equal to the lines, limits, and grades, as shown on the Contract Drawings.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure – TON (TON)
2. This item will be measured per TON for all work associated with placement of rip rap armor stone for slope protection, including pre/post-survey verification.
3. Payment shall be for all costs, including but not limited to, furnishing all labor, materials, equipment, testing, and all other and all other incidentals as required to furnish and install this item in accordance with the Contract Documents.

## 1.64 ITEM 90 – SAFETY LADDERS (FURNISH AND INSTALL)

A. WORK COVERED BY CONTRACT PRICE

1. This item includes all costs associated with, but not limited to furnishing all labor, materials, equipment, and incidentals for installation safety ladders at locations shown on the Contract Drawings.
2. This work shall include but is not limited to ladders, brackets, protective coatings, and anchorage and bolts, braces, brackets, threshold plates, and any other item necessary for the complete installation of the safety ladders in accordance with Contract Documents.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure – EACH (EA)
2. Measurement will per EACH complete safety ladder installation.
3. Payment will be made for costs associated with this Bid Item including all incidental work described in the specifications and Contract Documents.

## 1.65 ITEM 91 - SILT CURTAINS AND PILES AT CAD CELL NO.3 (FURNISH, INSTALL, MAINTAIN & DISPOSAL)

A. WORK COVERED

1. This item includes all costs associated with Contractor's activities for a turbidity curtain to maintain erosion control to satisfy best management practices and specific permit requirements.
2. The Contractor is responsible for in-water construction activities use silt curtains that meet the technical specifications and ensure effective sediment containment. Install, routinely inspect, and maintain the turbidity curtain for the entire duration of the construction period. The turbidity curtain shall encompass disposal area and shall remain operational during all work hours, or when any potential for sediment discharge occurs into the waterway.
3. Pile anchors have been installed through a separate contract around CAD Cell #4 and as-built locations of the existing CAD Cell No. 4 timber piles have been provide as part of the Contract Drawings.

4. Bid Item includes installation of new piles and silt curtain around CAD Cell No. 3 disposal area as well as the NBMCT Dredge site, any and all repairs and or maintenance of the piles, anchors, and any associated hardware, and disposal of all silt curtain materials at an authorized disposal site at the completion of the project. Contractor shall make their own independent evaluation and assessment of the costs for material and or labor to maintain these silt curtains (turbidity curtains) in full working order as specified in Section 01355 – Environmental Protection and Section 01335 – Water Quality Monitoring and Control, for the duration of this contract, including any costs for re-securing, repairing, or replacing these curtains for any reason including but not limited to vessel traffic damage and weather or extremes of weather.
5. Bid item includes the deployment of approximately 2,500 LF of silt curtain for the duration of the disposal operation within CAD Cell No. 3, deployment of approximately 300 LF of silt curtain for the duration of the dredging and backfilling operation at the dredge site, and disposal of all silt curtain materials (excluding existing timer piles to remain to remain at CAD Cell No. 4) at an authorized disposal site at the completion of the project.
6. Work shall include, but is not limited to, pile anchor replacement and maintenance, installation of silt curtains, routine inspection, maintenance and replacement, especially after storms and accumulated sediment, including removal and disposal of all measures at the end of the project.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: LUMP SUM (LS)
2. This item will be measured as the LUMP SUM to include compensation for the work covered by contract price.
3. Payment shall be made for all costs, including but not limited to, furnishing all labor, materials, equipment, and incidentals as required for this bid item in accordance with the Contract Documents.

## 1.66 ITEM 92 - CONSTRUCTION PERMITTING (ALLOWANCE)

A. WORK COVERED

1. This item includes all costs associated with Contractor’s construction permitting for the site civil and marine infrastructure portions of the Work.
2. The work shall include an allowance for the procurement of required permits (not otherwise provided by Owner) by the Contractor or its sub-contractor. This item shall reimburse the Contractor for permit fees, without mark-up.
3. The work shall include efforts and costs associated with the Contractor application to obtain any/all additional permit(s)/authorization(s) that may be required beyond those provided herein and as required for the scope of work to be completed herein.

4. Any and all permits covered under this permit allowance are to be approved in advance and prior to any Contractor payments to any permitting authority by the Engineer to be considered under this payment item.
5. All work associated with the Contractor managing and obtaining the required construction permits for this project shall be included.
6. Construction permitting shall include coordination and securing any and all associated state and local governmental permits prior to construction activities. Including but not limited to construction inspections, marine construction, marine dredging, traffic, stormwater, sewer and water, driveway, sidewalk, erosion control/ disturbance, etc.
7. Contractor shall comply with all local, state and federal permitting requirements and secure all necessary construction permits not previously secured by the Owner prior to construction.

B. MEASUREMENT AND PAYMENT

1. Unit of Measure: PERMIT FEE WITHOUT MARKUP
2. Measurement shall not be made for this Item.
3. Payment shall be made for all approved permit fees paid by the Contractor to obtain permits required for the Work under this Contract and not otherwise provided by the Owner

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

# SECTION 01 32 16

# CONSTRUCTION PROGRESS SCHEDULE

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division I Specification Sections, apply to this section.

### 1.2 SUMMARY

A. Contractor shall prepare and submit to Owner's Representative for review and approval within 10 days after the Notice to Proceed the following:

1. A practicable and feasible schedule, on a bar-chart form in Microsoft Project or similar format, showing the order in which the Contractor proposes to carry on the salient components of the Work, the dollar value of each respective component of the Work, the dates on which the Contractor will start each, and the contemplated dates for completing the same, and a projection of each month's pay requisition, such schedule to be prepared in a manner prescribed by the Engineer based on money values of the various items of Work;

2. The scheduling of the Work shall be by the Critical Path Method at the expense of the Contractor; and

3. A written chronological statement of the order in which the Contractor proposes to perform the salient components of the Work, indicating in detail the date of starting work on each such component and the contemplated completion date for each.

The above bar-chart schedule and chronological statement shall be compatible in all respects and shall be consistent with all Contract requirements. It will be reviewed for reasonableness and conformity with the Contract and upon approval by the Engineer will be used to evaluate general job progress and to forecast periodic pay estimate requirements. The Engineer shall designate the salient components of the Work to appear on such schedule and statement.

No physical construction work shall be performed on the Work site until the above schedule and statement have been submitted in proper form and have been approved by the Engineer, and MassCEC shall not be liable for any delays or increased costs to the Contractor resulting from the Contractor's failure to meet this requirement. Prompt review will be made of any proposed schedule and chronological statement submitted by the Contractor. Prior to the Engineer's approval thereof, the Contractor may commence all aspects of the Work other

than physical construction work at the site, including but not limited to the placing of material orders, preparation of shop drawings, making of field survey layouts, assembly of equipment, and other work in preparation for the commencement of physical construction at the site.

B. If in the opinion of the Engineer, the Contractor's operations have been or will be materially affected by changes in the Plans or in the amount of Work, or if the Contractor's performance has materially failed to conform to the approved schedule and chronological statement, the Contractor shall, upon request by the Engineer, submit to the Engineer within 10 days after such request, for his/her approval, a revised schedule and chronological statement of the types specified above, which shall indicate how the Contractor proposes to prosecute the balance of the Work.

Approval of any such schedule or chronological statement by the Engineer shall not be construed as releasing the Contractor from any of its responsibilities or obligations under the Contract. Such approval shall be a condition precedent to the processing and payment of any monthly pay estimate.

C. Hours of operation are as noted in Section 01 11 00, Summary of Work.

1.3 FORM OF SCHEDULES

A. Prepare schedules in the form of a horizontal bar chart.

1. Provide separate horizontal bar for each trade or operation.
2. Horizontal time Scale: Identify first work date of each week.
3. Scale and spacing to allow space for notations and future revisions.

B. Format of Listings: Chronological order of start of each item of work

C. Identification of Listings: By work area

1.4 CONTENT OF SCHEDULES

A. Construction Progress Schedule

1. Show complete sequence of construction by activity.
2. Show dates for beginning and completion of each major element of construction and installation dates for major equipment items. Elements shall include, but not be limited to, the following:
   a. Receipt of submittal data from supplier/manufacturer submitted to Owner’s Representative, review and return to supplier/manufacturer. Review of Contractor submittals by Owner’s Representative. Allowance for revision of submittals by Contractor to address concerns of Owner’s Representative.
   b. Material and equipment order, manufacturer, delivery and installation, and checkout.
   c. Each mobilization or demobilization event.
   d. Installation of site security measures.

e. 25, 50, 75 and 100 percent complete of Mandatory Schedule Milestones as specified in Section 01 11 00, Summary of Work.
f. Subcontractors items of work.
g. Final cleanup.
h. Allowance for inclement weather.
i. Allowance to address punch list items from Owner's Representative or Owner.

3. Show projected percentage of completion for each item as of first day of each month.

1.5 SCHEDULE REVISIONS

A. Every 15 days, Contractor shall revise construction schedule to reflect changes in progress of work and to indicate progress of each activity at date of submittal.

1. Changes occurring since previous submittal of schedule shall be indicated including:
   a. Changes in scope.
   b. Activities modified since previous submittal.
   c. Revised projections of progress and completion.
   d. Other identifiable changes.

2. Provide a narrative report as needed to define:
   a. Problem areas, anticipated delays, and impact on schedule.
   b. Corrective action recommended and its effect.
   c. Effect of changes on schedules of other affected parties.

1.6 SUBMITTAL REQUIREMENTS

A. For initial submittal of construction schedule and subsequent revisions thereof, furnish an electronic copy of the schedule to Owner's Representative. The format should be in a .mpp file format or other electronic format as solely approved by the Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

# SECTION 01 33 00

# SUBMITTAL PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

### 1.2 SUMMARY

This section specifies the general methods and requirements of submissions applicable to the following work-related submittals.

A. Product Data

B. Planning Documents

C. Equipment Specifications

D. Progress Schedules

E. Construction Photographs

Detailed submittal requirements are specified in the technical specifications section.

### 1.3 SUBMITTALS

A. Submittal Register

The Contractor shall provide a complete list of all submittals included in the technical specifications for use as a submittal register to track the dates for submission, comment, resubmission and final acceptance of the project submittals.

B. Work Plan Submission to State Enhanced Remedy (SER) Project Manager shall include the following:

1. Contractor’s Work Plan
2. Site Specific QA/QC Plan
3. Health and Safety Plan

### 1.4 CONTRACTOR’S RESPONSIBILITIES

The Contractor shall review product data, including those by subcontractors, prior to submission to determine and verify the following:

A. Field measurements

B. Field construction criteria

C. Catalog numbers and similar data

D. Conformance with the Specifications

1. Each submittal shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor. Certification Statement: "By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved submittals and all Contract requirements." Submittals and product data sheets 11-inch x 17-inch and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package. Provide to the Owner's Representative a copy of each submittal transmittal form for product data and samples at the time of submittal of said product data and samples to the Owner's Representative.

    a. Submittals received "WITHOUT" Certification Statement will not be reviewed.

2. If a submittal shows any deviation from the requirements of the Contract Documents, the Contractor shall make specific mention of the deviations in the submittal which shall detail same furnished by the Contractor to the Owner's Representative and provide a description of the deviations in detail which shall include all attachments and materials supporting the Contractors request for deviating from the project Plans and Specifications.

3. The review and acceptance of samples or product data by the Owner's Representative shall not relieve the Contractor from their responsibility with regard to the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor, and the Owner's Representative will not have responsibility thereto.

4. No portion of the work requiring a submittal shall be started whatsoever nor shall any materials be fabricated, placed or installed prior to the acceptance or qualified acceptance of such item. Fabrication performed, materials purchased, or on-site construction accomplished which does not conform to accepted submittals and data shall be at the Contractor's risk. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish written conformity prior to any get ready costs, fabrication, installation or if required by Owner, removal of said work.

5. Project work, materials, fabrication, and installation shall conform with approved applicable samples and product data.

    a. Manufacturer's printed installation instructions, a part of product data submitted to the Owner's Representative will not be reviewed and are for informational purposes only.

## 1.5 SUBMISSION REQUIREMENTS

Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Work or in the work of any other Contractor.

A. All complete submittals shall be submitted sufficiently in advance of construction requirements to provide no less than five (5) days, excluding Saturdays, Sundays and legal holidays for review from the time received at the Owner's Representative's reviewing office. For submittals of major equipment, that require more than five (5) days to review, due to its sheer complexity and amount of detail and also requiring review by more than one engineering discipline, a letter will be sent by the Owner's Representative or his/her designee to the Contractor informing him/her of the circumstances and the date it is expected the submittal will be returned to the Contractor.

1. Number of submittals required
    a. Shop Drawings: Unless otherwise stated in the respective Specifications Sections, submit three (3) copies.
    b. Product Data: Unless otherwise stated in the respective Specifications submit three (3) copies.

2. Submittal Content
    a. The date of submission and the dates of any previous submissions.
    b. The Project title and number.
    c. Contractor identification.

3. The names of:
    a. Contractor
    b. Supplier
    c. Manufacturer

4. Identification of the product, with the specification section number, page and paragraph(s)

5. Field dimensions clearly identified as such.

6. Relation to adjacent or critical features of the Work or materials.

7. Applicable standards, such as ASTM or Federal Specification numbers.

8. Identification of deviations from Contract Documents.

9. Identification of revisions on resubmittals.

10. An 8-in. x 3-in blank space for Contractor and Owner's Representative stamps.

11. Each shipment of drawings shall be accompanied by a transmittal form furnished by the Owner's Representative giving a list of the drawing numbers and the names mentioned above.

## 1.6 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES

A. The Owner's Representative's review is for general conformance with the design concept and contract drawings. Markings or comments shall not be construed as relieving the Contractor from compliance with the contract plans and specifications or from departures therefrom. The Contractor remains solely responsible for details and accuracy, for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.

B. The review of shop drawings, data, and samples will be general. They shall not be construed:

1. as permitting or allowing any departure from the Contract requirements.
2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials.
3. as approving departures from details furnished by the Owner's Representative, except as otherwise provided herein.

C. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirement which the Owner's Representative finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or time for performance, the Owner's Representative may return the reviewed drawings without noting an exception nevertheless not relieving the Contractor for any and all departures from the issued plans and specifications.

D. One (maximum) copy of shop drawings or product data will be returned to the Contractor.

E. Submittals will be returned to the Contractor under one of the action codes indicated and defined on the transmittal form furnished by the Owner's Representative.

F. Resubmittals will be handled in the same manner as first submittals. The Contractor shall direct specific attention, in writing, on the letter of transmittal and on resubmitted shop drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the Owner's Representative, on previous submissions. Any such revisions which are not clearly identified shall be made at the risk of the Contractor. The Contractor shall make corrections to any work done

because of this type of revision that is not in accordance to the Contract Documents as may be required by the Owner's Representative.

G. Partial submittals may not be reviewed. The Owner's Representative will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor and will be considered "Rejected" until resubmitted. The Owner's Representative may at his option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.

H. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents the Contractor shall give written notice thereof to the Owner's Representative at least 7 working days prior to release for manufacture.

I. When the shop drawings have been completed to the satisfaction of the Owner's Representative, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Owner's Representative. Shop drawings shall be stamped by a Professional Engineer registered in the Commonwealth of Massachusetts when noted herein or as required by statute.

## 1.7 GENERAL PROCEDURES FOR SUBMITTALS

A. Coordination of Submittal Times

Prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work sections of the Specifications so that the installation will not be delayed by processing times including disapproval resubmittal (if required), coordination with other submittals, inspection, testing (off-site and on-site), purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the Work.

## 1.8 CERTIFICATION FORMS

If specified in other sections of these Specifications, the Contractor shall submit the applicable certification form for each item required, and in the form attached to this section completely filled in and stamped.

## 1.9 PRECONSTRUCTION SUBMITTALS

At a minimum, the following submittals shall be provided in sufficient time to support the scheduled date for mobilization:

A. Certificates of insurance

B. List of proposed subcontractors

C. List of proposed products and equipment. This includes, but is not limited to, the detailed requirements and items including, but not limited to materials and methods as set forth in the project plans and specifications.

D. Construction progress schedule

E. Submittal register

F. All planning documents referenced in other sections, including, but not limited to:

1. Field Data, Survey Data, Survey Personnel, and Survey Plans as described in Section 01 71 23, Field Engineering
2. Detailed Construction Progress Schedule as described in Section 01 32 16, Construction Progress Schedules
3. Environmental Protection Plan as described in Section 01 35 43, Environmental Protection
4. Equipment including applicable inspections and certification as described in Section 01 60 00, Plant and Equipment
5. Health and Safety Plan as described in Section 01 90 00, General Safety Requirements

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

# SECTION 01 35 43

# ENVIRONMENTAL PROCEDURES

## PART 1 - GENERAL

### 1.1 REFERENCES

A. The publications listed below are incorporated into these Technical Specifications by reference. The publications are referred to in the text by basic designation only.

1. U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

| | |
|---|---|
| 33 CFR 328 | Definitions |
| 40 CFR 68 | Chemical Accident Prevention Provisions |
| 40 CFR 129 | Toxic Pollutant Effluent Standards |
| 40 CFR 260 | Hazardous Waste Management System: General |
| 40 CFR 261 | Identification and Listing of Hazardous Waste |
| 40 CFR 302 | Designation, Reportable Quantities, and Notification |
| 40 CFR 355 | Emergency Planning and Notification |
| 49 CFR 171-178 | Hazardous Materials Regulations |

2. Release Abatement Measure Plan (RAM)/EPA Self Implementing Plan (SIP) (This RAM/SIP is provided as an **Attachment to the Request for Proposal [RFP].)**

3. Soil Management Plan
(This Plan is provided as an **Attachment to the RFP.)**

### 1.2 DEFINITIONS

A. Environmental Pollution

Environmental pollution is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

B. Environmental Protection

Environmental protection is the prevention/control of environmental pollution and habitat disruption that may occur to the environment during the Work. The control of environmental pollution requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid,

chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

C. Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of Hazardous Wastes as defined by MassDEP regulation 310 CMR 30. These waste streams could consist of material brought on site by the Contractor to execute work but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e., methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents and sediment admixtures. Reasonable efforts should be made to re-use these materials for other applications on other projects. if possible, before the Contractor determines that partially consumed materials are waste and must be disposed of as hazardous waste. Materials determined to be hazardous waste must be managed in accordance with MassDEP regulations at 310 CMR 30.0000; including requirements for storage, transport, disposal, and obtaining a Generator Identification Number.

D. Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

E. Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Refer to the definition of Wetlands in MassDEP regulations at 310 CMR 10.

## 1.3 ENVIRONMENTAL PROTECTION REQUIREMENTS

A. General

The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

B. Performance Standards

This section supplements the Contractor's responsibility to the extent that the Owner has already obtained approval of the Work Plan under the State Enhanced Remedy (SER) through the New Bedford Harbor Superfund remedy, and which follows the

guidelines of the Massachusetts Department of Environmental Protection (MassDEP) Water Quality Program Standards.

The Contractor shall comply with the terms and conditions of the Performance Standards and the included Performance Standards that are applicable to the work. Such applicable terms and conditions are specified in the various sections of these specifications, on the Contract Drawings, and provided on the Performance Standards in the **Attachments to the RFP**. The above referenced documents shall not be relied on for Contract requirements. In the event that a discrepancy is discovered in the reference documents, the specifications, or the Contract Drawings, the Contractor shall notify the Owner's Representative for clarification. The Owner's Representative will rely on requirements and conditions of the Performance Standards to resolve perceived conflicts.

C. Silt/Turbidity Curtain

Silt curtain anchor piles have been previously installed around CAD Cell No. 4 through a separate contract. Contractor shall evaluate materials (timber piles) and installation plan and include in Bid Item No. 028 (Dredge Mobilization / Demobilization) any proposed modifications as well as maintenance of the previously installed piles for the duration of the project. The Owner will not provide additional materials for Contractor use. Modifications to timber pile locations will be required to gain access into CAD Cell No. 3. See Drawing MD 104 for more information. No silt curtain will be deployed at CAD Cell No. 4 at the time of this project.

In addition, Contractor shall deploy and maintain silt curtains and absorbent booms to enclose all dredging and in-harbor disposal areas as required. See Contract Drawings for CAD Cell No. 4 information and SER Performance Standards in the **Attachments to the RFP**.

## 1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section with their subcontractors.

## 1.5 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00, Submittal Procedures:

A. Preconstruction Submittals

1. Environmental Protection Plan

The Environmental Protection Plan shall include the following plans as further described in a Spill Control Plan Contaminant Prevention Plan.

2. Silt Curtain (turbidity curtain) Installation Plan

The Contractor shall evaluate materials (timber piles) and installation plan and include any proposed modifications as well as maintenance of the previously installed piles for the duration of the project. The Owner will not provide additional materials for Contractor use. In addition, Contractor shall deploy and maintain silt curtains and absorbent booms to enclose all backfilling, dredging and in-harbor disposal areas as required. See the SER Performance Standards, which is an **Attachment to the RFP,** for more information.

a. Silt curtains and absorbent booms shall be deployed to enclose all backfilling and dredging and in-harbor disposal areas (CAD Cell No. 3). The Contractor is required to furnish and install a silt curtain and oil absorbent boom as required in the SER Performance Standards. CAD No. 4 silt curtain timber piles are in place for Contractor use and shall remain in place at the completion of CAD No. 4 disposal. The Contractor shall removal all silt curtain and boom at the completion of all dredging/disposal events.

b. The Contractor's plan for deployment of the silt curtains/absorbent booms shall be submitted to the SER Project Manager (PM) for review prior to the start of in-water work as part of the Contractor's work plan submittal. Should the deployment of silt curtains prove not feasible or be unsuccessful, the SER PM will be notified prior to any dredging without silt curtains.

c. The Contractor shall submit the Silt Curtain Installation Plan at least 10 days prior to commencing pile installation. The Silt Curtain Installation Plan shall incorporate the requirements specified herein with respect to the geotextile fabric, cable, anchoring, flotation elements, and fasteners regarding installation and anchoring procedures. This plan shall provide information on the specific silt curtain appurtenances, delivery of the silt curtain to the site, handling, storage, placement, and maintenance procedures. Fabrication details and installation techniques shall be documented in the Silt Curtain Installation Plan. This plan must be approved by the New Bedford Port Authority (NBPA) prior to the commencement of any in-river disposal activities.

## 1.6 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Owner's Representative. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during the Work. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to the submittal of the Environmental Protection Plan, the Contractor shall meet with the Owner's Representative for the purpose of discussing the implementation of the initial Environmental Protection Plan;

possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

A. Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

B. Contents

The Environmental Protection Plan shall include, but shall not be limited to, the following:

1. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.
2. Name(s) and qualifications of person(s) responsible for managing waste to be removed from the site, if applicable.
3. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
4. Description of the Contractor's environmental protection personnel training program.
5. Work area plan showing the proposed activity in each portion of the site and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.
6. The Spill Control Plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations (such as 310 CMR 40.0000, The Massachusetts Contingency Plan). Any spill above a reportable quantity should be reported to MassDEP at (888) 304-1133. The proper notifications need to comply with 310 CMR 40. This plan shall include as a minimum:

    a. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Owner's Representative in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.
    b. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

c. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.
d. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.
e. The methods and procedures to be used for expeditious contaminant cleanup.

C. A Contaminant Prevention Plan that identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. A copy of the Safety Data Sheets (SDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the Contaminant Prevention Plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.

## 1.7 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings, plans and specifications which may have an environmental impact will be subject to approval by the Owner's Representative and may require an extended review, processing, and approval time. The Owner's Representative reserves the right to disapprove alternate methods, even if they are more cost effective, if the Owner's Representative determines that the proposed alternate method will have an adverse environmental impact.

## 1.8 NOTIFICATION

The Owner's Representative will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, project Performance Standards, and other elements of the Contractor's Environmental Protection Plan. The Contractor shall, after receipt of such notice, inform the Owner's Representative of the proposed corrective action and take such action when approved by the Owner's Representative. The Owner's Representative may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Owner's Representative may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

# PART 2 - PRODUCTS

## 2.1 SILT CURTAIN

Silt curtains shall be SILTDAM Impermeable HD Floating Turbidity Barrier or approved equal. The silt curtain consists of a low impermeable geotextile barrier capable of being deployed and functioning as a silt barrier in the Acushnet River/New Bedford Harbor for the required duration.

A. The silt curtain shall be extended around the complete perimeter of the dredging and in-harbor disposal areas. The only openings shall be "doors" to allow vessel traffic into and out of the areas. These "doors" shall be returned to the closed position during all dredged material placement and openings shall be minimized during dredging in order to achieve the water quality standards. The silt curtain shall extend from the water surface to within approximately 6 inches of the harbor bottom at mean lower-low water. Note that a deeper curtain would rest on the harbor bottom at lower tides and may generate water column silt as a result.

B. The silt curtain shall be securely anchored to the existing/new wood piles at appropriate spacing, and be of sufficiently strong material construction, to withstand high winds, storm driven waves, large vessel wake, etc. The silt curtain shall be anchored along its bottom as necessary to maintain its vertical position. The Contractor is responsible for the design and deployment of silt curtain. The Contractor's work plan shall provide the details of the Contractor's proposed silt curtain plan for SER review and approval.

C. The separate sections making up the perimeter silt curtain shall be seamed to sufficiently overlap to prevent releases of any silt plumes or oil sheens between sections. The top foot of the curtain shall be a solid material to similarly prevent/minimize releases of an oil sheen and small debris.

D. An oil-absorbent boom shall be placed along the entire interior of the silt curtain during placement operations. This boom shall be overlapped as specified above and shall be replaced per manufacturer's direction or as needed to retain the ability to absorb any oil sheens that may be present.

Silt curtains were installed at CAD Cell No. 4 by others. The Contractor is not responsible for installation of silt curtains for CAD Cell No. 4 but is responsible to repair any damage caused from work activities being performed at CAD Cell No. 3 through this contract. If repairs are necessary, then they must be performed expeditiously and with consistent materials as described above.

## PART 3 - EXECUTION

### 3.1 GENERAL

The Contractor shall be responsible for complying with all environmental regulations required by Federal, State, Regional, and local environmental laws and regulations.

## 3.2 LAND RESOURCES

A. The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area.

B. The following additional specific erosion control measures (in addition to those measures shown on the Contract Drawings) shall be performed as needed by the Contractor to control erosion and sedimentation from exposed areas and from:

1. All unused debris, soil, and other material shall be stockpiled in locations of relatively flat grades, away from any trees identified to be saved and upgradient of the erosion control sock and generally in the locations shown on the Construction Drawings. Stockpile side slopes shall not be greater than 2:1. All stockpiles shall be surrounded by erosion control sock and shall be placed outside the 100-foot buffer to any bordering vegetated wetland. Surrounding erosion control sock shall be inspected and maintained on a daily basis in accordance with the 'Erosion Control Sock' requirements described above.

2. When stockpiles are not anticipated to be disturbed for long periods of time or left bare for more than 7 days, they should be covered in jute netting and/or watered on a regular basis to prevent dust from forming and potentially blowing off site. Should the surfaces of the piles appear to be dry and dust is being created, the piles should be covered or watered immediately.

3. In addition, areas identified by the Owner's Representative as requiring treatment to control erosion and sedimentation controls shall be treated in accordance with the above notes and Construction Drawings.

C. The Contractor shall immediately comply with any order from the Owner's Representative for the installation of additional erosion/sediment/turbidity controls to protect resource areas beyond what is shown on the plans if field conditions or the Owner's Representative's judgment dictate that additional protection is necessary.

D. Contractor Facilities and Work Areas

The Contractor shall propose locations for field offices, staging areas, stockpile storage, and temporary buildings for approval by the Owner/Owner's Representative. Temporary movement or relocation of Contractor facilities shall be made only when approved by the Owner's Representative.

## 3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of

quantifying sediment or pollutant loading to that surface water as required by the Clean Water Act.

A. Wetlands

The Contractor shall not enter, disturb, destroy, or allow discharge of contaminants into any wetlands. The Contractor shall be responsible for the protection of wetlands in accordance with applicable regulations. Authorization to enter specific wetlands identified shall not relieve the Contractor from any obligation to protect other wetlands within, adjacent to, or in the vicinity of the construction site and associated boundaries.

## 3.4 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

A. Particulates

Dust particles; aerosols and gaseous by-products from construction activities shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall maintain the work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. The Contractor must have sufficient, competent equipment available to accomplish these tasks. The Contractor shall implement particulate control measures whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations. Refer to MassDEP regulations at 310 CMR 7.00.

B. Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a nuisance or health hazard and shall be in compliance with State regulations at 310 CMR 7.02 and/or more stringent local ordinances.

C. Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environmental damage by noise. The Contractor shall comply with the provisions of the Commonwealth of Massachusetts rules and policy DAQC 90-01 “Allowable Sound Emissions.” The Contractor shall also comply with City of New Bedford noise regulations and requirements. Sound measurements at the property line shall not exceed 90 dBA. The Contractor shall implement measures to mitigate noise pollution if the Contractor exceeds this standard and shall consider, at a minimum, the following mitigation measures to reduce site noise:

1. Staging of site works to maximize use of the existing site features/facilities as acoustic barriers where possible.
2. Noise and vibration awareness training for all site staff including subcontractors as part of general site induction and tailgate talk activities.
3. Strict adherence to approved works times. In the event that out of hours delivery activities are required.
4. Works shall be scheduled, where practical, to avoid simultaneous noisy activities occurring on site.
5. Vehicles shall not be left turned on or idling at the site for longer than minimum amount of time required completing site activities.
6. Should the above-listed activities prove ineffective, the Contractor shall halt work until the Contractor is able to propose an effective solution to control site noise.

D. Additional Dust, Odor and Noise Control

Specific dust and odor details can be found in Section 8.0 in the Draft Release Abatement Measure Plan (RAM)/EPA Self-Implementing Plan (SIP) and in Section 4.0 of the Soil Management Plan. If, in the opinion of the Owner's Representative, the dust, odor and noise control measures are inadequate or insufficient to meet the intent of the specification, the Contractor shall be requested to implement additional measures to control dust, odor and noise at no additional cost to the Owner. Refer to MassDEP regulations at 310 CMR 7.09. Action levels for airborne particulates, airborne PCBs, airborne asbestos and lead are listed in the table below. The Contractor shall implement best management practices onsite to minimize the potential for exceedances of air quality standards onsite. Actions to control impacts to air shall not be cause for additional compensation to the Contractor. The air quality standards are as follows:

| Constituent | Air Quality Standard | Required Action |
|---|---|---|
| Airborne Particulates ($PM_{10}$) | Any visible dust emissions from Work activities. | Implement corrective measures to control dust (e.g., water sprays). |
| Airborne Particulates ($PM_{10}$) – (5-minute average TEOM data or equivalent) | Not to Exceed 75 ug/$m^3$ | Increase application of dust controls |
| Airborne Particulates ($PM_{10}$) – (5-minute average TEOM data or equivalent) | Not to Exceed 150 ug/$m^3$ | Halt Work and Notify Owner’s Representative and EPA |
| Airborne Particulates ($PM_{10}$) – 10 Hour Time Weighted Average | Not to Exceed 100 ug/$m^3$ | Halt Work and Notify Owner’s Representative and EPA |
| Airborne PCBs | Not to Exceed 0.10 ug/$m^3$ | Halt Work and Notify Owner’s Representative and EPA |

| Constituent | Air Quality Standard | Required Action |
|---|---|---|
| Airborne Asbestos | Not to Exceed 0.1 fiber/ cubic centimeter | Halt Work and Notify Owner's Representative and EPA |
| Lead | Not to Exceed 50 ug/$m^3$ | Halt Work and Notify Owner's Representative and EPA |

Should the levels in the table above be exceeded, the Contractor shall immediately suspend all Work (except as noted in the table above) and implement whatever control measures are necessary to abate the condition. If the levels exceeded indicate a threshold that requires the halt of work, the Contractor shall halt work immediately and prepare and submit a Corrective Action Plan to the Owner's Representative for review and approval. The Owner's Representative shall submit the Corrective Action Plan to EPA for review and approval. Work shall not resume until EPA has approved the Correction Active Plan and until the plan has been implemented by the Contractor. Delays associated with the halt of work, preparation of a Corrective Action Plan, or review by EPA shall not be cause for a change in cost or schedule for the Work.

E. Diesel Exhaust

Any stationary emergency or standby engine installed at the site shall comply with the requirements of 310 CMR 7.02(8)(i) and 310 CMR 7.26(40) and (44) as applicable. Any engine that is mobile in nature shall comply with federal standards with regards to limitation on the sulfur content of fuel. Construction equipment used for this project shall comply with federal off road diesel emission standards including the use of ultra-low sulfur diesel fuel (15 ppm sulfur content) in all diesel engine powered equipment. All equipment shall meet the Tier 1-3 emission standards for off-road diesel equipment and to the extent practicable; all diesel-powered equipment shall meet the Tier 4 emission standards (the final deadline for which is 2015), per 40 CFR Part 89.

Contractors are encouraged to use diesel oxidation catalyst retrofitted vehicles and equipment, and projects are directed to MassDEP for retrofitting guidance. Diesel-powered equipment shall be fitted with after-engine emissions controls such as oxidation catalysts or particulate filters.

The Contractor shall not cause, suffer, allow or permit visible emissions including smoke from any marine vessel, spark-ignited internal combustion engine or non-stationary diesel engine as per 310 CMR 7.06.

To the extent any activities may include Groundwater/Soil venting systems, Conveyors and dry material storage silos, and rock crushing/processing as part of the construction or reconstruction of the site, they shall comply with the requirements of 310 CMR 7.03.

## 3.5 MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of waste shall be as directed below, unless otherwise specified in other sections and/or shown on the Drawings.

A. Solid Waste

Solid waste shall be managed in accordance with applicable regulations.

B. Contractor Management of Hazardous Waste/Excess Hazardous Materials and Spill Response

1. Contractor Management of Hazardous Waste/Excess Hazardous Materials

Hazardous waste is defined by applicable MassDEP regulations at 310 CMR 30.0000 and more stringent local regulations, if any. Hazardous materials are defined in M.G.L. Chapter 21E and 49 CFR 171 - 178. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during performance of the work. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take appropriate precautionary measures to prevent accidental spillage. The Contractor shall be responsible for storing, describing, packaging, labeling, marking, and placarding hazardous waste and hazardous material in accordance with all appropriate, relevant and applicable Federal, State, and local laws and regulations. The Contractor shall transport Contractor generated hazardous waste off Government property within 30 days in accordance with MassDEP regulations at 310 CMR 30.0000 and Department of Transportation laws and regulations.

2. Contractor Response to a Spill or Release of Hazardous Materials

A spill or release of hazardous or toxic materials resulting from Contractor activities shall be immediately reported to the Owner's Representative. Appropriate regulatory authorities shall be notified in a timely fashion in accordance with MassDEP regulations at 310 CMR 40.0000. All associated cleanup activities and cleanup costs due to such spills shall be the Contractor's responsibility. The Contractor shall coordinate the disposition of hazardous materials unearthed as a result of the dredging activity that can be attributed to prior disposal activities by a third party(ies) with the Owner's Representative. The Contractor shall provide to the Owner's Representative three quotes for the disposal of such hazardous materials for consideration of payment as a changed condition. All cleanup activities shall be conducted in conformance with the Massachusetts Contingency Plan regulations at 310 CMR 40.0000 as administered by MassDEP.

C. Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations.

## 3.6 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

## 3.7 BIOLOGICAL RESOURCES

The Contractor shall make every reasonable effort to minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

## 3.8 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil or sediment residuals, egg deposits from plant pests, noxious weeds, and plant seeds.

## 3.9 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control, and in accordance with the provisions contained in Section 00700, General Conditions, and in Section 00800, Supplementary Conditions. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

## 3.10 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for Construction (“Construction Areas” shall be defined as any area used by the Contractor) to their pre- construction condition. The Contractor shall, unless otherwise instructed in writing by the Owner's Representative, obliterate all signs of

temporary construction facilities such as work areas, structures, construction trailers, staging areas, stockpiles of excess or waste materials, and all other vestiges of construction prior to final acceptance of the work.

END OF SECTION

# SECTION 01 50 00

# TEMPORARY CONSTRUCTION FACILITIES

## PART 1 - GENERAL

### 1.1 GENERAL REQUIREMENTS

A. Site Plan

The Contractor shall propose a location for temporary construction facilities, Contractor's temporary project field office, staging areas, areas for staging materials, areas for staging debris, as necessary, or staging of equipment for the review and approval by the Owner's Representative. The Contractor shall also indicate if the use of a supplemental or other staging area is desired.

B. Identification of Employees

The Contractor shall be responsible for furnishing to each employee, and for requiring each employee engaged on the work to display identification as approved and directed by the Owner's Representative. Prescribed identification shall immediately be delivered to the Owner's Representative for cancellation upon release of any employee. When required, the Contractor shall obtain and provide fingerprints of persons employed on the project. Contractor and subcontractor personnel shall wear identifying markings on hard hats clearly identifying the company for whom the employee works.

### 1.2 AVAILABILITY AND USE OF UTILITY SERVICES

A. Temporary Electrical Service

The Contractor, at its expense and in a manner satisfactory to the Owner's Representative, shall provide and maintain necessary temporary connections, distribution lines and disconnects, and other equipment to provide temporary electrical service for site needs. The Contractor shall coordinate with the Owner and the New Bedford electrical inspector to obtain, operate, meter, and pay for, the necessary electrical connection and permits. All electrical work shall conform to applicable federal, state and local electrical code requirements.

B. Sanitation

The Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities approved by the Owner's Representative.

At its discretion, the Contractor may, at its expense and in a manner satisfactory to the Owner's Representative, provide and maintain necessary temporary connections, distribution lines and disconnects, and other equipment to provide temporary sanitary

service for site needs. The Contractor shall coordinate with the New Bedford Department of Public Infrastructure to obtain, operate, and pay for, the necessary sanitary connection and permits. All sanitary work shall conform to applicable federal, state and local requirements.

C. Telephone/Internet

The Contractor shall make arrangements and pay all costs for telephone and internet facilities desired for Contractor's own operations.

D. Project Lighting

MassCEC's Marine Commerce Terminal is equipped with high-mast lighting on the upland of the site. MassCEC shall enable nighttime high-mast lighting at Contractor's request and pro-rata expense. Contractor shall provide, at Contractor's sole expense, all other lighting needs.

E. Water Service

At its discretion, the Contractor may, at its expense and in a manner satisfactory to the Owner's Representative, provide and maintain necessary temporary connections, distribution lines and disconnects, and other equipment to provide temporary water service for site needs. The Contractor shall coordinate with the Owner to obtain, operate, and pay for, the necessary water connection and permits. All water work shall conform to applicable federal, state and local requirements.

1.3 BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

A. Bulletin Board

Upon beginning of work, the Contractor shall provide a bulletin board for displaying all applicable postings as required by Federal, State and local regulations. The bulletin board shall be located at the project site in a conspicuous place easily accessible to all employees, as approved by the Owner's Representative. Legible copies of the aforementioned data shall be displayed until work is completed. Upon completion of work the bulletin board shall be removed by and remain the property of the Contractor.

B. Project and Safety Signs

The Contractor will be required to construct a project sign to be displayed on any temporary structures. The sign shall contain three logos (Owner Representative and Contractor) of a maximum of three colors each. The specific wording and layout of the sign will be provided by the Owner's Representative at the time of award. The sign shall be erected within 15 days after receipt of the notice to proceed. Upon completion of the project, any signs shall be removed from the site.

The Contractor is responsible to provide sufficient safety signage at the entrance to the site in accordance with MA State Highway and other applicable regulations. Safety

and other signs shall be provided as required to support the Contractor's work on the site.

## 1.4 SECURITY PROVISIONS

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall establish fencing around land-based portions of work associated with the project and shall maintain adequate security measures to prevent unauthorized entry. The Contractor shall be responsible for the security of its own equipment; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

## 1.5 COMMUNICATION

Whenever the Contractor has the individual elements of its vehicles and/or equipment so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. One such device shall be made available for use by the Owner's Representative.

## 1.6 CLEANUP

Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away twice daily or more frequently, if requested by the Owner. Stored material, not in trailers, whether new or salvaged, shall be neatly stacked when stored.

## 1.7 RESTORATION OF PROJECT AREA

Areas used by the Contractor for the storage of equipment or material, debris handling, sediment offloading, dewatering or other use, shall be restored to the original or better condition.

# PART 2 - PRODUCTS (NOT USED)

# PART 3 - EXECUTION (NOT USED)

END OF SECTION

# SECTION 01 57 00

# TRAFFIC REGULATION

## PART 1 - GENERAL

### 1.1 REQUIREMENTS INCLUDED

A. The Contractor shall furnish, install, operate and maintain equipment, services and personnel with traffic control and protective devices, as required by the agencies responsible for the roads to expedite vehicular traffic flow on haul roads, at site entrances, on-site access roads and parking areas.

B. Prior to performing any work on public roads or thoroughfares, the Contractor shall obtain a permit from the City of New Bedford. The Contractor shall perform all work in accordance with the obtained permits. The Contractor is responsible for maintaining traffic control with police officers, signs, etc., as required by the permit.

C. The Contractor shall notify all property owners at least 48 hours in advance of any work which will interfere with access to their residence or place of business.

D. No road shall be closed to traffic without the prior consent of the Owner's Representative, the agency responsible for the road and the local police department.

E. Traffic control including, but not restricted to, signing and devices shall be provided for all openings in roads in accordance with standards described in the latest edition of the Massachusetts Department of Highways Manual on Uniform Traffic Control Devices.

F. If roads are disturbed during construction, the Contractor shall restore the road base and surface to the satisfaction of the City of New Bedford.

### 1.2 TRAFFIC SIGNALS AND SIGNS

A. The Contractor shall provide and operate traffic control and directional signals required to direct and maintain an orderly flow of traffic in all areas under the Contractor's control or affected by the operations.

B. The Contractor shall provide and operate traffic control and directional signals. Mounted on barricades or standard posts at the following locations:

1. Each change of direction of a roadway and each crossroads.
2. Detours.
3. Parking areas.

C. Existing permanent traffic control signing and devices, including guard rails, shall not be removed without the prior consent of the agency responsible for the road.

1.3 FLAGMEN

A. The Contractor shall provide qualified and suitably equipped flagmen when construction operations encroach on traffic lanes, as required for regulation of traffic.

1.4 FLARES AND LIGHTS

A. The Contractor shall provide flares and lights during periods of low visibility to clearly delineate traffic lanes and to guide traffic and for use by flagmen in directing traffic.

B. The Contractor shall provide illumination of critical traffic and parking areas.

1.5 CONSTRUCTION PARKING CONTROL

A. The Contractor shall control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, any utility's operations or construction operations.

B. The Contractor shall monitor parking of construction personnel's private vehicles, maintain free vehicular access to and through parking areas and prohibit parking on or adjacent to access roads or in non-designated areas.

1.6 HAUL ROUTES

A. The Contractor shall consult with governing authorities to establish those public thoroughfares which will be used as site access and haul routes.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

# SECTION 01 60 00

# PLANT AND EQUIPMENT

## PART 1 - GENERAL

### 1.1 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00, Submittal Procedures:

A. Plant and Equipment:

Submit a schedule of the plant and equipment, which hereby includes all vehicles, plant(s), equipment, the Contractor intends to employ in the performance of the work of this contract. See Section 01 00 00, Bidding Schedule, where this schedule is required as part of the Bid Form. Changes proposed by the Contractor to the plant and equipment schedule considered for award of the bid are subject to the approval of the Owner's Representative.

### 1.2 PLANT AND EQUIPMENT

A. Sufficient Capacity

The Contractor shall keep on the job sufficient plant and equipment to meet the requirements of the work and to meet the schedule milestones. The plant and equipment shall be in satisfactory operating condition and be capable of safely and efficiently performing the work. The plant and equipment shall be subject to inspection by the Owner's Representative at all times.

B. Minimum Capacity

The plant and equipment listed on the Plant and Equipment Schedule submitted with the Contractor's bid is the minimum which the Contractor shall place and keep on the job unless otherwise determined by the Owner's Representative. The listing of plant and equipment is not to be construed as an agreement on the part of the Owner that the equipment is adequate to perform the required work.

C. Reduction in Capacity

No reduction in the capacity of the plant and equipment employed on the work shall be made except by written permission of the Owner's Representative. The measure of the capacity of the plant and equipment shall be its actual performance on the work covered by this contract.

D. Inspections and Certifications

Prior to commencement of work at the site, the Contractor shall submit to the Owner's Representative for review, copies of all applicable inspections and certifications of plant and equipment as required by Federal, State and local laws and regulations. Such inspections and certifications shall be current and maintained in force for the duration of this Contract. The Contractor shall have on land a fuel and waste oil management plan which details the method for protecting fuel and waste oil from unintended releases, including secondary containment structures, and details intended for disposal method for waste oil and fuel. All equipment used in the prosecution of the work that uses fuel, oil or hydraulic fluid shall be inspected daily for leakage.

## 1.3 LICENSE REQUIREMENTS (NOT USED)

## 1.4 PERMIT REQUIREMENTS

The Contractor's plant and equipment employed on the work shall meet the requirements of all applicable permits, certifications, and performance standards issued for the project as specified in these specifications.

## 1.5 HEIGHT LIMITATIONS

Height limitations for equipment shall conform to the FAA requirements for the various areas of the project. The Contractor is responsible for coordinating these height limitations prior to commencing with the work.

# PART 2 - PRODUCTS (NOT USED)

# PART 3 - EXECUTION (NOT USED)

END OF SECTION

# SECTION 01 71 23

# FIELD ENGINEERING

## PART 1 – GENERAL

### 1.1 SUMMARY

A. Engineering Services

The Contractor shall provide and pay for field engineering services required for the project, including:

1. Survey work required in execution of this project, except for surveys performed by the Owner's Representative as indicated in these specifications.
2. Civil, geotechnical, structural or other professional engineering services specified, or required to execute Contractor's construction methods.
3. Equipment positioning work required in the execution of the project, including crane positioning, dredge positioning, and scow disposal positioning for CAD cells.

B. Existing Control Points

The Owner's Representative will identify existing control points as required.

C. Survey Datum

Horizontal Datum = North American Datum of 1983 (2011 adjustment) State Plane coordinates, Massachusetts Mainland Zone (FIPSZONE 2001), U.S. Foot. All coordinates and elevations shall be recorded to the nearest 100th of a foot. For plotting, soundings shall be rounded to one decimal place.

Vertical Datum = Mean Lower Low Water Datum (MLLW; offset 1.92’ from NAVD 88). Per MassCEC’s consultant, John McAllister, P.E. of McAllister Marine Engineering, email dated 2024-05-01 it was agreed that the 1.92’ datum offset of NAVD 88 to MLLW conversion was acceptable for all terminal projects. The 1.92’ offset was provided by the USACE. Vertical datum must be displayed on project notes sheet, at minimum.

Mean Higher High Water = EL. +3.96 (MLLW)
Mean High Water = EL. +3.71 (MLLW)
North American Vertical Datum = EL. +1.92 (NAVD88)
Mean Low Water = EL. +0.14 (MLLW)
Mean Lower Low Water = EL. 0.0 (MLLW)

## 1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00, Submittal Procedures:

A. Field Data

The Contractor shall submit sufficient field data in a digital format with ASCII files containing Easting, Northing, and Elevations in the project datum, along with any field survey notes. The field data submittal shall have enough detail to allow the Owner to reproduce the Contractor's submittal survey plot by referring only to this field data.

B. Survey Data

Submit all quality control survey data and plots. Plots shall include cross-sectional data that shows the latest survey, previous surveys, and design templates. Plots shall be at a sufficient density to indicate the general topography along with a schedule for correcting deficiencies. Plots shall be submitted no more than 1 day after completion of field work.

C. Survey Personnel

Furnish a complete listing of the personnel who will perform the survey work required by the contract. The listing shall include a brief summary of the hydrographic survey experience of each person. The list shall be submitted prior to the preconstruction conference. Land side survey work will be in the responsible charge of a licensed Professional Land Surveyor. Survey personnel for bathymetric work shall include a licensed Professional Engineer (PE), licensed Professional Land Surveyor (PLS), or a THSOA Certified Hydrographer (CH) who shall have responsible charge, and oversee all surveys. The state of licensure shall be Massachusetts.

D. Charts

Current and tide charts for the area(s) being dredged shall be submitted by the Contractor.

E. Site Specific Survey Plan and Quality Assurance/Quality Control (QA/QC) Document

Submit survey plans specified below. Field surveys shall not begin until these plans are approved.

F. Survey Vessel Calibration Report

After confirmation of vessel calibration, the Contractor shall submit a survey vessel calibration report that includes the results of all QA/QC testing. It shall also include an XYZ ASCII file of the Contractor's survey of the reference surface provided by the Owner. No dredging shall be performed until the Contractor can confirm survey vessel performance.

G. Dredge Positioning Plan

Submit a Dredge Positioning Plan as specified below.

H. Dredge Positioning Calibration Report

After confirmation of dredge positioning system calibration, the Contractor shall submit a Dredge Positioning Calibration Report that includes the results of all QA/QC testing. No dredging shall be performed until the Contractor can confirm dredge positioning performance.

I. Scow Positioning Plan

Submit a Scow Positioning Plan as specified below. This shall include positioning systems that will be utilized to control both CAD cell disposal and offshore disposal.

J. Scow Positioning Calibration Report

After confirmation of scow positioning system calibration, the Contractor shall submit a Scow Positioning Calibration Report that includes the results of all QA/QC testing. No dredging shall be performed until the Contractor can confirm scow positioning performance.

K. Crane Positioning Calibration Report

After confirmation of crane positioning system calibration, the Contractor shall submit a Crane Positioning Calibration Report that includes results of all QA/QC testing. No piles shall be installed until the Contractor can confirm layout and crane positioning performance.

L. Record As Built Plans

Contractor shall provide record measurements and as-built plans of the facilities. Terminal expansion as-built plans shall be prepared and stamped by a Professional Land Surveyor registered in the Commonwealth of MA. Contractor to supply as-built plans in ESRI or GIS friendly format, AutoCAD, as well as stamped paper plan set.

## 1.3 EXAMINATION

A. Examination of Site and Verification of Conditions

1. Before starting operations, the Contractor shall examine site to become acquainted with conditions to be encountered.
2. The Contractor shall verify exact locations of all above and below ground and submerged utilities including sewers, water mains, gas mains, telephone/ communications lines, above or below ground and submerged electrical wires, other utilities, conduits and structures which may interfere with work.
3. Furnish information to the Engineer and the appropriate utility regarding conflicts that are necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction.

B. Utility Company Contacts

The names and contact numbers of area utility companies are included in Section 00800, Supplementary Conditions. Additional utility companies, appurtenances, and municipal and private utilities may be present in the work areas. It is the Contractor's sole responsibility to conduct its own due diligence concerning the presence of utilities within the work area, and to protect all utilities from damage (of any kind) as a result of any of the Contractor's activities. The Contractor is responsible to contact Dig Safe prior to dredging or excavation of any kind and to implement all necessary and appropriate safeguards to prevent damage or disturbance to buried utilities and appurtenances.

## 1.4 EASEMENTS AND RIGHTS-OF-WAY

A. Easements and rights-of-way reasonably necessary for performance of the Work, unless otherwise specified herein, will be provided by the Owner.

B. The Contractor shall confine construction operations within limits indicated on drawings and/or within limits of approved easements or public ways.

C. The Contractor shall perform the work in a way that minimizes disturbance to the landowner's operations and property to the greatest extent possible.

D. The Contractor shall place construction tools, equipment, materials and supplies, so as to cause least possible damage to property and interference with traffic.

E. The Contractor shall restore the temporary construction easement area and land used for construction to a state equal to or better than it was before the project began. All work, including labor, equipment and materials, shall be considered incidental to Site Preparation bid item. Includes all surface and structure repair, vegetation and landscaping, debris removal, etc.

## 1.5 LAYOUT OF WORK

A. The Owner's Representative will furnish two controls point to the Contractor. The Contractor must supply additional control points as may be required in the performance of the dredging. Any new control produced for the project must be submitted on a benchmark sheet similar to the ones provided. All sheets must be stamped by a PE (elevations only) or PLS.

B. From these control points, the Contractor shall lay out the dredging Work by establishing all lines and grades at the site necessary to control the Work and shall be responsible for all measurements that may be required for the execution of the Work as prescribed in the specifications and/or shown on the Contract Drawings. All field notes, sketches, recordings and computations made by the Contractor shall be available at all times during the progress of the work for ready examination by the Owner's Representative.

C. The Contractor shall furnish, at their own expense, all such stakes, spikes, steel pins, templates, platforms, equipment, tools and material and all labor as may be required in laying out any part of the work from the control points established by the Owner. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other markers established by them until authorized to remove them. If the control point(s) established at the site by the Owner are destroyed by or through the activities of the Contractor (prior to their authorized removal), said point shall be replaced by the Owner or the Owner's Representative. The expense of replacement will be deducted from any amount due or which may become due the Contractor. The Owner's Representative may require Work be suspended at any time when horizontal and vertical control points established at the site by the Contractor are not reasonably adequate to permit checking the Work. Such suspension will be withdrawn upon proper replacement of the control points.

D. Prior to the commencement of Work, the Contractor shall submit details of their proposed dredge positioning system for the Project Engineer's review. All dredge control and positioning for this project shall be accomplished by means of a dredge mounted global positioning system (GPS) controlled positioning systems. The dredge positioning shall consist of, as a minimum, a differential GPS positioning system, an on-board computer with Microsoft Windows 11 or higher, an azimuth determination system (GPS or electronic compass), a bucket depth sensing device and positioning system software. The Contractor shall provide confirmation that he/she provides adequate control during construction so that required depths are achieved but excess dredging beyond authorized depths/limits is avoided/minimized. Conventional depth identifying methods such as cable markings are not acceptable for this project.

The operator shall have a full "heads up" computer monitor display within easy view for control of their Work. The software shall be "Dredge Pack" package as manufactured by Hypack® or approved equal. Positioning systems shall be capable of producing mean horizontal deviations of 2.0 feet or less and maximum vertical deviation of 0.20 feet. The Operator's display shall have an outline of the project

area and the limits of dredging areas. The dredging areas shall be sectioned into individual cuts, which represent the real swing width of the dredge. The true horizontal position of the dredge bucket shall be visible in real time on the display, and the depth of the bucket shall also be displayed. The on-board computer shall have the ability to store real-time dredge positions. This data shall be made available to the Project Engineer from time to time on digital format as he/she may request from time to time.

The Contractor shall provide a Dredge Positioning Calibration Report prior to the commencement of dredging. The Contractor shall demonstrate to the Project Engineer that the positioning system has been properly calibrated and shall proof all azimuth and offsets by checking against the stationary position of the dredge utilizing conventional land survey methods. If during dredging operations, the system should malfunction, dredging operations shall cease until such a time that the system is repaired and back in proper operation.

The Contractor shall have an individual on site at least 4 hours per day, who has at least 5-years' experience in the setup, operation, calibration and maintenance of on-board marine electronic position systems. This individual shall have a working knowledge of electronic positioning systems and accepted survey procedures and practices. No dredging work will be allowed to commence until the Contractor's dredge positioning system is approved by the Project Engineer, operational, calibrated and properly functioning.

E. Prior to the commencement of filling in the CAD cells, the Contractor shall submit details of their proposed Scow Positioning Plan for the Project Engineer's review. All scow control and positioning for this project shall be accomplished by means of scow mounted GPS controlled positioning system. The scow positioning shall consist of, as a minimum, a differential GPS, an on-board computer with MS Windows 11 or higher, an azimuth determination system (GPS or electronic compass), a scow draft sensing device, and positioning system software. The Contractor shall provide confirmation that he/she provides adequate control during scow dumping operations so that there is a controlled release of the sediments into the CAD cell at the specified locations.

The Contractor shall provide, in the Scow Positioning Plan, the means and methods that ensure that the disposal of sediments into the CAD cells is done in a controlled manner.

## 1.6 CONTRACTOR SURVEYS

A. Personnel

The Contractor survey Work, to be performed under this contract, shall be accomplished by, reviewed, and approved by a PE, PLS, or CH familiar with and having a minimum of 5 years of personal experience with hydrographic surveys.

B. Site Specific Survey Plan and QA/QC Document

To ensure that the method of surveying is acceptable, the Contractor shall submit a detailed, Site Specific Survey Plan and QA/QC document setting out the proposed method of surveying. This plan will include a description of all equipment, personnel, and specific methods that will be employed to ensure surveys are of the highest quality. Prior to the start of any Work at the site, the Contractor shall prepare a plan describing the method(s) to be used:

1. to complete the layout and sequencing of the Work
2. to conduct the hydrographic surveys
3. to confirm data quality for all submitted data

C. Quality Control Surveys

The Contractor shall examine their work by conducting hydrographic surveys daily for work in the dredge area and at 3-day intervals (maximum time between surveys) for other work. Surveys shall be performed upon completion of separable portions of the work and upon completion of the entire work. The Contractor shall prepare survey maps based on the results of these surveys. These maps shall be used, by the Contractor, to satisfy them of the effectiveness of their operations. Particular attention shall be directed to attainment of contract depth and the reduction of dredging beyond the allowable over-dredge template. The Contractor shall utilize the surveys to compare actual progress and in-place quantities dredged with scheduled progress. Contractor surveys will not be used for final payment or acceptance.

D. Method of Surveying

1. Bathymetric Surveys

Surveys shall be performed with a Multibeam Echo-Sounder (MBES) survey system. MBES surveys for the project shall meet or exceed the most current USACE guidance. Data will be gathered using standard USACE procedures for Dredge Measurement & Payment Surveys for New Work or Rock Cuts as established in Table 3-1 of the USACE manual.

The base files for bathymetric surveys shall be provided for the project on a 1-foot grid selecting the average value from all points within the cell. A minimum of three soundings in a cell will be required to report an elevation of any individual cell.

The 1-foot base file will be used to develop digital terrain models and volumetric calculations.

In addition, the 1-foot base file will be used for the determination of compliance to final grades for CAD cell construction. For plotting, data will be decimated by selecting the centermost point of the base file on a grid selected to provide readable plans at the drawing scale. In some cases, differing sorting techniques

may be required to fully examine the results of the survey, any sorting done shall be clearly indicated on the plans.

For dredging in navigation areas including, but not limited to the Schuster Berth, compliance to final grades will be determined using a 1-foot grid selecting the minimum value from all the points within the cell. For plotting, data will be decimated by selecting the minimum value point, moved to the center of the cell, to provide readable plans at the drawing scale.

In general, sounding lines shall be parallel to the design slopes and shall extend a minimum of 3 times the design depth outside of the limits except where limited by the surrounding topography or lack of sufficient depth for the survey boat.

For each survey performed by the Contractor, the following QA/QC checks will be performed:

a. Control points used for the surveys shall be occupied and the positions recorded to confirm that the positioning system shall be capable of meeting the requirements as described by the USACE hydrographic survey manual. Positions and elevations will be recorded using real-time kinematic (RTK) level DGPS equipment. In areas where GPS quality is degraded due to overhead obstructions or multipath, positions will be generated using inertial-aided RTK-DGPS.
b. Sound velocity profiles shall be performed at a minimum before and after survey events. In areas of potential variable sound velocity additional profiles may be required.
c. At the start of each day's soundings, following any lengthy breaks and at the end of the day's soundings a bar check shall be taken. A record showing the results of the bar checks shall be provided with the field notes.
d. A manual sounding at the sonar head shall be taken and compared to the measurements of the sonar as an overall blunder check.
e. Bottom coverage will be 200%. Survey track lines shall be developed to ensure proper coverage. Overlap shall be used to confirm system performance in real-time and in processing.
f. The allowable beam angle for surveys shall be limited to 45 degrees to either side of the nadir. With the exception that areas with limited access and adjacent to banks shall be surveyed using either a physically canted sonar head or electronic beam steering in order to capture data to the maximum extent practicable.
g. Prior to performing the project surveys a patch test will be performed to confirm mounting offsets. Results of the patch test including an indication of any changes to the mounting offsets shall be noted in the report of survey. In addition, a patch test will be performed at a minimum monthly, when the transducer head contacts the bottom, or when the transducer head is removed from the mount.
h. Prior to performing the project surveys an area outside of the Work site shall be selected and surveyed as a reference site. The reference site will be

developed using guidance provided by Hypack®. The reference site will be used for a performance test as described in the USACE manual. The results of the performance test shall be provided in the report of survey. Any data provided by beam angles that do not meet the accuracy standard shall be eliminated from the final data set.

After completion of the Contractor's survey, the results will be plotted and reviewed by the Contractor to ensure that all Work was completed in accordance with contract requirements and submitted to the Owner's Representative in digital ASCII format and as a PDF drawing. If deficiencies are noted, a re-survey of the area after correction of deficiencies will be required to assure that correction has been achieved. Upon completion of the project, sufficient surveys will have been performed and plots submitted to assure that the proper depth has been achieved throughout the entire project.

Submission of all Contractor QC survey data, including plots, is required prior to performance of final examination and acceptance surveys by the Owner. The results of QC surveys should be utilized by the Contractor to ensure that work was performed in accordance with contract requirements. Final acceptance by the Owner's Representative will be in accordance with Section 01 22 00, Measurement and Payment.

2. Alternative Bathymetric Survey Methods

The primary source of bathymetric data will be multibeam sonar surveys. The Contractor is required to make every reasonable effort to collect multibeam data to the fullest extent practicable. Navigational areas within the channel, as well as any locations where rock removal is necessary, must be validated using multibeam surveys. In instances where access is restricted, the Contractor shall propose alternative methods to confirm that the specified grade has been achieved.

3. Vessel Calibration

Prior to performing any project surveys, the Contractor shall provide the results of all vessel calibrations to the Owner. This shall include the results of: a bar check, a patch test, a performance test, and a verification survey of a reference surface provided by the Owner or Owner’s Representative.

## 1.7 QUANTITY SURVEYS

A. Quantity Surveys

Quantity surveys shall be conducted, and the data derived from these surveys shall be used in computing the quantities of work performed or finally in place. The 1-foot average value base file will be used to develop digital terrain models and volumetric calculations.

B. Owner Quantity Surveys

The Owner's Representative (or a third-party surveyor) will conduct the original (pre-dredge) and final (post-dredge) surveys for the project and make all quantity computations based on those surveys. The surveys will be performed at no expense to the Contractor, except as noted in Article "Final Examination and Acceptance" below. All surveys by the Owner will be performed using MBES survey equipment. The Contractor shall give a minimum of a 3-day notice before completion of a portion of the work requiring a post-dredge survey. A minimum of 2 days will be required by the Owner for completion of each of the post-dredge surveys at the site and another 5 to 10 days for calculation of quantities removed and verification of completion of Work.

C. Disposal Area Monitoring Surveys

The Contractor shall conduct a pre-disposal survey prior to any dumps into the CAD Cell and a MBES bathymetric survey of the CAD cell weekly during disposal operations. The surveys will be used for disposal studies, and to determine remaining available disposal capacity within the cells. The surveys will also be used to confirm location within the cells of discharged dredged material. Survey data will be provided to the Owner. The Contractor shall provide to the Owner the survey data for each event within 2 days of performing the survey. The Contractor shall provide a hydrographic survey for each day that a disposal event is conducted within the limits of the CAD Cell. Disposal survey is not required when work is not conducted within the area.

D. Contractor Quantity Surveys

The Contractor shall conduct the surveys for any periods for which progress payments are requested. The Contractor will make the computations based on these surveys. All surveys accomplished by the Contractor shall be conducted under the observation of the Owner's Representative, unless the Owner's Representative waives this requirement for each specific instance.

E. Concrete Mat Installation Surveys

Multibeam surveys are required to confirm that the installed mats do not extend into the berth limits above the target elevation. Mat installation must be confirmed by examining the entirety of the data set collected to confirm that no soundings are above the target elevation within the berth limits.

F. Survey Submittal

Promptly upon completing a survey, the Contractor shall furnish the originals of all plans, calculations, and all other records relating to the survey to the Owner's Representative, who shall use them as necessary to determine the amount of progress

payments. The Contractor shall retain copies of all such material furnished to the Owner's Representative.

## 1.8 FINAL EXAMINATION AND ACCEPTANCE

### A. Final Examination

As soon as practicable after the completion of the entire Work, or completion of pre-approved acceptance sections and after examination by the Contractor of the entire work area, the work will be thoroughly examined by the Owner's Representative. Examinations by the Owner's Representative will be made at the expense of the Owner.

### B. Final Acceptance

Final acceptance of the whole or any part of the Work, and the deductions or corrections of deductions made thereon, will not be reopened after having once been made, except on evidence of collusion, fraud, or obvious error.

### C. Verification of Substantial Completion Bathymetric

Final examination of the in-water portion of the site will occur only after all site activities that may induce shoaling or have the potential for the loss of construction materials into the berth are complete. The purpose of the final examination is to confirm that there are no obstructions above the required berth grade within the areas indicated on the contract documents as Dredge Areas 2 and 3. Prior to final examination survey by the Owner’s Representative, the Contractor shall submit to the Owner’s Representative a full coverage contractor examination survey demonstrating achievement of contract depth throughout the Work area. The Contractor shall provide minimum 24-hour notice to the Owner’s Representative of the pending submittal. After examination of the Contractor’s submittal, the Owner’s Representative may conduct an independent survey of the Work area for the purpose of confirmation of substantial completion of the Work. Based on review of the Contractor’s survey and if conducted, the Owner’s Representative’s confirmation survey, the Owner’s Representative will make an assessment as to substantial completion of the Work.

Results of the survey and the assessment relative to substantial completion will be made available to the Contractor within 24 hours of receipt of the Contractor’s examination survey submittal. Verification of substantial completion by the Owner’s Representative does not constitute the final examination survey as detailed in paragraph D – Final Examination Bathymetric.

D. Final Examination Bathymetric

As soon as practicable after the completion of the entire Work and after examination by the Contractor using MBES equipment for full coverage of the entire work area, the work will be thoroughly examined by the Owner's Representative. Examinations by the Owner's Representative will be made at the expense of the Owner. Should any shoals or other lack of contract depth (including the presence of debris above contract depth) be disclosed by this examination, the Contractor shall remove the debris or shoals (by dredging), at the contract rate, or by otherwise removing the shoals or debris, as directed by the Owner's Representative. The Contractor or their authorized representative will be notified if and when soundings are to be made. One individual will be allowed to accompany the survey party during the final examination survey(s). When the area is found to be satisfactorily cleared, it will be accepted finally. Should more than one final examination survey of an area be required, the cost of all additional surveys of that area will be deducted from amounts due or to become due the Contractor. These survey costs will be based upon a rate of $9,000.00 per day for each day in which the Owner's Representative survey plant is engaged in surveying operations.

1.9 TIDE GAUGES/STAFFS/CHARTS

Contractor shall set a minimum of one standard tide board within site of the dredge operator. Tide board elevations will be set to proper elevations by surveying using only previously established project vertical control. All tide boards will be set to the correct reference datum for this project, NAVD88. Tide boards shall be maintained for the duration of the dredging project. The Contractor, at their discretion, may also use digital tide recorder, however digital tide recorder shall not replace the tide board. Current and tide charts for the area(s) being dredged for the duration of the project shall be submitted by the Contractor and shall be available on site.

1.10 CONTRACTOR PROVIDED FIELD OFFICE

The Contractor shall provide, at a minimum, work space within the Contractor’s field office including two desks for the Owner and Owner’s Representative’s use during field operations.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

# SECTION 01 90 00

# GENERAL SAFETY REQUIREMENTS

## PART 1 - GENERAL

### 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910 Occupational Safety and Health Standards

29 CFR 1926 Safety and Health Regulations for Construction

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2011) National Electrical Code

NFPA 241 (2009) Standard for Safeguarding Construction, Alteration, and Demolition Operations

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

NIOSH Pub No. 85-115 (1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

### 1.2 REGULATORY REQUIREMENTS

Work performed under this contract shall comply with OSHA requirements in 29 CFR 1910 and 29 CFR 1926 (especially OSHA's Hazardous Waste Operations and Emergency Response Standard 29 CFR 1926.65/29 CFR 1910.120, state specific OSHA requirements (where applicable), and in accordance with the provisions contained in Section 00700, General Conditions, and in Section 00800, Supplementary Conditions. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

The Marine Commerce Terminal and the parcels where the work is taking place are in and adjacent to the New Bedford Harbor Superfund Site, which is under active remediation. At a minimum, all work must be completed under the direction of a 40-hour OSHA Hazardous Waste Operations (29 CFR 1910.120) trained individual. All personnel coming in contact with sediment or soil contaminated with hazardous materials shall have, or obtain, similar OSHA training.

## 1.3 SUBMITTAL

Submit the following for acceptance by the Owner's Representative. Follow the administrative procedures for making submittals as specified in Section 01 33 00, Submittal Procedures.

A. Statements – Health and Safety Plan meeting the criteria of 29 CFR 1926.65/29 CFR 1910.120 (OSHA's Hazardous Waste Operations and Emergency Response Standard), and also including:

1. Site Specific Accident Prevention Plan.

2. Phased Job Activity Hazard Analysis.

3. Machinery Inspection Certification:

   Submit certifications that earth moving equipment, cranes, lifting equipment, trucks, vehicles, machinery, and other mechanized equipment is in safe operating condition.

4. Modification to Equipment:

   Submit manufacturer's written approval of modifications or additions to vehicles, machinery, floating plant, or hoisting equipment. Owner acceptance of submittal must be attained before such equipment can be brought on the job site.

5. Safety Meeting Report:

   Submit safety meeting reports detailing the subjects discussed at safety meetings within three days after each meeting.

B. Accident Prevention Plan Submittal

Submit a plan outlining Contractor proposal for accident prevention.

1. List all major definable features of work to be completed under this contract.

2. Accident Reporting
   a. All accidents shall be investigated and a report prepared that outlines basic causes and proposed actions to prevent future occurrence.

3. Submit an "Activity Hazard Analysis" for each definable feature of the work identified in paragraph A above. Submit each "Activity Hazard Analysis" a minimum of 15 days prior to the start of that phase of work. A major phase of work is defined as an operation involving a type of work presenting hazards not experienced in previous operations or where a new subcontractor or work crew is to perform. The analysis shall define all activities to be performed and identify the sequence of work, the specific hazards anticipated, and the control measures to be

implemented to eliminate or reduce each hazard to an acceptable level. The activity hazard analyses shall be continuously reviewed with the quality control definable features of work and when appropriate, modified to address changing site conditions or operations.

## 1.4 UNFORESEEN HAZARDOUS MATERIAL

If unanticipated hazardous materials are encountered during construction operations that may be dangerous to human health upon disturbance, stop that portion of work and notify the Owner's Representative immediately.

# PART 2 - PRODUCTS (Not Applicable)

# PART 3 - EXECUTION

## 3.1 WEEKLY SAFETY MEETINGS

Prior to the start of construction and at least once a month, the Contractor shall conduct a safety meeting for all supervisors and foremen. Additionally, prior to the start of construction and at least once per day, the foremen of the Contractor shall conduct a safety meeting for all workers. After each safety meeting, a safety meeting report shall be completed. A copy of a suggested weekly safety meeting form is attached at the end of this section which is provided for convenience only. The Owner does not endorse or require this use of this specific form as ALL site safety the sole responsibility of the Contractor.

END OF SECTION

# WEEKLY SAFETY MEETING

Date Held _____
Time_____

CLIENT: _____ CONTRACT: _____

PROJECT: _____

PERSONNEL PRESENT: _____

_____

CONDUCTED BY: _____

**All persons attending the meeting must sign the bottom or back of this form.**

Subjects discussed (Note, delete, or add)

Accident Prevention Plan ___ Individual Protective Equipment ___

Prevention of Falls ___ Back Injury/Safe Lifting Techniques ___

Fire Prevention ___ Sanitation, First Aid, Waste Disposal ___

Tripping Hazards ___ Clean-up - trash, nails in lumber ___

Staging, Ladders, Concrete Forms, Safety Nets ___

Hand Tools, Power Tools, Machinery, Chain Saws ___

Equipment Inspection & Maintenance (Zero Defects) ___

Hoisting Equipment, Winch and Crane Safety ___

Ropes. Hooks, Chains and Slings ___

Vehicle Operation Safety ___

Electrical Grounding, Temporary Wiring, GFCI ___

Lockouts/Safe clearance procedures (electrical, pressure, moving parts)

Welding, Cutting ___ Excavation Hazard/Rescue ___
Loose Rock/Steep Slopes ___ Explosives ___
Water Safety ___ Boat Safety ___
HAZMAT, Toxic hazards, SDS, respiratory, ventilation ___

Other items of concern specific to this Contract: _____

# SECTION 02 11 00

# CLEARING AND GRUBBING

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

A. Site Preparation

B. Protection

C. Clearing

D. Grubbing

E. Disposal of Waste Materials

### 1.2 RELATED SECTIONS

A. Additional requirements relative to specifications of unsuitable materials are provided in Section 02 11 10, Excavation and Handling of Contaminated Material, Section 02 20 00, Earthwork; in the Release Abatement Measure Plan (RAM)/EPA Self Implementing Plan (SIP); and in the Soil Management Plan. The RAM/SIP and Soil Management Plan are provided as Attachments to this Request for Proposal. The first RAM Plan Modification and Status Report will be issued as an addendum upon MassDEP Submittal in December 2025.

### 1.3 SITE PREPARATION

A. Examine the site thoroughly and determine the existing conditions and difficulty of work to be performed.

### 1.4 PROTECTION

A. Locate, protect and support existing utilities which may be encountered during the course of the work and which are not designated for relocation or removal.

B. Locate, protect and support trees and underbrush which are outside of the construction area and are therefore designated for preservation.

C. Protect benchmarks, baseline monuments, and survey control points from disturbance or destruction.

D. Use qualified surveyors to immediately replace any such point disturbed or destroyed.

E. Accomplish work to avoid damage to the site and existing site appurtenances not designated for removal.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 CLEARING

A. Clear debris, rubble, and materials unsuitable for reuse. Crush rubble, rock, or concrete for reuse at site, if feasible, as stipulated within Section 02 20 00, Earthwork. Dispose of debris offsite.

B. Clear cut trees, brush and shrubs as necessary to complete the work as shown on the Contract Documents. Contractor shall not clear trees, brush, or shrubs that are outside of the work area and are therefore designated for preservation. As necessary, chip brush, shrubs and tree debris or otherwise set aside for offsite disposal. Any materials that are located within the PCB contaminated areas as shown in the RAM/SIP, shall be cleared and disposed of in accordance with Section 02 11 10, Excavation and Handling of Contaminated Material, and the RAM/SIP.

C. Cut up, chip or otherwise set aside snags, brush, grass, floatable material, weeds, rubbish, roots, and other objectionable vegetation growth.

D. Contractor shall identify any and all overhead electric lines prior to the start of construction and determine appropriate safe distances that must be maintained during construction. Contractor shall abide by those safe distances during tree felling or other operations at the site. Contractor shall not damage or come into contact with any existing electric transmission line during tree felling or other operations.

### 3.2 GRUBBING

A. Grub only in Work Areas, as noted on the Contract Documents, as necessary to complete the Work. Additional grubbing may be authorized, if requested by Contractor.

B. Remove and dispose of all stumps and large roots, and other objectionable buried and/or decayed vegetative matter within the Work Areas as necessary to complete the Work. Note that stumps and other material removed from below ground may be impacted with PCB contamination and will need to be treated and disposed of as such by the Contractor in accordance with Section 02 11 10, Excavation and Handling of Contaminated Material, and the RAM/SIP.

C. Protect topsoil from contamination from other materials.

## 3.3 STOCKPILING

A. Keep stockpiles of materials from clearing and grubbing activities clear of active Work Areas.

## 3.4 DISPOSAL

A. Trees, grass, floatable material, weeds, rubbish, snags, roots, brush, trash, unsuitable construction debris, unstable material, topsoil and other vegetation and material generated during clearing and grubbing operations shall be taken off-site and disposed of in accordance with local and state regulations and/or in accordance with Section 02 11 10, Excavation and Handling of Contaminated Material, and the RAM/SIP.

END OF SECTION

# SECTION 02 11 05

# SITE CLEARING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Other specification Sections which directly relate to the work of this Section include:

1. Section 02 20 00 – Earthwork
2. Section 02 11 10 – Excavation and Handling of Contaminated Material
3. Section 02 41 10 – Site Demolition
4. Section 31 25 00 – Erosion and Sedimentation Control
5. Section 32 31 13 – Chain Link Fences and Gates

### 1.2 SUMMARY

A. This Section specifies requirements for site clearing.

B. The work includes:

1. Clearing and grubbing
2. Protection of existing vegetation to remain
3. Selective clearing and thinning
4. Disposal of debris and material from clearing, grubbing and thinning in approved off-site disposal areas

### 1.3 SITE CONDITIONS

A. Site conditions existing during the bidding period will be maintained by the Owner insofar as practical.

B. Actual site condition variations that differ from those of the bidding period that affect site preparation operations shall be brought to the attention of the Owner prior to the commencement of any site work.

### 1.4 ACTION SUBMITTALS

A. The Contractor shall submit the following information to the Owner's Representative for review before commencing any site or demolition work:

1. All permits and notices authorizing site clearing and earthwork.
2. Permits for transport and disposal of debris.

3. Site clearing procedures and operational sequence.
4. Calculations.
5. Product Data: For each type of product indicated.

## PART 2 - PRODUCTS

### 2.1 TREE PROTECTION FENCING

A. Tree protection fencing shall be orange plastic web fence, 6 feet high minimum. Wood stakes shall be 8-foot long by 1-inch by 1-inch square driven a minimum of 2 feet into the ground. Posts shall be spaced 4 feet (maximum) on center.

## PART 3 - EXECUTION

### 3.1 CLEARING AND GRUBBING

A. Protect and maintain benchmarks and survey control points from disturbance.

B. Clearing shall include cutting, removal, and off-site disposal of trees, bushes, shrubs, grass, stumps, fallen timber, refuse, trash, fencing and other incidental materials not required for reuse on the site.

C. The Contractor shall grub the area within the clearing limits to completely remove stumps and root systems, except for those to remain or to be transplanted.

D. Depressions, excavations and voids resulting from the removal of stumps or roots shall be filled with suitable material and compacted.

E. Burning of materials from clearing and grubbing operations will not be allowed.

F. Minimize production of dust due to clearing operations and do not use water if that will result in ice, flooding, sedimentation of waterways or storm drains, or other pollution.

### 3.2 SELECTIVE CLEARING AND THINNING

A. Selective clearing and thinning shall be completed as directed by the Landscape Architect or Arborist. Approximate limits of selective clearing and thinning are shown on the Drawings. Do not remove or damage vegetation beyond the limits indicated on the Drawings.

B. The work shall include the removal of dead and diseased tree limbs and plants and pruning and removal of live vegetation that interferes with the growth of other trees and plants. Areas of dense growth shall be thinned to provide room for healthy growth.

## 3.3 PROTECTION

A. The Contractor shall flag the limits of clearing shown on the drawings by accurate field survey with marked stakes or other means acceptable to the Owner's Representative. Trees to remain and trees to be saved and transplanted shall be clearly identified during this staking process. The Owner's Representative shall be notified a minimum of 5 working days prior to scheduled commencement of clearing operations to review the flagged limits. Adjust the clearing limits as directed by the Owner's Representative.

B. Before clearing begins, protect designated trees to remain with tree protection fencing to the approximate diameter of foliage to prevent damage to the trunk, foliage and root system by construction equipment and procedures. Trees to be transplanted shall be protected in similar fashion as the trees to remain as described above.

C. Place tree protection fencing as required to protect other plants, adjacent property areas to remain uncleared, monuments and existing improvements from damage.

D. The Contractor shall repair or replace immediately any damage to existing trees or root systems that are to remain and to trees that are to be transplanted. The Contractor shall employ an arborist licensed in the Commonwealth of Massachusetts to determine the repair and replacement needs and methods for approval by the Owner's Representative.

E. Replace damaged shrubs and other vegetation designated to remain with the same size and species.

F. The tree protection fencing shall be maintained for the duration of construction operations. The work shall include immediate replacement of any damaged fence. Fencing shall be removed from the site at the completion of construction operations. The fencing disposal shall be in accordance with local, state and federal laws and regulations for the disposal of the material.

G. Protect existing utility lines that are indicated to remain. Notify the Owner's Representative and utility Owner immediately of damage to or an encounter with an unknown existing utility line. The Contractor shall be responsible for the repairs of damage to existing utility lines that are indicated or made known to the Contractor prior to start of clearing and grubbing operations. When utility lines which are to be removed are encountered within the area of operations, notify the Owner's Representative and utility Owner in ample time to minimize interruption of the service.

## 3.4 DEBRIS

A. Remove debris, junk, and trash from the site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

# SECTION 02 11 10

# EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL

## PART 1 - GENERAL

### 1.1 SUMMARY

A. This section details proper handling, stockpiling, excavation, and grading procedures to be undertaken upon generation of contaminated material in upland areas. Soil contamination exists onsite within site material (particularly within the vicinity of the southern property line adjacent to the main terminal on 4 Wright Street) that the Contractor will be excavating, staging onsite, and backfilling. The Contractor shall assume that any site material (see Section 02 20 00, Earthwork, and Part 1.1, C of this specification) is contaminated and shall handle such site material accordingly. This includes tree stumps and other debris removed from below grade.

B. The Owner's Representative may direct the Contractor to segregate contaminated materials during the course of the Work, including soils deemed to be geotechnically unsuitable for reuse but may also be contaminated. A plan of action for final disposition of such soils will be developed by the Owners Representative.

C. The Contractor is directed to utilize materials from utility or other excavation activities as compacted site backfill material, if possible, prior to ground improvement options. As per the Release Abatement Measure (RAM) Plan/EPA Self-Implementing Plan (SIP) and Soil Management Plan (provided as **Attachments to the Request for Proposal**), this shall apply to soils where polychlorinated biphenyls (PCB) concentrations are <1 milligrams per kilogram (mg/kg), and all reuse of soils on site shall be reviewed and approved by the Licensed Site Professional of Record.

### 1.2 RELATED SECTIONS

A. Requirements relative to sediment dewatering and stockpiling.

B. Additional requirements relative excavation, backfilling and fill materials are specified in Section 02 20 00, Earthwork.

### 1.3 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D5434 (2010) Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock

CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 302
40 CFR 761
29 CFR 1910.120

Designation, Reportable Quantities, and Notification

POLYCHLORINATED BIPHENYLS (PCBs) MANUFACTURING, PROCESSING, DISTRIBUTION IN COMMERCE, AND USE PROHIBITIONS

Occupational Safety and Health Standards, Hazardous Waste Operations and Emergency Response

CODE OF MASSACOUSETTS REGULATIONS (CMR)

310 CMR 40.0000 Massachusetts Contingency Plan

B. Compliance with PCB regulations at 40 CFR Part 761 shall be required during all phases of work involving PCB-contaminated soils and/or sediments, including, but not limited to:

1. 40 CFR 761, Subpart C - Marking of PCBs and PCB Items
2. 40 CFR 761.65 - Storage for Disposal
3. 40 CFR 761.79 - Decontamination Standards and Procedures
4. 40 CFR 761.180 - Records and Monitoring
5. 40 CFR 761, Subpart K - PCB Waste Disposal Records and Reports
6. Release Abatement Measure (RAM) Plan/EPA Self-Implementing Plan (SIP)
7. Soil Management Plan

*The RAM/SIP and Soil Management Plan are provided as **Attachments to this Request for Proposal.** The first RAM Plan Modification and Status Report will be issued as an addendum upon MassDEP Submittal in December 2025.

1.4 SUBMITTALS

A. Excavation and Handling Work Plan: The Contractor shall submit to the Owner's Representative an Excavation and Handling Work Plan that will include the following:

1. Documentation that the Contractor will utilize appropriately trained staff to excavate potentially contaminated materials if encountered on site and that the staff is informed of procedures to be followed to protect the Health and Safety of all on-site workers as it relates to possible contaminated materials to be handled. Documentation must show that workers involved in these activities have completed Health and Safety Training per Hazardous Waste Operations and Emergency Response (HAZWOPER) Regulation 29 CFR 1926.65, and

Occupational Safety and Health Administration (OSHA) Regulation 29 CFR 1910.120, as appropriate. The Contractor is entirely responsible for the Health and Safety of their own employees and subcontractors.

2. Locations and methods, including drainage, for on-site stockpiling of excavated potentially contaminated soils as specified in this Section. Describe methods to keep different classifications of material segregated during processing operations.
3. Procedure for decontamination of tools and equipment.
4. Methodology for on-site soil tracking, including methodology to ensure cross contamination does not occur.

## 1.5 RESPONSIBILITY OF THE CONTRACTOR

A. The Contractor is responsible for adhering to regulations, Specifications, and recognized standard practices related to the management of contaminated and potentially contaminated material during excavation and re-use activities. The Owner and Owner's Representative will not be responsible at any time for the Contractor's violation of pertinent State or Federal regulations or endangerment of laborers, passersby or any others.

B. The Owner will not be held negligent or liable for any inadequacies or deficiencies in the Contractor's site-specific worker Health and Safety Plan or for any oversight or inadequacies in the Contractor's implementation of the Health and Safety Plan.

C. Provide labor, materials and equipment necessary to complete the work including:

1. Excavation, backfilling, on-site transportation, stockpiling, and maintenance of excavated material.
2. The Contractor is responsible for all construction, protection and maintenance of soil stockpiles from excavation through chemical testing and on-site re-use. Contractor shall stockpile material only in areas designated by the Owner.
3. The Contractor is responsible for providing all documentation to track potentially contaminated material from the time of excavation until it is re-used onsite.
4. The Contractor shall backfill excavations with suitable materials in accordance with Section 02 20 00, Earthwork, to the limits and elevations shown on the Contract Drawings.

## 1.6 REGULATORY REQUIREMENTS

A. Permits and Licenses

1. The Contractor shall obtain required federal, state, and local permits for excavation and storage of contaminated material. Permits shall be obtained at no additional cost to the Owner.
2. During removal and reuse of site materials, the Owner's Representative may identify material that is unsuitable for reuse due to geotechnical reasons (i.e., "geotechnically unsuitable, or because the material is excess and cannot be reused at the site. That material shall be separated from other stockpiled material

(but shall not be removed physically from the site), and be assumed by the Contractor to be hazardous, until and unless analytical results indicate otherwise. The Owner's Representative shall prepare and submit a Sampling and Analysis Plan to EPA for their approval and then shall collect sufficient samples (if required) to fully characterize this material, before the Owner's Representative shall develop a plan to reuse or dispose of the material. If PCB concentrations in the soils are determined to be greater than 1 mg/kg, but less than 50 mg/kg, EPA approval shall be required prior to disposal of these soils offsite. The Contractor shall not dispose of this material offsite until such time as the material has been fully characterized in compliance with EPA regulations and EPA approval has been received; notwithstanding these characterization requirements by EPA, the Contractor shall comply with 40 CFR 761.65(a)(9) and shall not allow PCB containing soil stockpiled onsite to remain onsite for longer than 180 days. If the concentration of PCBs in these soils is greater than or equal to 50 mg/kg, the soils will need to be disposed of in accordance with 40 CFR 761.61(c). The Contractor shall take into account the possible length of time associated with the Owner's Representative completing this task when situating the stockpile associated with the geotechnically unsuitable or excess material. Delays in the Contractor's operations associated with time needed to complete these tasks shall not be a basis of any change in the cost of the work or a change in the Contract Time for the work. Costs for characterization and preparation of the Sampling and Analysis Plan will be borne by the Owner. Additional details are included within the RAM/SIP and Soil Management Plan, which are provided as **Attachments** to this Request for Proposal.

## 1.7 SCHEDULING

A. The Contractor shall notify the Owner's Representative prior to the start of excavation of contaminated material.

# PART 2 - PRODUCTS

## 2.1 BACKFILL MATERIAL

A. Approved backfill materials are specified in Section 02 20 00, Earthwork, and shall be placed to the limits and elevations as shown on the Contract Drawings.

## 2.2 SPILL RESPONSE MATERIALS

A. The Contractor shall provide spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. Spill response materials/wastes are being handled or transported. Appropriate spill response materials shall be available at all times to respond to a leak of fuel or other hazardous material from Contractor's vehicles or other mechanical devices. Spill response materials shall be compatible with the type of materials and contaminants being handled.

## 2.3 POLYETHYLENE BARRIER

A. Polyethylene barrier for use in protecting stockpiles from spreading contamination or for protecting truck bodies shall be minimum 6-mil (0.006 inches) thick. At least two (2) layers of polyethylene shall be used beneath stockpiles of impacted materials to protect the ground surface. At least one (1) layer of black, 6-mil polyethylene will be used to cover stockpiles of impacted material at all times except when modifying stockpiles. Notwithstanding these stockpile requirements (as well as the requirements of PART 3.5 of this specification), the Contractor shall ensure compliance with storage requirements for PCB impacted soil as outlined within 40 CFR 761.65(c) (9).

# PART 3 - EXECUTION

## 3.1 EXISTING STRUCTURES AND UTILITIES

A. No excavation shall be performed until site utilities have been "field" located. The Contractor shall take the necessary precautions to ensure no damage occurs to existing structures and utilities. Damage to existing structures and utilities resulting from the Contractor's operations shall be repaired at no additional cost to the Owner. Utilities encountered that were not previously shown or otherwise located shall not be disturbed without written approval from the Owner's Representative.

## 3.2 CONTAMINATED MATERIAL REMOVAL

A. Excavation

Excavation shall be performed in a manner that will limit the potential for contaminated material to be mixed with uncontaminated material. A log of the materials and any visible signs of contamination encountered during excavation shall be maintained for each area of excavation. Additional details are included within the RAM/SIP and Soil Management Plan.

B. Dewatering and Discharge of Dewatering Effluent

Contractor shall follow all pertinent local, State, and Federal Regulations for dewatering techniques, upland storage, and treatment of dewatering liquids.

## 3.3 BACKFILLING

A. As needed and if required by EPA or MassDEP, if an excavated area is determined to contain contaminated material, prior to backfilling the Contractor shall provide access to the bottom and side walls of excavations for pre-subgrade and side walls. Results shall be made available to the Contractor 14 days after sample collection. Backfilling may not commence prior to written approval of the Owner's Representative based on confirmatory sample test data.

B. It is the Contractor's Responsibility to protect the subgrade prior to backfilling. Additional excavation and backfilling requirements are specified in Section 02 20 00, Earthwork.

## 3.4 SOIL TRACKING

A. For upland soils identified as exhibiting olfactory or visual evidence of potential contamination or identified in the RAM/SIP, or containing >1 mg/kg of PCBs, provide soil tracking system to track all excavated soils between excavation and final disposition.

1. A soil tracking system shall include identification of the source of material (area, depth, date of excavation, etc.). The system shall be designed by the Contractor and shall be submitted to the Owner's Representative for review and acceptance. The system should include daily log sheets for tracking all soils from excavation through final disposition.
2. Provide to the Owner's Representative on a daily basis, copies of field records documenting the location of stockpiled material, and stockpile identification data. This documentation shall be provided on a daily basis when stockpiles are present on-site.

## 3.5 CONTAMINATED MATERIAL STORAGE

A. The Contractor is responsible for the construction, protection and maintenance of temporary stockpiles and through the final re-use of those stockpiles by the Contractor.

1. Stockpile areas will be graded such that storm water runoff is diverted from stockpiled soils: berms (i.e., hay bales, silt fencing, gravel) as specified in the Contract Drawings will be placed around the perimeter of the area to prevent contact of runoff with contaminated soils.
2. The area will be blocked off to minimize worker and passersby contact with stockpiled soils. The area will be visibly marked with appropriate warning signs of potential hazards.
3. For soils identified by the Owner as contaminated, or for potentially contaminated soils, the first lift of stockpiled soil materials will be placed on a minimum of two layers of 6-mil-thick (0.006") or one layer of 20-mil-thick (0.020") polyethylene barrier.
4. The size of the individual stockpiles will be limited such that no individual stockpile is larger than 500 cubic yards. Total dimensions and locations of the stockpile areas will be at the discretion and approval of the Owner's Representative.

B. The transfer of soil materials from the excavation to the stockpile areas will be conducted by the Contractor in such a manner as to prevent the spread of contaminated or potentially contaminated materials across the site and to minimize the mixing of soils from different areas of the excavation in different stockpiles.

C. The Contractor will place stockpiled soils within a designated stockpile area, graded to shed water, and shall cover the stockpiled soils prior to inclement weather and at the end of each work day with a minimum 6-mil-thick (0.006") black polyethylene cover overlapped and weighted to form a continuous waterproof barrier over the soil. The cover will be maintained by the Contractor throughout the stockpile period to prevent water from entering the soils and to prevent blowing dust. The cover will be suitably weighted to prevent the soil from being exposed by wind.

D. Excavation and soil handling will be performed in a manner which limits mixing of soils with different levels and types of contamination to the highest degree possible. Final disposition of soil which is contaminated as a result of the Contractor's careless or unauthorized procedures for excavation or soil handling and stockpiling will be at their own expense. All stockpiles will be located within the Project limits.

E. Water-tight roll-off units may be used to temporarily store contaminated material. An impermeable cover shall be placed over the units to prevent precipitation from contacting the stored material.

F. For soil to be disposed of by others, the soil may not be stockpiled longer than allowed by federal, state or local law or regulations.

G. The Contractor is responsible for the construction, protection and maintenance of temporary stockpiles. Stockpiles shall not contain solid waste material.

## 3.6 SPILLS

A. In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), pollutant, contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), or a Release of oil or hazardous material as defined under 310 CMR 40.0000 (Massachusetts Contingency Plan or MCP) the Contractor shall notify the Owner's Representative immediately. If the spill exceeds the reporting threshold, the Contractor shall follow the pre-established procedures for immediate reporting and containment. Immediate containment actions shall be taken to minimize the effect of any spill or leak. Cleanup shall be in accordance with applicable federal, state, and local regulations. As directed by the Owner's Representative, additional sampling and testing shall be performed to verify spills have been cleaned up. Spill cleanup and testing shall be done at no additional cost to the Owner or the Owner's Representative.

## 3.7 DISPOSAL REQUIREMENTS

A. This work shall consist of the transport and disposal of impacted soil and miscellaneous materials (including but not limited to PPE, wooden stakes, used polyethylene sheeting, and/or rinsate generated during the project, etc.) as required to be disposed of in compliance with the RAM/SIP, Soil Management Plan, and in accordance with the conditions of the USEPA PCB Cleanup and Disposal Approval under 40 CFR §§ 761.61(a) and (c) letter, which is provided as an **Attachment to the Request for Proposal.**

B. With respect to miscellaneous materials that come in contact with soils containing PCBs >1 mg/kg, these materials shall be disposed of with contaminated soil only after consultation with the Owner's Licensed Site Professional.

END OF SECTION

# SECTION 02 22 13

# STRUCTURE CONDITION SURVEY AND VIBRATION MONITORING

## PART 1 - GENERAL

### 1.1 DESCRIPTION OF WORK

A. The work to be done under this section shall consist of furnishing all materials, labor, supervision, tools, and equipment and performing all operations necessary to complete all work as shown on the Contract Drawings and as specified.

B. The work includes, but is not limited to, the following items:

1. Structure Condition Survey:

   This work shall consist of performing a structure condition survey(s) and preparing permanent records as indicated in the Contract Documents prior to the commencement of work, after completion of work, and at locations and times during construction as directed by the Engineer.

2. Vibration Monitoring (Non-blasting):

   This work shall consist of performing vibration monitoring of background and construction activities and preparing daily and summary report(s) of vibration readings during vibration producing activities such as, but not limited to pile driving, vibratory compaction, demolition of seawall or operation of heavy construction equipment.

### 1.2 QUALITY ASSURANCE

A. Use adequate number of skilled work men and women who are thoroughly trained and experienced in the necessary craft and who are completely familiar with the specific requirements and the methods needed for proper performance of the Work of this section.

B. The Contractor shall engage the services of a Consultant capable to perform a pre-construction survey of the existing buildings and structures in order to document the pre-construction condition of all elements of such buildings and structures. This survey shall serve as a baseline to monitor the structure for any potential movement that may occur because of the planned construction activities.

C. The Contractor shall engage the services of a Consultant experienced in vibration monitoring to measure and assess peak particle velocities during construction activities.

## 1.3 SUBMITTALS

A. Data from both activities, pre-construction survey and vibration monitoring, shall be provided in a comprehensive report that must be sealed and stamped by a Professional Engineer, licensed in the Commonwealth of Massachusetts.

1. Submit Consultants experience performing pre-construction survey and vibration monitoring, for the review and acceptance by the Engineer.

2. Submit two copies of the pre-construction survey and vibration monitoring to the Engineer.

B. Submittal of Written Vibration Monitoring Plan: Prior to performing work adjacent to specified locations, a written Vibration Monitoring Plan prepared by the Contractor's Consultant shall be submitted to the Engineer a minimum of 30 workdays in advance for review and approval. The Vibration Monitoring Plan may be returned to the Contractor for revision or clarification. The Vibration Monitoring Plan shall include:

1. The name of vibration monitoring specialist(s).

2. The scheduled start date and length of construction operations, which require vibration monitoring.

3. The limits of vibration monitoring work

4. The location of all structures to be monitored in proximity to the construction operation.

5. The location of any underground utilities in proximity to the construction operation.

6. Experience and Equipment
   a. Submit proof and details, as references, of two projects in the past 5 years where the vibration monitoring consultant performing the work has satisfactorily monitored construction operations by recording maximum peak particle velocities (PPVs). Include contact information for each reference provided.
   b. Submit information on the required 3-component seismograph, capable of measuring particle velocity data in three mutually perpendicular directions, including: the manufacturer's name, model number, and documentation of factory calibration performed within the last 12 months.

C. Submit Copies of all Vibration Monitoring Records

D. The Contractor shall maintain a complaint log and make this available to the Engineer on request. Occupants/owners of adjacent buildings and structures shall

be notified by the Contractor at least 2 weeks prior to commencement of any vibration producing activity that might affect the structure or inhabitants.

## PART 2 – PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 STRUCTURE CONDITION SURVEY

A. The structure condition survey shall include documentation of interior sub-grade and above grade accessible walls, ceilings, floors, roof, and visible exterior as viewed from the grade level. The survey shall detail (by engineering sketches, video tape, photographs, and/or notes) any existing structural, cosmetic, plumbing, or electrical damage. The survey shall be conducted by a Professional Engineer, registered in the Commonwealth of Massachusetts.

1. Inspect and document conditions of all buildings and structures located within 300 feet of vibration generating work. Coordinate with Massachusetts Clean Energy Technology Center to establish entry periods to allow access in order to document existing conditions prior to any vibration producing work.
2. The Engineer shall accompany the Contractor on each structure condition survey for verification of the data recorded.
3. A report shall be issued that summarizes the pre-construction condition of the structure(s) and identifies areas of concern, including potential personnel hazards (falling debris) and structural elements that may require temporary support or repair.
4. Crack displacement monitoring gages shall be installed as appropriate across any significant existing cracks to help verify any additional structure distress if it should develop. The appropriate location, number, and type of gage shall be established by the Contractor and/or the Project Engineer. The gages shall be read prior to vibration producing activities, as well as during these activities. Data shall be obtained on a weekly basis for as long as vibration-producing activities are being conducted.
5. A report shall be submitted which summarizes the data. The Engineer shall be alerted if any significant movement is detected by the monitoring gages. Provide general photography and video equipment, analog or digital, capable of superimposing the date and time on all images.

### 3.2 VIBRATION MONITORING (NON-BLASTING)

A. The Contractor shall install a minimum of two seismographs, one on each side of the structure closer to the construction activities, meeting the requirements outlined below:

1. Seismic range – 0.01 to 4.00 inches per second with accuracy of +/-5% of the measured peak particle velocity or better at frequencies between 1 and 100 Hertz, and with a resolution of 0.01 inches per second or less.
2. Three channels for vibration monitoring.
3. Power sources – an internal rechargeable battery with charger and 115 volts alternating current. The battery must be of approximate size and type to supply continuous power to the monitor for a minimum of 24 hours.
4. Instruments must be capable of producing strip chart recordings and readings on site within one hour of reading. The Contractor shall provide the appropriate computer and software to perform the analysis and produce reports of the continuous monitoring.
5. The continuous monitoring mode must be capable of recording single-component peak particle velocities, and the frequency of peaks shall have an interval of one minute or less.
6. The location of adjacent structures to be monitored and maximum allowable PPVs as indicated in the Contract Documents. If not otherwise specified, a maximum allowable PPV, in accordance with the United States Bureau of Mines (USBM) Vibration Criteria (Figure 1), shall be observed at all structures.

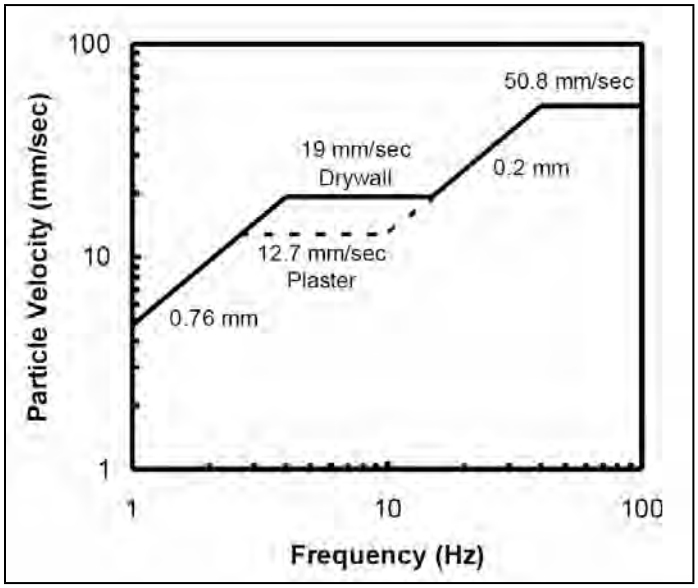



**Figure 1 – USBM Vibration Criteria (after Siskind et al, 1980)**
*The figure provides a "threshold damage" limit, defined as cosmetic damage (e.g., cracking) within the structure, categorized by both frequency ranges and particle velocity.*

7. The location of seismograph(s) placements, as directed by the Contractor's Professional Engineer. Recording seismographs may be installed on selected structures at as many locations required as determined by the Contractor's Professional Engineer.
8. Certifications shall be provided to the Engineer that all monitoring equipment is calibrated and maintained in accordance with manufacturer's

requirements and that, were applicable, calibrations are traced to the National Institute of Standards and Technology.

9. The Contractor shall operate the monitoring equipment and record data for the duration of the construction activities. The Contractor shall document with photos, sketches, and notes, if appropriate, all events responsible for measured vibration levels and submit documentation along with the readings to the Engineer.
10. Should the peak velocity ever exceed 0.5 inches per second (ips), the Contractor shall:
    a. Double the frequency of the readings.
    b. Notify the Engineer.
    c. Verify with the Engineer that all work is being conducted according to the Contract Documents.
    d. Schedule a meeting with the Engineer to be held within 48 hours of the reading to discuss further action.
11. Should the peak particle velocity ever exceed 1 inch per second (ips), the Contractor shall:
    a. Stop all construction activities immediately.
    b. Verify the readings.
    c. Schedule a meeting with the Engineer to be held immediately to discuss further action.
12. The procedure for tracking PPV throughout construction operations (e.g., Pile Driving Operations: pile tip vs. vibrations may be correlated through time of day. A record of the time of day at each depth interval, included on the pile driving records, would be required to correlate to a time-based readout of PPV).
13. The Contractor shall inform the Engineer immediately each time measured particle velocities exceed 85% of the allowable peak particle velocity. The Contractor shall make equipment or procedural modifications as required to avoid exceeding the allowable vibration intensity.
14. If the measured velocities exceed the maximum allowable PPVs, the Contractor shall stop operations immediately and revise equipment and procedures to reduce vibrations to allowable levels. If the seismographs show any indication of damage or vandalism, the seismographs shall be immediately recalibrated or replaced.
15. The Contractor shall be in communication with their monitoring firm's personnel during vibration monitoring at all locations to verify the data recorded.
16. The Contractor shall provide the Engineer with the results of daily vibration monitoring, one workday after the readings are taken. Upon completion of the construction operations for those locations requiring vibration monitoring, the daily submittals shall be synthesized into a final report.

END OF SECTION

# SECTION 02 22 20

# EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITY SYSTEMS

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

A. Excavating trenches for buried utilities.

B. Backfilling and compaction of trenches.

### 1.2 RELATED SECTIONS

A. Additional requirements for earthwork activities are specified in Section 02 20 00, Earthwork.

### 1.3 CODES AND STANDARDS

AMERICAN SOCIETY FOR TESTING AND MATERIALS

| | |
|---|---|
| ASTM D422-63(R90) | Standard Test Method for Particle-Size Analysis of Soils |
| ASTM D1557-91 | Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft (2700 kN-m/m)) |
| ASTM D2922-91 | Standard Test Methods for Density of Soil and Rock in Place by Nuclear Methods (Shallow Depth) |
| ASTM D3017-88 | Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth) |

### 1.4 DEFINITIONS

A. Degree of Compaction:

1. Expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D1557.
2. Abbreviated in this Section as a percent of laboratory maximum density.

### 1.5 SUBMITTALS

A. Soil Compaction Results: Submit results of the soil backfill compaction tests conducted by an independent testing firm as required.

## 1.6 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. Protect and support existing structures and utilities where adjacent excavation is likely to cause damage or settlement.

B. Immediately report to Owner's Representative any sewers, water lines, electric power, telephone conduits or cables, or any other utility lines not indicated on the drawings that are encountered during excavation.

# PART 2 - PRODUCTS

## 2.1 MATERIAL

A. Bedding and backfill material above the installed utility shall meet the requirements of Crushed Stone, Dense Graded Aggregate, or Granular Fill as specified in Section 02 20 00, Earthwork, and on the Contract Drawings, unless approved otherwise by Owner's Representative or per the New Bedford DPI requirements.

## 2.2 PLASTIC MARKING TAPE

A. Plastic Marking Tape:

1. Acid and alkali-resistant polyethylene film.
2. Provide tape type specifically manufactured for marking and locating underground utilities.
3. Provide tape with the metallic core encased in a protective jacket or with other means to protect it from corrosion.

# PART 3 - EXECUTION

## 3.1 EXCAVATION

A. General:

1. Perform work in accordance with OSHA requirements.
2. Perform excavation of trenches to the lines and grades indicated on drawings.
3. During excavation, stockpile material satisfactory of backfilling in an orderly manner at a distance no closer than 2 feet.
4. Provide grading that will prevent surface water from flowing into the excavation.
5. Remove water accumulating in the excavation as necessary to maintain the stability of the bottom and sides of the excavation.
6. Place and compact backfill material in unauthorized over-excavations in accordance with Section 02 20 00, Earthwork.

B. Trench Excavation:

1. Trench width and profile below the top of the buried commodity:
   a. Conform to the buried commodity manufacturer's recommendations.
   b. Where manufacturer recommendations are not available, follow the guidelines on the Project Drawings.
2. Give special attention to trench side slopes that may be adversely affected by weather or moisture content.

C. Bottom Preparation:

1. Accurately grade the bottoms of trenches to provide uniform bearing and support of the bottom quadrant of each section of the pipe.
2. Excavate bell holes to the required size at each joint or coupling to eliminate point bearing.
3. Remove stones of 3 inches or greater in any dimension or as recommended by the pipe or cable manufacturer, whichever is smaller, to avoid point bearing.

D. Removal of Unyielding Material: Where unyielding material is encountered in the bottom of the trench, remove material at least 4 inches below the required grade and replace with suitable materials as directed by the Owners Representative.

E. Removal of Unsuitable Construction Debris and Unstable Material: Where unsuitable construction debris or unstable material, as specified in Section 02 20 00, Earthwork, is encountered in the bottom of the trench, remove material to the directed depth and replace to the proper grade with approved backfill material as directed by the Owners Representative.

## 3.2 BEDDING AND BACKFILL

A. Bedding

1. Place approved backfill material in maximum 12-inch loose layers (depending on equipment used) and mechanically compact to not less than the 95 percent laboratory maximum density (ASTM D1557) if within 15 feet of the heavy lift area, and to not less than 90 percent laboratory maximum density if more than 15 feet from the heavy lift area. Compact within 3 percent of the optimum moisture content per ASTM D1557. Besides meeting the compaction and moisture content requirements, each lift or backfill shall be compacted to a firm, stable, and non-yielding condition.
2. Minimum final compacted thickness: 4 inches.

B. Backfill

1. Place approved backfill material around and to a depth 1/2 of the diameter of the pipe.

2. Spread material uniformly along each side of the pipe in loose layers not exceeding 6 inches and compacted to not less than the 95 percent laboratory maximum density if within 15 feet of the heavy lift area, and to not less than 90 percent laboratory maximum density if more than 15 feet from the heavy lift area.

## 3.3 PLASTIC MARKING TAPE

A. Install plastic marking tape directly above the top of pipe.

## 3.4 TESTING AND INSPECTION

A. Visually inspect pipe joints for displacement or improper fit of the gasket material.

B. Follow pipe and gasket manufacturer's recommendations for rejection due to non-watertightness of the joint.

C. Remove and re-install defective sections of the pipe with rejected joints.

D. The Contractor shall contact the Owner's Representative when the pipe bedding is prepared. The Contractor shall grant the Owner's Representative 12 hours to conduct testing to determine the relative degree of compaction of trench backfill materials. The Owner's Representative will conduct soil density tests to determine the relative degree of compaction for pipe bedding and trench backfill materials. Contractor shall re-compact any soil that does not meet the minimum soil density. Soil density testing frequency will, at a minimum, be as follows:

1. One test each 100 linear feet of trench backfill placed and compacted or one test for each 250 cubic yards of trench backfill placed and compacted.
2. Not less than one test for each shift.
3. Additional testing may be conducted at the Owner's Representative's discretion.

## 3.5 PROTECTION FROM EROSION

A. Implement temporary erosion control measures (i.e., silt fencing, hay bale sediment traps, etc.) to minimize the effects of erosion and sedimentation.

B. Utility trenches should be protected from stormwater run-on during construction activities.

C. Utility trenches, particularly drainage and infiltration trenches shall be protected during all construction activities. Trenches shall be protected from construction vehicle traffic, run-on, sedimentation and stormwater infiltration until the project has been accepted by the Owner. Any sedimentation or impact from any of these activities shall be remedied by the Contractor at no expense to the Owner. No dewatering discharge shall be allowed to be directed into the infiltration trenches.

END OF SECTION

# SECTION 02 26 00

# GEOSYNTHETICS

## PART 1 - GENERAL

### 1.1 SCOPE

The following describes parameters for the manufacture, supply, and installation of geosynthetics.

### 1.2 DEFINITIONS

Geosynthetics herein refer to both filter fabric and geogrid. Filter fabric consists of non-woven and woven materials which are generally used for separation purposes. Geogrid for this project consists of Tensar Interax geogrid and Tensar Interax Filtergrid as noted on the Contract Drawings, which is a geogrid with sewn filter fabric for both stabilization and separation.

### 1.3 QUALIFICATIONS

The geosynthetic manufacturer shall have successfully manufactured 5,000,000 square feet of geosynthetic product.

### 1.4 SUBMITTALS

The Contractor shall provide the following information to the Owner’s Representative:

A. Method of Placement Plan

B. List of material properties

C. Quality control certificate for the filter fabric, upon request

## PART 2 - PRODUCTS AND MATERIAL SPECIFICATIONS

### 2.1 MATERIALS

A. Filter Fabric

Non-woven filter fabric as identified on the Contract Drawings or approved equal and shall meet the criteria of Paragraph 2.3. Woven filter fabric shall be ACF M200 (US Equivalent US 1540) or approved equal and shall meet the criteria of Paragraph 2.3.

B. Geogrid

Geogrid as identified on the Contract Drawings or approved equal and shall meet the criteria of Paragraph 2.4.

## 2.2 MANUFACTURER'S QUALITY CONTROL TESTING

The filter fabric shall be tested by its manufacturer once every 100,000 square feet except for AOS and permittivity, which shall be tested once every 500,000 square feet and UV stability, which shall be per manufacturer historical data.

Any rolls not meeting the requirements of the specification shall be rejected. The manufacturer shall prepare a quality control report to be submitted to the Owner's Representative upon request.

## 2.3 ADDITIONAL GEOSYNTHETIC CRITERIA

A. The filter fabric shall meet the minimum physical requirements listed in Table 3 of these Specifications. Consultation with the manufacturer is recommended.

B. The filter fabric must be permitted to function properly by allowing relief of hydrostatic pressure; therefore, fine soil particles shall not be allowed to clog the filter fabric.

C. The filter fabric shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of propylene, ethylene, ester, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic, if necessary, to make the filaments resistant to deterioration due to ultraviolet and heat exposure. The edges of the filter fabric shall be finished to prevent the outer fiber from pulling away from the filter fabric.

D. The geogrid shall be manufactured from a coextruded, composite polymer sheet.

E. The Contractor shall furnish the Owner's Representative, in duplicate, manufacturer's certified test results for all geosynthetics showing actual test values obtained when the physical properties are tested for compliance with the specifications.

F. During all periods of shipment and storage, all geosynthetics shall be protected from direct sunlight, ultraviolet rays and temperatures greater than 140 degrees Fahrenheit. To the extent possible, the geosynthetics shall be maintained wrapped in its protective covering. The geosynthetics shall not be exposed to sunlight, ultraviolet rays until the installation process begins.

## Table 3

## Physical Requirements

| Physical Property | Test Procedure | Minimum Value |
|---|---|---|
| Grab Tensile Strength (Unaged Filter Fabric) | ASTM D4632 | 120 lbs. (in any principal direction) |
| Breaking Elongation (Unaged Filter Fabric) | ASTM D4632 | 50% max. (in any principal direction) |
| Burst Strength | ASTM D3786 | 400 p.s.i |
| Puncture Strength | ASTM D4833 | 115 lbs. |
| A.O.S., U.S. Std. Sieve | ASTM D4751 | see Design Manual |
| % Open Area | CWO-22125-86 | See Design Manual |
| Permittivity | ASTM D4491 | See Design Manual |

G. Final acceptance of the filtration filter fabric by the Owner's Representative shall be dependent upon the filter fabric performance when tested in accordance with ASTM D5101, Standard Test Method for Measuring the Soil-Geotextile System Clogging by the Gradient Ratio test or the Hydraulic Conductivity Ratio test. Soil characteristics such as grain size distribution and plasticity shall be determined for every 200,000 square feet of filter fabric installed or for each source of borrow material used during construction. Significant differences in soil characteristics shall require further performance testing by either the Gradient Ratio or the Hydraulic Conductivity Ratio tests at the discretion of the Owner's Representative. The locations for which the material to be tested are extracted and shall be approved by the Owner's Representative. The Contractor shall provide the site-specific soil and modified proctor curves for the site-soil, at their own expense, to the manufacturer. Also, the Contractor shall be responsible for the performance of the test by a certified independent laboratory experienced in performing such test. The test shall be performed under the actual field soil conditions or as otherwise required by the Owner's Representative.

H. At the time of installation, geosynthetics shall be rejected if it has been removed from its protective cover for over 72 hours or has defects, tears, punctures, flow deterioration, or damage incurred during manufacture, transportation or storage. With the acceptance of the Owner's Representative, placing a geosynthetic patch over the damaged area prior to fill placement shall repair a torn or punctured section of the geosynthetic. The patch shall be large enough to overlap a minimum of 3 feet in all directions.

I. In the event pre-assembled panels of fabric are required, the panels of filter fabric shall be sewn together at the manufacturer or another approved location.

## PART 3 - EXECUTION AND FILTER FABRIC INSTALLATION

### 3.1 TRANSPORTATION AND ON-SITE STORAGE

The geosynthetic rolls shall be wrapped in a plastic cover. The rolls shall be shipped to the job site in a manner not to damage the rolls.

### 3.2 METHOD OF PLACEMENT

The Contractor shall submit to the Owner's Representative a plan describing a suitable method of placement for geosynthetics. The subgrade shall be free of foreign and organic material, sharp objects, or debris of any kind, which could potentially damage the geosynthetic. On side slopes, the rolls shall be deployed in the general direction of the maximum slope. The deployment equipment shall not damage the underlying subgrade. Geosynthetics shall be properly secured. An extra layer of geosynthetic may be required at the intersection of any two side slopes to cover the area where the panels are staggered. The Contractor shall submit a proposed method for installing and securing geosynthetic where it is placed within tidal or sub-tidal locations.

### 3.3 FIELD SEAMING

On slopes, the spacing of ties across the roll end shall be 6 inches. The upper geosynthetic flaps of the adjacent panels shall be heat-bonded or sewn on all sides in accordance with the project specification.

### 3.4 COVER MATERIAL

The geosynthetic shall be covered as soon as possible. The covering operation shall not damage the geosynthetic. The cover soil material shall be free of foreign and organic material, sharp objects, or debris of any kind, which could potentially damage the geosynthetic. No construction equipment or machinery shall operate directly on the geosynthetic. The use of lightweight machinery (i.e., generator, etc.) with low ground pressure is allowed.

### 3.5 REPAIRS

All panels shall be inspected for damage. Any damaged area shall be repaired by a patch of the same material. Filter fabric repair shall extend 1 foot beyond the edges of the damaged area and geogrid repair shall extend 2 feet beyond the edge of the damaged area.

END OF SECTION

# SECTION 02 41 00

# SELECTIVE DEMOLITION (MARINE STRUCTURES)

## PART 1 - GENERAL

### 1.1 DESCRIPTION OF WORK

A. Carefully demolish and remove from the site those items scheduled to be so demolished and removed.

B. Carefully remove and store off or on site those items scheduled to be reused. Replace these items as indicated on the Drawings such that they are undamaged and fit for their intended purpose.

C. All utility lines that are altered or relocated during the construction are to be of an equal standard to those now existing and are to be acceptable to the Owner and the appropriate Utility Company. The Contractor is to inform and liaise with the Owner regarding all work that may affect the existing utilities. The Owner will make arrangements with the Utility Company for services to be cut-off if required during construction. The Contractor is responsible for notification of local utilities.

### 1.2 QUALITY ASSURANCE

Use adequate numbers of skilled work men and women who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this specification.

### 1.3 SUBMITTALS

Except for items specifically scheduled for reuse, demolished material shall be considered to be property of the Contractor and shall be completely removed from the job site and disposed of in legal manner. The Contractor shall submit a detailed disposal plan to the Engineer. The disposal plan shall include the name, address, and telephone number of the disposal site. The Contractor shall submit to the Engineer a signed manifest and trip ticket stating that the debris was disposed at the stated site within 24 hours after the material has left the site.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

Examine the areas and conditions under which Work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until satisfactory conditions are corrected.

### 3.2 DEMOLITION

A. By careful study of the Contract Documents, determine the location and extent of selective demolition to be performed.

B. In company with the Engineer, visit the site and verify the extent and location of selective demolition required.

1. Carefully identify limits of selective demolition.
2. Secure the Engineer's review of the items scheduled for selective demolition.
3. Demolish and remove the scheduled items.

C. Prepare and follow an organized plan for demolition and removal of items.

1. Shut off, cap, and otherwise protect existing utility lines in accordance with the requirements of the public agency or utility having jurisdiction.
2. Completely remove items scheduled to be so demolished and removed, leaving surfaces clean, solid, and ready to receive new materials specified elsewhere or excavation.
3. In all activities, comply with pertinent regulations of governmental agencies having jurisdiction.

D. Exercise all necessary care so as not to damage items scheduled to remain in place for re-use.

E. Except for items specifically scheduled for reuse or to be turned over to the Owner, demolished material shall be considered to be property of the Contractor and shall be completely removed from the job site and disposed of in accordance with all Federal, State and local regulations. Provide documentation to the Engineer that material has been disposed of in such a manner.

## 3.3 REPLACEMENTS

In the event of demolition or damage caused to items not so scheduled to be demolished, promptly replace such items to the approval of the Owner and at no additional cost to the Owner.

## 3.4 ALTERATIONS TO REUSED ITEMS

All alterations to reused items are to be of an equal standard to their original construction, or as otherwise indicated in these specifications. The Contractor is responsible for ensuring that the dimensions of reused items are adjusted to suit the new construction. Drawings are to be presented to the Engineer for review prior to making any alterations; however, this review does not relieve the Contractor of his responsibilities as indicated elsewhere in this Contract.

## 3.5 RELOCATION OF UTILITIES

Relocate existing utilities as required during construction such that services to the site are maintained to the Owner's satisfaction. The Contractor is responsible for liaison with the Owner on all aspects of utility service maintenance and relocation. If replacement of utilities is undertaken by a Utility Company or others, the Contractor shall coordinate these activities with their own work.

END OF SECTION

# SECTION 02 41 10

# SITE DEMOLITION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section. Refer also to the following specifications:

1. Section 02 11 00, Clearing and Grubbing
2. Section 02 20 00, Earthwork
3. Section 01 35 50, Environmental Protection

### 1.2 DESCRIPTION OF WORK

A. Provide all materials, equipment and labor necessary to complete the work as indicated on the drawings or as specified herein.

B. The principal work of this section includes, but may not be limited to, the following:

1. Identifying and Disconnecting Existing Utilities
2. Selective Demolition and removal of former other associated materials, building slab, building foundations if encountered.
3. Removal of existing site items such as bituminous concrete pavement and fencing
4. Dust Control

C. The Contractor shall take every precaution necessary to protect adjacent structures, pavements, etc. and shall be responsible for making all repairs/replacements as may be necessary due to damage caused by site operations, negligence, etc.

D. The Contractor shall be responsible for the removal of all materials from the site except as specifically provided; the removal of subsurface masonry as provided; the removal of paved surfaces, as provided; and entire portions of all designated storm and drainage structures to be removed; filling, the smooth grading of land within the demolition area to a safe, clean, sanitary and non-hazardous condition.

E. Install fences and safety control devices as necessary or as directed by plans, and maintain in a neat, functioning manner on a daily basis.

F. Utilize temporary access to site as directed by Owner.

G. The Contractor shall take every precaution and action necessary to protect, if necessary, adjacent structures, pavements, utilities, etc. and shall be responsible for

making all repairs/ replacements as may be necessary due to damage caused by site operations, negligence, etc.

1.3 EXISTING CONDITIONS

A. Grades and other available survey data of the site have been included in the drawings for reference only. Contractor shall be deemed to have inspected the site and satisfied themself as to actual grades and levels, and the true conditions under which the work is to be performed.

B. The Contractor shall verify dimensions and elevations on the ground and report any discrepancies immediately to the Owner. Any discrepancies not reported prior to the start of work shall not be the basis for claims for extra compensation. Adjustments shall be made at no additional cost to the Owner.

1.4 SUBSURFACE INFORMATION

A. The Owner assumes no responsibility for the Contractor's failure to examine all available subsurface information and/or failure to make their own site investigation and makes no representation regarding the character of soil and/or structures which may be encountered during the performance of the work. The Owner assumes no responsibility for unforeseen conditions on or near the site for buildings, structures or the site itself.

1.5 FINISHED GRADES

A. The words "finished grades" as used herein mean the required final grade elevations indicated on the drawings. Where not otherwise indicated, areas shall be given uniform slopes between points, for which finished grades are given, or between such points and existing grade, except that vertical curves or rounding shall be provided at abrupt changes in slope.

1.6 PROTECTION

A. All rules and regulations governing the respective utilities shall be observed in executing all work under this section. All work shall be executed in a manner as to prevent any damage to existing streets, paving, utility lines, structures, and adjoining property. Monuments and benchmarks shall be carefully maintained, and if disturbed or destroyed, replaced as directed.

B. The furnishing of all facilities and materials necessary to prevent the earth at the bottom of excavation from becoming frozen or unsuitable to receive fill materials shall be included by the Contractor.

C. The Contractor shall provide, at their own expense, adequate pumping and drainage facilities to keep the excavation sufficiently dry as not to affect adversely, the quality or time of placement of materials to be installed in the excavated areas. The drainage

of all water resulting from pumping shall be arranged so as to cause no damage to adjacent properties.

D. The Contractor shall assume full responsibilities for damages caused by them or their Subcontractor's equipment and their personnel to any adjoining properties.

E. The work of this Section shall be performed in such a manner as to cause no interference with access by Subcontractor's or Owner's personnel to all portions of the site as is necessary for the normal conduct of their work.

F. All existing vegetation outside the Limit of Work shall be protected from physical injury and from harm to roots due to chemicals, run-off of water, excessive silting, erosion, or excavation.

1.7 UTILITIES

A. Before starting demolition/site preparation, the Contractor shall confirm, in writing, that all utility cutoff work has been accomplished with verification through appropriate agencies / departments, as required.

B. No wires, conduits, pipes or other connections shall be removed until the applicable services have been disconnected as herein before described.

C. It shall be the responsibility of the Contractor to protect and preserve in operating condition, all utilities that traverse the site, protect manholes, including frames and covers, catch basins, including frames and grates, valve boxes and other appurtenances, unless otherwise noted on the plans.

D. Damage done to any utility due to work under this contract shall be repaired to the satisfaction of the Agency and the respective utility company. The Contractor shall not disturb utilities serving buildings / areas not released to the Contractor for demolition.

1.8 DEMOLITION AND REMOVAL

A. Except as otherwise shown or specified, the Contractor shall remove and properly dispose of all materials entirely whether above or below grade. All appurtenances are to be completely removed, no matter depth, or thickness, to limits established on the drawings, all subject to exceptions defined and described in subsequent sections of these specifications, and further delineated on the site drawings, which forms part of these technical specifications.

B. Hand labor shall be employed to facilitate final clearing of wood, debris, combustible materials, pipes, rods, etc.

C. Adjacent streets and other improvements shall be protected from any damage or displacement during the demolition process.

D. The Contractor shall take all procedures and precautions necessary to prevent excessive spread of dust during the demolition / site preparation procedure.

E. No blasting shall be permitted on the project site.

F. No material or debris shall be burned on the site.

G. All voids shall be backfilled with approved / required fill to obtain an elevation to conform with required subgrade or finished grade work, existing surrounding elevations adjacent to the work, filling and grading shall be performed in a manner to prevent settlement of proposed site improvements and to prevent the collection of stagnant water. All finished grading shall be performed so as to allow proper drainage away from adjacent properties.

H. The Contractor shall remove and dispose from the site, all brush, bushes, hedges, tree stumps, rubbish, trash and garbage, tires, etc., found on the site. Except as otherwise specified, all materials and debris resulting from the demolition shall also be removed from the project site.

I. All excess masonry, concrete, brick, etc., shall be removed from the site unless otherwise approved by the Owner's Representative for selective backfilling. The site shall be left in a safe, clean sanitary and non-hazardous condition upon completion.

J. The Contractor shall protect and maintain all sidewalks and streets in a safe, clean, and passable condition at all times.

K. Adequate protection of persons and property shall be provided by the Contractor at all times. The Contractor shall execute the work so as to 1) keep all standing equipment and crews off the right-of-way unless specifically authorized by the City; and 2) avoid interference with the use of or passage to and from adjoining buildings and facilities.

L. The Contractor, or a competent supervisory employee, shall be present at the site while all operations are in process.

M. The methods to be used in demolition shall not involve undue hazards or unnecessary danger to work men and women and shall be in accordance with good practices. All persons actively engaged in demolition operations on the project site shall wear required protective clothing, safety hardhat and other safety equipment as required by law.

## 1.9 REGULATORY REQUIREMENTS

A. Conform to all applicable codes for disposal of debris.

## PART 2 - PRODUCTS

### 2.1 CALCIUM CHLORIDE FOR DUST CONTROL

A. Calcium chloride shall meet the requirements of Massachusetts Highway.

B. Calcium chloride shall have weights marked on the shipping containers to be used, or if directed by Owner's representative, scales shall be furnished by and at Contractor's expense to measure calcium chloride by the ton.

### 2.2 FILL MATERIALS

A. Refer to Section 02 20 00, Earthwork.

## PART 3 - EXECUTION

### 3.1 IDENTIFYING EXISTING UTILITIES

A. Consult with appropriate engineering department regarding location of underground utilities prior to start of construction.

B. Disconnect, remove and cap designated utility lines within demolition areas.

C. Mark location of disconnected utilities. Provide information on "as built" drawings for Owner.

### 3.2 RULES, PERMITS, AND CERTIFICATES

A. The Contractor shall pay all fees, give all notices, file all necessary documents and obtain all permits and Certificates of Approval required in connection with the work of this contract. The Contractor shall comply with all laws, ordinances, rules, and regulations of the Commonwealth of Massachusetts, City of New Bedford, and all other authorities having jurisdiction over this project.

### 3.3 SUBSURFACE SOIL CONDITIONS

A. In the demolition operation of this work, the Contractor shall have filled, compacted and graded all voids and other openings with specified fill and removed unoccupied able debris. The Contractor is responsible for subsurface conditions being suitably compacted and stable and free of obstructions for performance of work in accordance with these contract documents. Subsurface removal of footings and slabs shall be done prior to the Contractor's method and implementation of Ground Improvements specified under Section 02 20 00, Earthwork.

## 3.4 PROTECTION AND COORDINATION

A. Properly protect persons and property at all times against harm or damage of any kind during all construction and operations. Provide substantial barricades around all openings as soon as they are uncovered to block access and afford protection to work men and women and the public. Provide lanterns and other signalization, as may be required by law or directed by the Owner, in the vicinity of any open excavations or other unsafe areas and be certain that such devices are operable at all times during the hours of darkness or when the work is left unattended.

B. Preserve in operating condition, any active utilities indicated on the Contract drawings to remain, which traverse the site or exist in the immediate vicinity of the site, including, but not limited to mains, sewers, manholes, catch basins, poles, etc.

C. Damage to any utility lines or related appurtenances resulting from the work under this Contract shall be repaired by and/or at the expense of the Contractor to the satisfaction of the Owner, utility company, or local authority. If any active utility lines are broken or damaged during any site improvement operations, take all necessary steps immediately, to avoid endangering persons or property.

D. Notify all utility companies, the appropriate officials and respective water and sewer departments prior to the commencement of any operations on the site. Confirm locations with all utility companies involved of all live or active utilities / water / sewer within or immediately adjacent to the Contract Limit Lines of this project.

E. Remove, plug or cap as required, any inactive and abandoned utilities or other lines if encountered, when deemed by Owner not to be of any further use to the project.

## 3.5 SELECTIVE DEMOLITION

A. The Contractor shall prevent movement or settlement of adjacent structures and shall shore up, brace, underpin and do whatever is necessary to protect adjacent structures.

B. Demolish indicated appurtenances in an orderly and careful manner so as to allow for minimal disturbance to adjacent areas.

C. Protect existing pavements, vegetation, appurtenances and structures that are not denoted on plan to be demolished.

D. Cease operations and notify Owner’s representative immediately if adjacent structures appear to be endangered. Do not resume operations until corrective measures have been taken.

E. Except where noted otherwise, immediately remove demolished material from site and dispose of legally off- site.

F. Relics, antiques and similar objects, as indicated by the Owner’s representative or as discovered or uncovered in the process of performing the Work of this Section, remain

the property of the Owner. Notify Owner's representative prior to removal and obtain acceptance regarding method of removal.

G. Remove and promptly dispose of contaminated, vermin-infested, or dangerous materials encountered.

H. Do not burn or bury materials on site.

I. Backfill areas excavated completely as a result of demolition.

J. Rough grade and compact areas affected by demolition to maintain site grades and contours.

K. Remove demolished materials from site as work progresses. Leave site in clean condition.

L. If any of the excavation is carried through error beyond the depth and dimensions indicated on the drawings or specified herein, or if the foundation soils are disturbed by de-watering or other construction operations, the Contractor shall, at their own expense, refill with approved gravel compacted to 95% of the maximum dry density at optimum moisture content or with concrete as determined by Owner.

M. When excavations have reached the prescribed depths, the Owner shall be notified and will make an inspection of the conditions and approve the placing of fill.

N. The Contractor shall obtain the location of all utilities within the scope of this work from the proper authorities so that there will be no damage done to such utilities.

O. All excavated materials that are not suitable for fill or backfill as specified herein, shall be removed and disposed of properly and legally off the property.

P. Any unsanitary condition encountered shall be corrected or entirely removed as directed.

## 3.6 STORAGE OF EXISTING SITE IMPROVEMENTS

A. Carefully remove, clean and deliver to an appropriate area all identified equipment to be stored.

## 3.7 DUST CONTROL

A. Provide all equipment, labor, materials and related work necessary for the prevention and control of dust resulting from operations in the performance of the work of this contract and in accordance with additional requirements specified herein. All costs in connection therewith shall be considered to be included in the various unit and/or lump sum prices bid for the various items as listed in the bid.

B. When, in the opinion of the Owner's representative, conditions at the site are such as to require dust control measures to supplement those required to be provided by the Contractor as described in the preceding paragraph, the Owner's representative may direct the Contractor to furnish and spread calcium chloride over certain areas at the site, at certain times and at specific rates of application. The calcium chloride shall be spread over the designated areas by approved mechanical devices at the rate for each area as directed at no additional cost to the Owner.

END OF SECTION

# SECTION 02 60 50

# UNDERGROUND PIPING

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

A. Provide underground piping at the locations shown on the Contract Drawings and in accordance with the applicable details also included on the Contract Drawings.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 MATERIAL HANDLING

A. Pipe, fittings, and appurtenances shall be inspected before they are lowered into trench. Interior of pipe and joint surfaces shall be thoroughly cleaned and shall be maintained clean. Open end of pipeline shall be securely plugged whenever pipe laying is not in progress.

B. Pipe and fittings which do not fit together to form a tight joint shall be rejected. Pipe and fittings shall be selected so that there will be as small a deviation as possible at joints so that the interior presents a smooth surface.

C. Pipe cutting shall be done with sharp tools using methods approved by pipe manufacturer in such a manner that it will not crack the pipe.

D. Pipeline materials shall be carefully handled. Pipe and fittings shall be unloaded with power equipment or lowered on plank ramp to ground. Pipe and fittings shall not be dropped or dumped.

E. Pipe shall be lowered into trench using backhoe, loader or other suitable means so as not to damage pipe.

### 3.2 LOCATION

A. The location of the centerline of the proposed pipeline will be staked in the field before utility construction begins.

B. The Contractor shall determine the location and elevation of underground utilities before commencing construction. Exploratory excavation shall be made sufficiently ahead of construction to permit revisions as required to meet the existing conditions.

The Contractor shall take precautionary measures to protect the utility lines shown on these plans and any other lines not shown.

## 3.3 OBSERVATION

A. All piping shall be observed in place by the Owner's Representative prior to backfilling. Any pipe buried without approval of the Owner's Representative shall be uncovered by the Contractor for observation at no expense to the Owner.

## 3.4 PIPELINE SEPARATION

A. Where an existing pipe crosses a trench at an elevation which conflicts with the proposed grade for the new pipeline, either the grade for the new pipeline shall be changed or the existing pipe shall be moved, as directed. The new pipeline shall have a clearance from all existing lines of not less than 6 inches unless specified otherwise. The space between the two pipes shall be solidly filled with compacted crushed stone. During construction, temporary supports shall be provided as required to maintain existing pipelines in position. Before the trench is refilled, existing pipelines shall be permanently supported.

## 3.5 PIPELINE FOUNDATION

A. Trenches shall be cut to specified depth limit by machinery. In select earth material, where machine excavation is stopped the specified distance above grade and another bedding material is not specified for the pipe, bed for pipe shall be formed of that material and trench bottom trimmed by hand to grade. Stones and unsuitable material shall be removed, and low spots refilled with crushed stone, as specified in Section 02 20 00, Earthwork.

B. In rock the pipe shall be bedded in crushed stone.

C. Pipe bed shall be hand shaped so that the pipe barrel is uniformly supported along its entire length. Joint holes shall be accurately located along pipe bed. Holes shall be cut sufficiently large for making joint and no larger. In no case shall pipe be laid on blocks.

D. After pipe is laid and adjusted to its final position, bed shall be repaired where disturbed by laying operation, and joint holes filled. Repairs shall be made by ramming bedding material under bottom and haunches of pipe, so pipe is supported for its full length and is tightly held in position.

## 3.6 SPECIAL PIPE FOUNDATIONS

A. Where required by the Contract Documents or directed by the Owner's Representative, a cradle of crushed stone, or concrete shall be provided to form a stable, firm bed of dimensions shown for full width of trench. No material greater than 1 inch in diameter shall be used in the cradle.

B. In deep trenches, initial backfill over pipe with concrete cradle shall not exceed a depth that will put excessive stress on pipe or concrete. Remaining backfill shall be placed not less than 48 hours after pipe is laid. Initial backfill shall not be placed until concrete has reached its initial set.

END OF SECTION

# SECTION 02 81 00

# TRANSPORTATION AND DISPOSAL OF HAZARDOUS MATERIALS WITHIN STRUCTURES

## PART 1 - GENERAL

### 1.1 SCOPE OF WORK

A. Contractor shall properly transport and dispose of all items, including solid hazardous and nonhazardous wastes removed from the site, to appropriate disposal facilities. Contractor shall characterize all wastes prior to offsite disposal. This includes wastes designated for disposal by the Owner's Representative as well as the wastes generated by Contractor. Contractor shall be responsible, and will be held accountable, for assuring that all sampling, analysis, transportation, and disposal requirements of the receiving facility and federal, state, and local governments are complied with and properly documented.

### 1.2 SUBMITTALS

A. All final versions of weight slips, material shipping records, completed bills of lading, or hazardous waste manifests for material generated at the site and transported and disposed of offsite.

### 1.3 PERMITS AND REGULATIONS

A. Contractor shall comply with all federal, state, and local regulations regarding transportation and disposal of hazardous and nonhazardous material. These include, but are not limited to:

1. Trucks used for transportation of hazardous material for disposal off site shall be permitted pursuant to 310 CMR 30.0000.
2. Vehicle operator possession of a commercial driver's license with hazardous materials endorsement (if applicable).
3. Registration of vehicle as a hazardous waste carrier (if applicable).
4. Utilization of shipping papers, bills of lading, and/or hazardous waste manifest (40 CFR 262.20).
5. Proper marking and placarding of vehicles.
6. Placement of emergency response procedures and emergency telephone numbers in vehicle, and operator familiarity with emergency response procedures.
7. Compliance with load height and weight regulations.

## PART 2 - PRODUCTS

### 2.1 MATERIALS AND EQUIPMENT

A. All equipment supplied shall be in good working condition. Equipment and machinery delivered to the site, including haul trucks that have visible oil or hydraulic fluid leaks, will not be allowed on site until satisfactorily repaired. Contractor is responsible for the cleanup of any oil or hydraulic fluid spills at Contractor's expense.

B. Contractor shall not allow soil/sediment to be tracked off site at any time during the Project. Contractor shall wash trucks before they leave the site. Visible soil tracks on streets will not be allowed. Contractor shall take sufficient precautions to prevent loose soils from adhering to tire treads, wheel wells, etc. Any loose soil spread shall be cleaned up.

C. Contractor shall not allow fugitive dust emissions to be generated from trucks containing soil/sediment when leaving the site or at any time offsite. Contractor shall provide covers, such as a tarpaulin or other means, for the trucks to prevent the generation of dust prior to their arrival at the ultimate reuse or disposal location.

## PART 3 - EXECUTION

### 3.1 TRANSPORTATION

A. All waste disposal facilities used by the Contractor shall be submitted to the Owner's Representative for approval. Contractor shall not use any disposal facility that does not have the Owner's Representative's approval. Prior to shipment of wastes off the site, Contractor shall confirm with the Owner's Representative by written communication from the designated Transportation, Storage, or Disposal Facility (TSDF) that it is authorized, has the capacity, and will provide or assure that the ultimate disposal method is followed for the particular hazardous waste on the manifest. Additionally, Contractor shall confirm by written communication from the designated transporter(s) that they are authorized to deliver the manifested waste to the designated TSDF or Solid Waste Management Facility (SWMF).

B. Any transported materials must be covered to prevent the loss of material and to prevent the generation of dust.

### 3.2 ANTI-TRACKING PAD

A. An Anti-Tracking Pad shall be constructed by the Contractor so that soil/sediment is not tracked off site. Details of the Anti-Tracking Pad are provided on the Project Drawings. The pad shall be constructed with a layer of filter fabric per Section 02 26 00, Geosynthetics, above the existing grade and a minimum 8-inch-thick layer of 3" - 6" crushed stone. The pad shall be graded so that water is directed away from the pad and the public right-of-way.

## 3.3 MANIFESTING AND DOCUMENTATION

A. Contractor shall complete all required manifest forms and Bill of Lading forms for proper transportation and disposal of materials off site. Contractor shall present the documents for proper signatory by the Owner. Contractor shall promptly provide Owner's Representative copies of all final bills of lading, manifests, Certificates of Disposal, and/or papers involved in shipping of material off of the site, as well as any weight tickets or receipts for delivery of materials to the site, or delivery to a disposal facility.

END OF SECTION

# SECTION 03 30 00

# CAST-IN-PLACE CONCRETE

## PART 1 - GENERAL

### 1.1 WORK SPECIFIED

Work included: The Work covered under this Section of these Specifications consist of furnishing all plant, labor, supervision, equipment, appliances, and materials and in performing all operations in connection with the installation of cast-in-place reinforced concrete for all aspects of the project, all in strict accordance with the Contract Documents.

### 1.2 SUBMITTALS

A. Shop Drawings and Product Data.

Shop drawings and product data showing all fabricated dimensions and locations for placing of the reinforcing steel and accessories shall be submitted for review. Shop Drawings shall provide sufficient technical data to demonstrate compliance with the specified requirements. Products, materials, or information submitted for review shall not be used or fabricated until after receipt of the Engineer's review comments. Distribute only reviewed shop drawings to the job site.

B. Mix Design.

Submit concrete mix design, with known test results, to the Engineer for review. The concrete mix design submittal shall consist of at least the following:

1. Type of cement.
2. Dry weight of cement.
3. Saturated surface-dry weights of fine and coarse aggregates.
4. Specific gravity of fine and coarse aggregates.
5. Quantities, type, name, and producer of admixtures, as applicable.
6. Total weight of water, including the water that is absorbed by and on the surface of the aggregates.
7. Water to cement ratio.
8. Slump: Maximum slump, taken at the truck, will be determined based on the pump hose length. The mix designs shall include the anticipated loss of slump per 100-foot length of specified hose size.
9. Entrained air content.
10. Required average batch test strength data of the proposed mix design per ACI and as specified herein.

Distribute reviewed mix design to testing laboratory, batch plant, and job site.

C. Submit concrete batch tickets for each truck delivered to site. Each ticket shall note at least the following data: design mix strength; batch proportions including actual water

and aggregate moisture contents; date and batch time; arrival time at site; discharge time; concrete volume; and any change to concrete made at the site.

D. Construction Joints: Submit proposed construction and control joint details and locations for Engineer's review.

E. Curing and protection procedures: including product data on materials proposed for use.

F. Hot and/or cold weather construction procedures if anticipated and/or required by Engineer.

G. Test Reports

1. Concrete Temperature
2. Concrete Slump
3. Concrete Air Content
4. Compressive Strength Tests

H. Certificates

1. Reinforcing Bar Material Certificates

I. Testing Agency Qualifications

1.3 QUALITY ASSURANCE

A. Field Testing Technician and Testing Agency

1. The Owner will engage a qualified independent testing and inspection agency to perform concrete testing during construction.
2. Work on concrete must be performed by an ACI Concrete Field Testing Technician Grade 1 qualified in accordance with ACI SP-2 or equivalent. Equivalent certification programs must include requirements for written and performance examinations as stipulated in ACI SP-2.

    a. Testing agencies that perform testing services on reinforcing steel must meet the requirements of ASTM E329.
    b. Testing agencies that perform testing services on concrete materials must meet the requirements of ASTM C1077.

B. Laboratory Qualifications for Concrete Qualification Testing

1. The concrete testing laboratory must have the necessary equipment experience to accomplish required testing. The laboratory must meet the requirements of ASTM C1077 and be Cement and Concrete Reference Laboratory (CCRL) inspected.

C. Laboratory Accreditation

1. Laboratory and testing facilities must be provided by and at the expense of the Contractor unless noted otherwise. The laboratories performing the tests must be accredited in accordance with ASTM C1077, including ASTM C78/C78M and ASTM C1260. The accreditation must be current and must include the required test methods, as specified.

D. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

E. The Owner, through the Engineer, reserves the right of approval of any Subcontractor pre-qualified and selected for this portion of the Work by the Contractor. Approval will be based, in part, on documented successful experience in performing work of a similar nature.

F. Cast-in-Place Reinforced Concrete work shall conform to all requirements of ACI 301, "Specifications for Structural Concrete for Buildings".

G. Detailing, fabrication, and erection of reinforcing steel shall conform to ACI 318, "Building Code Requirements for Structural Concrete and Commentary" and "ACI Detailing Manual", MNL-66, "CRSI: Manual of Standard Practice" and "CRSI: Placing Reinforcing Bars".

H. Ready mix plant equipment and facilities shall conform to the "Check List for Certification of Ready Mixed Concrete Production Facilities" of the NRMCA.

1.4 DELIVERY, STORAGE AND HANDLING

A. Delivery, storage and handling of concrete components shall conform to recommended practices of ACI 301, ACI 304 and manufacturer's instructions.

B. Deliver reinforcing steel bundled, marked for identification, and tagged with mill run, bar grade and bar number.

C. Store and cover reinforcing materials to prevent damage and accumulation of dirt and rust.

## PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete

1. Portland cement: Type I/II - low alkali conforming to ASTM C 150, "Standard Specification for Portland Cement".

Portland cement may be replaced by one of the following supplementary cementitious materials:

a. Ground Granulated Blast Furnace (GGBF) Slag, ASTM C 989, Grade 100 or Grade 120 at a minimum of 40 percent / maximum of 50 percent of total cementitious material.
b. ASTM C 618, Class F Fly Ash or natural pozzolan at a minimum of 20 percent / maximum of 25 percent of total cementitious material.
c. Silica fume, ASTM C 1240, at a minimum of 7 percent / maximum of 10 percent of total cementitious material.
d. Total of flay ash or natural pozzolans and silica fume at a maximum of 35 percent of the total cementitious material by mass.
e. Total of fly ash or natural pozzolans, slag cement, and silica fume at a maximum of 50 percent of the total cementitious material by mass.

2. Aggregate, general:

a. Shall be normal weight and uniformly graded and clean conforming to ASTM C33, “Standard Specification for Concrete Aggregates”.
b. Do not use aggregate known to cause excessive shrinkage.

3. Aggregate, coarse: Crushed rock or washed gravel with a maximum size of 3/8".
4. Aggregate, fine: Natural washed sand of hard and durable particles varying from fine to particles passing a 3/8" screen, of which at least 12% shall pass a 50-mesh screen.
5. Water: Clean and potable.
6. Air entraining admixture shall conform to ASTM C260, “Standard Specification for Air Entraining Admixture for Concrete”. The air entraining agent shall be a nontoxic concentrated solution of neutralized Vinsol resin, such as "Daravair 1000" as manufactured by GCP Applied Technologies or equivalent accepted by the Engineer.
7. Water reducing admixture shall conform to ASTM C494 “Standard Specification for Chemical Admixtures for Concrete.” Water reducing agent shall be of Type A, F, or G (as noted in concrete mix design) such as “Daracem-100" as manufactured by GCP Applied Technologies or equivalent accepted by the Engineer.
8. Corrosion Inhibitor Admixture shall conform to ASTM C1582 “Standard Specification for Admixtures to Inhibit Chloride-Induced Corrosion of Reinforcing Steel in Concrete. The addition of calcium nitrate to the concrete mix shall not adversely affect the properties of fresh and hardened concrete.
9. High Range Water Reducer (HRWR) shall be ASTM C494 Type F and ASTM C1017 and shall be used as needed to normalize the set time in concrete mixes containing corrosion inhibitor admixtures.

B. Concrete Mix Proportioning

1. Concrete shall be proportioned by the Contractor in accordance with ACI 301. The proposed design mix, together with all the Test Records, or Trial Mix Data, as required by ACI 301, shall be submitted to the Engineer for review at least 2 weeks prior to the first intended placement. Submit a separate pump mix if different from concrete mix placed by conventional methods.
2. Concrete shall be normal weight with a minimum compressive strength of 5000 psi at 28 days, unless noted otherwise (UNO).
3. Concrete shall have a maximum water to cement ratio of 0.40, UNO.
4. Concrete shall be proportioned to have a slump of 4 inches, + 1 inch, at the discharge end of the pump hose. Use a water reducing agent as required to achieve the desired slump range. Addition of water at site will not be permitted.
5. Concrete shall contain 7.5%±1.5% entrained air (based on 3/8" coarse aggregate).
6. Concrete shall include a corrosion inhibitor admixture.

C. Reinforcing Steel

1. All reinforcing steel shall conform to ASTM A615 Grade 60, "Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement" or ASTM A706, Grade 60, "Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
2. Welded wire reinforcement shall conform to ASTM A1064, "Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete".
3. Fabricate reinforcement to the required shapes and dimensions, within fabrication tolerances stated in the latest edition of the CRSI "Manual of Standard Practices."
4. Do not use reinforcement having any of the following defects:

    a. Bar lengths, depths, or bends exceeding the specified fabricating tolerances.
    b. Bends or kinks not indicated on the Drawings or required for this Work.
    c. Bars with cross section reduced due to excessive rust or other causes.

D. Moisture Protection

Curing materials for concrete cast above the tidal zone shall conform to ASTM C309, "Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete," wet burlap, or plastic membrane.

E. Accessories

All spacers, chairs, bolsters, and other devices necessary for proper reinforcing steel placement shall be epoxy coated with nylon tipped legs. All reinforcing steel shall be adequately tied with nylon, epoxy, or plastic-coated tie wire and supported with epoxy-coated chairs that hold the bars to the specified clearance. One chair sample shall be submitted to the Engineer for review. No clay or concrete bricks or any other material other than reviewed chairs shall be permitted to support reinforcing steel.

F. Bonding Agent

Bonding agent shall be Sika Armatec 110 Epocem, as manufactured by Sika Corporation or an equivalent accepted by the Engineer.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Product Delivery, Storage and Handling shall conform to the recommendations of ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete."

B. Form Construction

1. Design, erect, support, brace, and maintain formwork so it will safely support vertical and lateral loads which might be applied until such loads can be supported safely by the concrete structure in accordance with ACI 347.
2. Contractor shall be responsible for design of formwork, shores, reshores, and backshores to support loads transmitted to them and to comply with applicable building code requirements.
3. Construct forms to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, and level and plumb work in the finished structure.
4. Construct formwork for openings to facilitate removal and to produce opening dimensions as specified and within tolerances.
5. Formwork release agent or water shall be applied to all forms to inhibit bond with concrete. If release agent is used, it shall be applied prior to placement of reinforcing steel. Do not allow formwork release agent to contact reinforcement.
6. Form ties and spreaders shall be of such type as to leave no metal closer than 3 inches from any exposed concrete surface.

    a. Form ties shall be of a non-corrosive material.
    b. Form ties and accessories must not reduce the effective cover of the reinforcement.
    c. Use form ties with ends or end fasteners that can be removed without damage to concrete.

C. Reinforcement Placement

1. Place reinforcement to obtain the required coverage for concrete protection. Minimum concrete cover for all reinforcing shall be 3 inches except where specifically noted otherwise.
2. Clean reinforcement and remove loose dust, earth, and other materials which reduce bond or destroy bond with concrete other than coating.
3. Position, support, and secure reinforcement against displacement by forms, construction, and the concrete placement operations.

4. All reinforcing steel shall be continuous unless specifically detailed otherwise on the Contract Drawings. Provide dowels or lap splices of the appropriate class to maintain continuity. Unless otherwise shown on the Contract Drawings lap bars in compliance with ACI 318. Dowels or splices shall be shown on the shop drawings and shall be subject to the field review of the Engineer. No more than 60% of the total number of bars shall be spliced at one location.

D. Embedded Items

1. Install embedded items furnished under this Section and other Sections. All sleeves, inserts, anchors, and embedded items required for adjoining work or its support shall be placed prior to casting concrete. All embedded items shall be positioned accurately and supported against displacement.

E. Concrete Mixing

1. Transit-mix the concrete in accordance with provisions of ASTM C94.
2. Do not use concrete after 90 minutes from time of introduction of water to the mix. Addition of water at site will not be permitted.

F. Concrete Placement

1. All concrete work shall conform to the requirements of ACI 318, “Building Code Requirements for Structural Concrete” and ACI 301, “Specification for Concrete Construction.”

2. Preparation:
   a. Remove foreign matter accumulated in the forms.
   b. Rigidly close openings left in the formwork.
   c. Wet wood forms immediately prior to concrete placement. Wet wood forms sufficiently to tighten up cracks. Wet other material sufficiently to maintain workability of the concrete.
   d. Use only clean tools.

3. Conveying:
   a. Perform concrete placing at such a rate that concrete which is being integrated with fresh concrete is still plastic.
   b. Deposit concrete as nearly as practicable in its final location so as to avoid separation due to re-handling and flowing.
   c. Do not use concrete which becomes non-plastic and unworkable, or does not meet required quality control limits, or has been contaminated by foreign materials.
   d. Remove rejected and excess concrete from the job site.

4. Placing concrete in forms:
   a. Concrete shall be cast to full dimensions in one operation.

b. Free-fall of concrete during placement greater than eight feet is prohibited. The Contractor shall place concrete with a tremie tube for drops greater than 8 feet.
c. Deposit concrete in horizontal layers not deeper than 24 inches and avoid inclined construction joints.
d. Remove temporary spreaders in forms when concrete has reached the elevation of the spreaders.

5. Consolidation
   a. Consolidate each layer of concrete immediately after placing, by use of internal concrete vibrators supplemented by hand spading, rodding, or tamping.
   b. Do not use vibrators to transport concrete inside the forms.

6. Depositing Concrete Under Water
   a. ACI 301 methods and equipment used shall prevent the washing of the cement from the mixture, minimize the formation of laitance, prevent the flow of water through the concrete before it has hardened, and minimize disturbance to the previously placed concrete.
   b. Deposit concrete through water by a tremie or concrete pump. Submit the methods and equipment used in advance of placement for review. Submittal shall include methods for preparation of the underwater surface, such as cleaning, dewatering, and surface roughening. Concrete buckets may be used only to charge the hopper on top of the tremie. Do not lower concrete buckets under water and discharge the concrete sub aqueously. Ensure tremie is watertight and sufficiently large to permit a free flow of concrete. Keep discharge end of the pump line or tremie pipe submerged continuously in the concrete after placement starts. Effect underwater seal in a manner that will not produce undue contamination of the concrete or turbulence in the water. Placement must proceed without interruption until the concrete has been brought to the required height. Do not move tremie or pump lines horizontally during a placing operation, unless removed, moved, and properly restarted, and provide a sufficient number of tremies or pump lines so that the maximum horizontal flow will be limited to 15 feet.

7. Construction Joints
   a. Do not use horizontal construction joints without engineer approval.
   b. Secure the Engineer's review of joint design and location prior to start of concrete placement.

G. Curing And Protection

1. Beginning immediately after placement, concrete shall be protected from premature drying, excessively hot or cold temperatures, and mechanical damage and shall be maintained with minimal moisture loss at a relative constant temperature for the period necessary for hydration of the cement and hardening of the concrete.

2. Concrete surfaces not covered by forms or within the inter-tidal elevations shall be protected from loss of surface moisture for not less than seven days using moisture protection as specified herein. (Water, continuous water-fog spray, absorptive cover, water saturated, and kept continuously wet, curing and sealing compound.)

3. If cold-weather concreting is anticipated, a Cold Weather Concreting Plan shall be submitted, and a preconstruction meeting should be held to define how cold weather concreting methods will be used. When the mean daily ambient temperature is 40 degrees F and falling the Contractor shall follow the requirements of ACI 306.1, "Standard Specification for Cold Weather Concreting":
   a. Set up proper enclosure and heat to 50 degrees F for at least 2 hours before starting any pour. Set up individual thermometers within enclosure to monitor ambient temperatures near the face of fresh concrete. Thermometers shall be placed at a maximum of 50-foot centers, at major corners or returns, and at ends of concrete sections. Monitor and record temperatures in a log at early morning, noon, and early evening.
   b. Use a water-reducing admixture with an accelerated set, but do not use or rely upon any material as an anti-freeze. Use of calcium chloride is forbidden.
   c. Use vented heaters with blowers so placed that they do not produce localized hot spots which may dry out the concrete. Exposure to exhaust gases from combustion heaters is prohibited for the first 24 hours of the curing period.
   d. Maintain the temperature of the formwork at not less than 50 degrees F but not greater than 70 degrees F for 48 hours after completion of pour; formwork may be stripped after 72 hours after completion of pour. After 48 hours of maintaining at least 50 degrees F, the temperature may be allowed to drop gradually and shall be kept above 32 degrees F for a period of seven (7) days after completion of pour. Protection during this period may be provided by existing enclosure or by means indicated in note e below.
   e. Protection may be provided by use of insulation methods. Adequate insulation shall consist of at least one of the following:
      - 12" of dry earth; provide moisture cover if over slab concrete.
      - 4" of hay under adequate moisture cover.
      - 1" of insulation blankets with vapor barrier seal.
      - Other insulating material acceptable to the Engineer.

        NOTE: Extreme conditions of temperature or wind may require more protection.

   f. Concrete may not be placed on frozen ground.
   g. All frozen concrete shall be removed from the job and replaced at a cost to the Contractor.

4. When the mean daily ambient and substrate temperature is above 80 degrees F, the Contractor shall follow the requirements of ACI 305.1, "Standard Specification for Hot Weather Concreting". Concrete shall be protected from thermal damage. Provisions for windbreaks, shading, fog spraying, sprinkling,

ponding, or wet covering with a light-colored material shall be made in advance of placement and such protective measures shall be taken as quickly as concrete hardening and finishing operations will allow.

a. No concrete shall be placed when the air temperature is above 90 degrees F unless the air is still (<5 mph), and relative humidity is above 80%.
b. Set up proper windbreakers for concrete surfaces whenever the relative humidity is less than 70% for slight air motion or 80% for light breezes (4 to 7 mph).
c. Provide shade for pours otherwise exposed to the sun.
d. Concrete is to be at a temperature of 80 degrees F or less when placed. If necessary, the batching plant shall cool aggregates by spraying or by using chilled water or ice. All such water shall be accounted for as part of the mixing water.
e. Use an admixture with a retarded set.
f. All forms shall be thoroughly wetted at least daily and more often when the relative humidity is low.
g. For slabs, maintain the required materials for curing on hand, so they may be placed immediately upon finishing. All concrete placed in ambient temperatures over 80 degrees F shall be kept wet for a minimum of 24 hours. Intermittent spraying will not be permitted. No water shall be applied before concrete has acquired its initial set. When the concrete temperature of any slab goes above 100 degrees F, place a layer of sand on it and keep it continuously wet until the temperature is below 80 degrees F.

H. Finishing

1. Remove all fins, blemishes, and defective concrete areas and patch (where required) with reworked cement mortar of the same proportions as that used in the concrete.
2. Form tie holes shall be plugged solid with reworked cement mortar of the same proportions as that used in the concrete.
3. Exposed Surface Finishes shall comply with ACI 301M ACI 301. Place, consolidate, and immediately strike off concrete to obtain proper contour, grade, and elevation before bleedwater appears. Permit concrete to attain a set sufficient for floating and supporting the weight of the finisher and equipment. If bleedwater is present prior to floating the surface, drag excess water off or remove by absorption with porous materials. Do not use dry cement to absorb bleedwater. Unless noted otherwise, exposed surfaces of concrete shall receive broomed finish as follows:
   *a. Broomed: Perform a floated finish, then draw a broom or burlap belt across the surface to produce a coarse scored texture. Permit surface to harden sufficiently to retain the scoring or ridges. Broom transverse to traffic or at right angles to the slope of the slab.*
   *b. Vertical Surfaces: Rough form finish for concrete surfaces not exposed to view. Smooth rubbed finish for exterior surfaces exposed to view.*
4. Tolerances in accordance with ACI 117.

## 3.2 QUALITY CONTROL TESTING DURING CONSTRUCTION

The Owner will engage a qualified independent testing and inspecting agency to perform concrete testing during construction. Concrete testing shall comply with ACI-301. Test reports shall be submitted to the Engineer for review. Tests required include slump, temperature, air content, and compressive strength. The frequency of tests shall be as follows. Perform tests minimum once per day or for every 50 cubic yards of concrete placed.

A. Slump Tests

1. ASTM C143/C143M. Take concrete samples during concrete placement/discharge at point of placement. Perform additional tests when concrete consistency appears to change.

B. Temperature Tests

1. ASTM C1064/C1064M; One test hourly at point of placement when air temperature is 40 deg F and below or 80 deg F and above, and one test for each sample.

C. Air Content

1. ASTM C173/C173M or ASTM C231/C231M for normal weight concrete.

D. Compressive Strength Tests

1. ASTM C39/C39M. Make a minimum of five (5) 6-inch by 12-inch test cylinders for each sample in accordance with ASTM C31/C31M, ASTM C172/C172M and applicable requirements of ACI 305R and ACI 306R. Take precautions to prevent evaporation and loss of water from the specimen.
2. Test one (1) specimen at 7 days, three (3) specimens at 28 days and reserve one (1) cylinder for contingency testing at 56 days.
3. Concrete compressive tests must meet the requirements of the Contract Document, and ACI 301. Retest locations represented by low concrete compressive strengths by coring as directed by the Engineer. Where retest does not meet concrete compressive strength requirements, submit a mitigation or remediation plan for review and approval. Repair core holes with non-shrink grout. Match color and finish of adjacent concrete.

E. Test results shall be reported to the Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength and type of break for both 7- and 28-day tests.

## 3.3 REPAIR, REHABILITATION AND REMOVAL

A. Crack Repair

1. All concrete cracks in excess of 0.02 inches (0.50 mm) wide must be documented and repaired. The proposed method and materials to repair the cracks must be submitted for approval.

END OF SECTION

# SECTION 03 45 33

# PRECAST STRUCTURAL CONCRETE

## PART 1 - GENERAL

### 1.1 WORK SPECIFIED

Work included: The Work covered under this Section of these Specifications consist of furnishing all plant, labor, supervision, equipment, appliances, and materials and in performing all operations in connection with the installation of precast structural concrete for all aspects of the project, all in strict accordance with the Contract Documents.

### 1.2 SUBMITTALS

A. Shop Drawings and Product Data.

Shop drawings and product data showing all fabricated dimensions and locations for placing of the reinforcing steel and accessories shall be submitted for review. Shop Drawings shall provide sufficient technical data to demonstrate compliance with the specified requirements. Products, materials, or information submitted for review shall not be used or fabricated until after receipt of the Engineer's review comments. Distribute only reviewed shop drawings to the job site.

B. Concrete Mix Design.

The minimum compressive strength of concrete at 28 days must be 5000 psi, unless otherwise indicated. Add air entraining admixtures to produce between 6% (±1.5%) air by volume. For marine exposure, ensure a dense concrete free of shrinkage cracks, with a minimum degree of permeability. The maximum water cement ratio must be 0.4.

Submit concrete mix design, with known test results, to the Engineer for review. The concrete mix design submittal shall consist of at least the following:

1. Type of cement.
2. Dry weight of cement.
3. Saturated surface-dry weights of fine and coarse aggregates.
4. Specific gravity of fine and coarse aggregates.
5. Quantities, type, name, and producer of admixtures, as applicable.
6. Total weight of water, including the water that is absorbed by and on the surface of the aggregates.
7. Water to cement ratio.
    a. Slump: Maximum slump, taken at the truck, will be determined based on the pump hose length. The mix designs shall include the anticipated loss of slump per 100-foot length of specified hose size.

b. Strength test data of the proposed mix design as specified herein.

Distribute reviewed mix design to testing laboratory, batch plant, and job site.

C. Submit concrete batch tickets for each ready-mixed concrete truck delivered to the plant. Each ticket shall note at least the following data: design mix strength; batch proportions including actual water and aggregate moisture contents; date and batch time; arrival time at site; discharge time; concrete volume; and any change to concrete made at the site.

D. Curing and protection procedures: including product data on materials proposed for use.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Quality Assurance

1. Use adequate numbers of skilled work men and women who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

2. The Owner, through the Engineer, reserves the right of approval of any Subcontractor pre-qualified and selected for this portion of the Work by the Contractor. Approval will be based, in part, on a documented, successful experience in performing work of a similar nature.

3. Cast-in-Place Concrete work shall conform to all requirements of ACI 301, “Specifications for Structural Concrete for Buildings.”

4. Detailing, fabrication, and erection of reinforcing steel shall conform to ACI 318, “Building Code Requirements for Structural Concrete and Commentary”, “ACI Detailing Manual”, MNL-66, “CRSI: Manual of Standard Practice” and “CRSI: Placing Reinforcing Bars”.

5. Ready mix plant equipment and facilities shall conform to the “Check List for Certification of Ready Mixed Concrete Production Facilities” of the NRMCA.

B. Concrete

1. Portland cement: Type II - low alkali conforming to ASTM C150, “Standard Specification for Portland Cement.”

Portland cement may be replaced by one of the following supplementary cementitious materials:

a. Ground Granulated Blast Furnace (GGBF) Slag, ASTM C 989, Grade 100 or Grade 120 at a minimum of 40 percent / maximum of 50 percent of total cementitious material.
b. ASTM C 618, Class F Fly Ash or natural pozzolan at a minimum of 20 percent / maximum of 25 percent of total cementitious material.
c. Silica fume, ASTM C1240, at a maximum of 7 percent / maximum of 10 percent of total cementitious material.
d. Total of flay ash or natural pozzolans and silica fume at a maximum of 35 percent of the total cementitious material by mass.
e. Total of fly ash or natural pozzolans, slag cement, and silica fume at a maximum of 50 percent of the total cementitious material by mass.

2. Aggregate, general:

a. Shall be normal weight and uniformly graded and clean conforming to ASTM C33, “Standard Specification for Concrete Aggregates.”
b. Do not use aggregate known to cause excessive shrinkage.

3. Aggregate, coarse: Crushed rock or washed gravel with a maximum size of 3/4".

4. Aggregate, fine: Natural washed sand of hard and durable particles varying from fine to particles passing a 3/8" screen, of which at least 12% shall pass a 50-mesh screen.

5. Water: Clean and potable.

6. Air entraining admixture shall conform to ASTM C260, “Standard Specification for Air Entraining Admixture for Concrete.” The air entraining agent shall be a nontoxic concentrated solution of neutralized Vinsol resin, such as "Daravair" as manufactured by GCP Applied Technologies or equivalent accepted by the Engineer.

7. Water reducing admixture shall conform to ASTM C494 “Standard Specification for Chemical Admixtures for Concrete.” Water reducing agent shall be of Type A, B, C, D, E, F, or G (as noted in concrete mix design) such as “Daracem-100" as manufactured by GCP Applied Technologies or equivalent accepted by the Engineer.

8. Corrosion inhibitor admixture shall conform to ASTM C1582 “Standard Specification for Admixtures to Inhibit Chloride-Induced Corrosion of Reinforcing Steel in Concrete.”

C. Reinforcing Steel

1. All reinforcing steel shall conform to ASTM 615 Grade 60, “Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement.”

2. Fabricate reinforcement to the required shapes and dimensions, within fabrication tolerances stated in the CRSI "Manual of Standard Practices."

3. Do not use reinforcement that has any of the following defects:
   a. Bar lengths, depths, or bends exceeding the specified fabricating tolerances.
   b. Bends or kinks not indicated on the Drawings or required for this Work.
   c. Bars with cross section reduced due to excessive rust or other causes.

4. Prestressing Strands
   a. Use uncoated, 7-wire strand stress-relieved, in compliance with ASTM A416, Grade 270, strand with a minimum diameter of 1/2".

D. Moisture Protection:

Curing materials for concrete cast above the tidal zone shall conform to ASTM C309, "Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete," wet burlap, or plastic membrane.

E. Accessories:

All spacers, chairs, bolsters, and other devices necessary for proper reinforcing steel placement shall be epoxy coated with nylon tipped legs. All reinforcing steel shall be adequately tied with nylon, epoxy, or plastic-coated tie wire and supported with epoxy-coated chairs that hold the bars to the specified clearance. One chair sample shall be submitted to the Engineer for review. No clay or concrete bricks or any other material other than reviewed chairs shall be permitted to support reinforcing steel.

F. Bonding Agent and Fusion Bonded Epoxy Coating Touch-Up:

Bonding agent shall be Sika Armatec 110 Epocem, as manufactured by Sika Corporation or an equivalent accepted by the Engineer.

G. Product Delivery, Storage, and Handling:

Conform to the recommendations of ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete."

## 2.2 PRODUCTION QUALITY CONTROL

A. Surface Finish

1. Repairs located in a bearing area must be accepted by the Engineer of Record prior to repairs.
2. Unformed surfaces – provide rough finish.
3. Formed surfaces – provide a smooth rubbed finish.

B. Acceptance/Rejection of Defects

1. Minor Defects
All honeycombed areas, chipped corners, air pockets over 1/2” in diameter, and other minor defects involve less than 36 square inches of concrete must be repaired. Form offsets of fins over 1/8” must be ground smooth. All unsound concrete must be removed from defective areas prior to repairing. Precast containing hairline cracks which are visible and are less than 0.01” in width, may be accepted, except that cracks larger than 0.005” in width for surfaces exposed to the weather must be repaired.

2. Major Defects
Major defects are those which involve more than 36 square inches of concrete or expose stressing tendons or reinforcing steel. If one or more major defects appear in a member, it will be rejected. Cracks of a width of more than 0.01” will be cause for rejection of the member.

## 2.3 TESTS, INSPECTIONS, AND VERIFICATIONS

A. Chloride Ion Concentration Test

Maximum water-soluble chloride ion concentrations in hardened concrete at ages 28 to 42 days contributed from the ingredients including water, aggregates, cementitious materials, and admixtures must not exceed 0.06 percent by weight of cement. Sampling and determination of water-soluble chloride ion content in accordance with ASTM C1218.

B. Chloride Ion Penetration Test

Concrete must be proportionated to have the chloride ion penetration test in accordance with ASTM C1202 and be below 1500 coulombs for concrete specimens tested at 28 days.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

Prior to erection, and again after installation, precast members must be checked for damage, such as cracking, spalling, and honeycombing. Members that do not meet the surface finish requirements specified in paragraph Surface Finish must be repaired or removed and replaced with new precast members.

## 3.2 ERECTION

Precast members must be erected after the concrete has attained the specified compressive strength, unless otherwise approved by the precast manufacturer. Erect in accordance with the approved shop drawings.

## 3.3 BEARING SURFACES

Must be flat, free of irregularities, and properly sized. Size bearing surfaces to provide for the indicated clearances between the precast member and adjacent precast members or adjoining field placed surfaces. Correct bearing surface irregularities with non-shrink grout.

## 3.4 ANCHORAGE

Provide anchorage for fastening work in place. Conceal fasteners where practicable. Make threaded connections up tight and nick threads to prevent loosening.

## 3.5 WELDING

Welding shall be performed in compliance with AWS D1.1 and AWS D1.4 for welding connections and reinforcing splices. Protect the concrete and other reinforcing from heat during welding. Welding of epoxy-coated reinforcement is not allowed.

## 3.6 OPENINGS

Holes or cuts requiring reinforcement steel to be cut, which are not indicated on the approved shop drawings, must only be made with the approval of the Engineer and the precast manufacturer. Drill holes less than 12 inches in diameter with a diamond tip core drill. Ensure cuts are straight and at 90 degrees to the surfaces without breaking or spalling the edges.

## 3.7 GALVANIZING REPAIR

Touch-up of Galvanizing: Thoroughly clean galvanized steel by SSPC-SP 3 Power Tool Cleaning method at all damaged, scratched and field-welded galvanized surfaces. Apply a zinc-rich primer such as Cathacoat 304V by Devoe Coatings or equivalent accepted by Engineer. Touch-up repair shall conform to ASTM A780 and shall overlap a minimum of 2 inches with hot dip galvanized surfaces. Allow to dry to a minimum dry film thickness of 2.0-4.0 mils.

## 3.8 GROUTING

Clean and fill keyways between precast members and other indicated areas, solidly with non-shrink grout or cementitious grout. Remove excess grout before hardening.

## 3.9 PROTECTION AND CLEANING

Protect exposed-to-view surfaces against staining and other damage until completion of work. Upon completion of installation, swept clean and leave ready slab surfaces to receive concrete topping, or other covering.

## 3.10 CONCRETE TOPPING

Provide as indicated and as specified in Section 03 30 00, Cast-in-Place Concrete.

## 3.11 CONSTRUCTION RECORDS

Complete construction records must be kept of the manufacturing, handling, and erection of the precast concrete members and submitted. Records must be kept for, but not limited to, the following items:

A. Specifications for material used in the manufacture of the members.

B. Time-temperature history of the concrete members from casting to the transfer of the prestress force.

C. Records of the tendon stressing operation including initial prestress force, measured elongation, how it was measured, and how the tendons were stressed and destressed.

D. Records of inspection of the members before and after the prestress force is transferred to the members.

E. Records of the inspection of the members each time they are moved.

F. Records of any defects in the member and any corrective measures taken.

END OF SECTION

# SECTION 05 12 00

# STRUCTURAL STEEL

## PART 1 - GENERAL

### 1.1 WORK SPECIFIED

Work included: Provide miscellaneous structural steel items including but not limited to accessories as shown on the Drawings, specified herein, and needed for a complete and proper installation.

### 1.2 SUBMITTALS

A. Sufficient technical data to demonstrate compliance with the specified requirements.

B. Complete shop drawings detailing all members, profiles, sizes, spacing, proposed cuts, connections, camber, holes, openings, fasteners, and similar data. Erection plans showing the location and field connection of all members. Identify members by piece numbers which correspond to erection numbers. Structural steel connection details not specifically shown in the Contract Documents shall be detailed by the Contractor and included with shop drawing submittals.

C. Submit manufacturer's certifications showing that the products meet or exceed the required standards for the following items:

1. Bolts, including nuts and washers.
2. Threaded rods including all hardware.
3. Filler material and flux for welding.
4. Expansion bolts.

D. Submit Certified Mill Test Reports indicating structural strength, destructive and non-destructive test analysis, chemical and physical properties of each type of steel and conformance with ASTM A6.

E. Submit welder's certificates certifying welders employed on the Work, verifying AWS qualifications within the previous 12 months.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Quality Assurance

1. Use adequate number of skilled work men and women who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the

specified requirements and the methods needed for proper performance of the Work of this specification.

2. Perform welding with electric arc process and in accordance with AWS "Code for Arc and Gas Welding in Building Construction."
3. In addition to complying with pertinent codes and regulations, comply with:

    a. The American Institute of Steel Construction (AISC) "Steel Construction Manual," Fifteenth Edition.

B. Structural Steel Shapes shall conform to ASTM A992, A690, or A572 Grade 50.

C. Steel Angles, Channels and Plates shall conform to ASTM A572 Grade 50.

D. Anchor rods shall conform to ASTM F1554, for Grades 36, 55 and 105.

E. Carriage bolts and Lag screws shall conform to ASTM A307, Grade A.

F. High Strength Structural Bolts: Shall conform to ASTM F3125 Grade A325 with hexagonal heads.

G. Nuts: Shall be hexagonal and conform to ASTM A563.

H. Washers (except against timber): Shall conform to ASTM F436.

I. Shear studs: Shall conform to ASTM A29/A108, low carbon steel.

J. Threadbar Rods and Nuts: DYWIDAG Threadbar or equivalent accepted by the Engineer, shall conform to ASTM A615 for Grades 60, 70, 80, and 100, and ASTM A722 Grade 150.

K. Adhesive Anchors: Adhesive shall be HIT RE 500 V3 Injection Adhesive Anchor as manufactured by Hilti Corporation, or equivalent acceptable to the Engineer. Anchor rods shall be as specified above for threadbar anchors.

L. Expansion bolts: Shall be stainless steel HILTI KWIK BOLT 3, as manufactured by HILTI or equivalent accepted by the Engineer.

M. Welding Materials: AWS D1.1; Type E70XX or type required for materials being welded.

N. Grout: Non-shrink, non-metallic, high-performance cement-based grout conforming to ASTM C827 such as Sikagrout 212 as manufactured by Sika Corporation or equivalent accepted by the Engineer.

O. Fabrication:

1. Fabricate items of structural steel in accordance with AISC specifications and as shown on the accepted shop drawings.

2. Properly mark materials for field assembly and for identification of the structure and location intended. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
3. Provide bolts, nuts, and washers of all types and sizes required for completion of field erection.
4. Comply with AWS code for procedures, appearance, and quality of welds, and methods used in correcting welded work.
5. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates. No holes will be allowed unless first shown on the shop drawings and accepted by the Engineer.
6. Should holes be required in addition to those provided under this Section, provide all such holes, and strengthen the area as required to compensate but only as accepted by the Engineer.
7. Moment connections shall develop the full strength of joined members. The cold weather welding requirements of AWS shall be required and enforced.
8. Where finishing is required, complete the assembly, including welding of units, before start of finishing.
9. Provide finish surfaces of members exposed in the final structure free from markings, burrs, and other defects.
10. Assemble and weld built-up sections by methods which will produce true alignment of axes without warp.

P. Protective Coating

1. General: Unless specifically noted otherwise, all items scheduled to receive protective coating shall be fully fabricated with holes, cuts, threads, etc. prior to receiving protective coating, prior to delivery to site.
2. Steel Sections: Unless specifically noted otherwise, all steel sections shall be shop coated prior to delivery to site in accordance with Section 09 97 13 Coating on Steel Waterfront Structures.
3. Bolts, Nuts, and Washers: All bolts, nuts, and washers shall be hot dipped galvanized in accordance with ASTM A153.
4. Threadbar Rods, and Nuts: Epoxy coated in accordance with ASTM A775.
5. Adhesive Anchor Rods: anchor rods, nuts, and washers shall be hot-dipped galvanized in accordance with ASTM A153.
6. Field Touch-Up of Epoxy-Coated Items: Shall be performed in accordance with Section 09 97 13 Coating on Steel Waterfront Structures.
7. Field Touch-Up of Hot-Dipped Galvanized Items: Touch-up shall be performed with Tnemec 90-97 Tneme-Zinc primer or equivalent accepted by the Engineer. Surface preparation and coating application shall be in strict accordance with manufacturers' written instructions.

Q. Other Material

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the review of the Engineer prior to final installation.

R. Product Handling and Storage

1. Deliver materials to the job site properly marked to identify the location for which they are intended.
2. Use markings corresponding to markings shown on the reviewed shop drawings.
3. Store in a manner to maintain identification and prevent damage, off the ground, using pallets or other supports, and to permit easy access for inspection.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Surface Conditions

Examine the areas and verify the conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Erection

1. Surveys:
   a. Establish benchmarks necessary for accurate erection of structural steel.
   b. Check elevations of concrete surfaces, and locations of anchor bolts and similar items, before erection proceeds.
2. Temporary shoring and bracing:
   a. Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads.
   b. Provide temporary guy lines to achieve proper alignment of the structure as erection proceeds.
   c. Remove temporary connections and members when permanent members are in place and final connections are made.
   d. Field touch-up protective coating where damaged.
3. Anchor bolts:
   a. Install anchor bolts and other connectors required for securing structural steel to adjacent work as shown on the Contract Drawings.
   b. Provide templates and other devices as needed for presetting bolts and other anchors to accurate locations.
4. Field assembly:
   a. Set structural frames accurately to the lines and elevations indicated.
   b. Align and adjust the members forming part of a complete frame or structure before fastening permanently.
   c. Clean the bearing surfaces and other surfaces which will be in permanent contact before assembly.
   d. Adjust as required to compensate for discrepancies in elevation and alignment.
   e. Level and plumb individual members of the structure within specified AISC tolerances.

f. Establish required leveling and plumbing measurements on the mean operating temperature of the structure, making allowances for the difference between temperature at time of erection and the mean temperature at which the structure will be when completed and in service.
g. Comply with AISC specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to welds.

5. Gas cutting:
   a. Do not use gas cutting torches for correcting fabricating errors in structural framing, except on secondary members where acceptable to the Engineer.
   b. When gas cutting is permitted, finish the gas cut section to a sheared appearance acceptable to the Engineer.
6. Expansion Bolts and Adhesive Anchors: Install anchors in strict accordance with manufacturers' written instructions.
7. Field Welding: Where field welds are scheduled, surfaces to be joined are to be properly prepared, including removal of any existing coatings prior to welding. Following welding, prepare and touch-up all areas requiring coating as set forth in Section 09 97 13, Coating of Steel Waterfront Structures.

END OF SECTION

# SECTION 05 50 13

# METAL FABRICATIONS

## PART 1 - GENERAL

### 1.1 WORK SPECIFIED

The Work covered under this Section of these Specifications consists of providing all plant, labor, supervision, equipment, appliances, and materials, and in performing all operations in connection with the installation of metal fabrications (miscellaneous steel), all in strict accordance with the Contract Documents. The Work covered under this Section includes but is not necessarily limited to: rough hardware; pipe supports; railings and related connections; expanded metal mesh; grating; steel plate; steel diamond plate; pipe bollards; and fasteners. Provide accessories as shown on the Contract Documents specified herein and needed for a complete and proper installation.

### 1.2 SUBMITTALS

A. The Contractor shall submit shop drawings detailing fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other Sections.

B. Product data for gratings; shop paint products; anchor bolt systems; and grout.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Quality Assurance

1. Use adequate number of skilled work men and women who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

2. The Owner reserves the right of approval of any Subcontractor selected for this portion of the Work by the Contractor. Approval will be based, in part, on:
   a. Documented successful experience in performing work of a similar nature.
   b. Acceptable schedule of unit prices for measurement and payment in the event of changes in the Work of this Section.

3. Fabricator Qualifications: Firm experienced in producing metal fabrications similar to those indicated for this Project with a record of successful in-service performance, and with sufficient production capacity to produce required units without delaying the Work.

4. Perform welding with electric arc process and in accordance with “Structural Welding Code-Steel" (ANSI/AWS D1.1). All structural welds shall be performed by American Welding Society (AWS) welders certified for the appropriate welding application.

5. In addition to complying with pertinent codes and regulations, comply with:
   a. The American Institute of Steel Construction (AISC) “Steel Construction Manual,” Fifteenth Edition.

6. All connections shall be designed by the steel fabricator except those specifically detailed on the Contract Documents. Submit design calculations for review if requested by Owner.

7. All references to SSPC shall be interpreted as Steel Structures Painting Council Manual, Systems and Specifications, now part of the Association for Materials Protection and Performance (AMPP).

B. Ferrous Metals

1. Steel Plate, Diamond Plate, and Bar Stock: ASTM A36.
2. Steel Pipe: ASTM A53, standard weight (Schedule 40).
3. Welding Rods and Bare Electrodes: Select according to AWS specifications for the metal alloy to be welded.

C. Protective Coating

1. General: Unless specifically noted otherwise, all items scheduled to receive protective coating shall be fully fabricated with holes, cuts, threads, etc. prior to receiving protective coating, prior to delivery to site.
2. Steel Sections: Unless specifically noted otherwise, all steel sections shall be shop coated prior to delivery to site in accordance with Section 09 97 13, Coating of Steel Waterfront Structures.
3. Bolts, Nuts, and Washers: All bolts, nuts, and washers shall be hot dipped galvanized in accordance with ASTM A153.
4. Field Touch-Up of Epoxy-Coated Items: Shall be performed in accordance with Section 09 97 13, Coating of Steel Waterfront Structures.
5. Field Touch-Up of Hot-Dipped Galvanized Items: Touch-up shall be performed with Tnemec 90-97 Tnemec-Zinc primer or equivalent accepted by the Engineer. Surface preparation and coating application shall be in strict accordance with manufacturers’ written instructions.

D. General Fabrication

1. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details

of fabrication and support. Use type of materials indicated or specified for various components of each fabrication.

2. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
3. Remove sharp or rough areas on exposed traffic surfaces.
4. Weld corners and seams continuously to comply with the following:
   a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   b. Obtain fusion without undercut or overlap.
   c. Remove welding flux immediately.
   d. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.
5. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flathead (countersunk) screws or bolts. Locate joints where least conspicuous.
6. Provide for anchorage of type indicated, coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
7. Shop Assembly: Preassemble items in shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
8. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
9. Fabricate joints that will be exposed to weather in a manner to prevent water entry or provide weep holes where water may accumulate.

E. Rough Hardware

1. Furnish bent, or otherwise custom-fabricated, bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures.
2. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts that bear on wood structural connections and furnish steel washers elsewhere.

F. Miscellaneous Steel Trim

1. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and bars of profiles shown with continuously welded joints, and smooth exposed edges. Miter corners and use concealed field splices wherever possible.
2. Provide cutouts, fittings, and anchorages as required to coordinate assembly and installation with other work. Provide anchors, welded to trim, for embedding in

concrete or masonry construction, spaced not more than 6 inches from each end, 6 inches from corners, and 24 inches o.c., unless otherwise indicated.

3. Galvanize miscellaneous steel trim at all exterior locations and as indicated.

G. Steel Finishes

1. Rust-inhibitive, Alkyd Primer: Product to be Devguard 4160 manufactured by Devoe Coatings or equivalent accepted by Engineer. Apply 1 coat minimum 2.0-2.5 mils dry film thickness. Color to be selected by Owner.
2. Galvanizing: For those items indicated for galvanizing, apply zinc coating by the hot dip process complying with the following requirements:
   a. ASTM A153 for galvanizing iron and steel hardware.
   b. ASTM A123 for galvanizing both fabricated and un-fabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299 inch thick or thicker.
3. Epoxy Coating: Finish items per Section 09 97 13, Coating of Steel Waterfront Structures, where noted on Contract Documents.

H. Grating

1. Design steel grating in accordance with NAAMM MBG 531 and NAAMM MBG 532 for bar type gratings. All steel grating shall be galvanized and provided with slip resistant surface finish.
2. Band edges of grating with bars of the same size as the bearing bars. Weld banding in accordance with the manufacturer's standard from trim. Design tops of bearing bars, cross or intermediate bars to be the same plane and to match grating finish.
3. Band ends of gratings with bars of the same or greater thickness than the metal used for grating. Weld banding bars to bearing bars or channels at least every fourth bar or channel and in every corner. Tack weld intervening bars or channels. Band diagonal or round cuts by welding bars of the same or greater thickness as the grating and in accordance with the manufacturer's standard for trim.
4. All grating shall be removable and not welded to supports. Provide stainless steel saddle slips, bolts and washers as required for attachment.

I. Ladders

1. Steel ladders shall be fabricated from ASTM A36 or higher-grade steel. Rungs shall be non-slip with anti-skid surface.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Field Measurements

Check actual locations of walls and other construction to which metal fabrications must fit by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating products without field measurements. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

B. Preparation

1. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installing anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.
2. Set sleeves in concrete with tops flush with finish surface elevations. Protect sleeves from water and concrete entries.

C. General Installation

1. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction. Include threaded fasteners for concrete inserts, toggle bolts, through-bolts, and other connectors as required.
2. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
3. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.
4. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop-welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units that have been hot dip galvanized after fabrication and are intended for bolted or screwed field connections.
5. Field Welding shall comply with the following requirements:
    a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
    b. Obtain fusion without undercut or overlap.
    c. Remove welding flux immediately.
    d. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.

D. Field Touch-Up of Finishes

1. Touch-up of Galvanizing: Thoroughly clean galvanized steel by SSPC-SP 3 Power Tool Cleaning method at all damaged, scratched and field-welded galvanized surfaces. Apply a zinc-rich primer such as Cathacoat 304V by Devoe Coatings or equivalent accepted by Engineer. Touch-up repair shall conform to ASTM A780 and shall overlap a minimum of 2" with hot dip galvanized surfaces. Allow to dry to a minimum dry film thickness of 2.0-4.0 mils.
2. Touch-up of Epoxy Coating: Thoroughly clean all field-welded, damaged, scratched, and chipped coating areas per SSPC-SP 2 Hand Tool Cleaning. Remove all rust and weld slag. Field touch-up areas shall be coated with epoxy coating with material specified in Section 09 97 13, Coating of Steel Waterfront Structures. Overlap touch-up 2" minimum with existing coating.

END OF SECTION

# SECTION 09 97 13

# COATING OF STEEL WATERFRONT STRUCTURES

## PART 1 - GENERAL

### 1.1 WORK SPECIFIED

The work includes: The furnishing of all plant, labor, materials, tools and equipment, and the performance of all operations and incidentals necessary for the coating, handling, storing, and shipping of plant coated steel sheet piling, structural steel, and miscellaneous ancillary items.

### 1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled work men and women who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. The Owner, through the Engineer, reserves the right of approval of any Subcontractor pre-qualified and selected for this portion of the Work by the Contractor. Approval will be based, in part, on:

1. Documented successful experience in performing work of a similar nature.
2. Acceptable schedule of unit prices for measurement and payment in the event of changes in the Work of this Section.

C. Coating materials shall be handled, stored, and applied in accordance with the manufacturer's specifications, or as directed by an authorized representative of the coating manufacturer.

D. All references to SSPC shall be interpreted as Steel Structures Painting Council, part of Association for Materials Protection and Performance.

E. Structural steel fabrications shall be received by coating applicator free of all oil and grease.

### 1.3 SUBMITTAL

Submit material certification data for the coating system to the Engineer for review no later than the time of delivery of materials to the site. Certification shall include a statement by the coating applicator that the protective coating was installed in strict accordance with manufacturers' written instructions, including all surface preparation.

### 1.4 PRODUCT DELIVERY AND STORAGE

The Contractor guarantees that material shall be stored in a safe manner within Owner-designated area provided at the site.

## PART 2 - PRODUCTS

### 2.1 EPOXY COATING (SHEET PILE AND COMBINATION WALL)

A. Material used for factory epoxy coating of all scheduled surfaces shall be BAR-RUST 235 Multi-Purpose Epoxy Coating as manufactured by Devoe Coatings or equivalent accepted by the Engineer for steel sheet piles

B. Epoxy coating field touch-up material shall be identical to factory coating specified in Paragraph 2.1, A. above.

C. The topcoat color for all surfaces is to be black.

### 2.2 EPOXY COATING (PIPE PILES ONLY)

A. Material used for factory epoxy coating of all scheduled surfaces shall be Scotchkote Fusion Bond Epoxy Coating 6233 as manufactured by 3M or equivalent accepted by the Engineer for steel pipe piles

B. Epoxy coating field touch-up material shall be identical to factory coating specified in Paragraph 2.1, A. above.

C. The topcoat color for all surfaces is to be black.

## PART 3 - EXECUTION

### 3.1 SURFACE PREPARATION

A. Surfaces shall be prepared in strict accordance with the protective coating system manufacturers' written instructions. Surfaces are to be abrasion-blasted to a near-white surface cleanliness in accordance with SSPC-SP-10. Blast profile on steel shall be 1.5 to 2.5 mils in depth and be of a sharp, jagged nature as opposed to a "peen" pattern (from shot blasting). Surfaces must be sound, dry, clean, free of oil, grease, dirt, mildew, form release agents, curing compounds, loose and flaking paint, grit dust, and other foreign substances. Roto blasted surfaces are not acceptable.

B. Surfaces requiring field touch-up shall be prepared as described in Paragraph 3.1, A. above.

### 3.2 PROTECTIVE COATING APPLICATION

A. The protective coating shall be installed in strict accordance with manufacturers' written instructions. Coating is to be applied in two coats to achieve a minimum overall dry film thickness of 15 mils or as required by coating manufacturer.

B. All holidays or other imperfections in the coating shall be removed or repaired at the Contractors expense prior to final acceptance of the Work.

C. Surfaces requiring field touch-up of any required areas shall be prepared as described in Paragraph 3.1, A. above or by the following procedure:

1. Clean all surfaces to be repaired per SSPC-SP1 Solvent Clean to remove chlorides and general surface contamination.
2. Grind all welded areas to provide a smooth surface with no sharp edges.
3. Feather existing coatings back to sound material.
4. Clean all other surfaces to be repaired per SSPC-SP2 (Hand Tool Clean) or SSPC-SP3 (Power Tool Clean). Do not grind surfaces smooth; maintain adequate surface profile from original blast cleaning.
5. Stripe-coat all welds and edges with the epoxy coating prior to painting to ensure adequate film thickness.

END OF SECTION

# SECTION 14 47 13

# CATHODIC PROTECTION BY GALVANIC ANODES

## PART 1 - GENERAL

### 1.1 REFERENCES

A. References are in agreement with Unified Master Reference List (UMRL) dated January 2021.

B. NACE INTERNATIONAL (NACE)

1. NACE SP0169 (2013)
   a. Control of External Corrosion on Underground or Submerged Metallic Structures

### 1.2 PROJECT DESCRIPTION

A. Galvanic cathodic protection system designed to protect and extend the life of the submerged areas of the proposed sheet pile bulkhead and vertical pipe piles associated with the project.

### 1.3 SUBMITTALS

A. Product Data

1. Anodes
2. Junction Boxes
3. Test Stations
4. Shunt resistors
5. Permanent reference electrodes

B. Certificates

1. Qualifications of Corrosion Engineer

C. Closeout Submittals

1. Cathodic Protection System Field Test Report

### 1.4 SERVICES OF THE CORROSION ENGINEER

The Contractor shall obtain the services of a corrosion engineer to supervise, inspect and test the installation of the cathodic protection system(s). Corrosion Engineer refers to an engineer with certification of licensing that includes education and experience in cathodic protection of buried or submerged metal structures, or a person accredited or certified by the National Association of Corrosion Engineers at the level of Corrosion Specialist or Cathodic Protection Specialist. Such

a person shall have not less than five years' experience in the cathodic protection of submerged structures. The Contractor shall submit evidence of the qualifications of corrosion engineer for review and approval.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Aluminum Anodes

Chemical composition as follows:

| | |
|---|---|
| Zinc | 2.8-6.5 percent maximum |
| Indium | 0.01-0.025 percent maximum |
| Silicon | 0.08-0.21 percent maximum |
| Copper | 0.006 percent maximum |
| Iron | 0.12 percent maximum |
| Other | 0.02 percent maximum each |
| Aluminum | Remainder |

Anode sizes as indicated. All anodes shall be offset mounted.
4" x 4" x 48" anodes shall be 76.8 pounds not including core.
4" x 4" x 36" anodes shall be 57.6 pounds not including core.

B. Anode Core

Steel Strap 2 inch wide by 3/8 inch thick. Exposed steel strap shall be completely coated with coal-tar epoxy with the exception of welding tabs. Anodes shall have standard 3-6" offset mounting.

C. Wall Mounted Junction Box

NEMA ICS 6, Type 4X hinged enclosure with clamped cover. Enclosure shall be of 316 stainless steel construction with terminal board and labeled with nameplate "CP – Test". Enclosure shall be mounted with stainless steel wedge anchors and hardware at the locations indicated.

D. Junction Box Terminal Board

Provide terminal boards for junction boxes made of phenolic plastic 1/8 inch thick. Insulated terminal boards shall have the required number of terminals (one terminal required for each conductor). Install properly sized Burndy copper lugs on the terminal board as indicated. Terminal connections shall be permanently tagged to

identify each termination of conductors (e.g. identify the conductors connected to the protected structure and reference electrode. Conductors shall be permanently identified by means of plastic or metal tags, or plastic sleeves to indicate termination.

E. Permanent Reference Electrode

Permanent reference electrodes shall be Borin sea water service silver-silver chloride reference electrodes Model - Stelth1 - Ag-AgCl SRE-004-SFB-WGH. Provide cells with No. 12 AWG, RHW cable of sufficient length to extend to the corresponding junction box without splicing.

F. Structure Lead Wires

No. 6 AWG Type HMWPE/PVDF stranded copper conductor.

G. Welded Conduit Clamp

Sized as indicated with the holes predrilled. All U-bolts and nuts shall be tack welded to the base plate after installation.

H. Concrete Mounting Hardware

Shall be 3/16" Type 316 stainless steel wedge anchors and bolts with Type 316 stainless steel one-hole clamps and Type 316 stainless steel hardware.

I. Exothermic Weld Kits

Exothermic weld kits specifically designed by the manufacturer for welding the types of materials and shapes provided.

J. Exothermic Weld Coating

Shall be a bituminous insulation compound Tapecoat TC mastic or equal.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Anodes

Install each anode as indicated with a 1/4" fillet weld around 3 sides of each connection point on either end of the anode strap

B. Sheet Pile Wall

Install a 2” fillet weld between each knuckle of the sheet pile wall to ensure continuity. Weld can be installed above or below waterline.

C. Junction Boxes, Lead Wires, and Conduit

Provide junction box and label each of the wires terminating in box.

Structure cable connection shall be connected to the sheet pile wall by use of an exothermic weld kit. Clean the structure surface of the wall by grinding, scraping, filing, or wire brushing to produce a clean, bright surface. Weld connections using an exothermic weld kits in accordance with the manufacturer's instructions. Test the integrity of the weld, prior to coating, by striking with a two pound hammer. Cover connections and exposed structures with an electrically insulating bituminous coating.

If there is inadequate access to perform the weld, the cable shall be exothermically welded to a 4”x4”x1/2” steel plate prior to its installation. Cover the connection and the entire plate with an electrically insulating bituminous coating other than the area being welded to the wall. Fillet weld the steel plate to the sheet pile wall with a 1/4” fillet weld around the perimeter of the plate.

Conduit shall be mounted to sheet pile wall as indicated, with a max spacing between each conduit clamp being 4 feet.

Conduit shall be mounted to concrete utilizing stainless steel wedge anchors, 1-hole straps, and hardware as indicated. Max spacing between each conduit strap shall be 2 feet.

D. Removal of Existing Components

Remove existing conduit, junction box, cables, and hardware from existing test anode assembly at South end of project (North end of cell wall). Bond anodes back into the circuit by removing the PVDF insulating sleeves, or my welding across the sleeves with a 1/2” fillet weld.

## PART 4 - MEASUREMENT AND PAYMENT

### 4.1 CATHODIC PROTECTION SYSTEM FIELD TESTING

Systems shall be tested and inspected by the Contractor's corrosion engineer. Record test data, including date, time, and locations of testing and submit report to the Owner or Owner’s Representative. Testing shall include the following measurements.

A. Base potential tests: After installation of the entire structure, but prior to connection of anodes to the structure, measure base (native) structure-to-electrolyte potentials of the structure. Perform measurements at a minimum of 20% of the pipe piles, with selection of piles chosen in field to account for a sampling of pile sizes and water depth, For the sheet pile the bulkhead, testing should occur at intervals of no more than 25 feet and with readings at each end. Potentials shall be obtained at the surface, mid-depth and mudline for each location. Measurements shall be taken with a portable silver-silver chloride reference electrode and a voltmeter having an input impedance of not less than 10 megohm.

B. Protected potential measurement tests: With the entire galvanic protection system put into operation for at least two weeks, measure potentials at each location and depth taken during the base potential survey. The locations of these measurements and the test equipment used shall be identical to that for the base potential measurements. In addition, for this survey, read the current output of each test anode and the potential at each permanent reference electrode.

C. Criteria for Cathodic Protection

1. Conduct in accordance with NACE SP0169. Criteria for determining the adequacy of protection shall be selected by the corrosion engineer as applicable:

a. A negative voltage of at least 0.80 volt (800 millivolts) as measured between the structure surface and a saturated silver-silver chloride reference electrode contacting the electrolyte. Determination of this voltage is to be made with the protective current applied to the structures for a minimum of two weeks.

b. A minimum polarization voltage shift of 100 mV measured between the structure surface and a saturated copper-copper sulfate reference electrode contacting the electrolyte. The polarization shift shall be the difference between the base reading and the protected voltage measurement.

END OF SECTION

# SECTION 31 00 00

# EARTHWORK

## PART 1 - GENERAL

### 1.1 DESCRIPTION OF WORK

A. The work covered by this specification consists of furnishing all plant, labor, equipment, and materials; and performing all operations in connection with excavation, excavation of unsuitable organic soils, subgrade preparation, and placement; and compaction of fill materials required for the project construction.

B. In addition to regular and typical dust suppression procedures, the Contractor is advised that dust suppression is paramount, and the Owner will continuously monitor dust levels at various locations throughout the site to document and comply with dust level limits during construction.

C. Refer to Contract Drawings for final grades.

### 1.2 CODES AND STANDARDS

AMERICAN SOCIETY FOR TESTING AND MATERIALS

| | |
|---|---|
| ASTM D422-63(R90) | Standard Test Method for Particle-Size Analysis of Soils |
| ASTM D1556-92 | Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method |
| ASTM D1557-91 | Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft (2700 kN-m/m)) |
| ASTM D2216-92 | Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock |
| ASTM D2922-91 | Standard Test Methods for Density of Soil and Rock in Place by Nuclear Methods (Shallow Depth) |
| ASTM D3017-88 | Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth) |
| ASTM D4318-93 | Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils |
| ASTM D4643-93 | Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method |

## 1.3 SUBMITTALS

A. Testing of Off-Site Sources - Submit gradation and moisture-density compaction laboratory test reports on each type of off-site fill material to be used for backfilling. Perform gradation test for soil and crushed stone materials in accordance with the standards described on the Contract Drawings.

The following additional tests shall be performed on a sample of material from each off-site source from which the material is derived: VOCs, SVOCs, TPH, PCBs and total and TCLP RCRA 8 metals. Results of Contractor testing from each source of material shall be made available to the Owner's Representative for approval one week prior to its use. Off-site materials shall meet the Massachusetts (MA) Department of Environmental Protection RCS2 criteria. Contractor shall not bring material on site until approval is given.

B. Product Data Sheets for Geosynthetic Products – Submit data sheets from the product manufacturer for each type of geosynthetic to be used during construction.

C. Contractor shall note the characterization procedure for geotechnically unsuitable material contained in Section 02 11 10, Excavation and Handling of Contaminated Material, PART 1.5.

D. Earthwork Operation and Sequence Plan

1. Submit an Earthwork Operation and Sequence Plan outlining types of equipment, daily volumes, and grading, excavation, subgrade preparation, proof compacting, backfilling, and compaction sequence to the Owner's Representative for review at least 10 working days prior to commencement of construction. The Earthwork Operation and Sequence Plan shall be coordinated with the work of other trades as necessary to complete the earthwork. Owner will not allow the work to start without a satisfactorily detailed Earthwork Operation and Sequence Plan.

2. Where excavation to design subgrade elevation results in generation of suitable granular fill, indicate proposed location (in plan and elevation) where granular fill will be reused on site.

E. Shoring and Bracing Plan

If the Contractor selects to use shoring and bracing, submit the support of excavation plan to the Owner for review at least 10 working days prior to commencement of construction. The support of the excavation system shall be prepared by a Professional Engineer, registered in the Commonwealth of Massachusetts.

## 1.4 DEFINITIONS

A. SOURCE shall mean those areas from which any material brought to the site is derived. All material brought to the site shall be certified in writing as clean and free

from environmental contaminants. The sources and test results shall meet with the approval of the Owner's Representative before any material is delivered to the project. The following tests shall be performed on a sample of material from each source from which the material is derived: Sieve Analysis, VOCs, SVOCs, TPH, PCBs and total and TCLP RCRA 8 metals.

B. UPPER EXISTING MATERIAL shall mean existing fill material on site.

C. SUITABLE MATERIALS, for reuse on-site, shall generally consist of predominantly granular (sand, gravel, silt, and rock) material free of organic material, peat, dredge debris, organic silt, and other objectionable material. Suitable materials shall be reused on-site as compacted or densified fill as designated on the drawings.

D. ORGANIC MATERIAL shall mean fibrous mats of roots, decaying vegetation, organic silt, peat, timber piles, planks, wharf or fendering, garbage and sanitary wastes.

E. UNSTABLE MATERIAL shall mean organic debris, frozen materials, topsoil, and organic silts.

F. SUITABLE CONSTRUCTION DEBRIS shall mean on-site concrete, brick, or asphalt debris, processed to be less than 6 inches in size that is suitable for compaction when mixed with granular material.

G. UNSUITABLE CONSTRUCTION DEBRIS shall mean on-site organic debris such as wood, stumps, organic material, roofing debris, or other miscellaneous debris that is unsuitable for compaction when mixed with granular material.

H. TRENCH AND CULVERT EXCAVATION shall consist of the excavation of all culverts, utility trenches, infiltration trenches, pipelines, and other minor structures including but not limited to leaching basins, catch basins, field inlets, manholes and drop inlets.

I. Refer to PART 2 – PRODUCTS of this specification for additional definitions of soil fill materials.

1.5 RELATED WORK SPECIFIED ELSEWHERE

A. Additional requirements relative to site preparation are specified in Section 02 11 00, Clearing and Grubbing.

B. Additional requirements relative to erosion control and prevention of sedimentation are contained in Section 01 35 43, Environmental Procedures.

C. Additional requirements relative to on-site soils are contained in Section 02 11 10, Excavation and Handling of Contaminated Material.

D. Additional requirements relative to placement and compaction of backfill materials around utilities are contained in Section 02 22 20, Excavation, Trenching, and Backfilling for Utility Systems.

1.6 PREPARATION

A. Examine the site thoroughly and determine the existing conditions and difficulty of work to be performed.

B. Before commencing earthwork operations, determine that preparatory work has been completed.

C. Perform field surveys required to accomplish the work.

1.7 DEGREE OF COMPACTION

A. Expressed as a percentage of the maximum dry density obtained by the test procedure presented in ASTM D1557 Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft$^3$ (2700 kN-m/m$^3$)).

B. Abbreviated in this Specification as a percent of laboratory maximum dry density.

1.8 FIELD QUALITY CONTROL

A. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements. Testing of materials for compliance with specifications shall be the responsibility of the Contractor.

1. Material Source Testing – Contractor shall perform all source sampling and testing of soil materials used for construction. Testing shall be performed by a certified laboratory approved by the Owner. All test results shall be forwarded to Owner in an electronic format (PDF) upon receipt.
2. Confirmation Testing (In-situ) – Contractor shall coordinate with a 3rd party testing service approved by the Owner to perform all in-situ confirmation sampling and testing of installed soil layers. Sample locations to be determined by the Owner's Representative.
3. Retesting – The Contractor is responsible for retesting fees required due to failed testing where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility. The cost of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction indicated noncompliance with Contract Document requirements.

B. Source Testing

1. The Contractor shall provide source testing for the following materials using the testing methods and frequencies specified below, or elsewhere in the Contract Documents for qualification of material.
    a. Structural Fill
        i. One Unified Soil Classification System (USCS) soil description (ASTM D2487), one Grain Size Analysis w/ Hydrometer (ASTM D6913), and one Lab Compaction (Modified Proctor) ASTM D1557 shall be performed per 2,500 cy per soil type. Structural fill shall have no organic matter, debris, sticks, roots, sharp objects, boulders or weed growth. Imported fill must be sampled before import and approved for use by the Engineer.

C. In-situ Testing

1. The Contractor shall provide in-situ testing for the following materials using the testing methods and frequencies specified below, or elsewhere in the Contract Documents for qualification of material.

**In-situ Testing for Structural Fill**

| Test Description | ASTM Method | Frequency | Material Quantity | Total Number of Tests | Passing Criteria |
|---|---|---|---|---|---|
| In-place moisture density | D6938 | 1 per | 500 cy | 24 | ≥ 95% maximum dry density |

2. Permit the Owner's Representative to observe all subgrades for each layer of fill or backfill. Additional fill or backfill should not be placed unless the Owner's Representative has approved the subgrade and/or previous layer of fill.
3. When required or requested by the Owner's Representative, the Contractor shall provide field elevations of the compacted subgrade or fill layer.

D. Compacted materials that are below specified density shall be re-compacted at no additional expense to the Owner.

E. The Contractor shall bear the cost of removal of all unsuitable material placed without approval by the Owner's Representative that fail to conform to the specifications.

F. Additional quality control compaction testing of material placed during construction may be provided by the Owner's Representative as an independent verification of the Contractor's field quality control. The Owner's Representative shall be notified 48 hours prior to any excavation, fill, backfill, or compaction operations.

1. Permit the Owner's Representative to observe all subgrades for each layer of fill or backfill. Additional fill or backfill shall not be placed unless the Owner's Representative has approved the subgrade and/or previous layer of fill.

2. When required or requested by the Owner's Representative, the Contractor shall provide field elevations of the compacted subgrade or fill layer.

## 1.9 RESPONSIBILITY OF THE CONTRACTOR

A. The Contractor is responsible for adhering to regulations, Specifications, and recognized standard practices related to the management of contaminated and potentially contaminated material during excavation and removal activities. The Owner and Owner's Representative will not be responsible at any time for the Contractor's violation of pertinent State or Federal regulations or endangerment of laborers, passers-by, or any others.

B. The Owner will not be held negligent or liable for any inadequacies or deficiencies in the Contractor's site-specific worker Health and Safety Plan or for any oversight or inadequacies in the Contractor's implementation of the safety plan.

C. Provide labor, materials, and equipment necessary to complete the work including:

1. Excavation, backfilling, on-site transportation, stockpiling, and maintenance of excavated material.
2. The Contractor is responsible for all construction, protection, and maintenance of soil stockpiles from excavation through chemical testing and on-site re-use or off-site disposal (if required). The Contractor shall stockpile material only in areas designated by the Owner.
3. The Contractor is responsible for providing all documentation to track potentially contaminated material from the time of excavation until it is accepted by and disposed of at the disposal facility.
4. The Contractor shall backfill excavations with suitable materials in accordance with this section and the limits and elevations shown on the Contract Drawings.

D. The Contractor is responsible for all disposal costs at the disposal facility.

# PART 2 - PRODUCTS

## 2.1 IMPORTED GRANULAR FILL (Structural Fill)

IMPORTED GRANULAR FILL shall be free from ice and snow, roots, sod, rubbish, and other deleterious or organic matter. It shall conform to the following gradation requirements:

| SIEVE SIZE | PERCENT FINER BY WEIGHT |
|---|---|
| 2/3 of the loose lift thickness | 100 |
| No. 10 | 30-95 |
| No. 40 | 10-70 |
| No. 200 | 0-10 |

Granular Fill if placed 4 feet below finish grade, at the discretion of the Owner's Representative, provided it is properly moisture controlled and can meet the required compaction. It should be noted, however, that these materials are very sensitive to changes in moisture content and may be difficult to properly compact using ordinary means and equipment.

2.2 DENSE GRADED AGGREGATE (also called out "gravel base" or "gravel borrow") shall consist of one or the other of the following material.

A. DENSE GRADED AGGREGATE shall meet M2.01.7 in the Massachusetts Highway Department, Standard Specifications for Highways and Bridges, and shall conform to the following gradation requirements:

| SIEVE SIZE | PERCENT FINER BY WEIGHT |
|---|---|
| 2 inches | 100 |
| 1 1/2 inch | 70-100 |
| 3/4 inch | 50-85 |
| No. 4 | 30-55 |
| No. 50 | 8-24 |
| No. 200 | 3-10 |

2.3 CRUSHED STONE

A. CRUSHED STONE (also called out "double washed stone", "screened gravel", "crushed rock") shall consist of one or the other of the following material:

1. Durable crushed rock consisting of the granular fragments obtained by breaking and crushing solid or shattered natural rock, and free from a detrimental quantity of thin, flat, elongated*, or other objectionable pieces.
   a. Thin or elongated pieces are defined as follows: Thin stones shall be stones whose average width exceeds four (4) times their average thickness. Elongated stones shall be such stones whose average length is in excess four (4) times their average width.
2. Durable crushed gravel stone obtained by artificial crushing of cobbles, boulders, or field stone with a minimum diameter before crushing of 8 inches.
3. The crushed stone shall be reasonably free from clay, loam or deleterious material and not more than 1.0% of satisfactory material passing a #200 sieve will be allowed to adhere to the crushed stone.
4. Crushed stone shall be uniformly blended according to the following grading requirements:

| SIEVE SIZE | PERCENT FINER BY WEIGHT | |
|---|---|---|
| | 3/4" INCH CRUSHED STONE | 1-1/2" CRUSHED STONE |
| 1 ½-inch | -- | 100 |
| 1 ¼-inch | -- | 85-100 |
| 1-inch | 100 | -- |
| 3/4-inch | 90-100 | 10-40 |

| SIEVE SIZE | PERCENT FINER BY WEIGHT | |
|---|---|---|
| | 3/4" INCH CRUSHED STONE | 1-1/2" CRUSHED STONE |
| 1/2-inch | 10-50 | 0-8 |
| 3/8-inch | 0-20 | -- |
| No. 4 | 0-5 | -- |
| No. 200 | <1 | <1 |

5. All crushed stone referred to on the Contract Drawings shall be 3/4-inch crushed stone unless otherwise specified.
6. "1-1/2-inch crushed rock aggregate," referred to on the Contract Drawings, shall be 1-1/2-inch crushed stone.

## 2.4 COMMON FILL

Common fill shall consist of sand, silt, gravel, or similar materials free from trash, topsoil, organic or compressible material, roots, and vegetation. Stones, rock, brick, and concrete fragments not exceeding 6 inches in their largest dimension are acceptable provided they are not nested when placed for compaction and can be readily spread and compacted during filling. Common fill may be acceptable for use as Granular Fill at the discretion of the Owner's Representative, provided it can be placed and properly compacted.

## 2.5 SAND FILL

Sand fill shall be free from ice and snow, roots, sod, rubbish and other deleterious or organic material. Sand fill shall be a well-graded, medium to coarse sand with a maximum diameter of 1/4 inch and less than 10% passing the #200 sieve by weight.

## 2.6 SAND BEDDING FOR UTILITIES

Sand Bedding shall be free from ice and snow, roots, sod, rubbish and other deleterious or organic material. Sand Fill shall be a well-graded, medium to coarse sand with a maximum diameter of 1/4 inch and less than 10% passing the #200 sieve by weight.

## 2.7 RIP-RAP MATERIAL (ARMOR LAYER, SCOUR PROTECTION, & TOE STONE)

1. RIP-RAP MATERIAL shall be crushed gravel or stone with 100% passing 9 inch diameter side, 10 to 100% passing the 8 inch diameter size, 40 to 60% passing the 6 inch diameter size and 0 to 20% passing the 4 inch diameter size.
2. Each load of rip rap shall be reasonably well graded from the smallest to the maximum size specified. Control of gradation will be by visual inspection.

## 2.8 FLOWABLE FILL

A. Flowable Fill shall meet the requirements for Controlled Low Strength Material as specified in section M4.08.0 in the MA Highway Department, Standard Specifications for Highways and Bridges Manual, 2025 Edition.

## 2.9 GEOSYNTHETICS AND MISC MATERIALS

A. Non-woven filter fabric shall be Mirafi 140N or approved equal, as specified on the Drawings.

B. Woven filter fabric shall be ACF M200(US Equivalent US 1540) or approved equal, as specified on the Drawings.

C. Geogrid at the base of the heavy lift shall be Tensar Interax NXF Filtergrid or approved equal, as specified on the Drawings

D. Geogrid in the middle of the heavy lift shall be Tensar Interax NXF Geogrid or approved equal, as specified on the Drawings.

E. Geogrid in the middle of the heavy lift shall be Tensar Interax NXF Geogrid or approved equal, as specified on the Drawings.

F. Waterproofing membrane shall be a minimum of 0.060 mil ethylene propylene diene monomer (EPDM) membrane fully adhered to the concrete. Membrane shall meet or exceed all of the requirements for ASTM D4637-04, Type I vulcanized rubber membrane and installed per manufacturer's product specifications, including nondestructive seam testing. Membrane shall be manufactured by Firestone, Carlisle, GenFlex, Roofing Products International, Inc. or approved equal. Membrane shall have a 20-year warrantee.

G. Drainage Composite shall be Mirafi SER G or approved equal, as specified on the drawings and installed per manufacturer's product specifications.

## 2.10 LOAM AND SEEDING (OFF-SITE TOPSOIL)

A. Loam and seeding shall be free from refuse or any material toxic to plant growth. Topsoil shall also be free from subsoil, woody vegetation, stumps, roots, brush, stones, clay lumps, or similar objects larger than 2 inches in greatest dimension except in lawn areas where maximum size shall be 1 inch. The soluble salt contents of the soil shall be between 750 to 1,500 parts per million (ppm) as determined by conductivity measurements. The soil shall be considered acceptable if the conductivity measurement is between 0.5 and 1.0 milli-mhos/centimeter for a 1:2 soil/water ratio. Topsoil shall be free from invasive plant species. Topsoil shall meet the following requirements unless otherwise specifically stated on the plans or proposal:

1. The loam grassed areas shall be 6 inches thick. Fertilizer shall be applied to the loam at a rate of 0.2 pounds per square yard and worked into the seed bed with an application of lime, if needed to 2021 Edition Roadway Construction Standards 5-6 achieve the required pH range. As soon as the seed is sown, it shall be covered with a thin layer of loam, rolled and watered. The grass strip shall be seeded at the rate of 3.6 pounds per 100 square yards. Grass shall grow to a satisfactory cover before being accepted by the Owner.

2. In locations where erosion is possible, erosion controls shall be in place until the vegetation has substantially rooted. Erosion, gullies and other damage will need to be reseeded as necessary until an adequate growth of grass is achieved.

3. Loam Borrow shall conform to MassDOT Standard Spec. M1.05.0 or shall be the product of a commercial sand and gravel processing facility. It shall be uncontaminated by saltwater, foreign matter, or substances harmful to plant growth. The acidity range of the Loam Borrow shall be pH 5.5 to 7.0.

4. Fertilizer shall be of a 10-6-4 composition.

5. Seed composition shall be 60% Red Fescue, 20% Red Top, 20% Kentucky Blue. Seed shall be of the previous year's crop and in no case shall the weed seed content exceed 1% by weight.

## PART 3 - EXECUTION

### 3.1 UTILITY PROTECTION

A. Contact all utility companies and property owners which might have installations in the area to determine location of all utilities and structures.

B. Protect above and below grade utilities which are to remain.

C. Protect plant life, trees, lawns, and other features remaining as a portion of final landscaping.

D. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic.

E. Implement temporary erosion control measures such as silt fencing, hay bales, sediment traps, etc. as required to minimize the effects of erosion and sedimentation in excavations.

F. Excavation cuts shall be sloped sufficiently to prevent material from sliding into the excavation and to comply with local, state and Federal codes and regulations. Sheeting and bracing shall be placed as dictated by conditions.

G. Slope Side of excavations to comply with OSHA requirements and local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible either because of space restrictions, stability of material excavated, or where shoring and bracing is more economical than sloping. Shoring and bracing shall be designed by a Professional Engineer, Registered in the Commonwealth of Massachusetts. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

## 3.2 GRUBBING

A. Pull all stumps within the site boundary. All stumps shall be removed to a minimum of 2 feet below the existing ground surface.

B. Detailed requirements for clearing, grubbing, and disposal of stumps are contained in Section 02 11 00, Clearing and Grubbing.

## 3.3 EXCAVATIONS

A. Work shall be scheduled so the deepest elements are completed first when undermining of shallower elements could occur.

B. Excavation cut shall be sloped sufficiently to prevent material from sliding into the excavation and to comply with local, state, and Federal codes and regulations. Sheeting and bracing shall be placed as dictated by conditions.

C. The bottom of excavations shall be protected from frost action and surface drainage. Frozen material shall be removed and replaced with granular fill or concrete. Protect excavation bottoms against freezing when the atmospheric temperature is less than 35 degrees F.

D. All rock surfaces shall be level and cleaned of loose materials.

E. Slope side of excavations to comply with OSHA requirements and local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible either because of space restrictions, stability of material excavated, or where shoring and bracing is more economical than sloping. Shoring and bracing shall be designed by a Professional Engineer, Registered in the Commonwealth of MA. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

F. If requested by the Owner's Representative, the Contractor shall place a 12- to 18-inch layer of Granular Fill or 6 inches of crushed stone and a layer of non-woven filter fabric over the natural underlying soil to stabilize areas which may become disturbed.

## 3.4 DISPOSAL

A. Remove all unsuitable and organic materials (as determined by the Owner's Representative) from the property and dispose offsite as required by local, State and Federal codes, rules and regulations. Remove existing foundations, demolition debris, abandoned utility piping, slabs, pavements, and other debris encountered in areas of construction. Dispose of excess or unsuitable material as part of the Contract price.

## 3.5 DRAINAGE

A. Direct surface water away from excavations, existing buildings, roadways and construction sites to prevent erosion and undermining of foundations.

B. Provide diversion ditches, dikes and grading and maintain as required during construction.

C. Protect excavated slopes and backfill surfaces to prevent erosion and sloughing.

D. Perform excavation so that the site and the area immediately surrounding the site shall be continually and effectively drained.

## 3.6 DUST SUPPRESSION

A. Owner's Representative shall determine if dust generated at the site is significant enough to require dust suppression.

B. Dust suppression shall require application of water by Contractor, notwithstanding requirements of the Release Abatement Measure (RAM) Plan/EPA Self-Implementing Plan (SIP) and the Soil Management Plan (provided as Attachments to this Request for Proposal) and the erosion and sedimentation requirements identified in Section 31 25 00, Erosion and Sedimentation Controls. Contractor shall at all times keep machinery, and a sufficient supply of water onsite to suppress dust generated at the site, as necessary.

C. The Contractor shall suppress dust as necessary throughout construction, and until vegetation or other surface treatments have been established, if necessary.

D. Uniformly apply water to surface, subgrade or layer of soil material requiring dust suppression.

## 3.7 SUBGRADE PREPARATION

A. Proof Rolling

1. Clear and grub wood and brush vegetation in accordance with Specification Section 02 11 00, Excavation and Handling of Contaminated Material.

2. Any soft or weak spots that are identified during the proof rolling process shall be over excavated and replaced with compacted "Granular Fill" placed in accordance with Paragraphs 3.8 and 3.9 (below).

## 3.8 PLACEMENT AND COMPACTION

A. The Contractor is responsible for building and maintaining their own access within the site for their operations. Neither the Owner nor the Project Engineer warrants that construction equipment will be able to operate on the site without preparation. Neither the Owner nor the Project Engineer warrant that any type or size of equipment can operate at the site. The Contractor will be responsible for determining what type and size equipment the existing site and roads will support and will plan their operations and pricing accordingly. None of the above shall be considered as grounds for any claims for extra or additional cost.

B. Ground Surface Preparation: Generally, all filling is to be accomplished in the dry, under dewatered conditions. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills.

C. Place backfill and fill materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers.

D. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

E. Place backfill and fill materials evenly adjacent to structures, piping, or conduit to required elevations. Prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping, or conduit to approximately same elevation in each lift.

F. Control soil and fill compaction, providing minimum percentage of density specified for each area classification indicated below. Correct improperly compacted areas or lifts as directed by Project Engineer if soil density tests indicate inadequate compaction.

1. Percentage of Maximum Density Requirements: Compact soil materials to not less than the 90% of maximum density, in accordance with ASTM D1557.

G. Correct improperly compacted areas or lifts as directed by Project Engineer, if soil density tests indicate inadequate compaction.

## 3.9 COMPACTION (HEAVY LIFT SECTION)

A. Heavily surface compact subgrade with a minimum of 6 passes of a vibratory roller having a drum weight of at least 10,000 pounds and a dynamic force of at least 20,000 pounds prior to placing fill.

B. Soft areas shall be excavated and filled with compacted granular fill.

C. Subgrade shall be uniform throughout. There shall not be hard spots or soft spots.

D. Prevent free water from appearing on surface during or subsequent to compaction operations.

E. Soil material too wet to permit compaction to specified density shall be excavated and spread for drainage and air drying or shall be scarified in-place and air dried. All temporarily excavated material shall be placed on-site and compacted after it has been dried to a workable moisture content.

## 3.10 FILLING AND BACKFILLING IN-THE-DRY OR ABOVE MEAN HIGH WATER

A. Material placement shall begin after approval of the subgrade by the Owner's Representative.

B. Place "Suitable Native Material" or "Granular Fill" as backfill.

C. Place satisfactory materials in horizontal layers not exceeding 12 inches in loose thickness where self-propelled or towed mechanical compaction equipment is used, or 9-inch loose lift thickness when hand-operated compactors are used.

D. Do not begin backfilling until construction below finish grade has been approved and the excavation is clean of trash and debris.

E. Place and compact fill and backfill to indicated finish grade within a tolerance of one foot horizontally and 1 inch vertically.

F. Do not place successive layers of earth fill material until the compaction requirements of the previous layer have been satisfied.

G. Maintain positive drainage on the surface of unfinished earth fills. Blade the unfinished surfaces smooth to a crown at the conclusion of each day's work.

H. Uniformly grade the finished earth fill surfaces such that they are smooth, compacted, and free from irregular surface changes.

I. Unless otherwise noted compact fill and backfill material to a minimum of 95% of the maximum dry density per ASTM D1557.

J. Moisture control:

1. Where subgrade or layer of soil material must be moisture-conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material as needed to obtain optimum moisture content.
2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

K. The Contractor shall use extra care when compacting adjacent to walls. Where walls are buried on both sides, backfill and compaction shall proceed on both sides of the wall so that the difference in top of fill level on either side of the wall shall not exceed 2 feet at any stage of construction. Where backfill of a buried wall is only on one side, only hand-operated roller or plate compactor shall be used within a lateral distance of 5 feet of back of wall.

L. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operations. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks, and compaction equipment.

M. The Contractor shall not place a layer of compacted fill on snow, ice or soil that was permitted to freeze prior to compaction. Removal of these unsatisfactory materials will be required as directed by the Owner.

N. Once the Contractor has completed filling to subgrade elevation in accordance with Contract Drawings, and prior to placement of Dense Graded Aggregate, the Contractor shall provide an as-built survey (stamped by a MA Professional Land Surveyor [MA PLS]) of the sub-grade surface. The as-built plan shall be based on spot grades obtained on a grid spacing no greater than 50 feet x 50 feet and shall show said spot grades and topographical lines.

## 3.11 HEAVY LIFT SECTION PLACEMENT, SPREADING, AND COMPACTION

A. Spread Tensar Interax NXF Filtergrid or approved equivalent over prepared subgrade. Before fully unrolling the geogrid, anchor the beginning of the roll to the underlying surface in the center and at the corners of the roll's edge.

B. Unroll the geogrid. Align it and pull it taut to remove wrinkles and lay down slack with hand tension, then secure it in place. Overlap a minimum of 2 feet at roll ends.

C. Spread first lift of Dense Graded Aggregate over geogrid or geofabric.

D. Compact to a dry density of not less than 95 percent of the maximum density as determined by the Modified Proctor ASTM D1557, unless otherwise noted. Alternate blading and rolling will be required to obtain a smooth, even, and uniformly compacted course.

E. Repeat Part A and B with the placement Tensar Interax NXF geogrid or approved equal. Then, repeat Part C and D with the second lift of Dense Graded Aggregate.

F. The final surface compaction shall be with a smooth wheeled power roller to obtain a firm and smooth surface finish.

G. Level and contour surfaces to elevation and gradients indicated.

H. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

I. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

J. Once the Contractor has completed installation and compaction of dense grade aggregate to the final elevation in accordance with Contract Drawings, the Contractor shall provide an as-built survey (stamped by a MA PLS) of the final grade surface. The as-built plan shall be based on spot grades obtained on a grid spacing no greater than 50 feet x 50 feet and shall show said spot grades and topographical lines.

## 3.12 MAINTENANCE

A. Protect newly graded areas from traffic and erosion and keep free of trash and debris. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, remove to sound material, reshape, and compact to required density prior to further construction.

## 3.13 EROSION CONTROL

A. Protect disturbed areas from erosion.

## 3.14 DAMAGE

A. Any damage to utilities, buildings, personal property or anything else that is not proposed to be disturbed resulting from excavation, backfill and compaction shall be repaired by the Contractor to the satisfaction of the Owner's Representative and at the Contractor's expense.

END OF SECTION

# SECTION 31 23 00

# EXCAVATING, BACKFILLING, AND COMPACTING (MARINE STRUCTURES)

## PART 1 - GENERAL

### 1.1 WORK SPECIFIED

Work included: Excavate, backfill, compact, and grade the site to the elevations and limits shown on the Drawings, as specified herein, and as needed to meet the requirements of the construction shown on the Contract Documents.

### 1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled work men and women who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.

C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Consulting Engineer.

### 1.3 SUBMITTALS

A. Submit the pre-qualified list of subcontractors and the proposed schedule of unit prices to the Engineer for review.

B. Submit material gradation, moisture density curve, and representative material sample for each material proposed for use.

C. Submit results of soil compaction test conducted by an independent testing laboratory as required.

D. Submit de-watering plan if de-watering is to be performed. Include proposed intake and discharge location, containment measures for discharge, including details on size, type, and intended location of all components.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Granular Backfill

Where the Drawings indicate “structural fill” material, it shall meet the requirements of granular backfill as described herein. Granular backfill shall consist of broken or crushed stone, bank or crushed gravel, or mixtures thereof. A sample and grading curve is to be provided for the Engineer's review prior to commencing work. Recycled man-made products such as asphalt and concrete are not acceptable.

1. Broken or crushed stone shall consist of sound, tough, durable stone.
2. Bank or crushed gravel shall consist of sound, tough, durable particles of crushed or uncrushed gravel free from soft, thin, elongated, or laminated pieces and organic or other deleterious substances.

B. Uncontrolled Fill

Uncontrolled backfill material may consist of surplus excavated materials from the site.

C. Other Materials

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the review of the Engineer.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Surface Conditions

1. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Procedures

1. Utilities:
   a. Unless shown to be removed, protect active utility lines shown on the Drawings or otherwise made known to the Contractor prior to excavating. If damaged, repair or replace at no additional cost to the Owner. The Contractor is responsible for notification of local utilities.
   b. If active utility lines are encountered and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to ensure that service is not interrupted.
   c. If service is interrupted as a result of Work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.

d. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Engineer, and secure their instructions.
e. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.

2. Protection of persons and property:
   a. Barricade open holes and depressions occurring as part of the Work and post warning lights on property adjacent to or with public access.
   b. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
   c. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.
   d. Provide grounding of equipment.

3. Dewatering of Upland Excavations:
   a. Remove all water, including rainwater, encountered during trench and substructure work to an approved location by pumps, drains, and other approved methods.
   b. Keep excavations and site construction area free from water.
   c. Should de-watering systems be employed, discharge effluent to an upland location contained by hay bales, silt fencing or other means of containment acceptable to the Owner.

4. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

5. Always maintain access to adjacent areas.

6. Upland soil stockpiles shall be contained by hay bales or silt fencing to prevent erosion. Maintain containment measures during the Work.

C. Excavating

1. Perform excavating of every type of material encountered within the limits of the Work to the lines, grades, and elevations indicated and specified herein.

2. Satisfactory Excavated Materials
   a. Transport to, and place in, fill or embankment areas within the limits of the Work.

3. Unsatisfactory Excavated Materials
   a. Excavate to a distance below grade as directed by the Engineer and replace with satisfactory materials.
   b. Include excavation of unsatisfactory materials, and replacement by satisfactory materials, as part of the work of this Section.

4. Surplus Materials
   a. It is a requirement of this Contract that no excavated soils, including riprap and other stone products, are permitted to be removed from the site. Surplus materials are to be stockpiled by the Contractor at a location on site per the direction of the Owner. Stockpiles are to conform to the requirements of Paragraph 3.1-B above.

5. Excavating of Surfaces and Subsurfaces
   a. Where rocks, boulders, granite, or similar material is encountered, and where such material cannot be removed or excavated by conventional earth moving or ripping equipment, take required steps to proceed with the general grading operations of the Work, and remove or excavate such material by means which will neither cause additional cost to the Owner nor endanger buildings or structures whether on or off the site.
   b. Where existing subsurface structures are encountered, notwithstanding items described in Paragraph 3.1-C, where these subsurface structures are classified as abandoned by the Engineer, and where these structures impede progress of the Work, shall be removed by means which will neither cause additional cost to the Owner nor endanger buildings or structures on or off site.
   c. Do not use explosives without written permission from the Engineer.

6. Excavate and backfill in a manner and sequence that will always provide proper drainage.

7. Borrow
   Obtain material required for fill or embankment in excess of that produced within the grading limits of the Work from borrows areas selected and paid for by the Contractor and accepted by the Engineer.

8. Ditches and Gutters
   a. Cut accurately to the cross sections, grades, and elevations shown.
   b. Maintain excavations free from detrimental quantities of leaves, sticks, trash, and other debris until completion of the Work.

9. Unauthorized Excavations
   a. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific instruction from the Engineer.
   b. Under footings, foundations, or retaining walls:
      i. Fill unauthorized excavations by extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering the required top elevation.
      ii. When acceptable to the Engineer, lean concrete fill may be used to bring the bottom elevation to proper position.
      iii. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations, unless otherwise directed by the Engineer.

10. Stability of Excavations
    a. Slope excavations as necessary to make slopes safe in accordance with the appropriate regulations.
    b. Shore and brace where sloping is not possible because of space restrictions or stability of the materials being excavated.
    c. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

11. Shoring and Bracing
    a. Provide materials for shoring and bracing as may be necessary for safety of personnel, protection of work and compliance with requirements of governmental agencies having jurisdiction.
    b. Maintain shoring and bracing in excavations regardless of the time excavations will be open.
    c. Construct shoring and bracing as excavation progresses.

12. Excavating the Structure
    a. Conform to elevations and dimensions shown within a tolerance of 0.10 feet and extending a sufficient distance from footings and foundations to permit placing and removing concrete formwork, installation of services, other construction required, and for inspection.
    b. In excavating for footings, take care not to disturb bottom of excavation:
        i. Excavate by hand tools to final grade just before concrete is placed.
        ii. Trim bottoms to required lines and grades to leave solid base to receive concrete.
        iii. Excavate for footings and foundations only after general site excavating, filling, and grading are complete.

13. Excavating the Pavement
    a. Cut surface under pavements to comply with cross sections, elevations, and grades.

14. Cold Weather Protection
    a. Protect excavation bottoms against freezing when ambient atmospheric temperature remains lower than 35 degrees F for more than four consecutive hours or is anticipated to be lower than 35 degrees F during non-working hours such as overnight, weekends, or holidays.

15. Filling and Backfilling
    a. General:
        i. For each area shown on the Drawings, place acceptable soil material in layers to required elevations.
        ii. Perform all backfilling and compaction operations in a careful and controlled manner. Avoid damaging existing structures. Prevent loss of material through openings in the bulkhead and prevent materials from entering the waterway.

16. Backfill excavations as promptly as progress of the Work permits, but not until completion of the following:
    a. Acceptance of construction below finish grade including, where applicable, damp-proofing and waterproofing.
    b. Inspecting, testing, approving, and recording locations of underground utilities.
    c. Removing concrete formwork.
    d. Removing shoring and bracing, and backfilling of voids with satisfactory materials.
    e. Removing trash and debris.
    f. Placement of horizontal bracing on horizontally supported walls.

17. Ground Surface Preparation
    a. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious matter from ground surface prior to placement of fills.
    b. Plow, strip, or break up sloped surfaces steeper than one vertical to four horizontals so that fill material will bond with existing surface.
    c. When existing ground surface has a density less than specified under "compacting" for the particular area, break up the ground surface, pulverize, moisture condition to the optimum moisture content, and compact to required depth and percentage of maximum density.

18. Placing and Compacting
    a. De-water area scheduled to receive backfill.
    b. Place backfill and fill materials in layers not more than 8" in loose depth.
    c. Before compacting, moisten or aerate each layer as necessary to provide the optimum moisture content.
    d. Compact each layer to required percentage of maximum density for area.
    e. Do not place backfill or fill material on surfaces that are muddy, frozen, or containing frost or ice.
    f. Place backfill and fill materials evenly along structures, to required elevations.
    g. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around the structure to approximately the same elevation in each lift.

19. Grading
    a. General:
        i. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.
        ii. Smooth the finished surfaces within specified tolerance.
        iii. Compact with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.
        iv. Where a change of slope is indicated on the Drawings, construct a rolled transition section having a minimum radius of approximately 8'-0" unless adjacent construction will not permit such a transition, or if such a transition defeats positive control of drainage.

b. Grading outside building lines:
   i. Grade areas adjacent to buildings to achieve drainage away from the structures, and to prevent ponding.
   ii. Finish the surfaces to be free from irregular surface changes, and:
      a) Shape the surface of areas scheduled to be under walks to line, grade, and cross-section, with finished surface not more than 0.10 feet above or below the required subgrade elevation.
      b) Shape the surface of areas scheduled to be under pavement to line, grade, and cross section, with finished surface not more than 0.05 feet above or below the required subgrade elevation.

20. Compacting
   a. Control backfill compaction during construction to provide the minimum percentage of density specified for each area as determined according to ASTM D1557.
   b. Backfill material's density shall not be below 99% of its density at optimum moisture content as determined by the above test in all layers.
   c. Moisture control:
      i. Where subgrade or layer of soil material must be moisture-conditioned before compacting, uniformly apply water to surface of subgrade or layer of soil material to prevent free water appearing on surface during or subsequent to compacting operations.
      ii. Remove and replace, or scarify and air dry, soil material that is too wet to permit compacting to the specified density.
      iii. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry. Assist drying by dicing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value as determined by moisture density relation tests reviewed by the Engineer.

21. Dust Suppression
   a. Engineer shall determine if dust generated at the site is significant enough to require dust suppression.
   b. Contractor shall at all times keep machinery and a sufficient supply of water onsite to suppress dust generated at the site as necessary.
   c. Contractor shall suppress dust as necessary throughout construction and until vegetation or other surface treatments have been established, if necessary.
   d. Uniformly apply water to surface, subgrade, or layer of soil material requiring dust suppression.

## 3.2 MAINTENANCE

A. Protection of newly graded areas:

1. Protect newly graded areas from traffic and erosion and keep free from trash and weeds.

2. Repair and re-establish grades in settled, eroded, and rutted areas to the specified tolerances.

B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.

END OF SECTION

# SECTION 31 23 19

# DEWATERING

## PART 1 - GENERAL

### 1.1 GENERAL PROVISIONS

A. Attention is directed to the Contract and General Conditions and all Sections within Division 01 - General Requirements which are hereby made a part of this Section of the Specifications.

### 1.2 DESCRIPTION OF WORK

A. Section includes construction dewatering.

B. Related Work:

1. Section 01 41 29 – EPA NPDES Construction General Permit
2. Section 02 11 00 – Clearing and Grubbing
3. Section 02 11 05 – Site Clearing
4. Section 02 11 10 – Excavation and Handling of Contaminated Material
5. Section 02 20 00 – Earthwork
6. Section 31 20 00 – Earth Moving
7. Section 31 50 00 – Excavation Support and Protection

### 1.3 SUBMITTALS

A. Shop Drawings: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, and disposal of water.

1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
2. Include a written plan for dewatering operations including control procedures to be adopted if dewatering problems arise.

B. Delegated-Design Submittal: For dewatering system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified Professional Engineer responsible for their preparation.

C. Qualification Data: For qualified Installer and Professional Engineer.

D. Record drawings at Project closeout identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions performed during dewatering.

1. Note locations and capping depth of wells and well points.

E. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by dewatering operations.

F. Field Test Reports: Before starting excavation, submit test results and computations demonstrating that dewatering system is capable of meeting performance requirements.

## 1.4 PERFORMANCE REQUIREMENTS

A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

1. Delegated Design: Design dewatering system, including comprehensive engineering analysis by a qualified Professional Engineer, using performance requirements and design criteria indicated.
2. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
3. Prevent surface water from entering excavations by grading, dikes, or other means.
4. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
5. Remove dewatering system when no longer required for construction.

## 1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer that has specialized in design of dewatering systems and dewatering work.

B. Regulatory Requirements: Comply with governing Environmental Protection Agency notification regulations before beginning dewatering. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Preinstallation Conference: Conduct conference at Project Site.

## 1.6 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of utility.
2. Do not proceed with interruption of utility without Owner's written permission.

B. Project-Site Information: A geotechnical data and calculation package is available for information only. The opinions expressed are those of Geotechnical Engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by Geotechnical Engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for dewatering.
2. The geotechnical data and calculation package is included elsewhere in the Project Manual.

C. Survey Work: Engage a qualified Land Surveyor or Professional Engineer to survey adjacent existing buildings, structures, and site improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Engineer if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding the site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Provide temporary grading to facilitate dewatering and control of surface water.

D. Monitor dewatering systems continuously.

E. Promptly repair damages to adjacent facilities caused by dewatering.

F. Protect and maintain temporary erosion and sedimentation controls during dewatering operations.

3.2 INSTALLATION

A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

1. Space well points or wells at intervals required to provide sufficient dewatering.
2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.

B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.

C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.

1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.

D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.

1. Maintain piezometric water level a minimum of 24 inches below surface of excavation or as directed by the Geotechnical Engineer.

E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

F. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on a continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.

1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches below overlying construction.

G. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

3.3 FIELD QUALITY CONTROL

A. Observation Wells: Provide, take measurements, and maintain at least the minimum number of observation wells or piezometers indicated; additional observation wells may be required by authorities having jurisdiction.

1. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
2. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. In areas where observation wells are not functioning properly, suspend construction activities until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.
3. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.

B. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.

END OF SECTION

# SECTION 31 25 00

# EROSION AND SEDIMENTATION CONTROL

## PART 1 - GENERAL

### 1.1 DESCRIPTION

A. This Section specifies requirements for temporary erosion control provisions as they relate to the construction process.

B. The work includes:

1. Providing and maintaining all temporary erosion control measures shown on the Contract Drawings and required by the Owner's Representative during the life of the Contract to control soil erosion and water pollution.
2. The installation and maintenance of additional silt fence, berms, ditches, sedimentation basins, construction exits, fiber mats, catch basin filters, straw, netting, gravel, trenches, mulches, grasses, slope drains and other approved erosion control devices or methods, needed to protect any areas on or off site.

### 1.2 DEFINITION AND COORDINATION OF EROSION CONTROL REQUIREMENTS

A. Temporary erosion control measures are defined as those elements are necessary to be installed by the Contractor to meet Federal, State, and Local regulations for the construction program, including, but not necessarily limited to, such items as; silt fences, berms, portable sedimentation basins, straw bales, check dams, and other such items, all of which shall be removed by the Contractor after installation of permanent erosion control measures, stabilization of the site, and prior to final completion of the project.

### 1.3 PRIOR TO CONSTRUCTION

A. Install soil erosion and sediment control devices prior to any soil disturbance, or in proper sequence, and maintain until permanent protection/stabilization is established.

B. Prior to the start of the construction, the Contractor shall submit to the Owner's Representative: schedules for the construction of required temporary erosion and sediment control work. No work shall be started until control schedules and methods of operations have been submitted to the Owner's Representative.

### 1.4 CONSTRUCTION OPERATIONS

A. When in the opinion of the Owner's Representative it becomes necessary, the Owner's Representative will inform the Contractor of construction procedures and operations that jeopardize erosion and sedimentation control provisions. If these construction procedures and operations are not corrected promptly, the Owner may suspend the

performance of any or all construction until corrections have been made, and such suspension shall not be the basis of any claim by the Contractor for additional compensation from the Owner nor for an extension of time to complete the Work.

1.5 CONTRACT DRAWINGS

A. Conforming to Contract requirements, furnish and keep at the job site a set of Contract Documents, which illustrate proposed erosion control procedures.

B. Clearly, neatly and accurately note on the designated set of the Contract Drawings all changes, revisions, and additions to the work.

C. Update the designated set of the Contract Drawings promptly as work progresses.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Silt fence fabric shall be 100X, as manufactured by TenCate Mirafi®, or approved equal.

B. Filter fabric at construction entrance shall be 600X, as manufactured by TenCate Mirafi®, or approved equal.

C. Silt sacks shall be Siltsack®, as manufactured by ACF Environmental, or approved equal.

D. Mulch Sock/Compost Filter Tube (Silt Socks)

1. Type and use: as specified by the Massachusetts Erosion & Sedimentation Control Guidelines for Urban and Suburban Areas.
2. Long fibered hay, grass mowings, or straw, in dry condition and which are relatively free of weeds and foreign matter detrimental to plant life.
3. Mulch binder: asphalt emulsion mulch binder of type acceptable to the Engineer.
4. Mulch netting: plastic or nylon mesh netting with approximate openings of 1/8 inch; or other netting approved by the Engineer.
5. Color: orange or orange striped for visibility.
6. Tensile strength: minimum 202 psi per ASTM D5035 with ultra-violet exposure resistance of 100 percent at 1,000 hours per ASTM G155.
7. Stakes for installing compost filter tubes: 1-1/2 inches square hard wood stakes, trimmed to a blunt end.
8. Compost fill material for the compost filter tube: certified though the USCC's STA Program and not derived from agricultural, food, or industrial residues; bio-solids (treated sewerage sludge); yard clippings; source-separated or mixed solid waste, free from man-made foreign matter, and without objectionable odors.

E. Straw mulch: MassDOT M6.04.2, long fibered straw, 100 percent certified weed free, free from foreign matter detrimental to plant life, and in dry condition.

F. Tackifier: biodegradable and non-toxic bonding adhesive agent during hydraulic seeding or straw mulching to minimize wind and water effects.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine areas in which work is to be performed. Notify the Owner's Representative, in writing, all prevailing conditions that will adversely affect satisfactory execution of work.

B. Verify the locations of proposed erosion control measures.

### 3.2 EROSION CONTROL – STRAW BALES or SILT SOCKS

A. Straw bales shall be installed at the locations as shown on the Drawings and in general as follows:

1. Toe of slope of embankment construction to filter all runoff flowing to off-site discharges.
2. Toe of temporary earthwork stockpile slopes.
3. Other locations shown on the Contract Drawings and required by laws, regulations, and permits.

B. Tightly abut straw bales to form a continuous barrier. Secure bales in place with two stakes per bale. The bales shall be trenched 6 inches into the ground. Soil shall be constructed on the upside slope of the bales. Deteriorated, destroyed or rotted bales shall be replaced immediately. Sediment shall be removed and disposed of periodically from behind the straw bales. The accumulated sediment shall not be allowed to rise above the mid height of the bale. All sediment, straw bales and appurtenances shall be removed and disposed of at the completion of the Contract.

### 3.3 SILT FENCE

A. Silt fence shall be installed at locations as shown on the Contract Drawings.

B. Supporting posts shall be spaced 4 feet on center and driven at least 1 foot into the ground. Posts shall be 1-1/2 inch square or heavier wood posts, or standard steel posts.

C. Fabric shall be anchored in a 4-inch deep trench dug on the upslope side of the posts. The trench shall be at least 4 inches wide. The fabric shall be laid in the trench, backfilled and compacted.

D. Fabric rolls shall be spliced at posts. The fabric shall be overlapped 6 inches, folded over and securely fastened to posts.

E. Silt fences shall be inspected immediately after each storm event and at least daily during prolonged rainfall.

3.4 SILT SACKS

A. Silt sacks shall be placed at all catch basins, landscape drains and/or inlets to drainage structures (on-site and off-site according to the Contract Drawings).

3.5 CONSTRUCTION REQUIREMENTS – TEMPORARY SEDIMENT CONTROL

A. The Contractor shall construct all erosion and sediment control features at the earliest practical time as outlined in the accepted schedule. Temporary erosion and sediment control measures shall be used to correct conditions that develop during construction which were unforeseen, but are needed prior to installation of permanent control features, or that are needed temporarily to control erosion or sedimentation which develops during construction operations.

B. Where erosion is likely to be a problem, clearing and grubbing operations shall be scheduled and performed so that grading operations and permanent erosion and sediment control features can follow immediately thereafter, if conditions permit; otherwise, temporary control measures will be required between successive construction stages.

C. Contractor shall be responsible for controlling erosion within the project area and retaining sediment on-site away from sensitive environmental resources. Any fines, construction delays, remedial actions, or incarceration resulting from the Contractor's failure to comply with these provisions shall be the responsibility of the Contractor and not the Owner.

D. Failure by the Contractor to control erosion, pollution, and siltation shall be cause for the Owner to employ outside assistance to provide the necessary corrective measures. The cost of such assistance, including engineering costs, will be charged to the Contractor and appropriate deductions made to the Contractor's monthly progress payment request.

E. The Contractor shall remove and properly dispose of sediment from control facilities as required by the Owner's Representative. The Contractor shall modify and improve erosion and sedimentation control facilities and replace deteriorated straw bales and other devices as required by the Owner's Representative.

F. Minimum temporary and permanent erosion and sedimentation control measures are shown on the Drawings. The Contractor shall strictly adhere to the minimum provisions shown. Additionally, temporary measures shall be selected and constructed by the Contractor in consultation with the Owner's Representative to accommodate changing field conditions that develop during construction.

G. Disturbed areas where construction has permanently or temporarily ceased, the area must be stabilized within 14 days. If earth disturbing activities will resume within 14 days, temporary stabilization is not required.

H. All disturbed areas shall be re-vegetated by loaming and seeding unless otherwise noted on the approved plan.

## 3.6 MAINTENANCE OF EROSION CONTROL MEASURES

A. The Contractor shall check the condition of erosion and sedimentation control devices daily and maintain them in good operating condition. Straw bales shall be replaced when deteriorated.

B. The Contractor shall inspect the condition of diversion dikes and ditches, filter berms, interceptor dikes, sediment basins and other erosion and sedimentation control devices after each rainstorm and during major storm events. Repairs shall be made as necessary.

C. During construction, temporary outlets of the drainage systems shall direct the flow to temporary or permanent sedimentation basins.

D. Temporary soil erosion and sedimentation control devices shall be removed and adjacent areas outside the limits of grading restored upon completion of the work or when required by the Owner's Representative.

E. Erosion control problems created by the Contractor, and beyond the scope of work, shall be immediately corrected by the Contractor at no additional cost to the Owner.

END OF SECTION

# SECTION 31 41 00

# SHORING

## PART 1 - GENERAL

### 1.1 DESCRIPTION OF WORK

Work included: Provide shoring, temporary or permanent, at excavations and elsewhere as required to protect work men and women, materials, other properties, and the public.

### 1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled work men and women who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this specification.

B. Retain a qualified Engineer, properly licensed in the project state, to provide such services at the location of the Work; to design the shoring system; and to inspect and report on the quality of its construction.

C. Comply with pertinent requirements of governmental agencies having jurisdiction.

D. Coordinate the shoring design and construction with:

1. Soil Investigation Report prepared for this Work.
2. Structural systems and sequence of construction established for the Work.

### 1.3 SUBMITTALS

A. Prior to submitting shoring design for approval of governmental agencies having jurisdiction, submit the design to the Engineer for review. Include supporting calculations.

1. The Engineer's review will not relieve the Contractor of their responsibilities under the Contract.
2. Should changes in the shoring design be required, subsequent to the Engineer's review, coordinate all such changes with the Engineer.

B. Upon completion of construction of this portion of the Work, submit to the Engineer two copies of a letter signed by the approved shoring design engineer stating that, to the best of the shoring design engineer's knowledge, the shoring system was constructed in accordance with the arrangement reviewed by the Engineer.

## PART 2 - PRODUCTS

### 2.1 DESIGN

A. Design a shoring system which will safely and adequately prevent collapse of new and existing structures, and parts thereof, which will permit construction of the Work to the arrangement and tolerances required under the Contract Documents.

B. Secure all needed approvals, including those of governmental agencies having jurisdiction and of adjacent property owners if required, at no additional cost to the Owner.

### 2.2 MATERIALS

Provide materials of all kinds as required for execution of the approved shoring system.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

Examine the areas and conditions under which Work of this specification will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 INSTALLATION

Construct and install the shoring system in strict accordance with the design approved by the governmental agencies having jurisdiction, and in strict accordance with the space arrangement reviewed by the Engineer.

### 3.3 TEMPORARY SHORING

All shoring shall be considered temporary, unless specifically designated as permanent by the Contract Documents or the Engineer.

### 3.4 PERMANENT SHORING

In some cases, shoring may remain in place, as designated in the Contract Documents or by the Engineer. Permanent shoring shall not negatively affect the performance of the completed Work or anticipated future work. The Contractor shall secure the Engineer’s review prior to covering permanent shoring. Permanent shoring shall become concealed upon the completed Work.

END OF SECTION

# SECTION 31 41 16

# STEEL SHEET PILES

## PART 1 - GENERAL

### 1.1 DESCRIPTION OF WORK

The Work covered by this Section of these Specifications consists of furnishing all plant, labor, supervision, equipment, appliances, and materials and in performing all operations in connection with the construction of the steel sheet pile wall, all in strict accordance with this Section of the Specifications and the applicable drawings, and subject to the terms and conditions of the Contract.

### 1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled work men and women who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

B. The Owner, through the Engineer, reserves the right of approval of the subcontractor pre-qualified and selected for this portion of the Work by the Contractor. Approval will be based, in part, on documented successful experience in performing work of a similar nature.

C. Driving of additional piles at the Contractor's own expense may be required by the Engineer in the event tolerances are exceeded. Drive individual piles plumb within 2%, and in a manner that the completed wall appears vertical when viewed from any point.

D. The Engineer may elect to observe the shop fabrication of the steel sheet piling. The Contractor shall provide the fabrication schedule and allow access for the Engineer to perform this task.

E. The Owner reserves the right to take samples from steel sheet pile material at the site for testing to verify compliance with the Specifications.

### 1.3 SUBMITTALS

A. Submit the pre-qualified list of subcontractors to the Engineer for review.

B. Upon receipt of the Engineer's review of the pre-qualified subcontractor, promptly submit sufficient technical data on the equipment necessary to accurately measure and record pile penetration and capacity during the entire driving of each pile.

C. Submit a detailed Work Plan for review by the Engineer that includes the following:

1. Written description of the means and methods necessary to install the steel sheet piles plumb and straight and protect coating.
2. Falsework layout and temporary bracing plan.
3. Layout plan of steel sheet piles including shop drawings and bill of materials. Provide details of all corners and transitions.
4. Shop drawings of all temporary shoring and falsework components including calculations that demonstrate adequacy of such temporary work.

   Steel sheet piles shall not be installed until the work plan is reviewed and no exceptions taken by the Engineer.

D. Submit steel certificates for review no later than the time of delivery of materials to the site.

E. Submit pile driving records, including date of final installation, pile top elevation, and pile tip elevation within 24 hours of installation.

F. Submit an As-Built survey of pile locations.

G. Submit welder's certificates certifying welders employed on the Work, verifying AWS qualifications within the previous 12 months.

## 1.4 PRODUCT DELIVERY AND STORAGE

The Contractor shall notify the Engineer 24 hours in advance of delivery of steel sheet piles. The contractor guarantees that steel sheet piles shall be handled in such a manner as to not induce stresses which will damage the materials and shall be stored in a safe manner within designated areas provided on the site.

Materials delivered to the site must be new and undamaged and must be accompanied by certified test reports. Provide the manufacturer's logo and mill identification mark on the sheet piling as required by the referenced specifications. Store and handle sheet piling in the manner recommended by the manufacturer to prevent permanent deflection, distortion, or damage to the interlocks; as a minimum, support on level blocks or racks spaced not more than 10 feet apart and not more than 2 feet from the ends. Storage of sheet piling should also facilitate required inspection activities and prevent damage to coatings and corrosion protection prior to installation.

Lift piles to ensure that the maximum permissible curvature is not exceeded. Holes may be burned above the cutoff length for lifting piles into the leads. If there is evidence of pile damage during driving due to the holes, the Contracting Officer may forbid the burning of holes. Do not damage piles when dragging piles across the ground or barge deck.

Inspect piles for excessive curvature and for damage before transporting them from the storage area to the driving area and immediately prior to placement in the driving leads. Curvature in the pile must be measured with the pile laying on a flat surface and is the distance between the pile

at the mid-length of the pile and the flat surface. Piles having excessive curvature will be rejected.

## PART 2 - PRODUCTS

### 2.1 STEEL SECTIONS

A. Steel Sheet Pile

1. Sections shall be as indicated on the Contract Drawings. Steel grade shall be in compliance with ASTM A572 Grade 60 steel. Pile length as shown on the Drawings.
2. Subject to review of the Engineer, the Contractor may substitute higher section modulus piles at its option to facilitate driving at no additional cost to the Owner.
3. Steel sheet pile sections shall be shop fabricated by "hot-rolled" process. Steel sheet piles (referred to as "singles") shall be shop fabricated from a single piece of stock which is formed into the completed unit by the hot rolling process. "Singles" may be shop assembled (into units referred to as "doubles") after coating and prior to shipping to the site.

B. Welding - Special Conditions

1. Welding will be permitted only where specially fabricated pieces are required as shown on the Drawings, where field welds are scheduled, or where acceptable to the Engineer.
2. Welding shall conform to AWS D1.1 – Steel. Electrodes shall be in accordance with AWS A5.1 or A5.5.

### 2.2 PROTECTIVE COATING

Unless specifically noted on the Drawings, all steel piles shall be shop coated on both sides to a minimum of 10 feet below the design dredge depth elevation.

### 2.3 STEEL PILE PREPARATION

All holes are to be made in the piling prior to applying the epoxy coating except for holes to accommodate pipe sleeves for outlets and ground anchors. Field cut holes shall be carefully performed at the required locations in such a manner as to minimize damage to the coating. On completion of the welding of pipe sleeves, all damage to the coating is to be made good in accordance with these Specifications and to the satisfaction of the Engineer.

## PART 3 - EXECUTION

### 3.1 EQUIPMENT

A. Drive the piles with air, diesel, or vibratory hammers with sufficient energy and energy transfer characteristics to drive the piles to the required toe levels without crippling pile heads.

B. Piles are to be located by temporary frames. The frames shall be rigidly located such as to keep the piles plumb and to line while being driven. Piles may be continuously or incrementally driven or driven singly or in pairs, as required to maintain the line and level of the completed bulkhead.

C. Take precautions to avoid contact of coated pile surfaces with components of leads and/or falsework. Install timber rub strips or similar items at contact areas as may be required to reduce the potential for damage of the coating during driving. All damage to the protective coating shall be repaired at the Contractor's expense.

D. Use suitable cushions or driving heads to avoid damage to the piles, developing proper total driving energy, and directing the energy along the longitudinal center of gravity of the pile.

1. Drive sheet piles to their full penetration without bending, rupturing, or severely damaging the sheet piles.
2. If failure in any of the above respects is encountered, pull the sheet pile, and drive a new pile at no additional cost to the Owner.

### 3.2 PILE DRIVING

A. Drive the piles straight and true at indicated locations, with deviation from the longitudinal axis of not more than 1/4-inch per foot.

B. Provide the Engineer with a complete driving log with date of final installation and tip elevation. This log shall be submitted weekly and signed by a representative of the Contractor.

C. Plug all “lifting eye” holes in steel sheet piling per details on the Drawings.

D. Jetting of steel sheet piles will not be permitted.

E. Provide temporary wales, templates, [master pilings] [current deflectors] or guide structures to ensure that the pilings are placed and driven to the correct alignment. Use a system of structural framing sufficiently rigid to resist lateral and driving forces and to adequately support the sheet piling until design tip elevation is achieved. Use two templates, at least, when placing each piling at third points, not less than 20 feet apart. Templates must not move when supporting sheet piling. Fit templates with wood blocking to bear against the web of each alternate sheet pile and hold the sheet pile at the design location alignment. Provide outer template straps or other restraints as

necessary to prevent the sheets from warping or wandering from the alignment. Mark template for the location of the leading edge of each alternate sheet pile. If in view, also mark the second level to assure that the piles are vertical and in position. If two guide marks cannot be seen, other means must be used to keep the sheet pile vertical along its leading edge.

F. If obstructions restrict driving a piling to the specified penetration, the obstructions must be removed or penetrated with a chisel beam. If the Contractor demonstrates that removal or penetration is impractical, make changes in the design alignment of the piling structure as directed to ensure the adequacy and stability of the structure. Pilings must be driven to depths shown and must extend up to the elevation indicated for the top of pilings. Piling driven to rock must be seated individually on the rock. A tolerance of 12 inches above the indicated top elevation will be permitted. Pilings must not be driven within 100 feet of concrete less than 7 days old.

G. Submit records of the completed sheet piling driving operations, including a system of identification which shows the disposition of approved piling in the work, driving equipment performance data, piling penetration rate data, piling dimensions and top and bottom elevations of installed piling. Drive pilings with the proper size hammer and by approved methods so as not to subject the pilings to damage and to ensure proper interlocking throughout their lengths.

END OF SECTION

# SECTION 31 50 00

# EXCAVATION SUPPORT AND PROTECTION (UPLAND UTILITIES)

## PART 1 - GENERAL

### 1.1 GENERAL PROVISIONS

A. Attention is directed to the Contract and General Conditions and all Sections within Division 01 - General Requirements which are hereby made a part of this Section of the Specifications.

### 1.2 DESCRIPTION OF WORK

A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.

1. Delegated Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified Professional Engineer, using performance requirements and design criteria indicated.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
4. Monitor vibrations, settlements, and movements.

B. Related Work: The following items are not included in this Section and are specified under the designated Sections:

1. Section 02 11 00 – Clearing and Grubbing
2. Section 02 11 05 – Site Clearing
3. Section 02 11 10 – Excavation and Handling of Contaminated Material
4. Section 02 20 00 – Earthwork
5. Section 31 23 19 – Dewatering

### 1.3 SUBMITTALS

A. Delegated-Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified Professional Engineer responsible for their preparation.

B. Qualification Data: For qualified Professional Engineer.

C. Other Informational Submittals:

1. Photographs or Videotape: Show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by the absence of, the installation of, or the performance of excavation support and protection systems. Submit before Work begins.
2. Record Drawings: Identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions.
   a. Note locations and capping depth of wells and well points.

## 1.4 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project Site.

1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:
   a. Geotechnical report.
   b. Existing utilities and subsurface conditions.
   c. Proposed excavations.
   d. Proposed equipment.
   e. Monitoring of excavation support and protection system.
   f. Working area location and stability.
   g. Coordination with waterproofing.
   h. Abandonment or removal of excavation support and protection system.

## 1.5 PROJECT DESCRIPTION

A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Notify Owner no fewer than 2 days in advance of proposed interruption of utility.
2. Do not proceed with interruption of utility without Owner's written permission.

B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of Geotechnical Engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by Geotechnical Engineer. The Owner will not be responsible for interpretations or conclusions drawn from the data.

1. Make additional test borings and conduct other exploratory operations necessary for excavation support and protection.
2. The geotechnical report is included elsewhere in the Project Manual.

C. Survey Work: Engage a qualified Land Surveyor or Professional Engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During installation of excavation support and protection systems, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Owner's Representative if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Structural Steel: ASTM A36/A36M, ASTM A690/A690M, or ASTM A992/A992M.

C. Steel Sheet Piling: ASTM A328/A328M, ASTM A572/A572M, or ASTM A690/A690M; with continuous interlocks.

D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of 4 inches.

E. Shotcrete: Comply with Division 03 Section "Shotcrete" for shotcrete materials and mixes, reinforcement, and shotcrete application.

F. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.

G. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

H. Tiebacks: Steel bars, ASTM A722/A722M.

I. Tiebacks: Steel strand, ASTM A416/A416M.

## PART 3 - EXECUTION

### 3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.

1. Shore, support, and protect utilities encountered.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.

D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.

E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

## 3.2 SOLDIER PILES AND LAGGING

A. Install steel soldier piles before starting excavation. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

B. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. Fill voids behind lagging with soil, and compact.

C. Install wales horizontally at locations indicated on Drawings and secure to soldier piles.

## 3.3 SHEET PILING

A. Retain this article if driven sheet piling is required.

B. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Accurately place the piling, using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 60 inches. Accurately align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment. Cut tops of sheet piling to uniform elevation at top of excavation.

## 3.4 TIEBACKS

A. Most tieback systems are proprietary. Insert material requirements in Part 2 if a particular tieback is required. If tiebacks are permanent, consider level of corrosion protection of tendons and anchorage connections.

B. Tiebacks: Drill, install, grout, and tension tiebacks. Test load-carrying capacity of each tieback and replace and retest deficient tiebacks.

1. Test loading shall be observed by a qualified Professional Engineer responsible for design of excavation support and protection system.
2. Maintain tiebacks in place until permanent construction is able to withstand lateral soil and hydrostatic pressures.

## 3.5 BRACING

A. Bracing of wales may be required for soldier piles and lagging systems and for sheet piling.

B. Bracing: Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.

1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Engineer.
2. Install internal bracing, if required, to prevent spreading or distortion of braced frames.
3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

## 3.6 REMOVAL AND REPAIRS

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlaying construction and abandon remainder.
2. Fill voids immediately with approved backfill compacted to density.
3. Repair or replace, as approved by Engineer, adjacent work damaged or displaced by removing excavation support and protection systems.

END OF SECTION

# SECTION 31 62 16.13

# STEEL PIPE PILES

## PART 1 - GENERAL

### 1.1 DESCRIPTION OF WORK

Work included: The work covered by this section of these Specifications consists of furnishing all plant, labor, supervision, equipment, appliances, and materials and in performing all operations in connection with the installation of the steel pipe piles, all in strict accordance with this Section of the Specifications and the applicable Drawings and subject to the terms and conditions of the Contract. The Work includes providing Wave Equation Analyses for each proposed pile hammer and pile type.

### 1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled work men and women who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

B. The Owner reserves the right of approval of any Subcontractor pre-qualified and selected for this portion of the Work by the Contractor. Approval will be based, in part, on documented successful experience in performing work of a similar nature.

C. Driving of additional piles at the Contractor's own expense may be required by the Owner in the event installation tolerances are exceeded.

D. The Owner may perform shop inspections during the fabrication of the steel piles. The Contractor shall provide necessary detail on their project schedule and keep the Owner informed as to progress of this work (minimum of one week notice).

### 1.3 SUBMITTALS

A. Submit technical data for all pile driving equipment proposed for use and a Wave Equation Analysis for the proposed pile and driving equipment. The Wave Equation shall be used to assess the ability of the proposed driving system to install the pile within the allowable driving stresses.

B. No later than the time of delivery of materials to the site, submit steel certificates for review.

C. Submit pile driving log for each pile driven with recorded blows per inch for the last 1 foot of driving and blows per foot for the remainder of the driven length. Log should indicate all pertinent data related to the pile driving activity.

D. Submit details for shop splices in piles, if used.

E. Provide a minimum of 5 days' notice to the Owner prior to driving any piles. Notify the Owner of any changes in the schedule.

1.4 PRODUCT DELIVERY AND STORAGE

The Contractor shall notify the Owner 24 hours in advance of delivery of steel piles. Contractor guarantees that steel piles shall be handled in such a manner as to not induce stresses which will damage the materials and shall be stored in a safe manner within designated areas provided at the site.

PART 2 - PRODUCTS

2.1 STEEL SECTIONS

A. Steel Pipe Pile:

The steel pipe pile size and material shall be as specified on the Contract Drawings or equivalent as accepted by the Owner. Steel material shall be ASTM A252, Grade 3 with a minimum $F_y$ = 50 ksi. Pile length shall be as shown on the Contract Drawings.

Pipe piles shall have a minimum wall thickness as noted on the Drawings.

The tips of pipe piles shall be fitted with open-end cutting shoes, Part Number 0-14000, as manufactured by Associated Pile and Fitting, LLC or equivalent accepted by the Owner, unless noted otherwise.

B. Welding shall conform to AWS D1.1 Structural Welding Code – Steel.

C. Protective Coating

Pipe piles shall be shop coated, on outer surfaces only, to a minimum of 10 feet below the design dredge depth elevation, unless indicated otherwise. Protective coating shall conform to Section 09 97 13, Coating of Steel Waterfront Structures.

2.2 SPLICES

A. Submit detail drawings of shop and field splices prior to fabrication.

B. Perform all welding in accordance with the requirements for shield metal arc welding of AWS D1.1. Submit welding procedure for shop splices and verification of welder certification and qualifications. Make no more than one field splice per 60 feet of pile, unless directed by the Engineer. Fabrication drawings must show all shop splices.

C. Splice sections of pipe with an approved full penetration butt or single bevel-groove weld. Both pipe ends must be square cut and seated to bear. Use an approved jig or alignment device during welding to maintain the required straightness of pipe.

D. Field splices must be minimized or eliminated if possible. No splices will be allowed in the top 25 feet of pile to eliminate coating vulnerability. For splices made during pile installation, rigid frame pile leads may be used as a jig in a manner approved by the Engineer.

## PART 3 - EXECUTION

### 3.1 EQUIPMENT

A. Drive piles with an air, diesel, or hydraulic operated impact hammer with sufficient energy and energy transfer characteristics to drive the piles to the required toe elevations and capacity without damaging the pile head. Use care not to injure piles by over driving as would be indicated by rebound of hammer or staggering of pile. Cut off heads of piles accurately in accordance with the Contract Documents after completion of driving.

B. Rig the pile driver with fixed leads to guide the hammer from highest to lowest points of travel in a manner permitting free vertical movements of the hammer, and with leads laterally braced to assure firm support of the piles during driving.

C. The pile is to be located by temporary frames containing members of adequate size to guide and stabilize placement of the pile prior to and during driving. The frames shall be rigidly located such as to keep the pile plumb and in correct position while being driven.

### 3.2 PILE DRIVING

A. Drive the piles straight and true at indicated locations, with deviation from the longitudinal axis of not more than 1/4 inch per foot.

B. Locate the piles within 3 inches of the positions indicated on the Drawings.

C. Continuously drive each pile to reach the capacity and/or full embedded length called for on the Drawings.

1. Lengths shown on the Drawings are considered average values, and the actual lengths may vary when so accepted by the Owner.
2. Drive piles to achieve driving resistance penetration and refusal values as specified and as accepted by the Owner.

D. Use suitable cushions or driving heads to avoid damage to the piles, develop proper total driving energy, and direct the energy along the longitudinal center of gravity of the pile.

1. Drive piles to their full penetration without bending, rupturing, or severely damaging the piles.
2. If failure in any of the above respects is encountered, pull the pile, and drive a new pile at no additional cost to the Owner.

3. If a replacement pile fails to develop full driving resistance, pull the replacement pile, and drive a new pile with larger diameter at no additional cost to the Owner.

E. Jetting and Pre-drilling

1. Jetting to assist penetration will not be accepted unless accepted by the Owner and Engineer.
2. Approved pre-drilling to assist penetration may be used where extreme driving resistance is encountered, or where vibrations from driving may be detrimental to adjacent structures.
3. Make pre-drilled bores 80% of tip diameter and to 80% of the depth of penetration, reserving the lower phases of penetration solely for driving.

F. Where piles are pushed up by pressure from driving of adjacent piles, re-drive as required and at no additional cost to the Owner.

G. Record pile driving information, including date of installation, pile number, pile type and installed length, type of hammer and rated energy, date of installation, blow counts or minutes per driven foot/inch, and final tip elevation.

## 3.3 HANDLING, CUTTING AND FRAMING

Handle piles carefully, without sudden dropping or excessive bending.

## 3.4 LENGTH AND LOAD REQUIREMENTS

Required tip elevations and/or minimum ultimate load capacities are as indicated on the Drawings.

## 3.5 OBSTRUCTIONS

If a pile encounters an underground obstruction within 5 feet of the ground surface of such size as to prevent driving the pile to the required driving criteria, the pile must be pulled or cut off at no cost to the Client. If such an obstruction is encountered more than 5 feet below the ground surface, the pile must be cut off and paid for as if a completed pile. In either event, a replacement pile must be installed at a location indicated by the Engineer and paid for as completed pile.

## 3.6 FIELD SPLICES

A. Field splices shall be performed only when accepted by Engineer.

B. All field splices shall be visually inspected and tested.

C. The Contractor shall engage an independent testing agency to observe the production piles installation. The testing agency must be qualified according to ASTM E329 for testing indicated. Submit testing agency qualifications to the Engineer for review and acceptance.

D. The Contractor shall employ a testing agency to perform the welding inspections as required by Code.

E. In addition to visual inspection, 100% of the welds must be tested and inspected according to AWS D1.1 and inspection procedures listed below:

1. Magnetic Particle Inspection
2. Ultrasonic Inspection

END OF SECTION

# SECTION 31 63 19

# ROCK SOCKETS FOR PILES

## PART 1 - GENERAL

### 1.1 DESCRIPTION OF WORK

Work included: The work covered by this section of these Specifications consists of furnishing all plant, labor, supervision, equipment, appliances, and materials and in performing all operations in connection with the installation of the rock sockets for piles, all in strict accordance with this Section of the Specifications and the applicable Drawings and subject to the terms and conditions of the Contract. This work includes installing casings, drilling/excavating the rock socket shaft, cleaning out the rock socket pile excavation, disposing of all excavated material, verification of the excavation, steel pile placement, and grout placement in rock socket around pile for the socketed platform piles, the socketed combination wall king piles, and the socketed piles adjacent to the outfall.

### 1.2 DEFINITIONS

A. Casing: A steel shell used to construct the drilled shaft. The casing can help advance the hole and support the sides of the hole. Casings shall be ample strength to withstand handling and installation induced stresses. The outside diameter (O.D.) of the casings shall not be less than the specified size of socket. Casing can be permanent, interim or temporary. Permanent casings shall only be used upon approval by the Engineer.

B. Obstruction: Obstructions may include man-made and/or man-placed materials and natural materials, such as boulders, that require the use of special procedures and/or tools by the Contractor when the hole cannot be advanced using conventional augers, drilling buckets, and/or under-reaming tools or reverse circulation drilling (if this is used as the primary drilling method). Such special procedures/tools may include but are not limited to chisels, boulder breakers, core barrels, air tools, hand excavation, temporary casing, and increasing hole diameter. Surface and subsurface obstructions at drilled shaft locations shall be removed by the Contractor. Drilling tools that are lost in the excavation shall not be considered obstructions and shall be promptly removed by the Contractor without compensation. Surface rip rap and boulders encountered within 5 feet of ground surface shall not be considered an obstruction and shall be removed at the expense of the Contractor. Decomposed rock and/or weathered bedrock shall not be considered an obstruction. When suspected obstructions are encountered, the Contractor shall notify the Engineer and recommend a course of action to advance the drill hole in an expedient manner. The Engineer shall determine if an obstruction has been encountered.

C. Bedrock: Material underlying soil or other unconsolidated surficial materials in which refusal is consistently encountered. Bedrock is identified in the geotechnical boring logs provided within the Contract Documents. Bedrock may also be defined at the shaft installation site by the Engineer.

D. Weathered Rock: Fragments and particles created when rock breaks down through physical and chemical processes derived from lithified, undisturbed, natural bedrock, which are generally able to be sampled with a split-spoon.

E. Sound Rock: Hard, unbroken, and free of significant weathering or alteration. Any loose, fragmented, or weathered rock shall be considered unsuitable and will require additional drilling depth. The baseline for the sound rock determination shall be by the use of the geotechnical borings and rock cores provided with the Contract Documents, where the Rock Quality Designation (RQD) is 50% or greater.

F. Seat: The act of placing the tip of a casing or pile in intimate contact on rock for its entire circumference.

G. Top of Socket: The highest location of the rock socket that is capable of resisting axial and lateral design loads. At any given location, the top of socket elevation shall be at or below the top of sound rock elevation.

## 1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled work men and women who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this specification.

B. Rock Socket Construction Personnel

Rock socket construction personnel must be experienced in this type of work. Experience shall be relevant to anticipated subsurface materials, water conditions, socket size, and special construction techniques required. Prior to the Preconstruction Conference, the Contractor shall submit the following information to verify the firm's experience and the qualifications of personnel scheduled to perform the rock socket construction:

1. Submit a list of at least 3 projects successfully completed in the last 5 years, which used rock socket construction. Include a brief description and reference for each project listed.
2. Provide the names and detail the experience of the on-site supervisors and drill operators for the Project. On-site supervisors shall have at least 2 years of experience in rock socket construction, and drill operators shall have at least 1 year of experience.
3. A signed statement that the Contractor has inspected both the project site and all the subsurface information made available in the contract documents. Work on any rock sockets shall not begin until the qualifications have been approved. The Engineer may suspend the rock socket construction if the Contractor substitutes unapproved personnel during construction. Requests for substitution of field personnel shall be submitted to the Engineer for approval. Additional costs resulting from the suspension of work will be the Contractor's responsibility, and

no extension in contract completion date resulting from the suspension of work will be allowed.

4. The Contractor shall have on site during all rock socket construction activity a minimum of one certified Field Inspector. The Field Inspector will be responsible for quality control (QC) of the rock socket during all phases of construction and will monitor and document all QC inspection and testing activities required by the specifications and outlined in the Contractor's Rock Socket Installation Plan.

C. Contractor's Independent Inspection Agency

The Contractor shall retain, at their own expense, the services of a qualified independent inspection agency, licensed in the Commonwealth of Massachusetts, to provide inspection services during the installation of rock sockets for piles. The inspection agency shall be experienced in installation of drilled rock sockets. It shall be involved in at least 3 different projects in the last 5 years which used rock socket construction and have experience in recommending, testing, and specifying drilled foundations for similar subsurface conditions. This firm shall also provide consultation services to the Contractor if problems are encountered during the execution of the Work. The inspection agency shall be primarily concerned with the testing and construction methods which will result in finished foundation piling of the required quality and strength. The agency shall also be concerned with preventing settlement and/or damage to surrounding structures, roads, utilities, embankments, etc., both within the property lines and on adjoining properties during the construction.

D. The Owner reserves the right of approval of any subcontractor pre-qualified and selected for this portion of the Work by the Contractor. Approval will be based, in part, on documented successful experience in performing work of a similar nature.

1.4 SUBMITTALS

A. Contractor Qualifications

Submit Contractor qualifications for foundation system, proving its engagement in the successful installation of similar rock socketed pile foundations for at least 5 years.

B. Rock Socket Installation Plan, Sequencing and Equipment

The Contractor shall submit an installation plan and equipment to Engineer for review and approval at least 30 days prior to the anticipated date of beginning the rock socket work. The submittal shall include, but not be limited to, the following information:

1. List proposed equipment with manufacturer's specification and catalog data including cranes, drill rigs, drilling tools, augers, bailing buckets, casing oscillators, casing twisters, vibratory hammers, final cleaning equipment, desanding equipment, slurry pumps, core sampling equipment, tremies or concrete pumps, casing (including casing dimensions, materials and splice details) etc. based on the Contractor's understanding of the site subsurface conditions.

2. The sequence of rock socket construction as it relates to the overall construction plan and sequence of rock socket construction in bents or groups.
3. Proposed method for drilling the rock socket. Include a description of how the Contractor will achieve the design bottom of rock socket elevation. Include details of methods used for sloping bedrock and methods of removing any obstructions such as boulder or foundations.
4. Proposed method for cleaning out the rock socket pile excavation. Include a description of how the Contractor will perform spoil removal and disposal and checking the cleanliness and soundness of the rock socket sidewalls and bearing surface.
5. Method of monitoring plumbness and location of the rock socket during construction and protection during pile installation.
6. Methods for steel pile placement in the borehole, including bracing, centering and lifting methods. Include details for ensuring the steel pipe pile position is maintained during construction.
7. Details and methods of grout placement, including proposed operational procedures for pumping and/or tremie methods and methods of curing and protecting the grout.
8. Detailed procedures for temporary casing installation and removal, including casing dimensions.
9. The Contractor shall provide any additional information and submit a revised plan, if requested, for review and approval. All procedural approvals given by the Engineer will be subject to trial in the field and will not relieve the Contractor of the responsibility to satisfactorily complete the work. The Contractor shall submit requests for modification of adopted procedures to the Engineer.

C. Shop Drawings

All portions of proposed construction shall be described on shop drawings and submitted to the Engineer for approval. No work shall commence prior to receiving the written approval of the proposed methods and equipment by the Engineer. This approval shall be considered in no way as relieving the Contractor of the responsibility to satisfactorily complete the work in accordance with the Contract Documents.

D. Product Data for grout

E. Inspection agency qualifications.

F. Inspection Reports for rock sockets by independent inspection agency

G. Test Reports for grout compressive strength

H. Rock Socket Installation Plan Records including drilled shaft diameters and top and bottom of shaft elevations, grout strength, grout volume, quantity of rock excavation, excavation condition, dates of excavation and grout placement, bearing strata description, and subsurface water conditions.

I. Survey of Rock Socket Locations

Submit a certified survey of installed rock socket locations including top and bottom locations of socketed piles to confirm installation tolerances.

J. Wave Equation Analysis for Pilings (WEAP) reports, if required

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Grout shall be non-shrink cementitious underwater high-strength grout conforming to ASTM C827 and shall have a minimum 28-day compressive strength of 5,000 psi, as manufactured by Five Star Products, Inc. or equal.

## PART 3 - EXECUTION

### 3.1 PREPARATION:

A. Protect existing structures including but not limited to existing cells, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, vibration, and other hazards that may be created by rock socket installation.

B. Preventative measures shall include, but are not limited to, selecting construction methods and procedures that will prevent caving of the rock socket excavation, monitoring and controlling the vibrations from construction activities such as the driving of casing or drilling of the socket.

### 3.2 INSTALLATION:

A. Construction Criteria

Provide equipment for checking the dimensions and alignment of each rock socket shaft excavation. Determine dimensions and alignment jointly with the Contractor and inspection agency. Measure final rock socket depths with appropriate weighted tape measure or other approved method after cleaning.

Tolerances:

1. Maximum variation of the center of any rock socket from the required location shall be 3 inches, measured at the ground surface.
2. Maximum variation from plumb shall not exceed 1/4 inch per foot.
3. Bottom diameter shall not vary more than 6 inches, in any direction.

B. General

1. Drilled sockets shall consist of rock socket excavation, cleaning out the rock socket excavation, verification, steel pile placement, and grout in place against in-situ sound rock.

C. Rock Socket Excavation

1. Accomplish excavation of rock socket by standard excavation methods including, but not limited to, conventional augers fitted with soil and/or rock teeth, or under-reaming tools attached to drilling equipment of adequate size, power, torque, and down thrust necessary for the work.
2. The Contractor shall use excavation techniques that are technically adequate and cost effective to meet the geologic conditions encountered at the site.
3. Excavation for drilled sockets shall be made so that the sidewalls of the hole are stable at all times.
4. Drilled sockets shall be excavated to the dimensions and depths shown to achieve minimum socket depth into sound bedrock.

D. Clean Out

1. Appropriate means, such as a cleanout bucket or air lift, shall be employed to clean the bottom of the drilled socket excavations. No more than 1 inch of loose or disturbed material will be allowed at the bottom of the excavation. Socket cleanliness shall be determined by a qualified inspection agency.
2. Materials removed from the socket excavation shall be disposed of according to the applicable federal, state, and local regulations and shall not be discharged into any waterway or storm water drainage system.

E. Verification

1. The drilled socket dimensions and alignment shall be verified with approved methods. Final socket depths shall be measured with a suitable weighted tape and confirmed by diver inspection or other approved method after final cleaning. The drilled socket excavation may be extended if the Engineer determines that the subsurface materials encountered are not capable of providing the required bearing capacity or differ from those anticipated in the design of the drilled socket. If caving occurs during any of the installation process, the construction operation shall be stopped, the Engineer shall be notified, and the socket excavation shall be stabilized by approved methods.
2. Inspection reports of drilled rock sockets shall be submitted to the Engineer for review and acceptance prior to pile and grout placement.

F. Pile Placement

1. Lower steel pile into the hole in such a manner as to prevent damage to the walls of the excavation.

2. Seat that pile tip to ensure the tip of the pile is in intimate contact on the rock for its entire circumference.
3. Check pile for both horizontal position top and bottom.
4. Brace and secure the pile such that it will not shift from the surveyed position during placement of the grout.

G. Grout Placement

1. All grout shall be placed by either tremie or pump. Place grout in a continuous operation and without segregation into excavation from bottom of the socket to the top of the socket, using methods that will displace all water.
2. The free-fall placement of grout is not permitted for rock sockets.

## 3.3 CONSTRUCTION QUALITY CONTROL

A. The Contractor shall maintain a construction log during rock socket installation and grouting. This record shall be available for the Engineer's inspection. The log shall contain for each socket the following information:

1. Socket number, date and time of installation.
2. Description and approximate top of rock elevation,
3. Depth of socket into rock/final tip elevation.
4. Quantity, type of obstruction material, and drilling rate.
5. Quantity of rock excavation.
6. Diameter of each as-built drilled rock socket diameter.
7. Plumbness of pile and deviation each drilled rock socket location.
8. Time, method, and duration of placement of grout.
9. A chart showing quantity of grout placed versus depth or elevation of top of grout in socket during placement.
10. Other pertinent data relative to the installation.

B. Rock Socket Location

1. Rock sockets shall be positioned by the use of approved falsework, of sufficient stability, to assure that the falsework will not move during the drilling operations. The design of the falsework shall be submitted to the engineer 2 weeks in advance of the commencement of fabrication. Field positioning of the falsework shall be located by the Contractor using appropriate survey methods to assure accurate positioning of the drilling and casing apparatus. The Contractor shall be responsible for all drilled rock socket locations.

C. Rock Socket Inspection

1. The Contractor shall engage an independent inspection agency to perform rock socket cleanliness, dimension, and alignment verification. Inspection reports shall be submitted to the Engineer for review and acceptance prior to pile and grout placement.

2. After drilling is complete, a check of the bearing surface by sounding and diving inspection shall be made. The bottom of the socket shall be measured and sounded with a steel rod (AW) and/or weighted tape. Unless otherwise stated in the plans, no more than 1 inch of loose or disturbed material will be allowed at the bottom of the excavation.

D. Pile Placement Verification

1. Prior to grout placement, the pile shall be checked for both horizontal position top and bottom using an electronic bore hole logging device.

E. If temporary casing is required for rock socket installation, Contractor shall determine from a WEAP, the hammer energy required to accomplish the pipe casing bearing on rock. The WEAP is to be completed by the Contractor's Geotechnical Consultant for each steel casing location where different subsurface conditions exist. All WEAP analyses shall be submitted to the Engineer for review prior to commencement of work.

## 3.4 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. Grout Compressive Strength Tests

1. ASTM C109; make a minimum of two mold sets for each sample. Each mold set shall contain three 2-inch by 2-inch grout cubes. Test one set of three cubes at 7 days and one set of three cubes at 28 days.

B. Test results shall be reported to the Engineer and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of placement, name of testing and inspection agency, location of grout batch in Work, design compressive strength at 28 days, compressive breaking strength and type of break for both 7- and 28-day tests.

END OF SECTION

# SECTION 31 68 13

# SOIL AND ROCK ANCHORS

## PART 1 - GENERAL

### 1.1 DESCRIPTION OF WORK

Work included: The work covered by this section of these Specifications consists of furnishing all plant, labor, supervision, equipment, appliances, and materials and performing all operations in connection with the installation of the soil and/or rock anchors, all in strict accordance with this Section of the Specifications and the applicable Drawings and subject to the terms and conditions of the Contract. The Contractor is responsible for furnishing all design, materials, products, accessories, tools, equipment, services, transportation, labor, supervision, and manufacturing techniques required for design. The Contractor shall select the soil/rock anchor type, size, and installation means and methods, estimate the ground-grout bond value, and determine the required bond length and final soil/rock anchor diameter. The Contractor shall design and install soil/rock anchors that will develop the load capacities indicated on the Contract Documents. The soil/rock anchor load capacities shall be confirmed by verification and performance/proof load testing as required and must meet the test acceptance criteria specified herein.

A. Providing the design of the soil/rock anchor system will be completely the Contractor's responsibility. General design criteria are shown on the Drawings. The materials, design, stressing, load testing, and acceptance must be in accordance with PTI Recommendations for Prestressed Rock and Soil Anchors, and these specifications.

    1. Soil/Rock anchors may be threaded bar or strand type. The Contractor is responsible for the design of the anchor and bearing plate, determining drilling methods, and determining hole diameter and bond length. Submit design computations and data for the soil/rock anchors, bearing plates, and bond zones.
    2. Include computations with drawings, design assumptions, calculations, and other information in sufficient detail to verify the design proposed. The design must be certified by a registered professional engineer with proven experience in design of soil/rock anchor calculations for the stressing frames.
    3. Acceptance of the design calculations by the Engineer will not relieve the Contractor of responsibility for unsatisfactory performance of the installed soil/rock anchors. Furnish all design computations at least 30 calendar days prior to the proposed commencement of drilling. The complete design, including design computations, fabrication and installation drawings and installation plan, must be certified by registered Professional Engineer and must be submitted for approval.
    4. Submit a plan for installing the soil/rock anchors for review and comment. The proposal must describe the sequence for installation and other restrictions as outlined on the drawings or specified. Determine the anchor installation procedure as part of the anchor design. Include the installation plan with descriptions of methods and equipment to be used for alignment checking of anchor holes.

B. Design Load

The Design Load must not exceed 60 percent of the ultimate strength of the prestressing steel. The Lock Off Load must not exceed 70 percent of the ultimate strength of the prestressing steel. The maximum Test Load must not exceed 80 percent of the ultimate strength of the prestressing steel. The designer should include consideration of group effect of closely spaced anchors when determining design load and minimum spacing. Design the bearing plates so that the bending stresses in the plate do not exceed the yield strength of the steel when a load equal to 95 percent of the minimum specified ultimate tensile strength of the prestressing steel is applied and so that the average bearing stress on the structure does not exceed 3500 psi.

C. Design Schedule

Submit a design schedule for the anchors which includes the following:

1. Anchor number.
2. Anchor design load.
3. Type and size of tendon.
4. Minimum total anchor length.
5. Minimum bond length.
6. Minimum tendon bond length.
7. Minimum unbonded length.
8. Details of corrosion protection, including details of anchorage and installation.
9. Submit the design schedule at least 30 days prior to commencement of work on the anchors covered by the schedule.

## 1.2 SITE CONDITIONS

A geotechnical investigation has been conducted at the site and data is presented on the geotechnical exploration drawings. While the geotechnical information is representative of subsurface conditions at the respective locations, local variations in the characteristics of the subsurface materials may be anticipated. Local variations which may be encountered include, but are not limited to, classification and thickness of rock strata, fractures, and other discontinuities in the rock structure, and variation in the soil classifications. Such variations will not be considered as differing materially within the purview of the contract clauses. The Contractor is responsible for verifying the location of all utilities that may be affected by construction or the installation of the anchors.

## 1.3 SUBMITTALS

A. The Contractor shall submit the following in compliance with Section 01 25 13, Submittals and Substitutions.

1. Fabricator Qualifications
2. Installer Qualifications
3. Fabrication and Installation Shop Drawings
4. Equipment Data

5. Designer Qualifications
6. Installation Plan
7. Design Computations
8. Anchor Design
9. Design Schedule
10. Prestressing Steel Test Reports
11. Cement Grout Mixture Proportions
12. Prestressing Steel Certificates
13. Cement Certificate
14. Bearing Plates Certificate
15. Corrosion Inhibiting Compound Certificate
16. Driller Logs
17. Anchor Records

## 1.4 DELIVERY, STORAGE, AND HANDLING

Materials must be suitable wrapped, packaged, or covered at the factory or shop to prevent being affected by dirt, water, oil, grease, and rust. Protect materials against abrasion or damage during shipment and handling. Place materials stored at the site above ground on a well-supported platform and covered with plastic or other approved material. Protect material from adjacent construction operations. Grounding of welding leads to prestressing steel will not be permitted. Reject and remove from the site prestressing steel, which is damaged by abrasion, cuts, nicks, heavy corrosions, pitting, excessive heat, welds, or weld splatter. Inspect tendons prior to insertion into anchor holes for damage to corrosion protection. Repair any such damage in a manner recommended by the tendon manufacturer and approved by the Engineer. Lifting of pre-grouted tendons must be to manufacturer's recommendations and not cause excessive bending, which can debond the prestressing steel from the surrounding grout.

# PART 2 - PRODUCTS

## 2.1 MATERIALS

A. Prestressing Steel

Submit certified test reports for each heat or lot of prestressing steel with materials delivered to the site. Submit mill reports and certificates from the manufacturer stating chemical properties, ultimate strengths, yield strengths, modulus of elasticity, and any other physical properties needed for the required computations for the steel type of steel furnished.

1. High Strength Steel Bars

   High strength steel bars shall be in compliance with ASTM A722.

2. Epoxy-Coated Steel Bars

Submit written certification for coating material and coated bars with the delivery of bars.

3. Steel Bar

Steel bars shall be in compliance with ASTM A722 Gr. 150.

4. Strand

Steel strand shall be in compliance with ASTM A416, Gr. 270, low relaxation strand.

## 2.2 MANUFACTURED UNITS

A. Anchor Head

Anchor head must consist of steel bearing plate with wedge plate and wedges for strand anchors or steel bearing plate with nut for bar anchors, trumpet, and corrosion protection.

Anchorage devices must be capable of developing 95 percent of the guaranteed ultimate strength of prestressing steel.

B. Prestressing Steel Couplers

Prestressing steel couplers for bars must be capable of developing 100 percent of the minimum specified ultimate tensile strength of the prestressing steel. Splicing of strand will not be permitted.

C. Centralizers and Spacers

Fabricate centralizers and spacers from plastic, steel, or other approved material which is non-detrimental to the prestressing steel.

D. Casing

Casings must be steel pipe or steel tube in compliance with ASTM A53 or ASTM A500. Casing must be the necessary type and size to permit proper drilling of anchor holes and placing of anchors as specified herein and shown on the drawings.

E. Anchorage Covers

Fabricate anchorage covers from steel or plastic. The material used must not be subject to attack by cement, corrosion-inhibiting greases, or the environment. If plastic is used, it must not be susceptible to ultraviolet light degradation. Securely attach the cover to the bearing plate. If the cover is to be grease filled, the cover must form a permanent watertight enclosure for the anchorage device.

## 2.3 GROUT

### A. Cement

Cement shall comply with ASTM C150 and be type II.

### B. Water

Provide fresh, clean, potable water free from injurious amounts of sewage, oil, acid, alkali, salts, or organic matter.

### C. Aggregates

Fine aggregates for sand-cement grout must conform to ASTM C33. Aggregates must not contain substances which may be deleteriously reactive with alkalis in the cement.

### D. Admixtures

Admixtures which control bleed, improve flowability, reduce water content and retard set may be used in the grout subject to the acceptance of the Engineer. Any admixture used must be compatible with the prestressing steel and must be mixed in accordance with the manufacturer's recommendations.

# PART 3 - EXECUTION

## 3.1 DRILLING HOLES

### A. General

Drill holes at the locations and inclinations shown and the depths and diameter determined by the Contractor to provide the design bond length and capacity indicated on the drawings. The locations of the holes may be changed only as approved by the Engineer. Any redesign of the anchored structure due to relocation of anchor holes must be performed by the Contractor and reviewed/accepted by the Engineer. Take care while drilling to avoid damage of any kind to the existing structures. Damages of any nature will be evaluated by the Engineer and repairs or replacements must be made as required.

### B. Drilling Through Existing Structure

Drill holes through existing structure by core drilling equipment to prevent damage to the surrounding structure. The contractor is advised that foreign material, including metals and other materials remaining from original construction of the existing structure, may be encountered during drilling through existing structures.

C. Drilling in Soil

Holes in soil may be drilled by rotary drilling, rotary percussive, or vibratory driven casing. Holes in soil must be provided with steel casing where required for support of the surrounding material.

D. Drilling in Rock

Holes in rock may be drilled by core drilling, rotary drilling, percussion drilling or down-the-hole hammer using equipment suitable for the intended purpose. The drilling method must not cause structural damage to existing structures.

## 3.2 INSTALLATION OF ANCHORS

A. General

The Contractor is responsible for each drilled hole until the anchor has been installed, grouted, stressed, and accepted. Holes in rock and casings must be cleaned by pressurized air and/or water to remove drill cuttings and mud.

B. Placing

All the equipment used in handling and placing the anchors must be such that it does not damage or deteriorate the prestressing steel, corrosion protection, or the anchorages. Each anchor must be inspected prior to insertion into the hole. Any damage to corrosion protection must be repaired prior to insertion or, if determined by the Engineer to be not repairable, the anchor must be replaced.

C. Grouting of Soil Anchors

Grout placement within the bond length must proceed such that the hole is filled in a manner to prevent air voids. The soil anchor hole must be progressively filled with grout and maintained completely full, from bottom to top of the bond zone, until the grout has set. Grouting of a soil anchor hole must be performed within 48 hours of the time the hole is drilled. Grouting may be accomplished through the casing pipe, grout tubes, hollow-stem augers or hollow drill rods.

D. Anchorage Installation

The bearing plate and anchor head must be installed perpendicular to the tendon, within 3 degrees, and centered on the tendon without bending of the stressing steel.

## 3.3 STRESSING

A. General Requirements

After the anchor grout has reached sufficient strength, as verified by grout cube break, the anchors must be stressed. Prior to stressing, surfaces upon which the stressing equipment is resting must be clean and the stressing equipment must be aligned as

nearly with the center of the hole as possible. An alignment load of 10 percent of the design load must be applied to the anchor prior to setting dial gauges. All stressing must be done in the presence of a representative of the Engineer.

B. Lock-off

After completing of all required tests, the load must be returned to the alignment load and the specified lock-off load must be applied to the anchor. A lift-off test must be made to verify the load in the anchor tendon before the tendon is locked-off and the stressing equipment is removed. The lift-off reading must be within five percent of the specified lock-off load. If the lift-off reading is not within 5 percent of the specified lock-off load, the anchorage will be reset, and another lift-off reading must be made. This procedure must be repeated until a satisfactory lift-off reading is obtained.

3.4 FIELD QUALITY CONTROL

A. Performance Test

Performance test must consist of cyclically and incrementally loading and unloading the anchor and must be conducted in accordance with PTI Recommendations for Prestressed Rock and Soil Anchors.

**Performance Test Steps**

| Load | Total Movement at load cycle Maximum | Residual Movement at AL after cycle Maximum | Elastic Movement at load cycle Maximum |
|---|---|---|---|
| AL<br>0.25 DL | dt1 | | dt1-dr1=de1 |
| AL<br>0.25 DL<br>0.5 DL | dt2 | dr1 | dt2-dr2=de2 |
| AL<br>0.25 DL<br>0.5 DL<br>0.75 DL | dt3 | dr2 | dt3-dr3=de3 |
| AL<br>0.25 DL<br>0.5 DL<br>0.75 DL<br>1.0 DL | dt4 | dr3 | dt4-dr4=de4 |
| AL<br>0.25 DL<br>0.5 DL<br>0.75 DL<br>1.0 DL<br>1.2 DL | dt5 | dr4 | dt5-dr5=de5 |

| Load | Total Movement at load cycle Maximum | Residual Movement at AL after cycle Maximum | Elastic Movement at load cycle Maximum |
|---|---|---|---|
| AL<br>0.25 DL<br>0.5 DL<br>0.75 DL<br>1.0 DL<br>1.2 DL<br>1.33 DL | dt6 test load<br>(zero reading for creep test)<br>dtn final load<br>Hold reading | dr5 | dt6-dr6=de6 |
| AL<br>Adjust to lock-off load | | dr6 | |

B. Proof Test

Proof test must consist of incrementally loading the anchor and must be conducted in accordance with PTI Recommendations for Prestressed Rock and Soil Anchors.

**Proof Test Steps**

| |
|---|
| AL |
| 0.25 DL |
| 0.5 DL |
| 0.75 DL |
| 1.0 DL |
| 1.2 DL |
| 1.33 DL (test load/10-minute hold) |
| AL (optional) |
| Adjust to lock-off load |

3.5 ACCEPTANCE

A. General

Acceptance of anchors must be determined by the Engineer. The following criteria will be used in determination of the acceptability of each anchor.

1. Creep

Creep movement must not exceed 0.04 inch at maximum test load during the first 10 minutes of the performance or proof test. If the creep movement exceeds this

limit, it must not exceed 0.08 inch at the maximum test load at the end of 60 minutes. If the creed movement exceeds 0.08 inch at the maximum test load at the end of 60 minutes, the anchor will be rejected.

END OF SECTION

# SECTION 32 31 13

# CHAIN LINK FENCES AND GATES

## PART 1 - GENERAL

### 1.1 SCOPE

The work of this section includes all labor; materials, tools and equipment necessary to furnish and install chain link fencing and gates as specified herein and as shown on the Contract Drawings.

### 1.2 SUBMITTALS

Brochures shall be submitted in accordance with the General Conditions, as supplemented, describing all materials to be used and naming the manufacturer of such materials.

Submit Manufacturer's samples of the chain link fence fabric in accordance with the General Conditions as supplemented.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. All posts, rails and couplings used in the construction of the fence shall conform to ASTM A120, Schedule 40 and shall be hot dipped galvanized steel conforming to the applicable requirements of ASTM A123 and of the nominal sizes and weights specified herein. The pipe sizes shall conform to the nominal sizes specified herein and shall be of sufficient length to extend 48 inches into concrete footings. All posts shall be equipped with tops to exclude moisture.

1. Entire chain link fence and gate system shall be vinyl coated galvanized steel. The color of the vinyl coating shall be black as selected from manufacturer's samples by the Owner’s Representative.
2. Fabric shall be No. 9 gauge, vinyl-coated galvanized steel wire, woven into a 2-inch mesh. Minimum weight of zinc coating shall be 0.30 per square foot. Minimum thickness of PVC coating shall be 0.006 inches and maximum shall be 0.010 inches. PVC coating shall be thermally fused and bonded to a primer, which is thermally cured onto galvanized steel wire. Minimum breaking strength shall be 1200 pounds. Top selvages shall be knuckled, and bottom selvages shall be barbed. Fabric shall be height shown on the drawings.
3. The chain link fabric shall be securely fastened to all terminal posts using 3/16 inch x 3/4 inch tension bars and heavy II -gauge tension bands. One band shall be furnished for each foot in the height of fence. The fabric shall be fastened to all intermediate posts with 9 gauge tie wires, spacing not to exceed 14 inches apart. Fabric shall be tied to top rail with 9 gauge tie wires, spacing not to exceed 24

inches. All fabric connectors shall be of galvanized steel conforming to the applicable requirements of ASTM A153.

4. The bottom tension wire shall be 7 gauge galvanized wire. Tension wire shall be stretched taut from terminal post to terminal post and securely fastened to each intermediate post 6-inches above the grade line. Tension wire shall be attached to the fence fabric with 11 gauge rings every 24-inches.
5. The Intermediate posts shall be 2-3/8 inches outer diameter (OD) pipe NPS2, weight 3.65 lbs. Per lineal foot.
6. All end, comer, pull and single leaf gate posts shall be 2-7/8 inches OD pipe (NPS 2-1/2), weight 5.79 lbs. per lineal foot.
7. Double leaf gateposts shall be 6-5/8 inches OD round post pipe (NPS6), weight 18.97 lbs. per lineal foot, and shall be equipped with tops designed to exclude moisture.
8. The top and the intermediate rail shall be 1.66-inch OD pipe (NPS 1-1/4), weight 2.27 lbs. per lineal foot, provided with couplings approximately every 20 feet. Couplings shall be outside sleeve type at least 7 inches long. The top rail shall pass through the line post tops and form a continuous brace from end to end of each stretch of fence. The top rail shall be securely fastened to the terminal posts by heavy pressed steel brace ands and malleable rail end connections. The line post tops, brace bands and rail end connections shall be galvanized according to ASTM A153.
9. Bracing shall be provided as specified on the Contract Drawings.
10. Gates shall have truss rods or intermediate braces. Latches shall be arranged for padlocking so that padlock will be accessible from both sides of the gate regardless of the latching arrangement. Gate frames shall be 1.90 inches O.D. galvanized steel pipe (NPS 1-1/2) weighing 2.72 lbs. per foot. Gate fabric and shall conform to the requirements specified here in before. All gates shall be equipped with a positive type latching device with a means for padlocking. The double gate shall be equipped with a center plunger, rods, catch and semiautomatic outer catches to secure the leaves in open position. Hinges shall be of pressed steel.
11. All fittings shall be pressed steel in conformance with ASTM F226.

B. Barbed Wire (outward facing)

1. Barbed wire fence will be constructed of at least four wires; total height will not be less than 60” or as on adjacent fencing.
2. Barbed wire as a minimum shall be 12 ½ gage with 4-point barbs spaced not more than 6 in. apart or as on adjacent fencing.

C. Salvaged Fence

1. In locations noted on the plans, existing fencing shall be removed and salvaged.
2. The salvaged fence is to be protected from damage by the contractor and used in the locations shown on the Drawings.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Installation of new and salvaged materials shall be made by skilled mechanics experienced in erection of this type of fence. All posts shall be set in concrete foundations to a minimum depth of 48 inches. Diameter of the foundation shall be the pipe O.D. plus 12 inches. The foundation shall be a 11-2-4 mixture of concrete and set to a depth 54 inches minimum. All foundations shall extend approximately 1 inch above grade and shall slope away from the post to grade for proper drainage. Edge of foundation shall be flush with finish grade. Foundations shall be of the shape and sizes shown on the details.

B. Line posts shall be spaced at a maximum of 10-foot intervals. Intermediate rails shall be used to brace end and gate posts to the adjacent line post, and comer posts to the two adjacent line posts. Changes in line of 30 degrees or more shall be considered comers.

C. Top rails shall form a continuous brace from end to end of each stretch of fence. Sleeve type couplings shall joint lengths of top of rail. Top rails shall be securely fastened to terminal posts by pressed steel fittings.

END OF SECTION

# SECTION 35 24 00

# DREDGING AND DISPOSAL

## PART 1 - GENERAL

### 1.1 SUMMARY

A. The project scope as described herein is generally as follows:

1. In general, the work includes labor, materials, equipment, and services required for completion of the work under this Section; all as shown on the Drawings and as specified herein.
   a. Mobilize all dredge equipment to the project site.
   b. Perform dredging using mechanical methods.
   c. Perform mechanical treatment of material as required.
   d. Placement of dredged sediments in CAD Cell No. 3; and
   e. Demobilize from the project site.

2. This Section includes water control, manpower, fueling, maintenance, operation, positioning systems, calibration, progress/verification surveys, field engineering, environmental protection and restoration, towing, scow placement and anchoring, loading, hauling, unloading, placement and all other work incidental to the dredging, mechanical treatment, and disposal operations required to perform/complete the project in accordance with the Contract documents and permits issued for this project, which are provided in the **Attachment of the Request for Proposal (RFP)**.

3. The Work generally consists of a water-based operation using mechanical dredging methods with disposal of sediments removed from the Shuster Bulkhead Cellular Cofferdam Dredge Area with disposal in CAD Cell No. 3. The work to be performed is to achieve the required design depths shown on the Contract Drawings and as described in further detail below:
   a. Shuster Bulkhead Cellular Cofferdam Dredge Area: The proposed work includes dredging of the ±0.25-acre Shuster Bulkhead area within the cellular cofferdams to the project depth of up to -32.0 (MLLW). The project template is sloped from the seaward face of the cells back landward up to the face of the proposed bulkhead. The first 11.5’ of the template shall be dredged to a slope of 1 to 1, with this 1 to 1 slope to be protected from erosion with concrete mattresses. The remaining 45.6’ of the template shall be dredged to a slope of 5 to 1. The templates shall be dredged to the limits shown on the Contract Drawings. The dredged sediment will be placed in CAD Cell No. 3 in alignment with the Contractor's disposal plan.
   b. After the removal of the cellular cofferdams, the Contractor shall be responsible for removal of any material from within the cells that has

accumulated within the berth as the result of natural accretion or construction activities.

c. Removal of intact rock may be required to clear the berth limit as shown on the plans. Intact rock excavation is limited to areas to the east of the channel limit. Intact rock encountered westward of the channel limit above the required grade may remain in place unless removal is operationally required by the Contractor. Material accounted for in the bid items for rock treatment and rock removal is limited to rock removed within the channel.
d. If required, the Contractor shall provide mechanical treatment of the sediment and/or bedrock to ensure that the contract grades are met in one hundred percent of the required dredge area. Treatment methodology is to be determined by the Contractor and may include line drilling, hoe ramming, milling, or other such methods as determined by the Contractor.

4. The actual amount removed will be dependent on the amount of material the Contractor removes to the payment limit from within the established dredge areas as shown on the Contract Drawings. No payment will be made for any material removed from below the 1-foot allowable O.D. or beyond the side slopes shown on the Contract Drawings.

5. In general, sediments are anticipated to be a mix of medium to fine sands with varying amounts of silt and gravel, including fill, glacial till, and outwash soils, with low concentrations of heavy metals, petroleum hydrocarbons, VOCs, and PCBs. Intact rock and/or weathered rock may be encountered. Bidders are expected to examine the site of the work and review the information provided in the **Phase 3 Bulkhead Replacement Data Package (see the Attachment to the RFP)** and then decide for themselves the character of the materials.

6. The project area supports a working marine facility. The facility shall remain fully operational during construction, and the Contractor shall conduct the work in such a manner to assure minimal interference and complete communication with vessel operations. Channels and berths must not be blocked without prior authorization and per schedule, and vessel traffic must be allowed to continue with no interruptions.

7. The Work performed by the Contractor shall be subject to the following requirements:
   a. Work will be conducted to meet all **State Enhanced Remedy (SER) Performance Standards (see the Attachment to the RFP).**
      1) SER Performance Standards require the use of environmental buckets. Should the Contractor determine, after a full coverage first attempt, that the material cannot be removed with an environmental bucket, a waiver may be requested.
   b. The Contractor will inform the Owner and the Engineer of the scheduled dredging. The Contractor shall inform the Engineer 15 calendar days in advance of performing dredging.
   c. The Contractor shall adhere to all State and Local noise restrictions.

d. Disposal operations within CAD Cell No. 3 are restricted from 7 a.m. to 11 p.m. with a noise reduction requirement after 9 p.m. The Contractor shall adhere to all noise restrictions.
e. At the end of each working day, the Contractor shall position the equipment and barges such that interference with vessel traffic is avoided at all times. All equipment shall have sufficient lighting to allow for safe operations and navigation.

8. Upon request by the Owner or Engineer, the Contractor shall provide transportation to/from the operation and equipment as required for both the Owner and the Engineer along with regulatory representatives at any time deemed necessary to ensure that the work is or has been accomplished in accordance with the Contract documents and associated permits.

9. Dredging operations shall cease immediately whenever violations of Contract requirements are detected/observed. Contractor operations shall not resume until methods of compliance are approved.

## 1.2 RELATED DOCUMENTS AND REFERENCES

A. Drawings and general provisions of Contract, including General and Special Conditions and Specification sections, apply to work of this section.

B. The following section describes other required project related work:

01 13 50, Water Quality Monitoring and Control
01 22 00, Measurement and Payment
01 33 00, Submittal Procedures
01 35 50, Environmental Procedures
01 45 00, Contractor Quality Control
01 61 00, Plant and Equipment
01 71 23, Field Engineering

C. The following technical references apply to the work,

1. U.S. Army Corps of Engineers, Engineering and Design, Hydrographic Surveying, EM 1110-2-1003, 30 November 2013

2. Department of Homeland Security, United States Coast Guard (USCG), Navigation Rules and Regulations Handbook, August 2014 Edition

3. ASTM D1586 “Standard Test Method for Sampling Penetration Test (SPT) and Split-Barrel Sampling of Soils”

4. ASTM D2487 “Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)”

5. ASTM D6032 “Standard Method for Determination Rock Quality Designation (RQD) of Rock”

## 1.3 DEFINITIONS

### A. MAINTENANCE MATERIAL

1. Maintenance material is defined as the sediments which have accumulated within areas to be dredged under the Contract since the last dredging event was conducted at the site. The subsurface profile consists primarily of **fill materials and native deposits**. Bidders are expected to examine the site of the work along with the information provided in the **Phase 3 Bulkhead Replacement Data Package (**see the **Attachment to the RFP)** and decide for themselves the character of the maintenance material to be dredged.

### B. IMPROVEMENT MATERIAL

1. Improvement material is defined as the native, generally undisturbed sediment within an area never previously dredged and also includes in-situ materials encountered below previously dredged (maintenance) depths. Improvement material may consist, but not be limited to, cobbles, gravels, sands, silts and/or clays. Bidders are expected to examine the site of the work along with the sediment data provided in the **Phase 3 Bulkhead Replacement Data Package (**see the **Attachment to the RFP)** and decide for themselves the character of the improvement material to be dredged.

### C. MATERIAL CATEGORIES FOR PAYMENT

1. **Sediment Dredging** will encompass all materials to be dredged from the required grade or allowable O.D. that are excavatable and not intact rock. The Contractor is expected to make reasonable efforts to include all available material in this classification. This may involve maintenance and improvement materials along with structural fill within the cellular cofferdams. For areas outside the limits of the cellular cofferdams, the Contractor must complete at least one full pass over the entire required dredging footprint to ensure that all Sediment Dredging is accomplished. This category of material may not be excavatable with an environmental bucket which is designed for maintenance material dredging. If the Contractor choses to utilize an environmental bucket for this phase of work, an additional pass with a suitable bucket will be required. This includes the use of equipment suitable for the removal of dense materials such as glacial till and weathered rock. Sediment dredging includes the excavation of all materials not categorized as rock which is then disposed of in the CAD Cell No.3 disposal site (Bid Item 29 and Bid Item 30).

2. **Rock Dredging** refers to the treatment and removal of material from the dredging prism after efforts have been made to remove all sediment and other excavatable materials. This category may include weathered rock, intact rock, and treated rock

that was not excavatable as sediment (Bid Item 31). The Contractor is required to complete at least one full pass over the entire Rock Dredging footprint with material suitable for the removal of rock to minimize the need for mechanical treatment. This category of material is anticipated to require the use of an excavator or other suitable equipment as determined by the Contractor and approved by the Owner.

## 1.4 SUBMITTALS

A. The Contractor shall provide the following in accordance with Section 01 33 00, Submittal Procedures:

1. **Notice to Mariners:** File the Notification to Mariners with the USCG and provide confirmation of submittal to the Engineer.

2. **Utility Notification:** The Contractor shall provide confirmation of notification of the local 811 “Call Before You Dig” notification service prior to construction.

3. **Work Plan:** The Contractor shall submit a Work Plan for work outlined in this section. The Work Plan shall detail the Contractor's proposed sequence, equipment, and procedures for performance of the work. The Work Plan shall include, but not be limited to, the following:
   a. The Contractor shall provide details of the proposed equipment, including specifications for proposed equipment. The Contractor hereby affirms that they have reviewed any and all geotechnical and survey information regarding the project site as provided by Contract Documents and Drawings and that all equipment selected for the proposed project is capable of performing all of the required dredging and disposal operations as specified herein.
   b. Details of equipment and procedures for dredging maintenance and improvement material including plans and description indicating location, depth and sequence of dredge cuts.
   c. Include specifications for proposed buckets, indicating cut depths, estimated volume of free water entrained with the material for given cut depths and proposed method for minimizing volume of free water dredged with the sediment.
   d. Detailed description of proposed dredging means and methods indicating procedure for both dredging activities within the dredge template and for reasonably clearing side slopes to ensure no sloughing occurs which may impact future operations.
   e. Detailed description of the means and methods of treatment for bedrock encountered within the dredging prism, including details on the anticipated production rates.
   f. Submit plans and written description indicating layout and details of equipment and procedures for maintenance of silt curtains and placement of oil absorbent booms in Section 01 35 43, Environment Procedures, for more information.

g. Name, identification number, and date of last certification of each plant and piece of equipment including, but not limited to, dredge, hopper, or scow.
h. Organizational Chart, including resumes of the Site Project Superintendent as described in Section 01 45 00, Contractor Quality Control. The site project superintendent shall be the highest-level manager responsible for the overall construction activities at the site, including quality and production.
i. Detailed description of the proposed measures for protection of, or temporary or permanent relocation of, adjacent structures located in the vicinity of the dredge area. Proposed measures must include methods for dealing with debris that may be encountered.

4. **Dredge Positioning Plan:** The Contractor shall submit a Dredge Positioning Plan as indicated in Section 01 71 23, Field Engineering. The Dredge Positioning Plan shall detail the proposed method for maintaining horizontal and vertical control of dredge cuts, including the proposed method for avoiding over-dredging below allowable depths as authorized by permits and shown on the Contract Drawings.

5. **Scow Operation and Disposal Plan:** The Contractor shall submit Scow Operation and Disposal Plan, as indicated in Section 01 71 23, Field Engineering, that shall include a written description indicating layout and details of equipment (including scow ullage tables) and procedures for; water control, removal of standing water or free liquid from scows, filtering, and discharge of water, scow positioning and tracking to comply with the regulations and Contract requirements, and the transport of the dredged material to the disposal site. This plan should highlight the methods of distributing the material from the scow and the control measures to be utilized to ensure that material is not placed beyond the limits defined in the plans.

6. **Debris Management Plan:** The Debris Management Plan, as described in Paragraph 3.3 - DEBRIS MANAGEMENT, shall describe in detail the Contractor's proposed method and equipment to be used for material screening and removal of artificial obstructions and debris not suitable for placement at the disposal site. Identify methods and locations for solid waste disposal of dredged debris and other solid waste generated by the Contractor's activities. The Plan shall identify a methodology and equipment for containing, recovering, and/or securing floating debris that is not captured during dredging operations. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not commercial operating facilities. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during construction. The Contractor shall submit to the Engineer completed copies of all Bills of Lading indicating the total amount of debris in tons which was transported and accepted at the disposal facilities.

7. **Daily Report:** The Contractor shall be responsible for submitting daily dredging reports to the Engineer indicating all operational time and down time for all equipment and personnel. The Contractor's daily report shall include information

of sufficient detail to track daily production of dredging and disposal activities. The daily reports shall be given to the Owner's Engineer by 12:00 noon the day following the date shown on the reports. The Daily Report shall be filled out for each calendar day even when the equipment is not working. Progress payments for dredging will not be made until a complete set of reports covering the payment period are in the Owner's Engineer's possession and are deemed to be acceptable by the Owner's Engineer. Handwritten daily reports will not be accepted.

## 1.5 QUALITY CONTROL

A. Contractor quality control is the means by which the Contractor verifies that the construction/dredging work complies with the requirements of the Contract specifications herein. Contractor quality control shall be adequate to cover all construction, including dredging and disposal operations.

B. The Contractor shall provide and maintain an effective quality control program. The Contractor's Quality Control Program through inspection, testing, equipment/system operation, and reporting shall demonstrate and document the extent of compliance of all work with the standards and quality established by the Contract documents. Inspection and test reports shall reference specific drawing and/or specification requirements and shall state inspection/test procedures with both expected and actual results. The burden-of-proof of Contract compliance is placed on the Contractor and not assumed by the Owner's Engineer. The Contractor's Quality Control will not be accepted without question.

C. Notification of Changes: After approval of the Work Plan, the Contractor shall notify the Owners or the Owner's Engineer in writing of any proposed change.

D. Work Deficiencies: The Contractor shall not build upon or conceal any work containing uncorrected defects. If deficiencies indicate that the Contractor's quality control system is not adequate or does not produce the desired results, corrective actions in both the quality control system and the work shall be taken by the Contractor. If the Contractor does not promptly make the necessary corrections, the Owners may issue an order stopping all or any part of the work until satisfactory corrective action has been taken. Payment for deficient work will be withheld until work has been satisfactorily corrected. If the above does not obtain effective improvement in the Contractor's quality control system, the Owner's Engineer or their authorized representative may direct changes be made in the quality control system and/or organization, including but not limited to the removal and replacement of unsatisfactory quality control representatives at any level or the addition of quality control personnel or services. Any additional cost to the Owners for providing quality control services that are not satisfactorily performed by the Contractor, will be deducted from payment due the Contractor. If recurring deficiencies in an item or items indicate that the quality control system is not adequate, such corrective actions shall be taken as directed by the Owner's Engineer or their authorized representative.

E. Completion: At the completion of the work, the Contractor's quality control representative shall conduct a joint completion review with the Owner's Engineer's inspector(s). During this review the work shall be examined, quality control shall be reviewed, and a list shall be developed of work not properly completed or not conforming to plans and specifications. This list shall be included in the quality control documentation with an estimated date for correction of each deficiency. The Contractor shall make sure that deficiencies have been corrected prior to the specified completion date. Payment will be withheld for defective or deficient features until they are satisfactorily corrected.

F. Contractor Daily Quality Control Reports

1. The Contractor's Daily Dredging Report shall provide a comprehensive account of the daily activities undertaken by the dredging Contractor. This report will be cumulative and used to monitor production throughout the project lifecycle. Each day, the Contractor shall provide the following information, both as the quantity from the previous 24-hour period and the cumulative value for the entire project.

2. In instances where the Contractor's work is separated into discrete bid items or tasks, the Contractor shall ensure that the daily report tracks the production for each discrete dredging task separately to allow for the cumulative tracking of work on each discrete task. These reports will be developed from the Contractor's own quality control measures.

3. Each report shall provide at a minimum the following:
   a. Contract Name/Number
   b. Date and report number, the report number will be sequential by day.
   c. Name of Site Superintendent
   d. Project Sub-Task and report number for the sub-task.
   e. General location of the work performed.
   f. Weather conditions at the work site.
   g. Name of the dredge and the size and type of bucket used.
   h. A description of materials encountered
   i. The total number of hours on site, and the number of idle or delay hours for the day.
   j. Disposal location for dredged material
   k. A complete accounting of dredging delays including but not limited to; dredge moves, vessel traffic, weather, repairs, scow changes, delays waiting for scows, delays waiting for attendant plant, fueling, and other miscellaneous delays. Each delay shall be accounted for separately by the day and cumulatively for the project task.
   l. Hours will be accounted for in one of two categories delay time or work time. Delay time plus work time are considered revenue hours. A general efficiency will be provided which is the total work hours divided by the total revenue hours expressed as a percentage.

m. Production shall be tracked by both dredging area and the number of scows filled and disposed of at the disposal site. This will include daily production and cumulative values for the project.
   1) For dredge area production tracking, the Contractor shall supply the areas worked today expressed as square footage of cut covered in the previous day.
   2) Scow production tracking shall include the total number of scows loaded, number of scows shipped to the disposal site, and the estimated scow quantity. The scow quantity may be estimated from ullage tables or by survey.
   3) Each scow shipped will be accounted for on the report based on its identification number or other such indicator. For each scow shipped, the Contractor shall note the time the scow was started and the time it was finished, along with an estimate of the volume in the scow.
   4) Project volumes will be tracked as pay quantity, dig quantity, and over-dredged quantity. The volumes may be estimated from ullage tables or by survey.

n. The Contractor shall track the attendant plant actually utilized on the project for each day. This includes dredges, tugboats, survey boats, scows, and other plant as is actually on site. A cumulative tracking for each particular piece of plant shall be provided.

o. The Contractor shall track the employees, by role, actually utilized on the project for each day. This includes each person actively engaged on the project for each day. A cumulative tracking for each role shall be provided.

p. The Contractor shall track work supplies, actually utilized on the project for each day. This includes fuel used for each piece of plant and other such wear items required by the project for each day. Cumulative tracking for each particular type of supply shall be provided.

q. Remarks and notes shall be provided that describe any conditions encountered such as material changes, debris recovered, or other such activities or conditions that impacted production.

r. The Contractor shall utilize logs created by the dredge crew to generate the production report. Handwritten logs are acceptable; however, production reports must be typewritten.

## 1.6 PROJECT CONDITIONS

A. Information and data furnished or referred to below are furnished for information only and it is expressly understood that neither the Owner nor Engineer will be responsible for any interpretations or conclusions drawn therefore by the Contractor.

1. **Weather Conditions:** Complete weather records and reports may be obtained from the U.S. Weather Bureau. The Contractor is responsible for assessing and preparing for potential weather-related hazards during dredging and disposal activities. The project site and disposal site are exposed, and suspension of work may at times be necessary during extreme storm periods. Tidal currents may have an adverse effect on dredging operations.

2. **Conditions of Dredge Areas:** The best information available as to the present conditions of the project site is shown on the Contract Drawings, described by the specifications provided herein and additional information provided in the **Phase 3 Bulkhead Replacement Data Package (see the Attachment to the Request for Proposal).**

3. **Debris and Artificial Obstructions within Dredge Areas:** The Contractor shall assume that debris may be encountered as this site. Generally, all floating and bottom debris larger than 12 inches in any dimension or as determined by the Engineer, will be considered unsuitable for disposal at the designated disposal site and shall be legally disposed at a suitable upland site by the Contractor.
   a. The Contractor may encounter a wide variety of bottom debris such as, but not limited to, cable, rope, netting, miscellaneous metal, canisters, rags, discarded tools, miscellaneous rubber, miscellaneous plastic, miscellaneous wood, ballast, tires, shipwrecks, large stones, abandoned mooring buoys and blocks, cars, trucks, abandoned creosote pilings, fendering, cribbing and other timber debris.
   b. Two submerged obstructions believed to be abandoned sunken vessels have been identified adjacent to the existing CAD Cell No. 1 and Borrow Pit Area. Approximate locations of the submerged obstructions are shown on the Contract drawings and are considered navigation hazards. The obstructions shall not be disturbed as part of this Contract. It is the responsibility of the Contractor to field verify the location, depth, and character of the submerged obstructions, and avoid impact to it during all work and conditions.

4. **Existing Utilities:** Prior to commencement of Work, the Contractor shall coordinate with the applicable utility companies to identify and mark the exact locations of existing utilities and establish in detail the proposed method of protecting the existing utilities. The existing utility lines that are to be retained shall be protected from damage during dredging, and if damaged, shall be satisfactorily repaired by the Contractor at no additional cost to the Owner. No dredging or spudding shall occur within an area identified as having active utilities. It is the full responsibility of the Contractor to take all precautions, as deemed necessary, to confirm, identify and avoid any/all potential impacts.
   a. **As part of the project, an existing storm drain must be removed and relocated as shown on the Contract Drawings.**

5. **Vessel Traffic:** The project site is an active working waterfront facility. The Contractor shall be responsible for coordinating with the Owner to determine access to the site relative to uses/daily needs and shall be responsible for moving dredge plant from site, if so required. In addition, the general area may also be subject to vessel traffic and may cause minor delays to the dredging operations. No additional compensation shall be made for any required moves or minor delays.

6. **Obstruction of Federal Navigation Channel:** The Owner will undertake to keep the Federal Channel free from vessels or other obstructions, except to the extent of such regulations, if any, as may be prescribed by the Secretary of the Army, in accordance with the provisions of Section 7 of the River and Harbor Act, approved August 8, 1917. The Contractor shall be required to conduct the work in such manner as to obstruct navigation as little as possible, and in case the Contractor's plant so obstructs the channel as to make it difficult or endanger the passage of vessels, said plant shall be promptly moved on the approach of any vessels to such an extent as may be necessary to afford a safe practicable passage. Upon completion of the work, the Contractor shall promptly remove the plant, including ranges, buoys, piles, and other marks placed by them under the Contract in navigable waters or on shore.

7. **Navigation Aids:** The Contractor shall not relocate or move any aids to navigation that have been established by the USCG. If it becomes necessary to have any aid to navigation moved by the Contractor in order to complete dredging operations under this Contract, the Contractor shall notify the Commander AON, Office of Aids to Navigation, in writing with a copy to the Owner or Engineer not less than 30 days prior to such need for movement. The Contractor shall notify the USCG of the approximate time the navigation aid may be relocated to its original position.

8. **Notice To Mariners:** Should the Contractor, during dredging operations, encounter any objects on the channel bottom which could be a hazard to navigation, they shall immediately notify the Engineer as to the location of said object and any other pertinent information necessary for the Engineer to put out a Notice to Mariners.

9. **Survey Benchmarks, Lines, and Grades:** Survey benchmarks, lines and grades shall be made in accordance with the provisions cited in Section 01 71 23, Field Engineering.

10. **Results of Explorations:** Explorations to determine the general character of materials to be removed have been made by the Owner. Graphic logs and summary tables of geotechnical borings, vibracoring, and refusal probing are contained in the **Phase 3 Bulkhead Replacement Data Package (see the Attachment to the RFP)**. Although the results of such explorations are representative of subsurface conditions at their respective locations and for their respective vertical reaches, local variations in the subsurface materials are to be expected and, if encountered, will not be considered materially different within the purview of the Contract.
    a. Land Borings, CEC 1A through CEC 18A, were extended to refusal or bedrock. Rock elevations ranged from approximately -11 to -36 feet (MLW). Rock cores were performed at eleven boring locations. The rock encountered at the site is similar to previous efforts in the vicinity. The bedrock description is “Black and grey gneiss, very strong, slightly decomposed, competent, and slightly fractured.” The RQD values, from 12% to 100%, indicate a wide

variance in the quality of rock sampled, with the average RQD of 66.1% giving it a "Fair" Quality. RQD values were based on recovered sample not total penetration. The borings included standard penetration tests with split spoon sampling at 5-foot intervals. Soil field descriptions and the results are provided in the **Phase 3 Bulkhead Replacement Data Package**.

b. Sediment samples were collected from soil borings designated 1a through 13a. These borings were sampled at various depths, ranging from the surface down to 36 feet. Samples were obtained using grab sampling techniques, where material was collected with a jar. All samples were preserved and stored in accordance with Massachusetts Department of Environmental Protection (MassDEP) Analytical Protocols. Documentation provided through the protocol certification forms confirms that all procedures for sample collection, handling, and storage were properly followed. Analytical results are provided in the **Phase 3 Bulkhead Replacement Data Package**.
c. Results of bathymetric surveys are provided on the Contract Drawings

11. **Material to be Dredged:** The proposed dredging may consist of maintenance and improvement dredging with the disposal of sediments at CAD Cell No. 3 and as further defined below:
    a. The subsurface profile consists primarily of **fill materials** and **native deposits**. Fill layers include **poorly-graded sand with silt (SP-SM)**, **silty sand (SM)**, **sandy silt (ML)**, and occasional **well-graded sand with silt (SW-SM)**, often containing **trace to few gravel** and **shell fragments**, with conditions ranging from **dry to wet** and **loose to dense**. Below the fill, **outwash deposits** are generally **silty sand with gravel (SM)**, typically wet and medium dense to very dense. **Glacial till** is prevalent at depth, composed of **silty sand with gravel (SM)** or **poorly-graded sand with silt and gravel (SP-SM)**, very dense and wet. In deeper sections, **weathered rock** and **coarse-grained granite/gabbro** were encountered, described as slightly to moderately weathered, hard, and broken.
    b. Disposal Site for the materials is defined as CAD Cell No. 3. CAD Cell No. 3 is an authorized confined disposal site located approximately 1.3 nautical miles north of the Shuster Bulkhead Dredge site. The navigational channel that accesses CAD Cell No. 3 passes through the New Bedford/Fairhaven bridge. The Contractor shall familiarize themselves with the daily bridge schedule and any upcoming roadway/bridge improvements impeding bridge openings and plan their activities accordingly. The Contractor shall consider the impact of the New Bedford Fairhaven Island Bridge on disposal movements.
    c. Access to the CAD Cell No. 3 disposal site will use the CAD Cell No. 4 access channel and access through CAD Cell No. 4 for all scow traffic into the area of CAD Cell No. 3 during disposal operations as shown on the Disposal Plan. The Contractor will be required to remove and reinstall CAD Cell No. 4 silt curtain piles in order to gain access to CAD Cell No. 4. The Contractor shall provide an as-built location and top elevation of each pile prior to removal so the piles can be reinstalled at their original position.

d. Contractor shall be prepared with additional equipment and resources to fully perform the work outlined herein and to remove the materials that may be encountered at the project site. In preparing the bid, the Contractor shall take into account the density and hardness of the material and the need to produce a clear dredge footprint at the end of the project. The Contractor shall be prepared to excavate the material types that could be encountered within the area without prejudice to the amounts of any particular type of material that is encountered. Failure of the Contractor to anticipate or be prepared for the varying subsurface conditions that exist shall not be cause for a claim of change in conditions of any kind or entitle the Contractor to any additional compensation beyond the as stated unit price for the work to be performed.

12. **Existing Reports and Historical Data:** Listed below are reports and historical data, relative to the project, which are available for the Contractor's review (**see the Attachments to the RFP**). The Contractor shall interpret said data according to their own judgment and shall understand that conditions may differ from those recorded in the reports, drawings, and shown on the borings.
    a. Massachusetts Department of Environmental Protection – Chapter 91
        1) Minor Project Modification to DPW License No. 5579
    b. New Bedford Conservation Commission
        1) Order of Conditions SE 49-0973
    c. United State Army Corps of Engineers
        1) General Permit Authorization File Number: NAE-2022-01807

## 1.7 CODES

A. The Contractor shall comply with all applicable permits, codes, ordinances, rules, regulations, and laws of all local, municipal, and state authorities having jurisdiction over the Work, without additional cost to the Owner.

## 1.8 CONTRACTOR'S RESPONSIBILITY

A. The Contractor shall be responsible for ensuring strict compliance with all of requirements cited in the Contract Agreements with the Owner and all Federal, State, and municipal laws that may apply to operations under the Contract; and it is understood and agreed that the Contractor assumes full responsibility for the safety of employees, plant, and materials, and for any damage or injury done by or to them from any source or cause, except damage caused to the plant or equipment by acts of the Owner, its officers, agents or employees, in which event such damages will be the responsibility of the Owner in accordance with applicable Federal laws. For the purpose of this clause, the terms "officers, agents or employees" of the Owner shall not include persons who are employed by the Contractor and whose services have been furnished to the Owner pursuant to this or any other contract. The Owner will not be responsible for the dredge and attendant plant, any property aboard the dredge and attendant plant, or any accidental damage thereto during the period of the Contract. The Contractor shall release the Owner and its officers and agents from all

responsibility for damages to dock facilities, submerged and aerial crossings, bridges, moored vessels, or other damages ordinarily covered by fire and marine insurance.

1. **Warranty:** The Contractor warrants to the Owner the quiet and peaceable use of the aforesaid property, and in case of any disturbance, by suit or otherwise, will defend the same free of charge to the Owner in or before the proper State or United States courts.

2. **Delays:** If the Contractor refuses or fails to make delivery of the project within the time specified or any extension thereof, as provided in specifications, or to maintain the property in serviceable condition and diligently and competently to conduct the specified operations, the Owner may, by written notice terminate the right of the Contractor to proceed with delivery or with further performance under the Contract or such parts or parts thereof affected by the Contract or otherwise and the Contractor shall be liable to the Owner for any excess cost occasioned thereby.

3. **Disclaimer:** The Contractor shall hold and save harmless the Owner, its officers and employees, from all claims that may arise resulting from the Contractor's negligence in connection with the work to be performed under the Contract, or from noncompliance by the Contractor with the provisions of the Contract, Contract drawings, and specifications and/or the instructions of the Engineer.

## PART 2 - PRODUCTS

### 2.1 DREDGING PLANT AND ASSOCIATED EQUIPMENT

A. All dredging shall be performed under this Contract using a water-based operation consisting of mechanical dredging equipment as specified in Section 01 61 00, Plant and Equipment. No hydraulic dredging will be permitted for this project.

1. Dredging shall be accomplished with approved modern equipment. All equipment shall be kept in good working condition. Equipment shall be suitable for the proposed work, and of a design, size, and capacity to effectively perform the work. The plant and equipment list submitted with the Contractor’s Proposal shall be the minimum which the Contractor shall place and keep on the job unless otherwise determined by the Owners and Owner’s Engineer. The listing of plant and equipment is not to be construed as an agreement on the part of the Owner that the equipment is adequate to perform the work.

2. Plant and equipment employed on the work shall be in satisfactory operating condition and capable of safely and efficiently performing the work under exposed environmental conditions and as set forth in the specification and shall be subject to inspection by the Engineer at all times. No reduction in the capacity of the plant employed on the work shall be made except by written permission of the

Engineer. The measure of the "Capacity of Plant" shall be its actual performance on the work to which these specifications apply.

3. If the Contractor's plant and equipment is not sufficient or cannot remove any and all dredged materials from the project site whatsoever, the Contractor shall secure alternative equipment that will perform and provide to the Owner the final designed dredge prisms and depths as set forth herein. The Contractor expressly agrees that any and all additional plant and equipment, including any and all mobilization, labor, overhead costs incurred as a result thereto, are included in the set unit price for the work as provided by the Contractor and that no additional compensation whatsoever will be paid by the Owner for additional and or substituted equipment necessary for the Contractor's performance and delivery of the project.

4. The Contractor shall notify the Owner and its Engineer 15 days in advance of any dredge plant entering the activity so that necessary quality assurance spot checks can be coordinated. The Contractor's operator shall remain with the equipment during the spot check.

5. The Contractor shall demonstrate that the dredge operator has sufficient control over bucket depth in the water and bucket closure (for clamshell buckets) so that sediment re-suspension from bucket contact with the bottom and due to bucket over-filling can be minimized at the same time minimizing the amount of free water contained in the bucket.

6. The environmental bucket shall be designed to completely enclose the dredged sediment and water captured. The environmental bucket shall demonstrate the capability of meeting the water quality Performance Standards. Upon request and approval by the Owner and SER Project Manager, a conventional bucket or excavator may be used to dredge material if the enclosed bucket is unfeasible or unsuccessful and it can be demonstrated that water quality Performance Standards are not exceeded when using alternative methods. An enclosed bucket must be maintained at the site in the event of water quality exceedances.

7. Should dredging with an environmental bucket become unfeasible or unsuccessful, the Owner's Representative and SER Project Manager must be notified and approve the use of an alternative bucket prior to any sediment dredging not using an environmental bucket.

8. Where pilings or other debris are found to interfere with environmental bucket closure or equipment operation, a conventional mechanical bucket may be used to extract the pilings/debris.

9. Certification records, which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the dredge that was inspected shall always be available for review.

10. Written reports listing the load test procedures used along with any repairs or alterations performed on the dredge shall be available for review.

11. The Contractor shall certify that all dredge operators have been trained in proper use of all safety devices.

12. During dredging at night, shielded lights will be used to illuminate within 100 feet of dredge operations and all operations must be stopped if marine mammals are seen within 75 feet of operations. A handheld spotlight will also be available to assist as needed, and the lighting system must be assessed for sufficiency of monitoring prior to commencement of nighttime dredging activities.

13. The Contractor shall display lights and conduct operations in accordance with the General Regulations of the U.S. Army Corps of Engineers (USACE) and USCG governing lights and day signals to be displayed by towing vessels with tows on which no signals can be displayed, vessels working on wrecks, dredges, and vessels engaged in laying cables and day signals to be displayed by vessels of more than 65 feet in length moored or anchored in a fairway or channel, and the passing by other vessels of floating plant working in navigable channels, as set forth in Commandant U.S. Geological Survey Instruction M16672.2, Navigation Rules: International-Inland (Comdtinst M16672.2), or 33 Code of Federal Regulations (CFR) 81 Appendix A (International) and 33 CFR 84 through 33 CFR 89 (Inland) as applicable. (DAEN-PRP-1984 JUL).

14. The Contractor shall provide lights for buoys that could endanger or obstruct navigation.

15. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the dredge.

16. The Contractor is under the complete and full obligation to comply with all Owner's safety requirements and all other applicable industry safety regulations.

## 2.2 CRANES

A. All lifting shall be performed under this Contract shall adhere to the following minimum requirements in Section 01 61 00, Plant and Equipment.

1. Cranes must be equipped with:
   a. Load indicating devices (LIDs) and a boom angle or radius indicator, or load moment indicating devices (LMIs). Anti-two block prevention devices.
   b. Boom hoist hydraulic relief valve, disconnect, or shutoff (stops hoist when boom reaches a predetermined high angle).
   c. Boom length indicator (for telescoping booms).
   d. Device to prevent uncontrolled lowering of a telescoping hydraulic boom.
   e. Device to prevent uncontrolled retraction of a telescoping hydraulic boom.

f. If the crane system to be utilized by the Contractor does not include the aforementioned devices identified under items a. and 2 b. above, the Contractor shall provide the appropriate documentation, inspection(s) and certification(s) to the Engineer as required to fully demonstrate that their equipment is capable of being operated safely and that all applicable OSHA and industry safety standards will be met.

2. The Contractor shall notify the Owner and its Engineer 15 days in advance of any dredge plant entering the activity so that necessary quality assurance spot checks can be coordinated. The Contractor's operator shall remain with the equipment during the spot check.

3. The Contractor shall comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Erection shall be performed under the supervision of a designated person (as defined in ASME B30.5). All testing shall be performed in accordance with the manufacturer's recommended procedures.

4. The Contractor shall comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes and ASME B30.8 for floating cranes and floating derricks.

5. Each load shall be rigged/attached independently to the hook/master-link in such a fashion that the load cannot slide or otherwise become detached. Christmas-tree lifting (multiple rigged materials) is not allowed.

6. Under no circumstance shall a Contractor make a lift at or above 90% of the cranes rated capacity in any configuration.

7. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and shall follow the requirements of USACE Engineering Manual (EM) 385-1-1 section 11 and ASME B30.5 or ASME B30.22 (latest editions) as applicable.

8. Crane suspended personnel work platforms (baskets) shall not be used unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Personnel shall not be lifted with a line hoist or friction crane.

9. A fire extinguisher having a minimum rating of 10BC and a minimum nominal capacity of 5 lbs. of extinguishing agent shall be available at all operator stations or crane cabs. Portable fire extinguishers shall be inspected, maintained, and recharged as specified in NFPA 10, Standard for Portable Fire Extinguishers.

10. All employees shall be kept clear of loads about to be lifted and of suspended loads.

11. A weight handling equipment operator shall not leave their position at the controls while a load is suspended.

12. Only Contractor crane operators who have met the requirements of 29 CFR 1910.94, 29 CFR 1910.120, 29 CFR 1926.65, 29 CFR 1926.500, USACE EM 385-1-1, ASME B30.5, and ASME B30.22 and other local and state requirements shall be authorized to operate the crane.

13. The Contractor shall use cribbing when performing lifts on outriggers.

14. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

15. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.

16. A substantial and durable rating chart containing legible letters and figures shall be provided with each crane and securely mounted onto the crane cab in a location allowing easy reading by the operator while seated in the control station.

17. Certification records, which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by the Owner or its Engineer.

18. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by the Owner or its Engineer.

19. The Contractor shall certify that all crane operators have been trained in proper use of all safety devices (e.g., anti-two block devices).

20. The Contractor is under the complete and full obligation to comply with all Owner's safety requirements and all other applicable industry safety regulations.

## 2.3 TOW BOATS

A. All tow boats used under this Contract shall adhere to the following minimum requirements in Section 01 61 00, Plant and Equipment.

1. All tow boats used for towing to disposal areas shall be equipped with differential global positioning system (DGPS) and track recording navigational equipment or approved equivalent electronic navigation equipment, radar, corrected compass, marine radio, and depth sounding equipment which is to be maintained in operating condition during each tow.

2. The tow boats utilized by the Contractor for this purpose shall be of a size adequate for towing and shall have necessary reserve power for maneuvering with scows and under emergency conditions as well as for control of scows at the disposal and offloading sites.

3. Tug/Tow Operations within the existing CAD Cell footprints, and in proximity of the containment berm, shall be limited to push boat style vessels designed for use in shallow draft areas. These vessels should have a draft of no more than 4.5 feet, and a shaft horsepower applied to the propellers of 300 Hp.

4. The vessels utilized in proximity to the areas of concern shall be the smallest practicable equipment to safely perform the work. The Contractor shall submit with their equipment list the proposed disposal vessels as designated in this specification.

## 2.4 SCOWS AND ASSOCIATED DISPOSAL EQUIPMENT

A. All disposal operation shall be performed under this Contract using a water-based operation consisting of a scows and/or deck barges in Section 01 61 00, Plant and Equipment.

1. The Contractor shall comply with all applicable USCG ABS Load Line Regulations and Policies as per 46 CFR parts 42-47, 46 USC Chapter 51.

2. Water and dredged materials shall not be permitted to overflow or spill out of scows when transporting dredged material. Failure to repair leaks or change the method of operation which is resulting in overflow or spillage will result in suspension of disposal operations and require prompt repair or change of operation to prevent overflow or spillage as a prerequisite to the resumption of disposal.

3. The Contractor shall provide and maintain markings on all scows clearly indicating the draft of the scow and shall provide scow cards for each scow used on the Contract work. The scow cards shall show dimensions and volumes of individual pockets of scows and total volumes for varying depths below coaming or top of pockets. The Contractor shall provide draft verses displacement curves (ullage) for all scows. This is to enable the Engineer to make a determination of scow volume and corresponding drafts under partial and full load conditions. These measurements are to be made at the time of initial use of each scow. This information will then be furnished to the Engineer to estimate scow volume from draft of scows for each scow being towed to the disposal area. The scow volume estimates are not intended to be used in determining quantities dredged.

4. During the entire period of Contract work, the Contractor shall provide and maintain sufficient spot or floodlights to permit the reading of the draft on the sides of scows at bow and stern from the tow boat at night when visibility is impaired. The draft readings and each pocket/compartment measurement will be

required for each scow towed to the disposal area and will be made by the Contractor. Measurements are to be taken and recorded prior to departure from the dredge site and upon arrival at the immediate disposal location. The Contractor shall ensure that adequate time is allowed by the tow boat captain for these readings to be obtained.

5. Due to the fine nature of some of the dredged material, the Contractor shall achieve proper closure and water tightness of pocket doors to eliminate seepage or leakage of material. The use of plastic material to cover cracks in scow pockets will not be allowed.

6. Due to the contaminated nature of the material contained and the shallow depths within CAD Cells, tug/scow operations within the existing CAD Cells shall be restricted to push boat style vessels designed for operations in shallow draft conditions as noted above.

## PART 3 - EXECUTION

### 3.1 SEQUENCE OF DREDGE OPERATIONS

A. The Contractor shall perform the dredging of the minor and major cells sequentially from south to north. The project template is sloped from the seaward face of the cells back landward up to the face of the proposed bulkhead. The first 11’ of the template shall be dredged to a slope of 1 to 1, with this 1 to 1 slope to be protected from erosion with concrete mattresses. The remaining 45’ of the template shall be dredged to a slope of 5 to 1 to the combi-wall. The templates shall be dredged to the limits shown on the Contract Drawings.

### 3.2 CONTINUITY OF WORK

A. No payment will be made for work done in any area designated by the Engineer until the full depth required under the Contract is secured in the whole of such area, nor will payment be made for excavation in any area not adjacent to and in prolongation of areas where full depth has been secured except by decision of the Engineer. Should any such non-adjacent area be excavated to full depth during the operations carried on under the Contract, payment for all work therein may be deferred until the required depth has been made in the area intervening.

### 3.3 DEBRIS MANAGEMENT

A. A debris management plan shall be developed by the Contractor, reviewed for approval by the Engineer. Debris removed from the bottom during dredging operations shall be collected and removed from the site. Generally, all floating debris, and debris constructed from wood, rubber, rope, or plastic, will be considered unsuitable for disposal with dredged materials.

B. The Contractor's dredging operation shall allow for separation of debris which is unsuitable for disposal along with sediment or rock. The Contractor shall present its methodology for screening debris within its bid. The Contractor's proposed methodology shall be capable of removing all rubber, metal, plastic or wood from the dredged materials greater than 12 inches in dimension, in any direction. Additionally, at a minimum, the Contractor must contain floating debris and dispose of at an approved facility.

C. Debris removed from the dredge area shall be contained within the work site, separated, and stockpiled for offsite disposal. Disposal in accordance with local, Federal, and State laws and regulations shall be the responsibility of the Contractor.

D. Each day during dredging operations, the Contractor shall use a boat to collect and remove floating debris resulting from project activities. Floating debris shall also be removed from scows, if applicable.

E. Abandoned piles shall be extracted. Sediment removal during such activity shall be minimized to the greatest extent practicable.

F. The Contractor shall immediately report any possible obstructions to the Engineer for direction. The Owner has no knowledge of existing wrecks, wreckage, or other artificial obstructions, within the Shuster Bulkhead Cellular Cofferdam Area, of such size or character as to require the use of special equipment for its removal. However, special or additional plant or equipment may be required for economical removal of any submerged obstructions and other items, such as boulders, pilings. or sections of piers or docks.

G. Care must be taken when removing debris adjacent to existing structures as to minimize any possible impact. During dredging operations, the Contractor shall remove all debris encountered.

H. All oily material released during dredging or other project activities shall be promptly collected and disposed of at a licensed facility. Any spill above a reportable quantity shall be reported to Massachusetts Department of Environmental Protection (MassDEP) at (888) 304-1133. The proper notification needs to comply with 310 CMR 40. The Contractor must comply with reporting and cleanup requirements as specified in Section 01 35 50, Environmental Procedures.

## 3.4 HISTORIC OR ARCHEOLOGICAL REMAINS

A. If the Contractor discovers any previously unknown historic or archeological remains while accomplishing dredging, they shall immediately stop and notify the Engineer what has been found. Work shall cease until the site has been inspected and the status of the site has been reviewed. No project activities may resume until verbal and/or written approval from the USACE and the Division of Historical Resources Compliance Review Section has been received.

B. No structure or work shall adversely affect, impact, or disturb properties listed in the National Register of Historic Places (NRHP), or those eligible for inclusion in the NRHP.

C. Examples of submerged historical, archaeological or cultural resources include shipwrecks, shipwreck debris fields (such as steam engine parts, or wood planks and beams), anchors, ballast rock, concreted iron objects, concentrations of coal, prehistoric watercraft (such as log "dugouts"), historic artifacts, pottery or ceramics, projectile points, dugout canoes, metal implements, historic building materials, and other evidence of Native American, early European, or American settlement. The materials may be deeply buried in sediment, resting in shallow sediments or above them, or protruding into water.

## 3.5 MISPLACED MATERIAL

A. Should the Contractor during the progress of the work, lose, dump, throw overboard, sink, or misplace any material, plant machinery, or appliance, which in the opinion of the Engineer may be dangerous to or obstruct navigation, the Contractor shall recover and remove the same with the utmost dispatch. The Contractor shall give immediate notice, with description and location of such obstructions, to the Engineer, and when required, shall mark or buoy such obstructions until the same are removed. Should the Contractor refuse, neglect, or delay compliance with the above requirements, such obstructions may be removed by the Owner, and the cost of such removal may be deducted from any money due or to become due to the Contractor. The liability of the Contractor of the removal of a vessel wrecked or sunk without fault or negligence shall be limited to that provided in Section 15, 19, and 20 of the River and Harbor Act of March 3, 1899 (33 U.S.C. 410 et seq.).

B. Any material that is deposited elsewhere other than in places designated or approved by the Engineer, will not be paid for; and the Contractor may be required to remove such misplaced material and deposit it where directed at their expense. Misplaced excavated material may constitute a violation of applicable Federal, State, and Local statutes, and the Contractor shall be liable for any civil and/or criminal penalties imposed by these statutes.

## 3.6 SHOALING

A. If, before the Contract is completed, shoaling occurs within work areas or adjacent berths prior to acceptance, re-dredging shall occur at no cost to the Owner. This includes shoaling in the finished channel because of the sloughing of the side slopes

## 3.7 REQUIRED DEPTH, OVERDEPTH, SIDE SLOPES, AND EXCESSIVE DREDGING

A. Required Project Grade

1. The proposed work includes dredging of the ±0. 25-acre Shuster Bulkhead area within the cellular cofferdams to the project depth of -32.0 (MLLW). The project

template is sloped from the seaward face of the cells back landward up to the face of the proposed bulkhead. The first 11' of the template shall be dredged to a slope of 1 to 1, with this 1 to 1 slope to be protected from erosion with concrete mattresses. The remaining 45' of the template shall be dredged to a slope of 5 to 1. The templates shall be dredged to the limits shown on the Contract Drawings.

2. The contaminated material actually removed from within the specific areas to be dredged, to a depth of not more than the target depth shown on the Contract Drawings, will be estimated and paid for in accordance with the provisions contained in Section 01 22 00, Measurement and Payment. Volume estimates will be based on the Owner's pre- and post-dredge surveys. The target depth shall be obtained in 100% of the proposed dredge footprint for the work to be accepted and complete. Any side slope areas shall be left in a stable condition. The Contractor is responsible for re-dredging as required to remediate areas within dredging limits that are determined by the Engineer as not cleared to the required dredge depth based upon review of the Owner's post-dredge survey at no additional cost to the Owner.

B. Paid Allowable Overdepth

1. A 1-foot allowable overdepth (O.D.) is authorized for this project. The Contractor shall control and monitor dredging operations carefully to limit any excess dredging and ensure compliance with environmental permits (see the **Attachments in the Request for Proposal**). The Contractor shall conduct dredging to design elevations in such a manner as to minimize overdepth dredging and minimize volume of overdepth material required for disposal. The removal of material through contour dredging and within the overdepth limits from areas where no dredging is required to meet the specified dredge depth is considered excess dredging and will not be paid for. Allowable overdepth dredging will be permitted to the indicated depths shown on the Drawings, and only in areas that require dredging to achieve the target dredge depths. Material removed to the overdepth shown on the Drawings, for specific areas to be dredged, and within the dredging limits will be measured and paid for at full Contract price in the same manner as specified above for material removed to the design depth. No payment will be made for any material removed from a depth greater than the 1-foot allowable O.D. or beyond the side slopes as shown on the Contract Drawings.

2. Allowable O.D. on side slopes shall be permitted in all areas of the dredge footprints as shown and specified on the Contract Drawings.

C. Side Slopes.

1. Side Slopes Typical
   a. Side slopes have been designed with slopes as shown on the Contract Drawings. The Contractor shall use an appropriate methodology to ensure that all side slopes are reasonably clear to minimize/avoid residual sloughing into

berth areas which may have the potential to impact future operations. It may be necessary to dredge upslope material which has fallen into the cut, after the original pass, but remains above the required dredge depth.

b. Side slopes must be formed in compliance to the design plan to ensure proper installation of the concrete mattresses. Box cutting the slopes will not be allowed.
c. The Contractor shall submit proposed means and methods for cutting side slopes as part of the work plan for the Engineer's review and approval prior to start of work. The final project slopes shall be in general conformance with the Drawings.
d. The above is not to be taken as a guarantee that all slopes will stand on the slopes shown on the Drawings. The Contractor shall make their own determination as to what the angle of repose will be on all side slopes.

D. Excessive Dredging

1. Payment will not be made for material taken from beyond the authorized dredge prism, allowable overdepth, or side slope limits as shown on the Contract Drawings. If limits dredged by the Contractor and determined to be excessive beyond the limits as extended in the provisions of Paragraphs A through C (above), the Owner reserves the right to deduct this volume from the total amount dredged as excessive dredging or excessive side slope dredging. No payment will be made for material deemed as excessive dredging. Excessive dredging is defined as any material determined through the Owner's post-dredge survey to have been removed beyond the allowable O.D.

2. Excessive dredging may constitute a violation of applicable Federal, State, and local statutes, and the Contractor shall be liable for any civil and/or criminal penalties imposed by these statutes. If in the opinion of the Owner or Engineer, excessive dredging requires back-filing to restore grades, the Contractor will provide a revised work plan describing the means and methods by which the dredging area is restored to an acceptable condition using clean materials. The revised work plan will at a minimum provide the materials to be used, equipment to be utilized, and controls required to ensure satisfactory restoration of grade. Filling of overdredged areas may require permit modifications to be obtained by the Contractor. Any work required for restoration of grades due to excessive dredging will not be paid for.

3. CAD cell capacity is limited, excessive overdredging will not be permitted. The Contractor is to note that dredging below the overdredge boundary or dredging beyond the dredge footprint is prohibited. Dredging beyond the boundaries listed above and indicated on the drawings will not be paid for. In addition, the Contractor shall deduct excessive dredging volumes from each payment application at the unit cost for dredging. See Section 00800, Supplementary Condition, Article 6, 6.02 – PROSECUTION OF WORK for more information.

## 3.8 WORK IN THE VICINITY OF PROTECTED HABITAT, STRUCTURES AND UTILITY CROSSINGS

A. The Contractor shall exercise caution and shall conduct the dredging operation such that it does not undermine, weaken or otherwise impair protected habitat, existing structures, existing CAD Cells, and utility crossings located in or near the areas to be dredged. The Contractor shall take care to ensure the integrity and freedom from damage of all buildings, curbs, fences, gates, floats, marine fenders, wharves, boats, and other facilities adjoining or near the site.

B. The Contractor shall investigate protected habitats, existing structures, existing CAD Cells, and utility crossings at the site and plan the dredging work accordingly. The Contractor shall constantly monitor operations, the position of the dredge cut, and the natural caving of side slopes.

C. At all times, the Contractor shall be solely and completely responsible for the condition of the job site, including safety of persons, boats, docks, and all property, and for all necessary independent engineering reviews of these conditions.

D. Repair of any damage resulting from excessive or improper excavation in the bottom or side slopes of the dredge cut shall be the responsibility of the Contractor. Where dredging to the required elevation might endanger any structure, the Engineer may reduce the required excavation in the vicinity of such structure.

E. The Contractor shall be held responsible for any damage to the existing facilities resulting from dredging and shall notify the Engineer immediately upon occurrence and suspend operations until further instructions are received. Any damage caused by the Contractor's operations to any existing property shall be replaced or repaired in kind to the satisfaction of the Engineer, and at no cost to the Owner.

F. If required, the Contractor shall erect and maintain temporary lights, navigation lights, barricades, warning signs, buoys and guards necessary to protect the public from injury in accordance with applicable rules and regulations.

G. The Contractor, at their own expense, shall have personnel available to immediately clean, as necessary, any dredged material dropped or splashed on any boats, piers, floats, and gangways. The Contractor shall clean off all materials dropped on the and leave such facilities in the same condition as they were at the start of work. The Contractor shall inspect the above facilities at the end of each workday and clean off any materials missed as work progressed. Any and all cleaning will be performed in accordance with the dredge permits and in a manner that keeps turbidity and other discharges back into the river below applicable surface water quality standards. Any material which is dropped or splashed on adjacent vessels or facilities must immediately be brought to the attention of the Engineer and the Owner for direction Clean up shall be to the satisfaction of the Engineer and the Owner.

H. The Contractor shall not tie, moor, connect or contact the Owner's facilities, including all piers, docks, breakwater walls, etc., with any of the Contractor's equipment unless specifically required for disconnection, transportation, and reconnection of existing facilities without authorization from the Owner. The Contractor's equipment, boats, barges, scows, etc., shall be kept clear of the existing facilities, with the exception of personnel carrying skiffs or work boat, as approved by the Engineer.

I. The Contractor shall provide dimensions over all utility crossings as applicable. The Contractor shall submit for approval by the Engineer a detailed plan of operation at each pipeline or utility crossing. The plan shall contain emergency measures to be taken in the event of an accident. The Contractor shall notify the Owner of pipelines or utilities at least 3 calendar days prior to operating within 150 feet of a pipeline or utility.

J. Any unidentified pipelines or structures, which may be found within the limits of work, shall not be disturbed nor shall dredging or the disposal of dredged material be performed at these locations unless, and until, approved by the Engineer.

K. The Owner or Engineer will not be responsible for any damage to structures or utilities as a result of the dredging activities or the Contractor's deviation from the approved work plan.

## 3.9 PRE- AND POST-DREDGE SURVEYS

A. Prior to the start of dredging and at the completion of work (or any section thereof), the Engineer will conduct a pre- and post-dredge survey, respectively. These surveys will be used to determine the final payment volume removed and disposed by the Contractor as determined by computing the volume between the bottom surface shown by soundings of the Owner's pre-dredge survey made immediately before dredging, and the material surface shown by the soundings of the Owner's post-dredge survey made as soon as practicable after the removal of the material as described in Section 01 71 23, Field Engineering. Surveys will utilize the standards established by the USACE's Hydrographic Surveys Manual EM-1110-2-1003 (dated November 2013).

## 3.10 CAD CELL DISPOSAL

A. Material from areas as shown on the Contract Drawings shall be disposed of in CAD Cell No. 3. The Contractor shall be required to coordinate with all required agencies for this disposal and verify compliance with all permits as issued for the project (see the **Attachments in the RFP**).

B. The material to be excavated shall be transported and disposed of at the CAD Cell No. 3 in accordance with state and federal permit requirements.

C. The Contractor shall ensure that when dredged material is disposed, no portion of the disposal barge or scow shall be outside of the boundaries of the release zone. The limits of the release zone boundaries are provided in the CAD Cell disposal plan.

D. The Contractor shall ensure that the disposal barge or scow shall be in the closed position and all discharge of material has ceased before the disposal vessel leaves the disposal zone of CAD Cell No. 3.

E. The Contractor shall not allow excessive leakage, overflow, or spill out of barges or dump scows of water and excavated material while enroute to the disposal site. Failure to repair leaks or change the method of operation which is resulting in the leakage, overflow, or spillage will result in suspension of dredging operations and require prompt repair or change of operation to prevent overflow, leakage, or spillage as prerequisite to the resumption of dredging. Excessive leakage is defined by average loss of draft during transit from the dredging area to the disposal area in excess of 12 inches. Once excessive leakage is discovered, it shall be reported immediately to the Engineer.

F. The locations and bathymetry within the CAD cells are indicated on the Contract drawings. Reference coordinates of the north, south, east, and west limits of the CAD cells are indicated on the drawings and are provided as a general location aid to the Contractor.

G. The Contractor is to fill CAD Cell No. 3 as necessary to maximize the available capacity within the footprint of the CAD Cell and filling to within the tolerances of for the maximum elevation listed below.

H. The Shuster Bulkhead Cellular Cofferdam Dredge template material shall be placed into CAD Cell No. 3. Dredged material shall be distributed evenly over the disposal area to the extent practical. Scow positioning for disposal shall be designed to fill CAD Cell No. 3 as uniformly as practical. The maximum elevation of material in the CAD Cell shall not exceed Elevation –10 MLLW. Material disposed of within CAD Cell No. 3 which exceeds the maximum elevation/tolerance shall be either repositioned within CAD Cell No. 3 or removed, at the Owner's Representatives' direction, by the Contractor at no additional cost to the Owner. A tolerance of +/- 0.5 feet will be accepted for final disposal lifts. Minimum fill elevation within CAD Cell No. 3 is -10 MLLW. The placement tolerance is applicable only if the material approaches the minimum/ maximum fill elevation of -11' to -10' MLLW and is not applicable at any fill elevation below -13 feet mean lower low water (MLLW).

I. The Owner's Representative will be performing periodic bathymetric surveys as the CAD Cell is being filled. The surveys will be used for disposal studies, and to determine remaining available disposal capacity within the cell. The surveys will also be used to confirm location within the cell of discharged dredged material. Survey data will be provided to the Contractor. In order to effectively fill the CAD cell without exceeding tolerance, the Contractor may elect to perform additional or independent surveys for their own use.

J. Bed leveling may be required to effectively dispose of the dredged sediment and maintain the required placement tolerances. If the Contractor proposes to utilize bed

leveling equipment a detailed wok plan must be provided that describes the equipment, methodologies, and quality control measures to be employed.

K. Any dredged material that is deposited outside the limits of the CAD cells as designated on the Drawings will not be paid for, and the Contractor will be required to remove such misplaced material and deposit it within the limits of the cell at the Contractor's expense.

L. Except when directed otherwise, for site management purposes, all disposal of dredged material shall adhere to the following:

1. The Contractor shall release the dredged material at a specified set of coordinates within the disposal site with the scow at a complete halt.
2. These requirements must be followed except when doing so will create unsafe conditions because of weather or sea state, in which case disposal with the scow moving only fast enough to maintain safe control (generally less than one knot) is permitted. Disposal is not permitted if these requirements cannot be met due to weather or sea conditions. In that regard, special attention needs to be given to predicted conditions prior to departing for the disposal site.
3. All disposal operations shall be subject to the water quality criteria indicated in Section 01 13 50, Water Quality Monitoring and Control.
4. Each filled scow shall be inspected to confirm removal of floating debris, oversize debris, and standing water.
5. Scow positioning shall take into account tide and current conditions, scow volume, CAD cell filling requirements, and water quality criteria. It is the responsibility of the Contractor to ensure that discharged material is fully contained within the CAD cells.
6. Be aware that some control of door/hopper opening, and placement management may be necessary to attain available capacity when the existing mudline is relatively close to the final fill elevation.

## 3.11 WATER QUALITY

A. The owner will provide Water Quality Monitoring. The Contractor is responsible for meeting all water quality standards and requirements as stated in the permits issued for the project and in accordance with all local, state and federal regulations throughout the duration of construction. Should turbidity levels, as measured by the owner, resulting from the Contractor's dredging operations exceed acceptable standards/conditions, the Contractor will be required to implement corrective measures.

1. Dredging shall be accomplished in such a manner as to minimize water quality impacts. It is the Contractor's responsibility to achieve water quality criteria as indicated in Section 01 13 50, Water Quality Monitoring and Control.
2. No overflow of the scow while it is being filled shall be allowed.

3. Dredged materials are to be removed with an enclosed bucket. Use of alternative equipment may be allowed with approval of the Engineer and the SER Project Manager.
4. Material will be dredged in such a manner as to minimize the amount of free water dredged and placed into the scow. Buckets shall be sized appropriately in consideration of depth of dredge cuts, in order to minimize volume of free water dredged using an enclosed bucket.
5. Water quality and control criteria will be applicable during all dredging operations regardless of the type of bucket utilized.
6. Hydraulic dredging will not be permitted.

## 3.12 SCOW DEWATERING

A. The Contractor shall manage all excess water from scows so that discharge meets the turbidity criteria and additional requirements indicated in Section 01 13 50, Water Quality Monitoring and Control, and in the Performance Standards. Filtered standing water which meets water quality criteria may be discharged into the Harbor within the site limits, which includes the temporary mooring location.

B. Water discharged from the barge shall be appreciably free of suspended sediment and meet the water quality criteria in the Performance Standards. Any free liquid flowing from the barge in the harbor shall be passed through a sand media filter or equivalent filtration system (which must be approved by the Owner's Representative) prior to discharge. The sand media filter shall be selected, sized, and maintained by the Contractor to meet water quality criteria. The sand media filter system shall be equipped with a sample port to allow the Owner's Representative to sample filtered liquid and test for suspended solids prior to discharge. Liquid which does not meet the requirements of Section 01 13 50, Water Quality Monitoring and Control, and the Performance Standards shall not be discharged. It will be the responsibility of the Contractor to re-filter the material or provide alternate treatment such that water quality criteria are met.

## 3.13 FUEL USAGE

A. The Contractor shall furnish the Engineer a report, to be received on or before the last day of the calendar month, listing the totals of fuels consumed by the dredging plant and supporting vessels. The report shall list the quantities of different fuels separately. The report shall cover the period from the 25th of the preceding month to the 25th of the current month. This information may be included in the Contractor's Daily Report of Operations.

## 3.14 ENVIRONMENTAL LITIGATION: (1974 NOV OCE)

A. If the performance of all or any part of the work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation, as defined below, the Engineer, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the

Contractor or a Subcontractor at any tier not required by the terms of this Contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms of this Contract, such suspension, delay, or interruption shall be considered as if ordered by the Engineer in the administration of this Contract. The period of such suspension, delay or interruption shall be considered unreasonable, and an adjustment shall be made for any increase in the cost of performance of this Contract (excluding profit) as provided in that clause, subject to all the provisions thereof.

B. The term "environmental litigation", as used herein, means a lawsuit alleging that the work will have an adverse effect on the environment or that the Owner has not duly considered, either substantively or procedurally, the effect of the work on the environment.

## 3.15 LICENSE REQUIREMENTS

A. Each vessel exceeding 26 feet in length, excluding sheer, which is used for pushing, hauling alongside, or any other method of towing, and not required by law to have a valid Certificate of Inspection by the USCG, shall be under the actual direction and control of a person licensed for towing in the geographic area of the work by the USCG. Licensed persons shall not perform command or other duties in excess of 12 hours in any consecutive 24-hour period except in an emergency.

## 3.16 COMMUNICATIONS

A. The Contractor is responsible and required to provide any and all equipment necessary to maintain 24-hour oral communication between the dredge crew and the Engineer. Cell phones and/or portable 2-way marine radios are acceptable, and their use on-site shall meet Owner’s requirements/approval. The Contractor is responsible for any and all circumstances not conforming to the plans and specifications resulting from the inadequate operation of the equipment. The Contractor is required to monitor both Channels 13 and 16.

1. Channel 13: The master, operator, or designated pilot of the vessel must maintain a listening watch on the designated bridge-to-bridge frequency while underway on the navigable waters of the United States. The designated frequency is VHF-FM Channel 13. The person maintaining the watch also must be able to communicate in English.

2. Channel 16: In addition to the Channel 13 watch, vessels must keep a continuous watch on VHF-FM Channel 16 (International Distress and Calling Channel) while underway, except when transmitting or receiving traffic on other VHF-FM channels (e.g., vessels may switch to other channels to pass traffic, listen to weather reports, etc.) or when participating in and monitoring a VTS channel. While not required to have a VHF-FM radio onboard (Voluntary Ship Stations), vessels not subject to the bridge-to-bridge regulations must maintain a watch on

Channel 16 whenever the radio, if onboard, is operating (i.e., energized) and is not being used to communicate on other channels.

B. Notification of the USCG: Prior to commencement of work on this Contract, the Contractor shall notify the Commander, First USCG Aids to Navigation Office (617) 223-8355 and Department of Homeland Security, USCG Sector Southeastern New England of intended location of operations and estimated duration and request that it be published in the Local Notice to Mariners (LNM). This notification must be given in sufficient time so that it appears in the Notice to Mariners at least two weeks prior to the commencement of Work.

1. The LNM form can be downloaded here:
   a. https://www.navcen.uscg.gov/
2. The completed form is to be emailed to the following USCG Sectors:
   a. SENEWWM@uscg.mil
   b. D1lnm@uscg.mil

3.17 INSPECTION

A. The work will be conducted monitored by the Engineer and will be subject to inspection by an appointed inspector(s) to ensure strict compliance with the specifications. Portable lighting shall be provided upon request of the Engineer for more detailed inspection of potential trouble areas.

B. The Engineer will direct suspension of operations at any unit of work where the Contractor upon request does not correct a safety hazard which is so grave as to endanger life, limb, or property or cause serious damage to the work. This includes but is not limited to a failure on the part of the Contractor to have a full-time quality control person present and fully alert and awake on project site at all times when operations are in progress.

C. The Engineer will direct the maintenance of the navigation system, gauges, ranges, location marks and limit marks in proper order and position; but the presence of the Engineer shall not relieve the Contractor of responsibility for the proper execution of the work in accordance with the specifications. The Contractor shall be required:

1. To furnish, on the request of the Engineer, the use of such boats, boatmen, laborers, and material forming a part of the ordinary and usual equipment and crew of the dredging plant as may be reasonably necessary in inspecting the work.

2. To furnish, at the request of the Engineer, suitable transportation from all points on shore designated by the Engineer to and from the various pieces of plant, and to and from the disposal site.

## 3.18 UNDERWATER DIVING OPERATIONS

A. In the event that underwater diving operations become necessary due to the work of this Contract, such operations shall be conducted by personnel qualified by training and experience, in accordance with all applicable safety regulations including OSHA Standards 29 CFR 1910.

## 3.19 FINAL EXAMINATION AND ACCEPTANCE

A. Final examination and acceptance of Work shall be made in accordance with the provisions cited in Section 01 71 23, Field Engineering.

B. Final cleanup shall include the removal of all the Contractor's plant and equipment either for disposal or reuse. Plant, equipment, and materials to be disposed of shall only be disposed of in a manner and at locations approved by the Owner's Representative. The Contractor will not be permitted to abandon any equipment in the disposal area or other areas adjacent to the work site.

## 3.20 NON-COMPLIANCE

A. The Engineer will notify the Contractor in writing of any non-compliance with the foregoing provisions. Such notice, when delivered to the Contractor or an authorized representative at the site of the work, shall be deemed sufficient for the purpose. Within 24 hours after receipt of such notice, the Contractor shall mail, or personally deliver to the Engineer, a complete proposal of the prompt correction of the noncompliance. The Engineer will review the proposal and return it to the Contractor approved, subject to such changes or conditions as the Engineer finds necessary to ensure correction of noncompliance. Immediately upon receipt of such approval, the Contractor shall begin the corrective work and shall carry it to completion. If the Contractor fails or refuses to submit a proposal or to proceed with the corrective work, the Engineer may suspend all or any part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such suspension shall be made the subject of a claim for extension of time, nor for excess costs or damages by the Contractor. If so elected, the Engineer may cause the corrective work to be accomplished by others, in which the cost thereof shall be chargeable against any monies otherwise due to the Contractor from the Owner.

END OF SECTION

# SECTION 35 59 13.16

# MARINE FENDERS

## PART 1 - GENERAL

### 1.1 DESCRIPTION

The work under this section includes the furnishing of all labor, materials, tools, equipment, and services necessary to provide and install the fender systems as shown on the Contract Drawings.

### 1.2 QUALITY ASSURANCE

A. Use adequate number of skilled work men and women who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this section.

B. Performance curves: Submit certified performance curves for each different fender supplied.

C. Certifications: Submit certified test report or certificates of conformance or compliance, furnished by the manufacturer's testing laboratory or independent testing agency, attesting that each product or material furnished under this specification meets the requirements herein:

1. Rubber compound
2. Steel
3. UHMW Polyethylene
4. Galvanizing
5. Individual chain assembly components
6. Panel protective coating

### 1.3 SUBMITTALS

Submit:

A. Sufficient technical data to demonstrate compliance with the specified requirements; Certificates of compliance and shop drawings will be required for all materials entering the final work.

B. Complete shop drawings detailing all members, profiles, sizes, spacing, connections, holes, openings, fasteners, and similar data. Erection plans shall depict the location and field connection of all members. Identify members by piece numbers that correspond to erection numbers.

Structural steel connection details not specifically shown in the Contract Documents shall be detailed by the Contractor and included with shop drawing submittals.

C. Submit manufacturer's certifications showing that the products meet or exceed the required standards for the following items:

1. Rubber fenders
2. Steel fender panel

1.4 PRODUCT HANDLING

Delivery and storage:

A. Deliver materials to the job site properly marked to identify the location for which they are intended.

B. Use markings corresponding to markings shown on the reviewed shop drawings.

C. Store in a manner to maintain identification and prevent damage, off the ground, using pallets or other supports, and to permit easy access for inspection.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fender System: The system shall consist of one or more molded rubber fender elements, attached frontal panels(s) and any necessary chains.

1. Rubber Fender Elements: Elements shall be molded of rubber, homogeneous and free from any defects, impurities, pores, or cracks, bonded to integral, steel-mounting plates.

2. Fender Element Rubber: The rubber from which the elements are molded shall be natural or synthetic conforming to one of the following ASTM D2000 line callouts:

3BA 720 $A_{14}$, $B_{13}$, $C_{12}$, $EA_{14}$, $F_{17}$

3BA 620 $A_{14}$, $B_{13}$, $C_{12}$, $EA_{14}$, $F_{17}$

3. Fender Element Steel: The integral steel mounting flanges shall be of ASTM A36, or stronger, steel.

B. Frontal Panels: Attached frontal panel(s) shall consist of a steel structure, capable of absorbing all design berthing and mooring loads, with a low-friction, wear-resistant protecting facing. The frontal panel(s) shall be large enough to exert a hull pressure not to exceed 6.1 kips/sq-ft under maximum rated system reaction.

1. Frontal Panel Steel Structure: Frontal panel(s) shall be constructed of ASTM A36, or stronger, steel. Minimum steel thickness shall be 3/8 inch if only one side is exposed and 1/2 inch if both sides are exposed. The panels designs shall be

consistent with the latest edition of the AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings as set forth in Part 16 of the AISC Manual of Steel Construction. All welding shall be in accordance with the latest edition of AWS D1.1, and exposed welds shall be continuous and watertight.

2. Frontal Panel Protective Coating: Frontal panels shall be blast cleaned in accordance with SSPC-SP10 and coated with one or more coats as recommended by the coating system manufacturer, of a protective system designed for prolonged exposure to splash zone marine use. Coatings shall be prepared and applied according to their manufacturer's written instructions. The finish coat shall be free of sags, voids, and orange peel and resistant to impact and abrasion. Minimum acceptable rated adhesion strength of the coating system is 800 psi.

3. Frontal Panel Protective Facing: Protective facings shall have a minimum wear thickness of 1/2 inch and be made of UHMW polyethylene with 2-1/2% by weight UV-stabilization compound and having UV-stabilized dyes, conforming to the following specifications:

| Property | Test Method | Acceptance Requirement |
|---|---|---|
| Molecular Weight | | 3.0 million, min. |
| Ultimate tensile strength | ASTM D638 | 4,000 psi, min. |
| Izod impact, double notch | ASTM D256A | 18 ft. lbs/in., min. |
| Abrasion wear (carbon Steel = 100) | Sand Slurry | 18 max. |
| Water absorption | ASTM D570 | Nil |
| Coefficient of friction | ASTM C1894 | .20 max. |

Protective facing shall be attached to the frontal panel(s) with hardware having at least a 5/8" contact diameter and at least 1/2" thickness under the bolt heads/nuts. Individual protective facing panels shall be chamfered at least 3/4" x 45° on all 4 sides.

C. Chain Assemblies: Chains shall be provided as necessary for proper functioning of the system within the constraints of the specification. Each shall be selected to withstand its maximum design load with a minimum factor of safety, based on breaking, of three, but with a stock size of not less than 0.50 inches. All chain assembly components shall be galvanized per ASTM A123 or A153, as applicable. Chain brackets shall be sized and located by the fender manufacturer.

D. Fender Element Attaching Bolts: Bolts, nuts, and washers for attaching fenders to the contact panel(s), to steel structures and to embedded anchor sleeves shall be of size and quantity recommended by fender manufacturer. Bolts shall be A307, galvanized per ASTM A153 or B695. Nuts shall be ASTM A563, grade A heavy hex, galvanized per ASTM A153 or B695. Washers shall be per ANSI B18.22.1 of carbon steel, galvanized per ASTM A153 or B695.

## PART 3 - EXECUTION (NOT USED)

END OF SECTION

## ATTACHMENT 3: PREVAILING WAGE RATES

## ATTACHMENT 4: CONTRACT DRAWINGS

IFB DRAWINGS

(NOT FOR CONSTRUCTION)

# NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)
# PHASE 3 BULKHEAD REPLACEMENT PROJECT (SITE 4)

## NEW BEDFORD, MA
## NOVEMBER 10, 2025


**OWNER/APPLICANT**

MASSACHUSETTS CLEAN ENERGY
TECHNOLOGY CENTER
63 FRANKLIN STREET
3RD FLOOR
BOSTON, MA 02110

**PROGRAM MANAGER & MARINE STRUCTURAL ENGINEERING**

FOTH INFRASTRUCTURE &
ENVIRONMENT, LLC
15 CREEK ROAD
MARION, MA 02738
PH: (508) 748-0937
FX: (800) 668-3220

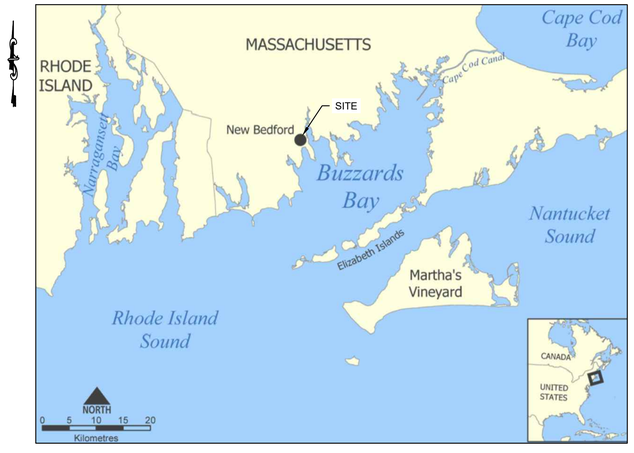
DOUGLAS ERNST
MASSCEC PROGRAM MANAGER
PH: (515) 251-2585
CELL: (515) 491-8852

**CATHODIC PROTECTION SPECIALIST**

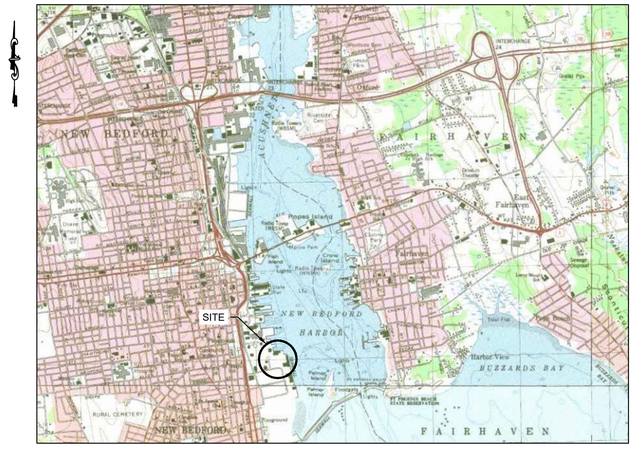
MASTEC PROFESSIONAL SERVICES
40 FEDERAL HILL RD
OXFORD, MA 01540

JOHN CONTILLO, JR
SENIOR CORROSION ENGINEER
PH: (401) 300-7910


THE FOLLOWING CURRENT EDITION STANDARD SPECIFICATIONS SHALL APPLY TO CONSTRUCTION ON THIS PROJECT: CITY OF NEW BEDFORD - DEPARTMENT OF PUBLIC INFRASTRUCTURE CONSTRUCTION STANDARDS AND SPECIFICATIONS (GOVERNING) AND MASSDOT STANDARD SPECIFICATIONS INCLUDING CONSTRUCTION & MATERIALS MANUALS (SECONDARY WHERE APPLICABLE).




VICINITY MAP
NOT TO SCALE




LOCATION MAP
NOT TO SCALE

811 Know what's below. Call 811 before you dig.

| PROFESSIONAL SEAL | PROFESSIONAL SEAL | PROFESSIONAL SEAL |
|---|---|---|
| PROFESSIONAL RESPONSIBLE FOR G, C, CG, MR AND SR | PROFESSIONAL RESPONSIBLE FOR MR AND SR | PROFESSIONAL RESPONSIBLE FOR MD |
| ENGINEER OF RECORD (PRIMARY STRUCTURAL) | ENGINEER OF RECORD (SECONDARY STRUCTURAL) | ENGINEER OF RECORD (DREDGING) |

SHEET TITLE:
COVER SHEET & SIGNATURE INDEX

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
G-001


Tuesday, November 11, 2025 12:43:16 AM
DWG Filename: 24m070.04 masscec_ front end.dwg Layout: g-001
DWG Folder Location: pw:\\foth-pw.bentley.com:foth-pw-01\Documents\Clients\MA Clean Energy\0024M070.04\CAD\Drawings\

## GENERAL SYMBOLS

| EXISTING | PROPOSED | |
|---|---|---|
| | | CONTOURS (MAJOR) |
| | | CONTOURS (MINOR) |
| | | CONDUIT |
| E | E | ELECTRIC |
| GAS | GAS | GAS |
| SS | SS | STORM SEWER (DRAINAGE) |
| SAN | SAN | SANITARY SEWER |
| W | W | WATER (POTABLE / IRRIGATION) |
| OHE | OHE | OVERHEAD UTILITY |
| FO | FO | FIBER OPTICS |
| COMM | COMM | COMMUNICATIONS |
| CA | CA | COMPRESSED AIR |
| | | LIMIT OF GRADING (DAYLIGHT) |
| | | EROSION CONTROL |
| | | FENCE |
| | | GUARDRAIL |
| | | ANNUAL HIGH TIDE LINE (AHTL) |
| | | MEAN HIGH WATER (MHW) |
| | | MEAN LOW WATER (MLW) |
| | | PROPERTY LINE |
| | | RESOURCE AREA |
| | | TREELINE |
| | | WATER SUPPLY |
| | | WELL |
| | | TREE CONIFEROUS |
| | | TREE DECIDUOUS |
| | | SHRUB |
| | | CONTROL POINT |
| | | BENCHMARK |
| | | SECTION CORNER |
| | | SOIL BORING |
| | | CLEANOUT |
| | | VALVE |
| | | WATER VALVE |
| | | GAS WELL |
| | | ABANDONED MONITORING WELL |
| | | MONITORING WELL |
| | | MONITORING WELL NEST |
| D | D | DRAIN MANHOLE |
| E | E | ELECTRIC MANHOLE |
| | | ELECTRIC CONTROL BOX |
| ET | ET | ELECTRIC TRANSFORMER |
| E | E | ELECTRIC METER |
| M | M | MISC MANHOLE |
| S | S | SEWER MANHOLE |
| W | W | WATER MANHOLE |
| C | C | COMMUNICATIONS MANHOLE |
| AC | AC | AC UNIT |
| VLT | VLT | VAULT |
| GM | GM | GAS METER |
| GG | GG | GAS GATE |
| WG | WG | WATER GATE |
| | | HYDRANT |
| | | UTILITY POLE |
| HH | HH | HANDHOLE |
| | | LIGHT POLE |
| TC | TC | TRASH CAN |
| MP | MP | METAL POST |
| PM | PM | PARKING METER |
| | | PILE (TIMBER OR STEEL) |
| | | SHEET PILE |
| | | W BEAM |

NOTE: NOT ALL LEGEND ENTRIES SHOWN ABOVE ARE UTILIZED IN THE PLAN SET.

## GENERAL SYMBOLS (CONT)

| EXISTING | PROPOSED | |
|---|---|---|
| | | TRAFFIC SIGN |
| | | DRAINAGE ARROW |
| | | HANDICAP SYMBOL |
| | | CATCH BASIN |
| | | INLET (CIRCULAR) |
| | | CURB INLET |
| | | SEWER CLEANOUT |
| | | WETLAND SYMBOL |
| | | TREE |

## HATCHING

| EXISTING | PROPOSED | |
|---|---|---|
| | | CONCRETE |
| | | GRAVEL |
| | | SAND |
| | | FILL/GROUND SURFACE |
| | | RIP RAP |
| | | STAGING AREA |
| | | WETLAND |
| | | DEMOLITION |
| | | SITE RESTORATION |

## CONVENTIONAL SIGNS

| | |
|---|---|
| A / 9 | CROSS SECTION SITE PLAN CALLOUT |
| A / 9 SECTION / DETAIL TITLE SCALE: 1" = 10' | SECTION / DETAIL LABEL |
| MATCH LINE | MATCHLINE |
| | SLOPE LABEL |
| | WATER LEVEL |
| N | NORTH ARROW |
| EBB / FLOOD | TIDAL FLOW DIRECTION |

| SHEET NUMBER | DRAWING NUMBER | SHEET TITLE | OWNER |
|---|---|---|---|
| | | **GENERAL DRAWINGS (G-SERIES)** | |
| 1 | G-001 | COVER SHEET & SIGNATURE INDEX | FOTH/MSALEHI |
| 2 | G-002 | LEGEND, ABBREVIATIONS, & DRAWING INDEX | FOTH/MSALEHI |
| 3 | G-003 | KEY MAP | FOTH/MSALEHI |
| 4 | G-004 | TERMINAL SURVEY CONTROL PLAN | FOTH/MSALEHI |
| 5 | G-005 | GENERAL NOTES (CIVIL INFRASTRUCTURE) | FOTH/MSALEHI |
| 6 | G-006 | GENERAL NOTES (MARINE INFRASTRUCTURE, 1 OF 2) | FOTH/MSALEHI |
| 7 | G-007 | GENERAL NOTES (MARINE INFRASTRUCTURE, 2 OF 2) | FOTH/MSALEHI |
| 8 | G-008 | CONSTRUCTION SEQUENCING & ACCESS CONTROL PLAN | FOTH/MSALEHI |
| | | **CIVIL DRAWINGS, UPLAND INFRASTRUCTURE (C-SERIES)** | |
| 9 | C-100 | SITE CIVIL UTILITY PLAN | FOTH/MSALEHI |
| 10 | C-101 | SITE CIVIL GRADING PLAN | FOTH/MSALEHI |
| 11 | C-300 | SITE CIVIL SECTIONS 1 OF 3 | FOTH/MSALEHI |
| 12 | C-301 | SITE CIVIL SECTIONS 2 OF 3 | FOTH/MSALEHI |
| 13 | C-302 | SITE CIVIL SECTIONS 3 OF 3 | FOTH/MSALEHI |
| 14 | C-500 | SITE CIVIL DETAILS | FOTH/MSALEHI |
| | | **CIVIL DRAWINGS, CATHODIC PROTECTION (CP-SERIES)** | |
| 15 | CP001 | CATHODIC PROTECTION SYSTEM PLAN | MASTEC/CONTILLO |
| 16 | CP002 | CATHODIC PROTECTION SYSTEM DETAILS | MASTEC/CONTILLO |
| 17 | CP003 | CATHODIC PROTECTION SYSTEM SECTION | MASTEC/CONTILLO |
| | | **DREDGE DRAWINGS, MARINE INFRASTRUCTURE (MD-SERIES)** | |
| 18 | MD101 | DREDGE PLAN | FOTH/MCAMPAGNONE |
| 19 | MD102 | DREDGE PLAN | FOTH/MCAMPAGNONE |
| 20 | MD103 | EX. SECTION WITH EXCAVATION LIMITS | FOTH/MCAMPAGNONE |
| 21 | MD104 | CAD CELL NO. 3 DISPOSAL PLAN | FOTH/MCAMPAGNONE |
| | | **STRUCTURAL DRAWINGS, CAST-IN-PLACE CONCRETE PLATFORM (MR-SERIES)** | |
| 22 | MR001 | EXISTING CONDITIONS PLAN (BULKHEAD) | FOTH/MSALEHI |
| 23 | MR002 | GEOTECHNICAL REFERENCES | FOTH/MSALEHI |
| 24 | MR010 | CONSTRUCTION SEQUENCING - PHASE 1 PLAN | FOTH/MSALEHI |
| 25 | MR011 | CONSTRUCTION SEQUENCING - PHASE 2 PLAN | FOTH/MSALEHI |
| 26 | MR012 | CONSTRUCTION SEQUENCING - PHASE 3 PLAN | FOTH/MSALEHI |
| 27 | MR013 | CONSTRUCTION SEQUENCING - PHASE 4 PLAN | FOTH/MSALEHI |
| 28 | MR014 | CONSTRUCTION SEQUENCING - PHASE 5 PLAN | FOTH/MSALEHI |
| 29 | MR015 | CONSTRUCTION SEQUENCING - PHASE 6 PLAN | FOTH/MSALEHI |
| 30 | MR016 | CONSTRUCTION SEQUENCING - PHASE 7 PLAN | FOTH/MSALEHI |
| 31 | MR017 | CONSTRUCTION SEQUENCING - PHASE 8 PLAN | FOTH/MSALEHI |
| 32 | MR018 | CONSTRUCTION SEQUENCING - PHASE 9 PLAN | FOTH/MSALEHI |
| 33 | MR019 | CONSTRUCTION SEQUENCING - PHASE 10 PLAN | FOTH/MSALEHI |
| 34 | MR100 | MARINE INFRASTRUCTURE CONFIGURATION PLAN | FOTH/MSALEHI |
| 35 | MR101 | MARINE INFRASTRUCTURE PILE LAYOUT PLAN | FOTH/MSALEHI |
| 36 | MR102 | MARINE INFRASTRUCTURE PILE CAP LAYOUT PLAN | FOTH/MSALEHI |
| 37 | MR103 | MARINE INFRASTRUCTURE PRECAST PLANKS LAYOUT PLAN | FOTH/MSALEHI |
| 38 | MR300 | EX. SECTION WITH EXCAVATION EXTENTS AT CULVERT | FOTH/MSALEHI |
| 39 | MR301 | EX. SECTION WITH EXCAVATION EXTENTS | FOTH/MSALEHI |
| 40 | MR302 | EX. SECTION WITH EXCAVATION EXTENTS | FOTH/MSALEHI |
| 41 | MR303 | STRUCTURAL SECTION 1 OF 3 | FOTH/MSALEHI |
| 42 | MR304 | STRUCTURAL SECTION 2 OF 3 | FOTH/MSALEHI |
| 43 | MR305 | STRUCTURAL SECTION 3 OF 3 | FOTH/MSALEHI |
| 44 | MR500 | CAST-IN-PLACE CONCRETE PLATFORM DETAIL 1 OF 4 | FOTH/MSALEHI |
| 45 | MR501 | CAST-IN-PLACE CONCRETE PLATFORM DETAIL 2 OF 4 | FOTH/MSALEHI |
| 46 | MR502 | CAST-IN-PLACE CONCRETE PLATFORM DETAIL 3 OF 4 | FOTH/MSALEHI |
| 47 | MR503 | CAST-IN-PLACE CONCRETE PLATFORM DETAIL 4 OF 4 | FOTH/MSALEHI |
| 48 | MR504 | UTILITY TRENCH DETAILS | FOTH/MSALEHI |
| 49 | MR505 | FENDER DETAILS | FOTH/MSALEHI |
| 50 | MR506 | BOLLARD DETAILS | FOTH/MSALEHI |
| 51 | MR507 | LADDER DETAILS | FOTH/MSALEHI |
| 52 | MR508 | PRECAST PILE CAP DETAIL 1 OF 6 | FOTH/MSALEHI |
| 53 | MR509 | PRECAST PILE CAP DETAIL 2 OF 6 | FOTH/MSALEHI |
| 54 | MR510 | PRECAST PILE CAP DETAIL 3 OF 6 | FOTH/MSALEHI |
| 55 | MR511 | PRECAST PILE CAP DETAIL 4 OF 6 | FOTH/MSALEHI |
| 56 | MR512 | PRECAST PILE CAP DETAIL 5 OF 6 | FOTH/MSALEHI |
| 57 | MR513 | PRECAST PILE CAP DETAIL 6 OF 6 | FOTH/MSALEHI |
| 58 | MR514 | PRECAST PLANK DETAIL | FOTH/MSALEHI |
| 59 | MR515 | MAIN TERMINAL TO SHUSTER DETAILS | FOTH/MSALEHI |
| | | **STRUCTURAL DRAWINGS, UPLAND STORM STRUCTURES (S-SERIES)** | |
| 60 | S-001 | STORM MANHOLE DETAILS (NO. 6 NEW STRUCTURE) | FOTH/MSALEHI |
| 61 | S-002 | CONCRETE COLLAR DETAILS | FOTH/MSALEHI |
| | | **STRUCTURAL DRAWINGS, BULKHEAD REPLACEMENT (SR-SERIES)** | |
| 62 | SR100 | SHEETPILE BULKHEAD CONFIGURATION PLAN | FOTH/MSALEHI |
| 63 | SR101 | COMBI-WALL 72IN OUTFALL PLAN | FOTH/MSALEHI |
| 64 | SR102 | EAST-WEST BULKHEAD PLAN | FOTH/MSALEHI |
| 65 | SR103 | EAST-WEST BULKHEAD INDUSTRIAL GRATING PLAN | |
| 66 | SR300 | COMBI-WALL PROFILE | FOTH/MSALEHI |
| 67 | SR301 | COMBI-WALL SECTION | FOTH/MSALEHI |
| 68 | SR302 | COMBI-WALL OUTFALL SECTIONS | FOTH/MSALEHI |
| 69 | SR303 | EAST-WEST BULKHEAD SECTION | FOTH/MSALEHI |
| 70 | SR304 | EAST-WEST BULKHEAD SECTION | FOTH/MSALEHI |
| 71 | SR305 | EAST-WEST BULKHEAD SECTION | FOTH/MSALEHI |
| 72 | SR306 | NORTH BULKHEAD CLOSURE SECTION | FOTH/MSALEHI |
| 73 | SR307 | NORTH END SECTION | FOTH/MSALEHI |
| 74 | SR500 | COMBI-WALL DETAILS 1 OF 2 | FOTH/MSALEHI |
| 75 | SR501 | COMBI-WALL DETAILS 2 OF 2 | FOTH/MSALEHI |
| 76 | SR502 | EAST-WEST BULKHEAD DETAILS | FOTH/MSALEHI |
| 77 | SR503 | CONCRETE CLOSURE DETAILS | FOTH/MSALEHI |
| 78 | SR504 | CONCRETE RETAINING WALL | FOTH/MSALEHI |

## ABBREVIATIONS

| | |
|---|---|
| ABAN | ABANDON |
| ADJ | ADJUST |
| APPROX | APPROXIMATE |
| A.C. | ASPHALT CONCRETE |
| AHT | ANNUAL HIGH TIDE |
| ALT | ANNUAL LOW TIDE |
| BB | BORING |
| BIT | BITUMINOUS |
| BD | BOUND |
| BL | BASELINE |
| BLDG | BUILDING |
| BM | BENCH MARK |
| BO | BY OTHERS |
| BOS | BOTTOM OF SLOPE |
| BR | BRIDGE |
| CB | CATCH BASIN |
| CBCI | CATCH BASIN WITH CURB INLET |
| CC | CEMENT CONCRETE |
| CCB | CAPE COD BERM |
| CCM | CEMENT CONCRETE MASONRY |
| CEM | CEMENT |
| CI | CURB INLET |
| CI | CAST IRON |
| CLF | CHAIN LINK FENCE |
| CL | CENTERLINE |
| CMP | CORRUGATED METAL PIPE |
| CSP | CORRUGATED STEEL PIPE |
| CO | CLEANOUT |
| CONC | CONCRETE |
| CONT | CONTINUED |
| CONST | CONSTRUCTION |
| CP | CONTROL POINT |
| CY | CUBIC YARD |
| D | DIAMETER |
| Ø | DIAMETER |
| DI | DUCTILE IRON |
| DWY | DRIVEWAY |
| EB | EASTBOUND |
| ELEV | ELEVATION |
| EL. | ELEVATION |
| EMB | EMBANKMENT |
| EOP | EDGE OF PAVEMENT |
| EXIST | EXISTING |
| EX | EXISTING |
| EXC | EXCAVATION |
| F&C | FRAME AND COVER |
| F&G | FRAME AND GRATE |
| FDN | FOUNDATION |
| FES | FLARED END SECTION |
| FT | FOOT |
| GALV | GALVANIZED |
| GAR | GARAGE |

## ABBREVIATIONS (CONT)

| | |
|---|---|
| GCL | GEOSYNTHETIC CLAY LINER |
| GD | GROUND |
| GG | GAS GATE |
| GI | GUTTER INLET |
| GIP | GALVANIZED IRON PIPE |
| GRAN | GRANITE |
| GRAV | GRAVEL |
| GRD | GUARD |
| GW | GAS WELL |
| HDPE | HIGH DENSITY POLYETHYLENE |
| HDW | HEADWALL |
| HMA | HOT MIX ASPHALT |
| HOR | HORIZONTAL |
| HYD | HYDRANT |
| ID | INSIDE DIAMETER |
| IN | INCH |
| INV | INVERT |
| JCT | JUNCTION |
| KSI | KIPS PER SQUARE INCH |
| L | LENGTH |
| LLDPE | LINEAR LOW DENSITY POLYETHYLENE |
| LB | LEACHING BASIN |
| LHW | LEACHATE HEAD WELL |
| LP | LIGHT POLE |
| LT | LEFT |
| LWD | LOW WATER DATUM |
| LYS | LYSIMETER |
| MAX | MAXIMUM |
| MB | MAIL BOX |
| MH | MANHOLE |
| MHW | MEAN HIGH WATER |
| MHHW | MEAN HIGHER HIGH WATER |
| MIN | MINIMUM |
| MISC | MISCELLANEOUS |
| MLW | MEAN LOW WATER |
| MLLW | MEAN LOWER LOW WATER |
| MW | MONITORING WELL |
| NB | NORTHBOUND |
| NIC | NOT IN CONTRACT |
| NO. | NUMBER |
| NTS | NOT-TO-SCALE |
| OD | OUTSIDE DIAMETER |
| OHWM | ORDINARY HIGH WATER MARK |
| PERM | PERMANENT |
| ± | PLUS OR MINUS |
| PC | POINT OF CURVATURE |
| PGL | PROFILE GRADE LINE |
| PROJ | PROJECT |
| PROP | PROPOSED |
| PSB | PLANTABLE SOIL BORROW |
| PSI | POUNDS PER SQUARE INCH |

## ABBREVIATIONS (CONT)

| | |
|---|---|
| PUE | PUBLIC UTILITY EASEMENT |
| PVC | POLYVINYL CHLORIDE |
| PVMT | PAVEMENT |
| PW | PRIVATE WELL |
| PWW | PAVED WATER WAY |
| R | RADIUS |
| R&D | REMOVE AND DISPOSE |
| RCP | REINFORCED CONCRETE PIPE |
| RD | ROAD |
| RDWY | ROADWAY |
| REM | REMOVE |
| RET | RETAIN |
| RET | WALL RETAINING WALL |
| ROW | RIGHT-OF-WAY |
| RR | RAILROAD |
| R&R | REMOVE AND RESET |
| R&S | REMOVE AND STACK |
| RT | RIGHT |
| SB | SOUTHBOUND |
| SDR | STANDARD DIMENSION RATIO |
| SF | SQUARE FOOT |
| SGC | SLOPED GRANITE CURB |
| SHLD | SHOULDER |
| SMH | SEWER MANHOLE |
| SS | STAINLESS STEEL |
| SSR | SIDE SLOPE RISER |
| ST | STREET |
| STA | STATION |
| STN | STONE |
| SW | SIDEWALK |
| TAN | TANGENT |
| TEMP | TEMPORARY |
| TC | TOP OF CURB |
| TOS | TOP OF SLOPE |
| TYP | TYPICAL |
| UP | UTILITY POLE |
| VAR | VARIES |
| VERT | VERTICAL |
| VC | VERTICAL CURVE |
| VGC | VERTICAL GRANITE CURB |
| VIF | VERIFY IN FIELD |
| WCR | WHEELCHAIR RAMP |
| WG | WATER GATE |
| WIP | WROUGHT IRON PIPE |
| WM | WATER METER/WATER MAIN |
| X-SECT | CROSS SECTION |

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT (SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

SHEET TITLE:
LEGEND, ABBREVIATIONS, & DRAWING INDEX

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
G-002

Tuesday, November 11, 2025 3:01:35 PM
DWG Filename: 24m070.04 masscec bulkhead sections.dwg Layout: g-002
DWG Folder Location: PW:\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

MACARTHUR DR

WRIGHT ST

**SITE 1**
(TERMINAL HEAVY-LIFT EXPANSION)
54 WRIGHT STREET 18 WRIGHT STREET
N.I.C

**SITE 3**
(TERMINAL HEAVY-LIFT EXPANSION)
4 WRIGHT STREET

**SITE 4**
(BULKHEAD REPLACEMENT)

POTOMSKA ST

(OFFICE
350 S. FRONT STREET)

**SITE 2**
(FUTURE OFFICE/WAREHOUSE EXPANSION)

(360-382 SOUTH FRONT STREET)
N.I.C

RADIO TOWER

LIGHT INDUSTRIAL TERMINAL ACCESS
(FUTURE GATE NO. 2)

**MASSACHUSETTS CLEAN ENERGY CENTER**
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**

APPROX. PROPERTY LINE
(TYP)

APPROX. NEW BEDFORD MARINE
COMMERCE TERMINAL BOUNDARY

ACUSHNET RIVER

EBB
FLOOD

JFK MEMORIAL HWY

S. FRONT ST

BLACKMER ST

BLACKMER ST

N

MAD 83

GRAPHIC SCALE
0 35 70 140
(IN FEET)
1 INCH = 70 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE**
**COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
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DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

SHEET TITLE:

KEY MAP

ISSUANCE:

**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER

G-003

Tuesday, November 11, 2025 12:43:25 AM
DWG Filename: 24m070.04 masscec_front end.dwg Layout: g-003
DWG Folder Location: PW:\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

NOTES:
1. SURVEY CONTROL ESTABLISHED BY NITSCH ENGINEERING IN JULY 2025 (MARK VIOLETTE, PLS).
2. THIS SURVEY IS REFERENCED HORIZONTALLY TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, MAINLAND ZONE, NAD83 (2011) EPOCH 2010.00, U.S. SURVEY FOOT, DERIVED FROM RTK OBSERVATIONS WITH CORRECTIONS PROVIDED BY MACORS NETWORK.
3. ELEVATIONS ARE IN U.S. SURVEY FEET AND REFER TO MEAN LOW LOWER WATER (MLLW) VERTICAL DATUM BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008. SEE DATUM CONVERSION CHART.

MACARTHUR DR
77 WRIGHT STREET
33 WRIGHT STREET
25 WRIGHT STREET
11 HASSEY STREET
6 HASSEY STREET
WRIGHT ST
CP #1
CP #2
CP #3
CP #4
CP #5
CP #6
CP #7
CP #8
CP #9
CP #10
CP #11
CP #12
CP #13
CP #14
CP #15
CP #16
CP #17
CP #18
CP #19
CP #20
CP #21
CP #22
CP #23
CP #24
CP #25
CP #26
CP #27
CP #28
TBM 2
CHISEL SQUARE SET IN CONCRETE BASE OF LIGHT POLE
ELEV.=12.29 (MLLW)
TBM: PH 3-1
CHISEL SQUARE IN CONCRETE CURB
EL.=10.91' (MLLW)
TBM: PH 3-2
X-CUT IN HYDRANT BONNET BOLT
EL.=14.5' (MLLW)
49 POTOMSKA STREET
80 WRIGHT STREET
54 WRIGHT STREET
18 WRIGHT STREET
4 WRIGHT STREET
POTOMSKA ST
350 S FRONT STREET
SS MACARTHUR DR
360-382 S FRONT STREET
ES R S FRONT STREET
JFK MEMORIAL HWY
S. FRONT ST
89 BLACKMER STREET
43 BLACKMER STREET
NS BLACKMER STREET
NE BLACKMER STREET
ES BLACKMER STREET
BLACKMER ST
APPROX. PROPERTY LINE (TYP)
APPROX. NEW BEDFORD MARINE COMMERCE TERMINAL BOUNDARY
ACUSHNET RIVER
EBB
FLOOD
N
NAD 83
GRAPHIC SCALE
0 35 70 140
(IN FEET)
1 INCH = 70 FEET

| Point Table (MLLW) | | | | |
|---|---|---|---|---|
| Point # | Raw Description | Elevation | Northing | Easting |
| 1 | TRAV MAG SET | 12.043 | 2688660.6264 | 815725.0790 |
| 2 | TRAV MAG SET | 9.996 | 2688589.4772 | 815300.5261 |
| 3 | TRAV DH SET | 12.246 | 2688767.9335 | 815865.9465 |
| 4 | TRAV DH SET | 11.176 | 2688471.8035 | 814903.0474 |
| 5 | TRAV DH FOUND | 11.137 | 2688243.8847 | 814944.6603 |
| 6 | TRAV MAG FOUND | 9.885 | 2688145.5538 | 814723.9728 |
| 7 | TRAV DH SET | 12.357 | 2687738.2546 | 814859.4343 |
| 8 | TRAV DH SET | 12.963 | 2687582.3365 | 814813.6090 |
| 9 | TRAV DH SET | 13.818 | 2687368.1727 | 814892.0366 |
| 10 | TRAV DH SET | 10.033 | 2687400.3847 | 815197.9841 |

| Point Table (MLLW) | | | | |
|---|---|---|---|---|
| Point # | Raw Description | Elevation | Northing | Easting |
| 11 | TRAV DH | 7.950 | 2687465.1760 | 815480.7420 |
| 12 | TRAV DH SET | 9.936 | 2687519.1251 | 815691.4736 |
| 13 | TRAV MAG SET | 8.703 | 2687939.9259 | 815603.5925 |
| 14 | TRAV DH | 10.843 | 2688589.1940 | 815474.0585 |
| 15 | TRAV SN SET | 10.619 | 2687617.7837 | 815740.0827 |
| 16 | TRAV MAG SET | 10.641 | 2687627.2205 | 815923.6869 |
| 17 | TRAV MAG SET | 10.496 | 2687675.4204 | 816025.8857 |
| 18 | TRAV MAG | 10.235 | 2687622.4696 | 816043.2734 |
| 19 | TRAV MAG | 11.057 | 2687528.9894 | 816323.0034 |
| 20 | TRAV HT | 10.780 | 2687454.8926 | 816351.7176 |

| Point Table (MLLW) | | | | |
|---|---|---|---|---|
| Point # | Raw Description | Elevation | Northing | Easting |
| 21 | TRAV DH SET | 13.485 | 2687536.0770 | 816476.1913 |
| 22 | TRAV DH SET BULKHEAD | 13.133 | 2687624.0033 | 816486.5072 |
| 23 | TRAV MAG SET | 11.806 | 2688579.8987 | 815747.4683 |
| 24 | TRAV MAG SET | 9.430 | 2688485.6948 | 815734.5723 |
| 25 | TRAV MAG SET | 10.324 | 2688632.8218 | 816021.5146 |
| 26 | TRAV MAG SET | 8.182 | 2688690.6201 | 816180.0273 |
| 27 | TRAV DISC FND SEAWALL | 13.106 | 2688526.2828 | 816252.9681 |
| 28 | TRAV TARGET FND ON SEAWALL | 13.152 | 2688156.3553 | 816348.2352 |

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

| REVISIONS | | | |
|---|---|---|---|
| NO | BY | DATE | DESCRIPTION |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

SHEET TITLE:
TERMINAL SURVEY CONTROL PLAN

ISSUANCE:
IFB DRAWINGS
(11/10/2025)

PROJECT NO: 0024M070.04

SHEET NUMBER
G-004

Tuesday, November 11, 2025 12:43:30 AM
DWG Filename: 24m070.04 masscec_front end.dwg Layout: g-004
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

## GENERAL NOTES

1. EXISTING CONDITIONS AS DEPICTED ON THESE PLANS ARE GENERAL AND ILLUSTRATIVE IN NATURE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO EXAMINE THE SITE AND BE FAMILIAR WITH EXISTING CONDITIONS PRIOR TO BIDDING ON THIS PROJECT. IF CONDITIONS ENCOUNTERED DURING EXAMINATION ARE SIGNIFICANTLY DIFFERENT FROM THOSE SHOWN, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.

2. THE SUBJECT PROPERTY IS LOCATED IN SPECIAL FLOOD HAZARD AREAS WITHOUT BASE FLOOD ELEVATION (BFE); AND "OTHER FLOOD AREAS" FLOOD "ZONE X" (AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD BASED ON THE FLOOD INSURANCE RATE MAP, MAP NO. 25005C0481G, WITH A MAP REVISED DATE OF JULY 16, 2014.

3. THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL EXISTING UTILITIES (INCLUDING THOSE LABELED PER RECORD DATA) PRIOR TO THE BEGINNING OF CONSTRUCTION OR EARTH MOVING OPERATIONS. INFORM ENGINEER OF ANY CONFLICTS DETRIMENTAL TO THE DESIGN INTENT.

4. THE CONTRACTOR SHALL CALL DIGSAFE AT 1-800-322-4844 AT LEAST 72 HOURS, SATURDAYS, SUNDAYS, AND HOLIDAYS EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. A COPY OF THE DIGSAFE PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER AND ENGINEER PRIOR TO EXCAVATION.

5. THE CONTRACTOR AND SUBCONTRACTORS SHALL BE RESPONSIBLE FOR COMPLYING WITH APPLICABLE FEDERAL, STATE AND LOCAL REQUIREMENTS, TOGETHER WITH EXERCISING PRECAUTIONS AT ALL TIMES FOR THE PROTECTION OF PERSONS (INCLUDING EMPLOYEES) AND PROPERTY. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SUBCONTRACTORS TO INITIATE, MAINTAIN AND SUPERVISE ALL SAFETY REQUIREMENTS, PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK.

6. THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE OWNER AND OWNER'S REPRESENTATIVE FOR ANY AND ALL INJURIES AND/OR DAMAGES TO PERSONNEL, EQUIPMENT AND/OR EXISTING FACILITIES OCCURRING IN THE COURSE OF THE DEMOLITION AND CONSTRUCTION DESCRIBED IN THE PLANS AND SPECIFICATIONS.

7. CONTRACTOR SHALL OBTAIN A PERMIT FOR ALL CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH LOCAL, STATE, & FEDERAL REGULATIONS.

8. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL CODES, OBTAIN ALL APPLICABLE PERMITS, AND PAY ALL REQUIRED FEES PRIOR TO BEGINNING WORK.

9. ANY WORK PERFORMED IN RIGHT OF WAYS SHALL BE IN ACCORDANCE WITH THE APPLICABLE LOCAL OR STATE REQUIREMENTS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THE NECESSARY PERMITS FOR THE WORK, SCHEDULE NECESSARY INSPECTIONS, AND PROVIDE THE NECESSARY TRAFFIC CONTROL MEASURES AND DEVICES, ETC., FOR WORK PERFORMED IN THE RIGHT OF WAYS.

10. THE CONTRACTOR IS TO PERFORM ALL INSPECTIONS AS REQUIRED BY THE UNITED STATES EPA FOR THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND FURNISH OWNERS REPRESENTATIVE WITH WRITTEN REPORTS.

11. CONTRACTOR SHALL IMPLEMENT ALL SOIL AND EROSION CONTROL PRACTICES IN ACCORDANCE WITH THE EROSION AND SEDIMENT CONTROL PLAN, STORM WATER POLLUTION PREVENTION PLAN AND STATE AND LOCAL REGULATIONS.

12. ALL GROUND SURFACE AREAS THAT HAVE BEEN EXPOSED OR LEFT BARE AS A RESULT OF CONSTRUCTION AND ARE TO FINAL GRADE AND ARE TO REMAIN SO, SHALL BE SEEDED AND MULCHED AS SOON AS PRACTICAL IN ACCORDANCE WITH SPECIFICATIONS. IF NO SPECIFICATIONS ARE SUPPLIED, USE STATE OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

13. ITEM NUMBERS REFER TO THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, AND ALL CONSTRUCTION WORK SHALL BE DONE ACCORDING TO SAID SPECIFICATIONS AND IN ACCORDANCE WITH APPLICABLE STANDARDS OF THE CITY OF NEW BEDFORD. WHEN IN CONFLICT, THE CITY OF NEW BEDFORD REQUIREMENTS SHALL PREVAIL.

14. ALL WORK PERFORMED BY THE CONTRACTOR SHALL CONFORM TO THE LATEST REGULATIONS OF THE AMERICANS WITH DISABILITIES ACT.

15. THE CONTRACTOR SHALL REFER TO OTHER PLANS WITHIN THIS CONSTRUCTION SET FOR OTHER PERTINENT INFORMATION. IT IS NOT THE ENGINEER'S INTENT THAT ANY SINGLE PLAN SHEET IN THIS SET OF DOCUMENTS FULLY DEPICTS ALL WORK ASSOCIATED WITH THE PROJECT.

16. BEFORE INSTALLATION OF STORM OR SANITARY SEWER, OR OTHER UTILITY, THE CONTRACTOR SHALL VERIFY ALL CROSSINGS, BY EXCAVATION WHERE NECESSARY, AND INFORM THE OWNER AND THE ENGINEER OF ANY CONFLICTS. THE ENGINEER WILL BE HELD HARMLESS IN THE EVENT HE IS NOT NOTIFIED OF DESIGN CONFLICTS PRIOR TO CONSTRUCTION.

17. ADJUST/RECONSTRUCT ALL EXISTING CASTINGS, CLEANOUTS, ETC. WITHIN PROJECT AREA TO GRADE AS REQUIRED.

18. CONTRACTOR TO REMOVE & REPLACE PAVEMENT AS SPECIFIED.

19. SITE SIGNAGE AND STRIPING SHALL BE IN ACCORDANCE WITH THE MASSACHUSETTS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

## DEMOLITION NOTES

1. ALL EXISTING ABOVE AND BELOW GROUND STRUCTURES WITHIN THE LIMITS OF CONSTRUCTION SHALL BE REMOVED UNLESS NOTED OTHERWISE WITHIN THIS CONSTRUCTION SET AND/OR PROJECT SPECIFICATIONS. THIS INCLUDES FOUNDATION SLABS, WALLS AND FOOTINGS. CAVITIES LEFT BY STRUCTURE REMOVAL SHALL BE BACKFILLED WITH SATISFACTORY MATERIALS AND COMPACTED TO THE GEOTECHNICAL ENGINEER'S RECOMMENDATION.

2. NO TREES SHALL BE REMOVED, NOR VEGETATION DISTURBED BEYOND THE LIMITS OF CONSTRUCTION WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.

3. TREE PROTECTION FENCING SHALL BE IN ACCORDANCE WITH THE DETAILED DRAWINGS. DO NOT OPERATE OR STORE EQUIPMENT, NOR HANDLE OR STORE MATERIALS WITHIN THE DRIP LINES OF THE TREES SHOWN TO REMAIN.

4. PROTECTION OF EXISTING TREES AND VEGETATION: PROTECT EXISTING TREES AND OTHER VEGETATION INDICATED TO REMAIN IN PLACE AGAINST UNNECESSARY CUTTING, BREAKING OR SKINNING OF ROOTS, SKINNING OR BRUISING OF BARK, SMOTHERING OF TREES BY STOCKPILING CONSTRUCTION MATERIALS OR EXCAVATED MATERIALS WITHIN DRIP LINE, EXCESS FOOT OR VEHICULAR TRAFFIC, OR PARKING OF VEHICLES WITHIN DRIP LINE. PROVIDE TEMPORARY GUARDS TO PROTECT TREES AND VEGETATION TO BE LEFT STANDING.

5. ALL DEMOLITION WASTE AND CONSTRUCTION DEBRIS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE DESIGNATED AND SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF OFFSITE IN A STATE APPROVED WASTE SITE AND IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS. TAKE CARE TO PROTECT UTILITIES THAT ARE TO REMAIN. REPAIR DAMAGE ACCORDING TO THE APPROPRIATE UTILITY COMPANY STANDARDS AND AT THE CONTRACTOR'S EXPENSE.

6. ALL UTILITY DISCONNECTION, REMOVAL, RELOCATION, CUTTING, CAPPING AND/OR ABANDONMENT SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANY / AGENCY OR THE CITY OF NEW BEDFORD.

7. THE BURNING OF CLEARED MATERIAL AND DEBRIS SHALL NOT BE ALLOWED UNLESS CONTRACTOR OBTAINS PRIOR WRITTEN AUTHORIZATION FROM THE LOCAL AUTHORITIES.

8. EROSION & SEDIMENT CONTROL MEASURES AROUND AREAS OF DEMOLITION SHALL BE PROPERLY INSTALLED AND FUNCTION PROPERLY PRIOR TO INITIATION OF DEMOLITION ACTIVITIES.

9. IF ASBESTOS OR HAZARDOUS MATERIALS ARE FOUND ON SITE, SUCH MATERIALS SHALL BE REMOVED BY A LICENSED HAZARDOUS MATERIALS CONTRACTOR. CONTRACTOR SHALL NOTIFY OWNER IMMEDIATELY IF HAZARDOUS MATERIALS ARE ENCOUNTERED.

10. CONTRACTOR SHALL ADHERE TO ALL LOCAL, STATE, FEDERAL AND OSHA REGULATIONS DURING ALL DEMOLITION ACTIVITIES.

11. CONTRACTOR SHALL PROTECT ALL CORNER PINS, MONUMENTS, PROPERTY CORNERS AND BENCHMARKS DURING DEMOLITION ACTIVITIES. IF DISTURBED, CONTRACTOR SHALL HAVE DISTURBED ITEMS RESET BY A LICENSED SURVEYOR AT NO ADDITIONAL COST TO THE OWNER.

12. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, STRUCTURES, AND FEATURES TO REMAIN. ANY ITEMS TO REMAIN THAT HAVE BEEN DISTURBED OR DAMAGED AS A RESULT OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT CONTRACTOR'S EXPENSE.

13. CONTRACTOR SHALL PROVIDE AND MAINTAIN TRAFFIC CONTROL MEASURES IN ACCORDANCE WITH STATE DEPARTMENT OF TRANSPORTATION REGULATIONS AND AS REQUIRED BY LOCAL AGENCIES WHEN WORKING IN AND/OR ALONG STREETS, ROADS, HIGHWAYS, ETC.. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN APPROVAL AND COORDINATE WITH LOCAL AND/OR STATE AGENCIES REGARDING THE NEED, EXTENT AND LIMITATIONS ASSOCIATED WITH INSTALLING AND MAINTAINING TRAFFIC CONTROL MEASURES.

14. THE CONTRACTOR SHALL PROVIDE NEAT, STRAIGHT, FULL DEPTH, SAW CUTS OF EXISTING PAVEMENT WHERE INDICATED ALONG LIMITS OF PAVEMENT DEMOLITION.

15. ALL UTILITY AND STRUCTURE REMOVAL, RELOCATION, CUTTING, CAPPING AND/OR ABANDONMENT SHALL BE COORDINATED AND PROPERLY DOCUMENTED BY A CERTIFIED PROFESSIONAL, WHEN APPLICABLE, WITH THE APPROPRIATE UTILITY COMPANY, MUNICIPALITY AND/OR AGENCY. DEMOLITION OF REGULATED ITEMS MAY INCLUDE, BUT ARE NOT LIMITED TO; WELLS, ASBESTOS, UNDER GROUND STORAGE TANKS, SEPTIC TANKS AND ELECTRIC TRANSFORMERS. DEMOLITION CONTRACTOR SHALL REFER TO ANY ENVIRONMENTAL STUDIES FOR DEMOLITION RECOMMENDATIONS AND GUIDANCE. AVAILABLE ENVIRONMENTAL STUDIES MAY INCLUDE, BUT ARE NOT LIMITED TO PHASE I ESA, PHASE II, WETLAND AND STREAM DELINEATION AND ASBESTOS ALL APPLICABLE ENVIRONMENTAL STUDIES SHALL BE MADE AVAILABLE UPON REQUEST.

16. ALL PAVEMENT, BASE COURSES, SIDEWALKS, CURBS, BUILDINGS, FOUNDATIONS, ETC., WITHIN THE AREA TO BE DEMOLISHED SHALL BE REMOVED TO FULL DEPTH. EXISTING BASE COURSE MATERIALS MAY BE WORKED INTO THE NEW PAVEMENT OR BUILDING SUBGRADE IF THE GRADATION, CONSISTENCY, COMPACTION, SUBGRADE CONDITION, ETC., ARE IN ACCORDANCE WITH THE SPECIFICATIONS AND RECOMMENDATIONS OF THE GEOTECHNICAL INVESTIGATION REPORT. BASE COURSE MATERIALS SHALL NOT BE WORKED INTO THE SUBGRADE AREAS TO RECEIVE LANDSCAPING.

17. THE CONTRACTOR SHALL USE SUITABLE METHODS TO CONTROL DUST AND DIRT CAUSED BY THE DEMOLITION ACTIVITIES.

## LAYOUT NOTES

1. THE CONTRACTOR SHALL CHECK EXISTING GRADES, DIMENSIONS, AND INVERTS IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING WORK.

2. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL EXISTING UTILITIES AND SHALL TAKE CARE TO PROTECT UTILITIES THAT ARE TO REMAIN. THE CONTRACTOR SHALL RELOCATE EXISTING UTILITIES AS INDICATED OR AS NECESSARY FOR CONSTRUCTION.

3. THE CONTRACTOR SHALL PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING PAVEMENT AND NEW PAVEMENT. FIELD ADJUSTMENT OF FINAL GRADES MAY BE NECESSARY. THE CONTRACTOR SHALL INSTALL ALL UTILITIES, INCLUDING IRRIGATION SLEEVING, PRIOR TO THE INSTALLATION OF PAVED SURFACES.

4. THE CONTRACTOR SHALL PROTECT ALL TREES TO REMAIN.

5. ALL DAMAGE TO EXISTING PAVEMENT TO REMAIN WHICH RESULTS FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED WITH EQUIVALENT MATERIALS AT THE CONTRACTOR'S EXPENSE.

6. SITE DIMENSIONS SHOWN ARE TO THE FACE OF CURB, EDGE OF PAVEMENT, OR DENSE GRADED GRAVEL UNLESS OTHERWISE NOTED.

7. COORDINATES ARE FOR BUILDING COLUMNS, EXTERIOR BUILDING WALLS, CENTER OF DRIVEWAYS, CENTER OF SANITARY SEWER MANHOLES, AND CENTER OF STRUCTURES PLACED SIX INCHES INSIDE FACE OF CURB FOR DRAIN INLETS, UNLESS OTHERWISE NOTED.

8. CONTRACTOR SHALL MAINTAIN ONE SET OF AS-BUILT / RECORD DRAWINGS ON-SITE DURING CONSTRUCTION FOR DISTRIBUTION TO THE OWNER AND/OR OWNER'S REPRESENTATIVE UPON COMPLETION.

9. REFER TO THE ARCHITECTURAL, PLUMBING & ELECTRICAL DRAWINGS FOR EXACT DIMENSIONS AND LOCATIONS OF UTILITY SERVICE ENTRY LOCATIONS AND PRECISE BUILDING DIMENSIONS.

10. THIS SITE LAYOUT IS SPECIFIC TO THE APPROVALS NECESSARY FOR THE CONSTRUCTION IN ACCORDANCE WITH THE CITY OF NEW BEDFORD. NO CHANGES TO THE SITE LAYOUT ARE ALLOWED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER. CHANGES MADE TO THE SITE LAYOUT WITHOUT APPROVAL IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR. CHANGES INCLUDE BUT ARE NOT LIMITED TO, INCREASED IMPERVIOUS PAVEMENT, ADDITION / DELETION OF PARKING SPACES, MOVEMENT OF CURB LINES, CHANGES TO DRAINAGE STRUCTURES AND PATTERNS, CHANGES TO LANDSCAPING, ETC.

## GRADING NOTES

1. ALL PROPOSED GRADES SHOWN ARE FINAL GRADES, TOP OF GROUND LEVEL, TOP OF PAVEMENT, OR GRATE ELEVATION AT THE DRAWDOWN POINT UNLESS NOTED OTHERWISE.

2. REFER TO AND FOLLOW THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT PREPARED FOR THIS PROJECT.

3. ALL FILL UNDER PAVEMENT OR DENSE GRADED GRAVEL (HEAVY LIFT) SHALL BE COMPACTED TO THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.

4. ALL ELEVATIONS SHOWN ARE FINISHED GRADE ELEVATIONS.

5. CONTRACTOR SHALL STRICTLY ADHERE TO THE EROSION & SEDIMENT CONTROL PLAN PREPARED FOR THIS PROJECT.

6. EARTHWORK SHALL INCLUDE CLEARING AND GRUBBING, STRIPPING AND STOCKPILING TOPSOIL, MASS GRADING, EXCAVATION, FILLING, UNDER CUT AND REPLACEMENT, IF REQUIRED, AND COMPACTION.

7. CONTRACTOR TO REFILL UNDERCUT AREAS WITH SUITABLE MATERIAL AND COMPACT AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.

8. CONTRACTOR TO PLACE TOPSOIL OVER THE SUBGRADE OF UNPAVED, DISTURBED AREAS TO A DEPTH INDICATED ON THE LANDSCAPE PLANS (6" MINIMUM).

9. ALL SLOPES IN NON-PAVED AREAS SHALL BE 3:1 (HORIZONTAL:VERTICAL) MAXIMUM UNLESS NOTED OTHERWISE.

10. ALL AREAS NOT PAVED OR DENSE GRADED GRAVEL SHALL BE STABILIZED IN ACCORDANCE WITH THE EROSION & SEDIMENT CONTROL PLAN, UNLESS NOTED OTHERWISE.

11. COMPACTED FILLS ARE TO BE MADE TO A MINIMUM OF THREE FEET ABOVE THE CROWN OF ANY PROPOSED SEWER PRIOR TO CUTTING OF TRENCHES FOR PLACEMENT OF SAID SEWERS. ALL FILLS SHALL BE CONTROLLED, COMPACTED, AND INSPECTED BY AN APPROVED TESTING LABORATORY OR AN INSPECTOR FROM THE APPROPRIATE GOVERNMENTAL AGENCY.

12. ALL EXCESS SOIL MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS NOTED OTHERWISE. EXCESS SOIL MATERIALS SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF OFFSITE AT NO ADDITIONAL COST TO THE OWNER IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS.

13. THE CONTRACTOR IS RESPONSIBLE FOR BALANCING THE SITE EARTHWORK BY IMPORTING OR EXPORTING AS NECESSARY TO ACHIEVE DESIGN GRADES AND SPECIFICATIONS.

## STORM DRAINAGE NOTES

1. DISTANCES SHOWN ON PIPING ARE HORIZONTAL DISTANCES FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE, UNLESS NOTED OTHERWISE.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE INSTALLATION, INSPECTION, TESTING AND FINAL ACCEPTANCE OF ALL NEW STORMWATER MANAGEMENT FACILITIES. CONTRACTOR SHALL COORDINATE WITH ALL APPLICABLE REGULATING AGENCIES CONCERNING INSTALLATION, INSPECTION AND APPROVAL OF THE STORM DRAINAGE SYSTEM CONSTRUCTION.

3. ALL STORMWATER MANAGEMENT FACILITIES, INCLUDING COLLECTION AND CONVEYANCE STRUCTURES, SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE LOCAL AND STATE CODES AND REGULATIONS.

4. ALL PROPOSED STORM SEWERS, SURFACE OR OTHER DRAINAGE FACILITIES WITHIN THE PROPERTY ARE TO BE PRIVATE AND MAINTAINED BY THE OWNER.

5. THE CONTRACTOR IS TO CONSTRUCT CURBS, CATCH BASINS, DOWNSPOUTS, PIPING AND CONNECTION ETC. AS REQUIRED TO CONVEY THE ROOF AND PAVED SURFACE DRAINAGE TO THE INFILTRATION CHAMBERS.

6. ALL CATCH BASINS AND MANHOLES WITH A DEPTH GREATER THAN 4' SHALL BE PROVIDED WITH STEPS SHALL MEET THE REQUIREMENTS OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.

7. STORM SEWER PIPE LABELED "ST" SHALL BE ONE OF THE FOLLOWING: PVC SDR-35, OR HIGH DENSITY POLYETHYLENE. HIGH DENSITY POLYETHYLENE (HDPE) SHALL NOT BE PERMITTED WITHIN THE CITY RIGHT OF WAY. ANY USE OF HDPE WITHIN PRIVATE PROPERTY MUST CHANGE IN MATERIAL PRIOR TO ENTERING CITY LAYOUT. STORM SEWER PIPE LABELED "RCP" SHALL BE REINFORCED CONCRETE PIPE. ALL STORM SEWER PIPE IS TO BE INSTALLED PER MASSDOT SPECIFICATIONS OR CITY OF NEW BEDFORD SPECIFICATIONS.

8. STORM SEWER IS TO BE BEDDED WITH CLEAN GRANULAR MATERIAL-AGGREGATES NOT TO BE LARGER THAN 3/4" AND NOT SMALLER THAN NO. 8 SIEVE, AND SHALL BE FREE OF SILT AND FINES. BEDDING TO EXTEND MINIMUM OF 6" BELOW & 12" ABOVE THE PIPE AND AS SHOWN ON THE DETAILS.

## UTILITY NOTES

1. ALL PROPOSED UTILITY LINES AND EXTENSIONS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE PRIVATE UTILITY COMPANY SPECIFICATIONS. CONTRACTOR SHALL COORDINATE UTILITY DISCONNECTIONS WITH THE APPROPRIATE AGENCY.

2. THE CONTRACTOR IS PARTICULARLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF THE EXISTING UTILITIES SHOWN HEREON IS BASED ON TOPOGRAPHIC SURVEYS AND RECORD DRAWINGS. THE CONTRACTOR SHALL NOT RELY UPON THIS INFORMATION AS BEING EXACT OR COMPLETE. SHOULD UNCHARTED UTILITIES BE ENCOUNTERED DURING EXCAVATION OPERATIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AS SOON AS POSSIBLE FOR INSTRUCTIONS. THE CONTRACTOR SHALL CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION AND REQUEST FIELD VERIFICATION OF UTILITY LOCATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO RELOCATE EXISTING UTILITIES CONFLICTING WITH IMPROVEMENTS SHOWN HEREON IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS GOVERNING SUCH OPERATIONS.

3. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

4. MAINTAIN MINIMUM 10-FOOT HORIZONTAL AND 18-INCH MINIMUM VERTICAL SEPARATION BETWEEN SANITARY SEWER, STORM SEWER AND WATER SUPPLY LINE, UNLESS NOTED OTHERWISE.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE SEQUENCING OF CONSTRUCTION FOR ALL UTILITY LINES SO THAT WATER LINES, GAS LINES, AND UNDERGROUND ELECTRIC DO NOT CONFLICT WITH SANITARY SEWERS OR STORM SEWERS. INSTALL UTILITIES PRIOR TO PAVEMENT AND DENSE GRADED AGGREGATE CONSTRUCTION.

6. ALL TRENCH SPOILS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS NOTED OTHERWISE. TRENCH SPOILS SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF OFFSITE AT NO ADDITIONAL COST TO THE OWNER IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS.

7. SANITARY SEWER SHALL BE PVC-SDR 35 PER ASTM D-3034 OR APPROVED EQUAL (CONFORMING TO CITY OF NEW BEDFORD WATER & SEWER DEPARTMENT RULES AND REGULATIONS) INSTALLED AT A MINIMUM SLOPE OF ONE PERCENT (1.00%) UNLESS NOTED OTHERWISE. SANITARY SEWER SERVICE SHALL BE INSTALLED AT A MINIMUM DEPTH OF FOUR FEET (4') UNLESS NOTED OTHERWISE. A MINIMUM OF 18" CLEARANCE SHALL BE MAINTAINED AT ALL WATER LINE & SANITARY SEWER CROSSINGS. SANITARY SEWER SERVICE JOINTS SHALL CONFORM TO ASTM D-3212.

8. SANITARY SEWER IS TO BE BEDDED WITH CLEAN GRANULAR MATERIAL-AGGREGATES NOT TO BE LARGER THAN 3/4" AND NOT SMALLER THAN NO. 8 SIEVE, AND SHALL BE FREE OF SILT AND FINES. BEDDING TO EXTEND MINIMUM OF 6" BELOW & 12" ABOVE THE PIPE AND AS SHOWN ON THE DETAILS.

9. DISTANCES SHOWN FOR BOTH SANITARY AND STORM SEWER PIPES ARE MEASURED FROM CENTER OF STRUCTURE, CONTRACTOR SHALL BE RESPONSIBLE FOR ACTUAL FIELD CUT LENGTH. COORDINATES FOR STORM & SANITARY STRUCTURES ARE SHOWN TO THE CENTER STRUCTURE UNLESS NOTED OTHERWISE.

10. ROOF DRAINS, FOUNDATION DRAINS AND ALL OTHER CLEAR WATER CONNECTIONS TO THE SANITARY SEWER SYSTEMS ARE PROHIBITED.

11. CONTRACTOR SHALL ADJUST ALL EXISTING UTILITY SURFACE FEATURES INCLUDING BUT NOT LIMITED TO CASTINGS, VALVE BOXES, PEDESTALS, CLEANOUTS, ETC. TO MATCH PROPOSED FINISHED GRADES, UNLESS NOTED OTHERWISE.

12. THE CONTRACTOR SHALL PROVIDE RECORD DRAWINGS OF ALL IMPROVEMENTS. DRAWINGS SHALL INCLUDE AT LEAST TWO DIMENSIONS TO EACH VALVE AND MANHOLE FROM KNOWN SITE FEATURES. DRAWINGS SHALL INCLUDE HORIZONTAL AND VERTICAL INFORMATION ON ALL NEW UTILITIES AS WELL AS EXISTING UTILITIES ENCOUNTERED.

13. ALL WATERLINE CROSSINGS SHALL MAINTAIN A VERTICAL SEPARATION OF 18" MINIMUM. SANITARY SEWER SHALL BE LOCATED 18" BELOW WATERMAIN AT ALL CROSSINGS. WATERMAIN SHALL BE LOCATED A MINIMUM OF 10' HORIZONTALLY FROM ANY SANITARY SEWER OR STORM SEWER. ALL MEASUREMENTS SHALL BE TAKEN FROM OUTSIDE OF SEWER PIPE TO THE OUTSIDE OF WATERMAIN ONE FULL LENGTH OF WATERMAIN PIPE SHALL BE LOCATED AT ALL CROSSINGS TO ENABLE BOTH JOINTS TO BE LOCATED AS FAR FROM SEWER AS POSSIBLE.

14. ALL WATER SERVICE PIPE SIZES 3" THRU 12" SHALL BE DUCTILE IRON PIPE CLASS 52 PIPE PER LOCAL JURISDICTION, FROM WATERMAIN THRU METER SETTING(S) INCLUDING THE METER BYPASS.

15. ALL WATER SERVICE PIPE, 2" AND SMALLER, SHALL BE K SOFT COPPER FROM WATERMAIN THRU CURB STOP, OR APPROVED EQUAL.

16. WATERLINE IS TO BE BEDDED WITH CLEAN GRANULAR MATERIAL-AGGREGATES NOT TO BE LARGER THAN 3/4" AND NOT SMALLER THAN NO. 8 SIEVE, AND SHALL BE FREE OF SILT AND FINES. BEDDING TO EXTEND MINIMUM OF 6" BELOW & 12" ABOVE THE PIPE AND AS SHOWN ON THE DETAILS.

## ABBREVIATIONS

| | |
|---|---|
| ABAN | ABANDON |
| ADJ | ADJUST |
| APPROX | APPROXIMATE |
| A.C. | ASPHALT CONCRETE |
| AHT | ANNUAL HIGH TIDE |
| ALT | ANNUAL LOW TIDE |
| BB | BORING |
| BIT | BITUMINOUS |
| BD | BOUND |
| BL | BASELINE |
| BLDG | BUILDING |
| BM | BENCH MARK |
| BO | BY OTHERS |
| BOS | BOTTOM OF SLOPE |
| BR | BRIDGE |
| CB | CATCH BASIN |
| CBCI | CATCH BASIN WITH CURB INLET |
| CC | CEMENT CONCRETE |
| CCB | CAPE COD BERM |
| CCM | CEMENT CONCRETE MASONRY |
| CEM | CEMENT |
| CI | CURB INLET |
| CI | CAST IRON |
| CLF | CHAIN LINK FENCE |
| CL | CENTERLINE |
| CMP | CORRUGATED METAL PIPE |
| CSP | CORRUGATED STEEL PIPE |
| CO | CLEANOUT |
| CONC | CONCRETE |
| CONT | CONTINUED |
| CONST | CONSTRUCTION |
| CP | CONTROL POINT |
| CY | CUBIC YARD |
| D | DIAMETER |
| Ø | DIAMETER |
| DI | DUCTILE IRON |
| DWY | DRIVEWAY |
| EB | EASTBOUND |
| ELEV | ELEVATION |
| EL. | ELEVATION |
| EMB | EMBANKMENT |
| EOP | EDGE OF PAVEMENT |
| EXIST | EXISTING |
| EX | EXISTING |
| EXC | EXCAVATION |
| F&C | FRAME AND COVER |
| F&G | FRAME AND GRATE |
| FDN | FOUNDATION |
| FES | FLARED END SECTION |
| FT | FOOT |
| GALV | GALVANIZED |
| GAR | GARAGE |
| GCL | GEOSYNTHETIC CLAY LINER |
| GD | GROUND |
| GG | GAS GATE |
| GI | GUTTER INLET |
| GIP | GALVANIZED IRON PIPE |
| GRAN | GRANITE |
| GRAV | GRAVEL |
| GRD | GUARD |
| GW | GAS WELL |
| HDPE | HIGH DENSITY POLYETHYLENE |
| HDW | HEADWALL |
| HMA | HOT MIX ASPHALT |
| HOR | HORIZONTAL |
| HYD | HYDRANT |
| ID | INSIDE DIAMETER |
| IN | INCH |
| INV | INVERT |
| JCT | JUNCTION |
| KSI | KIPS PER SQUARE INCH |
| L | LENGTH |
| LLDPE | LINEAR LOW DENSITY POLYETHYLENE |
| LB | LEACHING BASIN |
| LHW | LEACHATE HEAD WELL |

## ABBREVIATIONS (CONT)

| | |
|---|---|
| LP | LIGHT POLE |
| LT | LEFT |
| LWD | LOW WATER DATUM |
| LYS | LYSIMETER |
| MAX | MAXIMUM |
| MB | MAIL BOX |
| MH | MANHOLE |
| MHW | MEAN HIGH WATER |
| MHHW | MEAN HIGHER HIGH WATER |
| MIN | MINIMUM |
| MISC | MISCELLANEOUS |
| MLW | MEAN LOW WATER |
| MLLW | MEAN LOWER LOW WATER |
| MW | MONITORING WELL |
| NB | NORTHBOUND |
| NIC | NOT IN CONTRACT |
| NO. | NUMBER |
| NTS | NOT-TO-SCALE |
| OD | OUTSIDE DIAMETER |
| OHWM | ORDINARY HIGH WATER MARK |
| PERM | PERMANENT |
| ± | PLUS OR MINUS |
| PC | POINT OF CURVATURE |
| PGL | PROFILE GRADE LINE |
| PROJ | PROJECT |
| PROP | PROPOSED |
| PSB | PLANTABLE SOIL BORROW |
| PSI | POUNDS PER SQUARE INCH |
| PUE | PUBLIC UTILITY EASEMENT |
| PVC | POLYVINYL CHLORIDE |
| PVMT | PAVEMENT |
| PW | PRIVATE WELL |
| PWW | PAVED WATER WAY |
| R | RADIUS |
| R&D | REMOVE AND DISPOSE |
| RCP | REINFORCED CONCRETE PIPE |
| RD | ROAD |
| RDWY | ROADWAY |
| REM | REMOVE |
| RET | RETAIN |
| RET WALL | RETAINING WALL |
| ROW | RIGHT-OF-WAY |
| RR | RAILROAD |
| R&R | REMOVE AND RESET |
| R&S | REMOVE AND STACK |
| RT | RIGHT |
| SB | SOUTHBOUND |
| SDR | STANDARD DIMENSION RATIO |
| SF | SQUARE FOOT |
| SGC | SLOPED GRANITE CURB |
| SHLD | SHOULDER |
| SMH | SEWER MANHOLE |
| SS | STAINLESS STEEL |
| SSR | SIDE SLOPE RISER |
| ST | STREET |
| STA | STATION |
| STN | STONE |
| SW | SIDEWALK |
| TAN | TANGENT |
| TEMP | TEMPORARY |
| TC | TOP OF CURB |
| TOS | TOP OF SLOPE |
| TYP | TYPICAL |
| UP | UTILITY POLE |
| VAR | VARIES |
| VERT | VERTICAL |
| VC | VERTICAL CURVE |
| VGC | VERTICAL GRANITE CURB |
| VIF | VERIFY IN FIELD |
| WCR | WHEELCHAIR RAMP |
| WG | WATER GATE |
| WIP | WROUGHT IRON PIPE |
| WM | WATER METER/WATER MAIN |
| X-SECT | CROSS SECTION |

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/

SURVEY NOTES:

1. RESULTS OF HYDROGRAPHIC SURVEY BY FOTH INFRASTRUCTURE & ENVIRONMENT, LLC. (FOTH) ON 1/4/2023 AND 1/24/2023.
2. HYDROGRAPHIC SURVEY NOTES:
   - A. PROJECT NAME: MASSCEC CHANNEL CONDITIONS SURVEY
   - B. PROJECT NUMBER: 0022M091
   - C. PLOT SCALE: 1"=40'
   - D. SURVEY DATE: JANUARY 4 AND 24, 2023
   - E. SURVEYOR: J.RAY., M.WASHINGTON
   - F. VESSEL: OSCAR
   - G. TRANS./FATH.: RESON T-50, KEYNET
   - H. WEATHER COND: VARIABLE
   - I. PROJECT DATUM: MLLW (1.92' OFFSET)
   - J. COOR. SYSTEM: NAD83 (2011 ADJUSTMENT), MASSACHUSETTS MAINLAND (US SURVEY FEET)
   - K. DATA REDUCTION: DTM 1X1 MIN, SOUNDINGS 15' MINIMUM TRIMMED TO CHANNEL LIMITS
   - L. BENCHMARK: USACE CONTROL POINT "BOLT" 2008, PAINTED BOLT IN GUARDRAIL AT THE NORPEL SITE ON FISH ISLAND IN NEW BEDFORD, MA. EL=15.08 MLLW
3. ELEVATIONS ARE IN U.S. SURVEY FEET AND REFER TO MEAN LOW LOWER WATER (MLLW) VERTICAL DATUM BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008. SEE DATUM CONVERSION CHART.
4. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83) (2011 ADJUSTMENT) IN U.S. SURVEY FEET.
5. WATER LEVEL CORRECTIONS BASED ON ELEVATIONS MEASURED BY RTK USING CORRECTIONS FROM VRS-KEYNET. COORDINATES ARE BASED ON NAD83 MASSACHUSETTS MAINLAND STATE PLANE GRID SYSTEM (US SURVEY FEET).
6. PROJECT SITE LOCATED IN FEMA ZONE AE +6 NAVD88 AND ZONE X IN ACCORDANCE WITH FEMA FIRM #25005C0393G, EFFECTIVE 7/16/2014. 100-YEAR WATER LEVEL +17 FEET.
7. INFORMATION PROVIDED WITHIN THIS DRAWING FILE HAS BEEN COMPILED BY FOTH INFRASTRUCTURE & ENVIRONMENT, LLC (FOTH) ON MAY 1, 2023 AND ALSO CIVIL & ENVIRONMENTAL CONSULTANTS, INC (CEC) ON JULY 25, 2024. INFORMATION WAS COLLECTED FROM VARIOUS SOURCES, AND REPRESENTS THE CONDITIONS ON THE GROUND THAT EXISTED AT THE TIME OF THE DATA'S COLLECTION. THIS FILE HAS BEEN CREATED IN ORDER TO AID IN THE PLANNING OF FUTURE OPERATIONS AT THE TERMINAL, BUT NO WARRANTY IS PROVIDED OR IMPLIED TO THE ACCURACY OF THE DATA PROVIDED HEREIN. FOTH INFRASTRUCTURE & ENVIRONMENT, LLC HAS ENDEAVORED TO PROVIDE AN ACCURATE DEPICTION OF THE NEW BEDFORD MARINE COMMERCE TERMINAL AND THE SITE'S FEATURES, USING THE BEST INFORMATION AVAILABLE AT THE TIME OF THE FILE'S CREATION, HOWEVER EXACT LOCATIONS AND THE ACCURACY OF INDIVIDUAL POINTS OR ITEMS SHOWN IN THIS DRAWING WERE NOT COLLECTED BY FOTH INFRASTRUCTURE & ENVIRONMENT, LLC, AND THEREFORE CANNOT BE VERIFIED. THE USER SHOULD INDEPENDENTLY VERIFY THE LOCATION OF SITE COMPONENTS, ESPECIALLY SUBSURFACE COMPONENTS PRIOR TO CONDUCTING OPERATIONS AT THE TERMINAL. CONSULT WITH FOTH, LLC FOR MORE DETAILED INFORMATION.
8. POSSESSION AND USE OF THE MATERIAL CONTAINED ON THESE DRAWINGS IS GRANTED ONLY IN CONNECTION WITH ITS USE AS IT RELATES TO THE TITLED PROJECT, ANY OTHER USE, REPRODUCTION OR DISCLOSURE OF THE INFORMATION CONTAINED HEREON IS EXPRESSLY PROHIBITED WITHOUT THE WRITTEN CONSENT OF FOTH.

**STRUCTURAL DESIGN CRITERIA:**

1. STRUCTURAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE MASSACHUSETTS BUILDING CODE, NINTH EDITION. WORK SHALL COMPLY WITH FEDERAL, STATE, AND LOCAL PERMITS ISSUED FOR THIS PROJECT.
2. STRUCTURES HAVE BEEN DESIGNED TO WITHSTAND THE FOLLOWING DESIGN LOADS

2.1. LIVE LOADS:

| | |
|---|---|
| CONCRETE PLATFORM | 4100 PSF |

2.2. CRANE LOADS

a. DEMAG 66-6800 10-FEET AWAY FROM EDGE OF BULKHEAD

b. LIEBHERR LR-11350 10-FEET AWAY FROM EDGE OF BULKHEAD

SEE LOADING DIAGRAMS ON SHEET G-004

2.1. DEAD LOADS:

| | |
|---|---|
| STRUCTURAL STEEL | 490 PCF |
| CONCRETE | 150 PCF |
| GRANULAR FILL | 125 PCF |
| FRESH WATER | 62 PCF |
| SEA WATER | 64 PCF |

2.2. EARTHQUAKE LOAD

| | |
|---|---|
| $MCE_R$ GROUND MOTION (PERIOD = 0.2S) | $S_S$=0.188 |
| $MCE_R$ GROUND MOTION (PERIOD = 1.0S) | $S_1$=0.052 |
| SITE-MODIFIED SPECTRAL ACCELERATION VALUE | $S_{MS}$=0.17 |
| SITE-MODIFIED SPECTRAL ACCELERATION VALUE | $S_{M1}$=0.042 |
| NUMERIC SEISMIC DESIGN VALUE AT 0.2S SA | $S_{DS}$=0.113 |
| NUMERIC SEISMIC DESIGN VALUE AT 1.0S SA | $S_{D1}$=0.028 |
| $MCE_R$ PEAK GROUND ACCELERATION | PGA=0.103 |
| SEISMIC DESIGN CATEGORY | A |

2.3. LATERAL ICE LOADS 24 KIPS

2.4. WIND LOAD

| | |
|---|---|
| BASIC WIND SPEED | 130 MPH |
| WIND RISK CATEGORY | II |

2.5. MAXIMUM WAVE HEIGHT: 4.8-FEET

**GENERAL NOTES:**

1. NOTES BELOW ARE NOT INTENDED TO REPLACE SPECIFICATIONS. SEE SPECIFICATIONS FOR REQUIREMENTS AND ADDITIONAL INFORMATION.
2. ELEVATIONS SHOWN ARE IN FEET AND TENTHS AND REFER TO NORTHERN AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
3. SEE SPECIFICATIONS FOR COMPLETE GEOTECHNICAL BORING LOG INFORMATION.
4. THE CONTRACTOR IS ADVISED THAT THE DRAWINGS AND SPECIFICATIONS FORM A PART OF THE CONTRACT DOCUMENTS. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL KEEP A COPY OF THE DRAWING AND SPECIFICATIONS ONSITE AT ALL TIMES DURING THE PROJECT.
5. ALIGNMENT OF EXISTING CELLS AND CONCRETE PLATFORM VARIES ALONG PROPOSED PLATFORM DEPENDING ON WHERE THE SECTION IS CUT. CONTRACTOR SHALL PERFORM SURVEY TO VERIFY LOCATION OF EXISTING STRUCTURES PRIOR TO PERFORMING WORK.
6. THE CONTRACTOR SHALL MAINTAIN ADEQUATE SURVEY CONTROL AT ALL TIMES TO ESTABLISH AND MAINTAIN ALL LINES AND ELEVATIONS SHOWN ON THE CONTRACT DRAWINGS.
7. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES AND SUBMERGED UTILITIES WITHIN THE LIMITS OF THE WORK PRIOR TO COMMENCING ANY EXCAVATION OR GROUND PENETRATING WORK. THE CONTRACTOR SHALL NOTIFY "DIG SAFE" (1-88-344-7223) AT LEAST 3 BUSINESS DAYS PRIOR TO THE COMMENCEMENT OF THE EXCAVATION OR GROUND PENETRATING ACTIVITY.
8. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE AND MAINTAIN ENVIRONMENTAL CONTROLS AS REQUIRED BY STATE, LOCAL, AND FEDERAL REGULATION AND LAW, AS WELL AS REQUIRED WITHIN EXISTING PERMITS AND APPROVALS.
9. ALL APPLICABLE FEDERAL AND STATE REGULATION AND PERMITS SHALL BE FOLLOWED, INCLUDING BUT NOT LIMITED TO, THE CLEAN WATER ACT, THE FEDERAL DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY, HEALTH ACT, 401 WATER QUALITY CERTIFICATION, CHAPTER 91 LICENSE, AND U.S. ARMY CORP OF ENGINEERS PERMIT.
10. NUMEROUS SUBSURFACE EXPLORATIONS HAVE BEEN CONDUCTED WITHIN THE PROJECT SITE TO PROVIDE GEOTECHNICAL AND ANALYTICAL DATA REQUIRED FOR PROJECT DESIGN AND CONSTRUCTION. REFER TO THE SPECIFICATIONS FOR LOCATION PLAN OF THE SUBSURFACE EXPLORATION, LOGS OF EXPLORATIONS, AND RESULTS OF LABORATORY TESTING.
11. BASE PLAN COMPILED BY FOTH USING MAGIS AND INFORMATION PROVIDED BY MASSCEC.
12. THE CONTRACTOR, PRIOR TO CONSTRUCTION AND FABRICATION OF CONSTRUCTION MATERIALS, SHALL VERIFY EXISTING CONDITIONS AND DIMENSIONS.
13. IF, DURING THE PERFORMANCE OF THE WORK, THE CONTRACTOR FINDS A CONFLICT, ERROR, OR DISCREPANCY IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL SO REPORT TO THE ENGINEER IN WRITING AT ONCE BEFORE PROCEEDING WITH THE WORK AFFECTED THEREBY, THE CONTRACTOR SHALL OBTAIN A WRITTEN INTERPRETATION OR CLARIFICATION FROM THE ENGINEER. WORK DONE BEFORE THE ENGINEER RENDERS HIS/HER DECISION IS AT THE CONTRACTOR'S SOLE RISK.
14. THE CONTRACTOR SHALL TAKE HIS OWN MEASUREMENTS AT THE SITE, VERIFYING THE SAME WITH THE CONTRACT DRAWINGS AND EXISTING FACILITIES, AND WILL BE HELD RESPONSIBLE FOR THE PROPER FIT AND ALIGNMENT OF COMPLETED WORK IN POSITION.
15. LENGTHS SHOWN ON THE DRAWINGS ARE CONSIDERED APPROXIMATE, AND THE ACTUAL LENGTHS MAY VARY WHEN SO ACCEPTED BY THE ENGINEER.
16. THE CONTRACTOR SHALL PROTECT ALL SURROUNDING UTILITIES AND STRUCTURES DURING CONSTRUCTION, INCLUDING PROVIDE NECESSARY SHEETING, SHORING AND OTHER MEASURES TO MAINTAIN UTILITY SERIVCES AND STRUCTURAL INTEGRITY AS PART OF STAGED CONTRUCTION ACTIVITIES.

**RECOMMENDED CONSTRUCTION SEQUENCE:**

1. INSTALL TEMPORARY BYPASS PUMPS TO DIVERT FLOW UNTIL CONSTRUCTION IS FINISHED. INSTALL DUAL PURPOSE AZ19-700 NORTH CLOSURE WALL, REMOVE EX. DRAINAGE MANHOLE, APPROACH ALIGNMENT AND PORTION OF CULVERT AND EXCAVATE 17' DEEP WITH PROPER SHORING. EXCAVATE 3' DEEP FOR 7' WITH 2H:1V SLOPE AND THEN 3' EXCAVATION FOR 64'
2. DEMO EXISTING RELIEVING PLATFORM, RETURN WALL, CONCRETE CAPS AND MZ-27 SHEET PILES. INSTALL NEW MANHOLE W/ TEMPORARY PLUG, 20' OF 72" RCP, CAST IN PLACE CONCRETE COLLAR CONNECTION AND UNDERDRAIN MANHOLE - CIRCULAR LEACHING PIT. PLACE FILL AND COMPACT, ADJUST SHORING AS REQUIRED FOR WORK IN FUTURE PHASES.
3. CONSTRUCT COMBI-WALL WITH OUTFALL OPENING, INSTALL 2 SOCKETED HP12X98 AND INSTALL APPROXIMATELY 14' OF 72" RCP WITH CAST IN PLACE CONCRETE COLLAR.
4. DEMO EX. RELIEVING PLATFORM, REMAINING MZ-27 SHEETS, CLOSURE CONNECTION AND EXISTING 6'X6' BOX CULVERT. CUT EXSITING 36"ØX$\frac{3}{8}$" SOCKETED KING PILE AT THE MUDLINE.
5. CONSTRUCT EAST/WEST BULKHEAD, FORM AND POUR THE 11" CONCRETE WALL ON THE EXISTING RELIEVING PLATFORM.
6. ESTABLISH 5H:1V SLOPE FROM EL. -11' AT THE FACE OF NORTH/SOUTH COMBI-WALL TO INSIDE FACE OF EXISTING CELLS. ESTABLISH 1H:1V SLOPE FROM EL. -20' TO -32' AT LIMITS OF BERTH. REMOVE MINOR AND MAJOR CELLS SEQUENTIALLY FROM SOUTH TO NORTH.
7. DRIVE BOTH ROCK SOCKETED AND NON-ROCK SOCKETED 30"ØX1" STEEL PIPE PILES AND 24"ØX1" ROCK SOCKETED STEEL PIPE PILES. PLACE ARMORFLEX 70L CONCRETE MATTRESSES ON FRONT 5H:1V SLOPE TO PILE ROW C.
8. CONSTRUCT AND POUR CONCRETE BEAMS.
9. CONSTRUCT AND POUR RETAINING WALL, 6'-6" WIDE UTILITY TRENCH AND EAST/WEST BULKHEAD CONCRETE CAPS. REMOVE TEMPORARY AZ SHEETPILES FROM SOUTH TERMINAL AND RESTORE AREA TO ORIGINAL CONDITION.
10. CONSTRUCT FENDERS, BOLLARDS, GRATING, PERMANENT CHAIN LINK SECURITY FENCE AND LADDERS.

**EROSION CONTROL:**

1. ALL TERMS AND CONDITIONS OF THE U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA), NATIONAL DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT, IN PARTICULAR, SEDIMENT AND EROSION CONTROLS AND STORMWATER MANAGEMENT MEASURES SHALL BE STRICTLY FOLLOWED.
2. DEWATERING ASSOCIATED WITH CONSTRUCTION ACTIVITIES SHALL BE PERMITTED AS NECESSARY WITH THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MASSDEP) AND LOCAL WATER MANAGEMENT DISTRICT.
3. CONTRACTOR SHALL COMPLY WITH SPILL PREVENTION, CONTROL AND COUNTER MEASURES (SPCC) REQUIREMENTS PURSUANT TO EPA RULES AND REGULATIONS.
4. PRIOR TO SUBMITTING THE NPDES CONSTRUCTION GENERIC PERMIT NOTICE OF INTENT (NOI) TO DISCHARGE STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES, A STORMWATER POLLUTION PREVENTION PLAN SHALL BE DEVELOPED FOR IMPLEMENTATION. THE NOTICE OF INTENT (NOI) SHALL INCLUDE CONSTRUCTION DEWATERING AS NECESSARY.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION SWPPP FOR THE DURATION OF THE PROJECT. ONCE THE PROJECT HAS BEEN COMPLETED, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY STORMWATER MANAGEMENT AND EROSION CONTROL MEASURES AND SHALL DISPOSE OF MATERIALS ACCORDING TO CODE.
6. RECOMMENDED GENERAL SEQUENCE OF MAJOR CONSTRUCTION ACTIVITIES:
   a. INSTALL PERIMETER CONTROLS AND BEST MANAGEMENT PRACTICES (BMPS) AT LOCATIONS SHOWN ON ADJACENT PLAN.
   b. COMMENCE SITE DEMOLITION AND CONSTRUCTION ACTIVITIES.
   c. AS PROPOSED INLETS ARE CONSTRUCTED, INSTALL SEDIMENT FILTERS.
   d. INSTALL TEMPORARY SEED AND MULCH IN AREAS WHERE CONSTRUCTION TEMPORARILY CEASES FOR AT LEAST 21 DAYS, NO LATER THAN 14 DAYS AFTER THE LAST CONSTRUCTION ACTIVITIES IN THAT AREA.
   e. INSTALL PERMANENT SEEDING/SOD IN AREAS WHERE CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED NO LATER THAN 14 DAYS AFTER THE LAST CONSTRUCTION ACTIVITIES.
   f. REMOVED ACCUMULATED SEDIMENT FROM BMPS.
   g. REMOVE TEMPORARY POLLUTION PREVENTION MEASURES AFTER ALL CONSTRUCTION ON SITE HAS BEEN COMPLETED AND DISPOSE MATERIALS ACCORDING TO APPLICABLE FDEP REGULATIONS AND/OR LOCAL GOVERNMENTAL CODES, ETC.
7. ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF AS PER LOCAL AND/OR STATE REGULATIONS OR AS RECOMMENDED BY THE MANUFACTURER. CONSTRUCTION SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEEING THAT THESE PROCEDURES ARE FOLLOWED.
8. ALL CONSTRUCTION WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURED DUMPSTERS. DUMPSTERS SHALL MEET ALL LOCAL AND STATE SOLID WASTE MANAGEMENT REGULATIONS. ALL CONSTRUCTION PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL. NOTICES STATING THAT THESE PRACTICES SHALL BE POSTED IN THE OFFICE TRAILER AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEEING THAT THESE PROCEDURES ARE FOLLOWED.
9. ALL STOCKPILES OF EXISTING SOIL SHALL NOT BE PLACED NEAR THE PERIMETER OF THE SITE, NEAR A WATERBODY OR STORM DRAIN INLET. AT COMPLETION OF CONSTRUCTION, SOIL WASTE SHALL BE TESTED FOR WASTE CHARACTERIZATION AND DISPOSED OFF PURSUANT TO LOCAL AND/OR STATE REGULATIONS.
10. DUMP TRUCKS IMPORTING FILL MATERIALS TO THE SITE SHALL COVER THEIR LOADS WITH A TARPAULIN TO AVOID UNNECESSARY GENERATION OF DUST.
11. CONTRACTOR SHALL INSTALL BMPS AT LOCATIONS SHOWN ON THE EROSION CONTROL PLAN PRIOR TO ANY CLEARING, DEMOLITION, FILLING OR GRADING OF ANY PORTIONS OF THE SITE.
12. DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR AT LEAST 21 DAYS SHALL BE STABILIZED WITH SEED AND MULCH NO LATER THAN 14 DAYS FROM THE LAST CONSTRUCTION ACTIVITY IN THAT AREA. THE SEEDING AND MULCHING MATERIALS AND APPLICATION RATES SHALL BE APPLIED IN ACCORDANCE WITH THE FLORIDA STORMWATER EROSION AND SEDIMENTATION CONTROL INSPECTOR'S MANUAL.
13. ALL EROSION AND SEDIMENTATION CONTROL BMPS SHALL BE INSPECTED 7 DAYS OR WITHIN 24 HOURS OF A STORM OF 0.5 INCH OR MORE IN DEPTH. ALL CONTROLS MUST BE IN GOOD OPERATING CONDITION UNTIL THE AREA THEY PROTECT HAS BEEN COMPLETELY STABILIZED AND THE CONSTRUCTION IS COMPLETE.
14. BUILT UP SEDIMENT WILL BE REMOVED FROM THE PERIMETER CONTROL BMPS WHEN IT HAS REACHED ONE THIRD OF THE HEIGHT OF THE BMP.
15. SILT FENCE SHALL BE INSPECTED FOR DEPTH OF SEDIMENT, TEARS, IF FABRIC IS SECURELY ATTACHED TO THE FENCE POSTS, AND IF FENCE POSTS ARE FIRMLY IN THE GROUND.
16. TEMPORARY AND PERMANENT SEEDING AND PLANTING SHALL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND HEALTHY GROWTH.
17. DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES PERMANENTLY CEASE SHALL BE STABILIZED WITH PERMANENT SEED NO LATER THAN 14 DAYS AFTER THE LAST CONSTRUCTION ACTIVITY. SEEDING SHALL BE THE SAME AS THE TEMPORARY SEEDING.
18. A TYPE III FLOATING TURBIDITY BARRIER SHALL BE INSTALLED AND MAINTAINED AROUND CONSTRUCTION ACTIVITIES WITHIN THE ACUSHNET RIVER. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE FLOATING TURBIDITY BARRIER FOR THE DURATION OF THE PROJECT TO ENSURE CONTINUOUS PROTECTION OF THE WATERCOURSE IS MAINTAINED.
19. WHEN THE FLOATING TURBIDITY BARRIER IS NO LONGER NEEDED, THIS BMP SHALL BE REMOVED IN A MANNER THAT MINIMIZES TURBIDITY.
20. SOIL TRACKING PREVENTION DEVICES SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT THE TRACKING OF FLOW OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS WILL REQUIRE PERIODIC MAINTENANCE AND CONDITIONS DEMAND.

**DRAINAGE:**

1. MATERIALS, TRENCH EXCAVATION, PIPE LAYING, STRUCTURE INSTALLATION AND BACKFILLING OPERATIONS FOR DRAINAGE IMPROVEMENTS SHALL MEET THE REQUIREMENTS OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MASSDOT).
2. DRAINAGE PIPE SHALL BE INSTALLED IN TRUE ALIGNMENT IN PIPE TRENCHES AND IN ACCORDANCE WITH MASSDOT.
3. DRAINAGE STRUCTURES SHALL BE IN ACCORDANCE WITH MASSDOT STANDARD SPECIFICATIONS.
4. BACKFILL SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180.
5. REINFORCED CONCRETE PIPE SHALL MEET THE REQUIREMENTS OF ASTM C-76. PIPE CLASSIFICATION SHALL BE CLASS V (UNDER PAVED AREAS) AND CLASS III (OUTSIDE OF PAVED AREAS).
6. TWO BUSINESS DAYS BEFORE BEGINNING CONSTRUCTION, CONTRACTOR SHALL NOTIFY "DIG SAFE" AND ANY OTHER UTILITY COMPANIES WHICH MIGHT BE AFFECTED.
7. CONTRACTOR MAY BE REQUIRED TO PRESSURE CLEAN PIPES AND INLETS PRIOR TO FINAL ACCEPTANCE TO ENSURE THE NEWLY CONSTRUCTED SYSTEM IS FREE OF SEDIMENT AND ACCUMULATED DEBRIS.
8. PRIOR TO CONSTRUCTION OR INSTALLATION, SHOP DRAWINGS SHALL SUBMITTED TO AND APPROVED BY THE ENGINEER OF RECORD FOR THE FOLLOWING ITEMS:
   a. DRAINAGE PIPES
   b. DRAINAGE STRUCTURES
   c. MATERIAL SUBSTITUTION REQUESTS
   d. EROSION CONTROL MATERIALS
   e. FILL MATERIALS

**DEMOLITION:**

1. SELECTIVE DEMOLITION AND DISPOSAL SHALL BE PERFORMED IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL PERMIT AND BUILDING CODE REQUIREMENTS.
2. THE CONTRACTOR SHALL REMOVE AND DISPOSE THOSE STRUCTURES AND DERELICT COMPONENTS REQUIRED TO PERFORM THE WORK.
3. SELECTIVE DEMOLITION INCLUDES BUT IS NOT LIMITED TO REMOVAL AND REUSE (WHERE POSSIBLE) OF EXISTING MATERIALS, UTILITIES, AND OTHER COMPONENTS ESSENTIAL FOR A COMPLETE PROJECT.
4. THE CONTRACTOR SHALL TAKE REASONABLE CARE IN REMOVING ELEMENTS SELECTED TO BE DEMOLISHED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. DAMAGE OR DESTRUCTION BY THE CONTRACTOR TO EXISTING ELEMENTS DESIGNATED TO REMAIN SHALL BE REPAIRED OR REPLACED IN-KIND AT THE DISCRETION OF THE OWNER AT NO ADDITIONAL COST.
5. PRIOR TO COMMENCEMENT OF SELECTIVE DEMOLITION, THE CONTRACTOR SHALL SUBMIT A DISPOSAL PLAN FOR ITEMS TO BE DEMOLISHED. DEMOLITION MATERIAL DESIGNATED BY THE OWNER TO BE REMOVED FROM THE SITE SHALL BECOME THE PROPERTY OF THE CONTRACTOR. THE DEBRIS DISPOSAL PLAN SHALL ACKNOWLEDGE THIS OWNERSHIP AND SHALL IDENTIFY THE MEANS AND METHODS AND FINAL DISPOSITION FOR DISPOSAL MATERIALS.
6. PRIOR TO COMMENCEMENT OF DEMOLITION, THE CONTRACTOR SHALL CLEARLY MARK THE LIMITS OF THE DEMOLITION FOR REVIEW AND APPROVAL BY THE OWNER.
7. COMPLETELY REMOVE DESIGNATED ITEMS LEAVING SURFACES CLEAN, SOUND, AND READY TO RECEIVE NEW MATERIALS AS SPECIFIED IN THE CONTRACT DOCUMENTS.
8. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING THE COURSE OF DEMOLITION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF MISCELLANEOUS SHEETING AS PART OF SHORELINE RESTORATION AND MARINE INFRASTRUCTURE CONSTRUCTION.
10. THE CONTRACTOR SHALL SUBMIT A DISPOSAL CERTIFICATE TO THE OWNER'S REPRESENTATIVE CERTIFYING LEGAL AND PROPER DISPOSAL.

**TEMPORARY WORK:**

1. LABOR, EQUIPMENT, AND MATERIALS REQUIRED TO PERFORM THE WORK THAT, UPON COMPLETION, ARE NOT A PART OF THE WORK, SHALL BE FURNISHED, INSTALLED, AND SUBSEQUENTLY REMOVED FROM THE SITE BY THE CONTRACTOR.
2. TEMPORARY WORK SHALL BE SUBJECT TO THE REQUIREMENTS OF THE STATE BUILDING CODE AND APPLICABLE LOCAL BUILDING CODES.
3. THE CONTRACTOR SHALL SAFEGUARD AND PROTECT EXCAVATIONS.

**EXCAVATION AND BACKFILL:**

1. THE CONTRACTOR SHALL EXCAVATE, BACKFILL, COMPACT, AND GRADE THE SITE TO THE ELEVATIONS AND LIMITS SHOWN AND AS NEEDED TO MEET THE REQUIREMENTS OF THE CONSTRUCTION.
2. STRUCTURAL FILL SHALL BE PLACED IN LAYERS NOT MORE THAN 8" IN LOOSE DEPTH. DO NOT PLACE FILL MATERIAL ON SURFACES THAT ARE MUDDY, FROZEN, CONTAINING FROST OR ICE. PLACE FILL MATERIALS EVENLY ADJACENT TO STRUCTURES, TO REQUIRED ELEVATIONS. TAKE CARE TO PREVENT WEDGING ACTION OF BACKFILL AGAINST STRUCTURES BY CARRYING THE MATERIAL UNIFORMLY AROUND THE STRUCTURE TO APPROXIMATELY THE SAME ELEVATION IN EACH LIFT.

**WATERFRONT STRUCTURAL STEEL:**

1. STRUCTURAL STEEL SHALL COMPLY WITH THE "STEEL CONSTRUCTION MANUAL" SIXTEENTH EDITION PUBLISHED BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
2. STRUCTURAL STEEL SHAPES SHALL CONFORM TO ASTM A572, GRADE 50.
3. STRUCTURAL PLATES SHALL CONFORM TO ASTM A572, WITH A MINIMUM YIELD STRENGTH 50 KSI.
4. STEEL TUBES SHALL CONFORM TO ASTM A500, GRADE B.
5. STEEL HARDWARE:
   - a. ANCHOR: ASTM F1554 GR. 55
   - b. CARRIAGE BOLTS: ASTM A307
   - c. HIGH STRENGTH STRUCTURAL BOLTS: ASTM F3125 GR. A325, W/ HEXAGONAL HEADS OR CARRIAGE HEAD NUTS
   - d. NUTS: ASTM A563
   - e. WASHERS (EXCEPT AGAINST TIMBER): ASTM F436
   - f. WASHERS AGAINST TIMBER SHALL BE COMMON DOCK WASHERS.
6. HIGH STRENGTH BOLTS, NUTS AND WASHERS SHALL BE IN ACCORDANCE WITH "SPECIFICATIONS FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS".
7. STEEL HARDWARE ABOVE GRADE SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153.
8. CONNECTIONS SHALL BE DESIGNED AND DETAILED BY THE STEEL FABRICATOR EXCEPT FOR THOSE SPECIFICALLY DETAILED IN THE CONTRACT DOCUMENTS.

**PILES:**

1. STEEL PIPE PILES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A252, GR.3, 50 KSI YIELD.
2. STEEL W-PILES AND STEEL H-PILES SHALL CONFORM TO ASTM A572 WITH A MINIMUM YIELD STRESS OF 50 KSI.
3. STEEL PIPE PILES SHALL ONLY BE FIELD SPLICED UNDER CONDITIONS APPROVED BY THE ENGINEER.
4. DO NOT USE MORE THAN ONE SPLICE PER PILE. DO NOT SPLICE PILE IN LOWER 40 FEET. BOTH, UPPER AND LOWER SECTIONS OF PILE ENDS, SHALL BE SMOOTH, SQUARE AND FLAT PRIOR TO SPLICING.

**STEEL SHEET PILES:**

1. STEEL SHEET PILES SHALL BE HOT ROLLED SHEETS AS CALLED FOR ON THE DRAWINGS.
2. STEEL GRADE FOR SHEET PILING AND INTERLOCKS SHALL BE IN ASTM A 572, GRADE 50.

**PILE DRIVING:**

1. PILE DRIVING SHALL BE CONDUCTED IN SUCH A WAY AS TO MITIGATE EXCESSIVE NOISE. DRIVE PILES WITH AN APPROVED VIBRATORY HAMMER TO THE MAXIMUM PRACTICAL DEPTH, THEN FOLLOW WITH AIR OR DIESEL OPERATED IMPACT HAMMER, WITH SUFFICIENT ENERGY AND ENERGY TRANSFER CHARACTERISTICS TO DRIVE THE PILES TO THE REQUIRED CAPACITY AND TOE ELEVATIONS WITHOUT DAMAGING THE PILE HEAD. IN CASES WHERE WEATHERED LIMESTONE IS PRESENT ABOVE THE MINIMUM EMBEDMENT DEPTH, AUGUR PILES TO APPROVED DEPTHS BEFORE DRIVING COMMENCES. USE CAUTION NOT TO INJURE THE PILES BY OVER DRIVING AS WOULD BE INDICATED BY REBOUND OF HAMMER OR STAGGERING OF PILE. CUT OFF HEADS OF PILES ACCURATELY IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AFTER COMPLETION OF DRIVING.
2. DRIVE THE PILES STRAIGHT AND TRUE AT INDICATED LOCATIONS, WITH DEVIATION FROM THE LONGITUDINAL AXIS OF NOT MORE THAN 1/4 INCH PER FOOT.
3. LOCATE THE PILES WITHIN 3 INCHES OF THE POSITIONS INDICATED ON THE DRAWINGS WITHOUT APPLYING EXCESSIVE LATERAL FORCE.
4. ALL EXCAVATED MATERIAL AND DEBRIS GENERATED FROM PILE INSTALLATION OPERATIONS SHALL BE COLLECTED AND TRANSPORTED FOR DISPOSAL IN CAD CELL 3.
5. CONTRACTOR SHALL USE CASING ALONG THE SLOPE DURING THE PLACEMENT OF SOCKETED PILES TO MAINTAIN SLOPE STABILITY AND PREVENT SOIL DISPLACEMENT.
6. WITHDRAW PILES THAT ENCOUNTER UNDERGROUND OBSTRUCTIONS SUFFICIENT TO IMPEDE PILE DRIVING. IF EXTRACTED PILE TIPS ARE FOUND DAMAGED, REPAIR AS APPROVED BY THE ENGINEER, AT NO ADDITIONAL COST TO OWNER, BEFORE REDRIVING. REDRIVE AS CLOSE AS POSSIBLE TO ORIGINAL POSITION, SUBJECT TO REVIEW OF THE OWNER.
7. PROVIDE DRIVING RESISTANCE PENETRATION AND REFUSAL VALUES AS ACCEPTED BY THE ENGINEER OF RECORD.
8. USE SUITABLE CUSHIONS OR DRIVING HEADS TO AVOID DAMAGE TO THE PILES, DEVELOPING PROPER TOTAL DRIVING ENERGY, AND DIRECTING THE ENERGY ALONG THE LONGITUDINAL CENTER OF GRAVITY OF THE PILE.
9. DRIVE PILES TO THEIR FULL PENETRATION WITHOUT BENDING, RUPTURING, OR SEVERELY DAMAGING THE PILES. IF FAILURE IN THE ABOVE RESPECTS IS ENCOUNTERED, PULL THE PILE AND DRIVE A NEW PILE AT NO ADDITIONAL COST TO THE OWNER. IF A REPLACEMENT PILE FAILS TO DEVELOP FULL DRIVING RESISTANCE, PULL THE REPLACEMENT PILE AND DRIVE A NEW PILE WITH LARGER DIAMETER AT NO ADDITIONAL COST TO THE OWNER.
10. JETTING TO ASSIST PENETRATION WILL NOT BE PERMITTED UNLESS ACCEPTED BY THE ENGINEER OF RECORD. PRE-DRILLING WILL NOT BE PERMITTED UNLESS ACCEPTED BY THE ENGINEER OF RECORD, WHEREBY ACCEPTED PRE-DRILLING TO ASSIST PENETRATION MAY BE USED WHERE EXTREME DRIVING RESISTANCE IS ENCOUNTERED, OR WHERE VIBRATIONS FROM DRIVING MAY BE DETRIMENTAL TO ADJACENT STRUCTURES.
11. WHERE PILES ARE PUSHED UP BY PRESSURE FROM DRIVING OF ADJACENT PILES, RE-DRIVE AS REQUIRED AND AT NO ADDITIONAL COST TO THE OWNER.
12. THE CONTRACTOR SHALL PROVIDE THE OWNER WITH A COMPLETE DRIVING RECORD WITH THE DATE OF FINAL INSTALLATION AND TIP ELEVATIONS. THIS RECORD SHALL BE SUBMITTED WEEKLY AND SIGNED BY A REPRESENTATIVE OF THE CONTRACTOR. THE CONTRACTOR SHALL KEEP AN ACCURATE SET OF PILE RECORDS INDICATING PILE NUMBER, PILE TYPE AND INS

ROCK ANCHORS:

1. ROCK ANCHORS SHALL BE INSTALLED TO A 45 DEGREE INCLINATION WITH RESPECT TO THE HORIZONTAL.
2. THE ROCK ANCHOR DESIGN LOAD IS 370 KIPS AND TESTING LOAD IS 480 KIPS. THE SPACING OF THE ROCK ANCHORS SHALL BE INSTALLED PER PLAN.
3. STRANDS SHALL COMPLY WITH ASTM A416, 0.6" DIA. 7-WIRE, 270 KSI.
4. GROUT SHALL COMPLY WITH ASTM C150, MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, WATER TO CEMENT RATIO RANGING FROM 0.4 TO 0.6.
5. ROCK ANCHOR DESIGN IS BY CONTRACTOR. ROCK ANCHOR ASSEMBLY INCLUDING GROUND ANCHOR, STAND-OFF PLATES AND CAP PLATES SHALL BE DESIGNED FOR THE TEST LOAD BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MASSACHUSETTS.

PROTECTIVE COATING:

1. MATERIAL USED FOR FACTORY EPOXY COATING SHALL BE BAR-RUST 235 MULTI-PURPOSE EPOXY COATING AS MANUFACTURED BY DEVOE COATINGS OR EQUIVALENT ACCEPTED BY THE PROJECT ENGINEER FOR STEEL SHEET PILES.
2. MATERIAL USED FOR FACTORY EPOXY COATING SHALL BE SKOTCHKOTE FUSION BOND EPOXY COATING 6233 AS MANUFACTURED BY 3M OR EQUIVALENT ACCEPTED BY THE PROJECT ENGINEER FOR STEEL PIPE PILES.
3. ALL PILES LOCATED ON ROWS A SHALL BE WRAPPED WITH SEASHIELD SERIES 2000HD BY DENSO 10' ABOVE AND 10' BELOW THE MLLW. FOLLOW MANUFACTURER INSTALLATION PROCEDURE AND STANDARDS.
4. ALL PILES LOCATED ON ROWS A, B, C, D, E AND F SHALL BE WRAPPED WITH SEASHIELD SERIES 70 BY DENSO, 10' ABOVE MLLW AND 1' BELOW MUDLINE. FOLLOW MANUFACTURER INSTALLATION PROCEDURE AND STANDARDS.
5. FIELD TOUCH UP COATING SHALL BE IDENTICAL TO FACTORY COATING AND APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
6. DENSO 2000HD MARINE PILING TAPE SHALL APPLY ON ALL PILES IN CONTACT WITH WATER 5' ABOVE AND BELOW OF MLLW.
7. THE PROTECTIVE COATING SHALL BE APPLIED IN STRICT ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. COATING IS TO BE APPLIED IN TWO COATS TO ACHIEVE A MINIMUM OVERALL DRY FILM THICKNESS OF 15 MILS.
8. ALL HOLIDAYS OR OTHER IMPERFECTIONS IN THE COATING SHALL BE REMOVED OR REPAIRED AT THE CONTRACTORS EXPENSE PRIOR TO FINAL ACCEPTANCE OF THE WORK.

WELDING:

1. WELDING SHALL CONFORM TO AWS D1.1, THE 'STRUCTURAL WELDING CODE - STEEL', PUBLISHED BY THE AMERICAN WELDING SOCIETY. A WELDER CERTIFIED IN ACCORDANCE WITH AWS STANDARDS SHALL PERFORM WELDING.
2. WELDING ELECTRODES SHALL BE E70XX LOW HYDROGEN AND COMPLY WITH AWS A5.1 AND AWS A5.5.
3. UNLESS OTHERWISE INDICATED, ALL FILLET WELDS SHALL BE CONTINUOUS AND DOUBLE SIDED. ALL BUTT WELDS SHALL BE COMPLETE PENETRATION WELDS.
4. ALL WELDS SHALL BE SUBJECT TO NON-DESTRUCTIVE TESTING AT THE DISCRETION OF THE ENGINEER OF RECORD.
5. ANY DEFECTS SHALL BE CORRECTED IN ACCORDANCE WITH AWS RULES AT NO ADDITIONAL COST TO THE OWNER.
6. ALL SPLICES, WHEN PERMITTED, SHALL BE COMPLETE JOINT PENETRATION GROOVE WELDS AND BE SUBJECT TO NON-DESTRUCTIVE TESTING.
7. WELDS USED FOR PIPE MANUFACTURE SHALL HAVE SIMILAR CORROSIONAL RESISTANT QUALITIES TO THE BASE MATERIAL.

CAST-IN-PLACE CONCRETE:

1. CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF ACI-318-19 'BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE', AS ADOPTED BY THE AMERICAN CONCRETE INSTITUTE.
2. PLATFORM CONCRETE SHALL BE NORMAL WEIGHT WITH A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI AT 28 DAYS. PORTLAND CEMENT SHALL BE TYPE II. CONCRETE SHALL CONTAIN 7.5% (+/- 1.5%) ENTRAINED AIR AND HAVE A MAXIMUM WATER TO CEMENT RATIO OF 0.40.
3. CONCRETE MIX SHOULD BE DESIGNED AND TESTED BY CONTRACTOR AS TO DEVELOP THE REQUIRED COMPRESSIVE STRENGTH AND BE APPROVED BY ENGINEER BEFORE STARTING THE OPERATIONS.
4. USE ACCELERATORS/ADMIXTURES, AS NECESSARY, TO IMPROVE WORKABILITY AND REDUCE WATER/CEMENT RATIO TO CONTROL SHRINKAGE.
5. USE OF CORROSION INHIBITORS IN THE CONCRETE MIX IS REQUIRED. CORROSION INHIBITORS SHALL BE PROPORTIONED IN ACCORDANCE WITH THE SPECIFICATIONS.
6. SUBMIT PROPOSED CONCRETE MIX TO THE ENGINEER FOR REVIEW.
7. CONCRETE SHALL BE CONTROLLED CONCRETE, MIXED AND PLACED IN THE PRESENCE OF THE APPROVED TESTING AGENCY.
8. DO NOT PLACE CONCRETE UNTIL REINFORCEMENT AND EMBEDDED ITEMS HAVE BEEN APPROVED BY THE ENGINEER AND/OR THE APPROVED TESTING AGENCY (IF/WHEN DIRECTED). PROVIDE A MINIMUM OF 24 HOURS NOTIFICATION TO THE ENGINEER.
9. PROVIDE BROOM FINISH ON ALL CONCRETE SLABS.
10. PROVIDE SMOOTH FORM FINISH ON ALL OTHER EXPOSED SURFACES.

REINFORCING:

1. REINFORCING STEEL SHALL BE PLAIN, UNCOATED AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615 GRADE 60.
2. DETAILING, FABRICATION, AND ERECTION OF REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH ASTM A775 OR ASTM 767 AND CONFORM TO THE REQUIREMENTS OF ACI-318 AND ACI-315 'DETAILS AND DETAILING OF CONCRETE REINFORCEMENT'.
3. REINFORCEMENT SHALL CONFORM TO BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-19), ACI DETAILING MANUAL (SP-66), CRSI MANUAL OF STANDARD PRACTICE (MSP), AND THE STRUCTURAL WELDING CODE-REINFORCING STEEL (AWS D1.4).
4. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
5. PROVIDE SUPPLEMENTAL BARS AND ACCESSORIES AS REQUIRED TO HOLD REINFORCEMENT SECURELY IN POSITION.
6. MINIMUM CONCRETE PROTECTIVE COVER, UNLESS NOTED OTHERWISE, SHALL BE AS FOLLOWS:
   a. CONCRETE EXPOSED TO WEATHER 3 INCHES
   b. CONCRETE AT ADJACENT POURS 2 INCHES
   c. CONCRETE PLACED AGAINST EARTH 3 INCHES
7. ALL CONTINUOUS REINFORCEMENT SHALL BE EXTENDED AROUND CORNERS AND LAPPED AT NECESSARY SPLICES OR HOOKED AT DISCONTINUOUS ENDS. USE STANDARD HOOKS UNLESS OTHERWISE INDICATED.
8. LAPS SHALL BE CLASS B TENSION LAP SPLICES, UNLESS NOTED OTHERWISE.
9. REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS. PROVIDE MECHANICAL COUPLERS WHERE REQUIRED CONTINUOUS REINFORCEMENT EXCEEDS AVAILABLE LENGTHS.

FENDERING:

1. FENDERS SHALL BE ZALDA TECHNOLOGY FENDER AND HDPE FACED PANEL "SC-1150" SER (HIGH FORMULA), ZALDA TECHNOLOGY USA, (510) 783-4910 OR APPROVED EQUAL.

BOLLARDS:

1. BOLLARD LOCATIONS ARE AS PLANS WITH 200 METRIC TONS PULL CAPACITY.

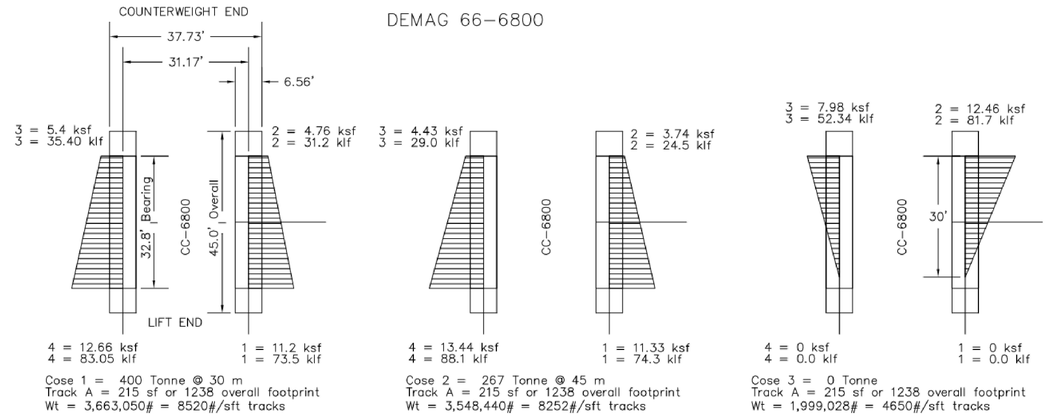
SCOUR PROTECTION:

1. SCOUR PROTECTION SHALL BE ARMORFLEX 70L BY CONTECH ENGINEERED SOLUTIONS OR APPROVED EQUAL.
2. CELLULAR CONCRETE MATS SHALL BE PREFABRICATED AS AN ASSEMBLY OF CONCRETE BLOCKS, LACED WITH REVETMENT CABLES. CELLULAR CONCRETE MATS MAY BE ASSEMBLED ON-SITE BY HAND-PLACING THE INDIVIDUAL UNITS EITHER WITH OR WITHOUT SUBSEQUENT INSERTION OF CABLES.
3. INDIVIDUAL UNITS IN THE SYSTEM SHALL BE STAGGERED AND INTERLOCKED FOR ENHANCED STABILITY. THE MATS SHALL BE CONSTRUCTED OF OPEN AND/OR CLOSED CELL UNITS. OPEN CELL UNITS SHALL HAVE TWO VERTICAL OPENING OF RECTANGULAR CROSS SECTION WITH SUFFICIENT WALL THICKNESS TO RESIST SHIPPING AND INSTALLATION.
4. PARALLEL STRANDS OF CABLE SHALL EXTEND THROUGH TWO CABLE DUCTS IN EACH BLOCK ALLOWING FOR LONGITUDINAL BINDING OF THE UNITS WITHIN A MAT.
5. EACH ROW OF UNITS SHALL BE LATERALLY OFFSET BY ONE-HALF OF A BLOCK WIDTH FROM THE ADJACENT ROW SO THAT ANY GIVEN BLOCK IS CABLED TO FOUR OTHER BLOCKS (TWO IN THE ROW ABOVE AND TWO IN THE ROW BELOW).
6. EACH BLOCK SHALL INCORPORATE INTERLOCKING SURFACES THAT MINIMIZE LATERAL DISPLACEMENT OF THE BLOCKS WITHIN THE MATS.
7. THE MATS MUST BE ABLE TO FLEX A MINIMUM OF 18 DEGREES BETWEEN ANY GIVEN ROW OR COLUMN OF BLOCKS IN THE UPLIFT DIRECTION AND A MINIMUM OF 45 DEGREES IN THE DOWNWARD DIRECTION.
8. THE CELLULAR CONCRETE MATS SHALL BE PLACED ON FILTER FABCRIC. UNDER NO CIRCUMSTANCES SHALL THE FILTER FABRIC BE AFFIXED TO THE MATTRESS IN A MANNER TO JEOPARDIZE THE FUCTIONALITY OF THE FILTER FABRIC.
9. AT THE TIME OF DELIVERY TO THE PROJECT SITE, THE MINIMUM COMPRESSIEVE STRENGTH OF AN INDIVIDUAL UNIT SHALL BE 3,500 PSI AND OF THE AVERAGE OF 3 UNITS SHALL BE 4,000 PSI.
10. AT THE TIME OF DELIVERY TO THE PROJECT SITE, THE MAXIMUM WATER ABSORPTION OF AN INDIVIDUAL UNIT SHALL BE 11.7 LB/FT$^3$ AND OF THE AVERAGE OF 3 UNITS SHALL BE 9.1 LB/FT$^3$.
11. REVETMENT CABLE SHALL BE CONSTRUCTED OF HIGH TENACITY, LOW ELONGATING, AND CONTINUOUS FILAMENT POLYESTER FIBERS. SELECTION OF CABLE AND FITTINGS SHALL BE MADE IN A MANNER THAT INSURES A SAFE DESIGN FACTOR FOR MATS BEING LIFTED FROM BOTH ENDS, THERBY FORMING A CATENARY.
12. MATS SHALL BE ANCHORED IN PLACE WITH MINIMUM 3" DIAMETER GALVANIZED PIPE DRIVEN FLUSH WITH TOP OF CONCRETE. THE DESIGN AND LAYOUT OF THE ANCHORED SYSTEM AND TOE ANCHORAGE SHALL BE BY THE MANUFACURER.
13. GRADE SLOPE AS SHOWN IN SECTION TO FORM A SMOOTH PLANE SURFACE. PLACE FILTER FABRIC AND PLACE FILER STONE TO PROVIDE A UNIFORM GRADE SMOOTH PLANE SURFACE FOR PLACEMENT OF CELLAR CONCRETE MATS.
14. PLACE CONCRETE MATS IN ASSEMBLED LARGE MATRESSES. USE SPREADER BARS OR OTHER APPROVED DEVICES TO AID IN LIFTING AND PLACING OF THE MATS. THE EQUIPMENT USED SHALL HAVE ADEQUATE CAPACITY TO PLACE THE MATS WITHOUT BUMPING, DRAGGING, TEARING OR OTHERWISE DAMAGING THE UNDERLYING FABRIC OR CONCRETE MATS.
15. THE MATS SHALL BE PLACED SIDE-BY-SIDE AND/OR END-TO-END, SO THAT THE MATS ABUT EACH OTHER. DISTINCT CHANGES IN GRADE THAT RESULT IN A DISCONTINOUS REVETMENT SURFACE WILL REQUIRE BACKFILL AT THE GRADE CHANGE LOCATION SO AS TO PRODUCE A CONTINOUS SURFACE.
16. NO INDIVIDUAL BLOCK WITHIN THE PLANE OF PLACED CELLULAR CONCRETE BLCOKS SHALL PROTRUDE MORE THAN ONE-HALF INCH OR AS OTHERWISE SPECIFIED BY THE ENGINEER.
17. THE CONTRACTOR SHALL SUBMIT MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR CELLULAR CONCRETE BLOCKS/MATS, REVETMENT CABLES, AND REVETMENT CABLE FITTINGS AND CONNECTORS, MANUFACTURER'S SPECIFICATIONS, MANUFACTURER'S LITERATURE, AND SHOP DRAWINGS FOR THE LAYOUT OF THE MATS.
18. THE CONTRATOR SHALL SUBMIT INSTALLATION PLAN FOR SUBRADE PREPARATION, CONCRETE MAT AND TOE ANCHORAGE INSTALLATION.

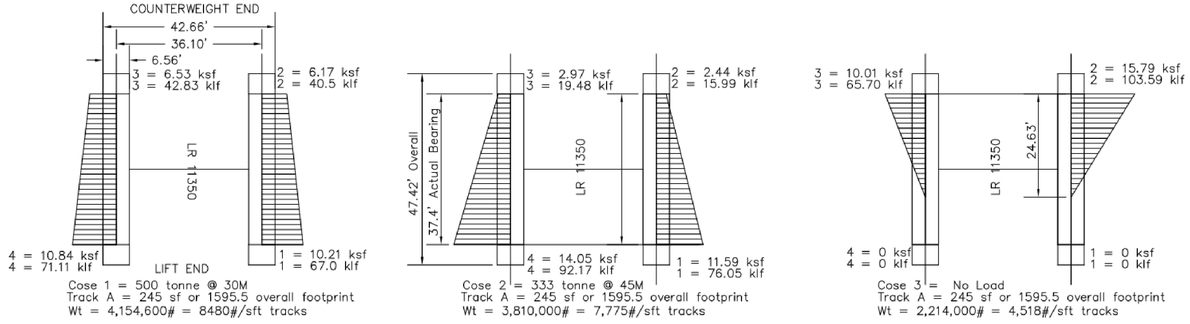
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## DESIGN CRANE LOADS

### DEMAG 66-6800




### LIEBHERR LR-11350




NOTE: TRACK A IS THE MORE HEAVILY LOADED TRACK

LOAD DIAGRAMS ARE INCLUDED FOR INFORMATIONAL PURPOSES ONLY AND AS A REFERENCE AS TO WHAT WAS USED FOR THE PROJECT DESIGN, OTHER SPECIFIC LOADING SHALL BE EVALUATED BY PROFESSIONAL THOROUGHLY FAMILIAR WITH THIS DESIGN; AND INTERPOLATING LOADING ALLOWANCES BASED ON THESE DIAGRAMS IS NOT ENCOURAGED.

DATUM OFFSETS

| MLLW | NAVD 88 | |
|---|---|---|
| 3.96 | 2.04 | MHHW |
| 3.71 | 1.79 | MHW |
| 1.92 | 0.00 | NAVD 88 |
| 0.14 | -1.78 | MLW |
| 0.0 | -1.92 | MLLW |

OFFSETS TAKEN FROM FROM USACE GUIDANCE IN QUALITY CONTROL REPORT BY JACOBS ENGINEERING, PROVIDED BY USACE

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

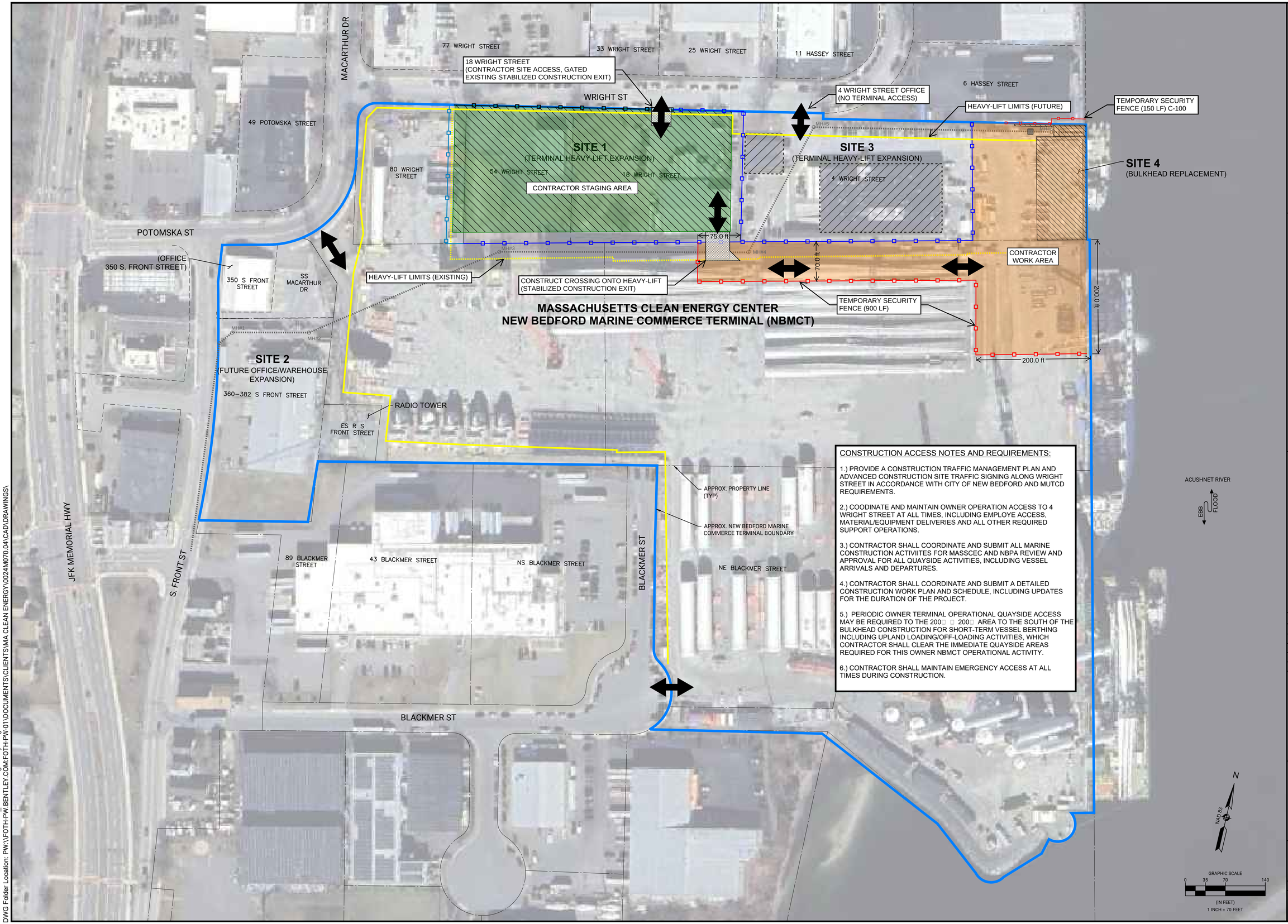
SHEET TITLE:
GENERAL NOTES (MARINE INFRASTRUCTURE, 2 OF 2)

ISSUANCE:
**IFB DRAWINGS**
(11/10/2025)

PROJECT NO: 0024M070.04

SHEET NUMBER
G-007

Tuesday, November 11, 2025 12:43:43 AM
DWG Filename: 24m070.04 masscec_front end.dwg Layout: g-007
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




CONSTRUCTION ACCESS NOTES AND REQUIREMENTS:

1.) PROVIDE A CONSTRUCTION TRAFFIC MANAGEMENT PLAN AND ADVANCED CONSTRUCTION SITE TRAFFIC SIGNING ALONG WRIGHT STREET IN ACCORDANCE WITH CITY OF NEW BEDFORD AND MUTCD REQUIREMENTS.

2.) COODINATE AND MAINTAIN OWNER OPERATION ACCESS TO 4 WRIGHT STREET AT ALL TIMES, INCLUDING EMPLOYE ACCESS, MATERIAL/EQUIPMENT DELIVERIES AND ALL OTHER REQUIRED SUPPORT OPERATIONS.

3.) CONTRACTOR SHALL COORDINATE AND SUBMIT ALL MARINE CONSTRUCTION ACTIVIITES FOR MASSCEC AND NBPA REVIEW AND APPROVAL FOR ALL QUAYSIDE ACTIVITIES, INCLUDING VESSEL ARRIVALS AND DEPARTURES.

4.) CONTRACTOR SHALL COORDINATE AND SUBMIT A DETAILED CONSTRUCTION WORK PLAN AND SCHEDULE, INCLUDING UPDATES FOR THE DURATION OF THE PROJECT.

5.) PERIODIC OWNER TERMINAL OPERATIONAL QUAYSIDE ACCESS MAY BE REQUIRED TO THE 200□ □ 200□ AREA TO THE SOUTH OF THE BULKHEAD CONSTRUCTION FOR SHORT-TERM VESSEL BERTHING INCLUDING UPLAND LOADING/OFF-LOADING ACTIVITIES, WHICH CONTRACTOR SHALL CLEAR THE IMMEDIATE QUAYSIDE AREAS REQUIRED FOR THIS OWNER NBMCT OPERATIONAL ACTIVITY.

6.) CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS AT ALL TIMES DURING CONSTRUCTION.

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE**
**COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

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| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

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SHEET TITLE:
**CONSTRUCTION SEQUENCING & ACCESS CONTROL PLAN**

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
**G-008**

Sunday, November 9, 2025 10:22:26 PM
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DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

EX. SECURITY FENCE TO REMAIN IN-PLACE (CONTRACTOR WORK LIMITS)

LOT LINE TO BE ABANDONED

NAD 83

N

MW-5

RIM=10.93
CLEANOUT SWEEP

EXISTING 8" DI FIRE PROTECTION SERVICE MAIN. CONTRACTOR SHALL CUT AND CAP WITH BLOW-OFF AND POST REFERENCING LOCATION

FIRE MAIN TO THE WEST SHALL REMAIN IN SERVICE AND BE ABANDONED AS PART OF A FUTURE HEAVY-LIFT PROJECT BY OTHERS

REFERENCE MR302 TYPICAL SECTION FOR TEMPORARY EXCAVATION EXTENTS.

REMOVAL, STOCKPILE AND REINSTALL DENSE GRADED AGGREGATE (3-FT DGA DEPTH) AND SUBSOILS (SEPARATE STOCKPILES) FOR REINSTALLATION.

REINSTALL AND COMPACT SUBSOILS AND DGA TO 95% STANDARD PROCTOR.

CONTRACTOR SHALL DEMO AND REMOVE EXISTING PIPE TO BE ABANDONED FROM THIS POINT TO THE EAST AND PLUG PIPE TO BE ABANDONED TO THE WEST (PROVIDE SURVEY LOCATION IN AS-BUILT RECORD FOR FUTURE REFERENCE)

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

S FRONT STREET
BOOK 10719 PAGE 242
PID:031 0288
ZONE=WI

REFERENCE CG-SERIES DRAWINGS FOR TYPICAL SECTION FOR SITE GRADING AND PLATFORM EXCAVATION LIMITS.

REMOVAL AND DISPOSE OF EXISTING ASPHALT PAVEMENT OFF-SITE (APPROX. 5")

REMOVAL AND STOCKPILE EXISTING CLASSIFIED SOILS ON-SITE FOR REINSTALLATION BETWEEN NEW MANHOLE AND BULKHEAD IN NW CORNER OF PROJECT (APPROX. XXX CY). FOLLOW SOIL CONTAINMENT STOCKPILING REQUIREMENTS IN THE SOIL MANAGEMENT PLAN (STOCKPILES LIMITED TO 500 CY EACH)

EXISTING PAVEMENT REMOVAL AND DGA GRADING LIMITS (SEE GRADING PLAN C-101)

LATERAL UNDERDRAIN (TYP.)
CRUSH STONE (1-½") W/ WOVEN FILTER FABRIC (MIRAFI 600x OR EQUIVALENT ALL AROUND)

108'

20'

5'

3'

EX. MASSDOT GUARDRAIL

REMOVE AND DISPOSAL OF EXISTING GUARD RAIL INCLUDING POST AND FOOTINGS

REMOVE AND DISPOSAL OF EXISTING 8" FIRE PROTECTION SERVICE MAIN PIPE, HYDRANT ASSEMBLY AND VALVES

EX. HYDRANT W/ (2) GATE VALVES

TEMPORARY AZ SHEETPILE WALL; SEE MR010

DGA GRADING LIMITS (SEE GRADING PLAN C-101)

DEMO EX. UTILITY TRENCH (CONTRACTOR SHALL VERIFY THAT EX. CONDUITS ARE EMPTY PRIOR TO TRENCH DEMOLITION)

EXISTING 8" DI(CL) GJ INSULATED FIRE PROTECTION SERVICE IN UTILITY TRENCH. CONTRACTOR SHALL CUT AND CAP WITH BLOW-OFF IN EXISTING UTILITY TRENCH AND REMOVE/ABANDON EXISTING PIPING TO THE WEST. FIRE MAIN SHALL BE EXTENDED AS PART OF A FUTURE HEAVY-LIFT PROJECT BY OTHERS.

EX. FENDER (TYP.)

EX. LADDER (TYP.)

12" HDPE

18"

APPROX. PROPERTY LINE (TYP)

30'-0" DRAINAGE EASEMENT

HEAVY-LIFT LIMITS LINE (FUTURE TIMBER BORDER BY OTHERS)

EX. REFRIGERATED TRUCK TRAILER

EX. BUILDING ADDITION

#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI

UNDERDRAIN MANHOLE - CIRCULAR
LEACHING PIT (48-IN DIA.)
EL. = +6.0 (12" HDPE)
EL. = +3.0 (BOTTOM OF SUMP)

TEMPORARY CONSTRUCTION FENCING (8-FT SECURITY CHAIN-LINK FENCE, 150')

PROPOSED ON-SITE SOIL REUSE AREA (FILL AREA) (DGA FUTURE INSTALLATION BY OTHERS)

ALL TRENCH EXCVATION FOR NEW MANHOLE STRUCTURE AND STORM DRAIN REPLACEMENT SHALL BE REINSTALLED AND COMPACTED TO 95% STANDARD PROCTOR DENSITY

EX. REFRIGERATED TRUCK TRAILER

CONSTRUCTION EASEMENT (USE REQUIREMENTS):

1) TYPE OF WORK - LIGHT SITE/CIVIL CONSTRUCTION
2) EQUIPMENT USED - LIGHT CONSTRUCTION EQUIPMENT
3) HOURS OF OPERATION - TYPICAL CONSTRUCTION 7AM-3PM
4) OVERALL DURATION OF WORK - LIMITED TO 4-6 MONTHS (CONTRACTOR SHALL ADJUST TEMPORARY CONSTRUCTION FENCING AS NECESSARY)
5) DETAILS REGARDING THE PROPOSED WALL - THE PROJECT REQUIRES A BURIED CONCRETE WALL TO BE CONSTRUCTION AT THE PROPERTY LINE ON 4 WRIGHT STREET IN ORDER TO DISCONNECT THE EXISTING QUAYSIDE PLATFORM AND REMOVAL OF THE MINOR CELLULAR COFFERDAM. THE CONTRACTOR SHALL ONLY EXCAVATE BELOW GRADE ON 6 HASSEY STREET FOR CONSTRUCTION OF THE BURIED CONCRETE WALL AT THE QUAYSIDE. THE WALL SHALL BE BACKFILLED WITH SUITABLE GRANULAR BACKFILL MATERIAL AND SURFACE RESTORATION OF EQUIVALENT TO CURRENT EXISTING CONDITIONS (EQUIVALENT OR BETTER).
6) OTHER - THE CONTRACTOR SHALL INSTALL A TEMPORARY CHAIN-LINK CONSTRUCTION FENCE ON TEMPORARY EASEMENT LINE TO RESTRICT ACCESS DURING CONSTRUCTION.

10'-0" CONSTRUCTION EASEMENT

EX. SHEET PILE CELL #4 AND CONCRETE RELIEVING PLATFORM NOT TO BE DISTURBED (REFERENCE INSPECTION/ASSESSMENT REPORT AND HISTORICAL DOCUMENTATION)

EX. BUILDING

EX. HP14x73 (TYP)

EX. CLEAT (TYP)

C MR305

G SR303

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT: MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT (SITE 4)

OWNER: NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

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| DRAWN | CJP/MXS6 | 11/7/2025 |
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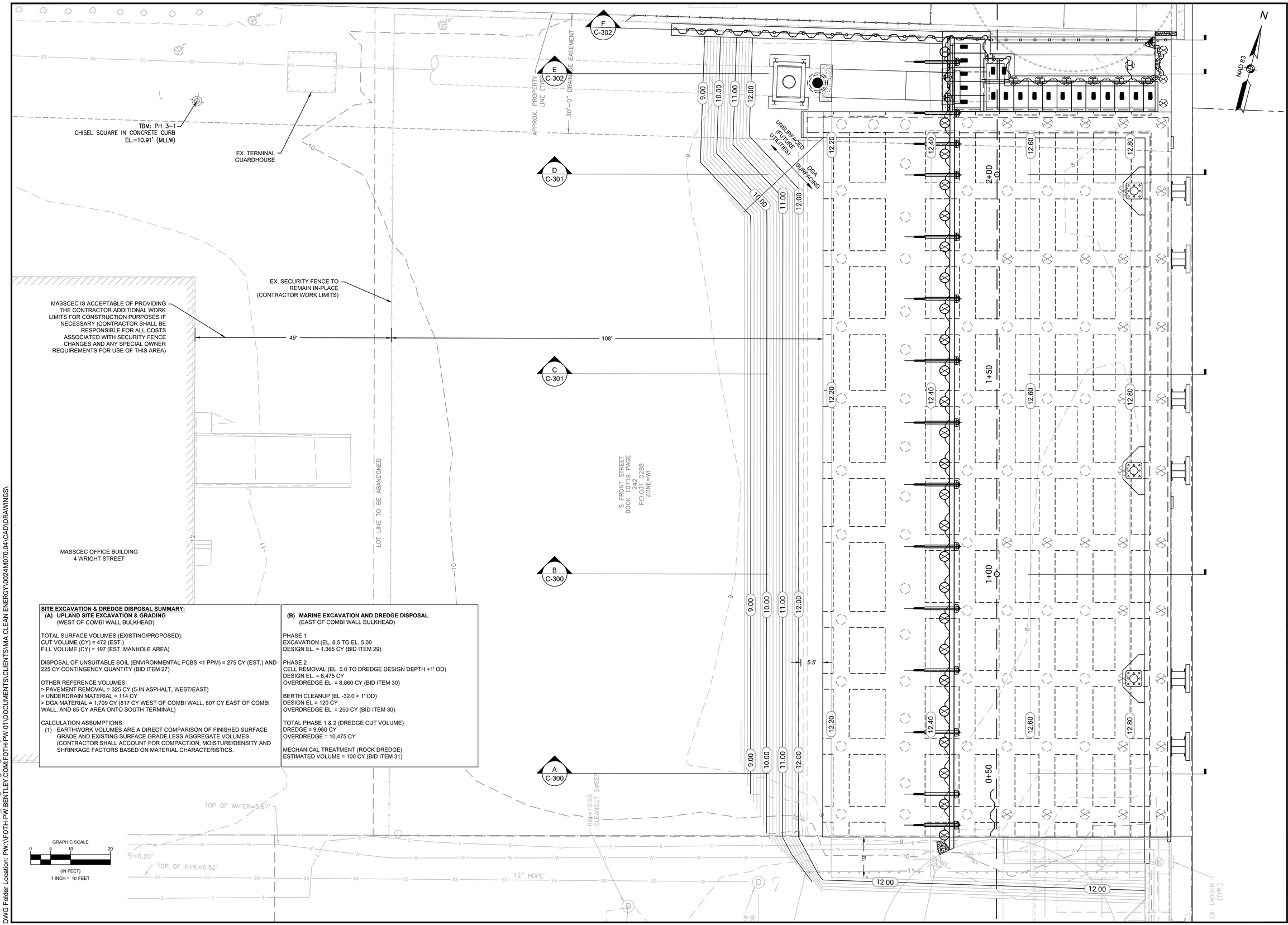
SHEET TITLE:
SITE CIVIL UTILITY PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
C-100

Tuesday, November 11, 2025 12:44:34 AM
DWG Filename: 24m070.04 masscec_civil grading.dwg Layout: c-100
DWG Folder Location: PW:\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




**SITE EXCAVATION & DREDGE DISPOSAL SUMMARY:**

**(A) UPLAND SITE EXCAVATION & GRADING**
(WEST OF COMBI WALL BULKHEAD)

TOTAL SURFACE VOLUMES (EXISTING/PROPOSED):
CUT VOLUME (CY) = 472 (EST.)
FILL VOLUME (CY) = 197 (EST. MANHOLE AREA)

DISPOSAL OF UNSUITABLE SOIL (ENVIRONMENTAL PCBS <1 PPM) = 275 CY (EST.) AND 225 CY CONTINGENCY QUANTITY (BID ITEM 27)

OTHER REFERENCE VOLUMES:
> PAVEMENT REMOVAL = 325 CY (5-IN ASPHALT, WEST/EAST)
> UNDERDRAIN MATERIAL = 114 CY
> DGA MATERIAL = 1,709 CY (817 CY WEST OF COMBI WALL, 807 CY EAST OF COMBI WALL, AND 85 CY AREA ONTO SOUTH TERMINAL)

CALCULATION ASSUMPTIONS:
(1) EARTHWORK VOLUMES ARE A DIRECT COMPARISON OF FINISHED SURFACE GRADE AND EXISTING SURFACE GRADE LESS AGGREGATE VOLUMES (CONTRACTOR SHALL ACCOUNT FOR COMPACTION, MOISTURE/DENSITY AND SHRINKAGE FACTORS BASED ON MATERIAL CHARACTERISTICS.

**(B) MARINE EXCAVATION AND DREDGE DISPOSAL**
(EAST OF COMBI WALL BULKHEAD)

PHASE 1
EXCAVATION (EL. 8.5 TO EL. 5.00
DESIGN EL. = 1,365 CY (BID ITEM 29)

PHASE 2
CELL REMOVAL (EL. 5.0 TO DREDGE DESIGN DEPTH +1' OD)
DESIGN EL. = 8,475 CY
OVERDREDGE EL. = 8,860 CY (BID ITEM 30)

BERTH CLEANUP (EL -32.0 + 1' OD)
DESIGN EL = 120 CY
OVERDREDGE EL. = 250 CY (BID ITEM 30)

TOTAL PHASE 1 & 2 (DREDGE CUT VOLUME)
DREDGE = 9,960 CY
OVERDREDGE = 10,475 CY

MECHANICAL TREATMENT (ROCK DREDGE)
ESTIMATED VOLUME = 100 CY (BID ITEM 31)

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Tuesday, November 11, 2025 12:44:52 AM
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PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

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| DESIGNED | MXS6 | 11/7/2025 |
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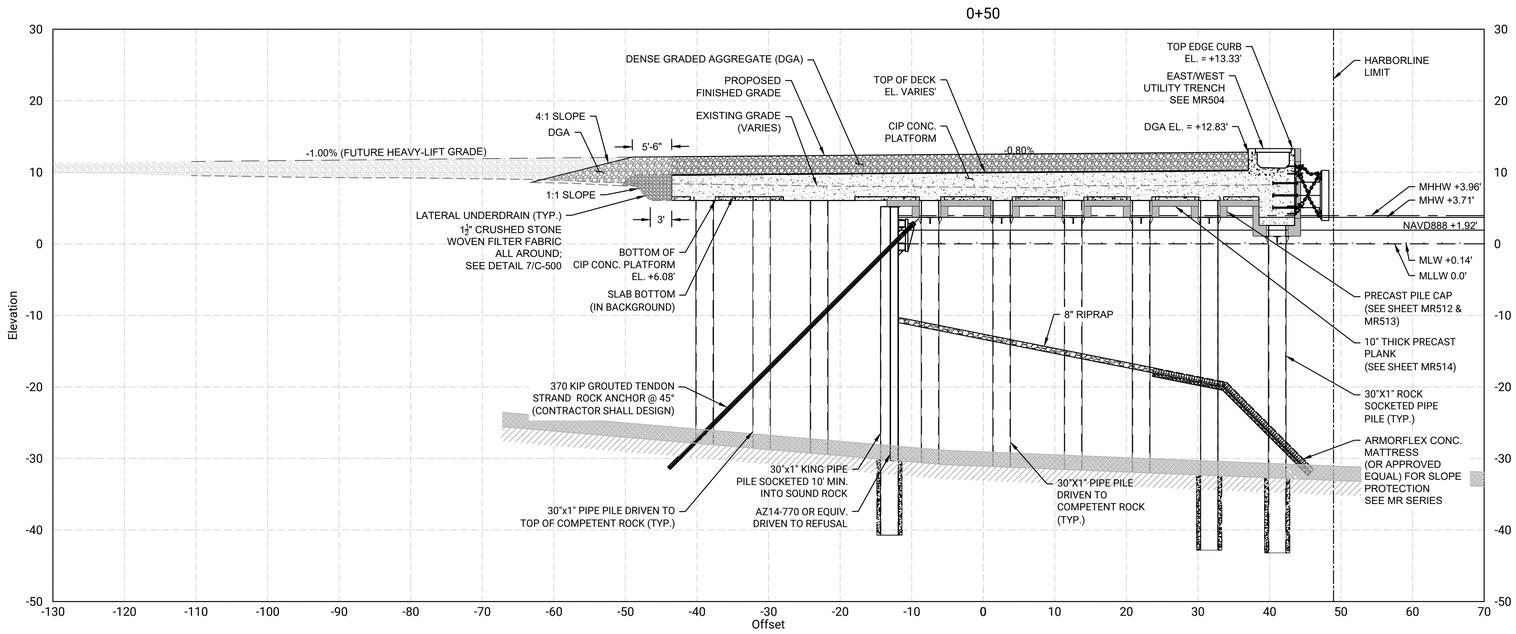
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SHEET TITLE:
**SITE CIVIL GRADING PLAN**

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

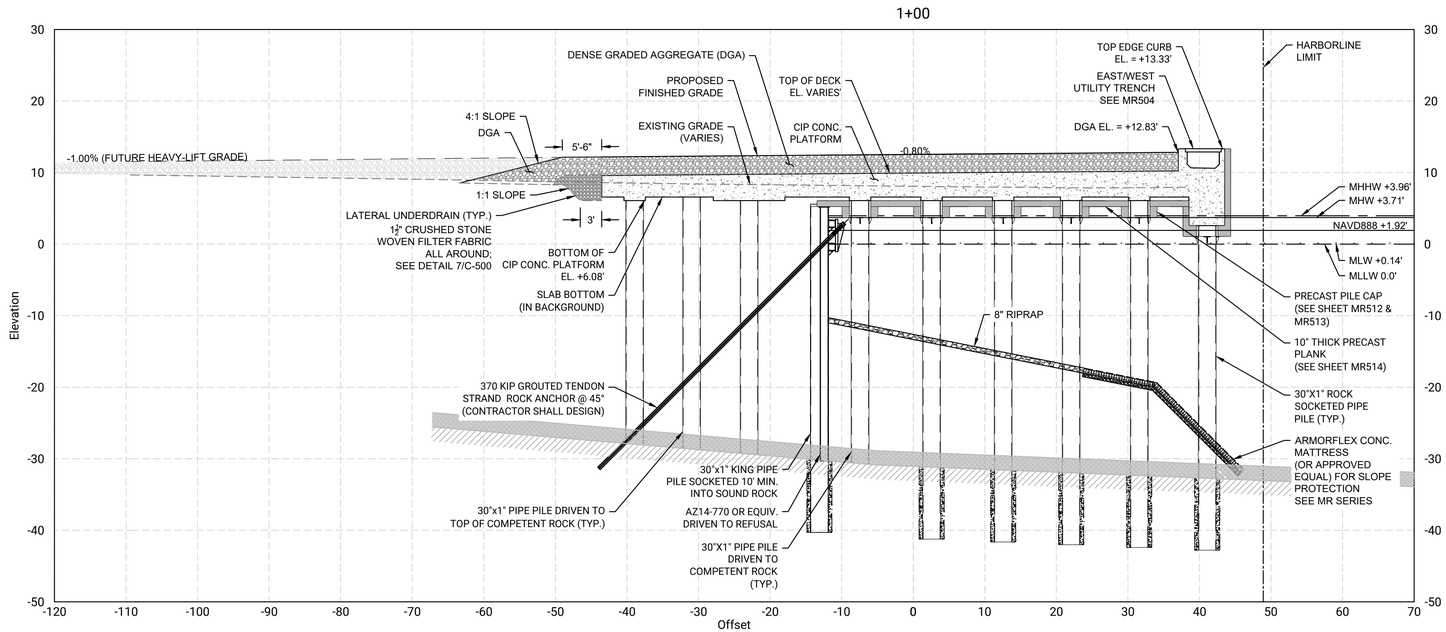
PROJECT NO: 0024M070.04

SHEET NUMBER
**C-101**




A C-101 BULKHEAD GRADING SECTION
SCALE: 1" = 10'

NOTE: SEE MR SERIES FOR STRUCTURAL DETAILS.




B C-101 BULKHEAD GRADING SECTION
SCALE: 1" = 10'

NOTE: SEE MR SERIES FOR STRUCTURAL DETAILS.

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT (SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

| REVISIONS | | | |
|---|---|---|---|
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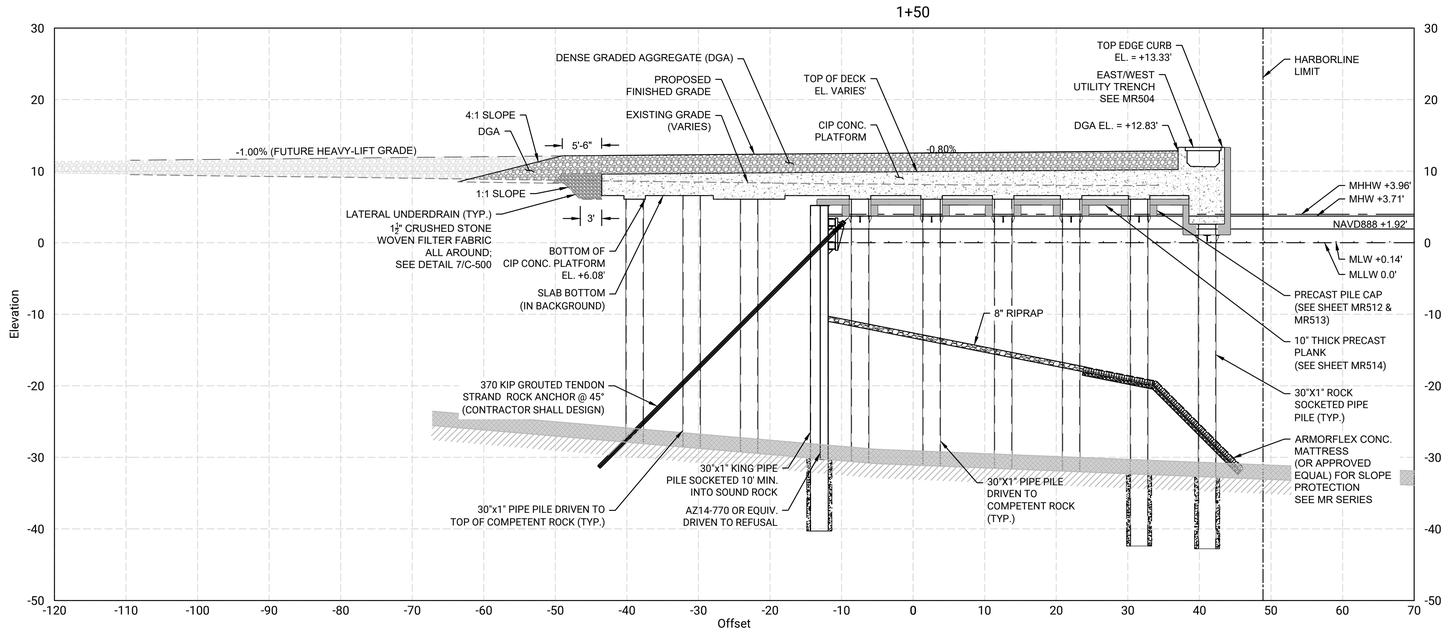
SHEET TITLE:
SITE CIVIL SECTIONS 1 OF 3

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

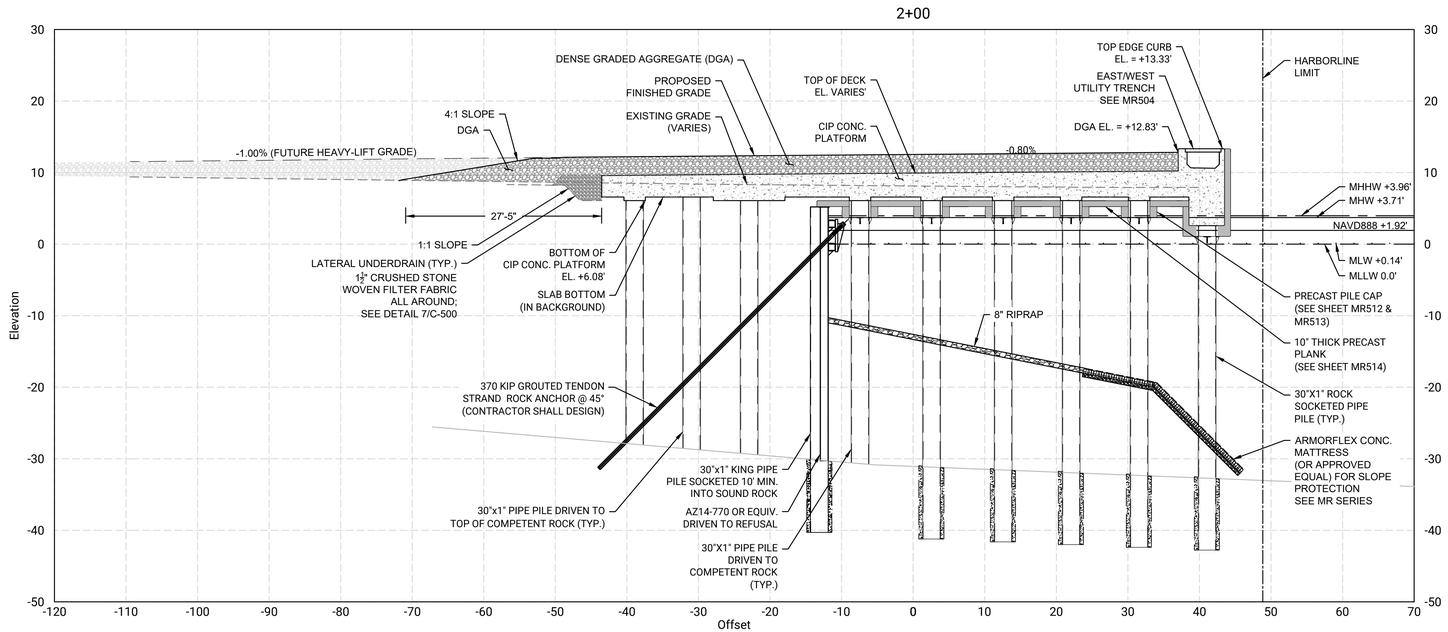
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C-300

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C / C-101 BULKHEAD GRADING SECTION
SCALE: 1" = 10'

NOTE: SEE MR SERIES FOR STRUCTURAL DETAILS.




D / C-101 BULKHEAD GRADING SECTION
SCALE: 1" = 10'

NOTE: SEE MR SERIES FOR STRUCTURAL DETAILS.

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT (SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

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|---|---|---|---|

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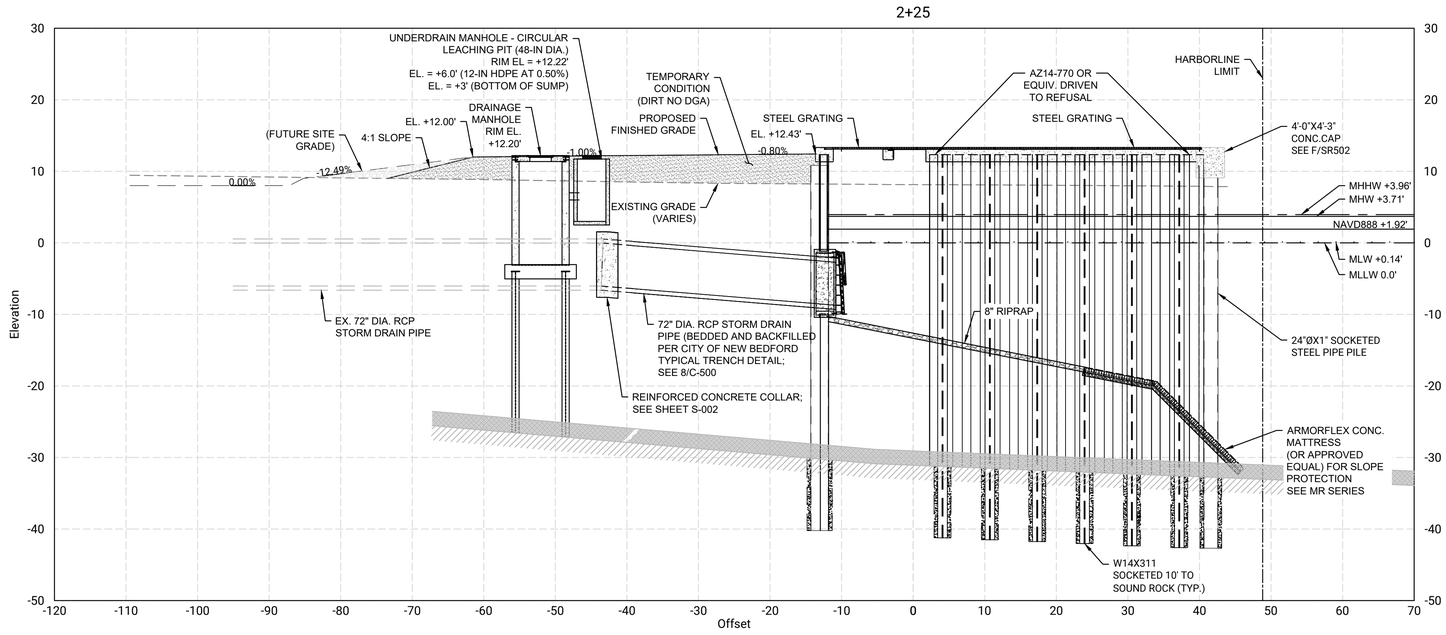
SHEET TITLE:
SITE CIVIL SECTIONS 2 OF 3

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

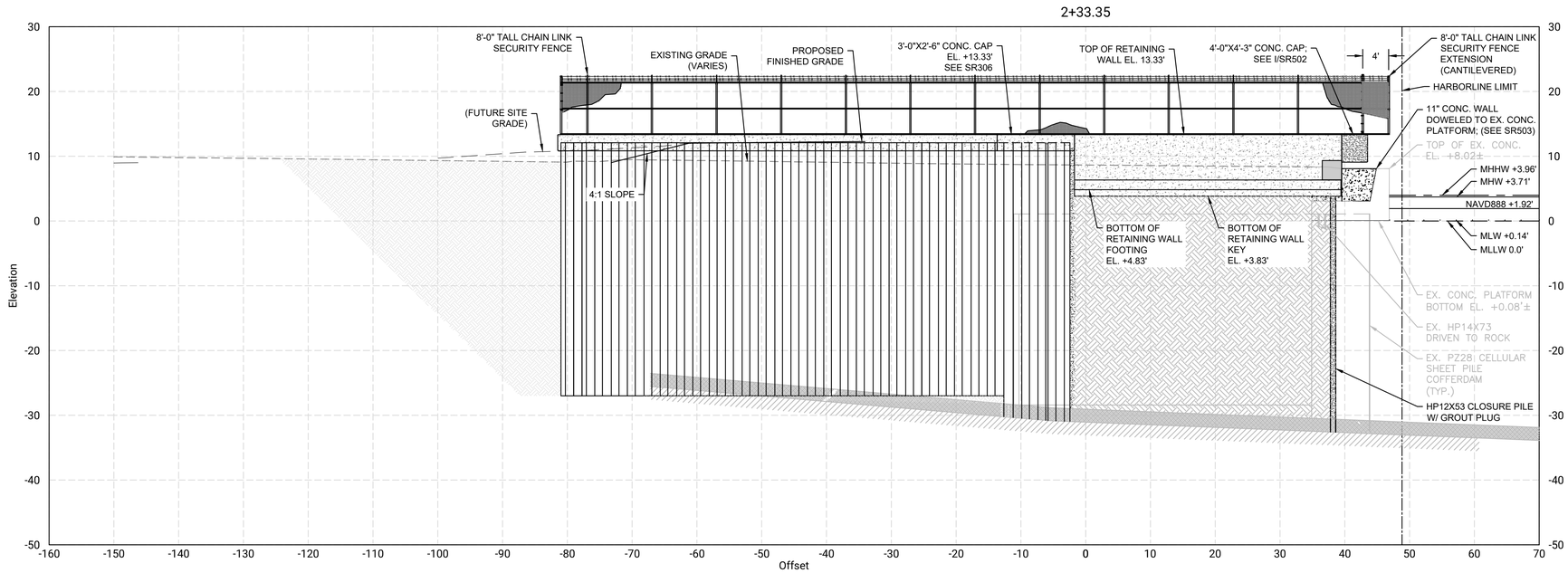
SHEET NUMBER
C-301

Tuesday, November 11, 2025 12:45:53 AM
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DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




E / C-101 EAST/WEST COMBI-WALL GRADING SECTION
SCALE: 1" = 10'

NOTE: SEE MR SERIES FOR STRUCTURAL DETAILS.




F / C-101 RETAINING WALL GRADING SECTION
SCALE: 1" = 10'

NOTE: SEE SR306 FOR STRUCTURAL DETAILS.

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

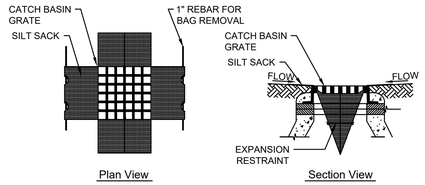
SHEET TITLE:
SITE CIVIL
SECTIONS
3 OF 3

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
C-302

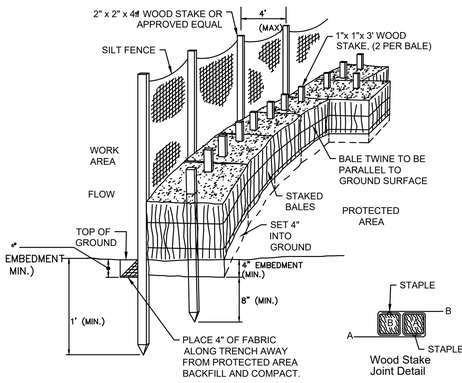
Tuesday, November 11, 2025 12:46:26 AM
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DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




CONSTRUCTION NOTES

1. INSTALL SILT SACKS IN ALL CATCH BASINS AND LANDSCAPE DRAIN INLETS WHERE INDICATED ON THE SITE PLANS BEFORE COMMENCING WORK OR IN PAVED AREAS AFTER THE BINDER COURSE IS PLACED AND EROSION CONTROL BARRIERS HAVE BEEN REMOVED.
2. GRATE TO BE PLACED OVER SILT SACK.
3. SILT SACKS SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS. CLEANING OR REPLACEMENT SHALL BE PERFORMED AS NEEDED. MAINTAIN SILT SACKS UNTIL UPSTREAM AREAS HAVE BEEN PERMANENTLY STABILIZED.

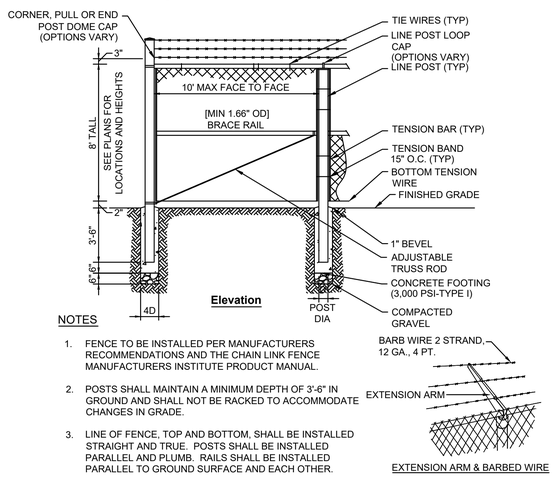
1 / C-500 SILT SACK INLET PROTECTION
SCALE: NTS




NOTES

1. PLACE ONE STRAW BALE PERPENDICULAR ALONG STRAW BALE BARRIER (100' O.C.)

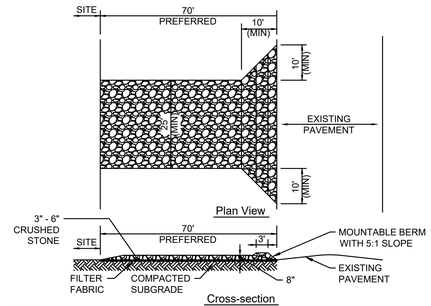
4 / C-500 SILT FENCE/STRAW BALE BARRIER
SCALE: NTS




NOTES

1. FENCE TO BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND THE CHAIN LINK FENCE MANUFACTURERS INSTITUTE PRODUCT MANUAL.
2. POSTS SHALL MAINTAIN A MINIMUM DEPTH OF 3'-6" IN GROUND AND SHALL NOT BE RACKED TO ACCOMMODATE CHANGES IN GRADE.
3. LINE OF FENCE, TOP AND BOTTOM, SHALL BE INSTALLED STRAIGHT AND TRUE. POSTS SHALL BE INSTALLED PARALLEL AND PLUMB. RAILS SHALL BE INSTALLED PARALLEL TO GROUND SURFACE AND EACH OTHER.

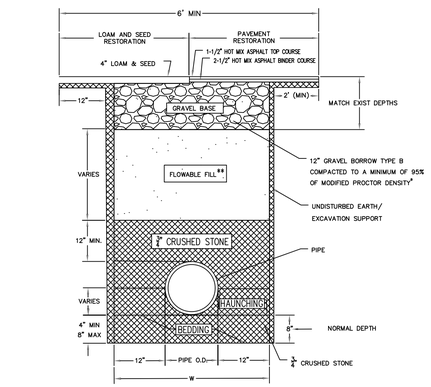
5 / C-500 PERIMETER FENCE
SCALE: NTS




NOTES:

1. ENTRANCE WIDTH SHALL BE A TWENTY-FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF WATER, RUNOFF AND/OR SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.
3. STABILIZED CONSTRUCTION ENTRANCE SHALL BE REMOVED PRIOR TO FINAL FINISHED MATERIALS BEING INSTALLED.

2 / C-500 STABILIZED CONSTRUCTION EXIT
SCALE: NTS




NOTES:

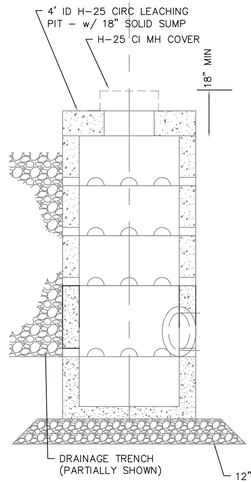
1. CONTRACTOR MUST MATCH INTO EXISTING PAVEMENT DEPTH IF MORE THAN 4" TOTAL.
2. WHEN IN ROCK, 8" CLEARANCE SHALL BE PROVIDED.

*SEE SPECIFICATIONS IN SECTION III

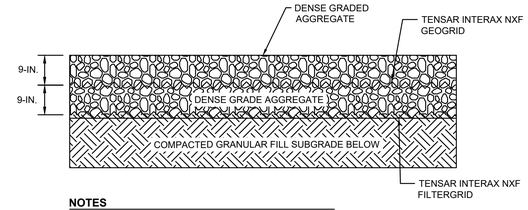
**SEE SPECIFICATIONS IN SECTION II-B

| Depth from Ground Surface to Pipe Invert (D) | Excavation Width (W) [Nominal Pipe Diameter] | | |
|---|---|---|---|
| | [0 to 6in] | [6in to 24in] | [Over 24in] |
| 0 to 6ft | 2ft | 4ft | D + 3ft |
| 6ft to 12ft | 4ft | 5ft | D + 3ft |
| 12ft to 20ft | 7ft | 7ft | D + 5ft |
| 20ft to 24ft | 8ft | 8ft | D + 5ft |

8 / C-500 TYPICAL TRENCH DETAIL
SCALE: NTS



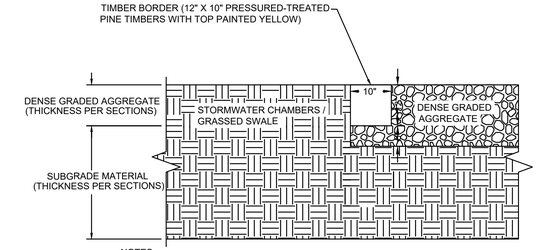

9 / C-500 STABILIZED CONSTRUCTION EXIT
SCALE: NTS




NOTES

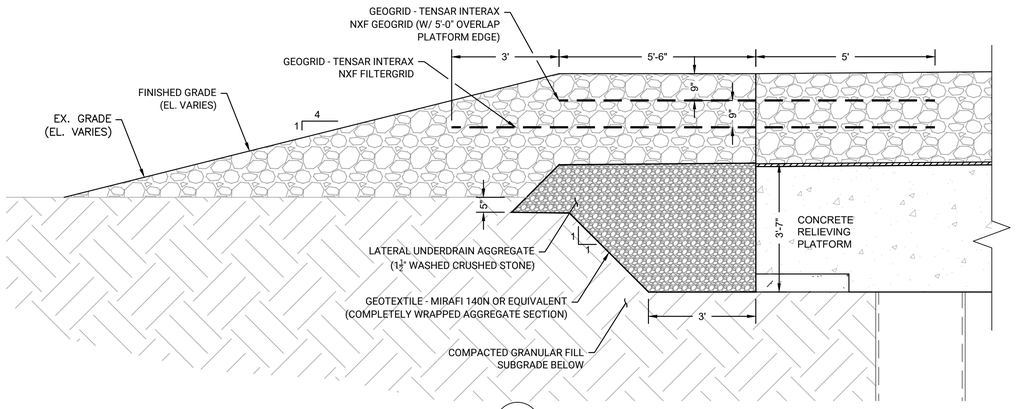
1. PRIOR TO GEOGRID PLACEMENT, ALL SURFICIAL ASPHALT AND TOPSOIL SHALL BE REMOVED DOWN TO GRANULAR SUBGRADE SOILS. THE SUBGRADE SHALL BE SCARIFIED IN PLACE AND PROOFROLLED USING HEAVY PNEUMATIC TIRED EQUIPMENT EXERTING A MINIMUM 10-TON AXLE LOAD TO VISUALLY EVALUATE FOR AREAS OF INSTABILITY. AREAS THAT ARE ASSESSED TO BE WEAK OR UNSTABLE DURING PROOFROLLING SHALL BE EXCAVATED DOWN TO FIRM GRANULAR SOIL AND THE RESULTING EXCAVATION SHOULD BE BACKFILLED WITH COMPACTED LIFTS OF GRANULAR FILL. THE GRANULAR FILL SHALL BE PLACED IN MAXIMUM 12-INCH THICK LOOSE LIFTS, COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY, AND WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR), AND TO VISUAL NON-MOVEMENT.
2. DENSE GRADE AGGREGATE SHALL MEET GRADATION REQUIREMENTS FOR PROCESSED GRAVEL FOR SUBBASE AS SPECIFIED IN TABLE M1.03.1-1 OF MASSACHUSETTS DOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, 2024 EDITION. SELECT GRAVEL FILL SHALL BE PLACED IN MAXIMUM 12-INCH THICK LOOSE LIFTS, COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR), AND TO VISUAL NON-MOVEMENT.
3. FOLLOW ALL MANUFACTURER'S INSTRUCTIONS WHEN INSTALLING GEOGRID. MINIMUM OVERLAP OF 2 FEET REQUIRED AT ROLL ENDS.
4. IN THE EVENT OF FUTURE EXCAVATIONS THAT REQUIRE REPAIR OF GEOGRID, THE DAMAGED GEOGRID SHALL BE REMOVED AND REPLACED WITH NEW GEOGRID. THE NEW GEOGRID SHOULD COVER THE DAMAGED AREA AND EXTEND THREE FEET BEYOND IT IN ALL DIRECTIONS.

3 / C-500 HEAVY LIFT SECTION DETAIL
SCALE: NTS




NOTES:
1. REFER TO PLANS FOR LOCATION OF TIMBER BORDER.
2. REINSTALL TIMBER BORDER AS NEEDED TO ACCOMMODATE GRADING.

6 / C-500 HEAVY LIFT BOUNDARY TIMBER EDGING DETAIL
SCALE: NTS




7 / MR304, MR504 RECONSTRUCTED INFILTRATION TRENCH DETAIL
SCALE: 1"=2'

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|

DATE OF PREPARATION

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|---|---|---|
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| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

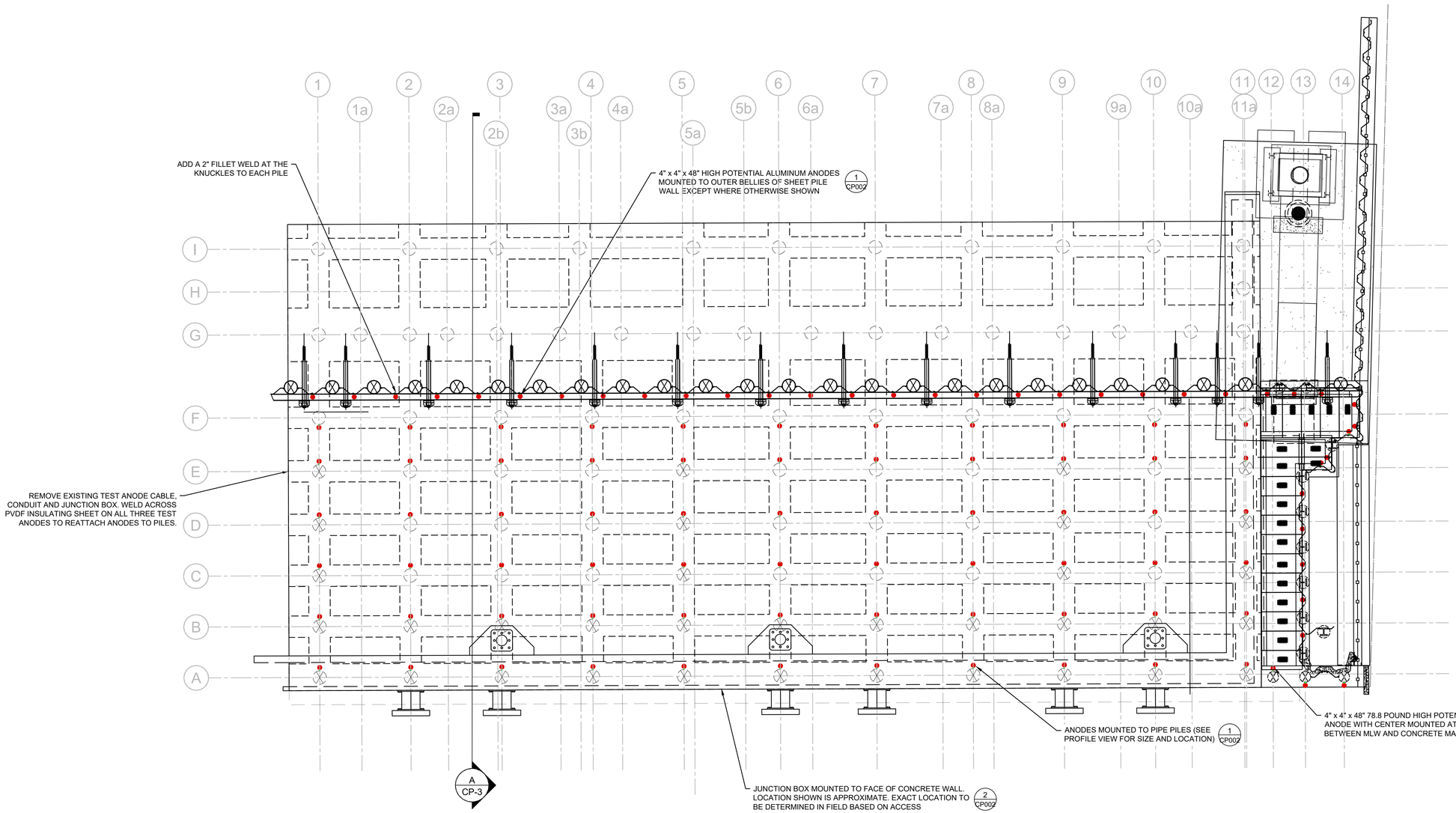
SHEET TITLE:
SITE CIVIL DETAILS

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
C-500

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1 CP001 SITE PLAN
SCALE: NONE

MasTec Professional Services
980 JOLLY ROAD, BLUE BELL, PA 19422
OFFICE NUMBER: 484-344-2161

PROJECT:
**MASSCEC NBMCT - PHASE 3 BULKHEAD REPLACEMENT PROJECT (SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA**

REVISIONS

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|---|---|---|
| SURVEYED | | |
| DRAWN | DT | 11/10/2025 |
| DESIGNED | JC | 11/10/2025 |
| CHECKED | JC | 11/10/2025 |

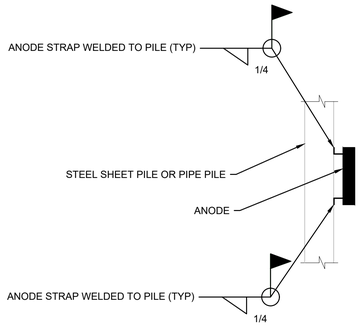
SHEET TITLE:
CATHODIC PROTECTION SYSTEM SITE PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

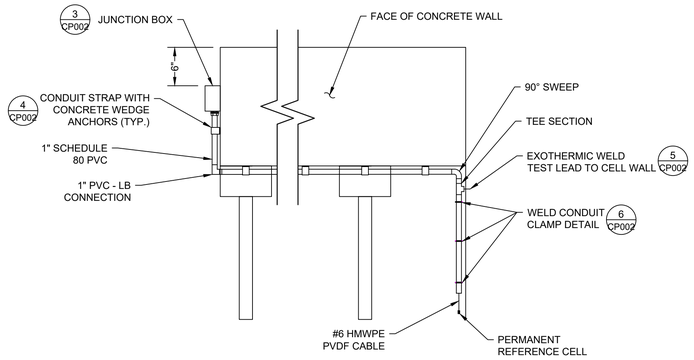
PROJECT NO: 0024M070.04

SHEET NUMBER
CP001

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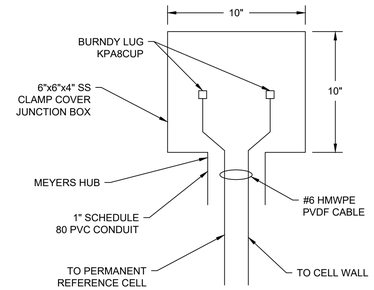



1 CP002 OFFSET MOUNT ANODE INSTALLATION -TYPICAL
SCALE: NONE



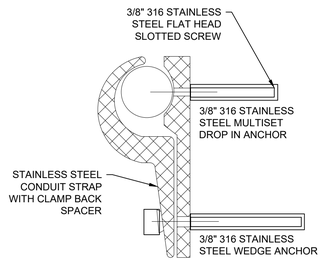

NOTES:
1. ALL CONDUIT 1" SCHEDULE 80 PVC UNLESS OTHERWISE NOTED.
2. CONDUIT SHALL BE MOUNTED TO CONCRETE WITH 3/8" 316 STAINLESS STEEL WEDGE ANCHORS AND STAINLESS STEEL CONDUIT STRAP WITH CLAMP BACK SPACER.
3. MAX. SPACING OF 2 FEET BETWEEN STRAPS.
4. ALL HARDWARE SHALL BE STAINLESS STEEL.
5. MAX. SPACING OF 4 FEET BETWEEN CLAMPS.
6. CONDUIT SHALL BE MOUNTED TO UNDERSIDE OF CONCRETE WALL.
7. ONE (1) #6 HMWPE PVDF CABLE SHALL BE ATTACHED TO A PERMANENT REFERENCE CELL UPON IMMEDIATE EXIT OF 1" SCHEDULE 80 PVC AT BOTTOM OF WALL.
8. ONE (1) #6 HMWPE PVDF CABLE SHALL BE EXOTHERMICALLY WELDED TO THE WALL UPON IMMEDIATE EXIT OF 1" SCHEDULE 80 PVC TEE SECTION AT TOP OF WALL.

2 CP002 JUNCTION BOX TEST STATION INSTALLATION DETAIL
SCALE: NONE

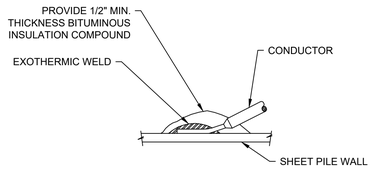



NOTES:
1. ALL HARDWARE INSIDE JUNCTION BOX SHALL BE COPPER AND MOUNTED ON PHENOLIC BACKING
2. JUNCTION BOX SHALL BE MOUNTED USING STAINLESS STEEL CONCRETE WEDGE ANCHORS AND STAINLESS STEEL HARDWARE.

3 CP002 JUNCTION BOX DETAIL
SCALE: NONE

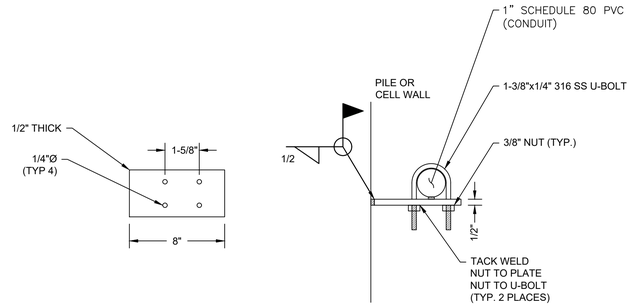



4 CP002 CONDUIT STRAP WITH CONCRETE WEDGE ANCHORS
SCALE: NONE




NOTE:
METAL SURFACE MUST BE DRY AND FREE OF FOREIGN MATERIAL AND COATING PRIOR TO WELDING.

5 CP002 CONDUIT STRAP WITH CONCRETE WEDGE ANCHORS
SCALE: NONE




6 CP002 WELDED CONDUIT CLAMP DETAIL
SCALE: NONE

MasTec
Professional Services
980 JOLLY ROAD, BLUE BELL, PA 19422
OFFICE NUMBER: 484-344-2161

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT (SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO. | DESCRIPTION | DATE | BY |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

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| DRAWN | DT | 11/10/2025 |
| DESIGNED | JC | 11/10/2025 |
| CHECKED | JC | 11/10/2025 |

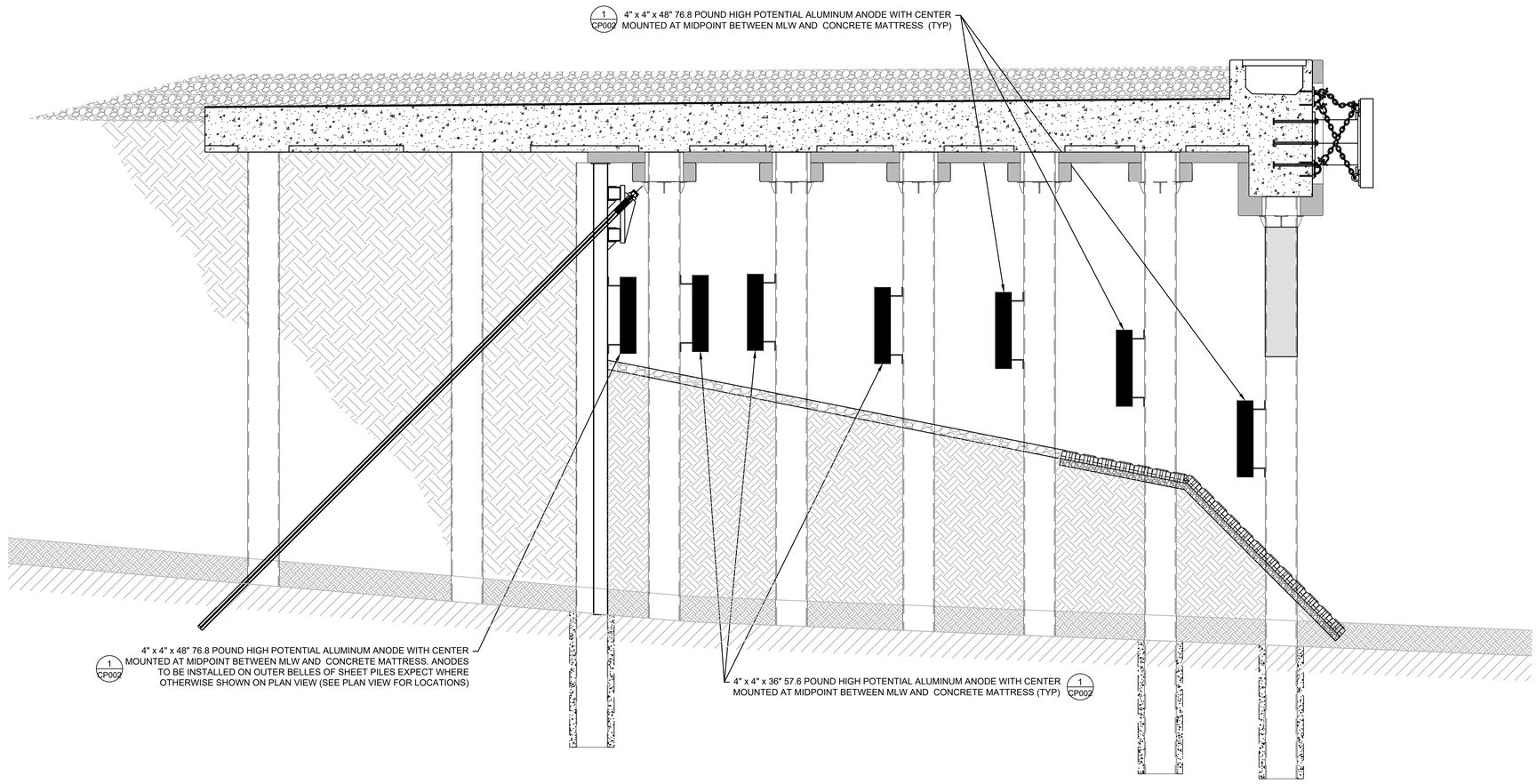
SHEET TITLE:
CATHODIC PROTECTION SYSTEM DETAILS

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
CP002

Monday, November 10, 2025 9:28:43 AM
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DWG Folder Location:




A
CP001
SECTION A
SCALE: NONE

Monday, November 10, 2025 9:28:44 AM
DWG Filename: _s-base_concept.dwg Layout: profile
DWG Folder Location:

MasTec
Professional Services
980 JOLLY ROAD, BLUE BELL, PA 19422
OFFICE NUMBER: 484-344-2161

PROJECT:
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**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
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DATE OF PREPARATION

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| SURVEYED | | |
| DRAWN | DT | 11/10/2025 |
| DESIGNED | JC | 11/10/2025 |
| CHECKED | JC | 11/10/2025 |

SHEET TITLE:
CATHODIC PROTECTION SYSTEM SECTION

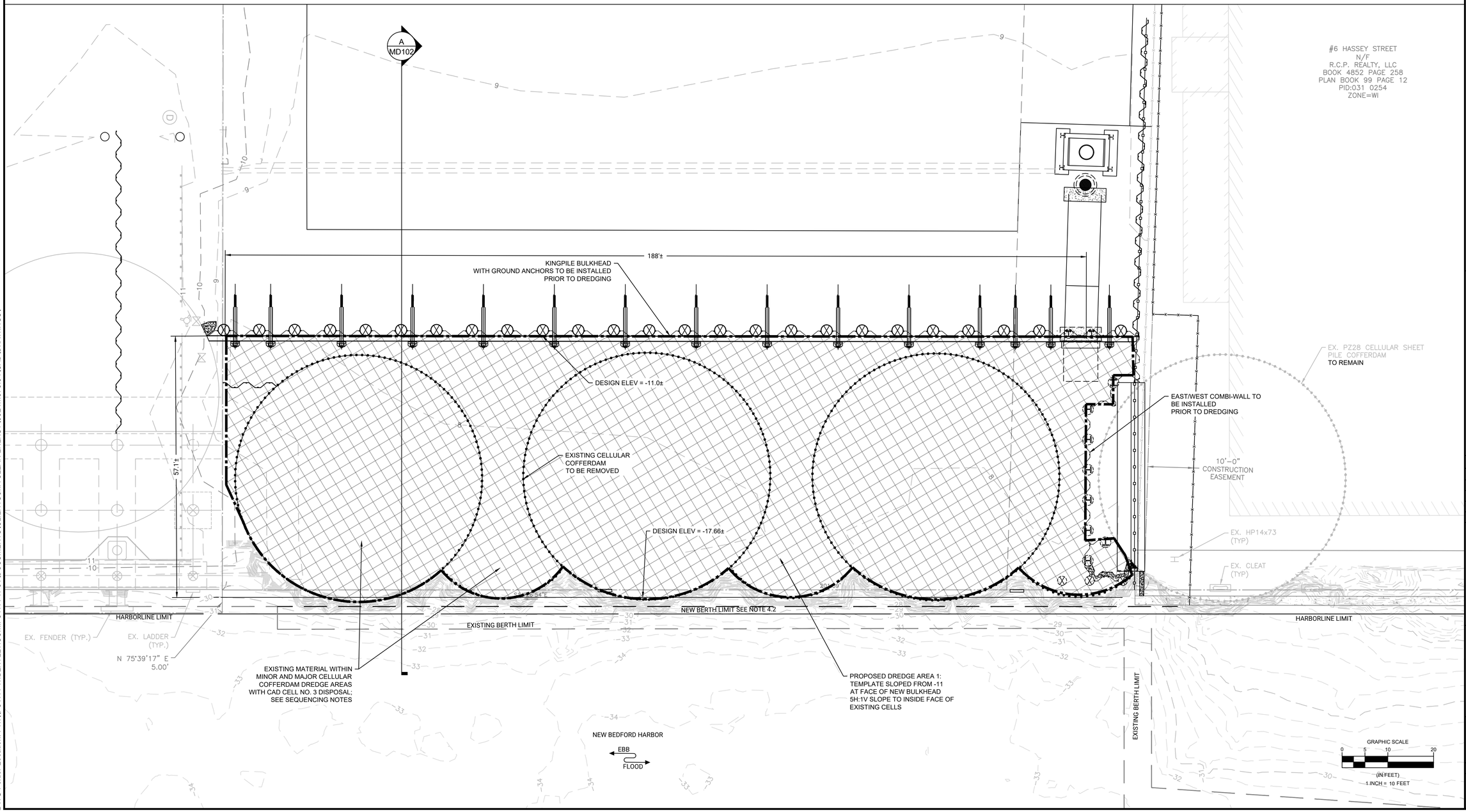
ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
CP003

NOTES:
1. REFER TO G-005 AND G-007 FOR GENERAL NOTES.
2. REFER TO G-100 FOR EXISTING CONDITIONS AND BATHYMETRY PLAN.
3. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83; 2011 ADJUSTMENT) IN U.S. SURVEY FEET.
4. ELEVATION REFERS TO MEAN LOW LOWER WATER MARK (MLLW) VERTICAL DATUM BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008.
5. CONTRACTOR TO PROVIDE PROPER SHORING FOR EXCAVATION.

DREDGE SEQUENCING:
1. DREDGING OPERATIONS SHALL BEGIN ONLY AFTER THE INSTALLATION OF THE NEW EAST COMBI WALL & KING PILE BULKHEAD AND ASSOCIATED GROUND ANCHORS HAVE BEEN INSTALLED.
2. AREA 1:
   - 2.1. DREDGE AND REMOVE MATERIAL WITHIN THE MINOR AND MAJOR CELLS SEQUENTIALLY FROM SOUTH TO NORTH FROM PHASE 1 EXCAVATION ELEVATION OF +5.0 TO A DEPTH OF -11.
   - 2.2. BEGINNING AT THE FACE OF THE NEW BULKHEAD, DREDGE WEST, WITH A SLOPE OF 5H:1V FROM A DESIGN DEPTH OF -11 TO FACE OF THE EXISTING CELLS (±17.66').
3. AREA 2:
   - 3.1. THE MAJOR AND MINOR COFFERDAM STRUCTURES SHALL BE EXTRACTED ONCE AREA 1 HAS BEEN COMPLETED.
   - 3.2. ITS EXPECTED THAT MATERIAL BELOW AREA 1 SHOULD SLOUGH INTO AREA 2.
   - 3.3. AT APPROXIMATELY 45.6' EAST OF THE NEW BULKHEAD, DREDGING SHALL COMMENCE AT THE DESIGN DEPTH OF -20, WITH AN ESTABLISHED DESIGN SLOPE OF 1H:1V, EAST ±11.5' TO A DESIGN DEPTH OF -32 SHOWN ON THE CONTRACT DRAWINGS.
4. AREA 3:
   - 4.1. AREA 3 LIMITS SHOULD BE DREDGED TO A DESIGN DEPTH OF -32' AS SHOWN ON THE CONTRACT DRAWINGS TO CLEAR THE EXISTING BERTH.
   - 4.2. ANY ROCK ENCOUNTERED WITHIN THE NEW BERTH LIMITS SHALL BE REMOVED TO A DEPTH OF -32 +1' OD.
5. ALL DESIGN DEPTHS SHALL HAVE A DESIGNATED ALLOWABLE OVER-DREDGE (O.D.) OF 1' BELOW DESIGN DEPTH.
6. ALL DREDGED MATERIAL SHALL BE CONSIDERED CONTAMINATED AND DISPOSED OF INTO CAD CELL NO. 3.




Foth

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**(SITE 4)**

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**NEW BEDFORD, MA**

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PE STAMP

SHEET TITLE:
DREDGE
PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MD101

Tuesday, November 11, 2025 12:49:03 AM
DWG Filename: 24m070.04 masscec_dredge plans.dwg Layout: md101
DWG Folder Location: PW:\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

N

A
MD102

#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI

188'±

DREDGE TOP OF SLOPE
DESIGN ELEV. = -11 MLLW

DREDGE TOP OF SLOPE
DESIGN ELEV. = -20 MLLW

DREDGE TOE OF SLOPE
DESIGN ELEV. = -32 MLLW

45.6'

57.1'±

1:3

2.0'

EX. PZ28 CELLULAR SHEET PILE COFFERDAM
TO REMAIN

10'-0"
CONSTRUCTION
EASEMENT

HARBORLINE LIMIT

EXISTING BERTH LIMIT

NEW BERTH LIMIT SEE NOTE 4.2

HARBORLINE LIMIT

PROPOSED DREDGE AREA 2;
SLOUGHING CLEAN UP AREA
TEMPLATE SLOPED 1H:1V FROM
-20 TO -32, AT LIMITS OF BERTH

PROPOSED DREDGE AREA 3;
DREDGE CLEAN UP AREA
-32 +1 O.D.

DREDGE CLEAN
UP AREA LIMITS

EXISTING BERTH LIMIT

NEW BEDFORD HARBOR

EBB
FLOOD

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

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**(SITE 4)**

OWNER:
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**NEW BEDFORD, MA**

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|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

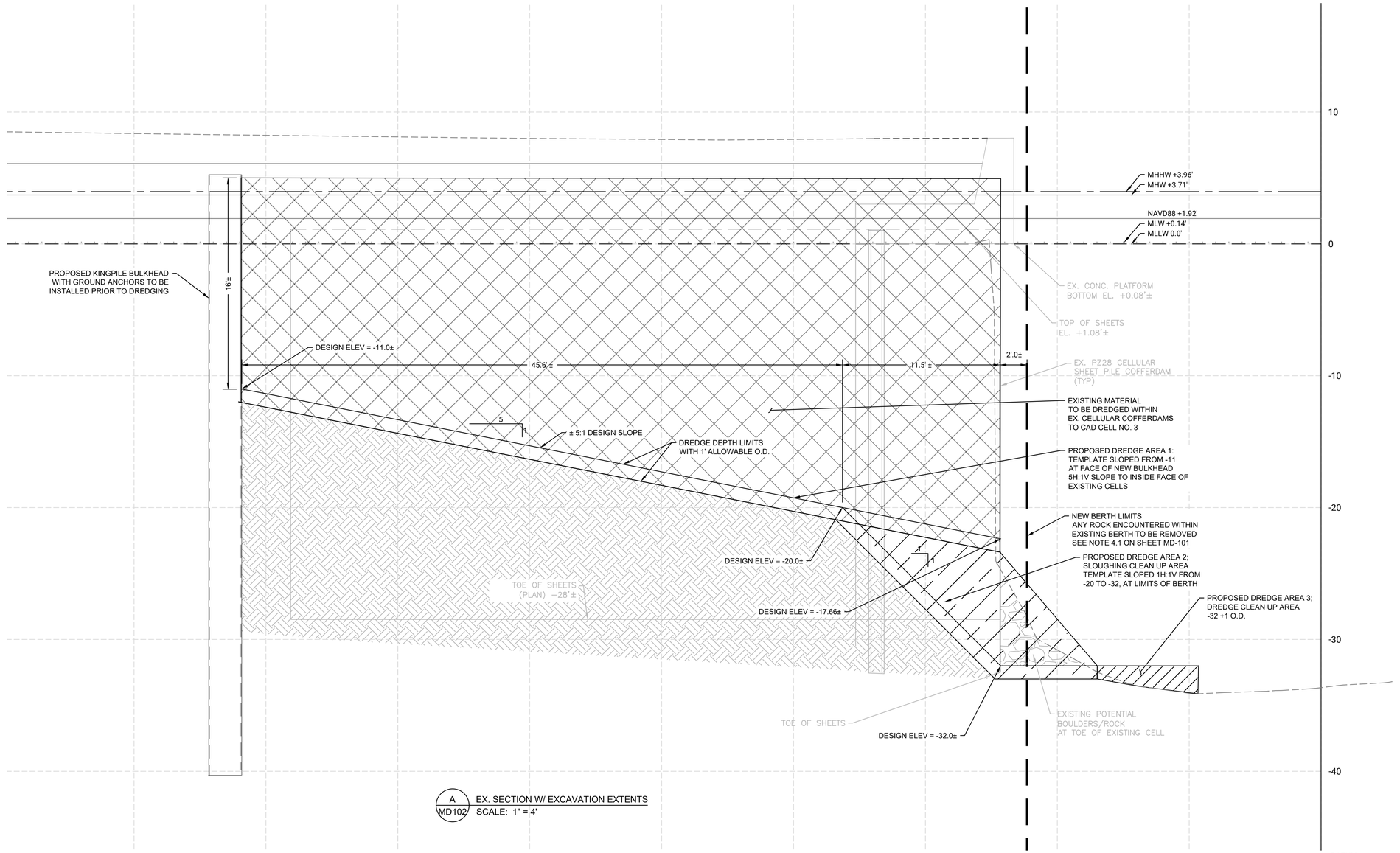
SHEET TITLE:
DREDGE
PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MD102

Tuesday, November 11, 2025 12:49:18 AM Layout: md102
DWG Filename: 24m070.04 masscec_dredge plans.dwg
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




A
MD102 EX. SECTION W/ EXCAVATION EXTENTS
SCALE: 1" = 4'

DATUM OFFSETS

| MLLW | NAVD 88 | |
|---|---|---|
| 3.96 | 2.04 | MHHW |
| 3.71 | 1.79 | MHW |
| 1.92 | 0.00 | NAVD 88 |
| 0.14 | -1.78 | MLW |
| 0.0 | -1.92 | MLLW |

OFFSETS TAKEN FROM FROM USACE GUIDANCE IN QUALITY CONTROL REPORT BY JACOBS ENGINEERING, PROVIDED BY USACE

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

SHEET TITLE:
EX. SECTION WITH EXCAVATION LIMITS

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MD103

Tuesday, November 11, 2025 2:44:24 PM
DWG Filename: 24m070.04 masscec_dredge plans.dwg Layout: md103
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

DISPOSAL NOTES:

1. DATUM REPRESENTED IN MLLW.
2. CAD CELL NO. 3 CONTOURS FROM LATEST CONDITIONS SURVEYS PROVIDED BY FOTH DATED 03/15/2024 & 09/25/2025.
3. CAD CELL NO. 3 AREA CONTOURS ARE BASED ON 3x3A VALUE DATA SET AND SHOWN AT 1' CONTOUR INTERVAL FOR CLARITY .
4. ALL ACCESS TO CAD CELL NO. 3 SHALL BE THROUGH CAD CELL NO. 4 AS SHOWN ON THE DISPOSAL PLAN. NO ALLOWABLE ACCESS THROUGH LHCC OR CAD CELL NO. 2 ACCESS CHANNEL. THE CONTRACT MAY REMOVE AND REINSTALL SILT CURTAIN PILES AS REQUIRED TO GAIN ACCESS TO CAD CELL NO. 3 THROUGH CAD CELL NO. 4.
5. SEE SPECIFICATIONS SECTION 35 24 00 DREDGING & DISPOSAL IN CAD CELLS FOR MORE INFORMATION.
6. MAXIMUM ALLOWABLE FILL ELEVATION WITHIN LOWER HARBOR CAD CELL IS -10.0 FT NAVDD88. NO MATERIAL SHALL BE PLACED ABOVE THIS ELEVATION. ANY MATERIAL PLACED ABOVE THE MAXIMUM FILL ELEVATION SHALL BE REMOVED AT THE EXPENSE OF THE CONTRACTOR.
7. THE CONTRACTOR SHALL ENSURE PLACEMENT OF DISPOSAL MATERIAL REMAINS WITHIN THE FOOTPRINT OF THE MAXIMUM FILL ELEVATION OF CAD CELL NO. 3.
8. THE CONTRACTOR SHALL SUBMIT A DISPOSAL PLAN WITH DETAILED PLACEMENT METHODOLOGY.
9. THE CONTRACTOR IS AUTHORIZED TO CONDUCT BED LEVELING WITH CAD CELL NO. 3 FOOTPRINT.
10. EXISTING BATHYMETRIC DATA SHOWS AN ACCESS CHANNEL LOCATED AT THE SOUTHERN END OF CAD CELL NO. 2. IT IS ANTICIPATED THAT A CONTAINMENT BERM WILL BE CONSTRUCTED ACROSS THE ACCESS CHANNEL FOR CAD CELL NO. 2 PRIOR TO THE START OF THE DREDGING AND REMOVAL OF MATERIAL FROM WITHIN THE CELLULAR COFFERDAMS. FUTURE CONTAINMENT BERM SHOWN FOR REFERENCE.
11. CAD 4 SILT CURTAIN MAY BE REMOVED AT THE COMPLETION OF THE LEONARDS WHARF PROJECT. CAD CELL NO. 4 SUPPORT PILES TO REMAIN AT THE COMPLETION OF THE LEONARDS WHARF PROJECT.
12. THE CONTRACTOR SHALL REMOVE EXISTING SILT CURTAIN PILES AS REQUIRED TO CREATE ACCESS TO CAD CELL NO. 3 AS SHOWN ON THE PLAN. THE CONTRACTOR SHALL LOCATE THE NORTHING, EASTING, AND ELEVATION OF THE THE TOP OF THE PILE PRIOR TO REMOVAL. THE CONTRACTOR SHALL REINSTALL THE REMOVED PILE TO THE SAME POSITION & ELEVATION PRIOR TO DEMOBILIZATION. THE CONTRACTOR SHALL REPLACE ANY SILT CURTAIN PILE DAMAGED DURING THE DISPOSAL OPERATION.
13. SEE SPECIFICATIONS SECTION 35 24 00 DREDGING & DISPOSAL FOR ALLOWABLE TUG & PUSH BOAT REQUIREMENTS FOR MOVEMENT OF SCOWS WITHIN THE CAD CELL AREA.

LHCC PHASE II
(NO SPUD ZONE)

LHCC PHASE I
(NO SPUD ZONE)

LOWER HARBOR CAD CELL (LHCC)
ACCESS CHANNEL / CONTAINMENT BERM
CREST ELEVATION -7 MLLW
SEE NOTE 4

N: 2696999.57
E: 815410.15

N: 2696984.74
E: 815616.09

APPROXIMATE
CAD CELL NO. 3
DISPOSAL AREA
MAX FILL EL.-10.00 FT MLLW

EXISTING CAD CELL NO. 4
SILT CURTAIN PILES
SEE NOTE 11

N: 2696898.87
E: 816021.88

CAD CELL NO. 3
DISPOSAL AREA

APPROXIMATE LIMIT
OF DISPOSAL AREA

250' ACCESS AREA
INTO CAD 3
SEE NOTE 12

N: 2696517.17
E: 815310.00

CAD CELL NO. 4

N: 2696435.56
E: 815664.41

N: 2696419.12
E: 815919.66

NEW BEDFORD
HARBOR

CAD CELL NO. 2
(NO SPUD ZONE)

CAD CELL NO. 1
(NO SPUD ZONE)

CAD CELL NO. 2
ACCESS CHANNEL / CONTAINMENT BERM
CREST ELEVATION -7 MLLW
SEE NOTE 10

LOCATION OF
CAD CELL NO. 4
GATE ACCESS
SEE NOTE 4

CAD CELL NO. 4
ACCESS CHANNEL

CAD CELL NO. 4
DEWATERING AREA
MOORING PILES
(STEEL H-PILES WITH
TIMBER PILE FENDERS)
(TYP OF 4)

FLOOD

EBB

BORROW PIT
(NO SPUD ZONE)

APPROXIMATE
LOCATION OF
SUNKEN BARGE
OBSTRUCTION

## LEGEND:

- LIMITS OF CAD CELL NO. 3 DISPOSAL AREA
- AS BUILT LIMIT OF EXISTING CAD CELL & EXISTING CAD CELL ACCESS CHANNELS
- AS-BUILT SILT CURTAIN PILE LOCATION

N

GRAPHIC SCALE
0 50 100 200
(IN FEET)
1 INCH = 100FEET

## DATUM OFFSETS

| MLLW | NAVD88 | |
|---|---|---|
| 3.75 | 1.83 | MHW |
| 1.92 | 0 | |
| 1.10 | -0.82 | NGVD29 |
| 0.00 | -1.92 | |

OFFSETS TAKEN FROM
JACOBS ENG. QUALITY CONTROL REPORT
PROJECT DATUMS DEFINED
(PROVIDED BY USACE)

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE**
**COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

SHEET TITLE:
**CAD CELL NO. 3 DISPOSAL PLAN**

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
**MD104**

Tuesday, November 11, 2025 12:49:43 AM
DWG Filename: 24m070.04 masscec_dredge plans.dwg Layout: md104
DWG Folder Location: PW:\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

N

GRAVEL

EDGE OF PAVEMENT (TYP)

12" HDPE

RIM=10.93
CLEANOUT SWEEP

EX. HEAVY LIFT
TIMBER BORDER

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

EX. MASSDOT
GUARDRAIL

EX. CHAINLINK
FENCE

EX. HYDRANT W/ (2)
GATE VALVES

EX. MZ-27 SHEET
PILE BULKHEAD
(TYP)

EX. DOUBLE
CHANNEL WALER

EX. 1 ¾" 150 KSI
TIE-BACK ROD

EX. AZ-13
SHEET PILES

EX. W33x201
EX. 36" DIA.x⅜"
SOCKETED KING PILE

EX. 4,000 PSI
JET GROUT

EX. CONCRETE
REINFORCED
UTILITY TRENCH

EX. FENDER (TYP.)

EX. LADDER
(TYP.)

N 75°39'17" E
5.00'

BITUMINOUS PARKING LOT

S FRONT STREET
BOOK 10719 PAGE
242
PID:031 0288
ZONE=WI

APPROX. PROPERTY
LINE (TYP)

30'-0" DRAINAGE EASEMENT

EX. GRAVEL/VEGETATION

EX. CHAINLINK FENCE

8' TALL

#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI

EX. BUILDING

EX. AZ-13x14'
LONG CANTILEVERED
SHEET PILE WALL

CEC-18A
CEC-17A
CEC-27A
CEC-16A
CEC-15A
CEC-14A

2
MR002

1
MR002

3
MR002

4
MR002

5
MR002

0+00
1+00
1+50
0+50
2+00

CEC-26A
CEC-13A
A-2011-LB-B10
CEC-25A
CEC-12A
SB-5
CEC-11A
CEC-24A
CEC-10A
CEC-9A
CEC-23A
CEC-1A
CEC-22A
CEC-3A
CEC-21A
SB-1
CEC-2A
CEC-8A
CEC-7A
CEC-6A
SB-3
CEC-20A
CEC-5A
SB-4
CEC-19A
CEC-4A
SB-2

EX. HP14x73
(TYP)

EX. PZ28 CELLULAR
SHEET PILE COFFERDAM
(TYP)

EX. 6'x6' BOX CULVERT
W/ 9'-2" COLLAR

EX. LIGHT POLE

±53'-10"

201.39'

S1°39'54"E

10'-0"
CONSTRUCTION
EASEMENT

EX. CLEAT
(TYP)

EX. 50T BOLLARD

EX. BOLLARD
(TYP)

EX. 6"ø RCP W/ CONC. COLLAR

EX. DRAINAGE MANHOLE 37
RIM=8.38

PARCEL ID: 031 0254
N/F
R.C.P REALTY LLC
BOOK 4852, PG. 258

A-2010-B1

EX. 6'x6' CULVERT OUTFALL
(9'-2" CONC. COLLAR)
APPROX. INV = 6' BELOW
EX. CONC. PIER CAP

A-2011-B18

EX. MINOR CELL
(TYP)

EX. CLEAT
(TYP)

EX. TIMBER CURB
(TYP)

EX. FENDER
(TYP)

NEW BEDFORD HARBOR
EBB
FLOOD

CHANNEL LIMIT

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE**
**COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

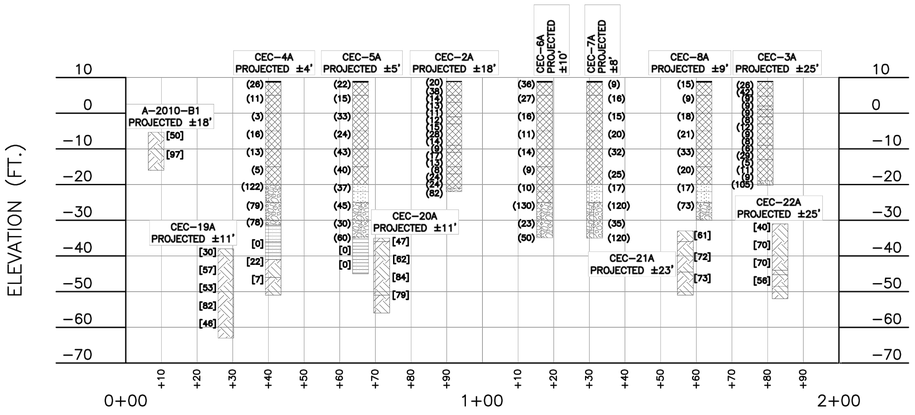
SHEET TITLE:
**EXISTING CONDITIONS PLAN (BULKHEAD)**

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
**MR001**

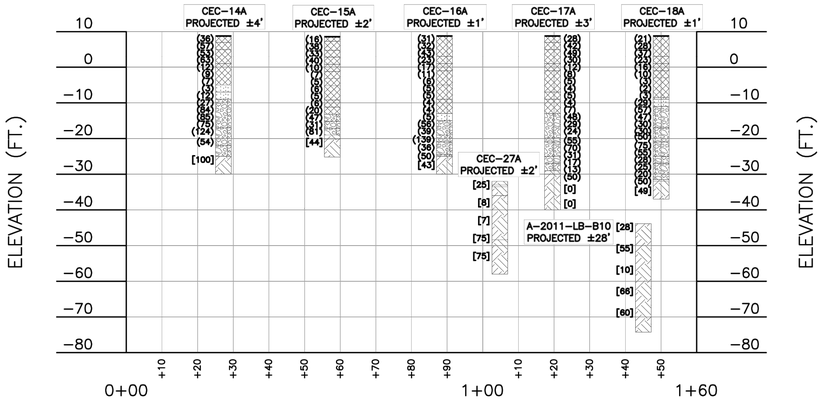
Tuesday, November 11, 2025 9:12:44 AM
DWG Filename: 24m070.04 masscec_ex cond & bathy plan.dwg Layout: mr001
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\



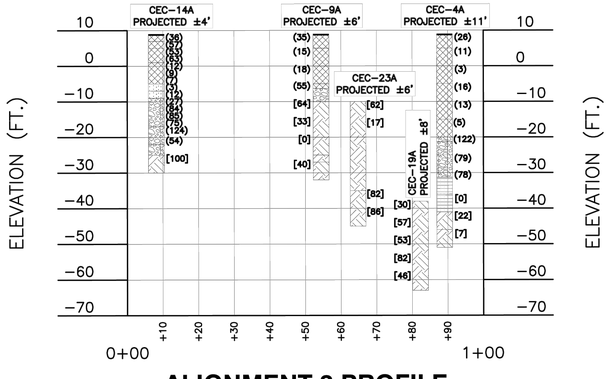

## ALIGNMENT 1 PROFILE

LEGEND

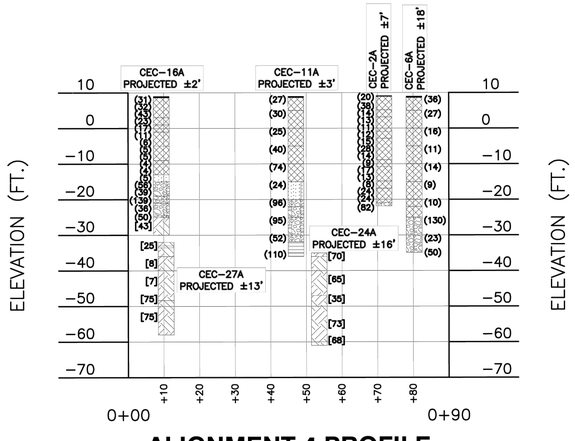
- ASPHALT
- FILL
- GLACIAL OUTWASH
- GLACIAL TILL
- WEATHERED ROCK
- BEDROCK
- (50) SPT "N−VALUE"
- [50] ROCK QUALITY DESIGNATION



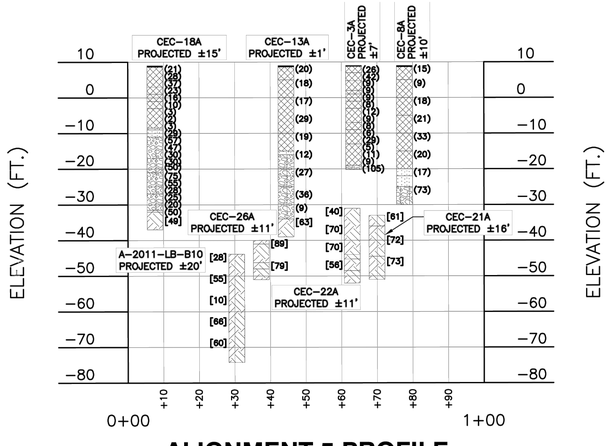

## ALIGNMENT 2 PROFILE




## ALIGNMENT 3 PROFILE




## ALIGNMENT 4 PROFILE




## ALIGNMENT 5 PROFILE

NOTES:

1) FOR SOIL PROFILE LOCATIONS, SEE SHEET MR001

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
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| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

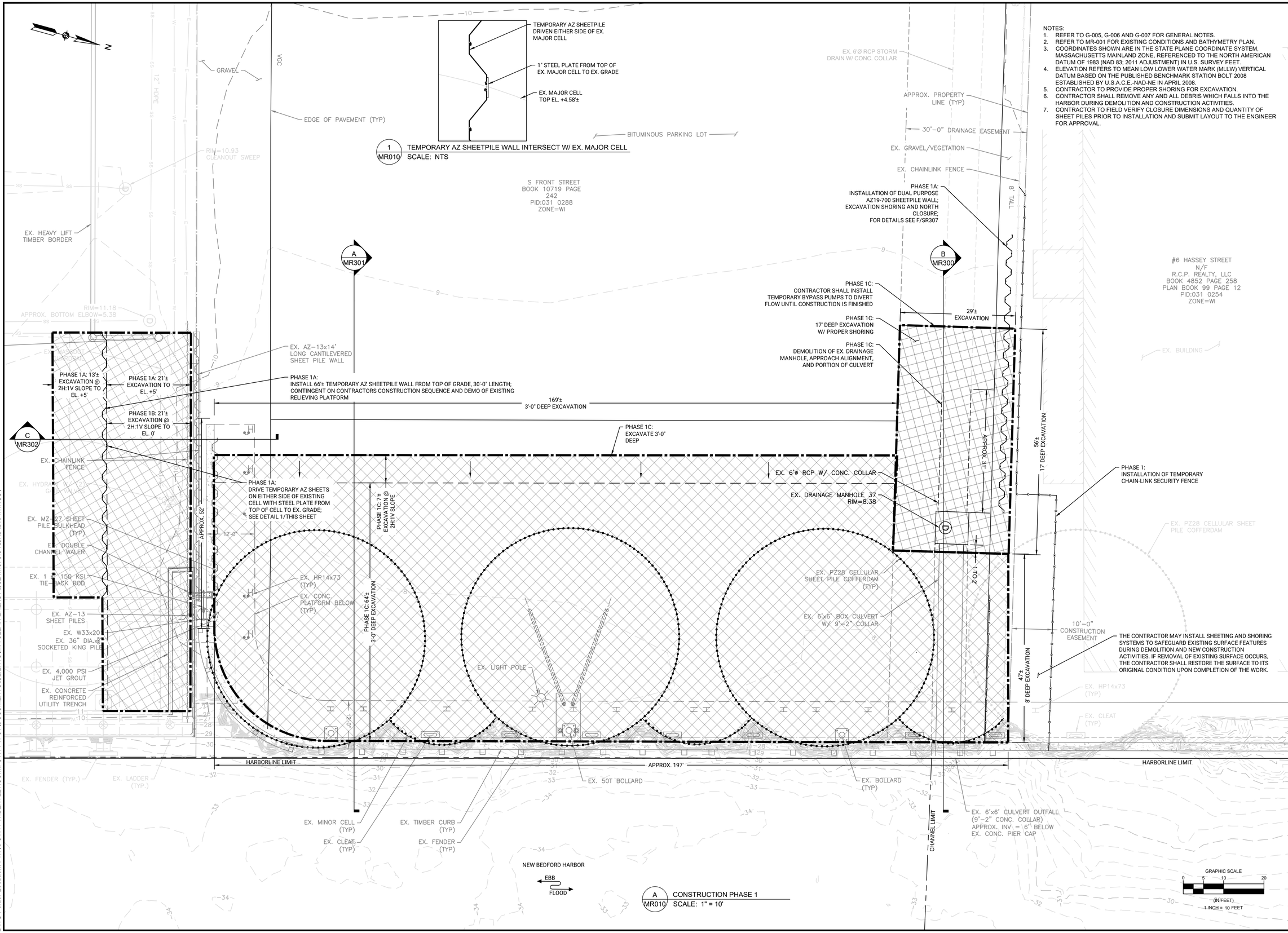
SHEET TITLE:
GEOTECHNICAL REFERENCES

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR002

Tuesday, November 11, 2025 9:01:21 AM
DWG Filename: 24m070.04 massecc geotechnical.dwg Layout: mr002
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




NOTES:
1. REFER TO G-005, G-006 AND G-007 FOR GENERAL NOTES.
2. REFER TO MR-001 FOR EXISTING CONDITIONS AND BATHYMETRY PLAN.
3. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83; 2011 ADJUSTMENT) IN U.S. SURVEY FEET.
4. ELEVATION REFERS TO MEAN LOW LOWER WATER MARK (MLLW) VERTICAL DATUM BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008.
5. CONTRACTOR TO PROVIDE PROPER SHORING FOR EXCAVATION.
6. CONTRACTOR SHALL REMOVE ANY AND ALL DEBRIS WHICH FALLS INTO THE HARBOR DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.
7. CONTRACTOR TO FIELD VERIFY CLOSURE DIMENSIONS AND QUANTITY OF SHEET PILES PRIOR TO INSTALLATION AND SUBMIT LAYOUT TO THE ENGINEER FOR APPROVAL.

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT (SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
CONSTRUCTION SEQUENCING - PHASE 1 PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR010

Tuesday, November 11, 2025 8:11:30 AM
DWG Filename: 24m070.04 masscec_const sequencing plans.dwg Layout: mr010
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

NOTES:
1. REFER TO G-005, G-006 AND G-007 FOR GENERAL NOTES.
2. REFER TO MR-001 FOR EXISTING CONDITIONS AND BATHYMETRY PLAN.
3. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83; 2011 ADJUSTMENT) IN U.S. SURVEY FEET.
4. ELEVATION REFERS TO MEAN LOW LOWER WATER MARK (MLLW) VERTICAL DATUM BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008.
5. CONTRACTOR TO PROVIDE PROPER SHORING FOR EXCAVATION.
6. CONTRACTOR SHALL REMOVE ANY AND ALL DEBRIS WHICH FALLS INTO THE HARBOR DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.

S FRONT STREET
BOOK 10719 PAGE 242
PID:031 0288
ZONE=WI

#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI

EX. 6Ø RCP STORM DRAIN W/ CONC. COLLAR
APPROX. PROPERTY LINE (TYP)
30'-0" DRAINAGE EASEMENT
EX. CHAINLINK FENCE
8' TALL
RIM=10.93
CLEANOUT SWEEP
EX. HEAVY LIFT TIMBER BORDER
RIM=11.18
APPROX. BOTTOM ELBOW=5.38
EX. MASSDOT GUARDRAIL
12" HDPE
PHASE 2: DEMOLITION OF EX. AZ13 SHEETS X 14' LONG AND REINFORCED CONCRETE CAP
EX. AZ-13x14' LONG CANTILEVERED SHEET PILE WALL
PHASE 2: DEMOLITION OF EX. RELIEVING PLATFORM, RETURN WALL, , CONCRETE CAPS AND FIRST 5 MZ-27 DOUBLES
EX. CHAINLINK FENCE
EX. HYDRANT W/ (2) GATE VALVES
EX. MZ-27 SHEET PILE BULKHEAD (TYP)
EX. DOUBLE CHANNEL WALER
EX. 1 ¾" 150 KSI TIE-BACK ROD
EX. AZ-13 SHEET PILES
EX. W33x201 EX. 36" DIA.x⅜" SOCKETED KING PILE
EX. 4,000 PSI JET GROUT
EX. CONCRETE REINFORCED UTILITY TRENCH
25±
12'-0"
EX. HP14x73 (TYP)
EX. CONC. PLATFORM BELOW (TYP)
PHASE 2: REMOVE EX. TEST ANODE CABLE, CONDUIT AND JUNCTION BOX. WELD ACROSS PVDF INSULATING SHEET ON ALL THREE TEST ANODES TO REATTACH ANODES TO PILES; REFER TO CP SERIES
12'-0"
EX. LIGHT POLE
HARBORLINE LIMIT
EX. FENDER (TYP.)
EX. LADDER (TYP.)
PHASE 2: DEMOLITION OF EX. UTILITY TRENCH; SEE DETAIL C/MR515
EX. MINOR CELL (TYP)
EX. CLEAT (TYP)
EX. TIMBER CURB (TYP)
EX. FENDER (TYP)
EX. 50T BOLLARD
EX. BOLLARD (TYP)
EX. PZ28 CELLULAR SHEET PILE COFFERDAM (TYP)
EX. 6'x6' BOX CULVERT W/ 9'-2" COLLAR
10'-0" CONSTRUCTION EASEMENT
EX. PZ28 CELLULAR SHEET PILE COFFERDAM
EX. HP14x73 (TYP)
EX. CLEAT (TYP)
HARBORLINE LIMIT
CHANNEL LIMIT
EX. 6'x6' CULVERT OUTFALL (9'-2" CONC. COLLAR) APPROX. INV. = 6'± BELOW EX. CONC. PIER CAP
PHASE 2: INSTALL NEW MANHOLE W/ TEMPORARY PLUG AND 20'± OF 72" RCP; SEE S-001 FOR MANHOLE DETAILS
PHASE 2: PLACE FILL AND COMPACT ADJUST SHORING AS REQUIRED FOR WORK IN FUTURE PHASES
5'± OF EX. 72" RCP BEYOND MANHOLE
29'±
20'± OF 72" RCP
2'-0"
56'±
PHASE 2: INSTALL UNDERDRAIN MANHOLE-CIRCULAR LEACHING PIT
PHASE 2: INSTALL CONCRETE COLLAR CONNECTION FOR EX. AND NEW 72" RCP.; SEE S-002
NEW BEDFORD HARBOR
EBB
FLOOD
A MR011 CONSTRUCTION PHASE 2
SCALE: 1" = 10'
GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

REVISIONS

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
CONSTRUCTION SEQUENCING - PHASE 2 PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR011

Tuesday, November 11, 2025 8:11:49 AM
DWG Filename: 24m070.04 masscec_const sequencing plans.dwg Layout: mr011
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

NOTES:
1. REFER TO G-005, G-006 AND G-007 FOR GENERAL NOTES.
2. REFER TO MR-001 FOR EXISTING CONDITIONS AND BATHYMETRY PLAN.
3. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83; 2011 ADJUSTMENT) IN U.S. SURVEY FEET.
4. ELEVATION REFERS TO MEAN LOW LOWER WATER MARK (MLLW) VERTICAL DATUM BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008.
5. CONTRACTOR TO PROVIDE PROPER SHORING FOR EXCAVATION.
6. CONTRACTOR SHALL REMOVE ANY AND ALL DEBRIS WHICH FALLS INTO THE HARBOR DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.
7. CONTRACTOR TO FIELD VERIFY CLOSURE DIMENSIONS AND QUANTITY OF SHEET PILES PRIOR TO INSTALLATION AND SUBMIT LAYOUT TO THE ENGINEER FOR APPROVAL.
8. DRIVE SHEET PILES TO REFUSAL TIGHT AGAINST EXISTING SHEET PILES. CUT LAST SHEETS IF REQUIRED FOR FIT.

N

12" HDPE

RIM=10.93
CLEANOUT SWEEP

EX. HEAVY LIFT
TIMBER BORDER

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

EX. MASSDOT
GUARDRAIL

S FRONT STREET
BOOK 10719 PAGE 242
PID:031 0288
ZONE=WI

EX. 6'Ø RCP STORM
DRAIN W/ CONC. COLLAR

APPROX. PROPERTY
LINE (TYP)

30'-0" DRAINAGE EASEMENT

EX. CHAINLINK FENCE
8' TALL

#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI

EX. BUILDING

CONTRACTOR TO
DEVELOP STAGED
CONSTRUCTION AND
BYPASS PLAN FOR
MAINTAINING STORM
DRAIN FLOW

PHASE 3:
CONSTRUCTION OF NORTH/SOUTH
COMBI-WALL WITH OUTFALL
OPENING

PHASE 3:
72" RCP (APPROX. 14')
ADJUST SHORING AS REQUIRED
(SHORING NOT SHOWN FOR CLARITY)

PHASE 3:
(15) 15' INTO SOUND ROCK, LR.
CONTRACTOR DESIGN FOR 370 KIP
SERVICE PULL-OUT, TEST TO 470
KIP, THEN BACK OFF TO 370 KIP
AND LOCK. GROUTED TENDON
STRAND ROCK ANCHOR @ 45°

PHASE 3:
(2) HP12x89
SOCKETED 10' TO
SOUND ROCK

PHASE 3:
GROUT PLUG TO SEAL
SHEET/CELL INTERFACE
FROM TOP TO BOTTOM

EX. HYDRANT W/ (2)
GATE VALVES

EX. MZ-27 SHEET
PILE BULKHEAD
(TYP)

EX. DOUBLE
CHANNEL WALER

EX. 1 ¾" 150 KSI
TIE-BACK ROD

EX. AZ-13
SHEET PILES

EX. W33x201
EX. 36" DIA.x⅜"
SOCKETED KING PILE

EX. 4,000 PSI
JET GROUT

7'-9" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 7'-9" 7'-9" 12'-10"

12'-0"

TB-1 TB-2 TB-3 TB-4 TB-5 TB-6 TB-7 TB-8 TB-9 TB-10 TB-11 TB-12 TB-13 TB-14 TB-15

EX. HP14x73
(TYP)

EX. CONC.
PLATFORM BELOW
(TYP)

57'±

PHASE 3:
AZ14-770 OR EQUV

PHASE 3:
30"Ø x1" STEEL KING
PIPE PILE SOCKETED
MIN. 10' INTO ROCK

PHASE 3:
(2) HSS 12x12x⅜"
CONT. WALER

EX. PZ28 CELLULAR
SHEET PILE COFFERDAM
(TYP)

EX. PZ28 CELLULAR SHEET
PILE COFFERDAM

PHASE 3:
CIP CONC. COLLAR
AROUND 72" RCP

EX. 6'x6' BOX CULVERT
W/ 9'-2" COLLAR

10'-0"
CONSTRUCTION
EASEMENT

THE CONTRACTOR MAY INSTALL SHEETING AND SHORING SYSTEMS TO SAFEGUARD EXISTING SURFACE FEATURES DURING DEMOLITION AND NEW CONSTRUCTION ACTIVITIES. IF REMOVAL OF EXISTING SURFACE OCCURS, THE CONTRACTOR SHALL RESTORE THE SURFACE TO ITS ORIGINAL CONDITION UPON COMPLETION OF THE WORK.

EX. LIGHT POLE

EX. HP14x73
(TYP)

EX. CLEAT
(TYP)

12'-0"

HARBORLINE LIMIT

HARBORLINE LIMIT

EX. FENDER (TYP.)

EX. LADDER
(TYP.)

EX. 50T BOLLARD

EX. BOLLARD
(TYP)

PHASE 3:
11" BURIED CONC.
CLOSURE WALL
DOWEL TO EX. BASE
AND VERTICAL WALL;
SEE SR503

EX. MINOR CELL
(TYP)

EX. CLEAT
(TYP)

EX. TIMBER CURB
(TYP)

EX. FENDER
(TYP)

EX. 6'x6' CULVERT OUTFALL
(9'-2" CONC. COLLAR)
APPROX. INV = 6' BELOW
EX. CONC. PIER CAP

CHANNEL LIMIT

NEW BEDFORD HARBOR

EBB
FLOOD

A
MR012
CONSTRUCTION PHASE 3
SCALE: 1" = 10'

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE**
**COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
CONSTRUCTION SEQUENCING - PHASE 3 PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR012

Tuesday, November 11, 2025 8:12:04 AM
DWG Filename: 24m070.04 masscec_const sequencing plans.dwg Layout: mr012
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

NOTES:
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N

12" HDPE

RIM=10.93
CLEANOUT SWEEP

EX. HEAVY LIFT
TIMBER BORDER

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

EX. MASSDOT
GUARDRAIL

EX. HYDRANT W/ (2)
GATE VALVES

S FRONT STREET
BOOK 10719 PAGE
242
PID:031 0288
ZONE=WI

EX. 6Ø RCP STORM
DRAIN W/ CONC. COLLAR

APPROX. PROPERTY
LINE (TYP)

30'-0" DRAINAGE EASEMENT

EX. CHAINLINK FENCE
8' TALL

#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI

EX. BUILDING

CONTRACTOR TO
DEVELOP STAGED
CONSTRUCTION AND
BYPASS PLAN FOR
MAINTAINING STORM
DRAIN FLOW

PHASE 4B:
INSTALL TEMPORARY SHEETPILES;
CONTINGENT ON CONTRACTORS CONSTRUCTION
SEQUENCE AND DEMO OF EXISTING RELIEVING PLATFORM.

PHASE 4A:
DEMOLISH 14'± EX.
RELIEVING PLATFORM
AND MZ-27 SHEETS

EX. MZ-27 SHEET
PILE BULKHEAD
(TYP)

EX. DOUBLE
CHANNEL WALER

EX. 1 ¾" 150 KSI
TIE-BACK ROD

EX. AZ-13
SHEET PILES

CUT AT MUDLINE EX. W33x201
EX. 36" DIA.x⅜"
SOCKETED KING PILE

EX. 4,000 PSI
JET GROUT

12'-0"

14±

43±

EX. HP14x73
(TYP)

EX. CONC.
PLATFORM BELOW
(TYP)

PHASE 4C:
DEMOLISH EX. RELIEVING
PLATFORM, DOUBLE
CHANNEL WALER,
TIE-BACK ROD AND AZ-13
SHEETS

EX. LIGHT POLE

195±

12'-0"

EX. PZ28 CELLULAR SHEET
PILE COFFERDAM

EX. PZ28 CELLULAR
SHEET PILE COFFERDAM
(TYP)

EX. 6'x6' BOX CULVERT
W/ 9'-2" COLLAR

PHASE 4C:
DEMO EX. 6'x6' BOX
CULVERT W/ 9'-2" COLLAR
& OUTFALL

10'-0"
CONSTRUCTION
EASEMENT

THE CONTRACTOR MAY INSTALL SHEETING AND SHORING SYSTEMS TO SAFEGUARD EXISTING SURFACE FEATURES DURING DEMOLITION AND NEW CONSTRUCTION ACTIVITIES. IF REMOVAL OF EXISTING SURFACE OCCURS, THE CONTRACTOR SHALL RESTORE THE SURFACE TO ITS ORIGINAL CONDITION UPON COMPLETION OF THE WORK.

EX. HP14x73
(TYP)

EX. CLEAT
(TYP)

HARBORLINE LIMIT

EX. 50T BOLLARD

EX. BOLLARD
(TYP)

HARBORLINE LIMIT

EX. FENDER (TYP.)

EX. LADDER
(TYP.)

EX. MINOR CELL
(TYP)

EX. CLEAT
(TYP)

EX. TIMBER CURB
(TYP)

EX. FENDER
(TYP)

CHANNEL LIMIT

EX. 6'x6' CULVERT OUTFALL
(9'-2" CONC. COLLAR)
APPROX. INV = 6' BELOW
EX. CONC. PIER CAP

NEW BEDFORD HARBOR

EBB
FLOOD

A
MR013
CONSTRUCTION PHASE 4
SCALE: 1" = 10'

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
CONSTRUCTION
SEQUENCING
- PHASE 4
PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR013

Tuesday, November 11, 2025 8:12:25 AM
DWG Filename: 24m070.04 masscec_const sequencing plans.dwg Layout: mr013
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

NOTES:
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7. DRIVE SHEET PILES TO REFUSAL TIGHT AGAINST EXISTING SHEET PILES. CUT LAST SHEETS IF REQUIRED FOR FIT.

EX. 6'Ø RCP STORM DRAIN W/ CONC. COLLAR
APPROX. PROPERTY LINE (TYP)
30'-0" DRAINAGE EASEMENT
EX. CHAINLINK FENCE 8' TALL
12" HDPE
RIM=10.93 CLEANOUT SWEEP
EX. HEAVY LIFT TIMBER BORDER
S FRONT STREET BOOK 10719 PAGE 242 PID:031 0288 ZONE=WI
#6 HASSEY STREET N/F R.C.P. REALTY, LLC BOOK 4852 PAGE 258 PLAN BOOK 99 PAGE 12 PID:031 0254 ZONE=WI
EX. BUILDING
RIM=11.18 APPROX. BOTTOM ELBOW=5.38
EX. MASSDOT GUARDRAIL
EX. HYDRANT W/ (2) GATE VALVES
CONTRACTOR CUSTOM FABRICATED SHEET
PHASE 5: CONSTRUCTION OF EAST/WEST COMBI-WALL
EX. PZ28 CELLULAR SHEET PILE COFFERDAM
(7) W14x311 SOCKETED 10' INTO SOUND ROCK
AZ14-770
10'-0" CONSTRUCTION EASEMENT
EX. HP14x73 (TYP)
EX. CLEAT (TYP)
HARBORLINE LIMIT
1'
HARBORLINE LIMIT
EX. FENDER (TYP.)
EX. LADDER (TYP.)
CHANNEL LIMIT
NEW BEDFORD HARBOR
EBB
FLOOD
A MR014 CONSTRUCTION PHASE 5
SCALE: 1" = 10'
GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
CONSTRUCTION SEQUENCING - PHASE 5 PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR014

Tuesday, November 11, 2025 8:12:44 AM
DWG Filename: 24m070.04 masscec_const sequencing plans.dwg Layout: mr014
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

NOTES:
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2. REFER TO MR-001 FOR EXISTING CONDITIONS AND BATHYMETRY PLAN.
3. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83; 2011 ADJUSTMENT) IN U.S. SURVEY FEET.
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N

12" HDPE

RIM=10.93
CLEANOUT SWEEP

EX. HEAVY LIFT
TIMBER BORDER

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

EX. MASSDOT
GUARDRAIL

EX. HYDRANT W/ (2)
GATE VALVES

S FRONT STREET
BOOK 10719 PAGE
242
PID:031 0288
ZONE=WI

A
MR301

PHASE 6B:
REMOVE TEMPORARY
SHEETPILES

EX. 6'Ø RCP STORM
DRAIN W/ CONC. COLLAR

APPROX. PROPERTY
LINE (TYP)

30'-0" DRAINAGE EASEMENT

EX. CHAINLINK FENCE
8' TALL

#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI

EX. BUILDING

EX. PZ28 CELLULAR SHEET
PILE COFFERDAM

45'-7"
5H:1V SLOPE

10'-0"
CONSTRUCTION
EASEMENT

EX. HP14x73
(TYP)

EX. CLEAT
(TYP)

HARBORLINE LIMIT

HARBORLINE LIMIT

11'-6"
1H:1V SLOPE

EX. FENDER (TYP.)

EX. LADDER
(TYP.)

PHASE 6A:
ESTABLISH 5H:1V SLOPE FROM EL. -11' AT
FACE OF NORTH/SOUTH COMBI-WALL TO
INSIDE FACE OF EXISTING CELL. ESTABLISH
1H:1V SLOPE FROM EL. -20' TO -32', AT LIMITS
OF BERTH. REMOVE MINOR AND MAJOR CELLS
SEQUENTIALLY FROM SOUTH TO NORTH;
SEE MD-103

CHANNEL LIMIT

NEW BEDFORD HARBOR

EBB
FLOOD

A
MR016
CONSTRUCTION PHASE 6
SCALE: 1" = 10'

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE**
**COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
CONSTRUCTION SEQUENCING - PHASE 6 PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR015

Tuesday, November 11, 2025 8:13:00 AM
DWG Filename: 24m070.04 masscec_const sequencing plans.dwg Layout: mr015
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

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5. CONTRACTOR SHALL REMOVE ANY AND ALL DEBRIS WHICH FALLS INTO THE HARBOR DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.
6. ALL EXCAVATED MATERIAL AND DEBRIS GENERATED FROM PILE INSTALLATION OPERATIONS SHALL BE COLLECTED AND TRANSPORTED FOR DISPOSAL IN CAD CELL 3.
7. CONTRACTOR SHALL USE CASING ALONG THE SLOPE DURING THE PLACEMENT OF SOCKETED PILES TO MAINTAIN SLOPE STABILITY AND PREVENT SOIL DISPLACEMENT.

EX. 6Ø RCP STORM DRAIN W/ CONC. COLLAR
APPROX. PROPERTY LINE (TYP)
30'-0" DRAINAGE EASEMENT
EX. CHAINLINK FENCE
8' TALL
S FRONT STREET
BOOK 10719 PAGE 242
PID:031 0288
ZONE=WI
#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI
EX. BUILDING
EX. HEAVY LIFT TIMBER BORDER
RIM=10.93
CLEANOUT SWEEP
12" HDPE
RIM=11.18
APPROX. BOTTOM ELBOW=5.38
EX. MASSDOT GUARDRAIL
EX. HYDRANT W/ (2) GATE VALVES
PHASE 7:
CONSTRUCT PILES AND SCOUR PROTECTION (AFTER PILE INSTALL)
1 1a 2 2a 3 2b 3a 3b 4 4a 5 5a 5b 6 6a 7 7a 8 8a 9 9a 10 10a 11 11a 12 13 14
7'-10" 17'-0" 16'-3" 17'-0" 7'-0" 11'-0" 17'-0" 9" 5'-6" 3'-9" 17'-0" 11'-6" 18'-0" 2'-0" 6'-0" 6'-6" 18'-0" 12'-0" 12'-4" 18'-0" 3'-10" 17'-0" 13'-2" 10'-6" 17'-0" 6'-10" 6'-6" 4" 16'-8" 4'-0" 7'-0" 7'-3"
I H G F E D C B A
8'-0" 8'-0" 15'-6" 10'-0" 10'-0" 9'-6" 9'-6" 9'-6" 9'-6" 2'-5"
ROW "I"
(11) 30"x1" PIPE PILE
DRIVEN TO TOP OF COMP ROCK
ROW "H"
(1) 30"x1" PIPE PILE
DRIVEN TO TOP OF COMP ROCK
ROW "G"
(17) 30"x1" PIPE PILE
DRIVEN TO TOP OF COMP ROCK
(12) ROW "C", "D", & "E"
30"x1" PIPE PILE SOCKETED
10' TO SOUND ROCK (TYP)
(32) ROW "C", "D", "E", & "F"
30"x1" PIPE PILE DRIVEN TO TOP
OF COMP ROCK (TYP)
10'-0" CONSTRUCTION EASEMENT
(22) ROW "A" & "B"
30"x1" PIPE PILE SOCKETED
10' TO SOUND ROCK (TYP)
(1) W14X311 SOCKETED
10' TO SOUND ROCK
GROUT PLUG TO SEAL
BOTTOM OF SHEETPILES
EX. PZ28 CELLULAR SHEET PILE COFFERDAM
EX. HP14x73 (TYP)
EX. CLEAT (TYP)
EX. MINOR CELL SHEETS TO REMAIN AS NEEDED
(1) HP12X53 CLOSURE PILE; SEE DETAIL I/SR503
AZ14-770 W/ TOE PINS; SEE DETAIL 7/SR502
(3) 24"x1" PIPE PILE SOCKETED 10' INTO SOUND ROCK (TYP.)
ARMORFLEX CONCRETE MATTRESS OR APPROVED EQUAL
HARBORLINE LIMIT
HARBORLINE LIMIT
CHANNEL LIMIT
EX. FENDER (TYP.)
EX. LADDER (TYP.)
NEW BEDFORD HARBOR
EBB
FLOOD
A MR017 CONSTRUCTION PHASE 7
SCALE: 1" = 10'
GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT: MASSCEC NBMCT - PHASE 3 BULKHEAD REPLACEMENT PROJECT (SITE 4)

OWNER: NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
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| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
CONSTRUCTION SEQUENCING - PHASE 7 PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR016

Tuesday, November 11, 2025 8:13:19 AM
DWG Filename: 24m070.04 masscec_const sequencing plans.dwg Layout: mr016
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1. REFER TO G-005, G-006 AND G-007 FOR GENERAL NOTES.
2. REFER TO MR-001 FOR EXISTING CONDITIONS AND BATHYMETRY PLAN.
3. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83; 2011 ADJUSTMENT) IN U.S. SURVEY FEET.
4. ELEVATION REFERS TO MEAN LOW LOWER WATER MARK (MLLW) VERTICAL DATUM BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008.
5. CONTRACTOR SHALL REMOVE ANY AND ALL DEBRIS WHICH FALLS INTO THE HARBOR DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.

EX. 6'Ø RCP STORM DRAIN W/ CONC. COLLAR

APPROX. PROPERTY LINE (TYP)

30'-0" DRAINAGE EASEMENT

EX. CHAINLINK FENCE 8' TALL

S FRONT STREET
BOOK 10719 PAGE 242
PID:031 0288
ZONE=WI

#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI

EX. BUILDING

RIM=10.93
CLEANOUT SWEEP

EX. HEAVY LIFT TIMBER BORDER

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

EX. MASSDOT GUARDRAIL

EX. HYDRANT W/ (2) GATE VALVES

PHASE 8: CONSTRUCT BEAMS

ROW "G" 10' WIDE BEAM DEPTH VARIES

EX. PZ28 CELLULAR SHEET PILE COFFERDAM

10'-0" CONSTRUCTION EASEMENT

EX. HP14x73 (TYP)

EX. CLEAT (TYP)

HARBORLINE LIMIT

HARBORLINE LIMIT

EX. FENDER (TYP.)

EX. LADDER (TYP.)

ROW "B", "C", "D", "E", "F", AND "I" 4' WIDE BEAM DEPTH VARIES

ROW "A" 5' WIDE BEAM DEPTH VARIES

NOTE: ARMORFLEX CONCRETE MATTRESS NOT SHOWN FOR CLARITY (SEE MR016)

1" THK STEEL CLOSURE PLATE W/ GROUT PLUG; SEE A/SR504

BACKFILL TO EL. +8.0', COMPACTED TO SPT 15 IN LAYERS

CHANNEL LIMIT

NEW BEDFORD HARBOR

EBB

FLOOD

A / MR018 CONSTRUCTION PHASE 8
SCALE: 1" = 10'

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT: MASSCEC NBMCT - PHASE 3 BULKHEAD REPLACEMENT PROJECT (SITE 4)

OWNER: NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA

| REVISIONS | | | |
|---|---|---|---|
| NO | BY | DATE | DESCRIPTION |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
CONSTRUCTION SEQUENCING - PHASE 8 PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR017

Tuesday, November 11, 2025 8:13:36 AM
DWG Filename: 24m070.04 masscec_const sequencing plans.dwg Layout: mr017
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

NOTES:
1. REFER TO G-005, G-006 AND G-007 FOR GENERAL NOTES.
2. REFER TO MR-001 FOR EXISTING CONDITIONS AND BATHYMETRY PLAN.
3. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83; 2011 ADJUSTMENT) IN U.S. SURVEY FEET.
4. ELEVATION REFERS TO MEAN LOW LOWER WATER MARK (MLLW) VERTICAL DATUM BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008.
5. CONTRACTOR SHALL REMOVE ANY AND ALL DEBRIS WHICH FALLS INTO THE HARBOR DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.

N

EX. 6'Ø RCP STORM DRAIN W/ CONC. COLLAR

APPROX. PROPERTY LINE (TYP)

30'-0" DRAINAGE EASEMENT

EX. CHAINLINK FENCE 8' TALL

S FRONT STREET
BOOK 10719 PAGE 242
PID:031 0288
ZONE=WI

#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI

EX. BUILDING

EX. HEAVY LIFT TIMBER BORDER

RIM=10.93
CLEANOUT SWEEP

12" HDPE

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

EX. MASSDOT GUARDRAIL

EX. HYDRANT W/ (2) GATE VALVES

PHASE 9: CONSTRUCT FORMWORK AND POUR CONCRETE PLATFORM

PHASE 9: REMOVE TEMPORARY SHEET PILES AND RESTORE AREA TO ORIGINAL CONDITION

181'-6"(4100 psf)

87'-0"
(4100 PSF)

5'-0"

4'-7"

3'

2'-9"

5'-6"

NORTH CLOSURE BULKHEAD 3'-0"X2'-6" CONCRETE CAP W/ 8' CHAIN LINK SECURITY FENCE

REMOVE TEMPORARY CHAIN-LINK SECURITY FENCE AFTER INSTALLATION OF PERMANENT 8' TALL CHAIN-LINK SECURITY FENCE ALONG CONCRETE BULKHEAD

20'-0"

17'-1"

12'-1"

11'-11"
(3-0"X2'-6" CONCRETE CAP)

1'-6"X1'-6" CONCRETE BEAM

HP12X53 GRATING SUPPORT BEAM

6'-0"

5'-5"

2'-6"X2'-0" CONCRETE CAP

41'-3" RETAINING WALL

37'-9"

10'-0" CONSTRUCTION EASEMENT

6'-0"

6'-6"

10'-7"

EX. HP14x73 (TYP)

EX. CLEAT (TYP)

EX. PZ28 CELLULAR SHEET PILE COFFERDAM

19'-7"

4'-0"X4'-3" CONCRETE CAP

6'-6" (TYP)

HARBORLINE LIMIT

HARBORLINE LIMIT

EX. FENDER (TYP.)

EX. LADDER (TYP.)

6'-6" WIDE UTILITY TRENCH TIE-IN; SEE DETAIL D/MR515

(3)POUR CONCRETE BOLLARD PEDESTAL

INSIDE FACE OF 6'-6" WIDE UTILITY TRENCH

OUTER EDGE OF PLATFORM

NOTE: ARMORFLEX CONCRETE MATTRESS NOT SHOWN FOR CLARITY (SEE MR016)

CHANNEL LIMIT

NEW BEDFORD HARBOR

EBB

FLOOD

A / MR019 CONSTRUCTION PHASE 9
SCALE: 1" = 10'

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

| REVISIONS | | | |
|---|---|---|---|
| NO | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
CONSTRUCTION SEQUENCING - PHASE 9 PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR018

Tuesday, November 11, 2025 8:13:55 AM
DWG Filename: 24m070.04 masscec_const sequencing plans.dwg Layout: mr018
DWG Folder Location: PW:\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

NOTES:
1. REFER TO G-005, G-006 AND G-007 FOR GENERAL NOTES.
2. REFER TO MR-001 FOR EXISTING CONDITIONS AND BATHYMETRY PLAN.
3. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83; 2011 ADJUSTMENT) IN U.S. SURVEY FEET.
4. ELEVATION REFERS TO MEAN LOW LOWER WATER MARK (MLLW) VERTICAL DATUM BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008.
5. CONTRACTOR SHALL REMOVE ANY AND ALL DEBRIS WHICH FALLS INTO THE HARBOR DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.

EX. 6'Ø RCP STORM DRAIN W/ CONC. COLLAR

APPROX. PROPERTY LINE (TYP)

30'-0" DRAINAGE EASEMENT

EX. CHAINLINK FENCE 8' TALL

S FRONT STREET
BOOK 10719 PAGE 242
PID:031 0288
ZONE=WI

#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI

EX. BUILDING

8' HIGH FENCE

RIM=10.93
CLEANOUT SWEEP

12" HDPE

EX. HEAVY LIFT TIMBER BORDER

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

EX. MASSDOT GUARDRAIL

EX. HYDRANT W/ (2) GATE VALVES

EX. PZ28 CELLULAR SHEET PILE COFFERDAM

$2\frac{1}{2}$"X$\frac{3}{8}$" GALV. STEEL GRATING PANEL (19-W-4); SEE SR103

10'-0" CONSTRUCTION EASEMENT

ALL AREAS WITHIN CONSTRUCTION EASEMENT SHALL BE RETURNED TO ITS ORIGINAL CONDITION, INCLUDING SURFACE MATERIALS, GRADING AND ANY EXISTING FEATURES.

EX. CLEAT (TYP)

EX. FENDER (TYP.)

EX. LADDER (TYP.)

HARBORLINE LIMIT

HARBORLINE LIMIT

45'-6"± (V.I.F.)
62'-6"
17'-0"
52'-0"
18'-0"
35'-0"
70'-0"
17'-0"
90'-0"
90'-0"

6'-6" (TYP)

PHASE 10:
CONSTRUCT FENDERS, BOLLARDS, AND GUARDRAIL

STEEL LADDER
(TYP OF 2)
SEE MR507

ZALDA TECHNOLOGY SBD-1
200-225 METRIC TON BOLLARD
(TYP OF 3)
SEE MR506

ZALDA TECHNOLOGY FENDER AND HDPE FACED PANEL "SC-1150" SER (HIGH FORMULA) (TYP OF 6) SEE MR505

NOTE: AMORFLEX CONCRETE MATTRESS NOT SHOWN FOR CLARITY (SEE MR016)

NEW BEDFORD HARBOR

EBB
FLOOD

CHANNEL LIMIT

A MR020 CONSTRUCTION PHASE 10
SCALE: 1" = 10'

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT: MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER: NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
CONSTRUCTION SEQUENCING - PHASE 10 PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR019

Tuesday, November 11, 2025 8:14:15 AM
DWG Filename: 24m070.04 masscec_const sequencing plans.dwg Layout: mr019
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

NOTES:
1. REFER TO G-006, G-007 AND G-008 FOR GENERAL NOTES.
2. REFER TO MR-001 FOR EXISTING CONDITIONS AND BATHYMETRY PLAN.
3. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83; 2011 ADJUSTMENT) IN U.S. SURVEY FEET.
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EX. 6'Ø RCP STORM DRAIN W/ CONC. COLLAR
APPROX. PROPERTY LINE (TYP)
30'-0" DRAINAGE EASEMENT
RIM=10.93
CLEANOUT SWEEP
S FRONT STREET
BOOK 10719 PAGE 242
PID:031 0288
ZONE=WI
#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI
RIM=11.18
APPROX. BOTTOM ELBOW=5.38
EX. MASSDOT GUARDRAIL
12" HDPE
CONTRACTOR SHALL INSTALL TEMPORARY BYPASS PUMPS TO DIVERT FLOW UNTIL CONSTRUCTION IS FINISHED
INSTALL NEW MANHOLE W/ TEMPORARY PLUG
EX. BUILDING
8' HIGH CHAIN LINK SECURITY FENCE
AZ19-700 NORTH CLOSURE WALL W/ CONC. CAP
181'-6" (4100 psf)
ROW "I" (11) 30"x1" PIPE PILE DRIVEN TO TOP OF COMP ROCK
ROW "H" (1) 30"x1" PIPE PILE DRIVEN TO TOP OF COMP ROCK
ROW "G" (17) 30"x1" PIPE PILE DRIVEN TO TOP OF COMP ROCK
CONTRACTOR IS ALLOWED TO USE FLAT SLAB WITH EMBEDED BEAMS ON THIS PART OF THE PLATFORM AT NO ADDITIONAL COST TO THE OWNER FOR ADDED CONCRETE
ROW "G" 10' WIDE BEAM DEPTH VARIES
72"RCP (34'± TOTAL) ADJUST SHORING AS REQUIRED (SHORING NOT SHOWN FOR CLARITY)
(15) 370 KIP GROUTED TENDON STRAND ROCK ANCHOR @ 45° (CONTRACTOR SHALL DESIGN) SEE SR100 FOR LOCATIONS AND SPACING
EX. HYDRANT W/ (2) GATE VALVES
NORTH/SOUTH COMBI-WALL BULKHEAD
30"Ø x1" KING PIPE PILE SOCKETED 10' INTO ROCK
(2) HSS 12x12x½" CONT. WALER
(2) HP12x89 SOCKETED 10' TO SOUND ROCK
EAST/WEST COMBI-WALL
2 ½"X⅜" GALV. STEEL GRATING PANEL (19-W-4 HEAVY DUTY); SEE SR103
EX. PZ28 CELLULAR SHEET PILE COFFERDAM
(12) ROW "C", "D", & "E" 30"x1" PIPE PILE SOCKETED 10' TO SOUND ROCK (TYP)
(32) ROW "C", "D", "E", & "F" 30"x1" PIPE PILE DRIVEN TO TOP OF COMP ROCK (TYP)
10'-0" CONSTRUCTION EASEMENT
(8) W14x311 SOCKETED 10' TO SOUND ROCK
EX. HP14x73 (TYP)
EX. CLEAT (TYP)
HARBORLINE LIMIT
EX. FENDER (TYP.)
EX. LADDER (TYP.)
STEEL LADDER (TYP. OF 2) SEE MR507
(3) 24"x1" PIPE PILE SOCKETED 10' TO SOUND ROCK (TYP.)
(22) ROW "A" & "B" 30"x1" PIPE PILE SOCKETED 10' TO SOUND ROCK (TYP)
INSIDE FACE OF 6'-6" WIDE UTILITY TRENCH
OUTER EDGE OF PLATFORM
ZALDA TECHNOLOGY SBD-1 200-225 METRIC TON BOLLARD (TYP OF 3) SEE MR506
ROW "B", "C", "D", "E", "F", AND "I" 4' WIDE BEAM DEPTH VARIES
ROW "A" 5' WIDE BEAM DEPTH VARIES
NOTE: ARMORFLEX CONCRETE MATTRESS SCOUR PROTECTION NOT SHOWN FOR CLARITY
ZALDA TECHNOLOGY FENDER AND HDPE FACED PANEL "SC-1150" SER (HIGH FORMULA) (TYP OF 6) SEE MR505
CHANNELL LIMIT
NEW BEDFORD HARBOR
EBB
FLOOD
GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT: MASSCEC NBMCT - PHASE 3 BULKHEAD REPLACEMENT PROJECT (SITE 4)

OWNER: NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| REVISIONS | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
MARINE INFRASTRUCTURE CONFIGURATION PLAN

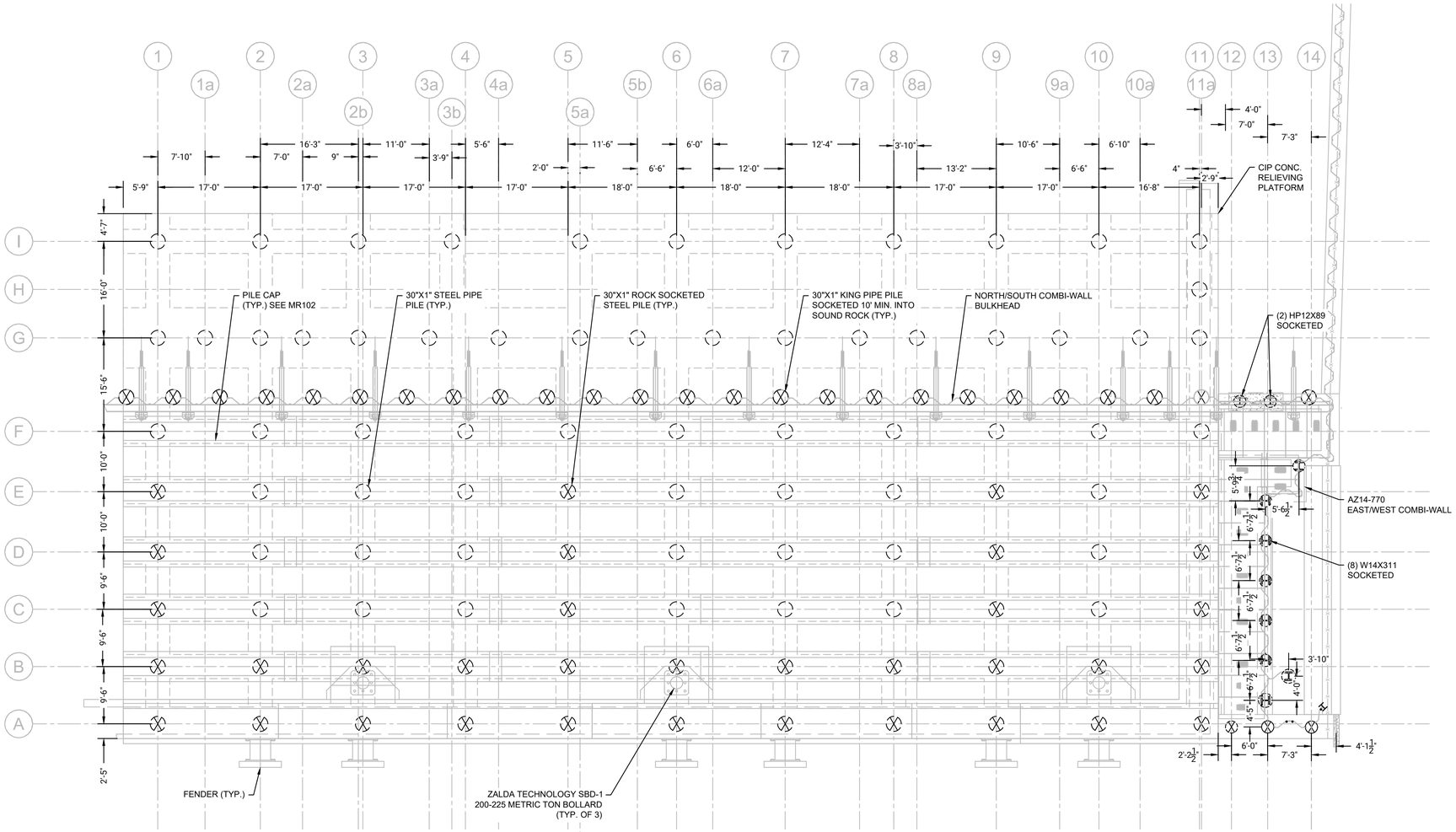
ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR100

Tuesday, November 11, 2025 8:14:58 AM
DWG Filename: 24m070.04 masscec_marine infra plan_rev 1.dwg Layout: mr100
DWG Folder Location: PW:\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

NOTES:
1. SEE SHEETS MR508 THROUGH MR513 FOR ADDITIONAL DIMENSIONS AND INFORMATION RELATED TO THE PRECAST CONCRETE PILE CAPS.
2. LINEWORK SCREENED FOR CLARITY.
3. EXISTING STRUCTURES NOT SHOWN FOR CLARITY.
4. PRECAST PLANKS NOT SHOWN FOR CLARITY. SEE SHEETS MR514 FOR ADDITIONAL DIMENSIONS AND INFORMATION.




NEW BEDFORD HARBOR

EBB
FLOOD

1 / MR101 STEEL PILES
SCALE: 1" = 10'

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
MARINE INFRASTRUCTURE PILE LAYOUT PLAN

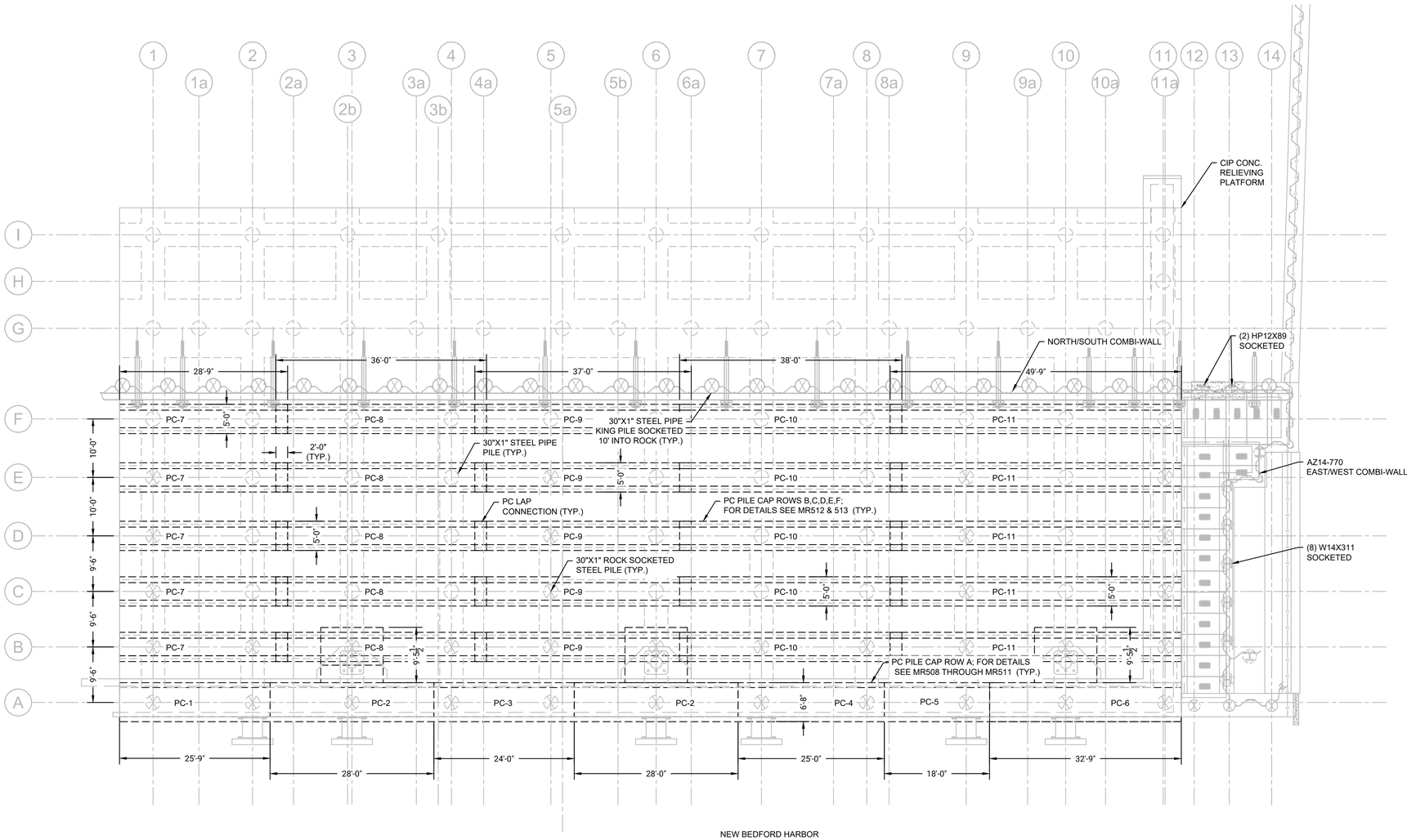
ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR101

Tuesday, November 11, 2025 8:15:14 AM
DWG Filename: 24m070.04 masscec_marine infra plan_rev 1.dwg Layout: mr101
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

NOTES:
1. SEE SHEETS MR508 THROUGH MR513 FOR ADDITIONAL DIMENSIONS AND INFORMATION RELATED TO THE PRECAST CONCRETE PILE CAPS.
2. LINEWORK SCREENED FOR CLARITY.
3. EXISTING STRUCTURES NOT SHOWN FOR CLARITY.
4. PRECAST PLANKS NOT SHOWN FOR CLARITY. SEE SHEETS MR514 FOR ADDITIONAL DIMENSIONS AND INFORMATION.




NEW BEDFORD HARBOR

EBB
FLOOD

1 / MR102 PRECAST PILE CAPS
SCALE: 1" = 10'

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Tuesday, November 11, 2025 8:15:28 AM
DWG Filename: 24m070.04 masscec_marine infra plan_rev 1.dwg Layout: mr102
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

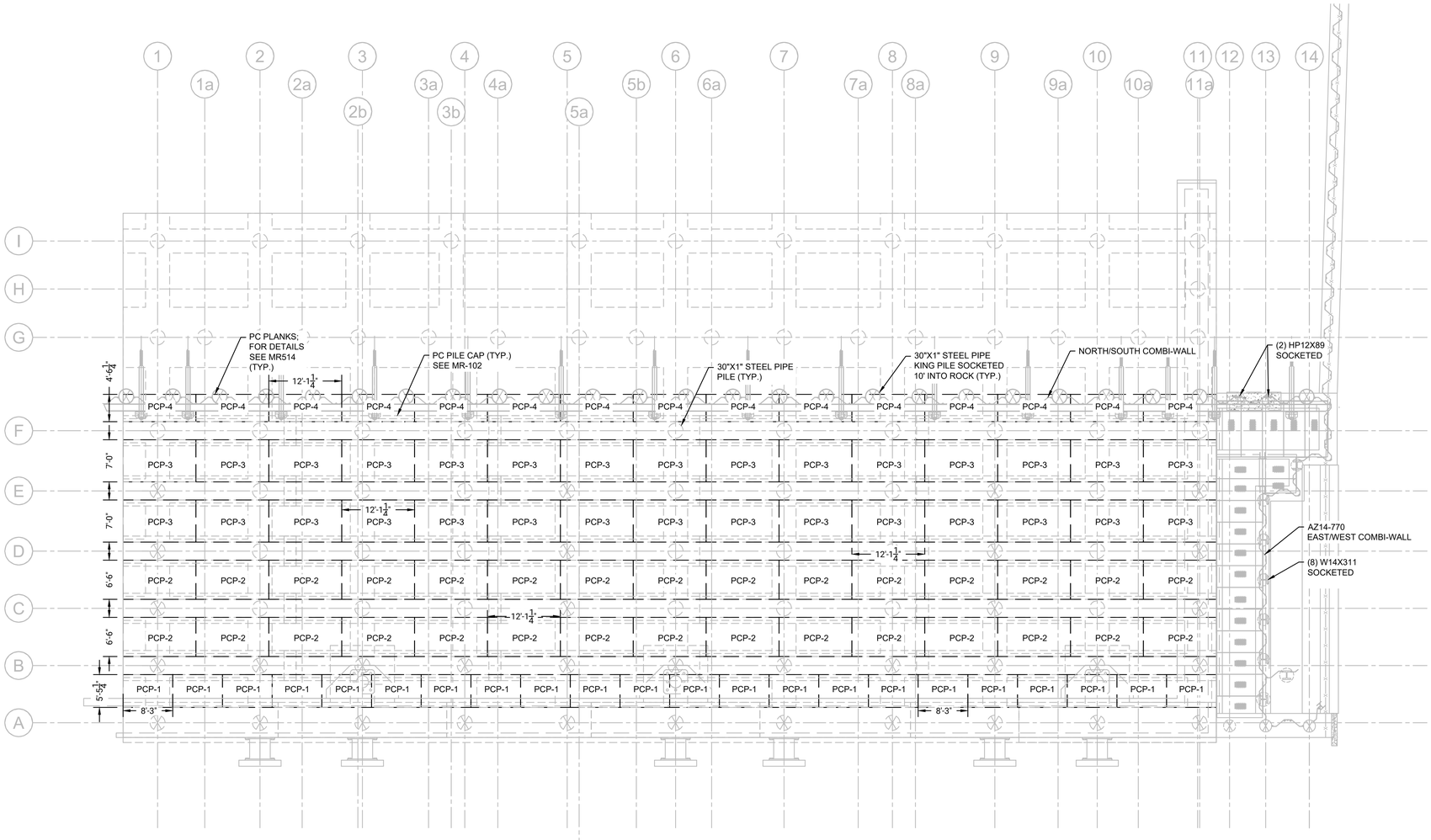
SHEET TITLE:
MARINE INFRASTRUCTURE PILE CAP LAYOUT PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR102

NOTES:
1. SEE SHEETS MR508 THROUGH MR513 FOR ADDITIONAL DIMENSIONS AND INFORMATION RELATED TO THE PRECAST CONCRETE PILE CAPS.
2. LINEWORK SCREENED FOR CLARITY.
3. EXISTING STRUCTURES NOT SHOWN FOR CLARITY.




NEW BEDFORD HARBOR

EBB
FLOOD

1 / MR103 PRECAST PLANKS
SCALE: 1" = 10'

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT (SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

| REVISIONS | NO | BY | DATE | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

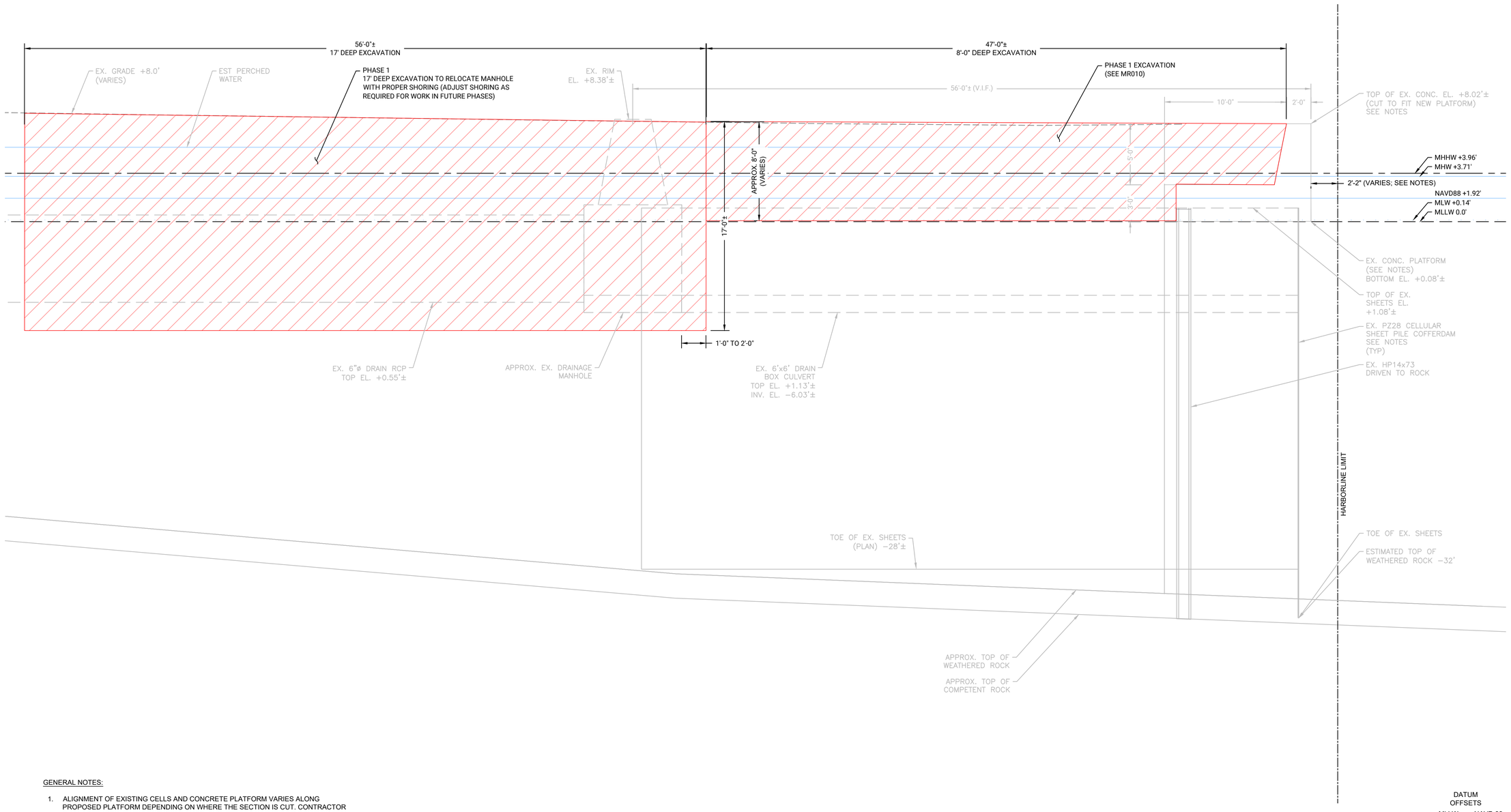
SHEET TITLE:
MARINE INFRASTRUCTURE PRECAST PLANKS LAYOUT PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR103

Tuesday, November 11, 2025 8:15:44 AM
DWG Filename: 24m070.04 masscec_marine infra plan_rev 1.dwg Layout: mr103
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




GENERAL NOTES:

1. ALIGNMENT OF EXISTING CELLS AND CONCRETE PLATFORM VARIES ALONG PROPOSED PLATFORM DEPENDING ON WHERE THE SECTION IS CUT. CONTRACTOR SHALL PERFORM SURVEY TO VERIFY LOCATION OF EXISTING STRUCTURES PRIOR TO PERFORMING WORK.

DATUM
OFFSETS

| MLLW | NAVD 88 | |
|---|---|---|
| 3.96 | 2.04 | MHHW |
| 3.71 | 1.79 | MHW |
| 1.92 | 0.00 | NAVD 88 |
| 0.14 | -1.78 | MLW |
| 0.0 | -1.92 | MLLW |

OFFSETS TAKEN FROM
FROM USACE GUIDANCE IN QUALITY
CONTROL REPORT BY JACOBS
ENGINEERING, PROVIDED BY USACE

B
MR010 EX. SECTION W/ EXCAVATION EXTENTS AT CULVERT
SCALE: 1" = 4'

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

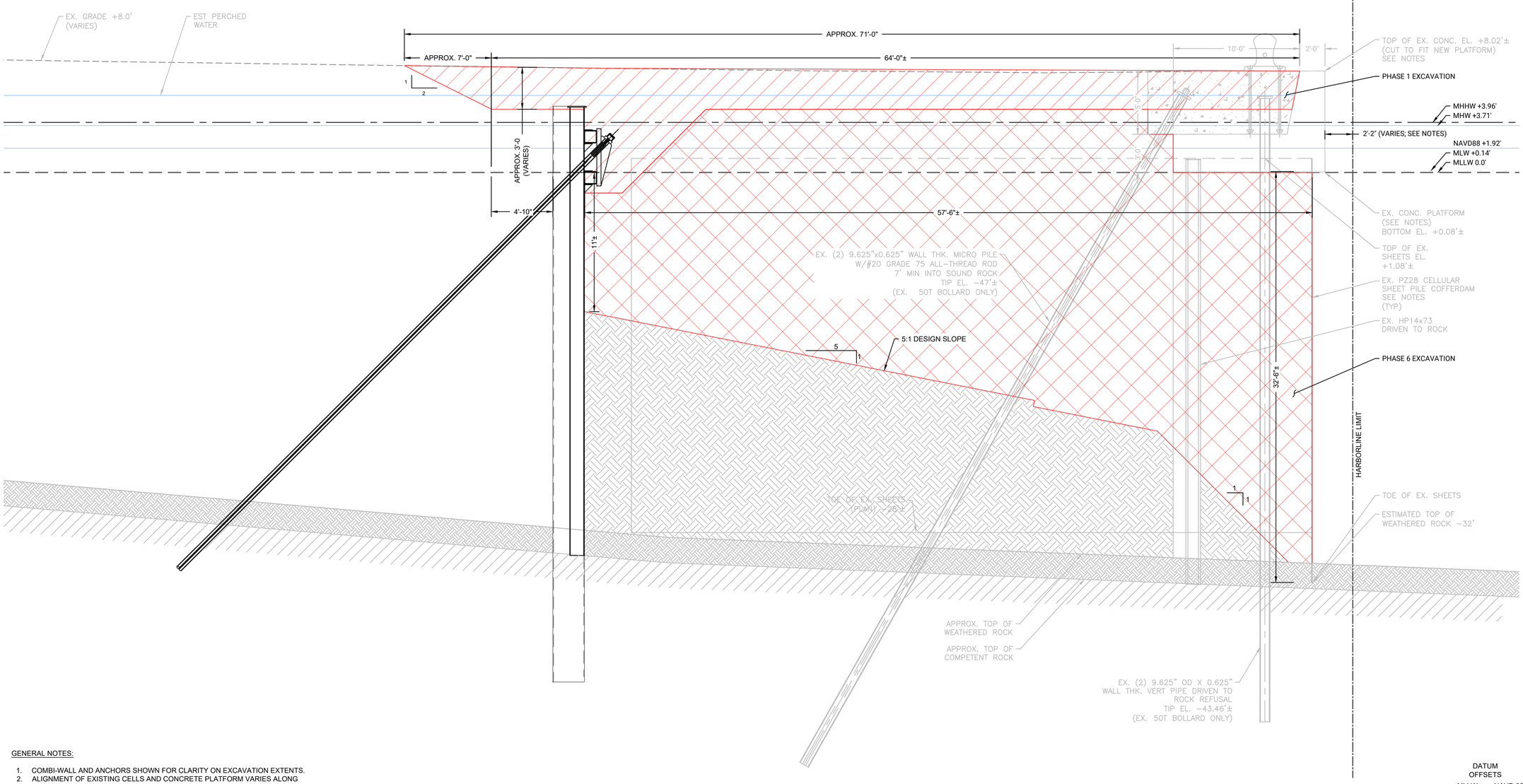
SHEET TITLE:
EX. SECTION WITH EXCAVATION EXTENTS AT CULVERT

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR300

Tuesday, November 11, 2025 8:16:11 AM
DWG Filename: 24m070.04 masscec_marine infra sections.dwg Layout: mr300
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




GENERAL NOTES:

1. COMBI-WALL AND ANCHORS SHOWN FOR CLARITY ON EXCAVATION EXTENTS.
2. ALIGNMENT OF EXISTING CELLS AND CONCRETE PLATFORM VARIES ALONG PROPOSED PLATFORM DEPENDING ON WHERE THE SECTION IS CUT. CONTRACTOR SHALL PERFORM SURVEY TO VERIFY LOCATION OF EXISTING STRUCTURES PRIOR TO PERFORMING WORK.

DATUM OFFSETS

| MLLW | NAVD 88 | |
|---|---|---|
| 3.96 | 2.04 | MHHW |
| 3.71 | 1.79 | MHW |
| 1.92 | 0.00 | NAVD 88 |
| 0.14 | -1.78 | MLW |
| 0.0 | -1.92 | MLLW |

OFFSETS TAKEN FROM
FROM USACE GUIDANCE IN QUALITY
CONTROL REPORT BY JACOBS
ENGINEERING, PROVIDED BY USACE

A
MR010 EX. SECTION W/ EXCAVATION EXTENTS
SCALE: 1" = 4'

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

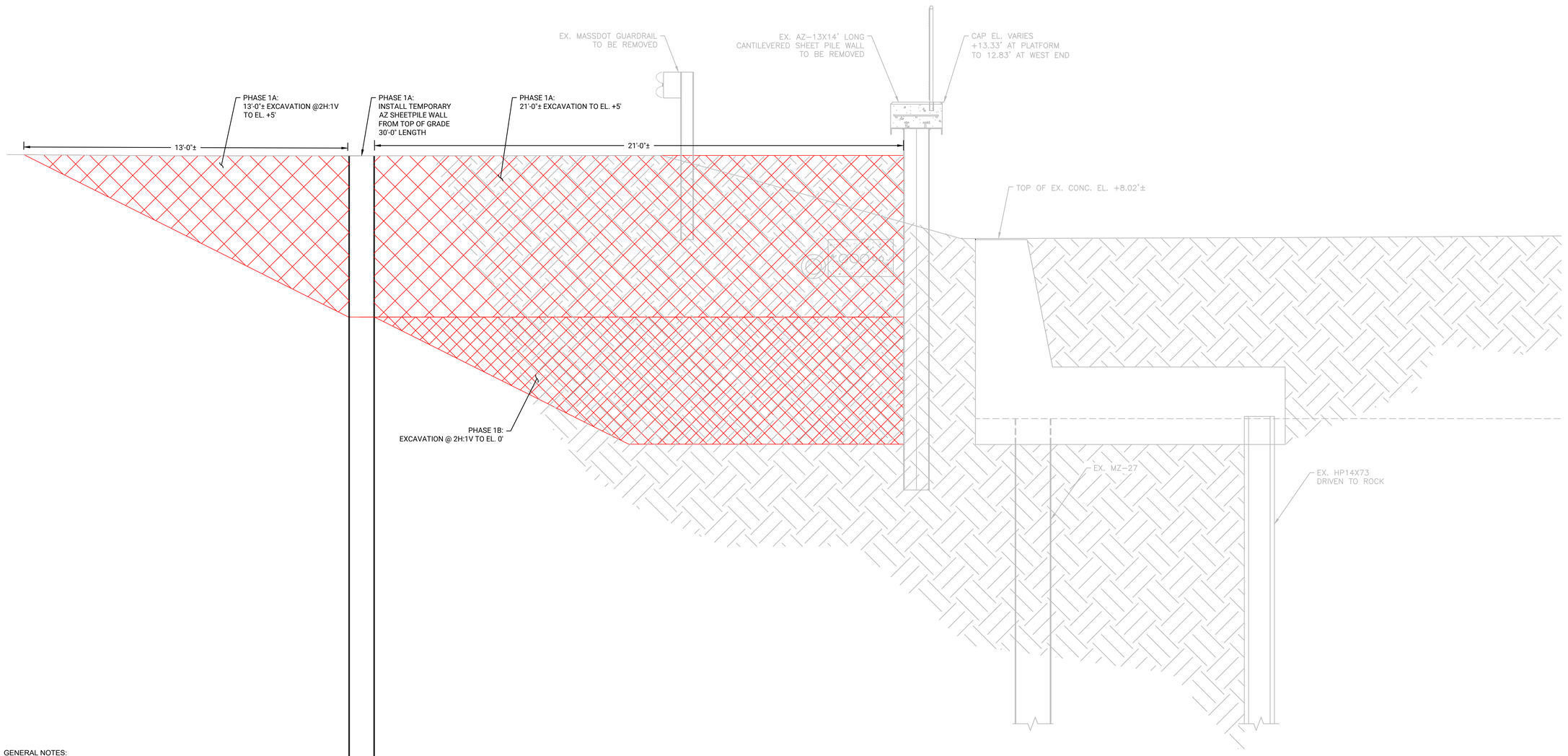
SHEET TITLE:
EX. SECTION WITH EXCAVATION EXTENTS

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR301

Tuesday, November 11, 2025 8:16:29 AM
DWG Filename: 24m070.04 masscec_marine infra sections.dwg Layout: mr301
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




GENERAL NOTES:

1. ALIGNMENT OF EXISTING CELLS AND CONCRETE PLATFORM VARIES ALONG PROPOSED PLATFORM DEPENDING ON WHERE THE SECTION IS CUT. CONTRACTOR SHALL PERFORM SURVEY TO VERIFY LOCATION OF EXISTING STRUCTURES PRIOR TO PERFORMING WORK.

C / MR010 EX. SECTION W/ EXCAVATION EXTENTS
SCALE: 1" = 2'

DATUM OFFSETS

| MLLW | NAVD 88 | |
|---|---|---|
| 3.96 | 2.04 | MHHW |
| 3.71 | 1.79 | MHW |
| 1.92 | 0.00 | NAVD 88 |
| 0.14 | -1.78 | MLW |
| 0.0 | -1.92 | MLLW |

OFFSETS TAKEN FROM FROM USACE GUIDANCE IN QUALITY CONTROL REPORT BY JACOBS ENGINEERING, PROVIDED BY USACE

GRAPHIC SCALE
0 1 4 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

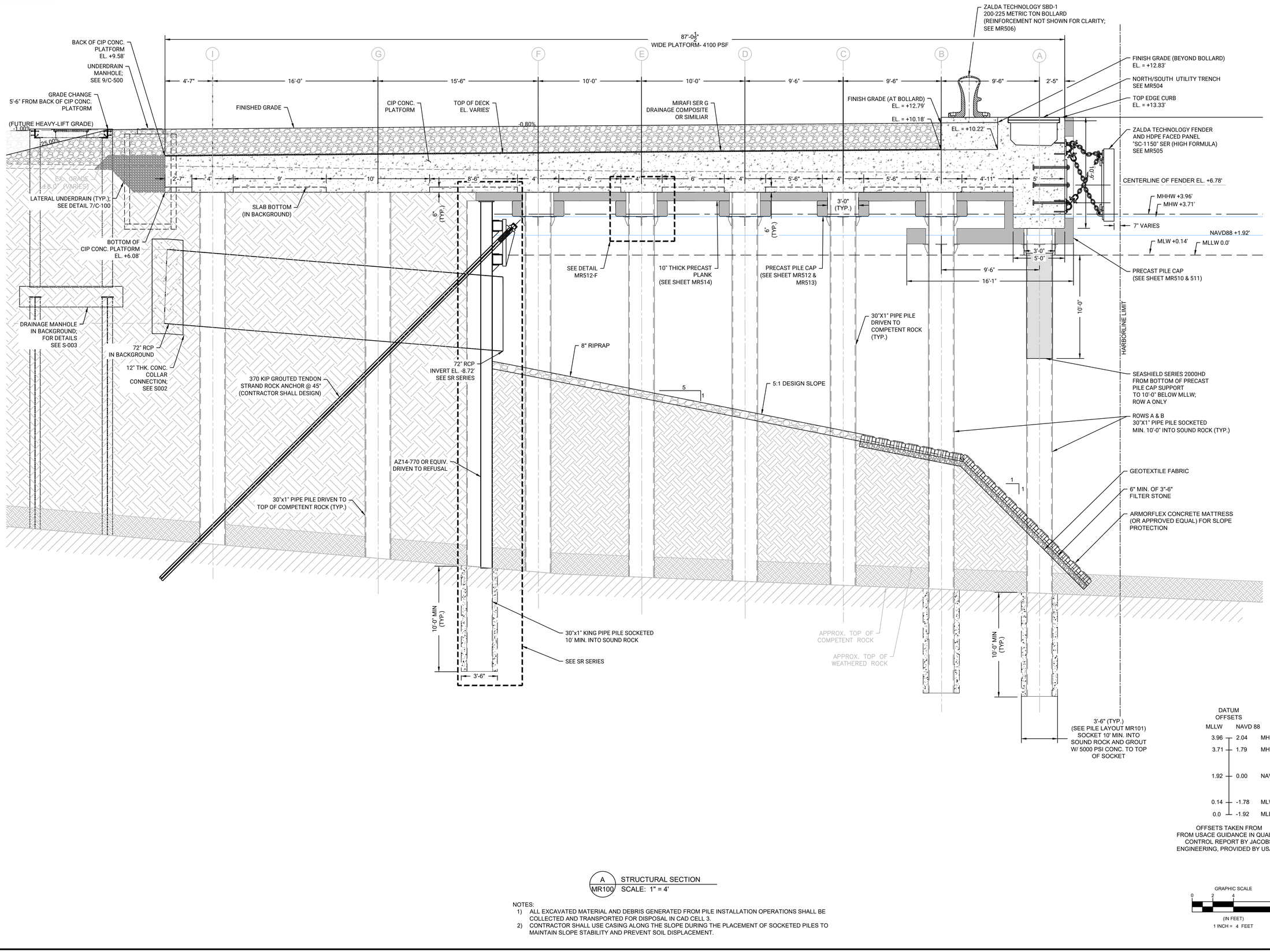
SHEET TITLE:
EX. SECTION WITH EXCAVATION EXTENTS

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR302

Tuesday, November 11, 2025 8:16:42 AM
DWG Filename: 24m070.04 masscec_marine infra sections.dwg Layout: mr302
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




DATUM OFFSETS

| MLLW | NAVD 88 | |
|---|---|---|
| 3.96 | 2.04 | MHHW |
| 3.71 | 1.79 | MHW |
| 1.92 | 0.00 | NAVD 88 |
| 0.14 | -1.78 | MLW |
| 0.0 | -1.92 | MLLW |

OFFSETS TAKEN FROM FROM USACE GUIDANCE IN QUALITY CONTROL REPORT BY JACOBS ENGINEERING, PROVIDED BY USACE

A MR100 STRUCTURAL SECTION
SCALE: 1" = 4'

NOTES:
1) ALL EXCAVATED MATERIAL AND DEBRIS GENERATED FROM PILE INSTALLATION OPERATIONS SHALL BE COLLECTED AND TRANSPORTED FOR DISPOSAL IN CAD CELL 3.
2) CONTRACTOR SHALL USE CASING ALONG THE SLOPE DURING THE PLACEMENT OF SOCKETED PILES TO MAINTAIN SLOPE STABILITY AND PREVENT SOIL DISPLACEMENT.

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

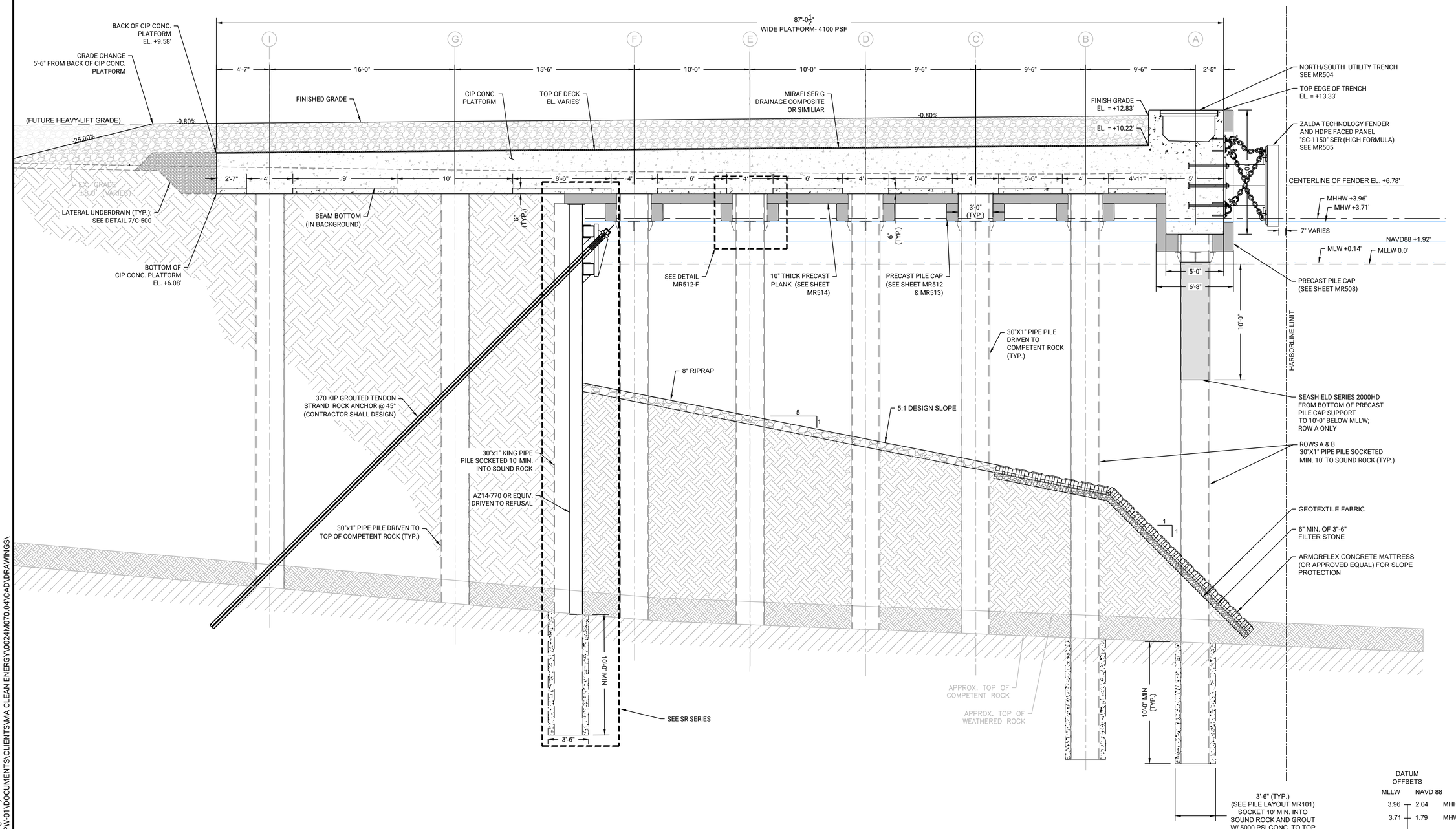
SHEET TITLE:
STRUCTURAL SECTION
1 OF 3

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR303

Tuesday, November 11, 2025 8:16:58 AM
DWG Filename: 24m070.04 masscec_marine infra sections.dwg Layout: mr303
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




B / MR100 STRUCTURAL SECTION
SCALE: 1" = 4'

NOTES:
1) ALL EXCAVATED MATERIAL AND DEBRIS GENERATED FROM PILE INSTALLATION OPERATIONS SHALL BE COLLECTED AND TRANSPORTED FOR DISPOSAL IN CAD CELL 3.
2) CONTRACTOR SHALL USE CASING ALONG THE SLOPE DURING THE PLACEMENT OF SOCKETED PILES TO MAINTAIN SLOPE STABILITY AND PREVENT SOIL DISPLACEMENT.

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

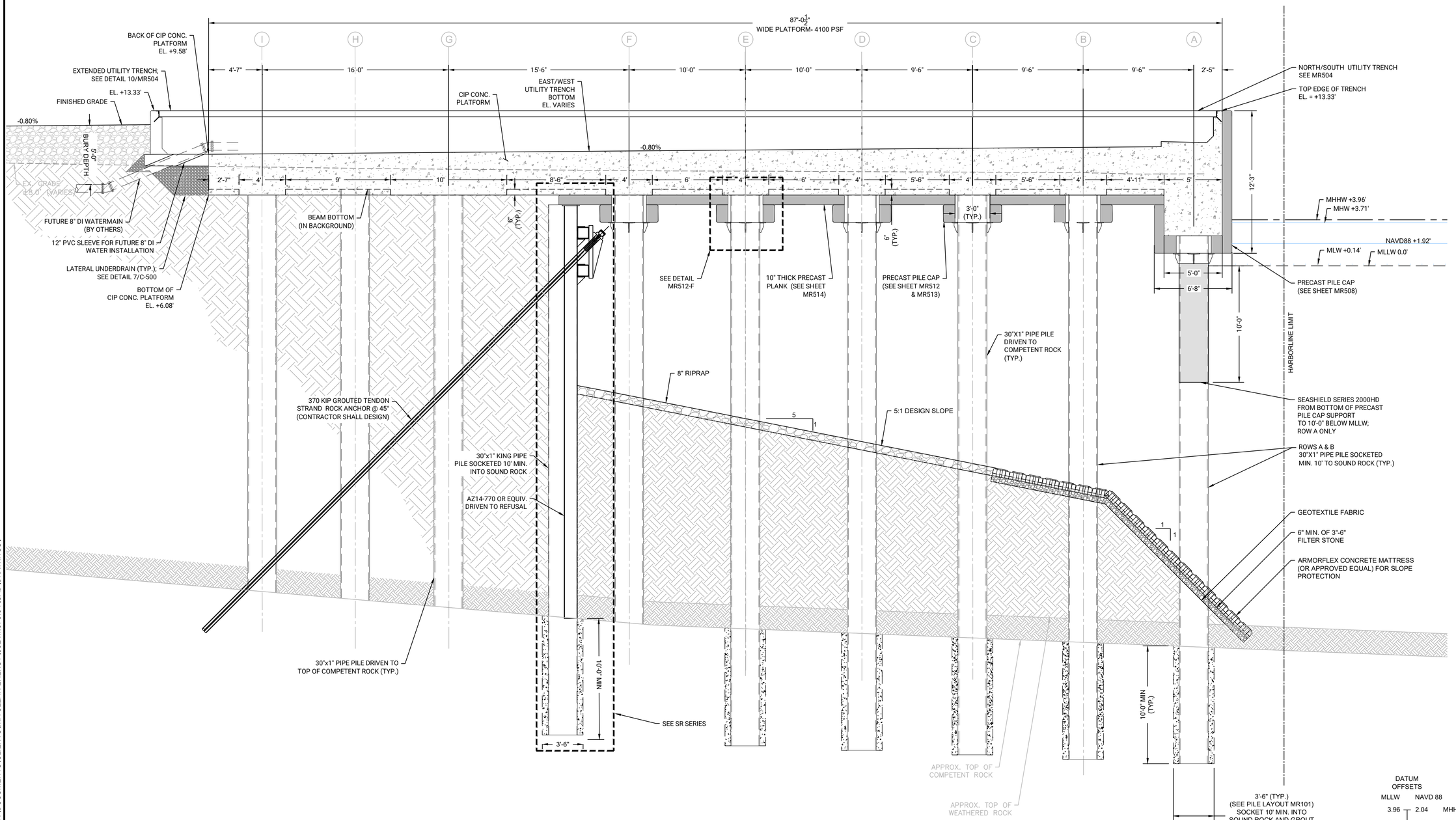
SHEET TITLE:
STRUCTURAL SECTION
2 OF 3

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR304

Tuesday, November 11, 2025 8:17:13 AM
DWG Filename: 24m070.04 masscec_marine infra sections.dwg Layout: mr304
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




C (MR100, C-100) STRUCTURAL SECTION
SCALE: 1" = 4'

DATUM OFFSETS

| MLLW | NAVD 88 | |
|---|---|---|
| 3.96 | 2.04 | MHHW |
| 3.71 | 1.79 | MHW |
| 1.92 | 0.00 | NAVD 88 |
| 0.14 | -1.78 | MLW |
| 0.0 | -1.92 | MLLW |

OFFSETS TAKEN FROM FROM USACE GUIDANCE IN QUALITY CONTROL REPORT BY JACOBS ENGINEERING, PROVIDED BY USACE

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

NOTES:
1) ALL EXCAVATED MATERIAL AND DEBRIS GENERATED FROM PILE INSTALLATION OPERATIONS SHALL BE COLLECTED AND TRANSPORTED FOR DISPOSAL IN CAD CELL 3.
2) CONTRACTOR SHALL USE CASING ALONG THE SLOPE DURING THE PLACEMENT OF SOCKETED PILES TO MAINTAIN SLOPE STABILITY AND PREVENT SOIL DISPLACEMENT.

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

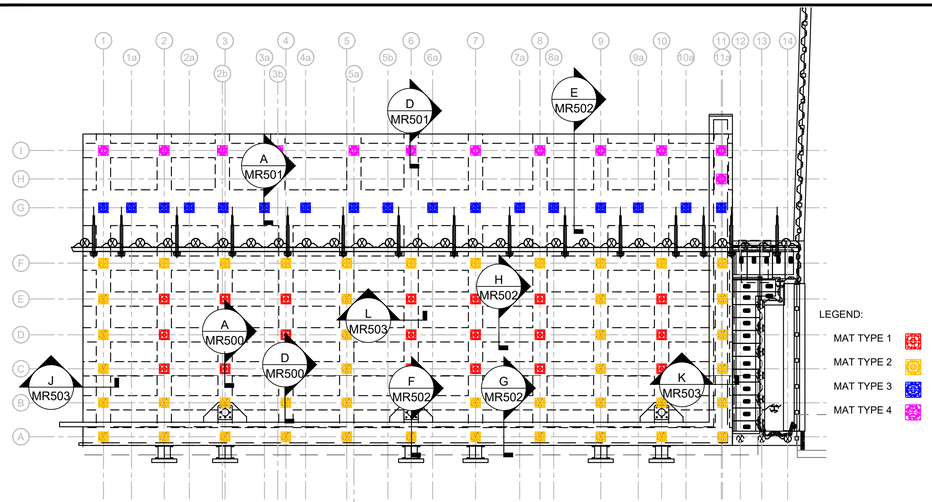
SHEET TITLE:
STRUCTURAL SECTION
3 OF 3

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

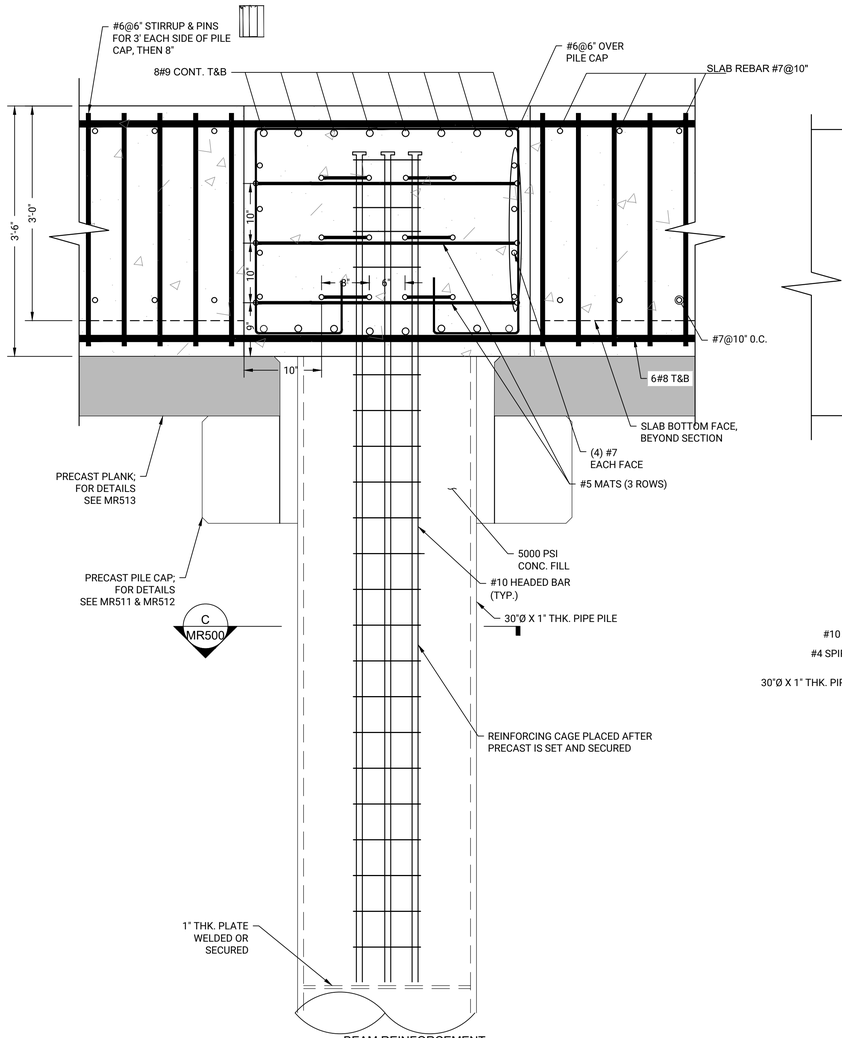
PROJECT NO: 0024M070.04

SHEET NUMBER
MR305

Tuesday, November 11, 2025 8:17:29 AM
DWG Filename: 24m070.04 masscec_marine infra sections.dwg Layout: mr305
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

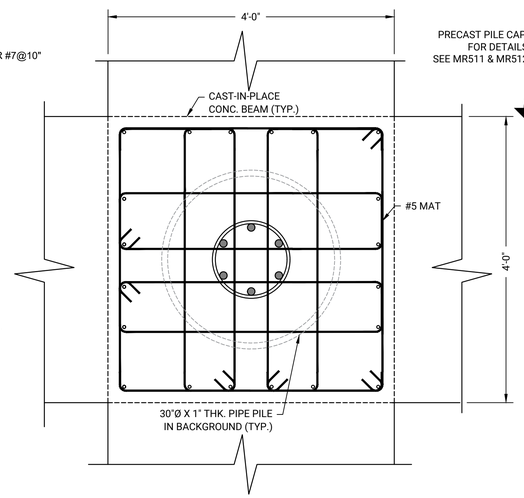



1 MR500 BEAM REINFORCEMENT PLAN
SCALE 1"=20'

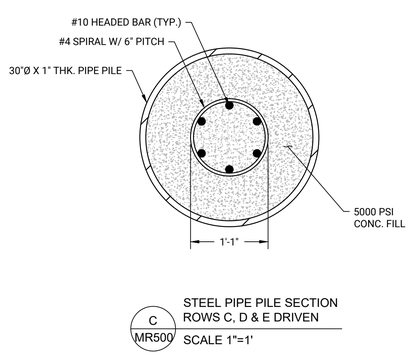



C MR500 PILE CAP MAT TYPE 2
ROWS A, B & F: PILES 1 TO 11
ROWS C, D & E: PILES 1, 5, 9 & 11
SCALE 1"=1'

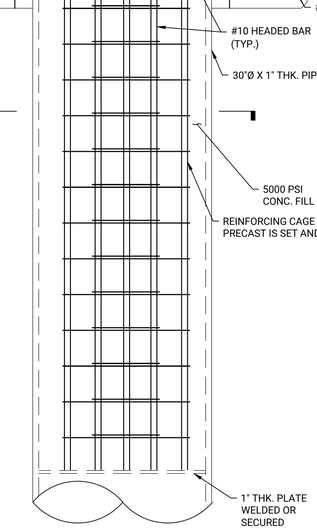
A MR500 BEAM REINFORCEMENT
ROWS C, D & E (PILES 2,3,4,6,7,8 &10)
SCALE 1"=1'



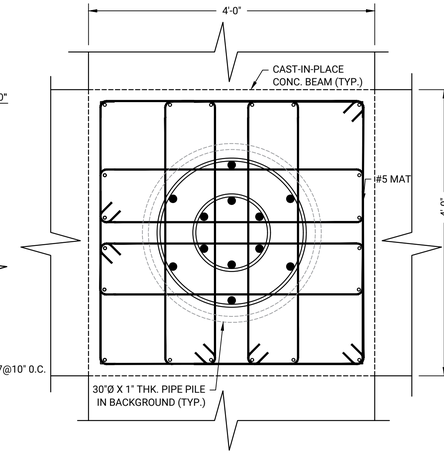

B MR500 PILE CAP MAT TYPE 1
ROWS C, D & E DRIVEN
SCALE 1"=1'



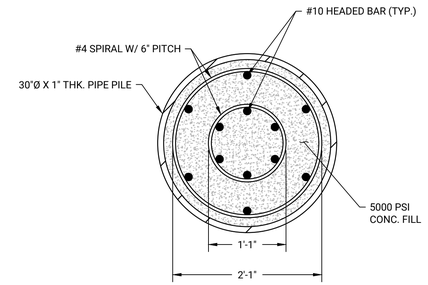

C MR500 STEEL PIPE PILE SECTION
ROWS C, D & E DRIVEN
SCALE 1"=1'




D MR500 BEAM REINFORCEMENT
ROWS A, B & F: PILES 1 TO 11
ROWS C, D & E: PILES 1, 5, 9 & 11
SCALE 1"=1'




E MR500 PILE CAP MAT TYPE 2
ROWS A, B & F: PILES 1 TO 11
ROWS C, D & E: PILES 1, 5, 9 & 11
SCALE 1"=1'




F MR500 STEEL PIPE PILE SECTION
ROWS A, B & F
ROWS C, D & E SOCKETED
SCALE 1"=1'

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

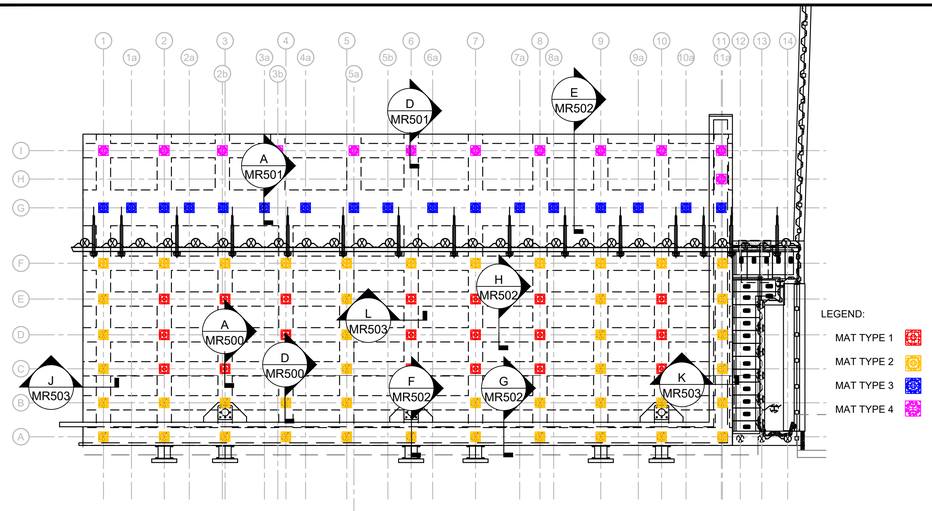
SHEET TITLE:
CAST-IN-PLACE CONCRETE PLATFORM DETAIL 1 OF 4

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

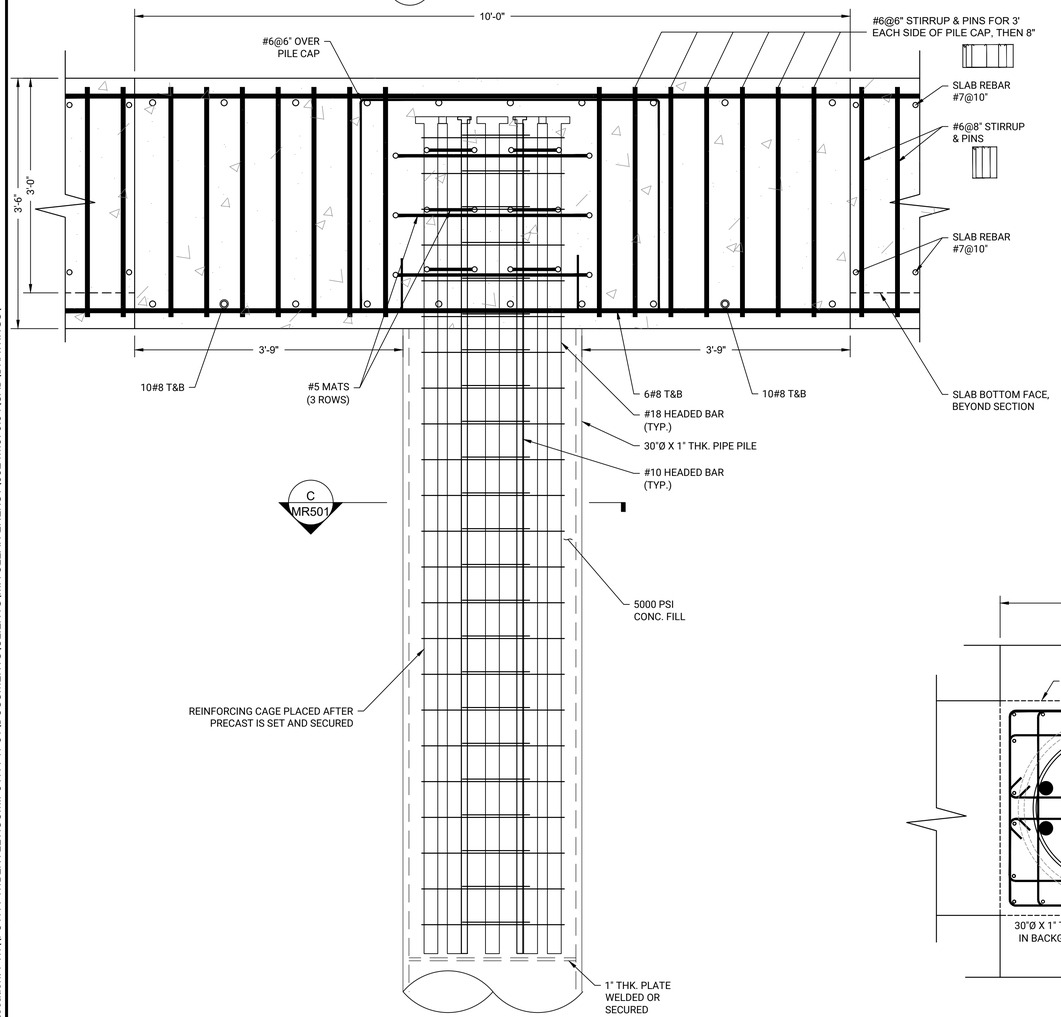
PROJECT NO: 0024M070.04

SHEET NUMBER
MR500

Tuesday, November 11, 2025 8:20:40 AM
DWG Filename: 24m070.04 masscec_marine infra details.dwg Layout: mr500
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

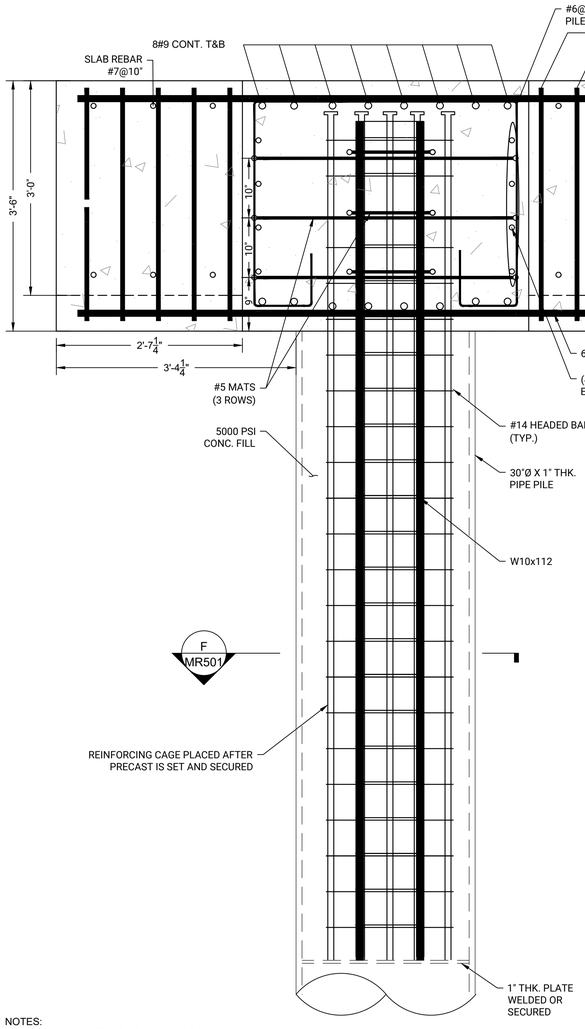



1 MR501 BEAM REINFORCEMENT PLAN
SCALE: 1" = 20'




C MR501

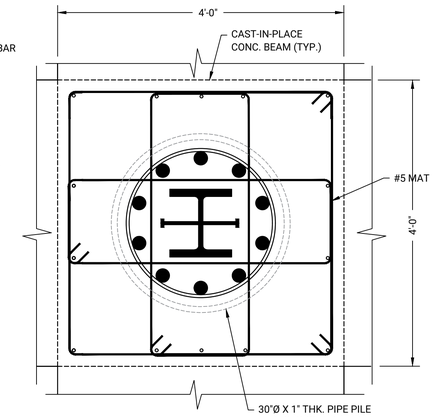
A MR501 BEAM REINFORCEMENT
ROW G
SCALE: 1" = 1'



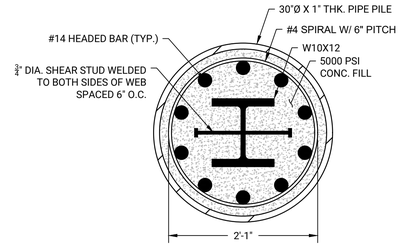

F MR501

NOTES:
1) SHEAR STUDS NOT SHOWN FOR CLARITY

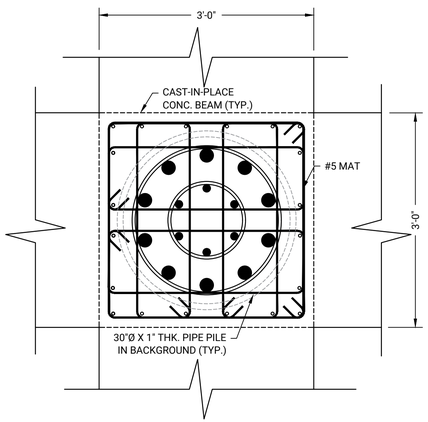
D MR501 BEAM REINFORCEMENT
ROW H & I
SCALE: 1" = 1'



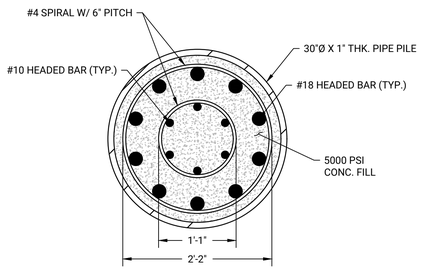

E MR501 PILE CAP MAT TYPE 4
ROW H & I
SCALE: 1" = 1'




F MR501 STEEL PIPE PILE SECTION
ROW H & I
SCALE: 1" = 1'




B MR501 PILE CAP MAT TYPE 3
ROW G
SCALE: 1" = 1'




C MR501 STEEL PIPE PILE SECTION
ROW G
SCALE: 1" = 1'

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

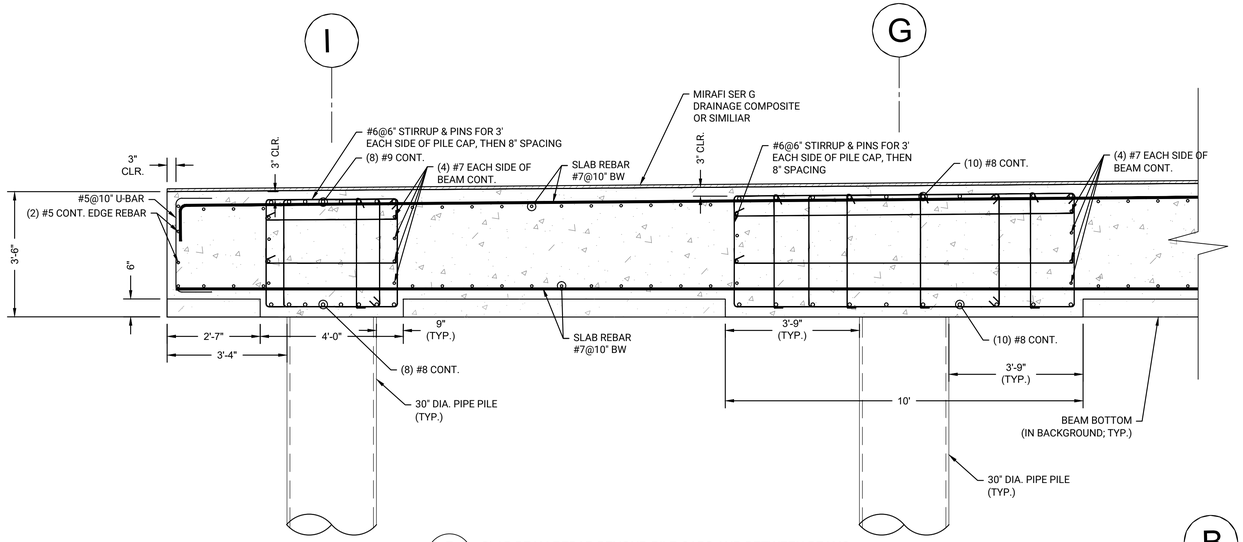
SHEET TITLE:
CAST-IN-PLACE CONCRETE PLATFORM DETAIL 2 OF 4

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

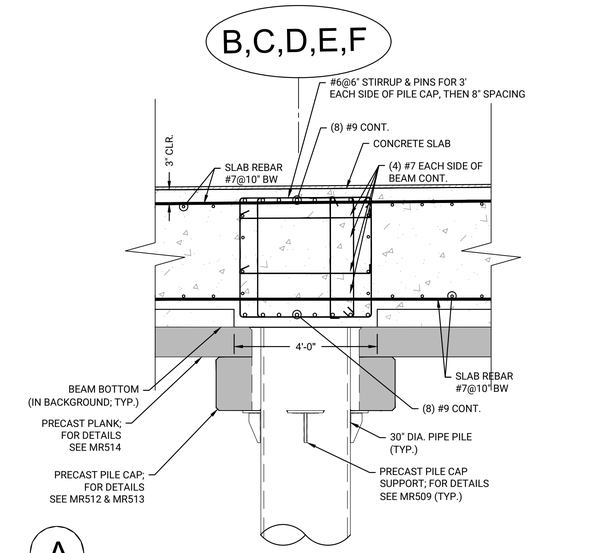
SHEET NUMBER
MR501

Tuesday, November 11, 2025 8:23:25 AM
DWG Filename: 24m070.04 masscec_marine infra details.dwg Layout: mr501
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\



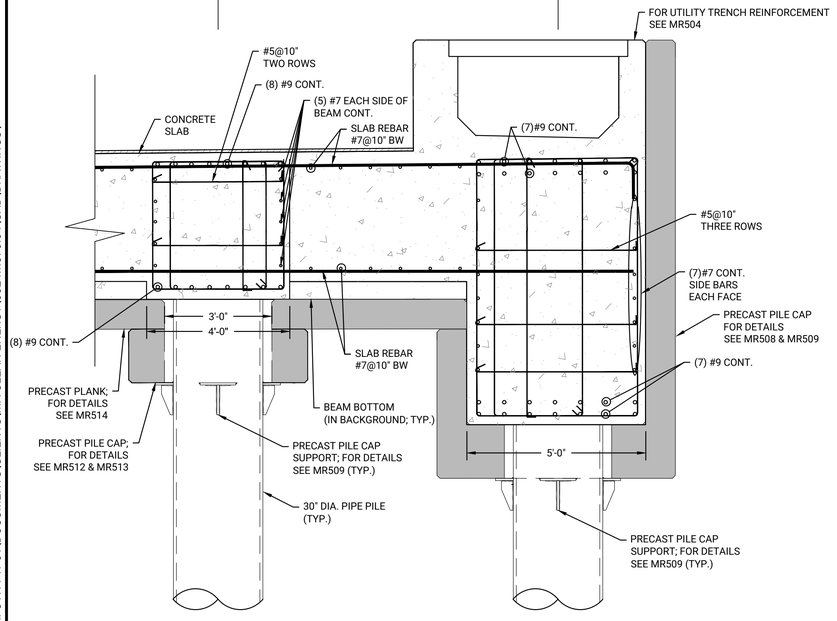

E MR500 MR501 SLAB BEAM REBAR BEYOND PILE CAPS AND BETWEEN BEAMS
SCALE: 1" = 2'

NOTES:
1) PILE REINFORCING CAGE NOT SHOWN FOR CLARITY



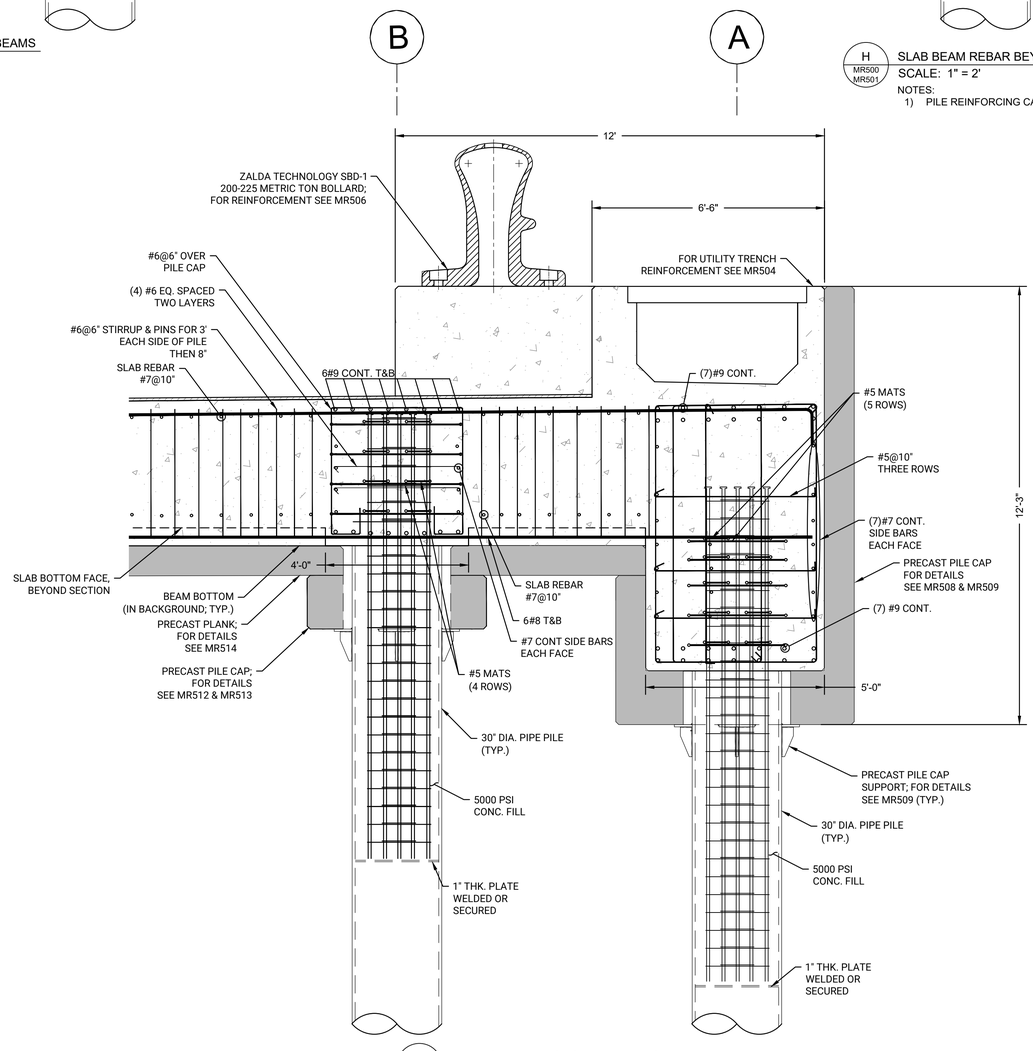

H MR500 MR501 SLAB BEAM REBAR BEYOND PILE CAPS AND BETWEEN BEAMS
SCALE: 1" = 2'

NOTES:
1) PILE REINFORCING CAGE NOT SHOWN FOR CLARITY




G MR500 MR501 SLAB BEAM REBAR BEYOND PILE CAPS AND BETWEEN BEAMS
SCALE: 1" = 2'

NOTES:
1) PILE REINFORCING CAGE NOT SHOWN FOR CLARITY




F MR500 MR501 BEAM/CAP REINFORCEMENT AT BOLLARD/FENDER
SCALE: 1" = 2'

NOTES:
1) FENDER PANEL NOT SHOWN FOR CLARITY

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

| REVISIONS | | | |
|---|---|---|---|
| NO | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

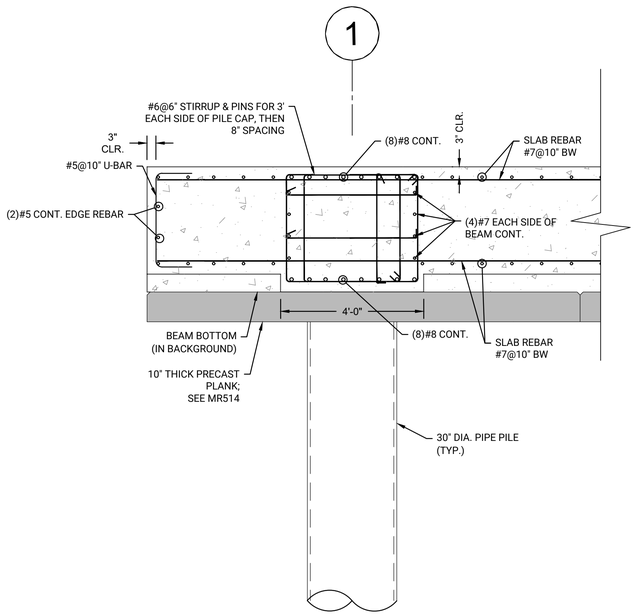
SHEET TITLE:
CAST-IN-PLACE CONCRETE PLATFORM DETAIL 3 OF 4

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

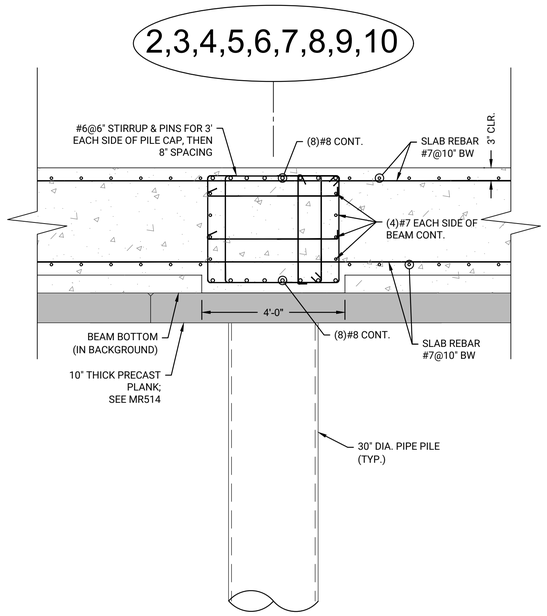
SHEET NUMBER
MR502

Tuesday, November 11, 2025 8:25:06 AM
DWG Filename: 24m070.04 masscec_marine infra details.dwg Layout: mr502
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\



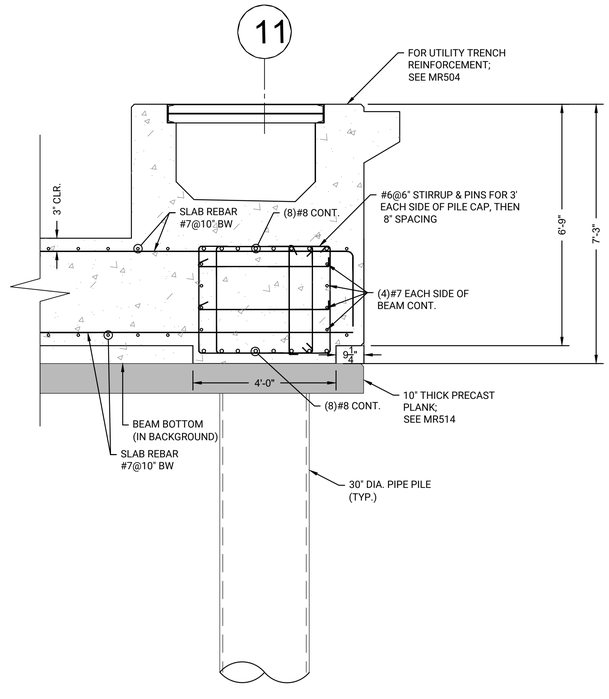

J (MR500 MR501) SLAB BEAM REBAR BEYOND PILE CAPS AND BETWEEN BEAMS
SCALE: 1" = 2'

NOTES:
1) PILE REINFORCING CAGE NOT SHOWN FOR CLARITY




L (MR500 MR501) SLAB BEAM REBAR BEYOND PILE CAPS AND BETWEEN BEAMS
SCALE: 1" = 2'

NOTES:
1) PILE REINFORCING CAGE NOT SHOWN FOR CLARITY




K (MR500 MR501) SLAB BEAM REBAR BEYOND PILE CAPS AND BETWEEN BEAMS
SCALE: 1" = 2'

NOTES:
1) PILE REINFORCING CAGE NOT SHOWN FOR CLARITY

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

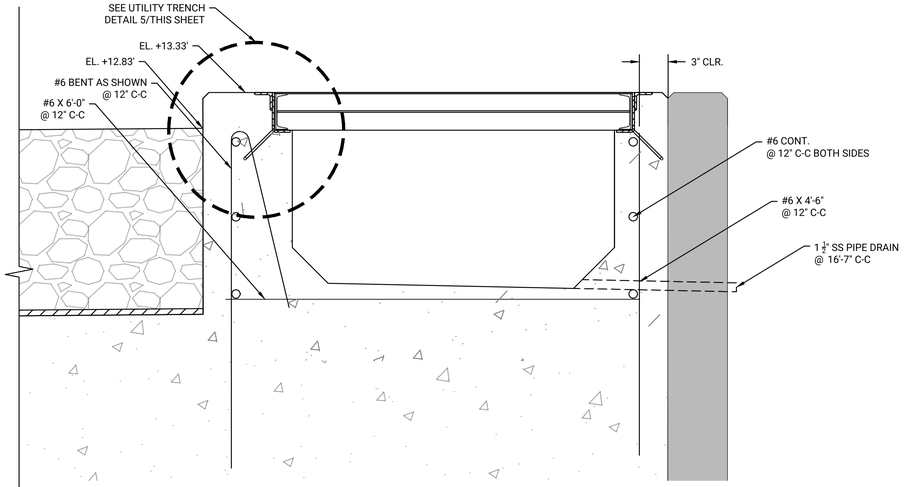
SHEET TITLE:
CAST-IN-PLACE CONCRETE PLATFORM DETAIL 4 OF 4

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

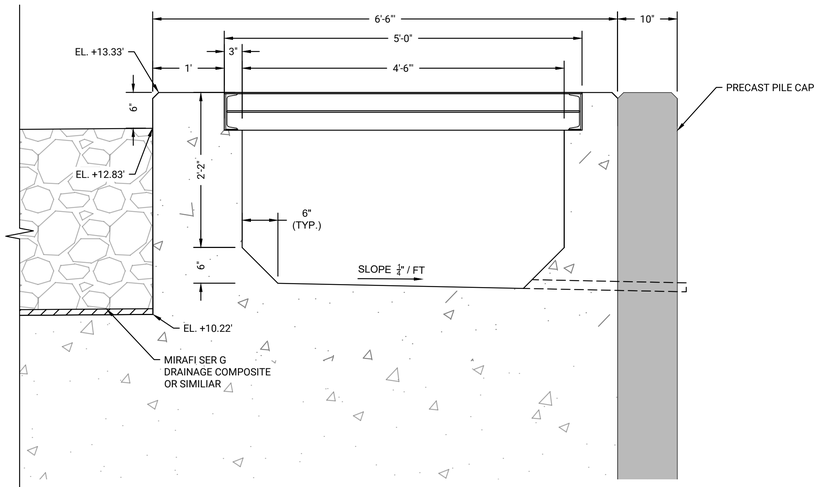
PROJECT NO: 0024M070.04

SHEET NUMBER
MR503

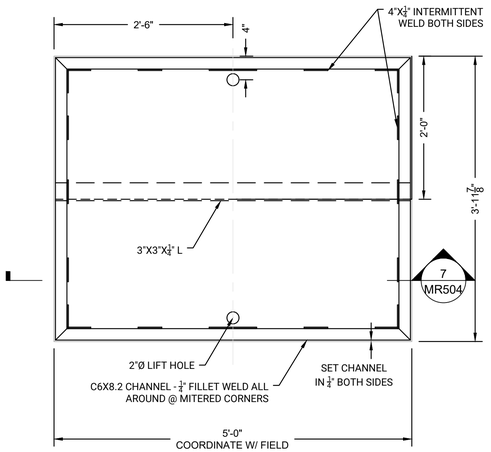
Tuesday, November 11, 2025 8:25:49 AM
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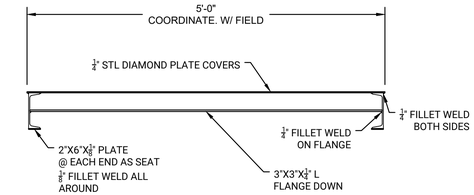

1 MR504 NORTH-SOUTH UTILITY TRENCH REBAR DETAIL
SCALE: 1" = 1'



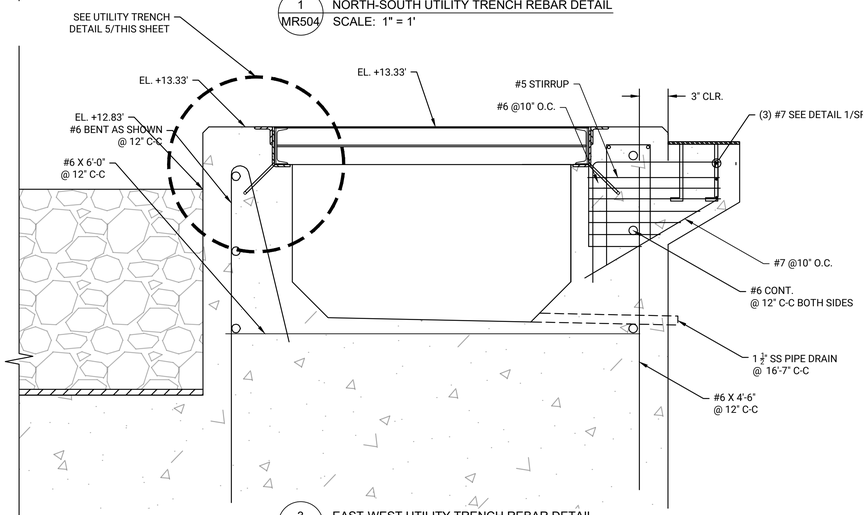

2 MR504 NORTH-SOUTH UTILITY TRENCH DETAIL
SCALE: 1" = 1'



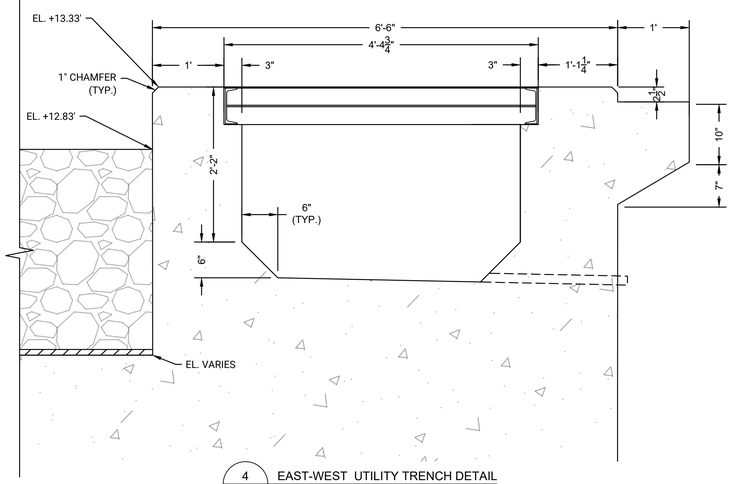

6 MR504 NORTH-SOUTH UTILITY TRENCH COVER PLAN
SCALE: 1" = 1'



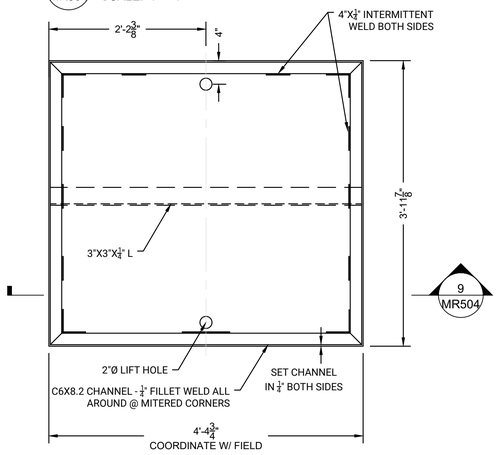

7 MR504 NORTH-SOUTH UTILITY TRENCH COVER SECTION
SCALE: 1" = 1'



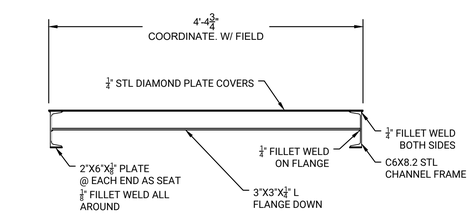

3 MR504 EAST-WEST UTILITY TRENCH REBAR DETAIL
SCALE: 1" = 1'



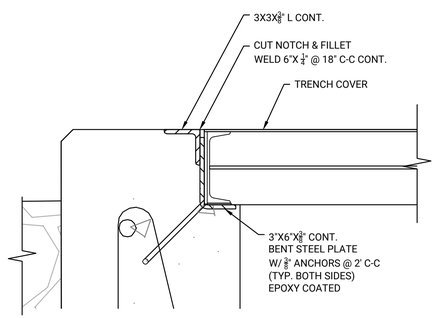

4 MR504 EAST-WEST UTILITY TRENCH DETAIL
SCALE: 1" = 1'



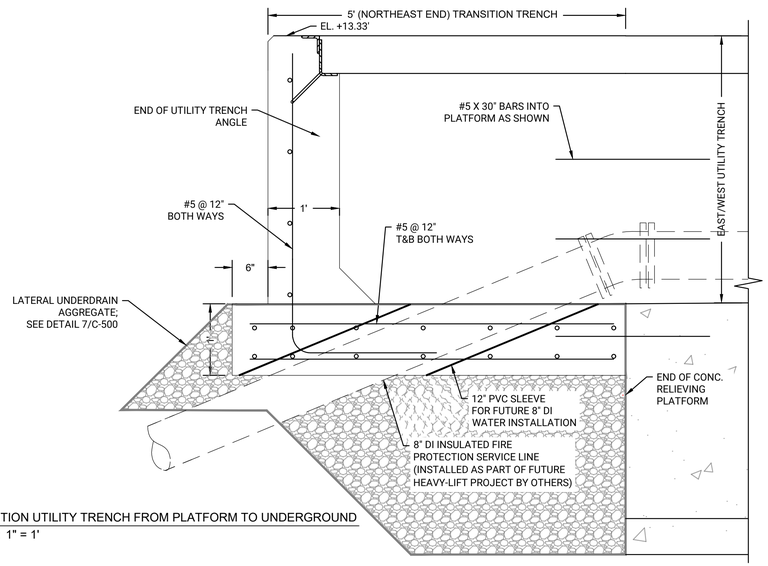

8 MR504 EAST-WEST UTILITY TRENCH COVER PLAN
SCALE: 1" = 1'




9 MR504 EAST-WEST UTILITY TRENCH COVER SECTION
SCALE: 1" = 1'




5 MR504 TYP. UTILITY TRENCH ANGLE DETAIL
SCALE: 1" = 1/2'




10 MR305 TRANSITION UTILITY TRENCH FROM PLATFORM TO UNDERGROUND
SCALE: 1" = 1'

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

GRAPHIC SCALE
0 1/4 1/2 1
(IN FEET)
1 INCH = 1/2 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT (SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

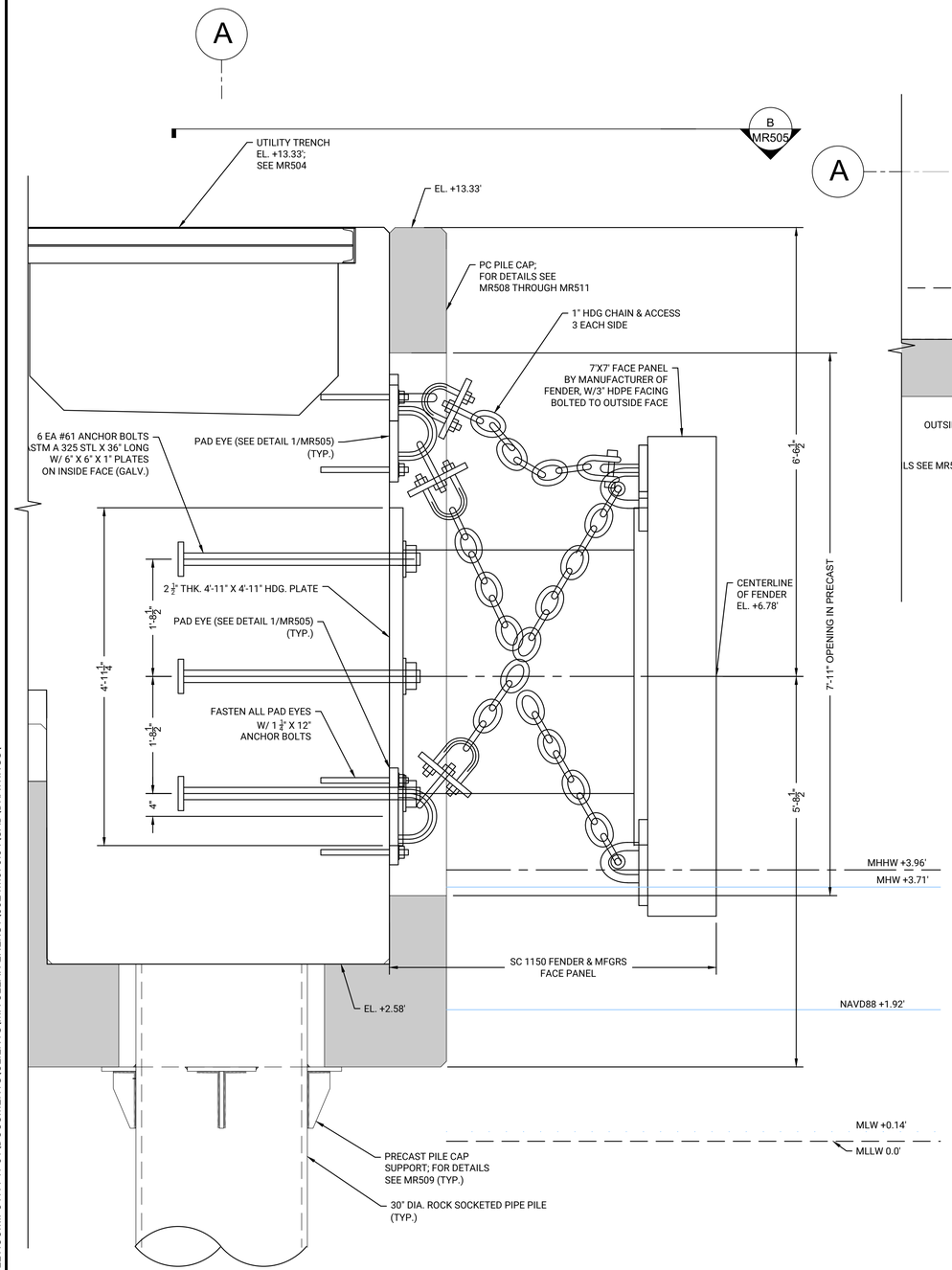
SHEET TITLE:
**UTILITY TRENCH DETAILS**

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

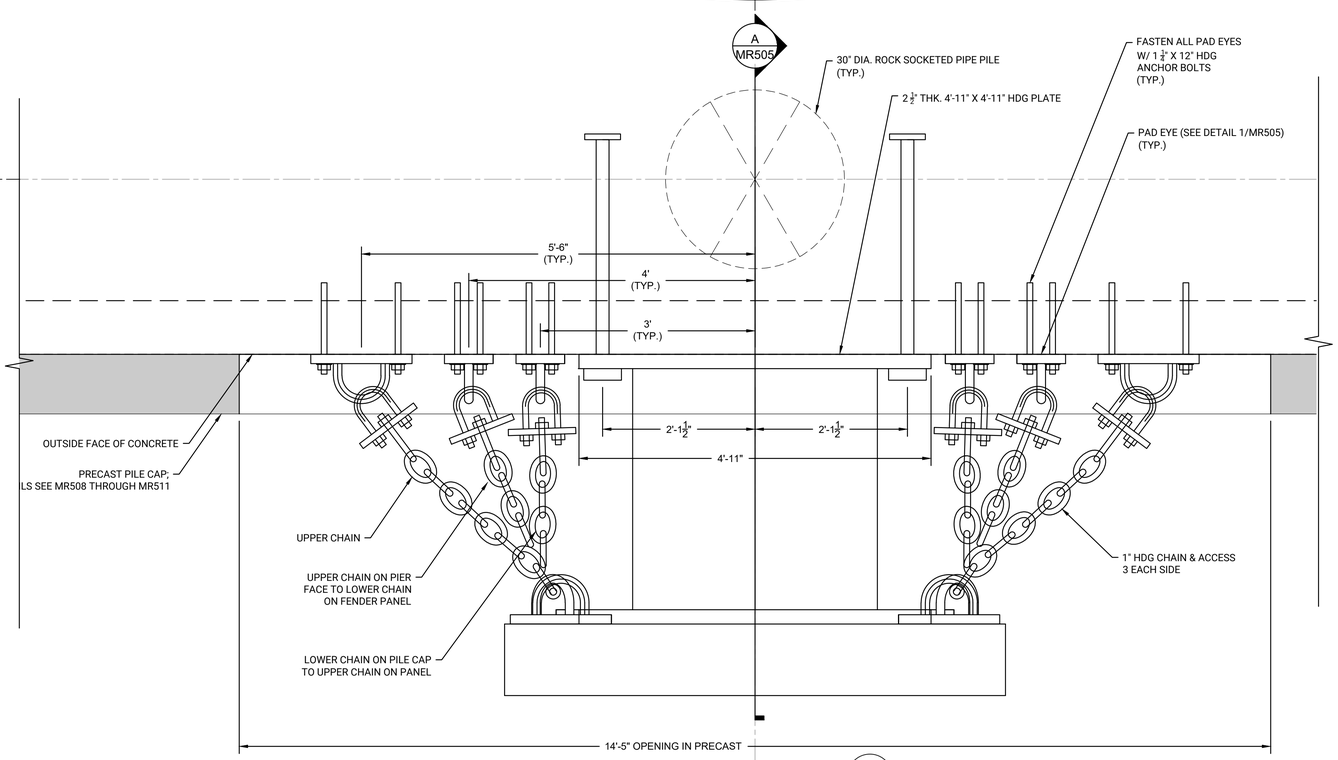
SHEET NUMBER
**MR504**

Tuesday, November 11, 2025 8:28:36 AM
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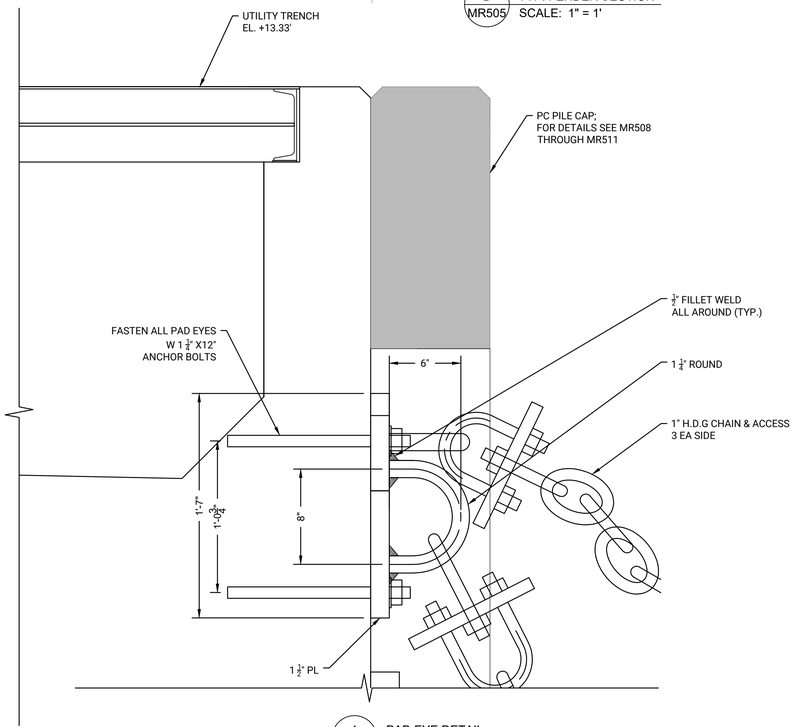



A MR505 TYP. FENDER SECTION
SCALE: 1" = 1'

2,3,6,7,9,10




B MR505 TYP. FENDER SECTION
SCALE: 1" = 1'




1 MR505 PAD EYE DETAIL
SCALE: 1" = 1/2'

GENERAL NOTES:
1. ALIGNMENT OF EXISTING CELLS AND CONCRETE PLATFORM VARIES ALONG PROPOSED PLATFORM DEPENDING ON WHERE THE SECTION IS CUT. CONTRACTOR SHALL PERFORM SURVEY TO VERIFY LOCATION OF EXISTING STRUCTURES PRIOR TO PERFORMING WORK.
   1.1. FENDER LINE SHALL NOT CROSS EXISTING HARBOR LINE.

GRAPHIC SCALE
0 1/4 1/2 1
(IN FEET)
1 INCH = 1/2 FEET

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

| REVISIONS | | | |
|---|---|---|---|
| NO | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

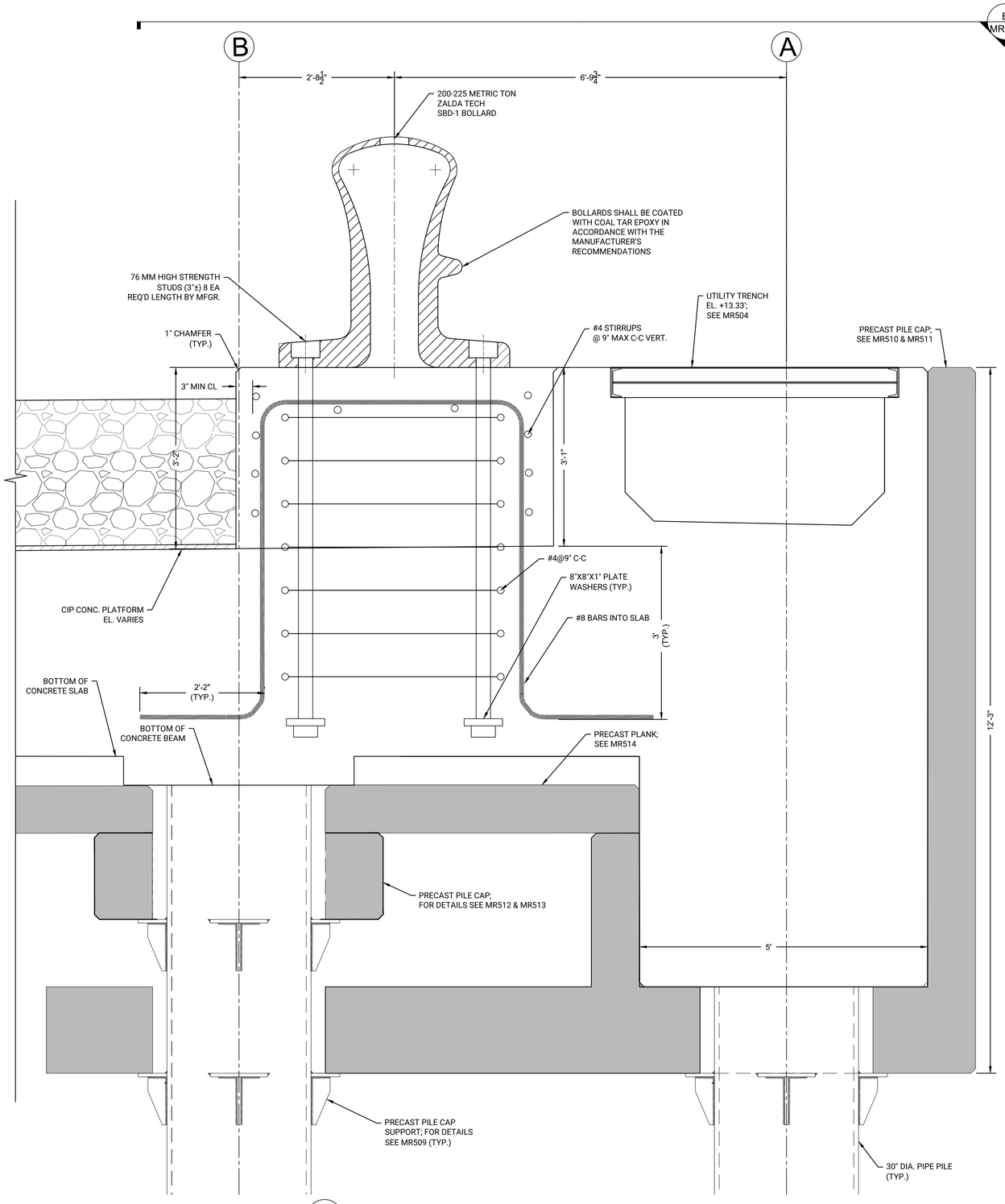
SHEET TITLE:
FENDER
DETAILS

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

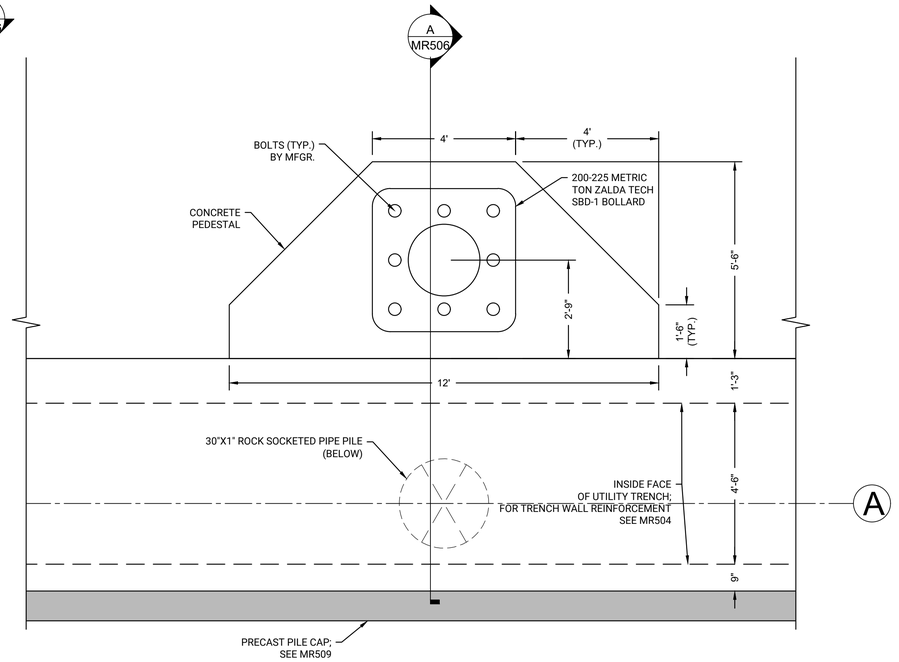
SHEET NUMBER
MR505

Tuesday, November 11, 2025 8:29:37 AM
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DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

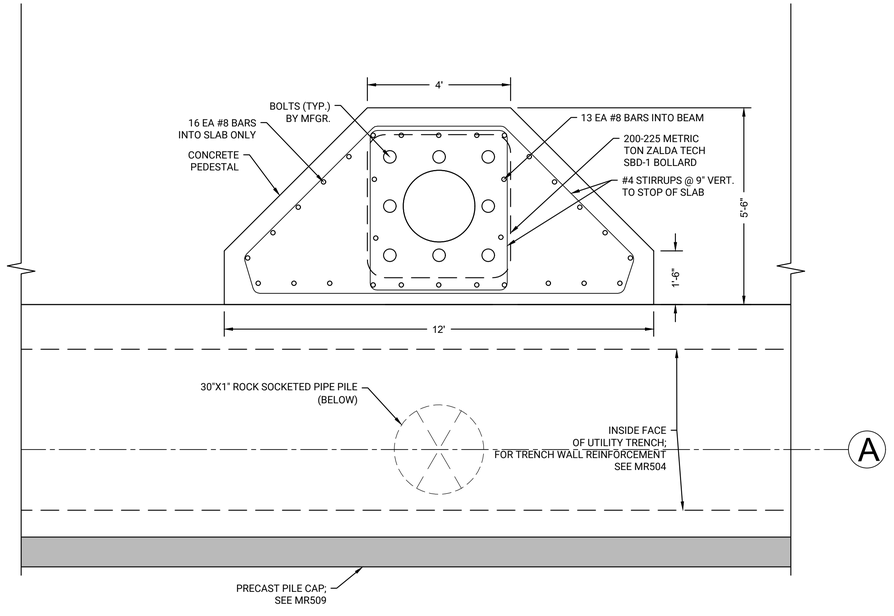



A MR506 200-225 METRIC TON BOLLARD
SCALE: 1" = 1'

NOTE: FENDER NOT SHOWN FOR CLARITY.




1 MR506 200-225 METRIC TON BOLLARD & CONCRETE PEDESTAL DETAIL
SCALE: 1" = 2'




2 MR506 200-225 METRIC TON BOLLARD & CONCRETE PEDESTAL REINFORCEMENT DETAIL
SCALE: 1" = 2'

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

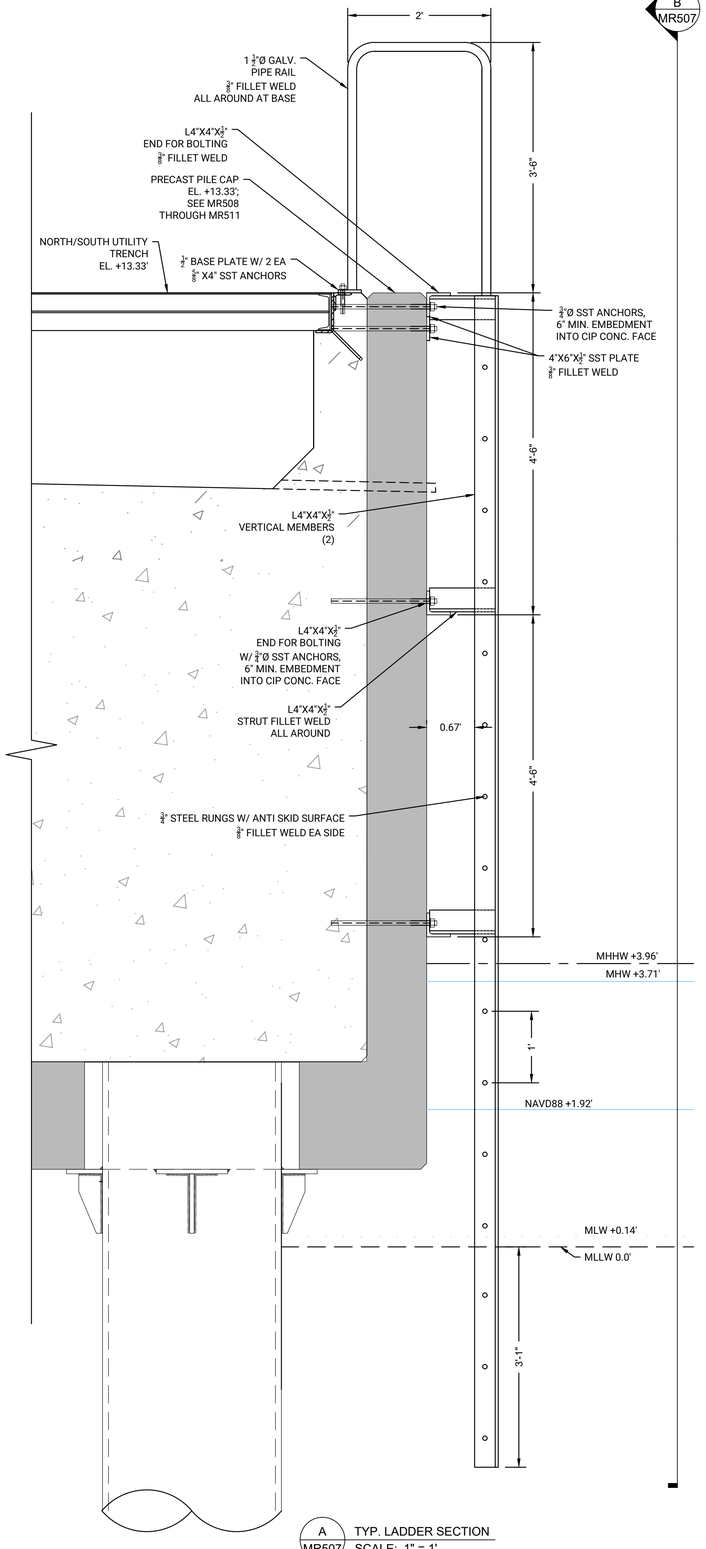
SHEET TITLE:
BOLLARD DETAILS

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR506

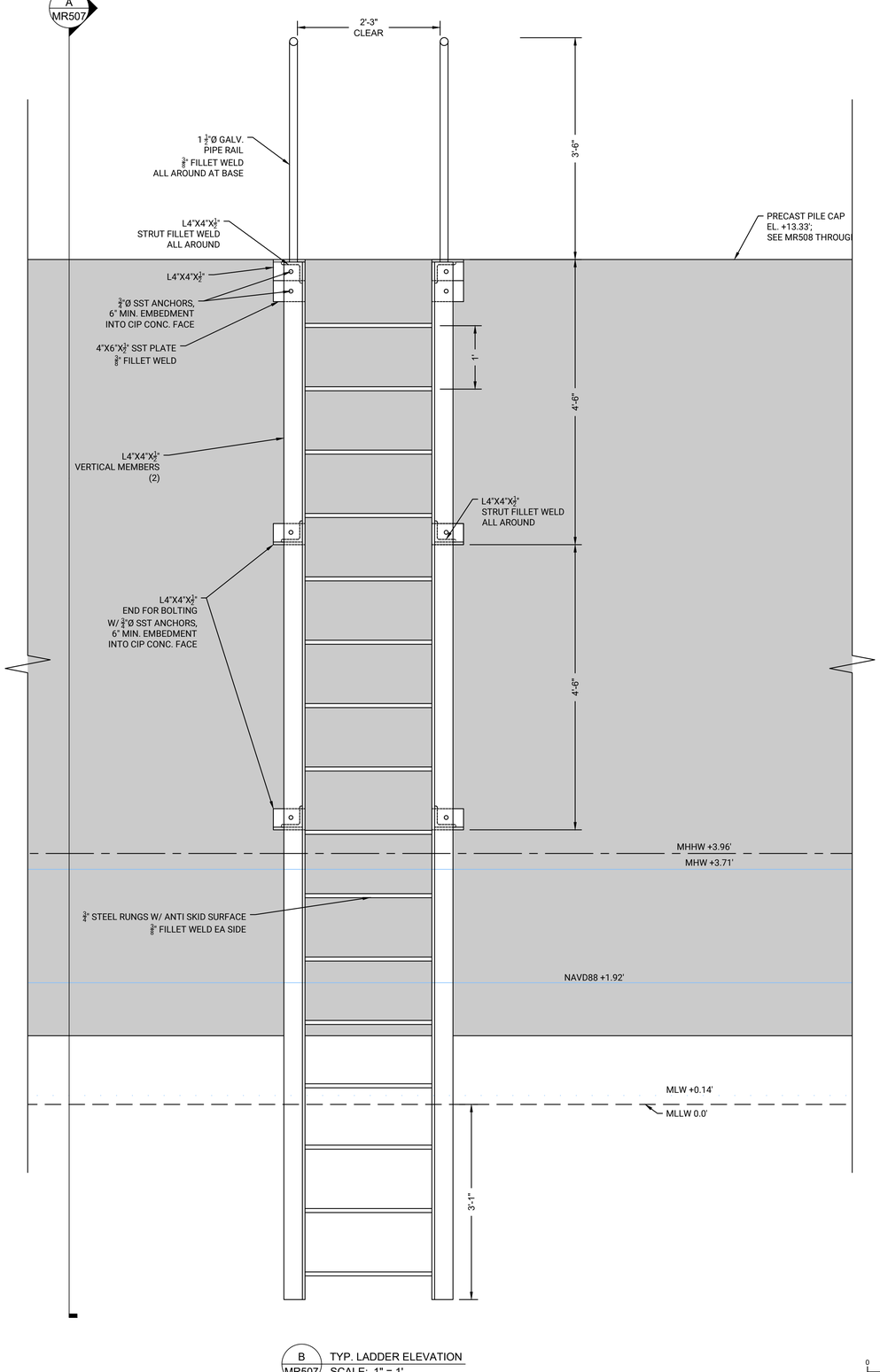
Tuesday, November 11, 2025 8:30:32 AM
DWG Filename: 24m070.04 masscec_marine infra details.dwg Layout: mr506
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




A MR507

A TYP. LADDER SECTION MR507 SCALE: 1" = 1'

NOTES:
1) LADDER ASSEMBLY SHALL BE HOT DIPPED GALVANIZED.




B MR507

B TYP. LADDER ELEVATION MR507 SCALE: 1" = 1'

NOTES:
1) LADDER ASSEMBLY SHALL BE HOT DIPPED GALVANIZED.

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

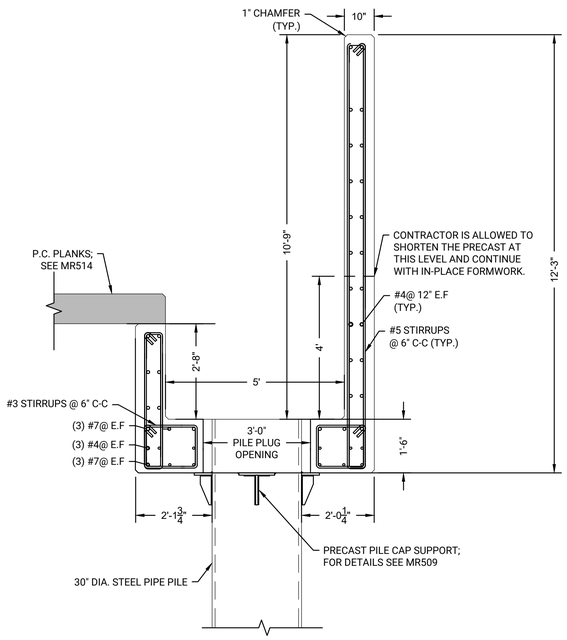
SHEET TITLE:
LADDER DETAILS

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

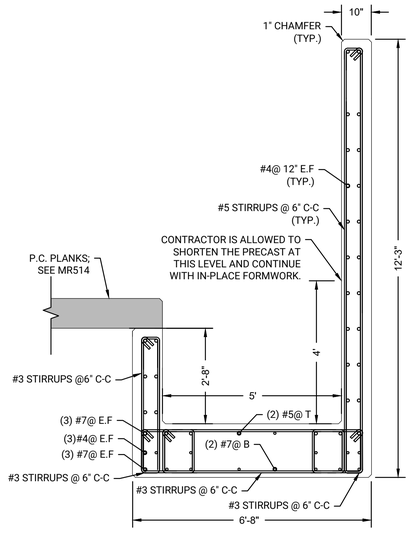
SHEET NUMBER
MR507

Tuesday, November 11, 2025 8:31:12 AM
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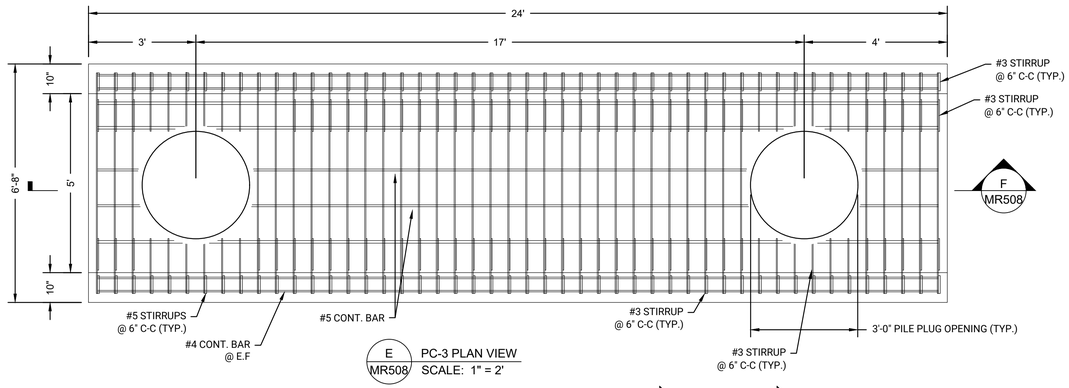



A MR508 MR509 TYPICAL SECTION AT PILE: PC-1, PC-3, PC-4, PC-5
SCALE: 1" = 2'

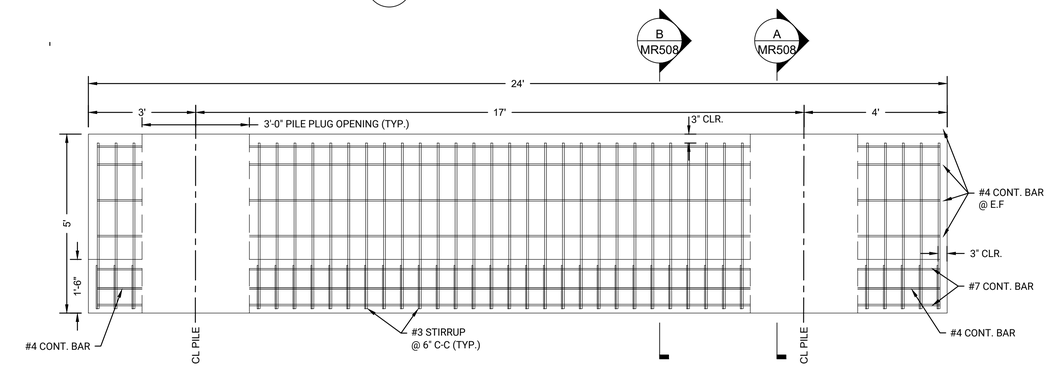
NOTES:
1) PILE PLUG REINFORCEMENT NOT SHOWN FOR CLARITY



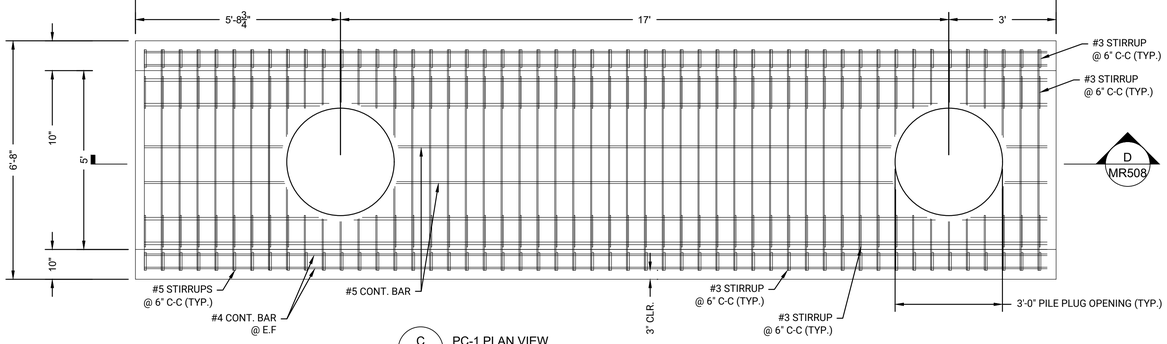

B MR508 MR509 TYPICAL SECTION AT PILE: PC-1, PC-3, PC-4, PC-5
SCALE: 1" = 2'



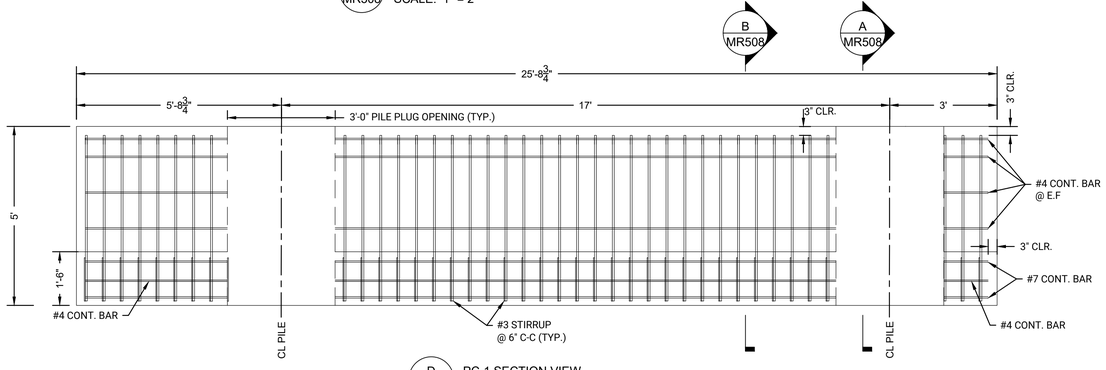

E MR508 PC-3 PLAN VIEW
SCALE: 1" = 2'




F MR508 PC-3 SECTION VIEW
SCALE: 1" = 2'




C MR508 PC-1 PLAN VIEW
SCALE: 1" = 2'




D MR508 PC-1 SECTION VIEW
SCALE: 1" = 2'

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

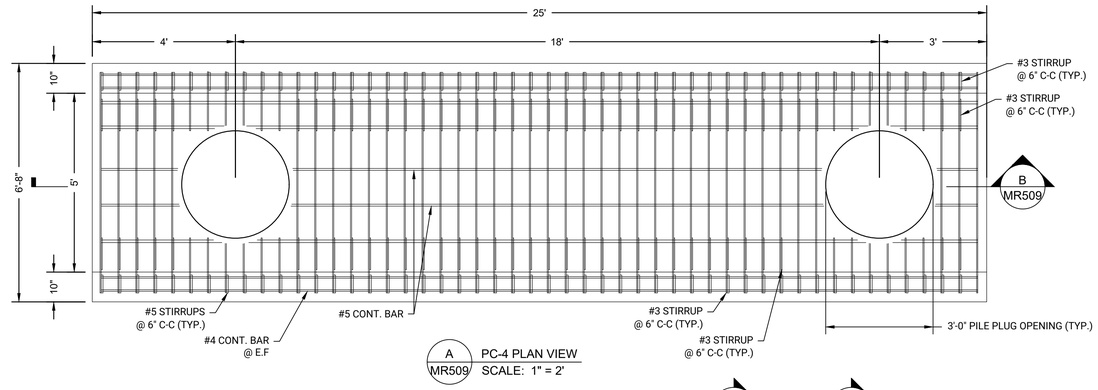
SHEET TITLE:
PRECAST
PILE CAP
DETAIL 1 OF 6

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

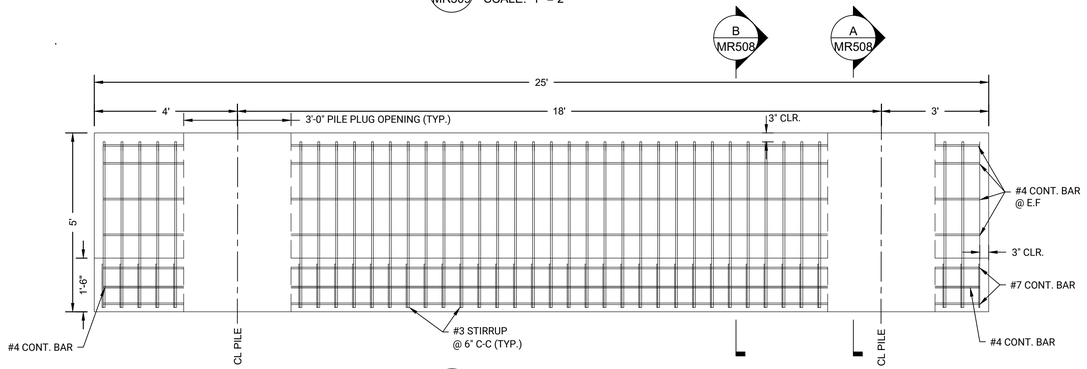
PROJECT NO: 0024M070.04

SHEET NUMBER
MR508

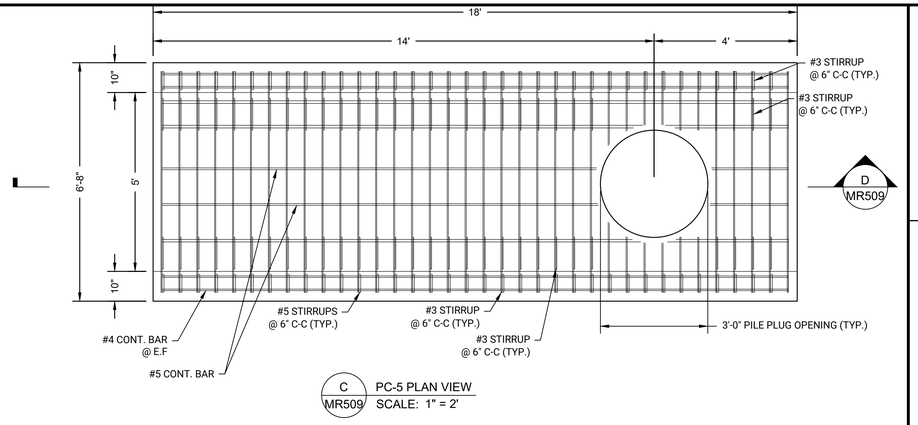
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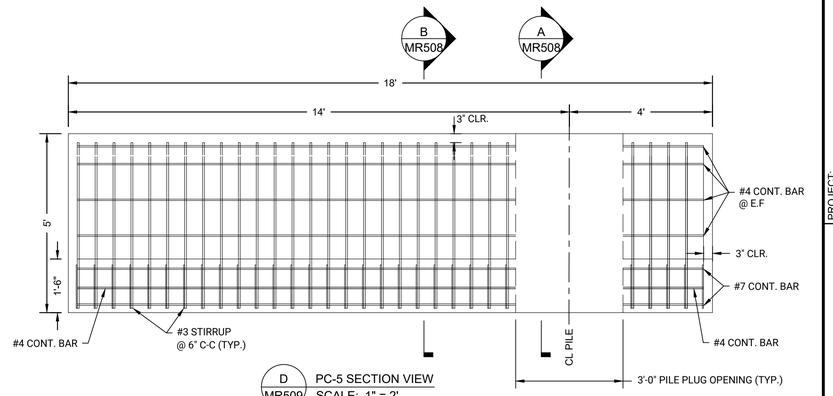

A MR509 PC-4 PLAN VIEW
SCALE: 1" = 2'



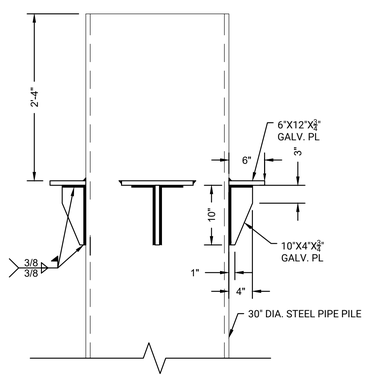

B MR509 PC-4 SECTION VIEW
SCALE: 1" = 2'



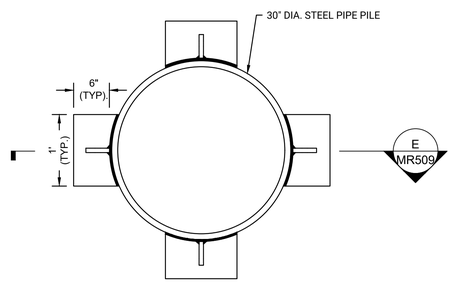

C MR509 PC-5 PLAN VIEW
SCALE: 1" = 2'




D MR509 PC-5 SECTION VIEW
SCALE: 1" = 2'




E MR512 PRECAST PILE CAP SUPPORT DETAIL
SCALE: 1" = 1'
NOTES:
1) PILE PLUG REINFORCEMENT NOT SHOWN FOR CLARITY




F - PRECAST PILE CAP SUPPORT PLAN VIEW
SCALE: 1" = 1'
NOTES:
1) PILE PLUG REINFORCEMENT NOT SHOWN FOR CLARITY

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

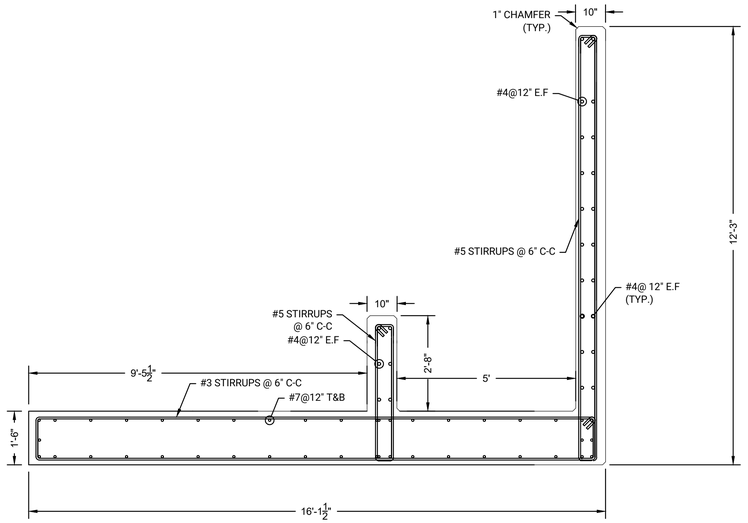
SHEET TITLE:
PRECAST
PILE CAP
DETAIL 2 OF 6

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

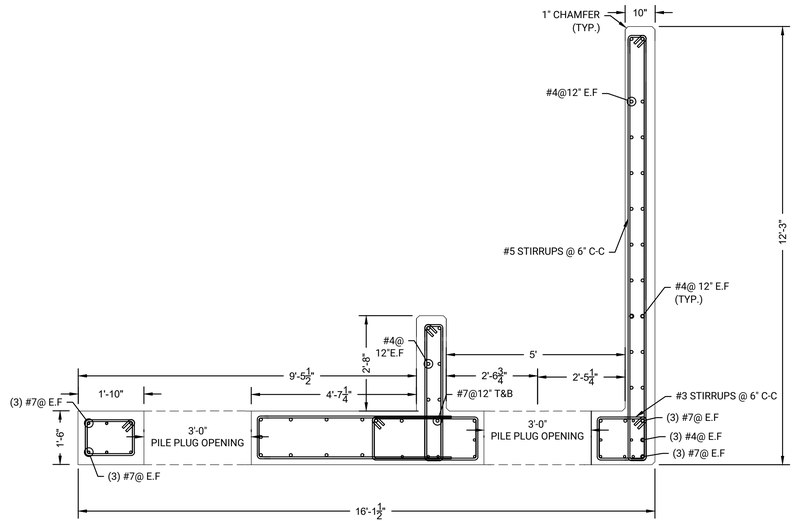
PROJECT NO: 0024M070.04

SHEET NUMBER
MR509

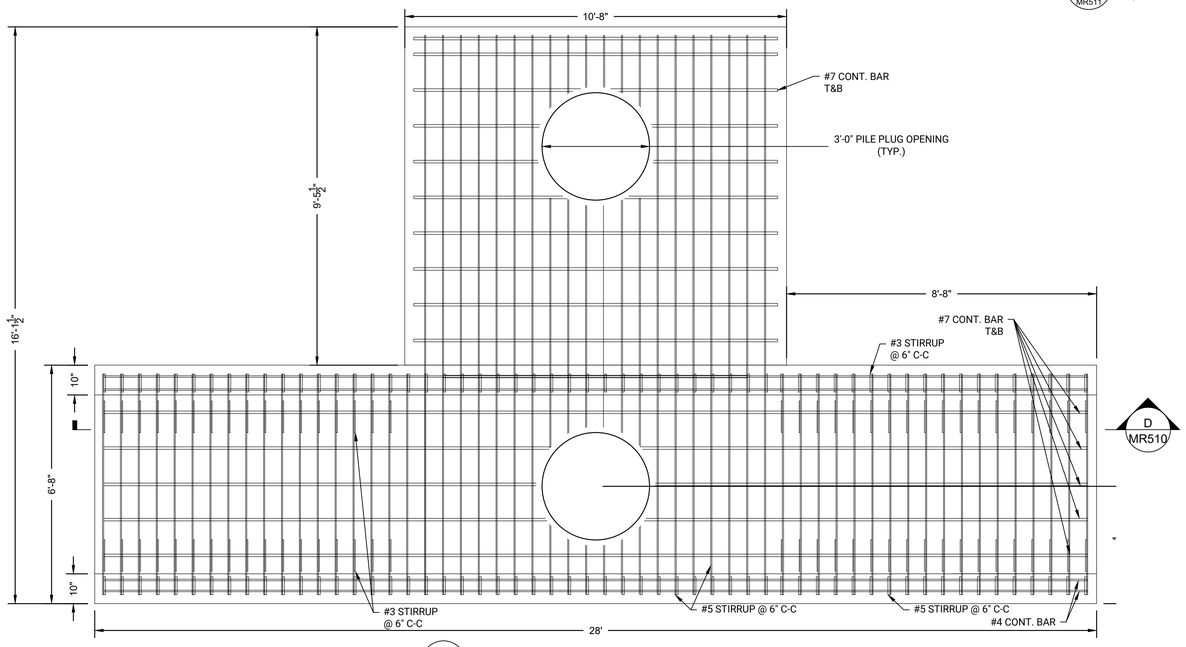
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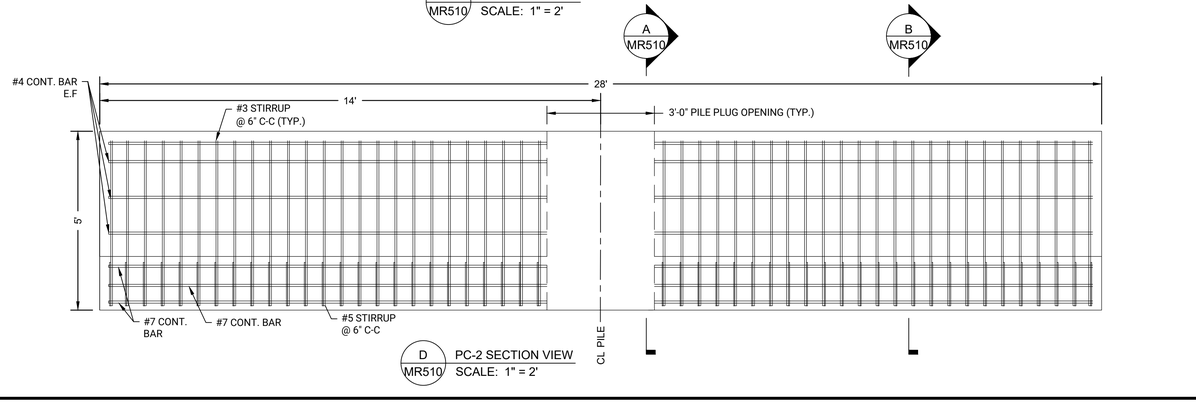

A MR510 MR511 TYPICAL PC FRONT PILE CAP SECTION AT BOLLARD
SCALE: 1" = 2'




B MR510 MR511 TYPICAL PC FRONT PILE CAP SECTION AT BOLLARD PILE
SCALE: 1" = 2'




C MR510 PC-2 PLAN VIEW
SCALE: 1" = 2'




D MR510 PC-2 SECTION VIEW
SCALE: 1" = 2'

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

| REVISIONS NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

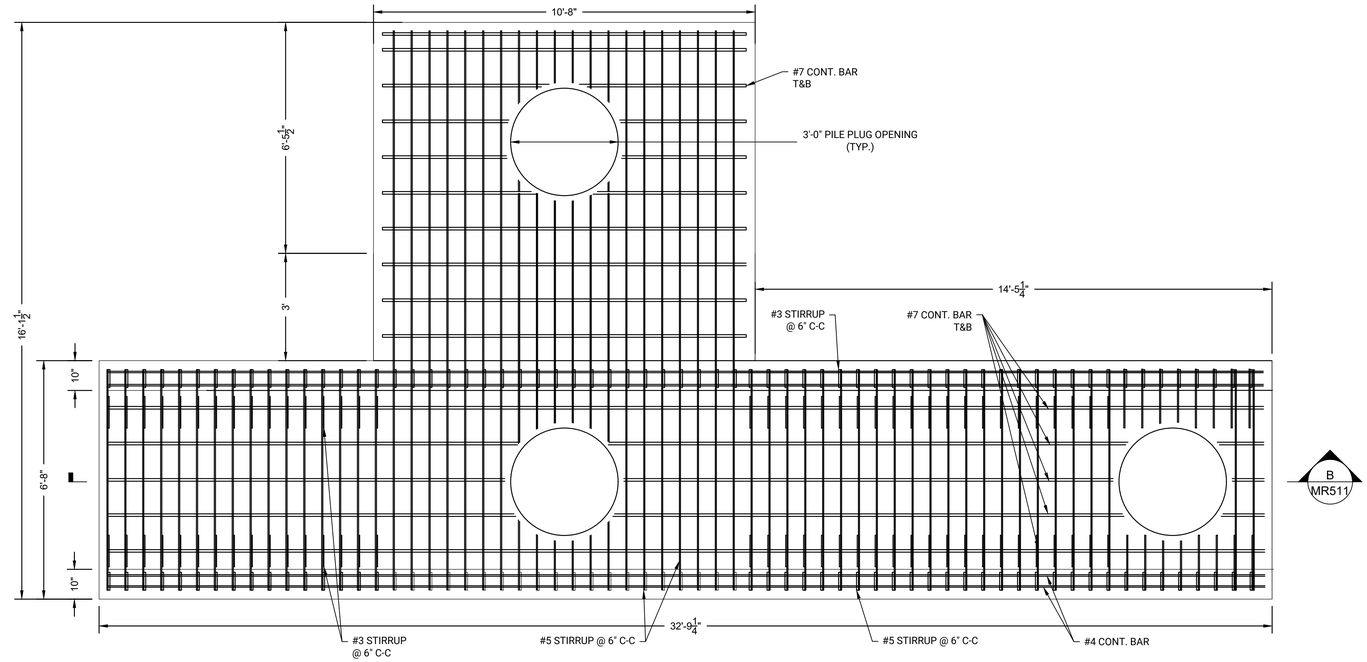
SHEET TITLE:
PRECAST
PILE CAP
DETAIL 3 OF 6

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

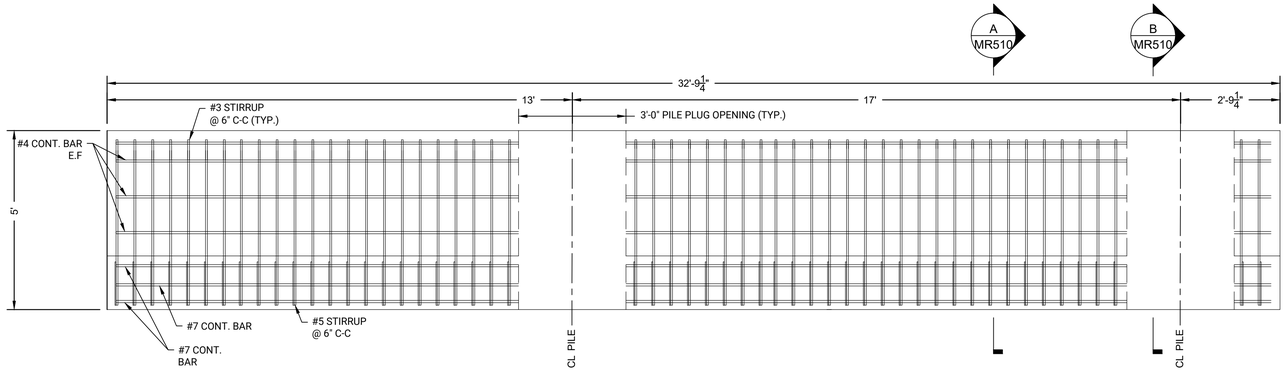
PROJECT NO: 0024M070.04

SHEET NUMBER
MR510

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DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




A MR511 PC-6 PLAN VIEW
SCALE: 1" = 2'




B MR511 PC-6 SECTION VIEW
SCALE: 1" = 2'

GRAPHIC SCALE
0 1 2 2
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

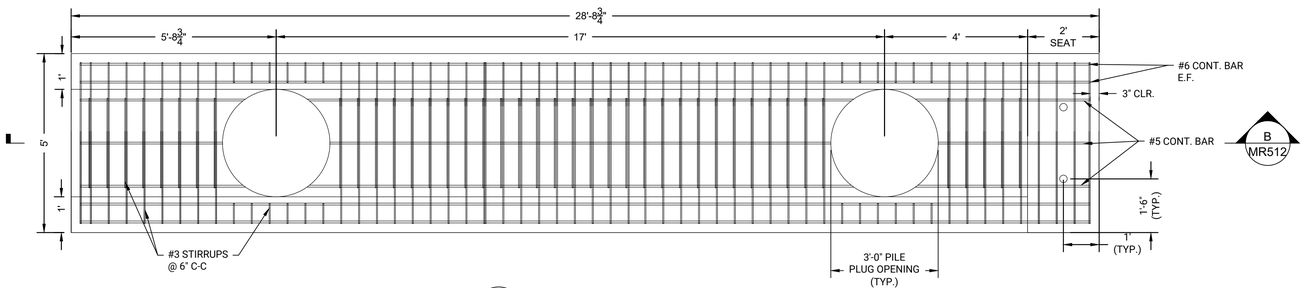
SHEET TITLE:
PRECAST
PILE CAP
DETAIL 4 OF 6

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

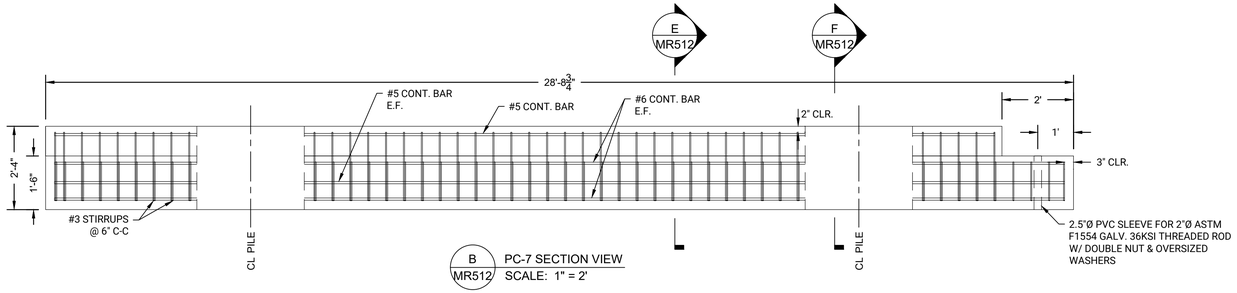
PROJECT NO: 0024M070.04

SHEET NUMBER
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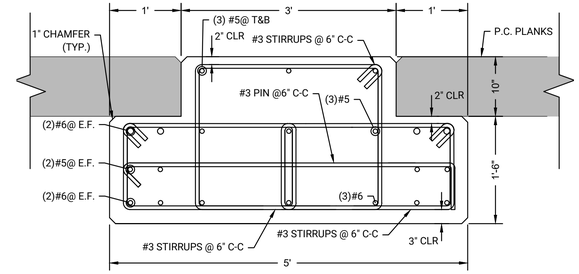
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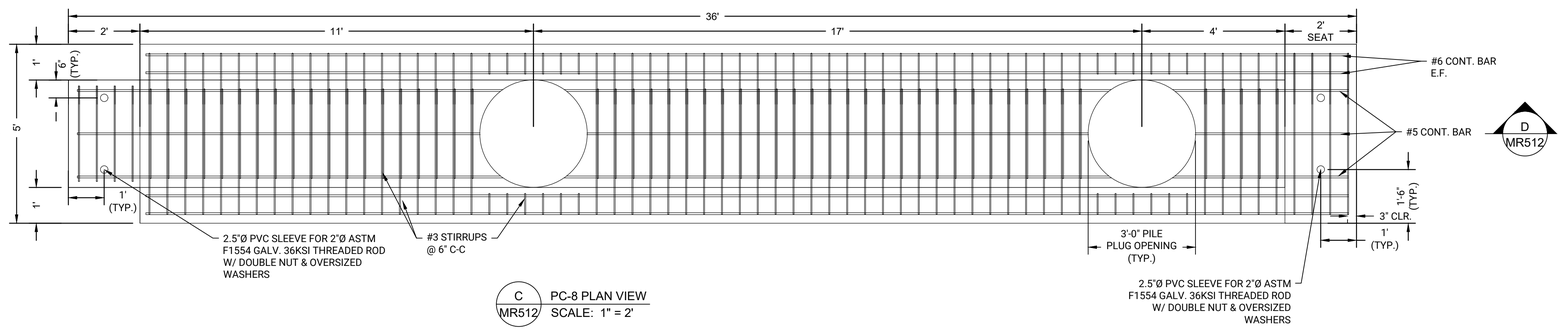

A MR512 PC-7 PLAN VIEW
SCALE: 1" = 2'



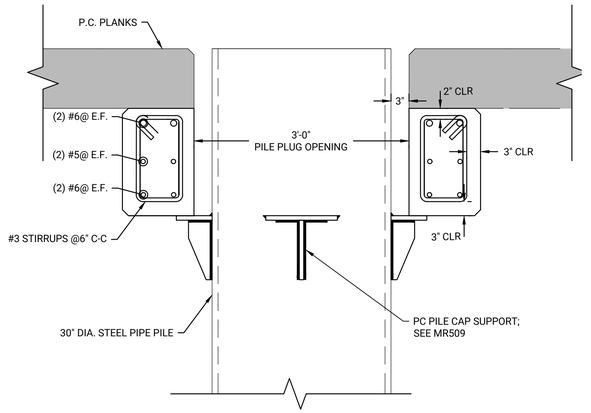

B MR512 PC-7 SECTION VIEW
SCALE: 1" = 2'




E MR512 MR513 TYPICAL PC PILE CAP REINFORCEMENT SECTION
SCALE: 1" = 1'

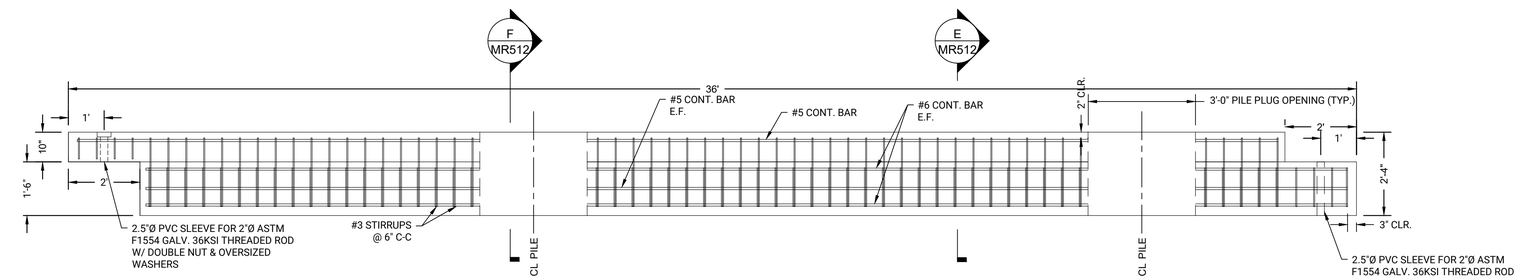



C MR512 PC-8 PLAN VIEW
SCALE: 1" = 2'




NOTE:
1. REINFORCEMENT FOR P.C. PLANKS AND PILE NOT SHOWN FOR CLARITY.

F MR303 MR304
F MR512 MR513
TYPICAL PC PILE CAP REINFORCEMENT DETAIL AT PILE
SCALE: 1" = 1'




D MR512 PC-8 SECTION VIEW
SCALE: 1" = 2'

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

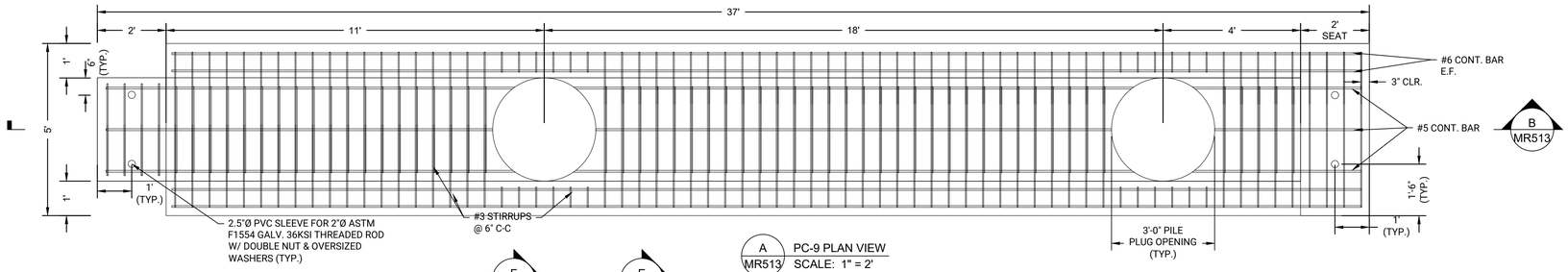
SHEET TITLE:
PRECAST
PILE CAP
DETAIL 5 OF 6

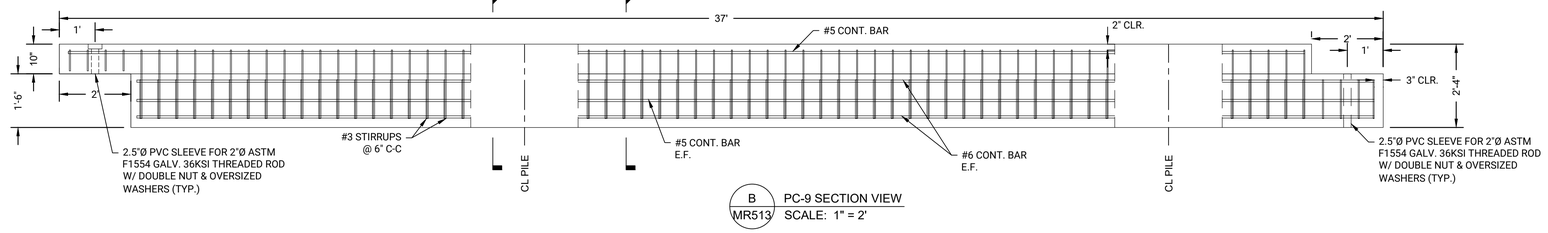
ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

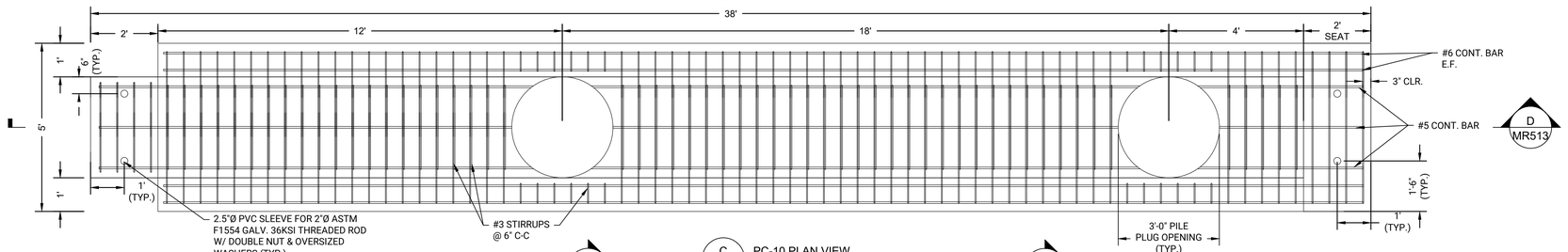
PROJECT NO: 0024M070.04

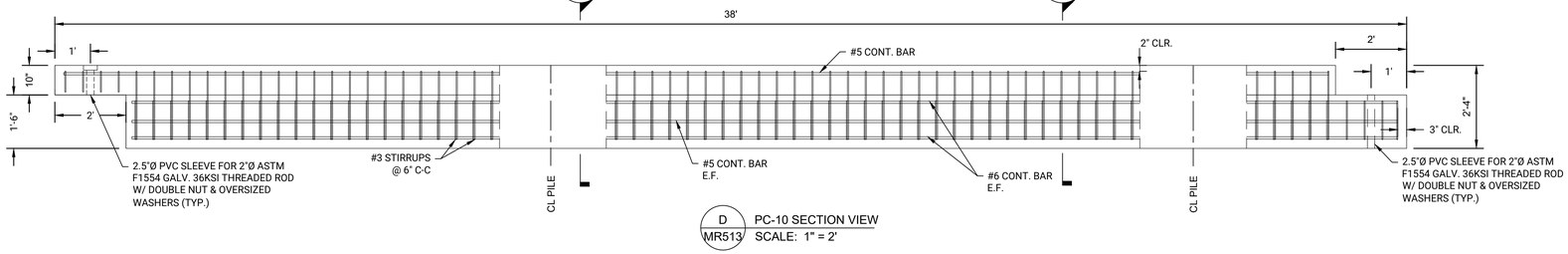
SHEET NUMBER
MR512

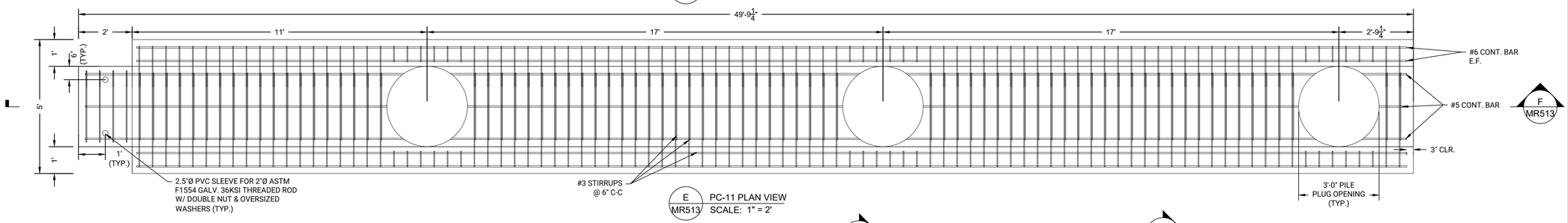
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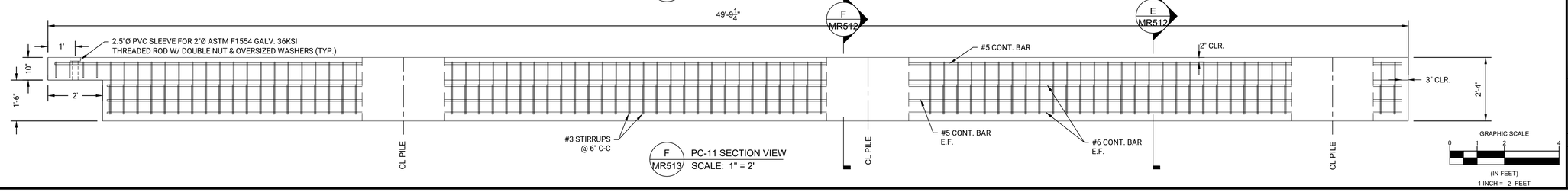



Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT (SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

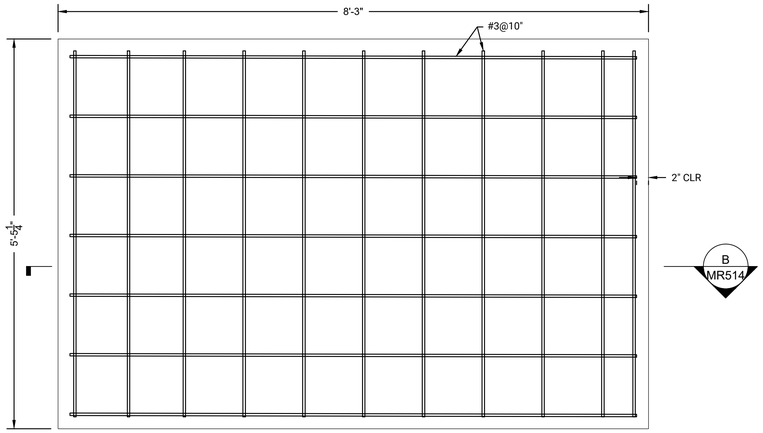
SHEET TITLE:
PRECAST PILE CAP DETAIL 6 OF 6

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

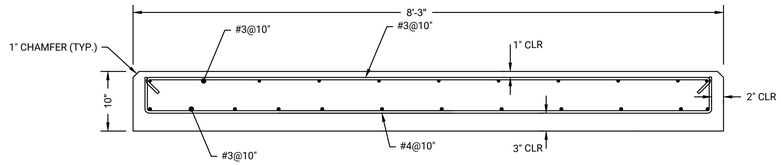
PROJECT NO: 0024M070.04

SHEET NUMBER
MR513

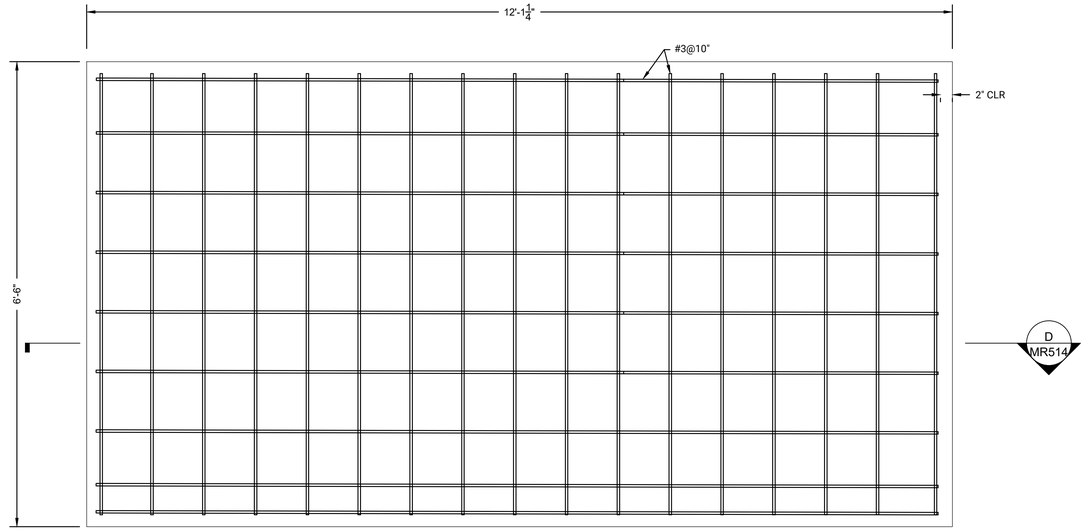
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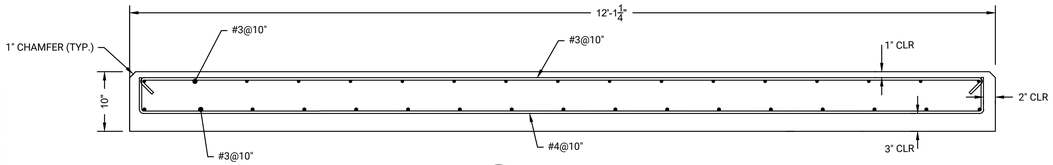

A MR514 PC PLANK TYPE 1 PLAN VIEW
SCALE: 1" = 1'



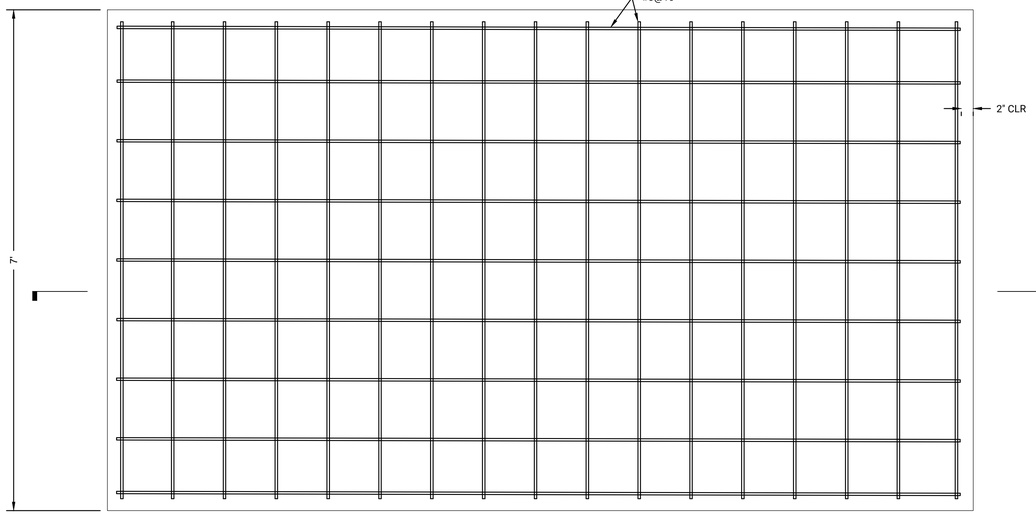

B MR514 PC PLANK TYPE 1 SECTION VIEW
SCALE: 1" = 1'



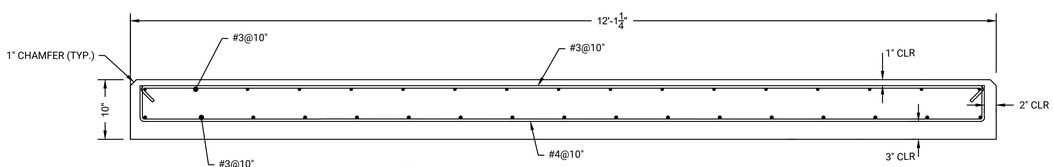

C MR514 PC PLANK TYPE 2 PLAN VIEW
SCALE: 1" = 1'



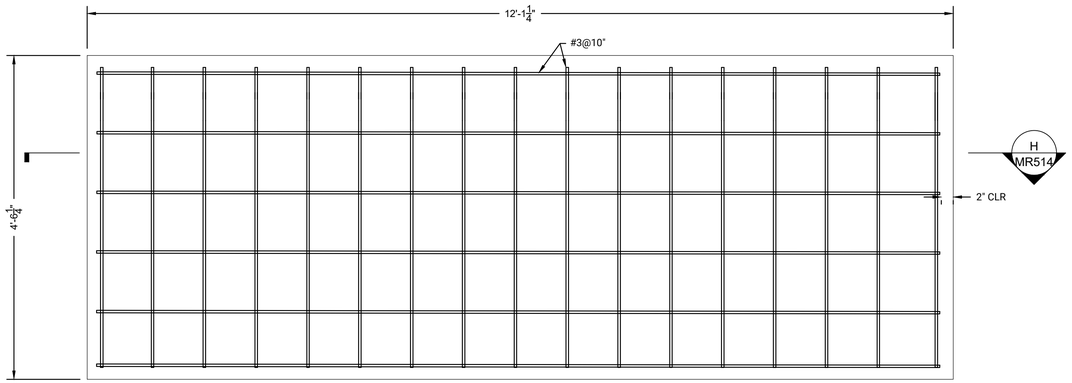

D MR514 PC PLANK TYPE 2 SECTION VIEW
SCALE: 1" = 1'



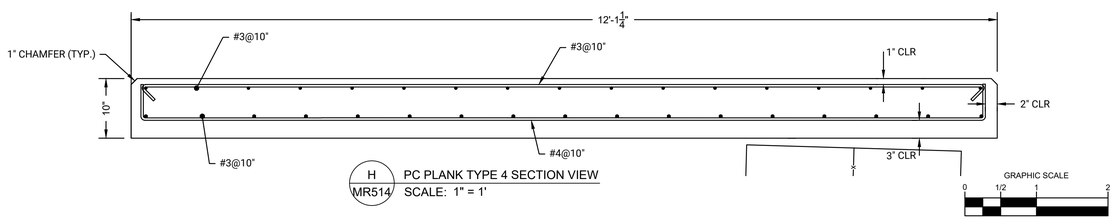

E MR514 PC PLANK TYPE 3 PLAN VIEW
SCALE: 1" = 1'




F MR514 PC PLANK TYPE 3 SECTION VIEW
SCALE: 1" = 1'




G MR514 PC PLANK TYPE 4 PLAN VIEW
SCALE: 1" = 1'




H MR514 PC PLANK TYPE 4 SECTION VIEW
SCALE: 1" = 1'

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

| REVISIONS | | | |
|---|---|---|---|
| NO | DESCRIPTION | DATE | BY |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

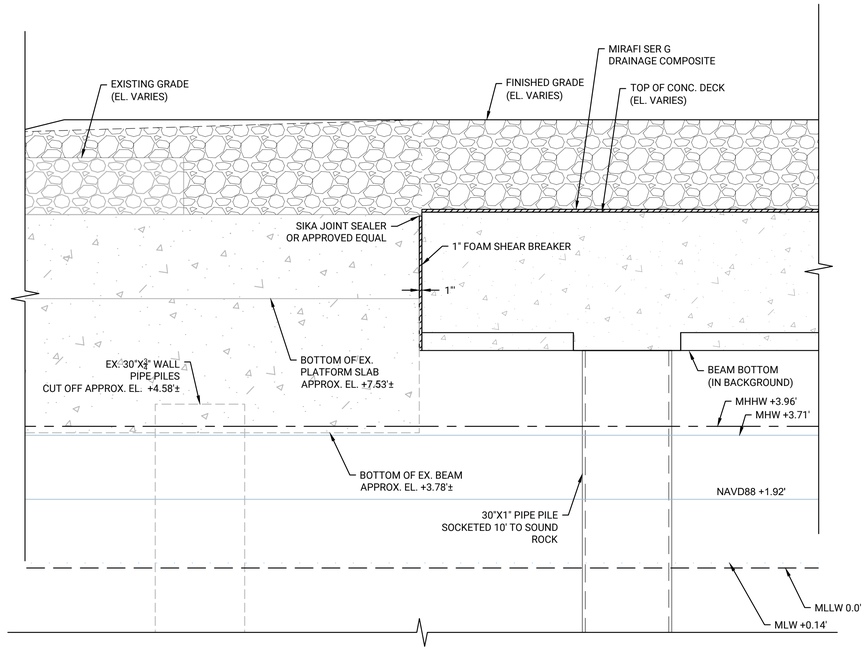
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PRECAST
PLANK DETAIL

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

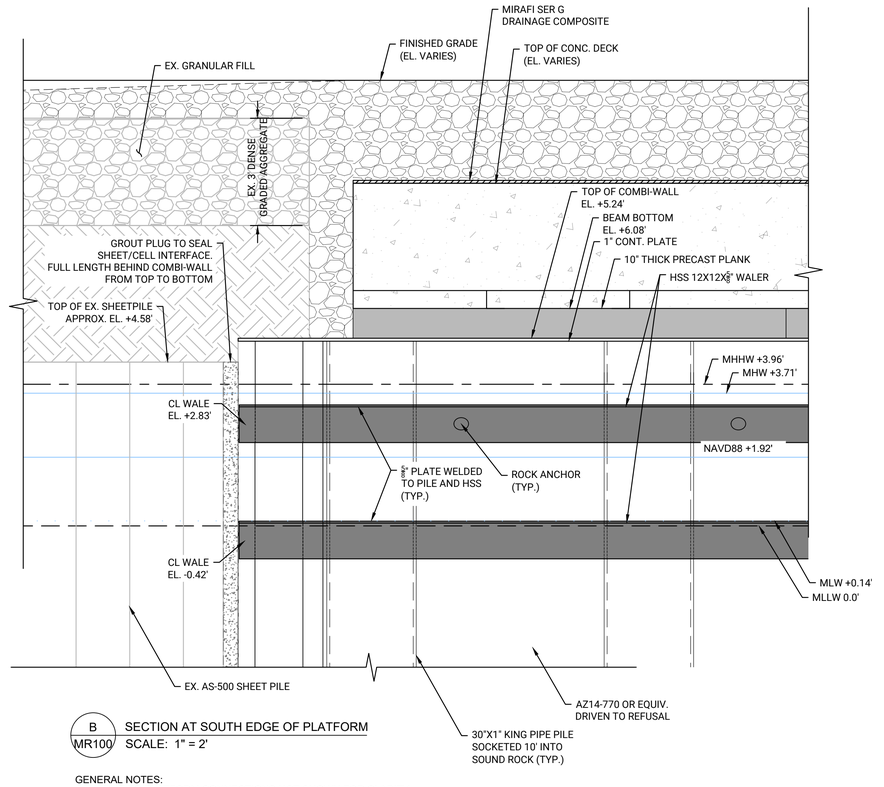
SHEET NUMBER
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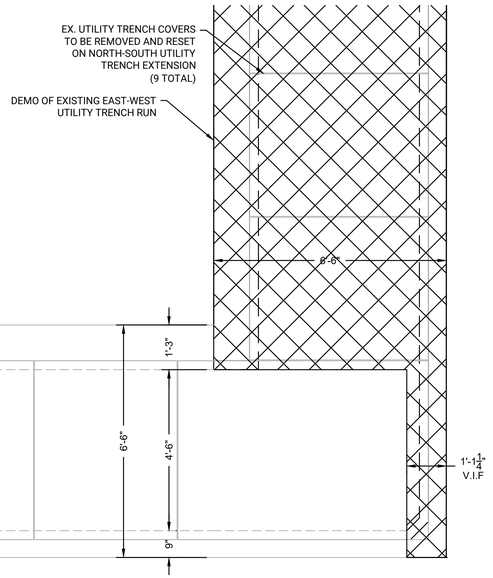

A MR100 SECTION AT SOUTH EDGE OF PLATFORM
SCALE: 1" = 2'

GENERAL NOTES:
1. PILE TO PLATFORM CONNECTIONS NOT SHOWN FOR CLARITY.



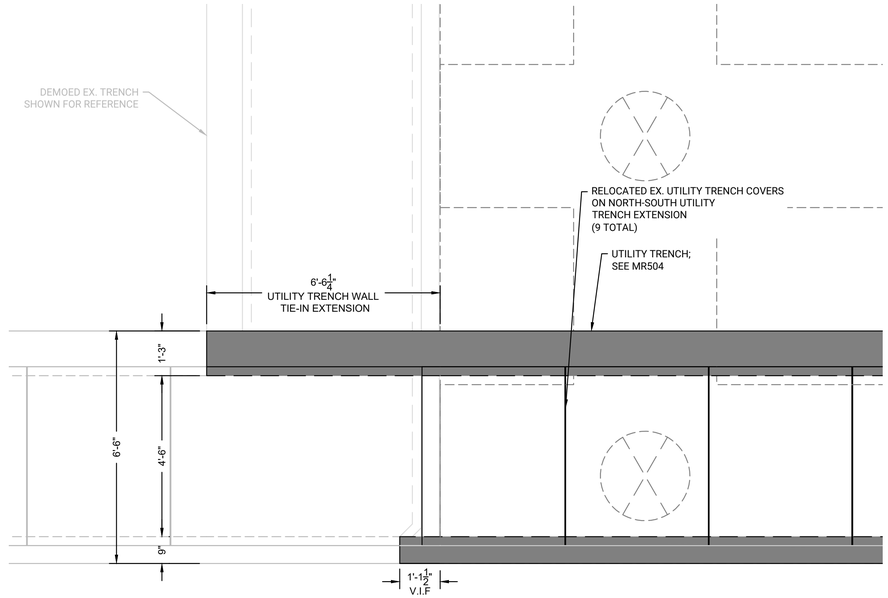

B MR100 SECTION AT SOUTH EDGE OF PLATFORM
SCALE: 1" = 2'

GENERAL NOTES:
1. PILE TO PLATFORM CONNECTIONS NOT SHOWN FOR CLARITY.




C MR011 EXISTING UTILITY TRENCH DEMO
SCALE: 1" = 2'

NOTES:
1. CONTRACTOR SHALL CLEAN SAW CUT PORTION OF EXISTING UTILITY TRENCH SHOWN.
2. IMMEDIATELY AFTER SAW CUT, CONTRACTOR SHALL CLEAN THE SAW CUT REBAR AND PROTECT SAW CUT REBAR BY APPLYING RUST INHIBITOR OR PROTECTIVE COATING. CONTRACTOR SHALL SUBMIT PROTECTIVE MATERIAL FOR ENGINEER APPROVAL.
3. CONTRACTOR SHALL APPLY 4 INCHES OF GROUT ON TOP OF THE SAW CUT AREA TO PROTECT REBAR.




D MR018 NORTH-SOUTH UTILITY TRENCH TIE-IN TO MAIN TERMINAL
SCALE: 1" = 2'

NOTES: CONCRETE PLATFORM BEAMS AND PILES SCREEN FOR CLARITY

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

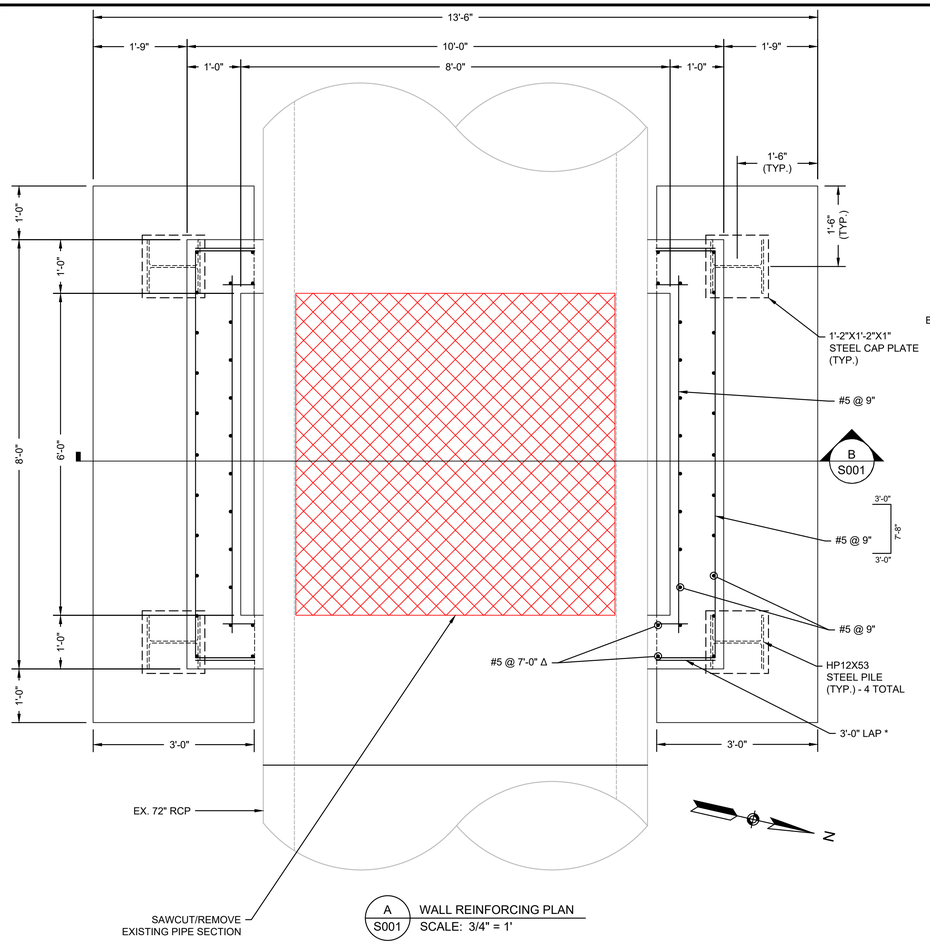
SHEET TITLE:
MAIN
TERMINAL
TO SHUSTER
DETAILS

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

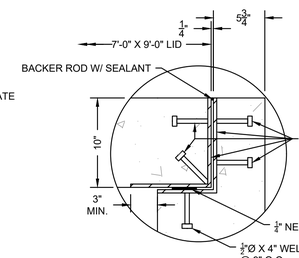
PROJECT NO: 0024M070.04

SHEET NUMBER
MR515

Tuesday, November 11, 2025 8:41:39 AM
DWG Filename: 24m070.04 masscec_marine infra details.dwg Layout: mr515
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




A S001 WALL REINFORCING PLAN
SCALE: 3/4" = 1'

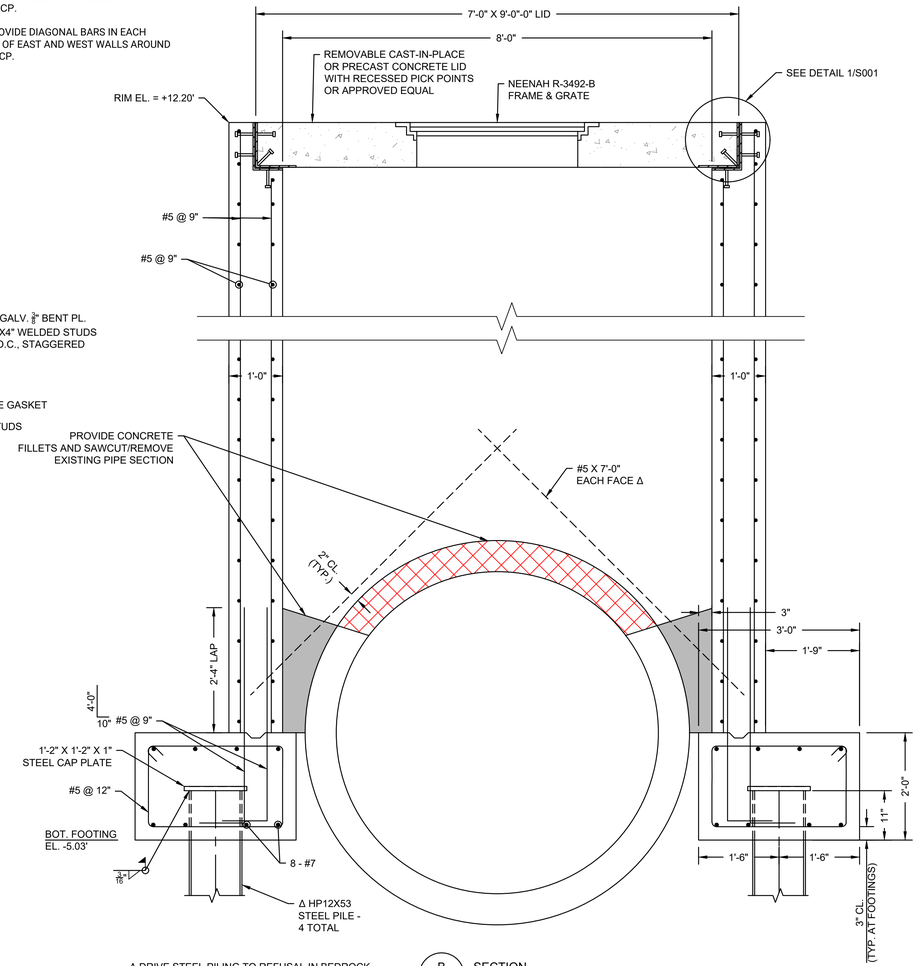



1 S001 CORNER DETAIL
SCALE: 1 1/2"=1'

NOTE: ALL BAR COVER IS 2" UNLESS OTHERWISE NOTED OR SHOWN

* LAP HORIZ. BARS 3'-0" ABOVE 72" RCP. FIELD TRIM 2" CLEAR AT 72" RCP.

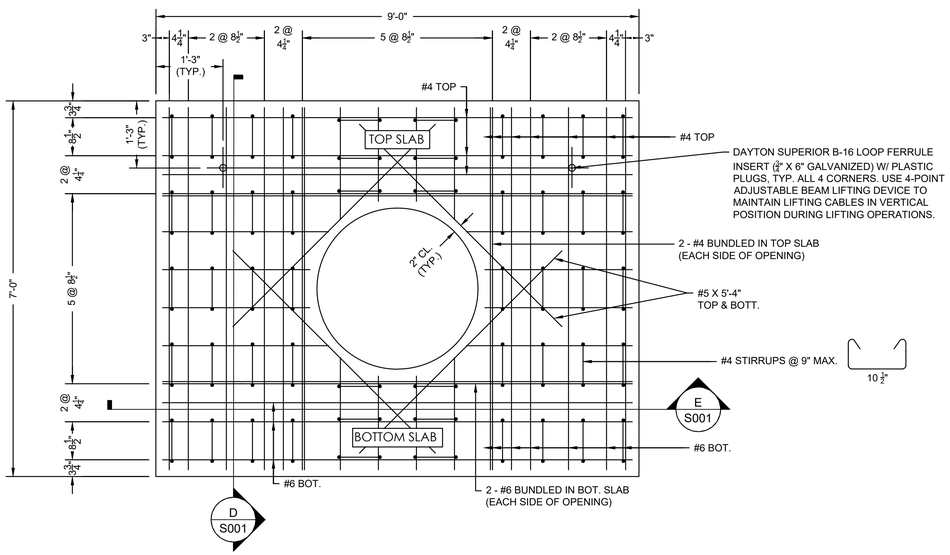
Δ PROVIDE DIAGONAL BARS IN EACH FACE OF EAST AND WEST WALLS AROUND 72" RCP.



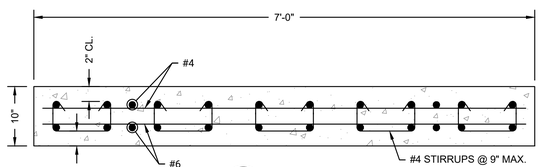

Δ DRIVE STEEL PILING TO REFUSAL IN BEDROCK. LENGTH PER PILE = 35'. DESIGN SERVICE BEARING = 67 KIPS/PILE. DESIGN FACTORED BEARING = 95 KIPS/PILE.

B S001 SECTION
SCALE: 3/4" = 1'

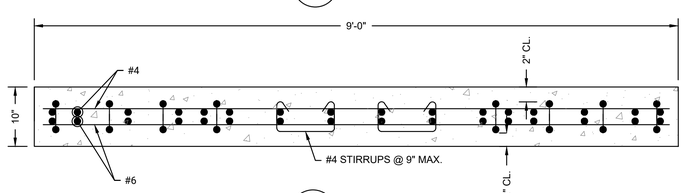
DESIGN LOAD: HS-40 TRUCK




C S001 LID REINFORCING PLAN
SCALE: 3/4" = 1'




D S001 LID SECTION
SCALE: 1" = 1'




E S001 LID SECTION
SCALE: 1" = 1'

GRAPHIC SCALE
0 1 2
(IN FEET)
3/4 INCH = 1 FEET

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP | 10/31/2025 |
| DESIGNED | TJC | 10/31/2025 |
| CHECKED | DJE | 10/31/2025 |

PE STAMP

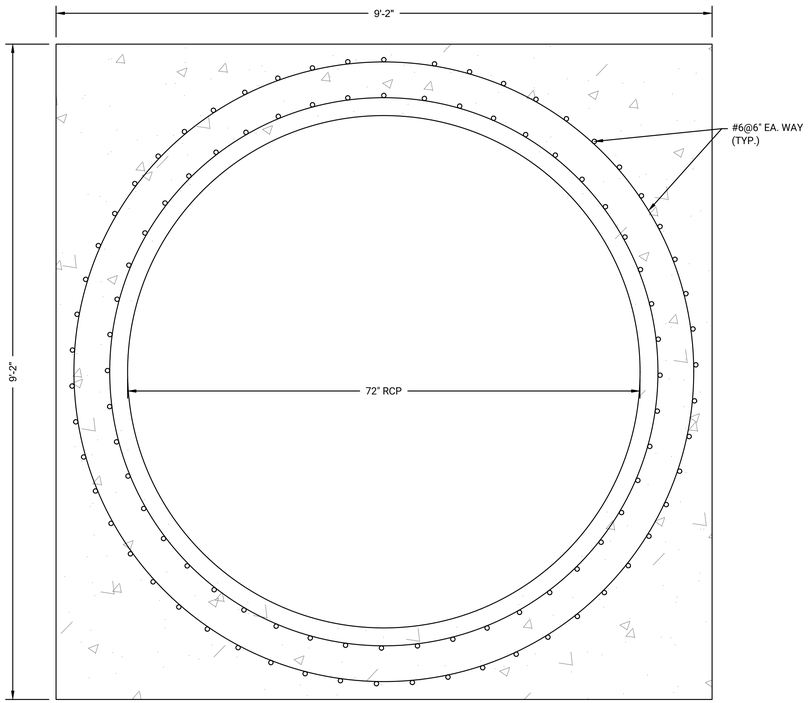
SHEET TITLE:
STORM MANHOLE DETAILS (NO. 6 NEW STRUCTURE)

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

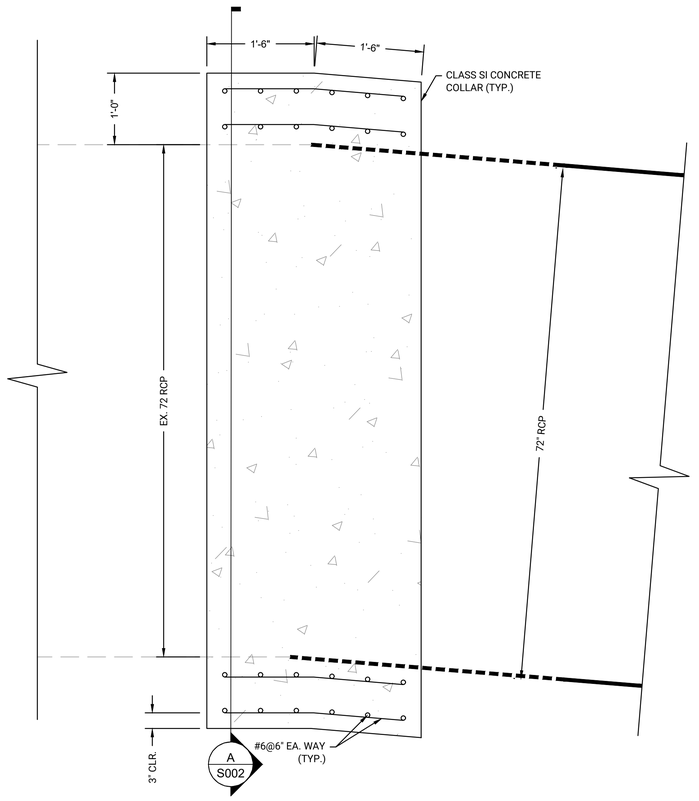
PROJECT NO: 0024M070.04

SHEET NUMBER
S-001

Tuesday, November 11, 2025 8:43:11 AM
DWG Filename: 24m070.04 masscec_storm structures.dwg Layout: s-001
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




A S002 72" RCP CONCRETE COLLAR
SCALE: 1" = 1'




B S002 72" RCP CONCRETE COLLAR
SCALE: 1" = 1'

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE**
**COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | DESCRIPTION |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

SHEET TITLE:
CONCRETE
COLLAR DETAILS

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
S-002

Tuesday, November 11, 2025 8:43:29 AM
DWG Filename: 24m070.04 masscec_storm structures.dwg Layout: s-002
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

N

S FRONT STREET
BOOK 10719 PAGE 242
PID:031 0288
ZONE=WI

#6 HASSEY STREET
N/F
R.C.P. REALTY, LLC
BOOK 4852 PAGE 258
PLAN BOOK 99 PAGE 12
PID:031 0254
ZONE=WI

APPROX. PROPERTY LINE (TYP)

30'-0" DRAINAGE EASEMENT

RIM=10.93
CLEANOUT SWEEP

12" HDPE

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

EX. MASSDOT GUARDRAIL

EX. CELL SHEET COFFERDAM

EX. HYDRANT W/ (2) GATE VALVES

GROUT PLUG TO SEAL SHEET/CELL INTERFACE FROM TOP TO BOTTOM

EX. FENDER (TYP.)

EX. LADDER (TYP.)

EX. BUILDING

1 1a 2 2a 3 3a 4 4a 5 5a 5b 6 6a 7 7a 8 8a 9 9a 10 10a 11 11a 12 13 14

A B C D E F G H I

TB-1 TB-2 TB-3 TB-4 TB-5 TB-6 TB-7 TB-8 TB-9 TB-10 TB-11 TB-12 TB-13 TB-14 TB-15

30"ØX1" STEEL PIPE PILE DRIVEN TO TOP OF COMPETANT ROCK (TYP.)

SEE PARTIAL PLAN DETAIL 3 ON SR500

NORTH/SOUTH COMBINATION WALL

7' 7'-9" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 15'-6" 7'-9" 7'-9" 12'-10" 6'-5"

67'-10"
NORTH CLOSURE AZ19-700 SHEET PILE BULKHEAD

SEE DETAIL 1 PARTIAL PLAN ON SR101

AZ14-770 OR EQUIV. (TYP.)

30"ØX1" STEEL KING PIPE PILE SOCKETED 10' INTO ROCK (TYP.)

GROUT PLUG (TOP OF EX. GRADE TO BOTTOM FACE OF 3'-0"X2'-6" CONC. CAP)

EX. PZ28 CELLULAR SHEET PILE COFFERDAM

LOW RELAXATION GROUTED STRAND ROCK ANCHOR @ 45°; EXTEND A MINIMUM OF 15-FT INTO SOUND ROCK CONTRACTOR DESIGN FOR 370 KIP SERVICE PULL-OUT, TEST TO 480 KIP, THEN BACK OFF TO 370 KIP AND LOCK. (TYP.)

(2) HSS 12X12X5/8 CONT. WALER (TYP.)

30"ØX1" STEEL PIPE PILE DRIVEN TO TOP OF COMPETANT ROCK (TYP.)

30"ØX1" STEEL PIPE PILE SOCKETED 10' INTO ROCK (TYP.)

(8) W14X311 KING PILE SOCKETED 10' INTO SOUND ROCK (TYP.)

SEE DETAIL 2 PARTIAL PLAN ON SR102

10'-0" CONSTRUCTION EASEMENT

HP12X53 CLOSURE PILE W/GROUT PLUG; SEE I/SR503

AZ14-770 OR EQUIV. (TYP.)

EAST/WEST UTILITY TRENCH WITH GRATING

11" CIP CONC. CLOSURE WALL; SEE SR504

EX. HP14x73 (TYP)

EX. CLEAT (TYP)

EX. AND PROP. FENDER LINE

22'-9" 17' 52' 18' 35' 17' 19'-9"

ZALDA TECHNOLOGY SBD-1 200-225 METRIC TON BOLLARD (TYP. OF 3) SEE MR506

ZALDA TECHNOLOGY FENDER AND HDPE FACED PANEL "SC-1150" SER (HIGH FORMULA) (TYP. OF 6) SEE MR505

NEW BEDFORD HARBOR
EBB
FLOOD

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

A SR300
B SR301
C SR303
D SR306
E SR503
F SR307

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT (SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

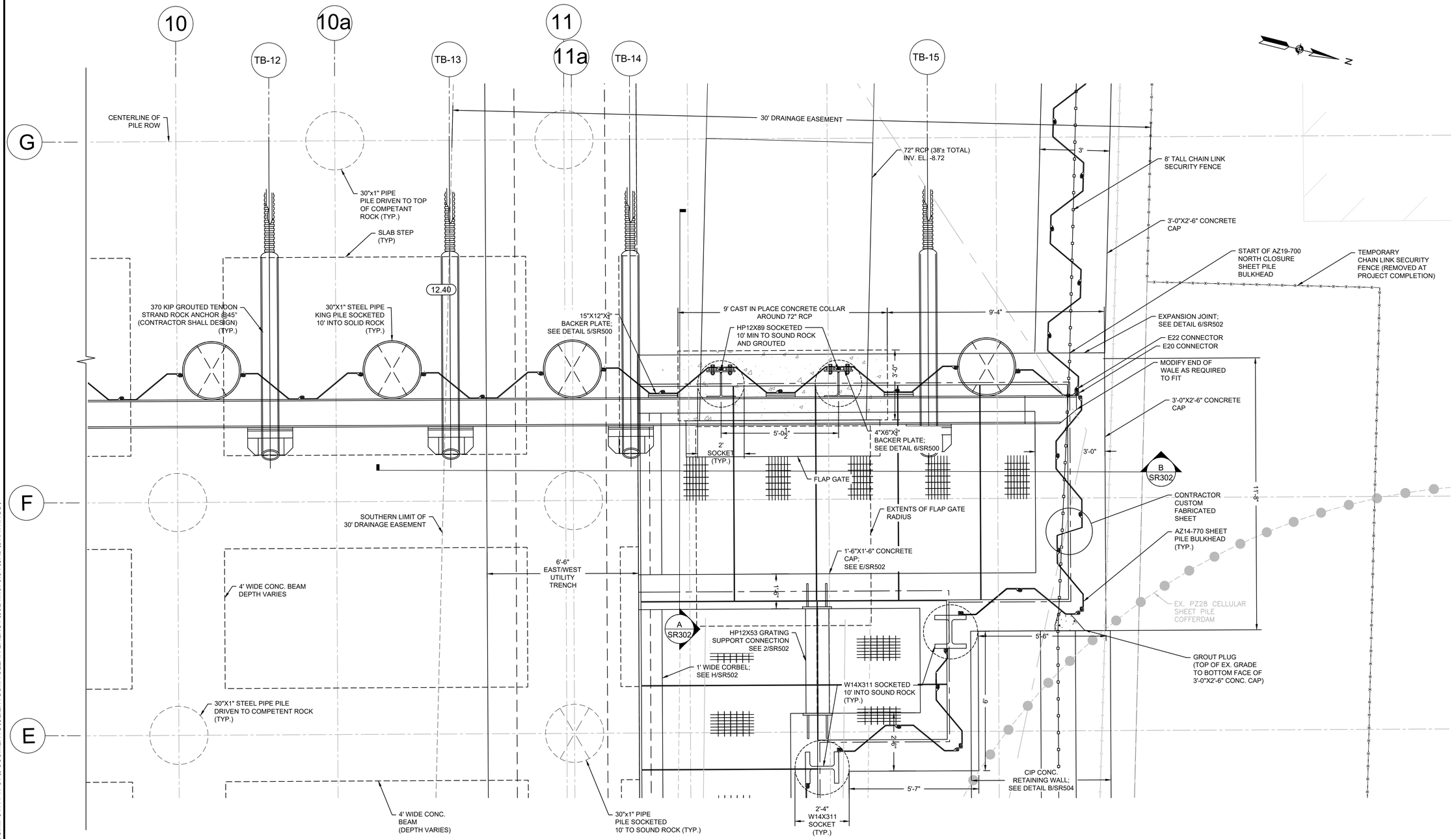
SHEET TITLE:
**SHEETEPILE BULKHEAD CONFIGURATION PLAN**

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
**SR100**

Tuesday, November 11, 2025 8:44:52 AM
DWG Filename: 24m070.04 masscec bulkhead plan.dwg Layout: sr100
DWG Folder Location: PW:\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




1 SR101 — 72" RCP OUTFALL STRUCTURE PARTIAL PLAN
SCALE: 1" = 2'

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT: MASSCEC NBMCT - PHASE 3 BULKHEAD REPLACEMENT PROJECT (SITE 4)

OWNER: NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

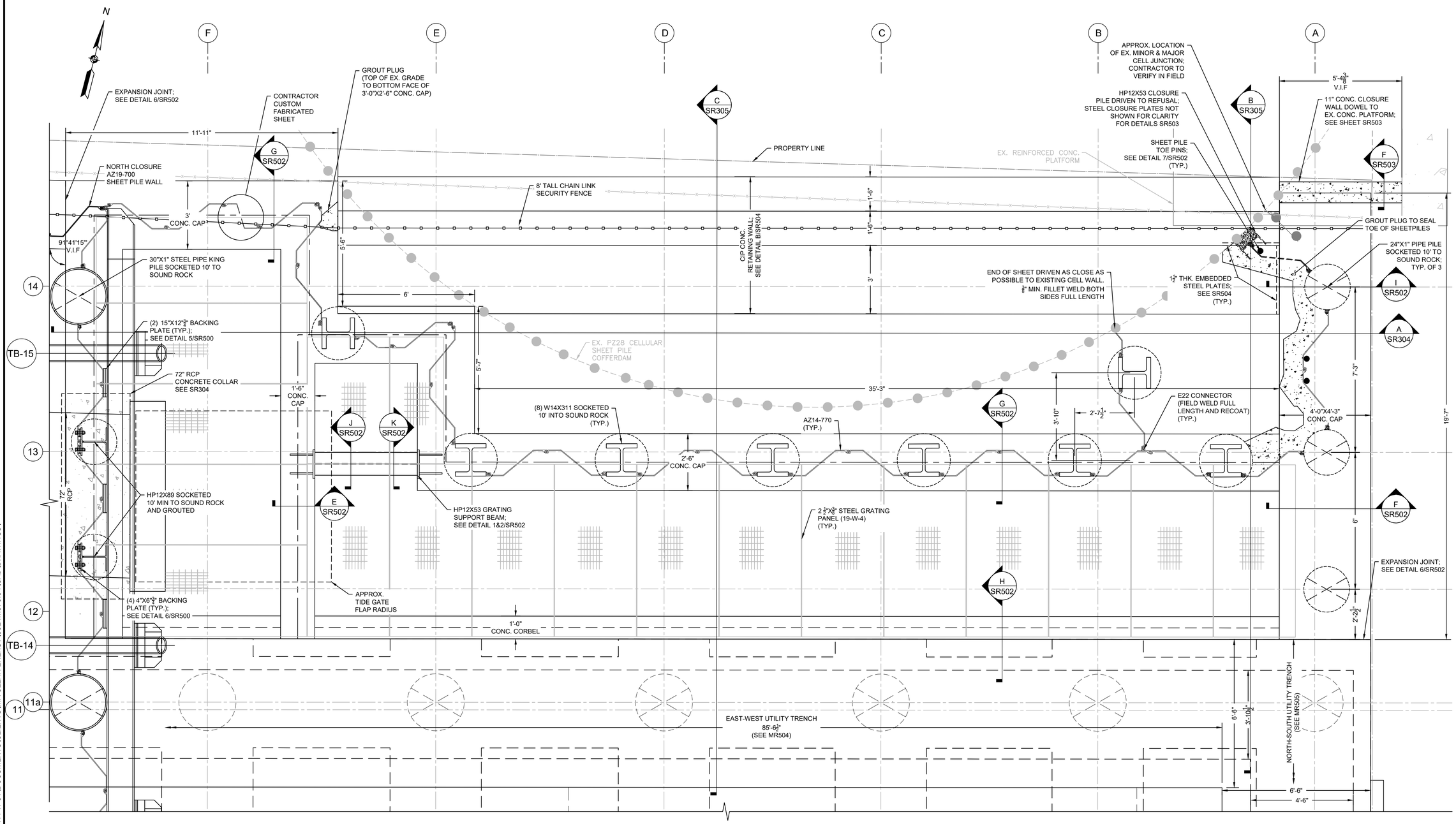
SHEET TITLE:
COMBI-WALL 72IN OUTFALL PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
SR101

Tuesday, November 11, 2025 8:45:10 AM
DWG Filename: 24m070.04 masscec bulkhead plan.dwg Layout: sr101
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




2 / SR102 EAST/WEST COMBI WALL AND NORTH CLOSURE PARTIAL PLAN DETAIL
SCALE: 1" = 2'

NOTES:
1) STEEL GRATING SCREENED FOR CLARITY.

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT: MASSCEC NBMCT - PHASE 3 BULKHEAD REPLACEMENT PROJECT (SITE 4)

OWNER: NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA

REVISIONS

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|---|---|---|---|
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DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:

EAST-WEST BULKHEAD PLAN

ISSUANCE:

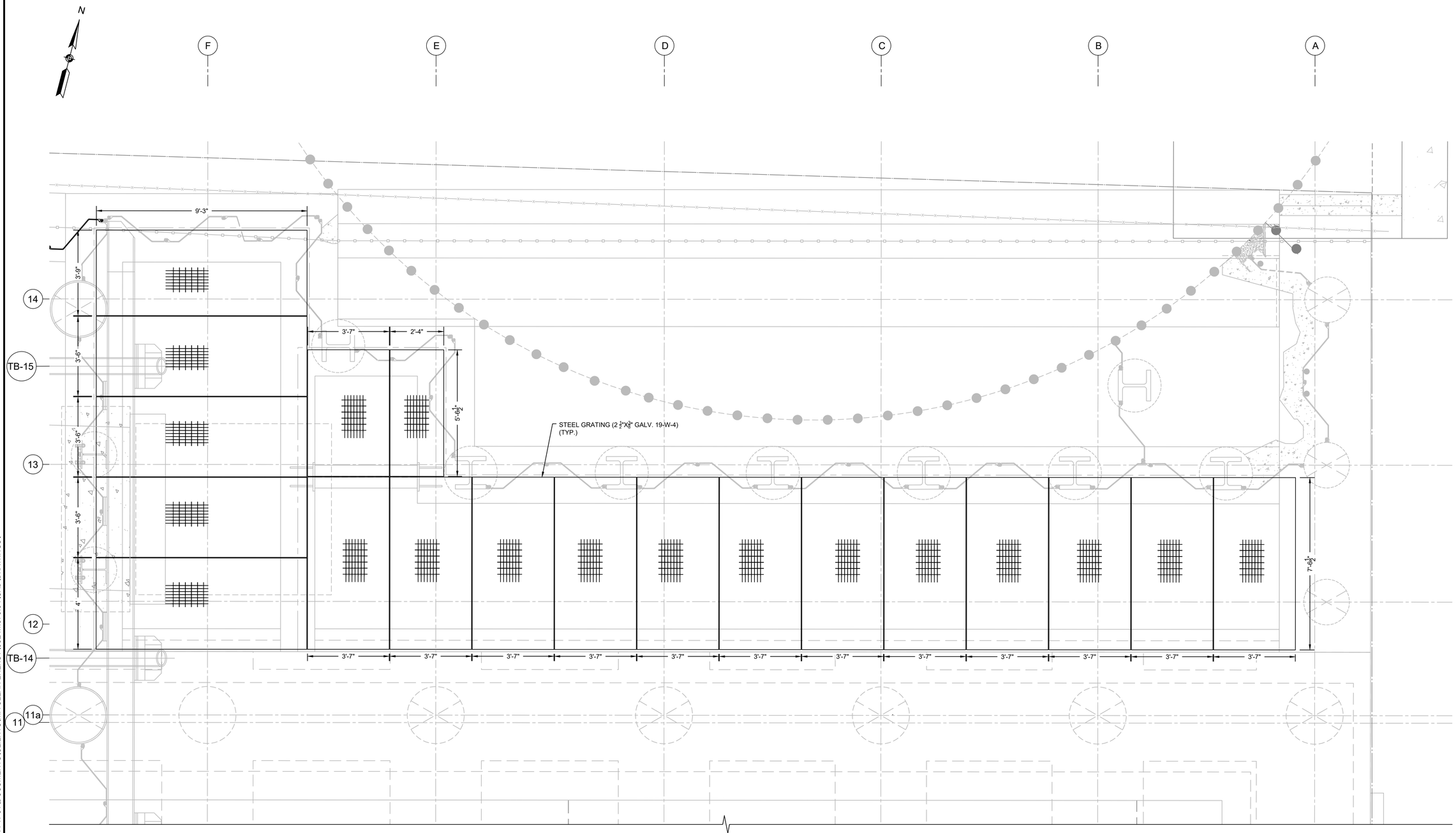
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER

SR102

Tuesday, November 11, 2025 9:09:53 AM
DWG Filename: 24m070.04 masscec bulkhead plan.dwg Layout: sr102
DWG Folder Location: PW:\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




1 / SR103 EAST/WEST BULKHEAD GRATING (19-W-4)
SCALE: 1" = 2'

NOTES:
1) ALL LINE WORK EXCEPT FOR GRATING SCREENED FOR CLARITY
2) TYPICAL INFILL GRATING: 2 ¾" X ⅜" 19-W-4 GALVANIZED STEEL GRATING, FASTEN PER MANUFACTURER REQUIREMENTS

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

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|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

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|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

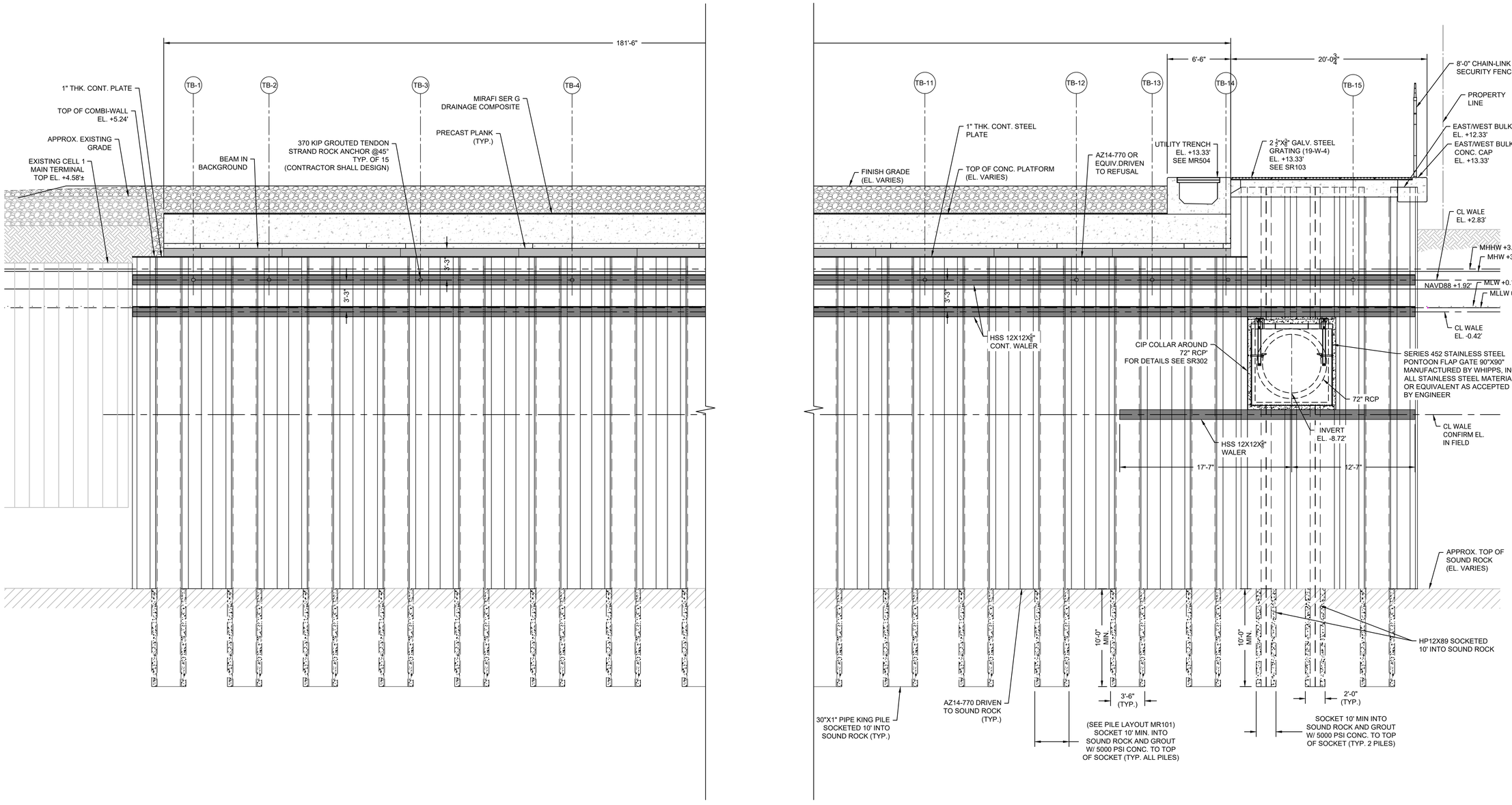
SHEET TITLE:
EAST-WEST BULKHEAD INDUSTRIAL GRATING PLAN

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
SR103

Tuesday, November 11, 2025 9:11:08 AM
DWG Filename: 24m070.04 masscec bulkhead plan.dwg Layout: sr103
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




A / SR100 NORTH/SOUTH COMBI-WALL ROCK ANCHOR ELEVATION

SCALE: 1" = 5'

NOTES:

1) PILE CONNECTIONS NOT SHOWN FOR CLARITY

GRAPHIC SCALE

0 2.5 5 10

(IN FEET)

1 INCH = 5 FEET

Foth

PROJECT: MASSCEC NBMCT - PHASE 3 BULKHEAD REPLACEMENT PROJECT (SITE 4)

OWNER: NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

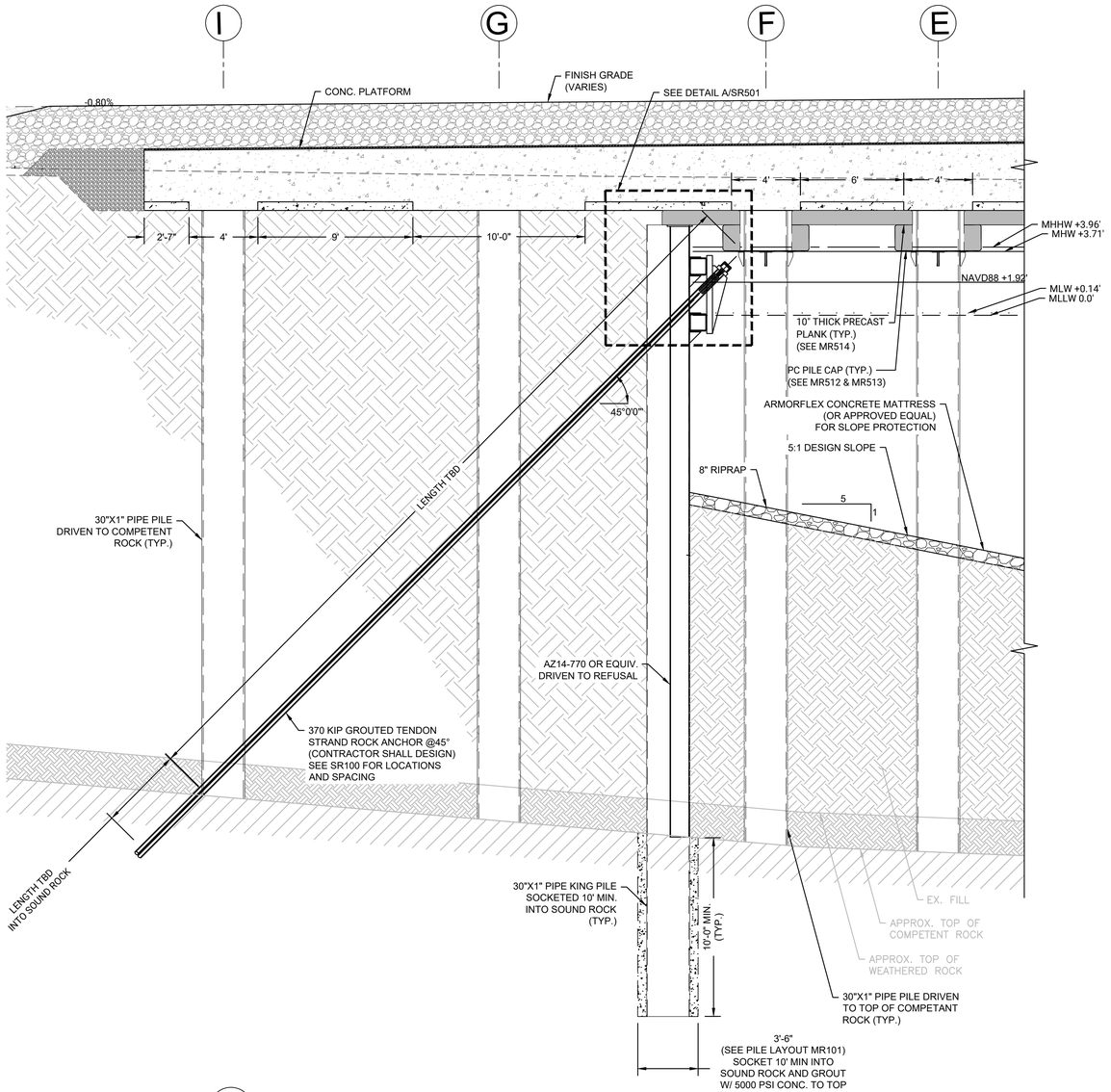
SHEET TITLE: COMBI-WALL PROFILE

ISSUANCE: **IFB DRAWINGS** (11/10/2025)

PROJECT NO: 0024M070.04

SHEET NUMBER SR300

Tuesday, November 11, 2025 8:46:31 AM
DWG Filename: 24m070.04 masscec bulkhead sections.dwg Layout: sr300
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




B / SR100 NORTH/SOUTH COMBI-WALL ROCK ANCHOR SECTION

SCALE: 1" = 4'

NOTES:
1) PILE CONNECTIONS NOT SHOWN FOR CLARITY

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE**
**COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

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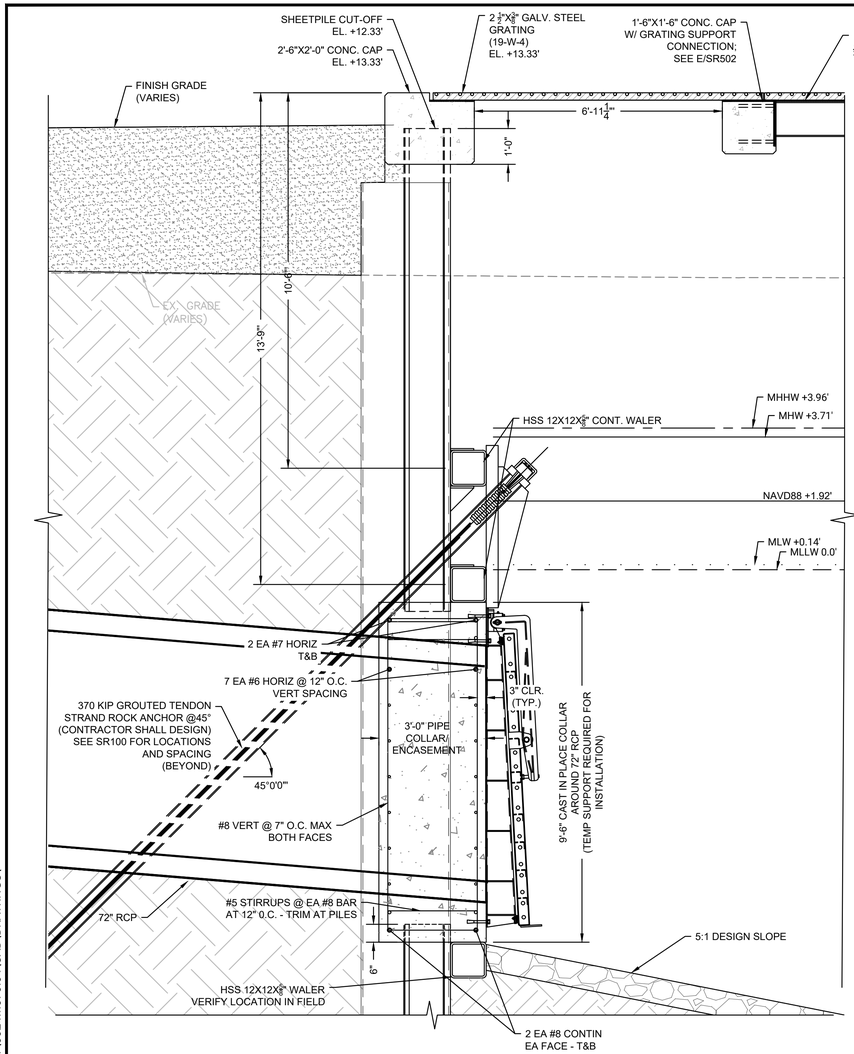
SHEET TITLE:
COMBI-WALL SECTION

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

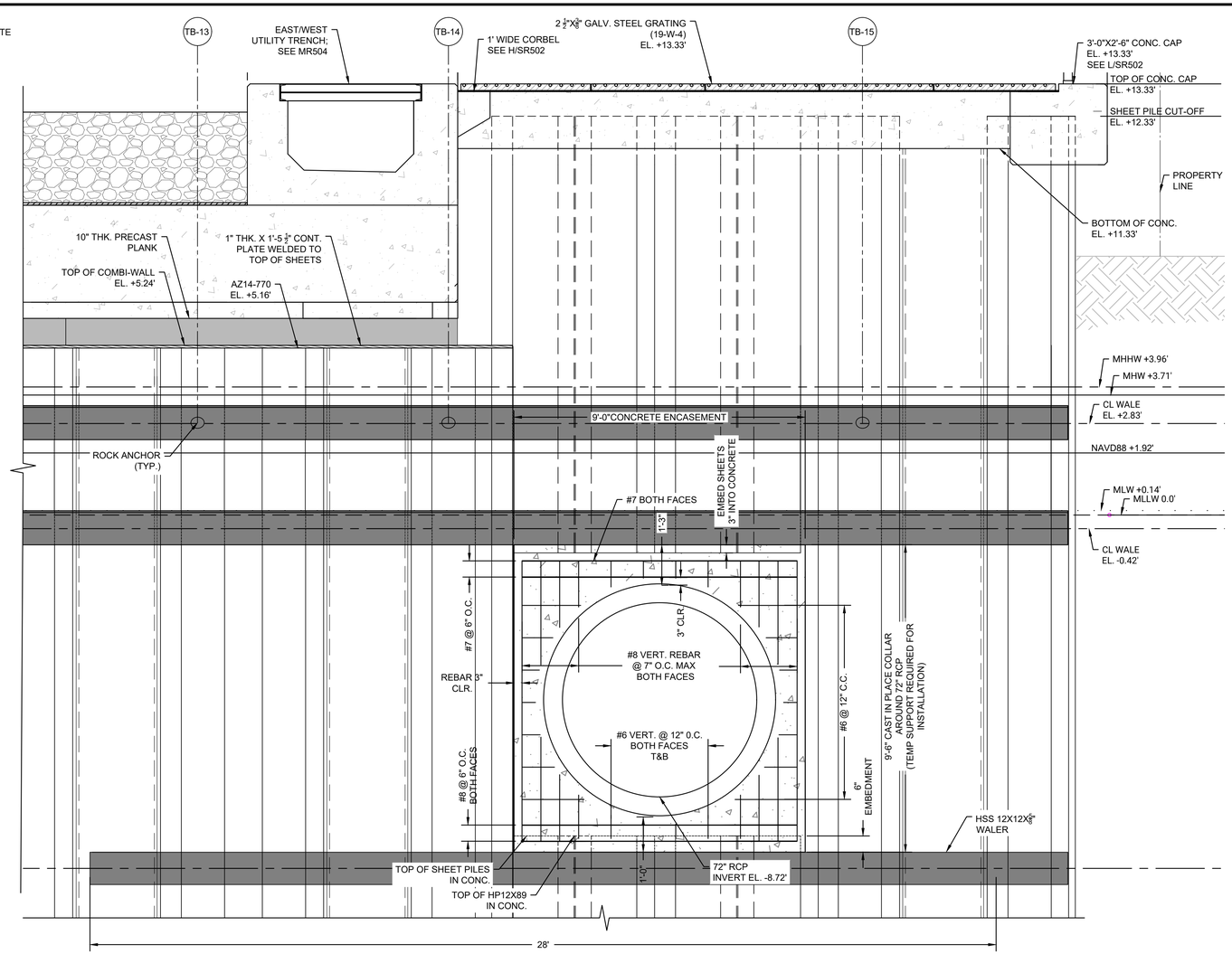
SHEET NUMBER
SR301

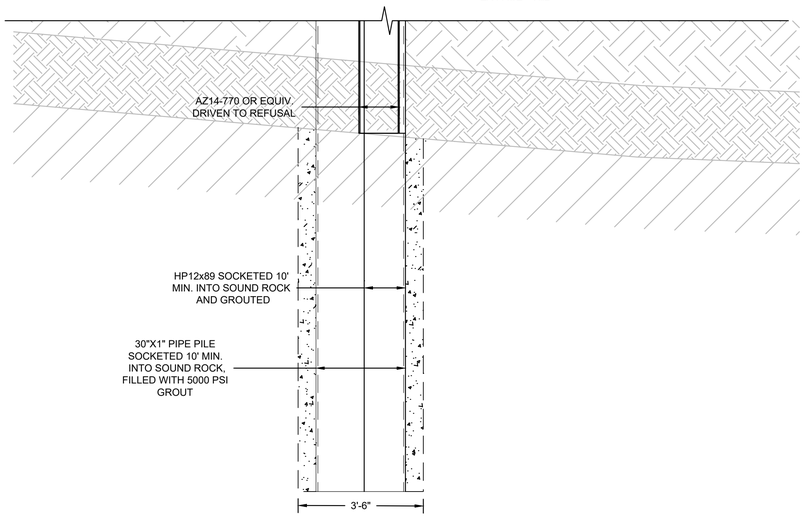
Tuesday, November 11, 2025 8:46:48 AM
DWG Filename: 24m070.04 masscec bulkhead sections.dwg Layout: sr301
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

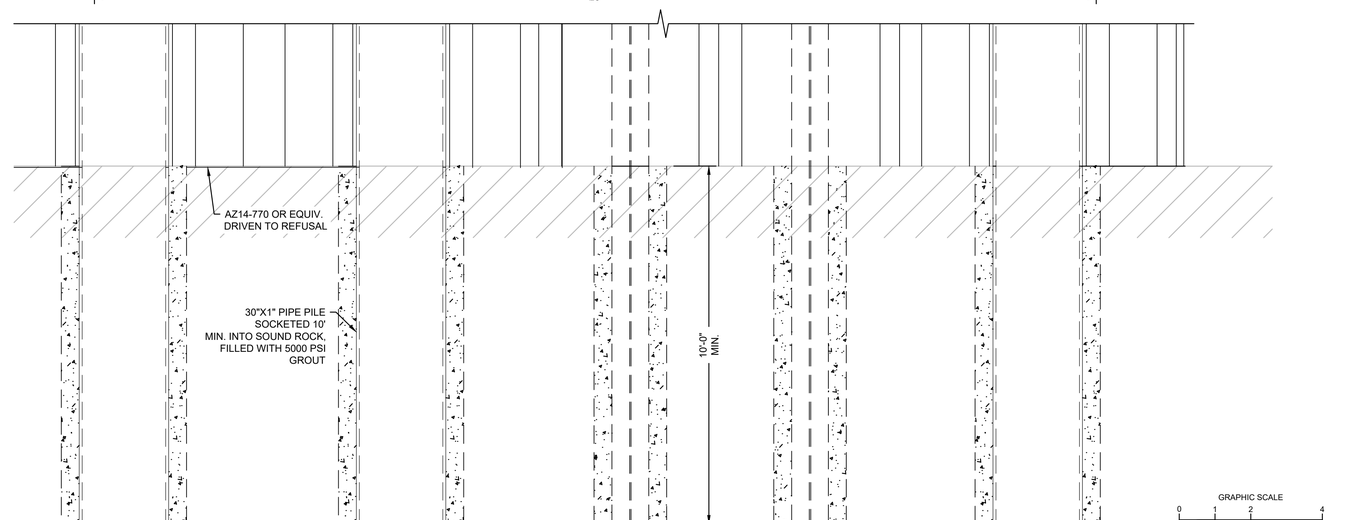



A
SR101

72" OUTFALL AT NORTH/SOUTH COMBI WALL AND EAST/WEST COMBI WALL INTERFACE
SCALE: 1" = 2'




B
SR101

72" OUTFALL ELEVATION
SCALE: 1" = 2'

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

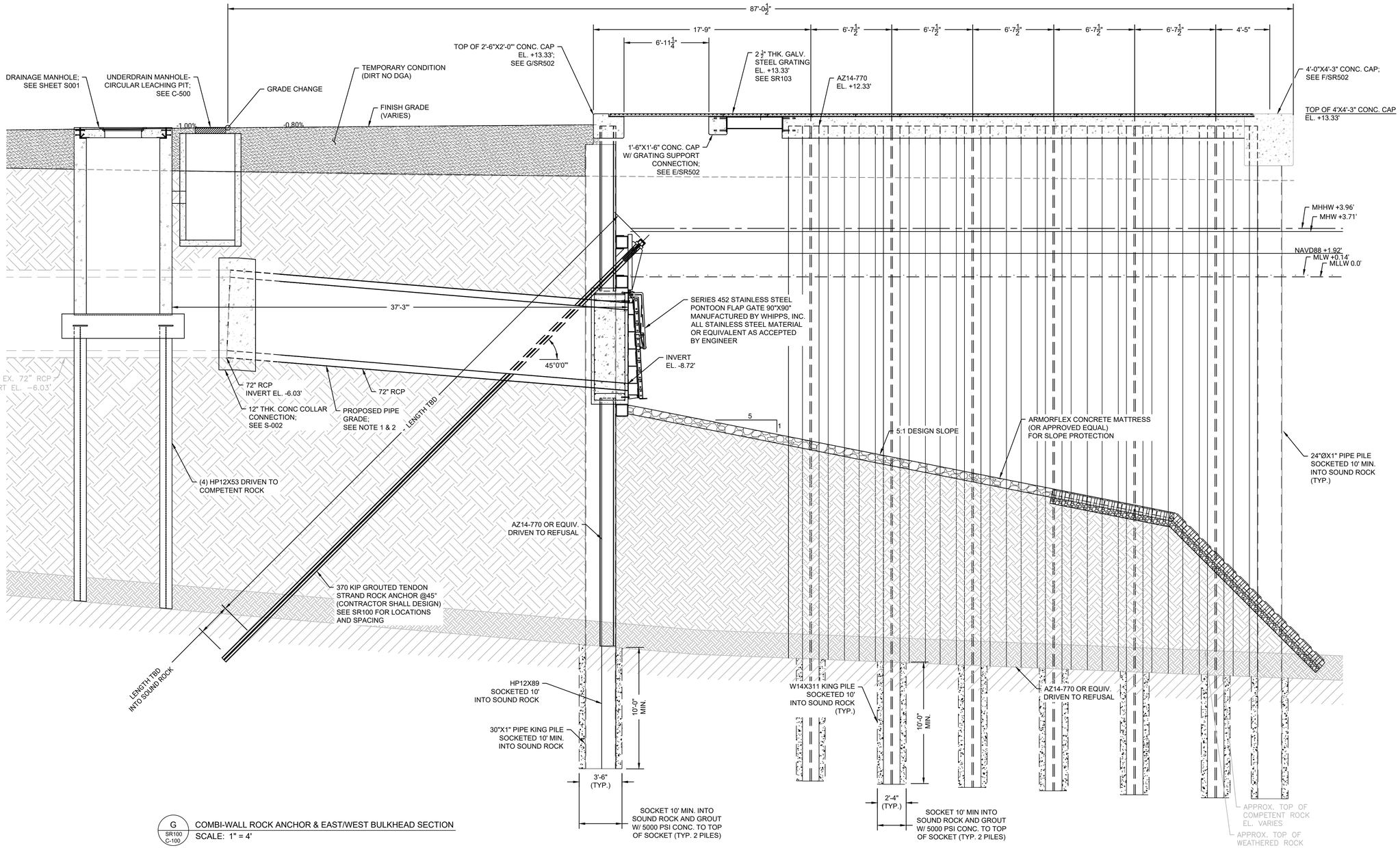
SHEET TITLE:
COMBI-WALL OUTFALL SECTIONS

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
SR302

Tuesday, November 11, 2025 2:47:12 PM
DWG Filename: 24m070.04 masscec bulkhead sections.dwg Layout: sr302
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




G
SR100
C-100

COMBI-WALL ROCK ANCHOR & EAST/WEST BULKHEAD SECTION
SCALE: 1" = 4'

NOTES:

1) THE EXISTING INVERT ELEVATION HAS BEEN DETERMINED BASED ON DATA PRESENTED IN DRAWINGS TITLED 'NEW BEDFORD JOHN F. KENNEDY MEMORIAL HIGHWAY EXTENSION', DATED 1982, PROVIDED BY THE CITY OF NEW BEDFORD.

2) THE CONTRACTOR SHALL PERFORM FIELD VERIFICATION OF THE INVERT ELEVATION AND PROMPTLY NOTIFY THE ENGINEER OF RECORD OF ANY DISCREPANCIES OR DEVIATIONS FROM THE DOCUMENTED EXISTING CONDITION.

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE**
**COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
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DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

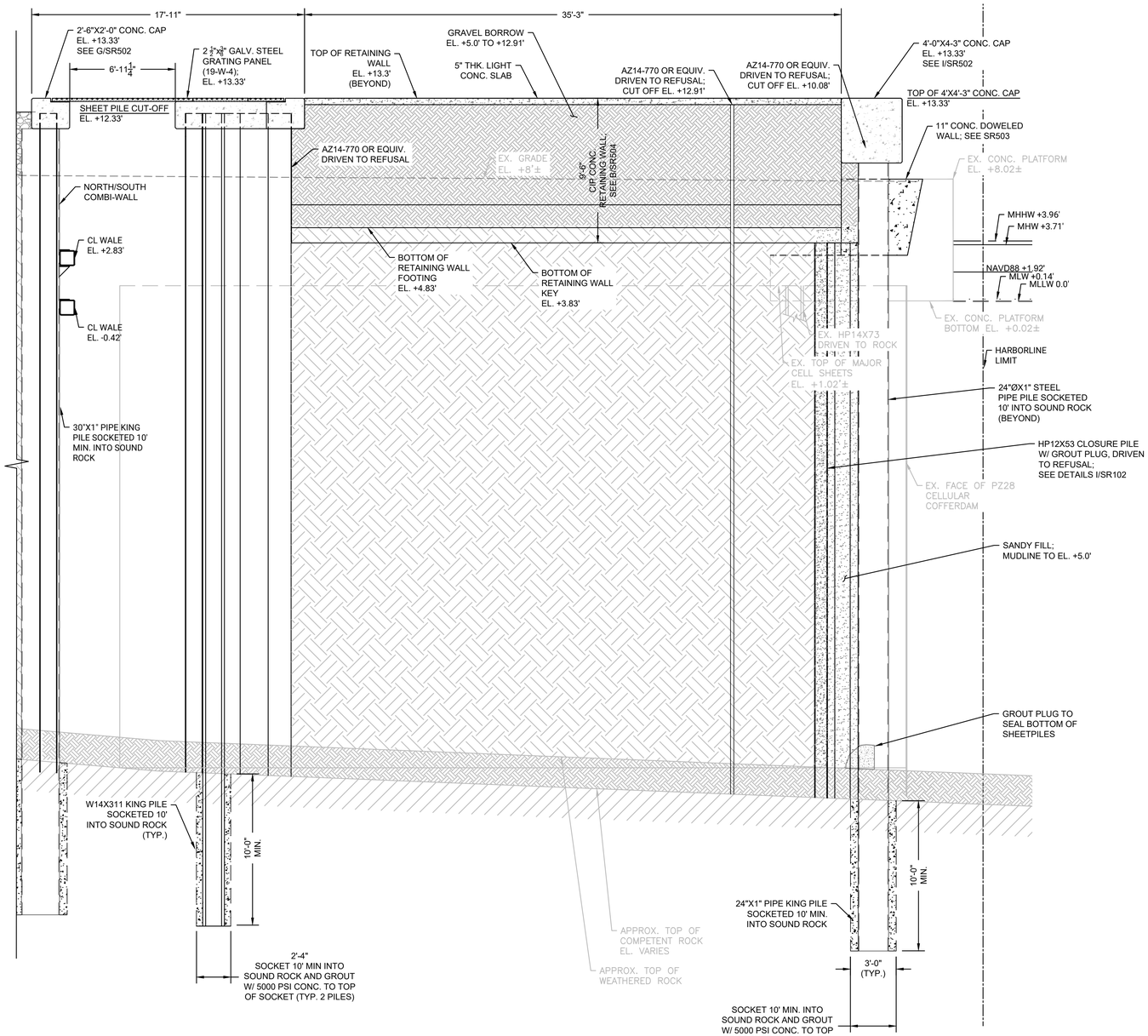
SHEET TITLE:
EAST-WEST
BULKHEAD
SECTION

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
SR303

Tuesday, November 11, 2025 8:47:58 AM
DWG Filename: 24m070.04 masscec bulkhead sections.dwg Layout: sr303
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




A / SR102 EAST/WEST BULKHEAD SECTION
SCALE: 1" = 4'

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

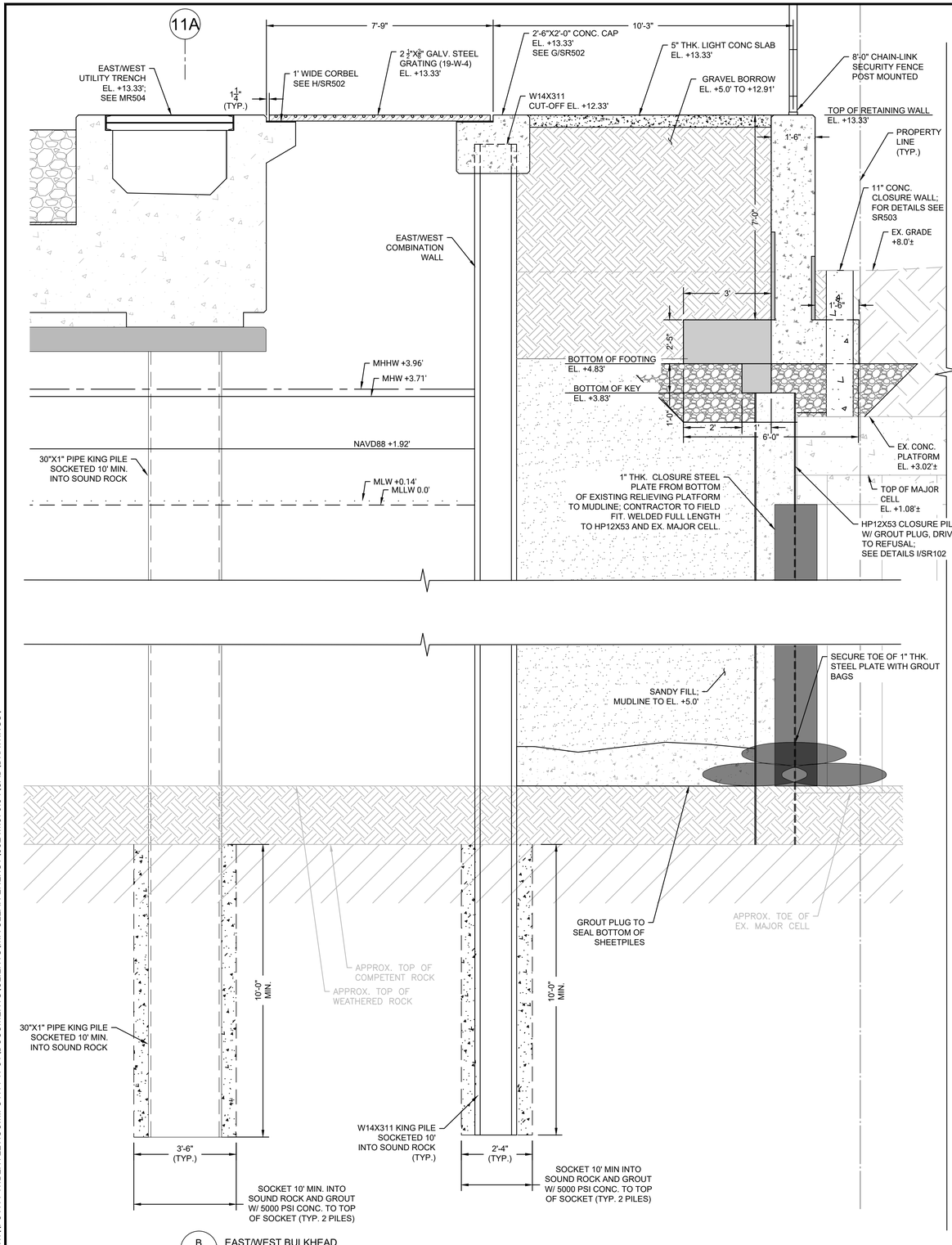
SHEET TITLE:
EAST-WEST BULKHEAD SECTION

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

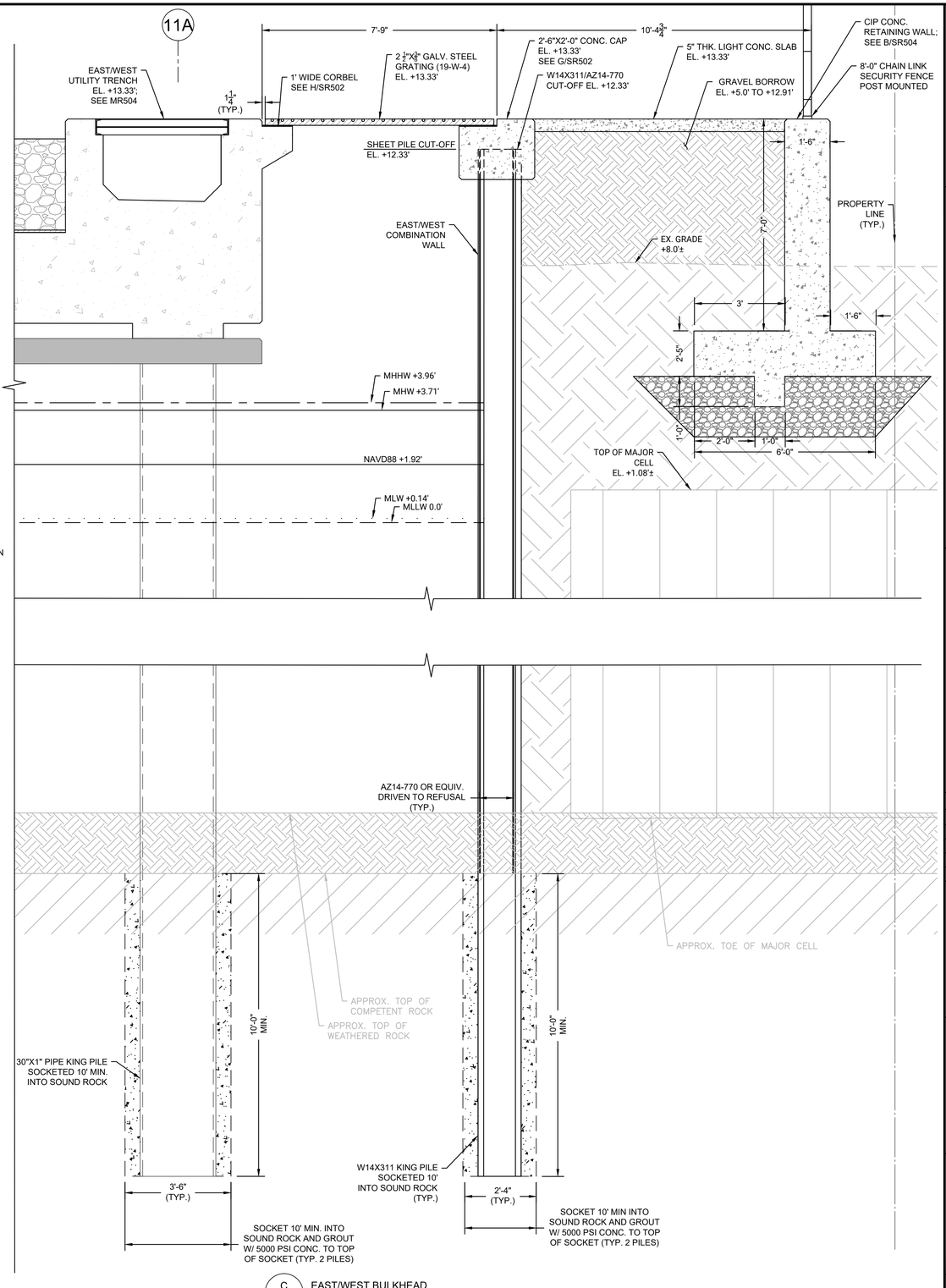
PROJECT NO: 0024M070.04

SHEET NUMBER
SR304

Tuesday, November 11, 2025 8:48:13 AM
DWG Filename: 24m070.04 masscec bulkhead sections.dwg Layout: sr304
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




B SR102 EAST/WEST BULKHEAD
SCALE: 1" = 2'




C SR102 EAST/WEST BULKHEAD
SCALE: 1" = 2'

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

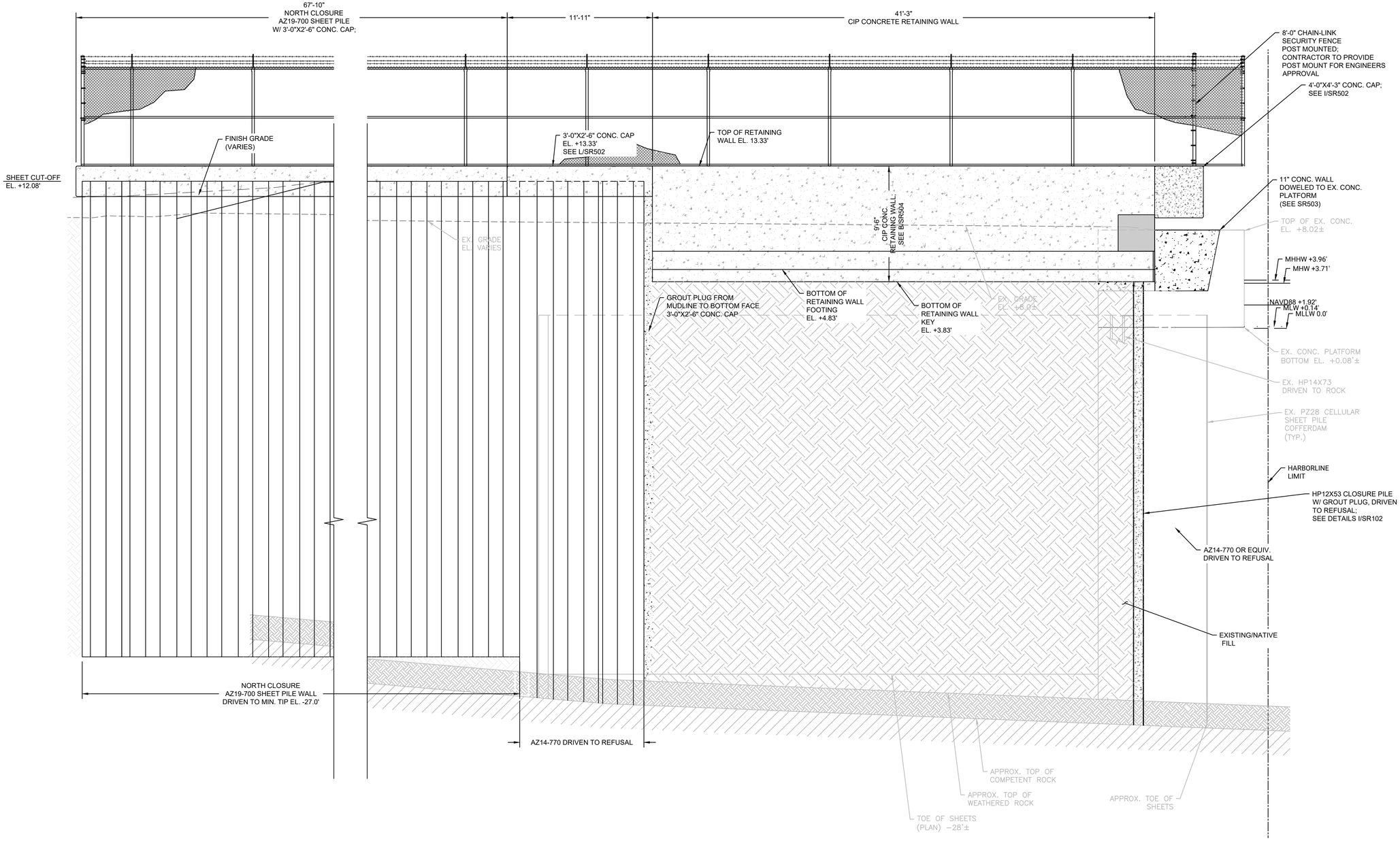
SHEET TITLE:
EAST-WEST BULKHEAD SECTION

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
SR305

Tuesday, November 11, 2025 8:49:06 AM
DWG Filename: 24m070.04 massecc bulkhead sections.dwg Layout: sr305
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




D / SR100 NORTH CLOSURE BULKHEAD
SCALE: 1" = 4'

NOTES:
1) ALIGNMENT OF EXISTING CELLS AND CONCRETE PLATFORM VARIES ALONG PROPOSED PLATFORM DEPENDING ON WHERE THE SECTION IS CUT. CONTRACTOR SHALL PERFORM SURVEY TO VERIFY LOCATION OF EXISTING STRUCTURES PRIOR TO PERFORMING WORK.

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

| REVISIONS | NO | BY | DATE | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

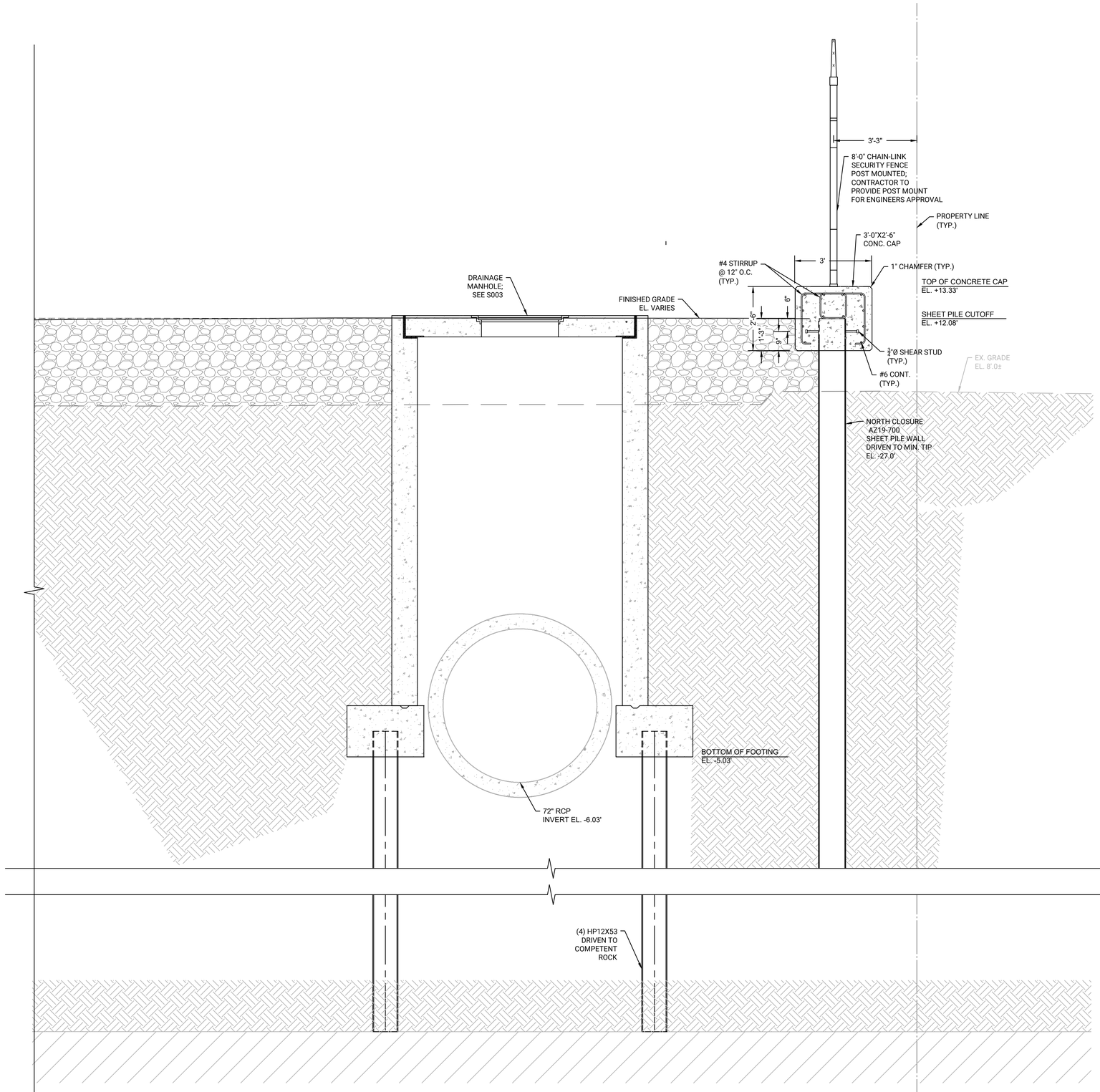
SHEET TITLE:
NORTH
BULKHEAD
CLOSURE
SECTION

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
SR306

Tuesday, November 11, 2025 2:53:53 PM
DWG Filename: 24m070.04 masscec bulkhead sections.dwg Layout: sr306
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




F / SR100 NORTH CLOSURE BULKHEAD AND CONCRETE CAP
SCALE: 1" = 2'

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
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| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

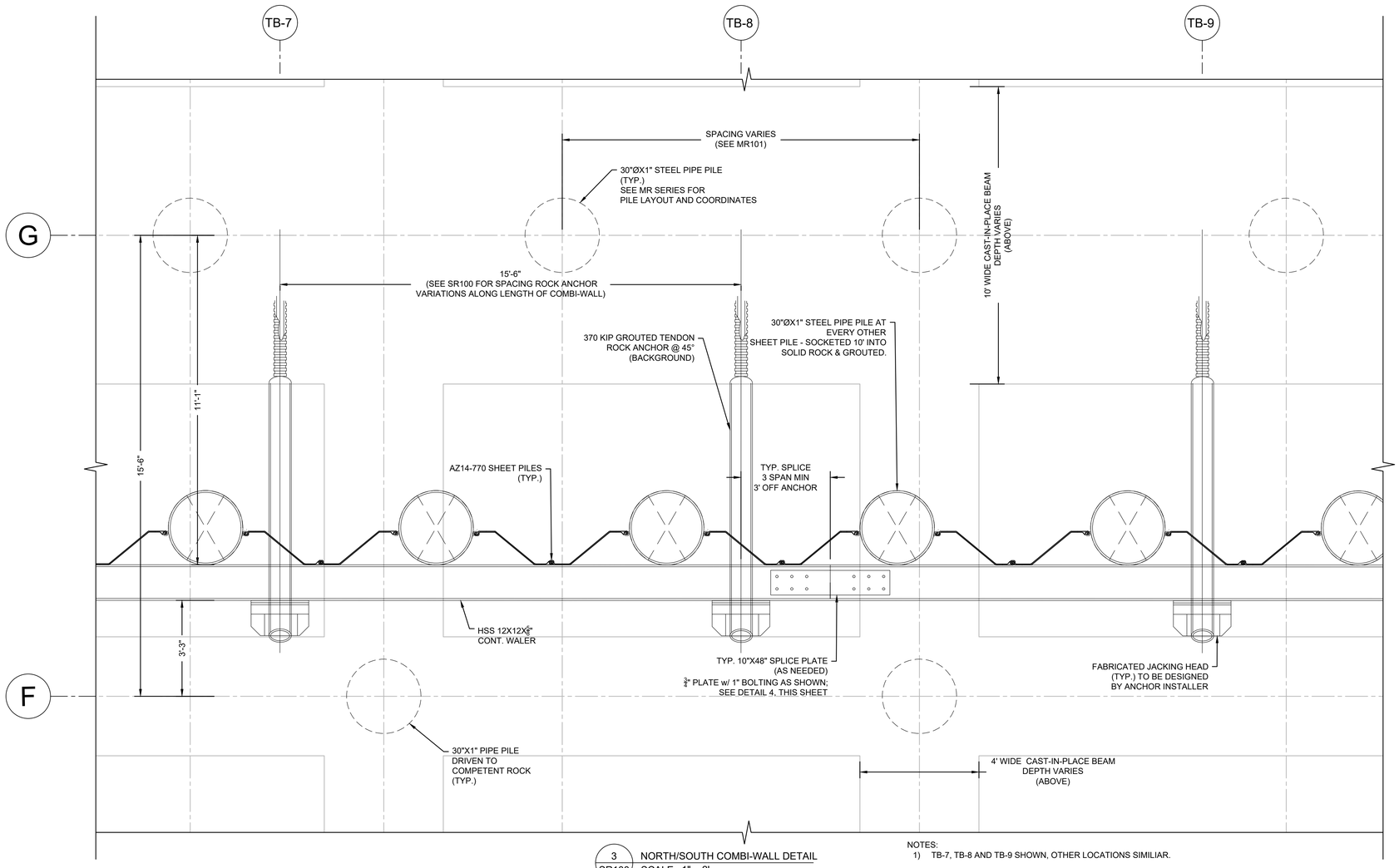
SHEET TITLE:
NORTH END SECTION

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

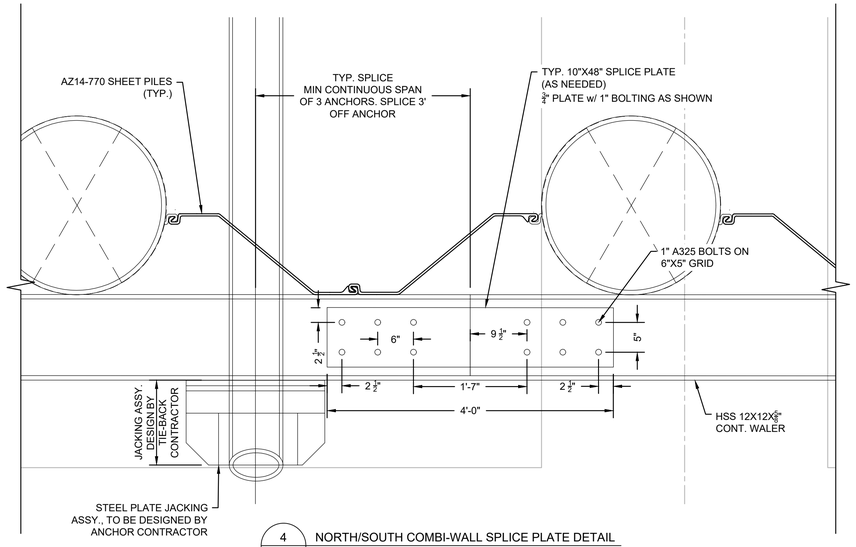
SHEET NUMBER
SR307

Tuesday, November 11, 2025 8:50:05 AM
DWG Filename: 24m070.04 masscec bulkhead sections.dwg Layout: sr307
DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

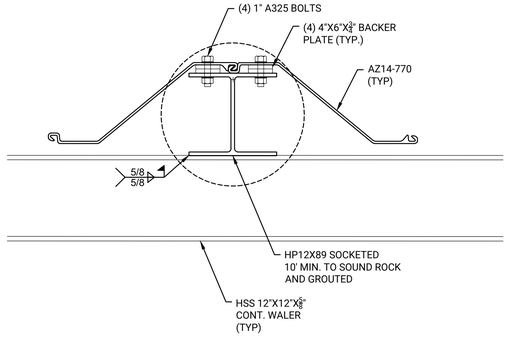



3 SR100 NORTH/SOUTH COMBI-WALL DETAIL
SCALE: 1" = 2'

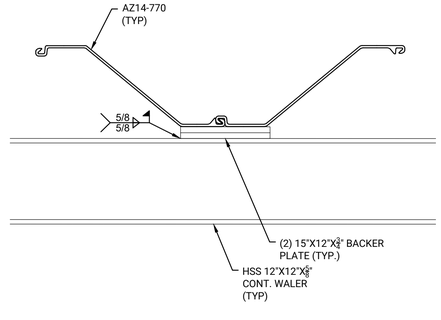
NOTES:
1) TB-7, TB-8 AND TB-9 SHOWN, OTHER LOCATIONS SIMILIAR.




4 SR100 NORTH/SOUTH COMBI-WALL SPLICE PLATE DETAIL
SCALE: 1" = 1'




5 SR101 SR102 4"X6"X3/4" BACKER PLATE DETAIL
SCALE: 1" = 1'




6 SR101 SR102 15"X12"X3/4" BACKER PLATE DETAIL
SCALE: 1" = 1'

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

GRAPHIC SCALE
0 1 2 2
(IN FEET)
1 INCH = 2 FEET

Foth

PROJECT:
**MASSCEC NBMCT - PHASE 3**
**BULKHEAD REPLACEMENT PROJECT**
**(SITE 4)**

OWNER:
**NEW BEDFORD MARINE**
**COMMERCE TERMINAL (NBMCT)**
**NEW BEDFORD, MA**

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

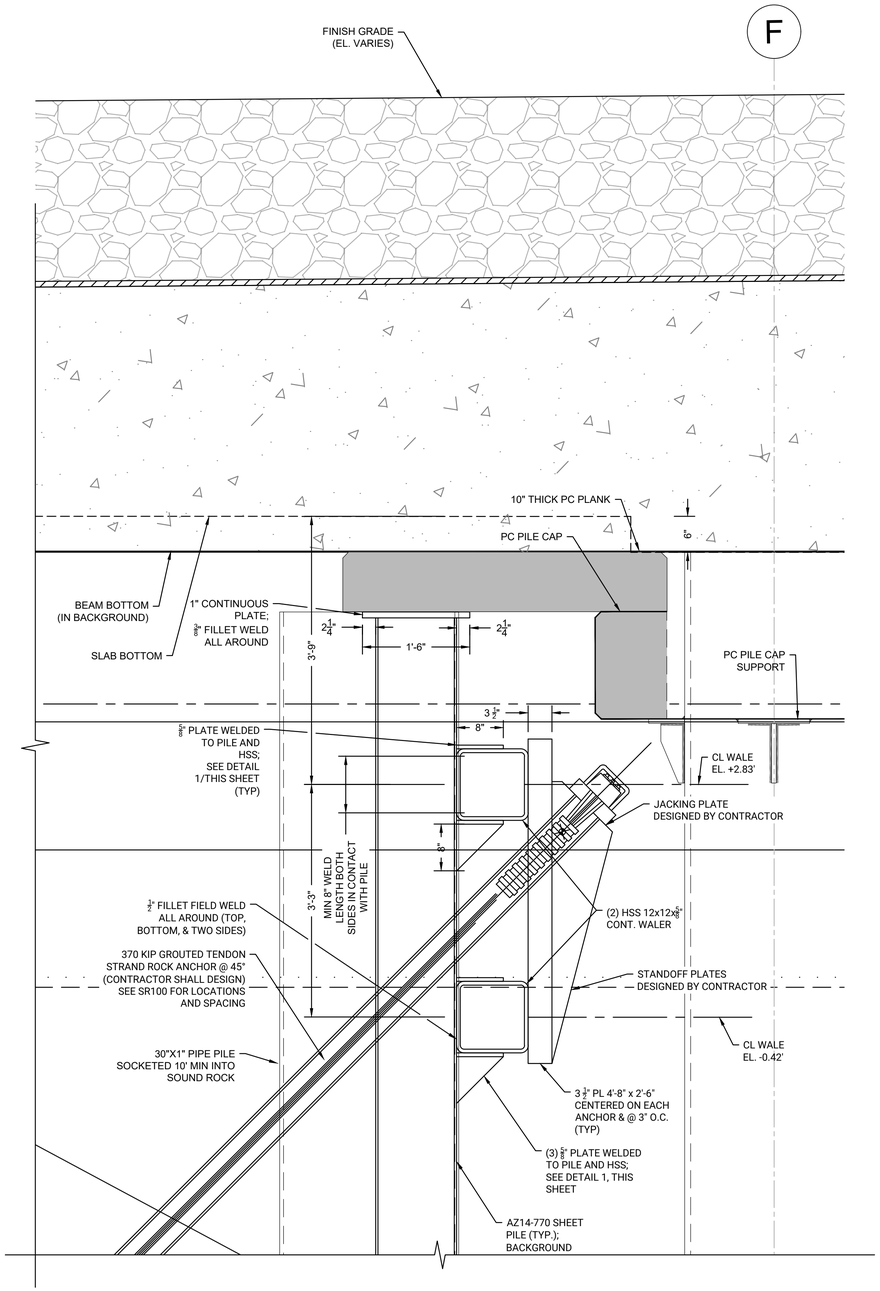
SHEET TITLE:
COMBI-WALL
DETAILS 1 OF 2

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

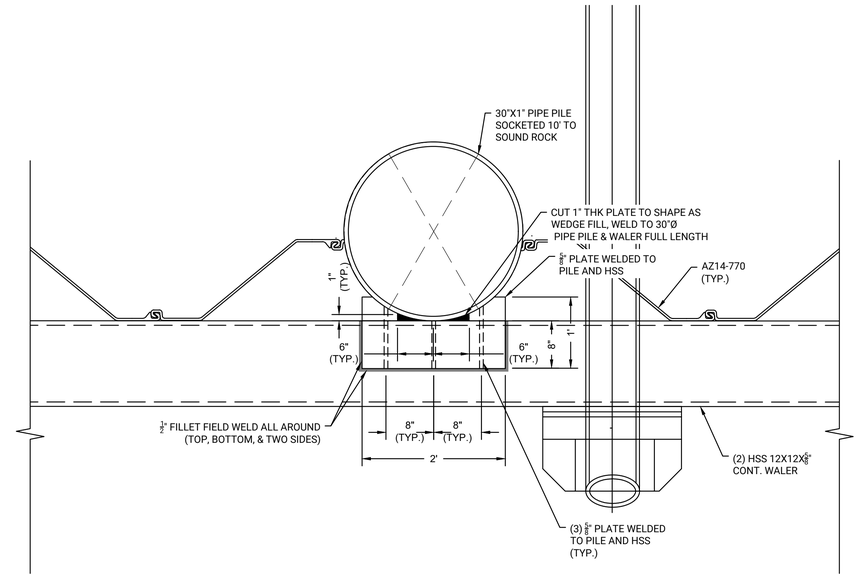
PROJECT NO: 0024M070.04

SHEET NUMBER
SR500

Tuesday, November 11, 2025 8:51:00 AM
DWG Filename: 24m070.04 masscec bulkhead details.dwg Layout: sr500
DWG Folder Location: PW:\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




A / SR301 ROCK ANCHOR DETAILS
SCALE: 1" = 1'




1 / SR501 COMBI-WALL WALER CONNECTION
SCALE: 1" = 1'

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

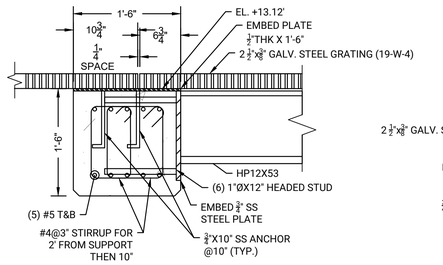
SHEET TITLE:
COMBI-WALL
DETAILS 2 OF 2

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

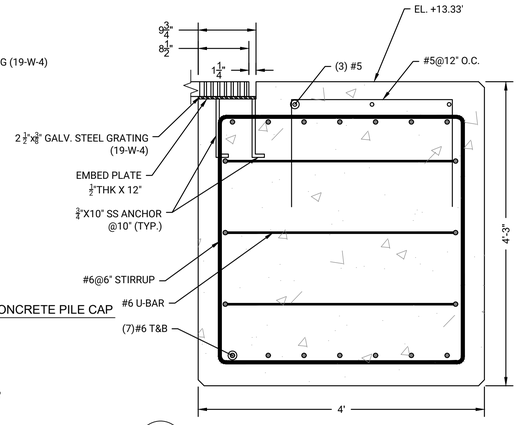
SHEET NUMBER
SR501

Tuesday, November 11, 2025 8:51:30 AM
DWG Filename: 24m070.04 masscec bulkhead details.dwg Layout: sr501
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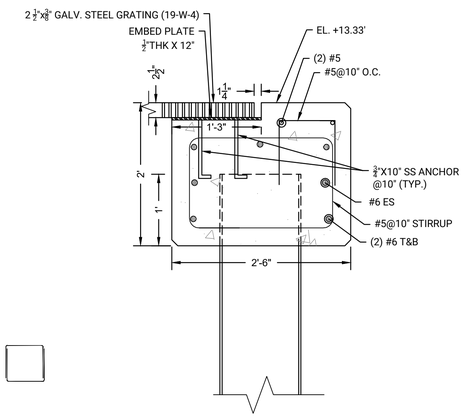



E SR102 EAST/WEST STEEL BULKHEAD 1'-6"X1'-6" CONCRETE PILE CAP
SCALE: 1"=1'

E SR302 SR303



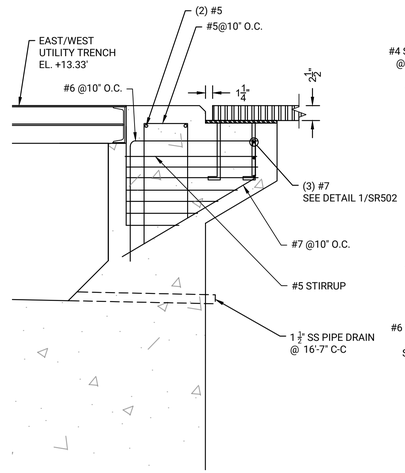

F SR102 SR303 NORTH CLOSURE 4'-0"X4'-3"CONCRETE PILE CAP
SCALE: 1"=1'




G SR102 SR302 EAST/WEST STEEL BULKHEAD 2'-6"X2'-0" CONCRETE PILE CAP
SCALE: 1"=1'

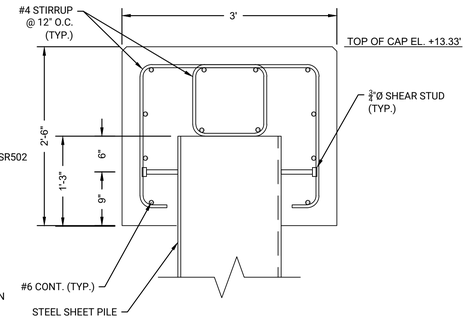
G SR304 SR305

G SR306

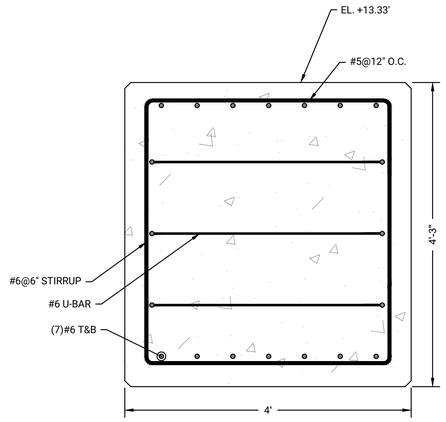



H SR102 1' WIDE CONCRETE CORBEL
SCALE: 1"=1'

H SR302 SR305



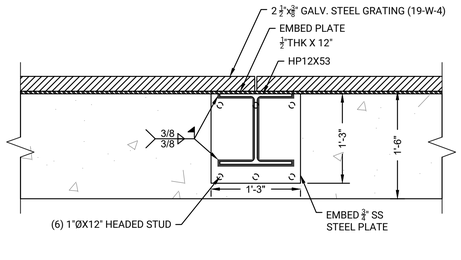

L SR101 SR102 3'-0" X 2'-6" CONCRETE PILE CAP
SCALE: 1"=1'



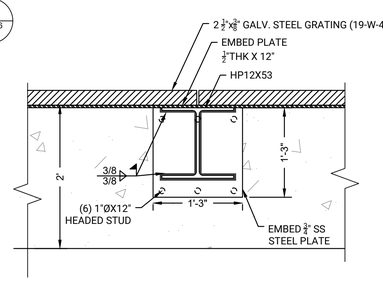

I SR102 NORTH CLOSURE 4'-0"X4'-3" CONCRETE PILE CAP
SCALE: 1"=1'

I SR304 SR306

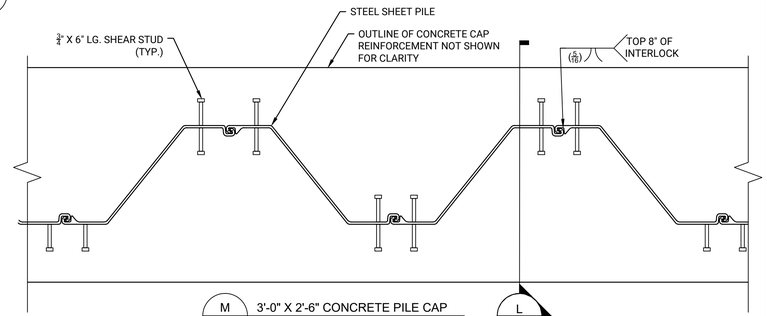
NOTES:
1) SEE DETAIL H/SR503 FOR 24"Ø STEEL PIPE PILE REINFORCEMENT CAGE




J SR102 HP12X53 GRATING SUPPORT CONNECTION TO 1'-6"X1'-6" CONC. PILE CAP
SCALE: 1"=1'

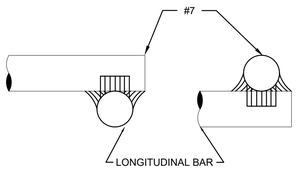



K SR102 HP12X53 GRATING SUPPORT CONNECTION TO 1'-6"X1'-6" CONC. PILE CAP
SCALE: 1"=1'

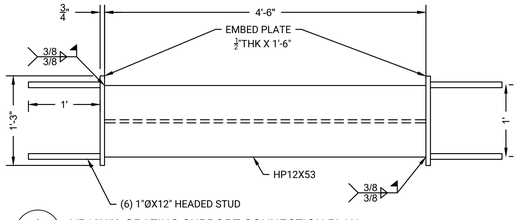



M SR101 SR102 3'-0" X 2'-6" CONCRETE PILE CAP
SCALE: 1"=1'

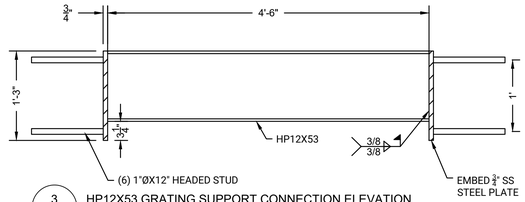
L MR502



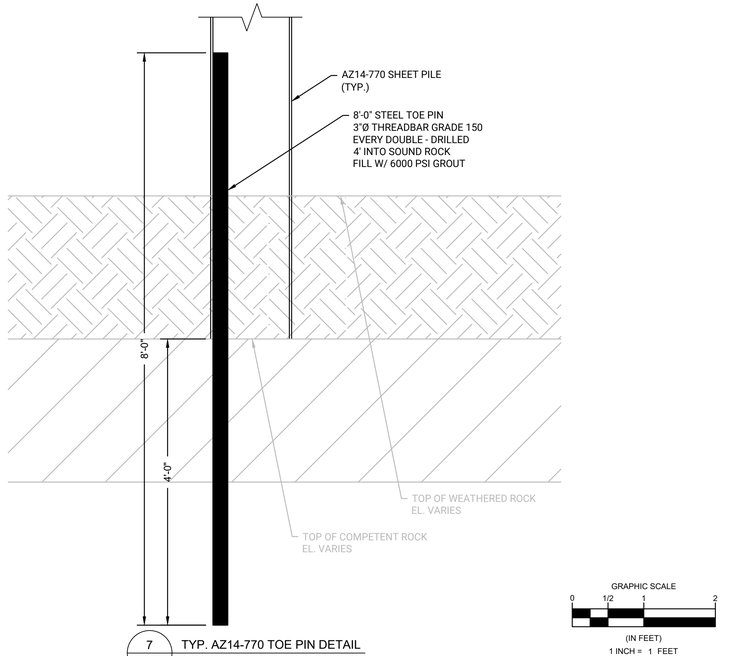

1 MR502 LONGITUDINAL BAR WELD DETAIL
SCALE: NTS



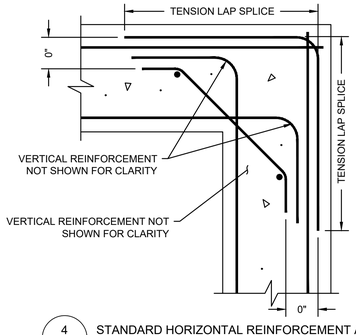

2 SR102 HP12X53 GRATING SUPPORT CONNECTION PLAN
SCALE: 1"=1'



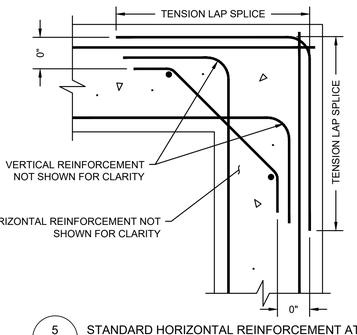

3 SR102 HP12X53 GRATING SUPPORT CONNECTION ELEVATION
SCALE: 1"=1'



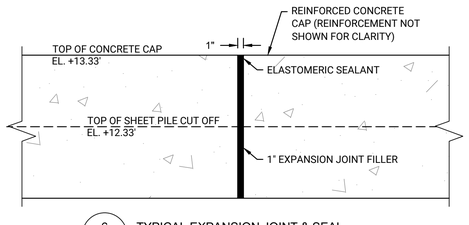

7 SR102 TYP. AZ14-770 TOE PIN DETAIL
SCALE: 1" = 1'




4 SR102 STANDARD HORIZONTAL REINFORCEMENT AT CORNERS
SCALE: NTS




5 SR102 STANDARD HORIZONTAL REINFORCEMENT AT CORNERS
SCALE: NTS




6 SR101 SR102 TYPICAL EXPANSION JOINT & SEAL
SCALE: NTS

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

Foth

PROJECT: MASSCEC NBMCT - PHASE 3 BULKHEAD REPLACEMENT PROJECT (SITE 4)

OWNER: NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT) NEW BEDFORD, MA

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

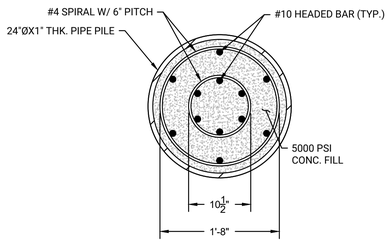
SHEET TITLE:
EAST-WEST BULKHEAD DETAILS

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

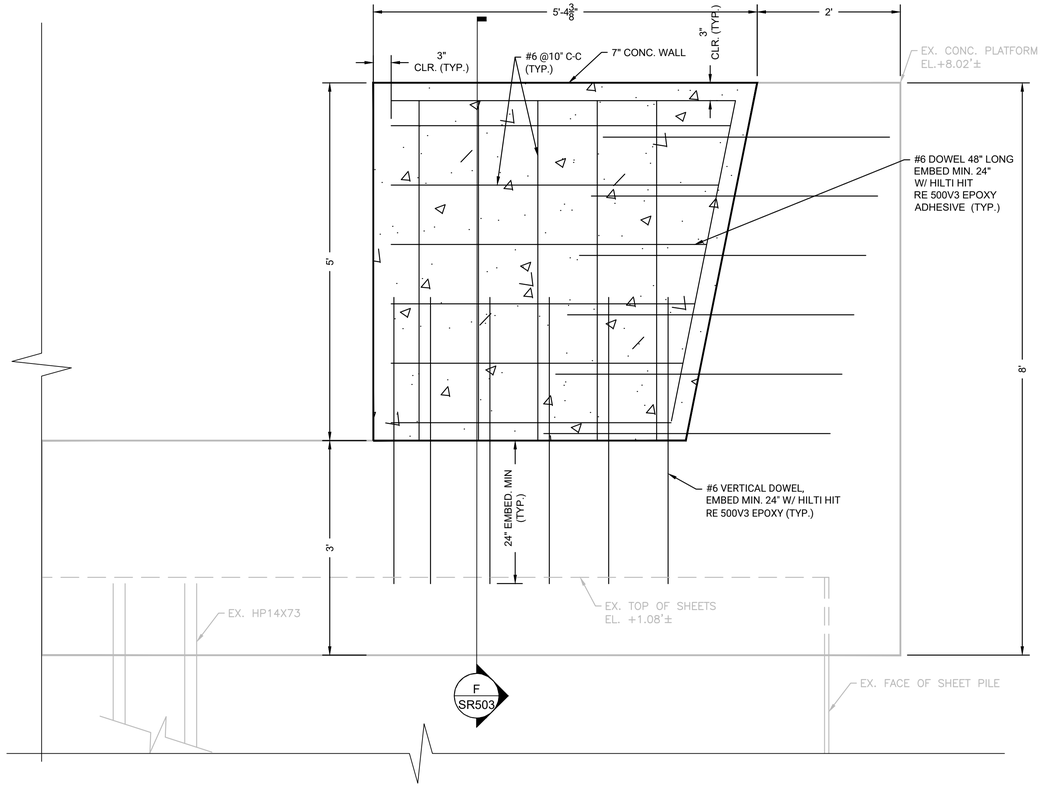
PROJECT NO: 0024M070.04

SHEET NUMBER
SR502

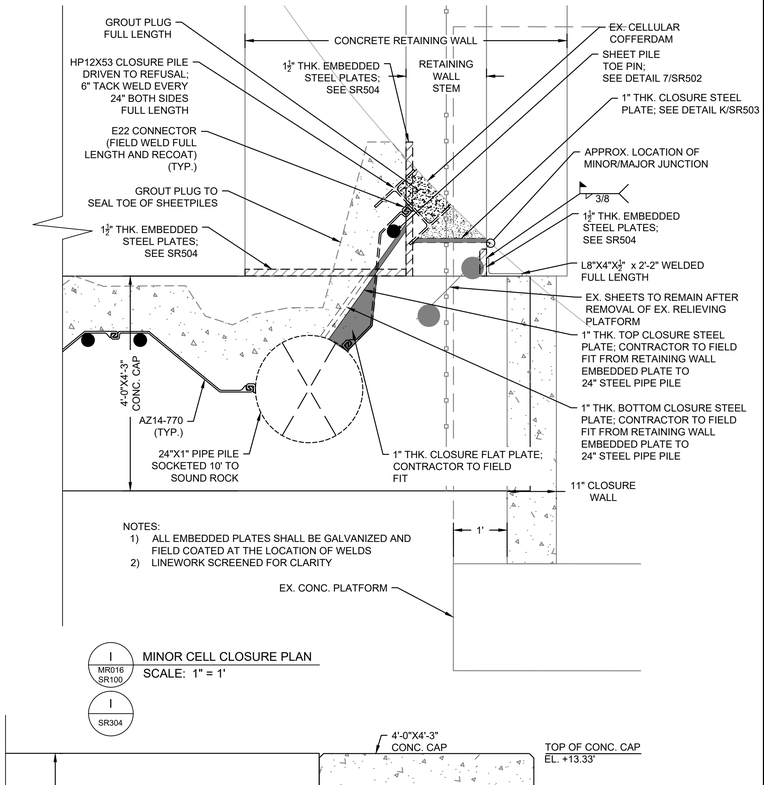
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G — 24" DIA. STEEL PIPE PILE REINFORCEMENT CAGE
SCALE: 1" = 1'



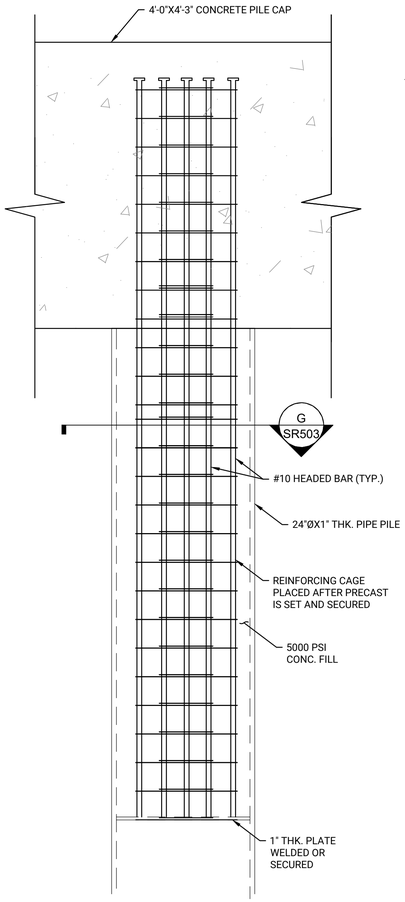

E SR100 — CONCRETE CLOSURE WALL REINFORCEMENT DETAILS
SCALE: 1" = 1'



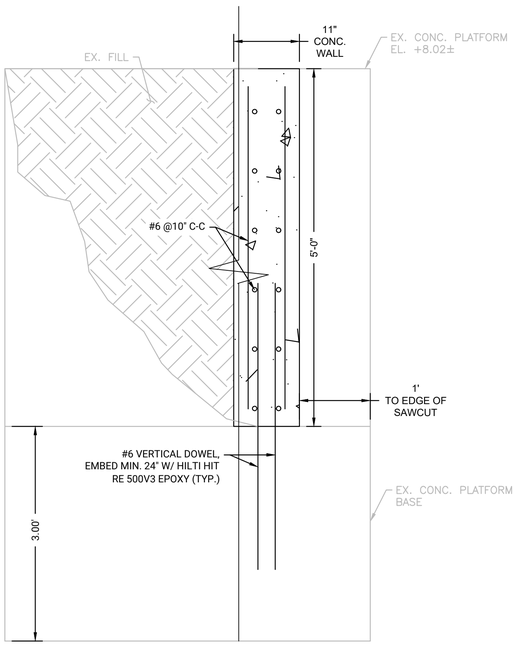

NOTES:
1) ALL EMBEDDED PLATES SHALL BE GALVANIZED AND FIELD COATED AT THE LOCATION OF WELDS
2) LINEWORK SCREENED FOR CLARITY

I MR016 SR100 — MINOR CELL CLOSURE PLAN
SCALE: 1" = 1'

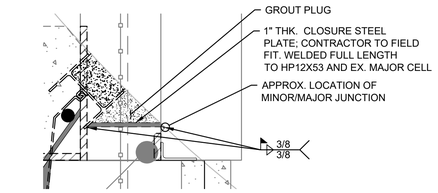
I SR304



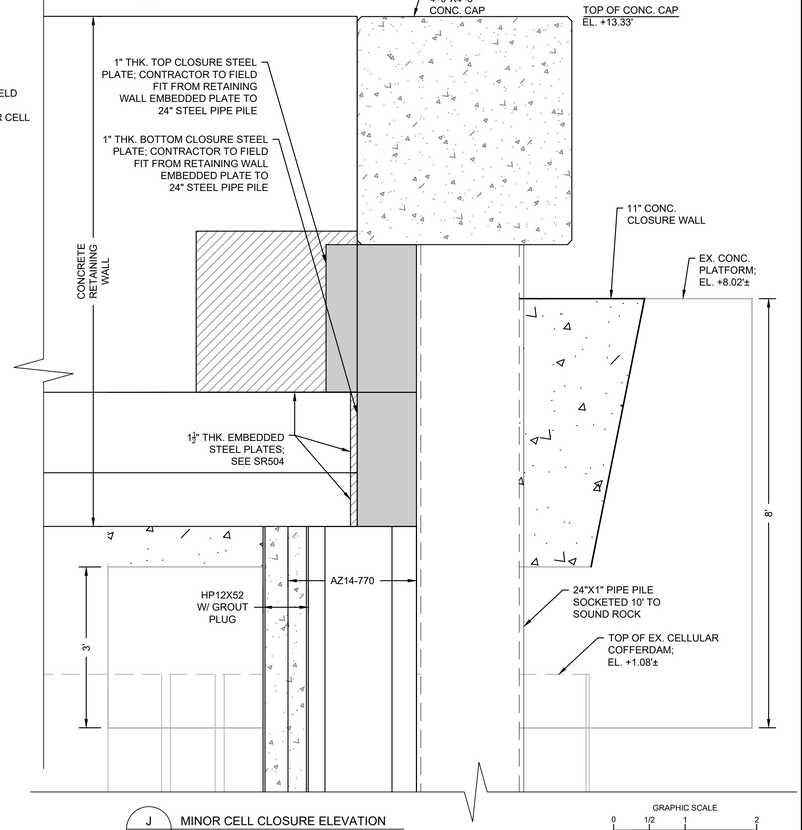

H SR502 — 24" DIA. STEEL PIPE PILE REINFORCEMENT CAGE
SCALE: 1" = 1'




F SR102 — CONCRETE CLOSURE WALL SECTION
SCALE: 1" = 1'




K SR503 — 1" THK. CLOSURE STEEL PLATE
SCALE: 1" = 1'




J SR102 — MINOR CELL CLOSURE ELEVATION
SCALE: 1" = 1'

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

| REVISIONS | | | |
|---|---|---|---|
| NO | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

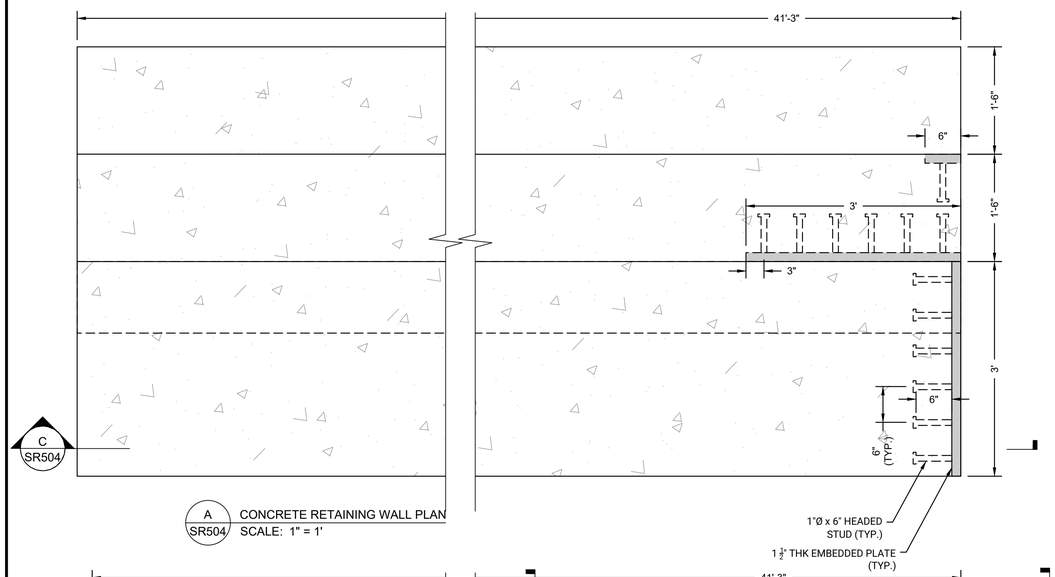
SHEET TITLE:
CONCRETE CLOSURE DETAILS

ISSUANCE:
IFB DRAWINGS
(11/10/2025)

PROJECT NO: 0024M070.04

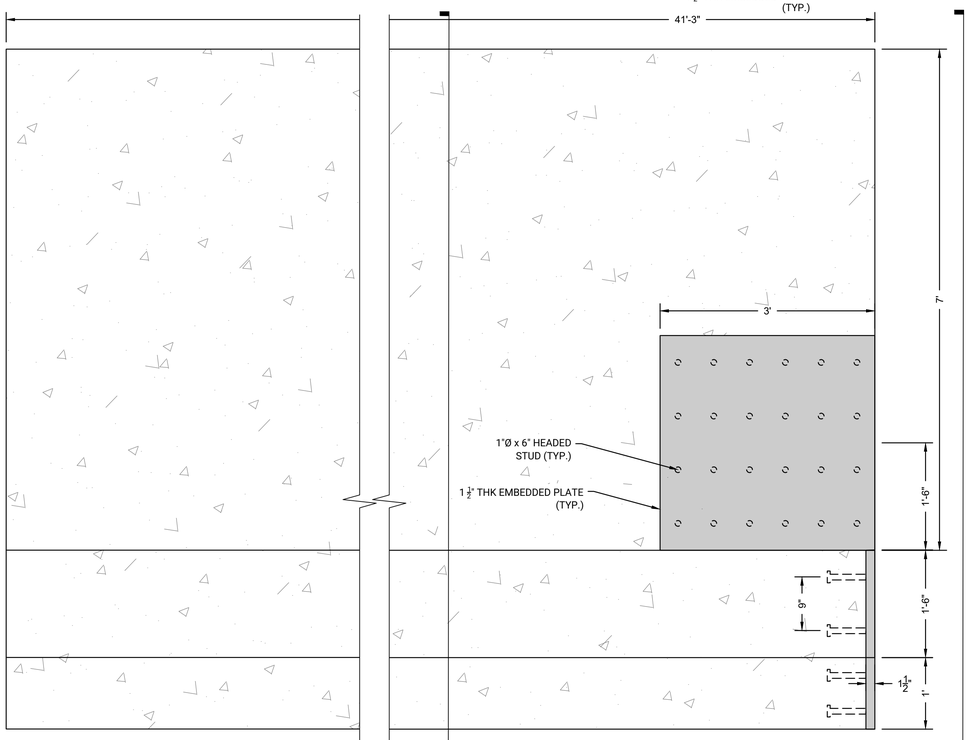
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C SR504

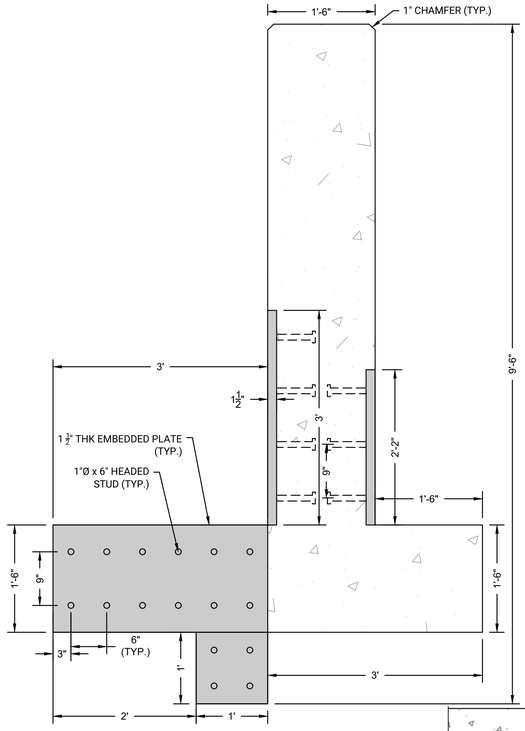
A SR504 CONCRETE RETAINING WALL PLAN
SCALE: 1" = 1'




C SR504 CONCRETE RETAINING WALL ELEVATION
SCALE: 1" = 1'

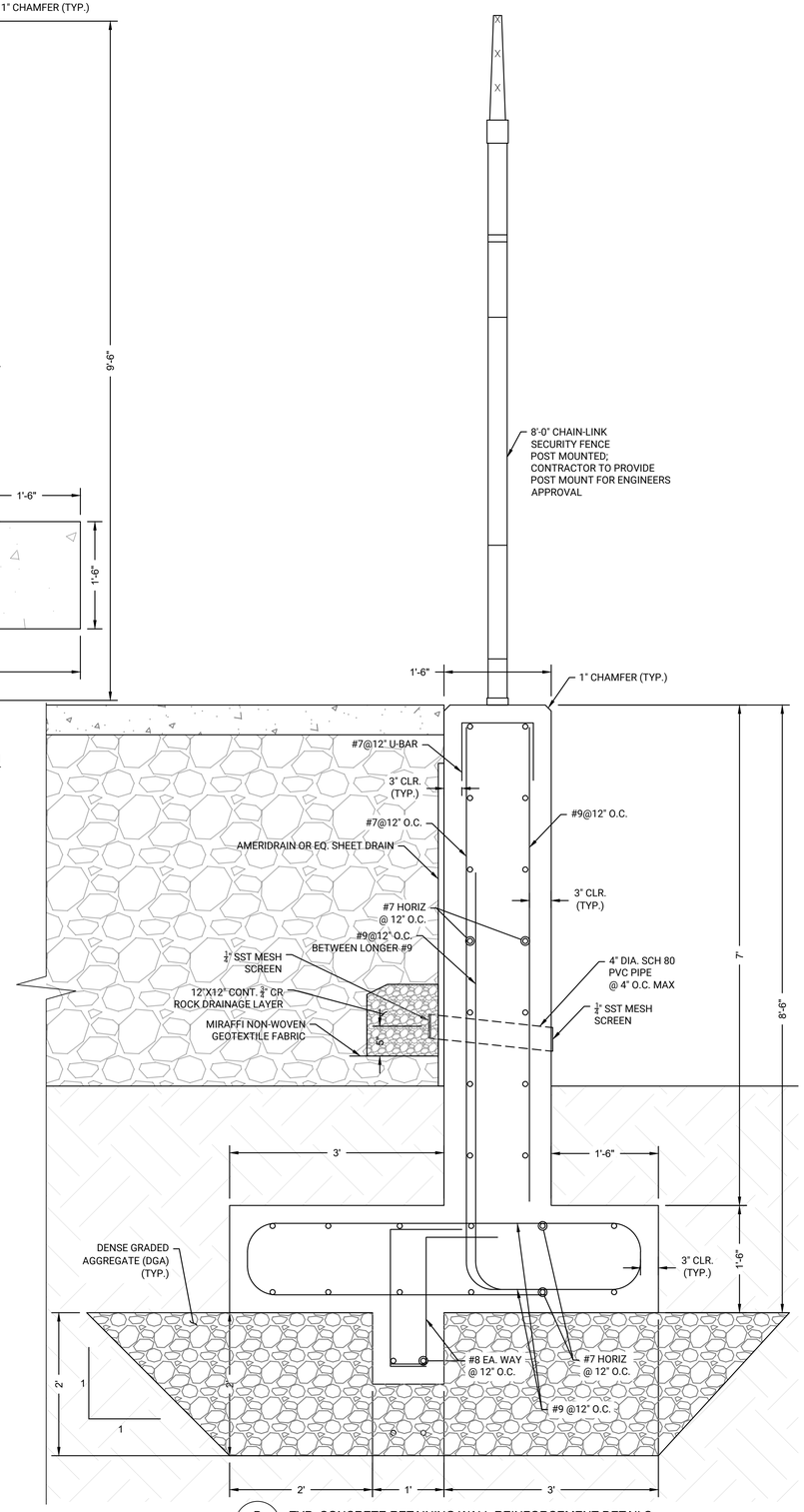
B SR504

D SR504




D SR504 CONCRETE RETAINING WALL EMBEDDED PLATE SECTION
SCALE: 1" = 1'

NOTES:
1) REINFORCEMENT NOT SHOWN FOR CLARITY




B SR101 SR102

B SR304 SR305

B SR306

B SR101 SR102 TYP. CONCRETE RETAINING WALL REINFORCEMENT DETAILS
SCALE: 1" = 1'

GRAPHIC SCALE
0 1/2 1 2
(IN FEET)
1 INCH = 1 FEET

Foth

PROJECT:
MASSCEC NBMCT - PHASE 3
BULKHEAD REPLACEMENT PROJECT
(SITE 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL (NBMCT)
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 11/7/2025 |
| DESIGNED | MXS6 | 11/7/2025 |
| CHECKED | AIM/JSG | 11/7/2025 |

PE STAMP

PE STAMP

SHEET TITLE:
CONCRETE RETAINING WALL

ISSUANCE:
**IFB DRAWINGS**
**(11/10/2025)**

PROJECT NO: 0024M070.04

SHEET NUMBER
SR504

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## ATTACHMENT 5: PROJECT PERMITS

- **Project License and Permit Requirements**
- **Chapter 91 - Minor Project Modification to DPW License No. 5579 (Massachusetts Department of Environmental Protection, dated May 23, 2024)**
- **Order of Conditions SE 49-0973 (New Bedford Conservation Commission, issued September 3, 2025)**
- **General Permit Authorization File Number: NAE-2022-01807 (U.S. Army Corps of Engineers, dated September 29, 2025)**
- **Approval for Stormwater Management Permit No. SMP-25-3 for Parcel ID: 031-0263 (City of New Bedford, September 3, 2025)**
- **Approval for PCB Cleanup and Disposal for 18 and 54 Wright Street (U.S. Environmental Protection Agency, July 24, 2025)**

**APPENDIX A**

## Project License and Permit Requirements

## MassCEC
## Shuster Bulkhead Rehabilitation

| MassCEC Shuster Bulkhead Rehabilitation Permits & Authorizations | | | |
|---|---|---|---|
| Agency | Permit/Authorization | Issued/Received | Expires |
| New Bedford Conservation Commission | Order of Conditions SE049-0973 | 9/3/2025 | 9/3/2028 |
| USACE | NAE -2022-01807 | 9/29/2025 | 6/1/2028 |
| MA DEP Ch. 91 | License No. 5579 Minor Modification | 5/23/2024 | N/A |
| MA DEP 401 WQC | N/A | 4/8/2024 | N/A |

### 1. License and Permit Requirements

The lists below are the notification and construction requirements including all of the issued licenses and permits for the project. The number and description listed below are directly associated with the Conditions listed in each license or permit. This list should be used for reference purposes only and does not override the verbiage or content of the License or Permits referenced.

| MassCEC Shuster Bulkhead Rehabilitation Construction Requirements | | | | | |
|---|---|---|---|---|---|
| Phase | Permit | Satisfied | Regulation | Number | Description |
| Preconstruction | OOC | | MA General | 9 | Order must be recorded at the registry of deeds |
| | | | MA General | 10 | Install 2-3 square foot sign with "MassDEP File No. SE049-0973" |
| | | | MA General | 17 | Flag wetlands on site (to be maintained during construction) |
| | | | New Bedford Con Com | 21 | Provide Con Com with Copies of All Permits |
| | | | New Bedford Con Com | 27 | Notify Con Com of work start date prior to construction |
| | | | New Bedford Con Com | 36 | Written documentation that the plans on file with the Con Com are consistent with permits and approvals of other City Boards and Departments |
| | | | New Bedford Con Com | 37 | Prior to any construction, an on-site inspection is to be held between the contractor, engineer, and the Con Com Agent to go over the sequence of construction and all other requirements as noted on the OOC. A written construction schedule is to be received at that time. |
| | | | New Bedford Con Com | 48 | Time-of-year restrictions should be observed on all in-water, silt producing activities to protect sensitive life stages of winter flounder. No in-water, silt-producing activities should take place from January 15th - May 31st of any year. |
| | NAE | | USACE | 2 | Complete and return the Work Start Notification Form at least two weeks before the anticipated start date |
| | | | | | |
| | OOC | | MA General | 18 | Inspect erosion controls on a daily basis |

| | | | | | |
|---|---|---|---|---|---|
| During Construction | | | New Bedford Con Com | 39 | NOI, OOC and approved plans shall be retained on site during construction |
| | | | New Bedford Con Com | 40 | All demolition and construction debris is to be disposed of in a legal upland location. |
| | | | New Bedford Con Com | 41 | Fuel Shall not be permanently stored within a flood zone and refueling shall be conducted as far from the resource areas and their buffer zones as is reasonable. |
| | | | New Bedford Con Com | 41 | A spill control kit including absorbent materials shall be on site at all times. |
| | | | New Bedford Con Com | 46 | Deploy and maintain impermeable turbidity curtain of sufficient length and vertical depth sufficiently seaward of work area for all silt producing activities. Curtain shall remain in place until work is completed. |
| | | | New Bedford Con Com | 47 | The discharge and/or cleanout of any concrete wash water to or excess cement to New Bedford Harbor is forbidden. All cleanouts shall be in a designated upland and away from any storm drains. |
| | | | New Bedford Con Com | 49 | Concrete delivery vehicles should be prohibited from washing down equipment on site. This activity could potentially wash excess concrete and hydrocarbons into marine resource areas. |
| | | | New Bedford Con Com | 50 | Applicant shall communicate in writing to the Con Com Agent when the turbidity curtain and landside erosion controls are installed prior to the commencement of silt producing activities and/or disturbed soils respectively. |
| | NAE | | USACE | 4 | All piles that are selected to be removed shall be fully removed to the extent that is operationally feasible. If full removal of the piles is not operationally feasible then the piles shall be cut as close to the mudline as possible and driven at least 3 feet further into the substrate or until refusal. |
| | | | USACE | 5 | Vibratory hammer shall be used as often as practicable, impact hammer shall only to be used when pile driving via vibratory hammer is not feasible. |
| | | | USACE | 6 | Vibratory pile driving shall be initiated for 15 seconds at reduced energy followed by a one-minute waiting period. |
| | | | USACE | 7 | Impact pile driving shall commence with an initial set of three strikes by the hammer at 40% energy, followed by a one-minute wait period, then two subsequent 3-strike sets at 40% energy, with one minute waiting periods, before initiating continuous impact driving |
| | | | USACE | 8 | Turbidity curtains shall be installed for the duration of all in-water work and shall be maintained in working condition. |

| | | | | | |
|---|---|---|---|---|---|
| | | | USACE | 9 | Time of the Year (TOY) restriction will be applied from January 15th to May 31st of any year to all in-water work. No in-water work shall take place within the TOY period. TOY restriction will not apply if the turbidity curtains are installed at least a week prior to the start of the TOY restriction period. The turbidity curtains shall be removed outside of the TOY restriction period |
| | | | USACE | 10 | Maintain project vessels operating within the action area to speed limits below 10 knots and dredge vessel speeds of 4 knots maximum, while dredging |
| | | | USACE | 11 | Maintain a 1,500-foot buffer between project vessels and ESA-listed whales and a 150-foot buffer between project vessels and sea turtles unless the vessel is navigating to an in-water disposal site/activity. If the vessel is navigating to an in-water disposal site/activity, refer to and include the conditions contained in the appropriate GARFO-USACE/EPA consultation for the disposal site. |
| | | | USACE | 12 | The number of project vessels must be limited to the greatest extent possible, as appropriate to size and scale of project. |
| | | | USACE | 13 | The permanent net increase in vessels resulting from a project (e.g., dock/float/pier/boating facility) must not exceed two non-commercial vessels. |
| | ALL PERMITS | | | | Keep a copy of all permits on-site during construction |
| | | | | | |
| Postconstruction | OOC | | New Bedford Con Com | 44 | An as-built plan shall be submitted upon completion of project and prior to issuance of a certificate of compliance. |
| | | | MA General | 12 | File a Certificate of Compliance with the Conservation Board and record once received |
| | | | MA General | 19b | As-Built final construction BMP plans are included, signed and stamped by a PE, certifying the site is fully stabilized |
| | | | MA General | 19c | Execute and Submit an Operations and Maintenance Compliance Statement & Plan (see Order of Conditions) |
| | | | MA General | 19d | Submit Stormwater Pollution Prevention Plan if applicable |
| | | | MA General | 19e | Submit legally binding agreement for the responsibility of the drainage BMP's. |
| | | | MA General | 19g | Maintain an operation and maintenance log for 3 consecutive calendar years (see Order of conditions) |
| | NAE | | USACE | 3 | Submit the required information listed in the OOC to request a Certificate of Compliance from the commission within 30 days of work completion. |

15



SO.BRISTOL #16825 Bk:15315 Pg:074
09/18/2025 03:36 PM OCDN Pg 1/15

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands

# WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
SE049-0973
MassDEP File #

eDEP Transaction #

New Bedford
City/Town

## A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. From: New Bedford
Conservation Commission

2. This issuance is for (check one): a. ■ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

Bruce (a. First Name) | Carlisle (b. Last Name)

Massachusetts Clean Energy Center
c. Organization

294 Washington Street Suite 1150
d. Mailing Address

Boston (e. City/Town) | MA (f. State) | 02108 (g. Zip Code)

4. Property Owner (if different from applicant):

a. First Name | b. Last Name

Massachusetts Clean Energy Technology Center
c. Organization

63 Franklin Street 3rd Floor
d. Mailing Address

Boston (e. City/Town) | MA (f. State) | 02110 (g. Zip Code)

5. Project Location:

4 Wright Street
a. Street Address

New Bedford
b. City/Town

031
c. Assessors Map/Plat Number

288, 263
d. Parcel/Lot Number

Latitude and Longitude, if known: 41 d 62 m 42 s (d. Latitude) | -70 d 91 m 46 s (e. Longitude)

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
# WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
SE049-0973
MassDEP File #

eDEP Transaction #

New Bedford
City/Town

## A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Bristol (S.D.)
a. County

b. Certificate Number (if registered land)

11982
c. Book

152
d. Page

7. Dates: 8/20/2025 a. Date Notice of Intent Filed; 9/2/2025 b. Date Public Hearing Closed; 9/3/2025 c. Date of Issuance

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

NEW BEDFORD MARINE COMMERCE TERMINALSHUSTER BULKHEAD REPLACEMENT
a. Plan Title

Benjamin Foley
b. Prepared By

Mark Salehi, PE
c. Signed and Stamped by

August 2025
d. Final Revision Date

See Plans
e. Scale

f. Additional Plan or Document Title

g. Date

## B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☐ Public Water Supply b. ■ Land Containing Shellfish c. ■ Prevention of Pollution

d. ☐ Private Water Supply e. ■ Fisheries f. ■ Protection of Wildlife Habitat

g. ☐ Groundwater Supply h. ■ Storm Damage Prevention i. ■ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

**Approved** subject to:

a. ■ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.



**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
# WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
SE049-0973
MassDEP File #

eDEP Transaction #
New Bedford
City/Town

## B. Findings (cont.)

**Denied** because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) _____ a. linear feet

**Inland Resource Area Impacts:** Check all that apply below. (For Approvals Only)

| Resource Area | Proposed Alteration | Permitted Alteration | Proposed Replacement | Permitted Replacement |
|---|---|---|---|---|
| 4. ☐ Bank | a. linear feet | b. linear feet | c. linear feet | d. linear feet |
| 5. ☐ Bordering Vegetated Wetland | a. square feet | b. square feet | c. square feet | d. square feet |
| 6. ☐ Land Under Waterbodies and Waterways | a. square feet | b. square feet | c. square feet | d. square feet |
| | e. c/y dredged | f. c/y dredged | | |
| 7. ☐ Bordering Land Subject to Flooding | a. square feet | b. square feet | c. square feet | d. square feet |
| Cubic Feet Flood Storage | e. cubic feet | f. cubic feet | g. cubic feet | h. cubic feet |
| 8. ☐ Isolated Land Subject to Flooding | a. square feet | b. square feet | | |
| Cubic Feet Flood Storage | c. cubic feet | d. cubic feet | e. cubic feet | f. cubic feet |
| 9. ☐ Riverfront Area | a. total sq. feet | b. total sq. feet | | |
| Sq ft within 100 ft | c. square feet | d. square feet | e. square feet | f. square feet |
| Sq ft between 100-200 ft | g. square feet | h. square feet | i. square feet | j. square feet |

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
# WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: SE049-0973
MassDEP File #

eDEP Transaction #

New Bedford
City/Town

## B. Findings (cont.)

**Coastal Resource Area Impacts:** Check all that apply below. (For Approvals Only)

| | Proposed Alteration | Permitted Alteration | Proposed Replacement | Permitted Replacement |
|---|---|---|---|---|
| 10. ☒ Designated Port Areas | Indicate size under Land Under the Ocean, below | | | |
| 11. ☒ Land Under the Ocean | 10,181 a. square feet | 10,181 b. square feet | | |
| | c. c/y dredged | d. c/y dredged | | |
| 12. ☐ Barrier Beaches | Indicate size under Coastal Beaches and/or Coastal Dunes below | | | |
| 13. ☐ Coastal Beaches | a. square feet | b. square feet | cu yd c. nourishment | cu yd d. nourishment |
| 14. ☐ Coastal Dunes | a. square feet | b. square feet | cu yd c. nourishment | cu yd d. nourishment |
| 15. ☐ Coastal Banks | a. linear feet | b. linear feet | | |
| 16. ☐ Rocky Intertidal Shores | a. square feet | b. square feet | | |
| 17. ☐ Salt Marshes | a. square feet | b. square feet | c. square feet | d. square feet |
| 18. ☐ Land Under Salt Ponds | a. square feet | b. square feet | | |
| | c. c/y dredged | d. c/y dredged | | |
| 19. ☐ Land Containing Shellfish | a. square feet | b. square feet | c. square feet | d. square feet |
| 20. ☐ Fish Runs | Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above | | | |
| | a. c/y dredged | b. c/y dredged | | |
| 21. ☒ Land Subject to Coastal Storm Flowage | 730 a. square feet | 730 b. square feet | | |
| 22. ☐ Riverfront Area | a. total sq. feet | b. total sq. feet | | |
| Sq ft within 100 ft | c. square feet | d. square feet | e. square feet | f. square feet |
| Sq ft between 100-200 ft | g. square feet | h. square feet | i. square feet | j. square feet |

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
# WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
SE049-0973
MassDEP File #

eDEP Transaction #

New Bedford
City/Town

## B. Findings (cont.)

* #23. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23. ☐ Restoration/Enhancement *:

a. square feet of BVW | b. square feet of salt marsh

24. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

## C. General Conditions Under Massachusetts Wetlands Protection Act

**The following conditions are only applicable to Approved projects.**

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. The work is a maintenance dredging project as provided for in the Act; or
   b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
   c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on 9/3/2028 unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
# WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
SE049-0973
MassDEP File #

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City/Town

## C. General Conditions Under Massachusetts Wetlands Protection Act

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number SE049-0973 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
**WPA Form 5 – Order of Conditions**
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
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MassDEP File #

eDEP Transaction #
New Bedford
City/Town

## C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

19. The work associated with this Order (the "Project")
    (1) ☐ is subject to the Massachusetts Stormwater Standards
    (2) ■ is NOT subject to the Massachusetts Stormwater Standards

    **If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:**

    a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

    b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
    *i.* all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
    *ii.* as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
    *iii.* any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
**WPA Form 5 – Order of Conditions**
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
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New Bedford
City/Town

## C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

*iv.* all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

*v.* any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 19(f) through 19(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 19(f) through 19(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
# WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
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New Bedford
City/Town

## C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

See Special Conditions 21 through 50

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
# WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
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New Bedford
City/Town

## D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☐ Yes ☐ No

2. The _____ hereby finds (check one that applies):
Conservation Commission

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

   _____ 1. Municipal Ordinance or Bylaw
   _____ 2. Citation

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ■ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

   Wetlands Ordinance — 1. Municipal Ordinance or Bylaw
   Sec. 15-101 thru 15-112 — 2. Citation

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.
   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

   MA DEP General Conditions 1 through 20 are Special Conditions pursuent to the City of New Bedford Wetlands Ordinance (Sec. 15-101 through 15-112). In addition, see attached Special Conditions 21 through 50.

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
# WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
SE049-0973
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eDEP Transaction #

New Bedford
City/Town

## E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

09/03/2025
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

| Signature | Printed Name |
|---|---|
| | Scott Grant |
| | Kimberly Roux |
| | Peter Blanchard |
| | Sean M. Carey |
| | |
| | |
| | |
| | |

☑ by hand delivery on

09/03/2025
Date

☐ by certified mail, return receipt requested, on

Date

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
**WPA Form 5 – Order of Conditions**
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
SE049-0973
MassDEP File #

eDEP Transaction #

New Bedford
City/Town

## F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
# WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
SE049-0973
MassDEP File #

eDEP Transaction #
New Bedford
City/Town

## G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

New Bedford
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

New Bedford
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location | MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for: Property Owner

and has been noted in the chain of title of the affected property in:

Book

In accordance with the Order of Conditions i

Date

South Bristol County ROD
Book 15315 Page 074 Type: OCDN
Recorded on 09/18/2025 at 03:36 PM Page 1/15
TID: 218278 Doc # 202500168250

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands

# Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

## A. Request Information

1. Location of Project

a. Street Address

b. City/Town, Zip

c. Check number

d. Fee amount

**Important:** When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.




2. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

4. DEP File Number:

South Bristol County ROD
Book 15315 Page 074 Type: OCDN
Recorded on 09/18/2025 at 03:36 PM Page 1/15
TID: 218278 Doc # 202500168250

## B. Instructions

1. When the Departmental action request is for (check one):

☐ Superseding Order of Conditions – Fee: $120.00 (single family house projects) or $245 (all other projects)

☐ Superseding Determination of Applicability – Fee: $120

☐ Superseding Order of Resource Area Delineation – Fee: $120

**Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands

# Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

## B. Instructions (cont.)

Send this form and check or money order, payable to the *Commonwealth of Massachusetts,* to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see https://www.mass.gov/service-details/massdep-regional-offices-by-community).

4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

**City of New Bedford Conservation Commission •**
**Department of Resilience and Environmental Stewardship**
133 William Street · Room 304 · New Bedford, Massachusetts 02740
Telephone: (508) 991.6188
**Conservation • Energy • Environmental Stewardship • Resilience**

**MAYOR**
JON MITCHELL

COASTAL ZONE SPECIAL CONDITIONS
MassCEC – SHUSTER BULKHEAD
BRUCE CARLISLE – Mass-CEC
SE049-0973

21. No activity shall occur prior to obtaining all necessary and required permits, licenses and approvals; and until copies of the same have been furnished to the Conservation Commission.

22. Any design modifications, alterations, amendments, or additions shall be subject to the approval of the New Bedford Conservation Commission. Requests for any changes shall be made in writing and shall be accompanied by a revised plan.

23. No modification to surface features, drainage or topography shall be permitted except as indicated by this Order of Conditions.

24. There shall be no construction other than that proposed by the Notice of Intent and included on the plans.

25. All resource areas not to be altered shall be kept clear of rubbish, debris, and construction material.

26. All excess material shall be removed from the site.

27. The owners shall notify the Conservation Commission of the work start date prior to its commencement so that regular inspections may be made.

28. The inspector and/or Commission members shall have the right to enter upon the land for the purpose of the inspection and/or the taking of pictures to determine and evaluate compliance with this Order.

29. All facilities and utility equipment/ infrastructure shall be continually maintained so as to comply with this Order of Conditions and M.G.L. Ch. 131 S40, the Wetlands Protection Act and Regulations 310 CMR 10.00 et seq as well as the New Bedford Stormwater Ordinance Sec16 – 131_140.

30. Certain conditions such as maintenance or monitoring are on-going and are not to expire at the end of three years or with the issuance of a Certificate of Compliance.

31. This Order of Conditions shall apply to any successor in interest or successor in control.

32. Any changes required by any other board or authority may require a new filing with the Conservation Commission.

33. It is the responsibility of the applicant to complete the review required by agencies with jurisdiction

over the activity that is subject to this Order of Conditions and procure all required permits or approvals before work commences. These reviews, permits, and approvals may include but are not limited to:

- The Army Corps of Engineers
- The MA Department of Environmental Protection
- The MA Natural Heritage and Endangered Species Program
- Review by local Planning Boards, Zoning Boards, Board of Health and Building Inspector.

34. The Conservation Commission shall not be responsible or liable for the construction, operation, or maintenance of any part of this project and does not warrant the safety of same.

35. Any fill or construction materials shall be placed in upland areas.

36. In accordance with Condition number fourteen (14), no activity shall take place until the applicant has furnished written documentation that the plans on file with the Conservation Commission are consistent with permits and approvals of other City Boards and Departments.

37. Prior to any construction, an on-site inspection is to be held between the proposed contractor, the engineer, and the Conservation Commission Agent to go over the sequence of construction and all other restrictions and requirements as noted on the Order of Conditions. A written construction schedule is to be received at that time.

38. Any changes in proposed drainage patterns shall require the written approval of the Conservation Commission.

39. Notice of Intent, Order of Conditions and approved plans shall be retained on the site during construction and made available to all contractors.

40. All demolition and construction debris is to be disposed of in a legal upland location.

41. CCA, ACA or ACQ are the approved wood preservatives, with the exception of the tops of the timber piles which shall be treated with AWPA M4 (2% copper napthenate followed by coal-tar roofing cement) or approved equivalent. Applicants shall make efforts to use sustainably sourced products when proposing the use of tropical woods (e.g. Greenheart - *Chlorocardium rodiei*).

42. Fuel shall not be permanently stored within a flood zone and refueling shall be conducted as far from the resource areas and their buffer zones as is reasonable.

43. A spill control kit including absorbent materials shall be on site at all times.

44. An as-built plan shall be submitted upon completion of project and prior to issuance of a Certificate of Compliance.

45. All green infrastructure, rain recharge structures, replication areas, and restored naturalized areas shall be maintained to look and perform as permitted and approved in this and/ or subsequent Order of Conditions, Determinations of Applicability, or Enforcement Orders in perpetuity. The New Bedford Conservation Commission or their Agent has the authority to require maintenance or reconstruction of these features back to their designed condition at any time to ensure proper function or value at the property owner's expense.

46. Deploy and maintain impermeable turbidity curtain of sufficient length and vertical depth sufficiently seaward of work area for all silt producing activities. Curtain shall remain in place until work is completed.

47. The discharge and/or cleanout of any concrete wash water to or excess cement to New Bedford Harbor is forbidden. All cleanouts shall be in a designated upland and away from any storm drains.

48. Wildlife time-of-year restrictions for certain activities as determined by the Division of Fisheries and Wildlife and the Division of Marine Fisheries shall be observed when declared a requirement of a project and are encouraged to be followed for all other projects regardless of a determination of a 'take' by the respective agency. See specific TOY below:

    - A time-of-year (TOY) restriction should be observed on all in-water, silt-producing activities to protect sensitive life stages of winter flounder. No in-water, silt-producing activities should take place from January 15th – May 31st of any year

49. Concrete delivery vehicles should be prohibited from washing down equipment on site. This activity could potentially wash excess concrete and hydrocarbons into marine resource areas.

50. Applicant shall communicate in writing to the Conservation Agent when the turbidity curtain and landside erosion controls are installed prior to the commencement of silt producing activities and/or disturbed soils respectively.

BRISTOL COUNTY REGISTRY OF DEEDS
25 N 6TH ST
NEW BEDFORD, MA 02740-6114
508-993-2606

BRISTOL COUNTY REGISTRY OF DEE

Date: 09/18/2025 03:35:12 PM

CREDIT CARD SALE

VISA

CARD NUMBER: **********3456
ENTRY METHOD: ICC
AUTH MODE: Issuer
AMOUNT: $107.00
SERVICE FEE: $3.21 (non-refundable)
TOTAL ALL CHARGES AND FEES: $110.21
SF APPROVAL CD: 163458
APPROVAL CD: 133454
RECORD #: 000
CLERK ID: ovaladao
Book and Page: olga

APPROVED
SIGNATURE VERIFIED

PLEASE RETAIN FOR YOUR RECORDS

AID: A0000000031010
TVR: 8000008000
IAD: 06021203A08000
TSI: 6800
VISA DEBIT

Customer Copy

Southern Bristol County Registry of Deeds
25 North Sixth Street
New Bedford, Massachusetts 02740

# Receipt

**Transaction ID:** 218278 **Station:** NBINDEX6

**Date/Time Recorded:** 9/18/25 03:36:00 PM **Instrument:** 16825 NB
**Book/Page:** 15315 / 074 **Type:** OCDN

| | | |
|---|---|---|
| FEE | | $55.00 |
| CPA | | $50.00 |
| POSTAGE | | $2.00 |
| maxwell h hirsh | CreditCard 00 | $107.00 |

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
Southeast Regional Office • 20 Riverside Drive, Lakeville MA 02347 • 508-946-2700

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

May 23, 2024

Massachusetts Clean Energy Center
c/o Foth Infrastructure & Environment, LLC
Attn: Scott Skuncik, P.E.
114 Touro Street
Newport, RI 02840

RE: Minor Project Modification to DPW License No. 5579
Bulkhead Replacement, New Bedford Harbor, New Bedford

Dear Mr. Skuncik:

The Department has reviewed your request on behalf of the Massachusetts Clean Energy Center (MassCEC) to modify the above referenced Chapter 91 License. The modification involves the replacement of a 197 foot section of steel bulkhead that consists of a steel cellular cofferdam system with a reinforced concrete seawall. The existing bulkhead will be replaced with a steel bulkhead and pile supported platform entirely within the existing wharf footprint authorized under DPW License No. 5579.

The proposed modifications are shown on a plan titled, "Shuster Bulkhead Structural Improvements", 3 sheets, dated 02/29/2024, prepared by Foth Infrastructure & Environment, LLC.

The Department has determined that pursuant to 310 CMR 9.22, the activity constitutes a minor project modification, which represents an insignificant deviation from the original specifications of the license, and as such this activity does not require a new or amended license. Please note that other local, state and federal requirements may apply.

If you have any questions pertaining to this matter, please do not hesitate to contact me at (508) 946-2707 or brendan.mullaney@mass.gov.

Sincerely,



Brendan C. Mullaney
Section Chief
Waterways Regulation Program

ecc: DEP, Waterways Regulation Program, Boston
New Bedford Harbormaster & Conservation Commission

**This information is available in alternate format. Please contact Melixza Esenyie at 617-626-1282.**
**TTY# MassRelay Service 1-800-439-2370**
MassDEP Website: www.mass.gov/dep

Printed on Recycled Paper

**DEPARTMENT OF THE ARMY**
**US ARMY CORPS OF ENGINEERS**
**NEW ENGLAND DISTRICT**
**696 VIRGINIA ROAD**
**CONCORD MA 01742-2751**

September 29, 2025

Regulatory Division
File Number: NAE-2022-01807

Summer Zeh
Deputy General Counsel, Massachusetts Clean Energy Center
4 Wright Street
New Bedford, Massachusetts 02740
Email: szeh@masscec.com

Dear Tim Griffin:

This letter is in regard to your preconstruction notification submitted to the U.S. Army Corps of Engineers (USACE) to dredge 9,750 cubic yards of sediment from 11,007 square feet of area below the mean high water (MHW) mark for the purpose of replacing a solid fill bulkhead with a pile supported dock. This project is located in New Bedford Harbor at 4 Wright Street, New Bedford, Massachusetts 02740 at site coordinated: 41.624190, -70.914920. The work is shown on the enclosed plans titled "MASSCEC MARINE COMMERCE TERMINAL SHUSTER BULKHEAD REPLACEMENT PROJECT NOTES," on a total of 6 sheets, and dated "JANUARY 17, 2025."

Specifically, the project involves the following activities, which will result in the discharge of dredged or fill material within waters of the United States:

- Removal of 52 steel sheet piles, 25 rock socketed pipe piles, and 9,750 cubic yards of backfill. The dredged backfill material will be disposed of at the New Bedford Harbor Confined Aquatic Disposal (CAD) site 4 located at 41.645646, -70.914905.
- Installation of a pile supported pier within the footprint of the existing solid-filled bulkhead. 210 piles will be installed in total: one hundred and eighteen (118) 30-inch steel pipe piles, eighty (80) steel sheet piles, and twelve (12) H-piles.
- Vibratory hammer will be used to the maximum extent that is operationally feasible. Impact hammer will be used when vibratory hammer use is not feasible.

Based on the information that you have provided, we verify that the activity is authorized under General Permit # 4 and # 7 of the June 2, 2023, federal permit known as the Massachusetts General Permits (GPs). The GPs are available at https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit.

Please review the enclosed GPs carefully, in particular the general conditions

beginning on page 35, and ensure that you and all personnel performing work authorized by the GPs are fully aware of and comply with its terms and conditions. A copy of the GPs and this verification letter shall be available at the work site as required by General Condition 17. You must perform this work in compliance with the following special condition(s):

1) All construction shall be completed in accordance with the limits of construction and construction sequences detailed on the enclosed plan drawings, titled "MASSCEC MARINE COMMERCE TERMINAL SHUSTER BULKHEAD REPLACEMENT PROJECT NOTES," on a total of 6 sheets, and dated "JANUARY 17, 2025." If you change the plans or construction methods for work within or adjacent to the New Bedford Harbor, please contact us immediately to discuss modification of this authorization. The Corps of Engineers must approve any changes before you undertake them.

2) You must complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated start date. The form shall be emailed to Maninder Singh at Maninder.Singh@usace.army.mil and cenae-r@usace.army.mil; or mailed to Maninder Singh, Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751.

3) You must complete and return the enclosed Compliance Certification Form to this office within 30 days of the completion of work. The form shall be emailed to Maninder Singh at Maninder.Singh@usace.army.mil and cenae-r@usace.army.mil; or mailed to Maninder Singh, Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751.

4) All piles that are selected to be removed shall be fully removed to the extent that is operationally feasible. If full removal of the piles is not operationally feasible then the piles shall be cut as close to the mudline as possible and driven at least 3 feet further into the substrate or until refusal.

5) Vibratory hammer shall be used as often as practicable, impact hammer shall only to be used when pile driving via vibratory hammer is not feasible.

6) Vibratory pile driving shall be initiated for 15 seconds at reduced energy followed by a one-minute waiting period. This sequence of 15 seconds of reduced energy driving, one-minute waiting period shall be repeated two more times, followed immediately by pile-driving at full rate and energy. In addition to using a soft start

at the beginning of the workday for pile driving, a soft start must also be used at any time following a cessation of pile driving for a period of 30 minutes or longer.

7) Impact pile driving shall commence with an initial set of three strikes by the hammer at 40% energy, followed by a one-minute wait period, then two subsequent 3-strike sets at 40% energy, with one minute waiting periods, before initiating continuous impact driving. In addition to using a soft start at the beginning of the workday for pile driving, a soft start must also be used at any time following a cessation of pile driving for a period of 30 minutes or longer.

8) Turbidity curtains shall be installed for the duration of all in-water work and shall be maintained in working condition.

9) Time of the Year (TOY) restriction will be applied from January 15th to May 31st of any year to all in-water work. No in-water work shall take place within the TOY period. TOY restriction will not apply if the turbidity curtains are installed at least a week prior to the start of the TOY restriction period. The turbidity curtains shall be removed outside of the TOY restriction period.

10) Maintain project vessels operating within the action area to speed limits below 10 knots and dredge vessel speeds of 4 knots maximum, while dredging.

11) Maintain a 1,500-foot buffer between project vessels and ESA-listed whales and a 150-foot buffer between project vessels and sea turtles unless the vessel is navigating to an in-water disposal site/activity. If the vessel is navigating to an in-water disposal site/activity, refer to and include the conditions contained in the appropriate GARFO-USACE/EPA consultation for the disposal site.

12) The number of project vessels must be limited to the greatest extent possible, as appropriate to size and scale of project.

13) The permanent net increase in vessels resulting from a project (e.g., dock/float/pier/boating facility) must not exceed two non-commercial vessels. A project must not result in the permanent net increase of any commercial vessels (e.g., a ferry terminal).

This authorization expires on June 1, 2028. You must commence or have under contract to commence the work authorized herein by June 1, 2028, and complete the work by June 1, 2029. If not, you must contact this office to determine the need for further authorization and we recommend you contact us *before* the work authorized herein expires. Please contact us immediately if you change the plans or construction methods for work within our jurisdiction as we must approve any changes before you

undertake them. Performing work within our jurisdiction that is not specifically authorized by this determination or failing to comply with the special condition(s) provided above or all the terms and conditions of the GPs may subject you to the enforcement provisions of our regulations.

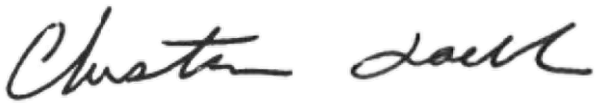
This authorization does not obviate the need to obtain other federal, state, or local authorizations required by law. Applicants are responsible for applying for and obtaining any other approvals.

Your project is located within, or may affect resources within, the coastal zone. The Massachusetts Office of Coastal Zone Management (CZM) has already determined that no further Federal Consistency Review is required.

We continually strive to improve our customer service. To better serve you, we would appreciate your completing our Customer Service Survey located at https://regulatory.ops.usace.army.mil/customer-service-survey.

Please contact Maninder Singh of my staff at (978) 318-8967 or (978)-257-6884 or Maninder.Singh@usace.army.mil if you have any questions.

Sincerely,



Christine Jacek
Chief, Massachusetts Branch
Regulatory Division

Enclosures:

1) Project Plans
2) Work Start Notification
3) Compliance Certification

Cc:

Benjamin Foley, Foth, Benjamin.Foley@foth.com
Doug Ernst, Foth, Doug.Ernst@Foth.com
Scott Skuncik, Foth, Scott.Skuncik@foth.com
John Hitt, Massachusetts Clean Energy Center, jhitt@masscec.com
Tim Griffin, Massachusetts Clean Energy Center, TGriffin@masscec.com

Jeannie Houde, Massachusetts Clean Energy Center, jhoude@masscec.com
George Morant, Massachusetts Clean Energy Center, gmorant@masscec.com
Nathan Margason, U.S. EPA, Region 1, Boston, MA, Margason.Nathan@epa.gov
Alexa Cacacie, NMFS, Gloucester, MA; alexa.cacacie@noaa.gov
Sean Duffey, Coastal Zone Management, Boston, MA, sean.duffey@mass.gov
Patrice Bordonaro, Coastal Zone Management, Boston, MA, patrice.bordonaro@mass.gov
Sam Haines, Coastal Zone Management, Samuel.Haines@mass.gov
Maissoun Reda, Chief, DEP SERO, Wetlands and Waterways, Lakeville, MA; maissoun.reda@mass.gov
David Wong, MassDEP, david.w.wong@mass.gov
David Robinson, MA Board of Underwater Archaeological Resources (BUAR); david.s.robinson@mass.gov
New Bedford Conservation Commission, chancery.perks@newbedford-ma.gov

# Appendix B

# Project Plans

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

NAME DATE

**DRAWING INDEX**

| SHEET NUMBER | TITLE |
|---|---|
| 1 | PROJECT NOTES |
| 2 | PROJECT LOCUS |
| 3 | EXISTING CONDITIONS PLAN |
| 4 | PROPOSED CONDITIONS PLAN |
| 5 | SECTION A |

**PRIOR USACE AUTHORIZATIONS**

**NOTES**

1. VERTICAL DATUM IS IN FEET AND TENTHS AND IS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2. HORIZONTAL DATUM IS REFERENCED TO THE NAD 1983 STATE PLANE MASSACHUSETTS MAINLAND COORDINATE GRID (NAD83) (US SURVEY FEET).
3. RESULTS OF HYDROGRAPHY FROM FOTH INFRASTRUCTURE & ENVIRONMENTAL, LLC. SURVEY DATED NOVEMBER 2018 REFERENCE DATUM: MEAN LOW WATER (MLW).
4. NO SURVEYS WERE CONDUCTED TO LOCATE PROPERTY LINES, CHANNEL LIMITS, EASEMENTS, UTILITIES, GEOTECHNICAL FEATURES, OR ANY OTHER PHYSICAL FEATURES RELATING TO THE PROJECT SITE, NOR DOES FOTH WARRANT THE EXISTENCE OR LOCATION OF SAID PHYSICAL FEATURES.
5. PROJECT SITE LOCATED IN FEMA ZONE AE 6 NAVD88 AND ZONE X IN ACCORDANCE WITH FEMA FIRM #25005C0393G EFFECTIVE 7/16/2014
6. STATE HARBOR LINES ARE REFERENCED FROM CONTRACT PLANS NO. 3315, MASS HARBORLINE ACTS OF 1937 CH. 127.
7. FEDERAL CHANNEL LIMITS REFERENCE FROM THE DEPARTMENT OF THE ARMY NEW BEDFORD AND FAIRHAVEN HARBOR MAP, DATED 30 SEPTEMBER 1986.
8. APPROXIMATE PROPERTY LINES COLLECTED FROM MA GIS AND SHOULD BE USED FOR REFERENCE PURPOSES ONLY.
9. ENTIRE SITE IS LOCATED WITHIN THE NEW BEDFORD AND FAIRHAVEN DESIGNATED PORT AREA (DPA) & THE NEW BEDFORD, MASSACHUSETTS HARBOR PLAN.
10. FEDERAL PROJECT LIMIT OBTAINED FROM THE U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT, SURVEY DIVISION DATED 09/30/1986.
11. PLEASE SEE PROJECT NARRATIVE FOR SOIL BORING AND SUBSTRATE INFORMATION.

**ABUTTING PARCEL INFORMATION**

| ABUTTING PROPERTY ADDRESS | OWNER | OWNER MAILING ADDRESS |
|---|---|---|
| | (NORTH OF PROJECT SITE) | |
| 6 HASSEY ST, NEW BEDFORD, MA 02740 | R C P REALTY LLC | 14 HENRY TICHON AVE. NEW BEDFORD, MA 02740 |
| | (SOUTH OF PROJECT SITE) | |
| 0 S. FRONT ST. NEW BEDFORD, MA 02740 | MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER | 294 WASHINGTON ST, SUITE 1150, BOSTON, MA 02108 |

**LEGEND**

- MEAN HIGH WATER (MHW, EL. 1.79 NAVD88)
- MEAN LOW WATER (MLW, EL. -1.78 NAVD88)
- STATE HARBOR LINES/USACE FEDERAL CHANNEL
- FEMA FLOODPLAIN ZONE AE BOUNDARY
- PROPERTY LINE
- PROJECT SITE

DATUM OFFSETS

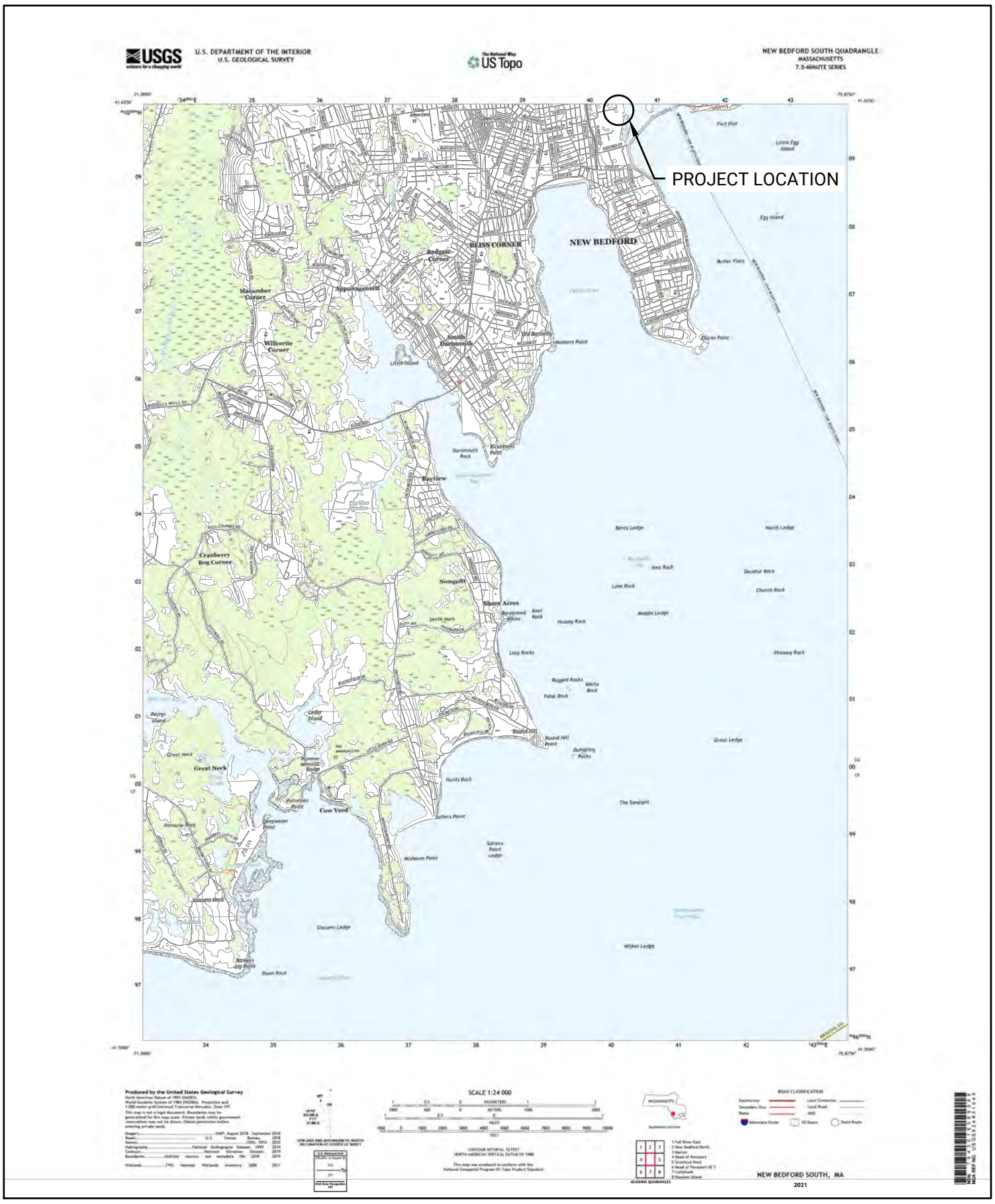
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|---|---|---|
| 3.96 | 2.04 | MHHW |
| 3.71 | 1.79 | MHW |
| 1.92 | 0.00 | NAVD 88 |
| 0.14 | -1.78 | MLW |
| 0.0 | -1.92 | MLLW |

OFFSETS TAKEN FROM FROM USACE GUIDANCE IN QUALITY CONTROL REPORT BY JACOBS ENGINEERING, PROVIDED BY USACE

**MASSCEC MARINE COMMERCE TERMINAL**
**SHUSTER BULKHEAD REPLACEMENT**
**PROJECT NOTES**
SHEET 1 OF 5
JANUARY 17, 2025

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

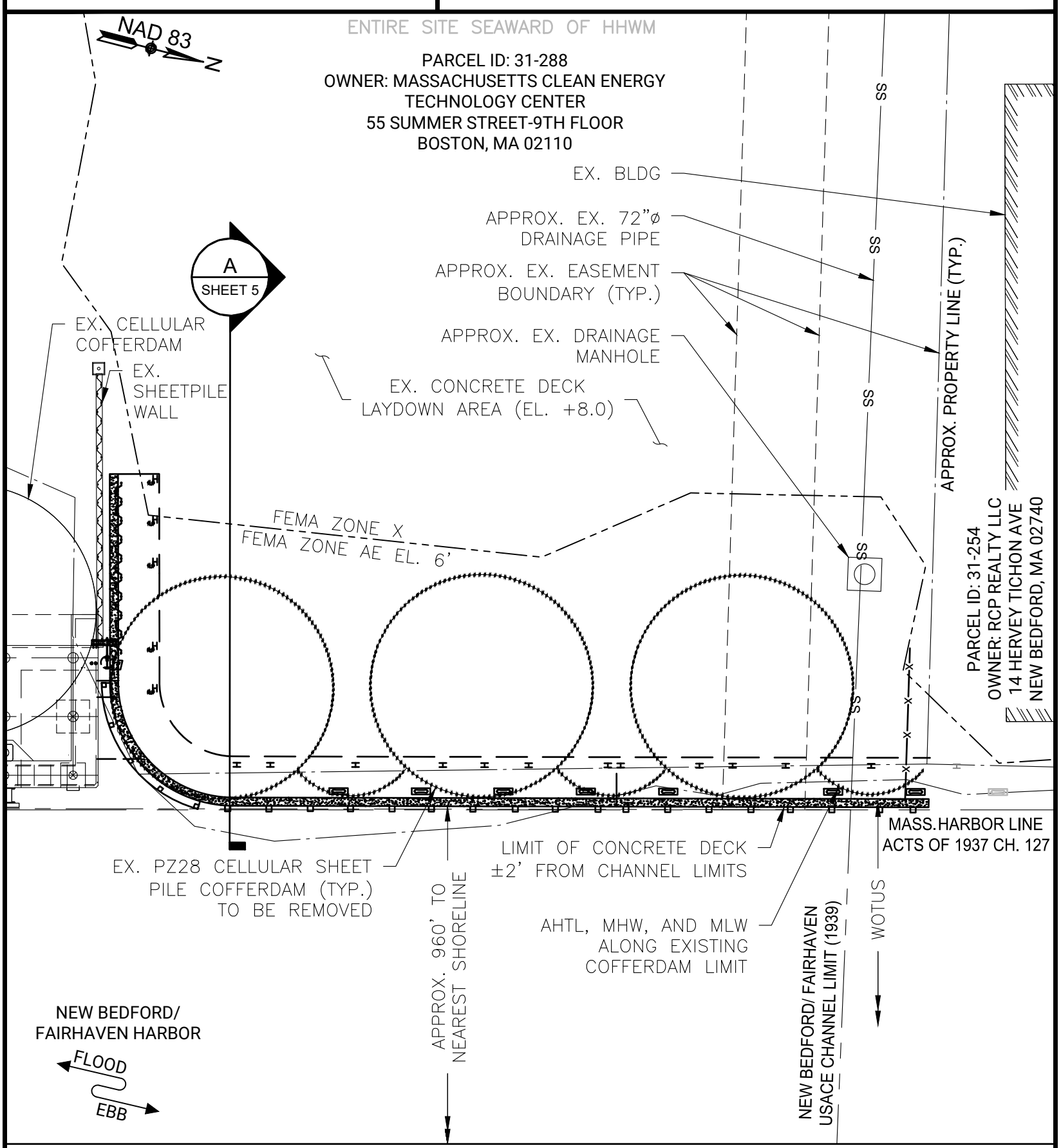
NAME DATE




**MASSCEC MARINE COMMERCE TERMINAL**
**SHUSTER BULKHEAD REPLACEMENT**
**PROJECT LOCUS**
SHEET 2 OF 5
JANUARY 17, 2025

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

NAME DATE

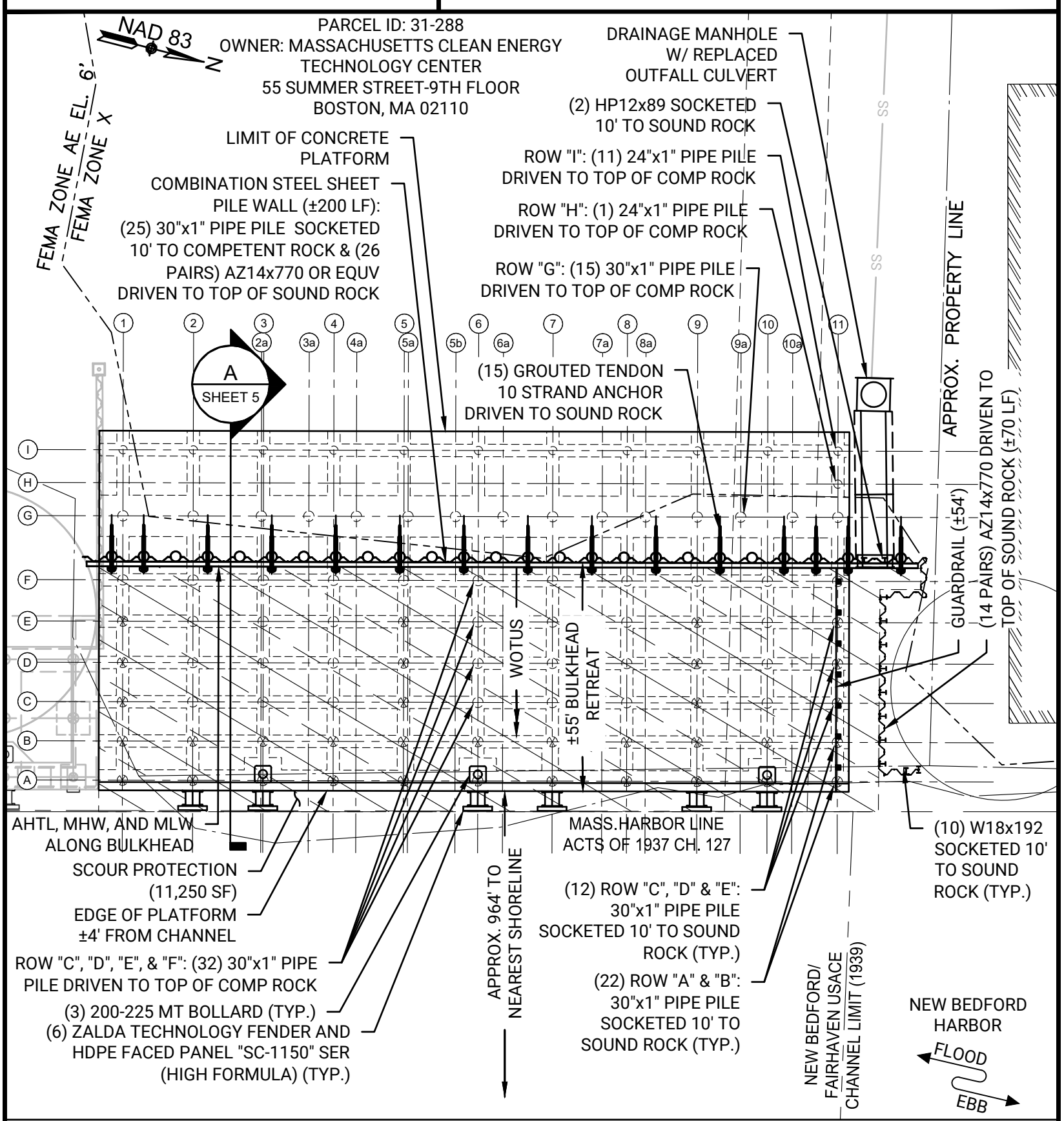



**MASSCEC MARINE COMMERCE TERMINAL**
**SHUSTER BULKHEAD REPLACEMENT**
**EXISTING CONDITIONS PLAN**
SHEET 3 OF 5
JANUARY 17, 2025

0 30 60
SCALE IN FEET
SCALE: 1"= 30'

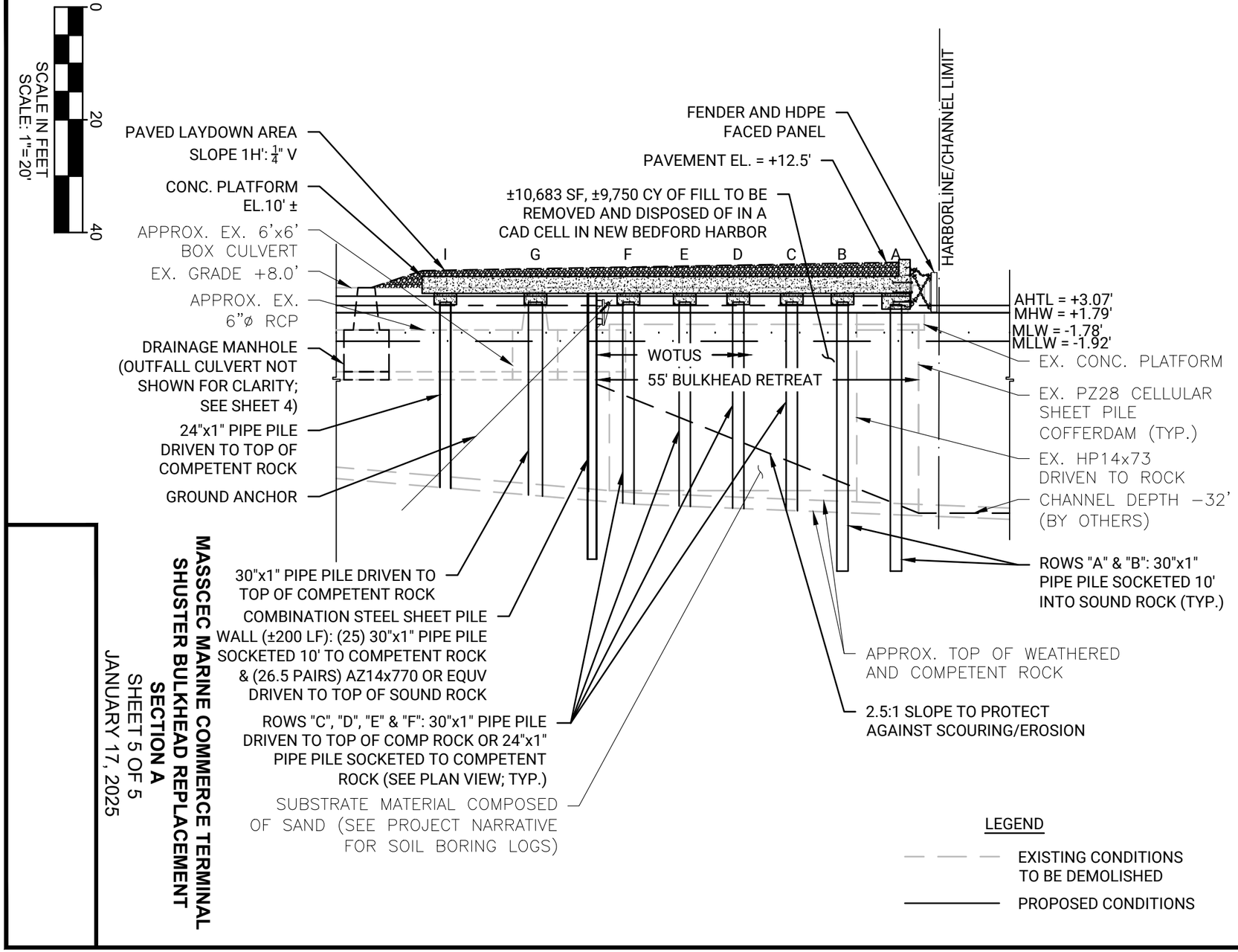
I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

NAME DATE




**MASSCEC MARINE COMMERCE TERMINAL**
**SHUSTER BULKHEAD REPLACEMENT**
**PROPOSED CONDITIONS PLAN**
SHEET 4 OF 5
JANUARY 17, 2025

NOTES:
1. 12 MONTHS TEMPORARY CONSTRUCTION IMPACTS TO WOTUS
2. PILES TO BE INSTALLED USING ROCK DRILL, VIBRATORY HAMMER, AND IMPACT HAMMER
3. RETURN ±10,683 SF OF WOTUS




**MASSCEC MARINE COMMERCE TERMINAL**
**SHUSTER BULKHEAD REPLACEMENT**
**SECTION A**
SHEET 5 OF 5
JANUARY 17, 2025

I CERTIFY THAT THIS PLAN, AS PREPARED, CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

NAME

DATE

US Army Corps of Engineers®
New England District

# WORK-START NOTIFICATION FORM

(Minimum Notice: Two weeks before work begins)

**********

EMAIL TO: Maninder.Singh@usace.army.mil and cenae-r@usace.army.mil; or

MAIL TO: Maninder Singh
Regulatory Division
U.S. Army Corps of Engineers, New England District
696 Virginia Road
Concord, Massachusetts 01742-2751

Also, if the work is in the Massachusetts Coastal Zone (https://www.mass.gov/service-details/czm-regions-coastal-communities-and-coastal-zone-boundary), email this form to Sean.Duffey@mass.gov and patrice.bordonaro@mass.gov or mail it to: The Massachusetts Office of Coastal Zone Management, Project Review Coordinator, Suite 800, 251 Causeway Street, Boston, MA 02114.

**********

Corps of Engineers Permit No. **NAE-2022-01807** was issued to **Summer Zeh**. This work is located in New Bedford Harbor at 4 Wright Street, New Bedford, Massachusetts 02740 at site coordinated: 41.624190, -70.914920 and authorized to dredge 9,750 cubic yards of sediment from 11,007 square feet of area below the mean high water (MHW) mark for the purpose of replacing a solid fill bulkhead with a pile supported dock.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

**PLEASE PRINT OR TYPE**

**Name of Person/Firm:** _____

**Business Address:** _____

_____

_____

**Phone & email:** (___) _____ (___) _____ _____

**Proposed Work Dates:** **Start:** _____ **Finish:** _____

**Permittee/Agent Signature:** _____ **Date:** _____

**Printed Name**: _____ **Title:** _____

**Date Permit Issued:** September 29, 2025 **Date Permit Expires:** June 1, 2028

**********

**FOR USE BY THE CORPS OF ENGINEERS**

**PM:** Maninder Singh **Submittals Required:** Yes

**Inspection Recommendation:** _____

U.S. Army Corps of Engineers (USACE)

# CERTIFICATION OF COMPLIANCE WITH DEPARTMENT OF THE ARMY PERMIT

For use of this form, see Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act of 1899, and Section 103 of the Marine Protection, Research, and Sanctuaries Act; the proponent agency is CECW-COR.

***Form Approved - OMB No. 0710-0003 Expires 2027-10-31***

**The Agency Disclosure Notice (ADN)**

The Public reporting burden for this collection of information, 0710-0003, is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

**PURPOSE**: This form is used by recipients of U.S. Army Corps of Engineer Regulatory permits to certify compliance with the permit terms and conditions.

Your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the U.S. Army Corps of Engineers, New England District.

The certification can be submitted by email at dll-cenae-r-ma@usace.army.mil or by mail at the below address:

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the U.S. Army Corps of Engineers,

U.S. Army Corps of Engineers
New England District
Regulatory Division
696 Virginia Road
Concord, MA 01742-2751

## COMPLETED BY THE CORPS

| | |
|---|---|
| Corps Action Number: | NAE-2022-01807 |
| Permit Type: | Regional General Permit |
| General Permit Number and Name (*if applicable*): | GP 4: Structures in Navigable Waters and GP 7: Dredging |
| Name of Permittee: | Summer Zeh |
| Project Name: | Mass CEC Marine Commerce Terminal Shuster Bulkhead Replacement |
| Project Location (*physical address*): | Within New Bedford Harbor at 4 Wright Street, New Bedford, Massachusetts 02740 at site coordinated: 41.624190, -70.914920. |

## PERMITTEE'S CERTIFICATION

Date Work Started: _____

Date Work Completed: _____

Enclose photographs showing the completed project (*if available*).

I _____ hereby certify that the work authorized by the above referenced permit has been completed in accordance with all of the permit terms and conditions, and that any required compensatory mitigation has been completed in accordance with the permit conditions.

| Name | Date | Signature |
|---|---|---|
| | | |

# CITY OF NEW BEDFORD, MA
## DEPARTMENT OF PUBLIC INFRASTRUCTURE

1105 Shawmut Ave, New Bedford, MA 02746

Parcel ID: 031 0263

# Stormwater Management Permit

| | |
|---|---|
| Expires: | **Permit No.: SMP-25-3** |

I HEREBY ACKNOWLEDGE the receipt of a copy of the Regulations prescribed in the Ordinance of the City, for the use of Water, and I request that the water may be furnished at **4 WRIGHT ST New Bedford, MA 02740** .

Type of Use: **Industrial**

Type of Pipe: **Subsurface infiltration chambers R-Tank Double Chambers (712) with inspection ports, drainage manholes, 24 RCP lines to connect to city storm line on Wright St, 12" Perfrated HDPE drain pipe into existing manhole at existing location**

**Owner Information**

Name :**MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER**

Address: **4 Wright Street New Bedford, MA 02740**

Service Connecting Location: **66" RCP Storm Drain in Wright Street**

**Timothy L Griffin**

Property Owner or Representative

**Amanda Jupin**

Issued By:

REGION 1
BOSTON, MA 02109

***TRANSMITTED BY EMAIL***

Massachusetts Clean Energy Technology Center
Attn: John Hitt, General Counsel
294 Washington Street, Suite 1105
Boston, Massachusetts 02108
*jhitt@MassCEC.com*

Re: PCB Cleanup and Disposal Approval under 40 CFR §§ 761.61(a) and (c)
Massachusetts Clean Energy Center
New Bedford, Massachusetts

Dear Mr. Hitt:

This is in response to the Massachusetts Clean Energy Center (MassCEC) Notification[1] to address PCBs identified on the property located at 18 and 54 Wright Street in New Bedford, Massachusetts. Specifically, soil located on Site 1 of the property (hereinafter "the Site") as shown on **Attachment 2** was identified to contain PCBs at concentrations that exceed the allowable PCB levels for unrestricted use under the federal PCB regulations at 40 CFR § 761.61(a). MassCEC has requested an approval to clean up and dispose of the PCB-contaminated soil located at the Site under the PCB self-implementing cleanup and disposal option with exception of the verification sampling at 40 CFR §§ 761.61(a). MassCEC has requested a deviation from § 761.61(a) for verification sampling.

MassCEC is proposing the following PCB cleanup and disposal activities as shown in **Attachment 3**:

- Remove *PCB remediation waste* (i.e., soil greater than (">") 25 parts per million ("ppm") PCBs) from the hot spot to a depth of 2.5 feet ("ft") and dispose in accordance with 40 CFR 761.61(a)(5)(i)(B)(*2*)**(***iii*);

- Remove *PCB remediation waste* (i.e., soils > 1 ppm but less than or equal to ("≤") 25 ppm) from Site 1 to a depth of 1.75 ft and dispose in accordance with 40 CFR § 761.61(a)(5)(i)(B)(*2*)(*ii*) or re-use on Site 1; and

[1]Information was submitted on behalf of MassCEC by CEC. The information was provided to satisfy the notification requirement under 40 CFR §§ 761.61(a) and (c). Information was provided dated March 2025 (Self-Implementing Cleanup Notification: 761.61(a)/Release Abatement Measure Plan) and July 17, 2025 (email response to Comments). These submittals will be referred to as the "Notification."

- Prepare a deed restriction that may be in the form of an Activity and Use Limitation (AUL) that will meet the requirements of 40 CFR § 761.61(a)(8).

With exception of the verification sampling, the Notification meets the requirements and standards established under § 761.61(a)(3) for cleanup and disposal of *PCB remediation waste*. Given the characterization sampling results and the proposed plan, which includes removal of all soil to a depth of 1.75 ft and to a depth of 2.5 ft in the hot spot, EPA has determined that the proposed alternative sampling is adequate to confirm that the PCB cleanup standard has been met. EPA finds that the alternative sampling proposed by MassCEC will not pose an unreasonable risk to health or the environment when conducted in accordance with the Notification and this Approval. EPA may approve the sampling under § 761.61(c).

This Approval only addresses cleanup and disposal of the *PCB remediation waste* (i.e., Site 1) identified in the Notification. In the event that MassCEC identifies other PCB-contaminated wastes subject to cleanup and disposal under the PCB regulations, MassCEC will be required to notify EPA and cleanup the PCB-contaminated wastes in accordance with 40 CFR Part 761 (see Approval Condition 1.)

This Approval does not release MassCEC from any applicable requirements of federal, state or local law, including the requirements related to cleanup and disposal of PCBs and other Site contaminants under the Massachusetts Department of Environmental Protection (MassDEP) regulations.

Questions and correspondence regarding this Approval should be directed to: R1PCBS@epa.gov

EPA shall not consider this project complete until it has received all submittals required under this Approval. Please be aware that upon receipt and review of the submittals, EPA may request any additional information necessary to establish that the work has been completed in accordance with 40 CFR Part §§ 761 (a) and (c), the Notification, and this Approval.

Sincerely,

Stephanie Carr Digitally signed by Stephanie Carr
Date: 2025.07.24 09:24:44 -04'00'

Stephanie Carr, Director
Land, Chemicals and Redevelopment Division

Attachment 1- PCB Approval Conditions
Attachment 2- Property Map
Attachment 3- Excavation Map

cc: Cassia Dal Bello, CEC cdalbello@cecinc.com
Jonathan Kitchen, LSP, CEC jkitchen@cecinc.com
File

**ATTACHMENT 1:**

**PCB CLEANUP AND DISPOSAL APPROVAL CONDITION**
**SITE 1 ("the Site")**
**MASSACHUSETTS CLEAN ENERGY CENTER/NEW BEDFORD MARINE COMMERCE TERMINAL**
**NEW BEDFORD, MASSACHUSETTS**

**GENERAL CONDITIONS**

1. This Approval is granted under the authority of Section 6(e) of the Toxic Substances Control Act (TSCA), 15 U.S.C. § 2605(e), and the PCB regulations at 40 CFR Part 761, and applies solely to *PCB remediation waste* (i.e., soil) located at the Site as identified in the Notification.

    a. In the event that the Massachusetts Clean Energy Center (MassCEC) identifies other PCB-contaminated wastes subject to cleanup and disposal under the PCB regulations, MassCEC will be required to notify EPA and clean up the PCB-contaminated wastes in accordance with 40 CFR Part 761.

    b. MassCEC may submit a separate plan to address the PCB contamination or may modify the Notification to incorporate cleanup of the PCBs under this Approval in accordance with Condition 17.

2. MassCEC shall conduct on-site activities in accordance with the conditions of this Approval and with the Notification.

3. In the event that the cleanup plan described in the Notification differs from the conditions specified in this Approval, the conditions of this Approval shall govern.

4. The terms and abbreviations used herein shall have the meanings as defined in 40 CFR § 761.3 unless otherwise defined within this Approval.

5. MassCEC must comply with all applicable federal, state and local regulations in the storage, handling, and disposal of all PCB wastes, including PCBs, PCB Items and decontamination wastes generated under this Approval. In the event of a new spill during response actions, MassCEC shall contact EPA within 24 hours for direction on sampling and cleanup requirements.

6. MassCEC is responsible for the actions of all officers, employees, agents, contractors, subcontractors, and others who are involved in activities conducted under this Approval. If at any time MassCEC has or receives information indicating that MassCEC or any other person has failed, or may have failed, to comply with any provision of this Approval, it must report the information to EPA in writing within 24 hours of having or receiving the information.

7. This Approval does not constitute a determination by EPA that the transporters or disposal facilities selected by MassCEC are authorized to conduct the activities set forth in the Notification. MassCEC is responsible for ensuring that its selected transporters and disposal facilities are authorized to conduct these activities in accordance with all applicable federal, state and local statutes and regulations.

8. This Approval does not: 1) waive or compromise EPA's enforcement and regulatory authority; 2) release MassCEC or the current property owner from compliance with TSCA or any applicable requirements of federal, state or local law; or 3) release MassCEC or the current property owner from liability for, or otherwise resolve, any violations of TSCA or other federal, state or local law.

9. Failure to comply with the Approval conditions specified herein shall constitute a violation of the requirement in § 761.50(a) to store or dispose of PCB waste in accordance with 40 CFR Part 761 Subpart D.

**NOTIFICATION AND CERTIFICATION CONDITIONS**

10. This Approval may be revoked if the EPA does not receive written notification from MassCEC of its acceptance of the conditions of this Approval within 10 business days of receipt.

11. MassCEC shall notify EPA in writing of the scheduled date of commencement of on-site activities at least 1 business day prior to conducting any work under this Approval. Such notification shall include an estimated schedule for completion of the PCB cleanup and disposal actions authorized under this Approval.

12. Prior to initiating onsite work under this Approval, MassCEC shall submit the following information:

    a. a certification signed by its selected remediation contractor, stating that the contractor has read and understands the Notification, and agrees to abide by the conditions specified in this Approval, and

    b. a certification signed by the selected analytical laboratory, stating that the laboratory has read and understands the sample preparation, extraction, analytical and quality assurance requirements specified in the Notification and in this Approval.

**CLEANUP AND DISPOSAL CONDITIONS**

13. The cleanup level for *PCB remediation waste* (i.e., soil) at the Site shall be less than or equal to (≤) 25 parts per million (ppm).

14. All PCB waste (regardless of concentration) generated as a result of the activities described in the Notification, excluding any decontaminated materials, shall be marked in accordance with § 761.40; stored in a manner prescribed in § 761.65; and, disposed of in accordance with 40 CFR § 761.61(a)(5), unless otherwise specified below:

    a. Decontamination wastes and residues shall be disposed of in accordance with 40 CFR § 761.79(g).

    b. Moveable equipment, tools, and sampling equipment shall be decontaminated in accordance with either 40 CFR § 761.79(b)(3)(i)(A), § 761.79(b)(3)(ii)(A), or § 761.79(c)(2).

    c. PCB-contaminated water generated during decontamination or dewatering shall be decontaminated in accordance with 40 CFR § 761.79(b)(1) or disposed of under § 761.60.

**DEED NOTICE AND USE CONDITIONS**

15. Within 60 days of completion of the cleanup activities described in the Notification and authorized by this Approval, and as required under § 761.61(a)(8)(i)(B), MassCEC shall submit to EPA a certification, signed by a MassCEC approving official, that it has recorded the notation on the deed as required under § 761.61(a)(8)(i)(A). A copy of the notation on the deed must also be submitted.

**INSPECTION, MODIFICATION AND REVOCATION CONDITIONS**

16. MassCEC shall allow any authorized representative of the Administrator of the EPA to inspect the Site, to inspect records, and to take samples as may be necessary to determine compliance with the PCB regulations and this Approval. Any refusal by MassCEC to allow such an inspection (as authorized by Section 11 of TSCA) shall be grounds for revocation of this Approval.

17. Any proposed modification(s) in the plan, specifications, or information in the Notification must be submitted to EPA no less than 14 calendar days prior to the proposed implementation of the change. Such proposed modifications will be subject to the procedures of 40 CFR § 761.61(a)(3)(ii).

18. Any departure from the conditions of this Approval without prior, written authorization from the EPA may result in the revocation, suspension and/or modification of the Approval, in addition to any other legal or equitable relief or remedy the EPA may choose to pursue.

19. Any misrepresentation or omission of any material fact in the Notification or in any records or reports may result in the EPA's revocation, suspension and/or modification of the Approval, in addition to any other legal or equitable relief or remedy the EPA may choose to pursue.

20. Approval for these activities may be revoked, modified or otherwise altered: if EPA finds a violation of the conditions of this Approval or of 40 CFR Part 761, including EPA's PCB Spill Cleanup Policy, or other applicable rules and regulations; or, if EPA finds that these activities present an unreasonable risk to public health or the environment.

**RECORDKEEPING AND REPORTING CONDITIONS**

21. MassCEC shall prepare and maintain all records and documents required by 40 CFR Part 761, including but not limited to the records required under Subparts J and K. A written record of the cleanup and the analytical sampling shall be established and maintained by MassCEC in one centralized location until such time as EPA authorizes, in writing, an alternative disposition for such records. All records shall be made available for inspection by authorized representatives of EPA.

22. MassCEC shall submit a final report to EPA in an electronic version within 60 days of completion of the activities authorized under this Approval. At a minimum, this final report shall include: a short narrative of the cleanup and disposal activities, with photo documentation; characterization and confirmation sampling analytical results (as applicable); copies of the accompanying analytical chains of custody; field and laboratory quality control/quality assurance checks; an estimate of the quantity of PCB waste disposed of and the size of the remediated area(s); copies of manifests and/or bills of lading; and copies of certificates of disposal or similar certifications issued by the disposer.

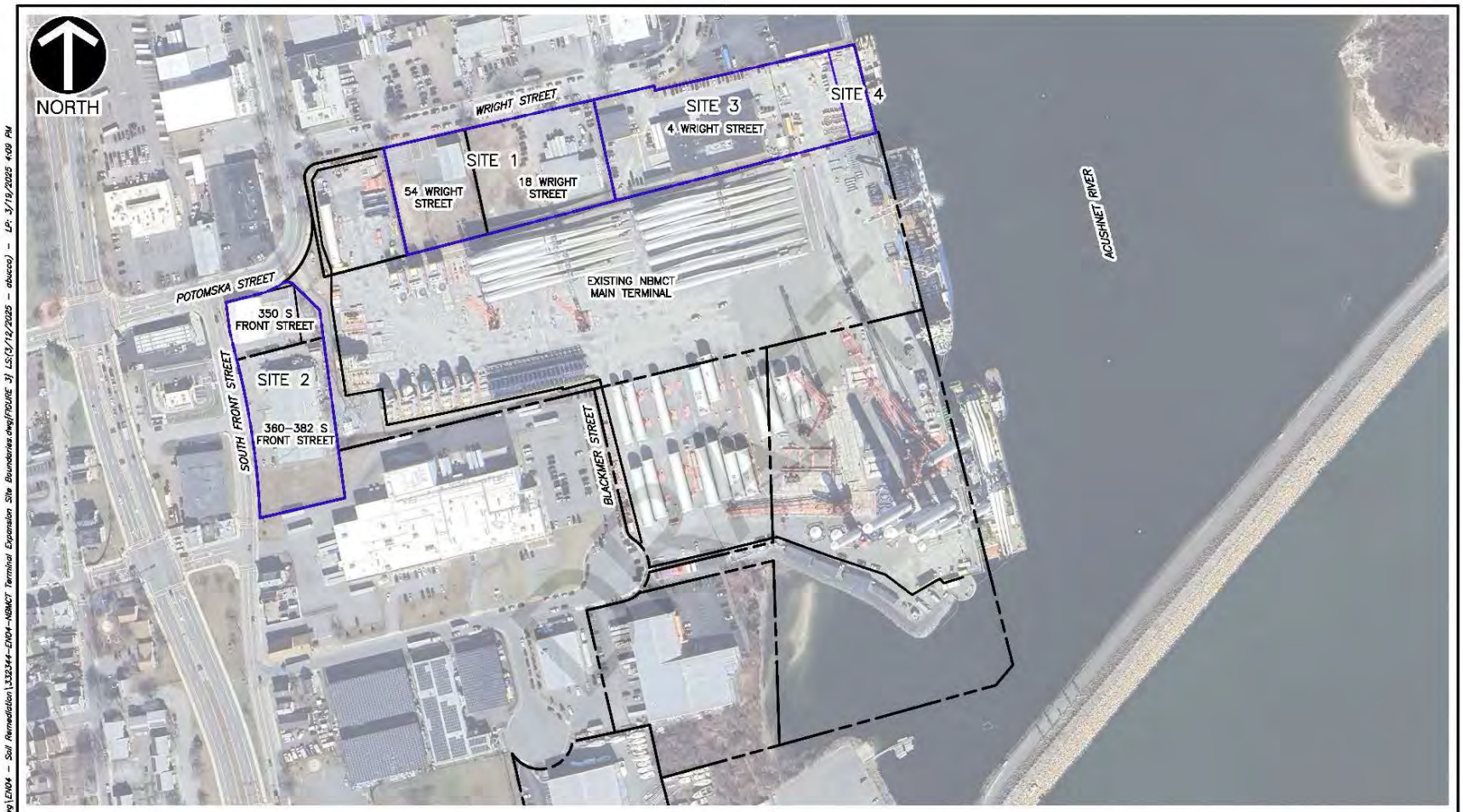
23. Required submittals shall be e-mailed to: R1PCBS@epa.gov

24. No record, report or communication required under this Approval shall qualify as a self-audit or voluntary disclosure under EPA audit, self-disclosure or penalty policies.

**********

**END OF ATTACHMENT 1**

*Attachment 2*
*Property Map*




LEGEND

PROPOSED EXPANSION AREA

PROPERTY LINE

SCALE IN FEET

0 200 400


Civil & Environmental Consultants, Inc.

31 Bellows Road
Raynham, MA 02767
Ph: 774.501.2176
www.cecinc.com

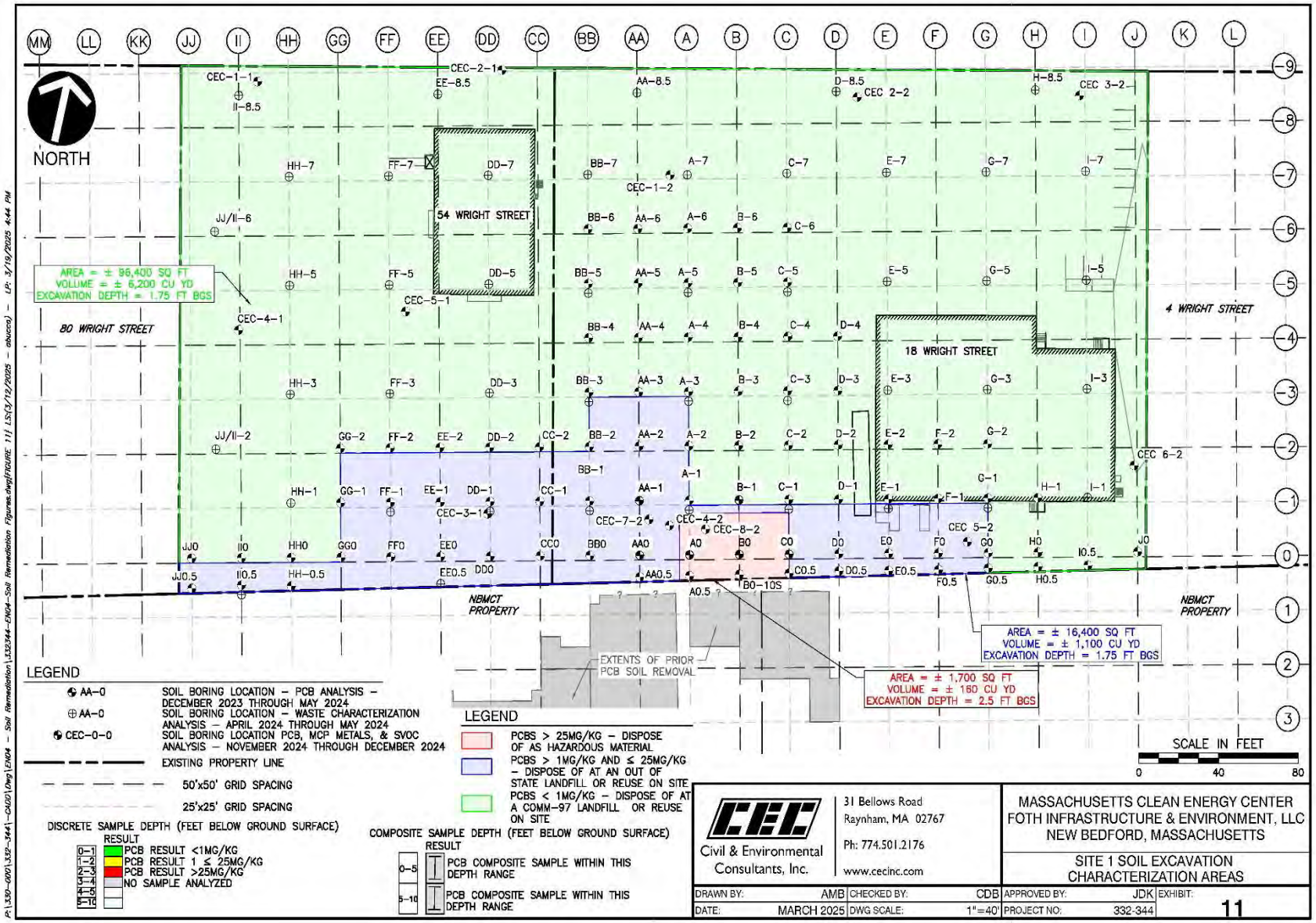

MASSACHUSETTS CLEAN ENERGY CENTER
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
NEW BEDFORD, MASSACHUSETTS

NBMCT TERMINAL EXPANSION
"SITE" BOUNDARY MAP

| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | FIGURE NO.: |
|---|---|---|---|---|---|---|
| DATE: | MARCH 2025 | DWG SCALE: | 1"=200' | PROJECT NO: | 332-344 | 3 |

P:\330-000\332-344\-CADD\Dwg\ENV4 - Soil Remediation\332344-ENV4-NBMCT Terminal Expansion Site Boundaries.dwg[FIGURE 3] LS:(3/19/2025 - abuzeo) - LP: 3/19/2025 4:09 PM

*Attachment 3*
*Excavation Map*




Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767
Ph: 774.501.2176
www.cecinc.com

MASSACHUSETTS CLEAN ENERGY CENTER
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
NEW BEDFORD, MASSACHUSETTS

SITE 1 SOIL EXCAVATION CHARACTERIZATION AREAS

| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | EXHIBIT: |
|---|---|---|---|---|---|---|
| DATE: | MARCH 2025 | DWG SCALE: | 1"=40' | PROJECT NO: | 332-344 | 11 |

P:\330-009\332-344\-CAD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg[FIGURE 11] LST:3/12/2025 - dbucco) - LP: 3/19/2025 4:44 PM

**ATTACHMENT 6: DEPARTMENT OF PUBLIC INFRASTRUCTURE CONSTRUCTION STANDARDS AND SPECIFICATIONS (CITY OF NEW BEDFORD, MARCH 2025)**

# CITY OF NEW BEDFORD

# DEPARTMENT OF PUBLIC INFRASTRUCTURE

## CONSTRUCTION STANDARDS AND SPECIFICATIONS

***Revision March 2025***

**This manual is updated annually during the first quarter of the calendar year. The latest version is available digitally at the City of New Bedford Department of Public Infrastructure Engineering Division's web page (https://www.newbedford-ma.gov/public-infrastructure/engineering/).*

Latest Edition: March 2025

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# SECTION I
# DEFINITIONS

Unless the context specifically indicates otherwise, the meaning of terms used in these Specifications shall be as follows:

"**Shall**" and "**Will"** are mandatory.

"**May**" and "**Should**" are permissive.

"**City"** shall mean the Commissioner of Public Infrastructure of the City of New Bedford, City Engineer or its duly authorized deputies, agents, representatives, or others having jurisdiction with regard to enforcement of these Specifications or acting for the City of New Bedford, Massachusetts.

"**Commissioner**" shall mean the Commissioner of Public Infrastructure or his duly authorized agents, representatives, or others having jurisdiction with regard to enforcement of the Specifications or acting for the City of New Bedford, Massachusetts.

**"Contractor"** means the Party of the Second Part to the Contract, acting directly or through an authorized lawful agent or employee.

**"DPI"** shall mean the City of New Bedford's Department of Public Infrastructure.

"**Engineer**" shall mean the City Engineer or his duly authorized agents, representatives, or others having jurisdiction with regard to enforcement of the Specifications or acting for the City of New Bedford, Massachusetts.

"**Hot Mix Asphalt"** shall mean Bituminous Concrete.

"**Inspector**" shall mean any person acting as a duly appointed agent of the DPI to ensure compliance with all Specifications and Rules and Regulations governing construction within the City of New Bedford, Massachusetts.

**"MassDOT Standards**" means the Massachusetts Department of Transportation – Highway Division Standard Specification for Highways and Bridges – 2025 Edition including all Massachusetts Department of Transportation – Highway Division (MassDOT) revisions and supplemental changes and/or information.

**"Moratorium"** shall mean the timeframe in which a person or contractor is not allowed to work in city rights of ways. The following moratoriums apply:

- No work shall occur in City Streets or Rights of Ways from December 15th to April 1st without prior written approval of the Commissioner.

- The City of New Bedford does not allow excavating on streets resurfaced (excluding crack sealing or fog sealing) within five years unless approved in writing

by the DPI Commissioner or his/her designee. Additional requirements are specified herein should permission be approved.

**"Municipal Storm Drain System"** The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or manmade or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the City of New Bedford.

**"Sewer Main"** shall mean, a drain or pipe that is underground and used to carry away surface water or sewage in a Public Way.

**"Sewer Service"** shall mean, an individual pipe that comes off the public sewer main to service a private house or business. Property Owners are responsible for a sewer service from their house or business to the connection at the Public Main.

**"Stormwater Service"** shall mean, an individual pipe that comes off the municipal main to service a private house or business. Property Owners are responsible for the stormwater service from the connection point at the municipal main to the collection system of the house or business.

**"Water Main"** shall mean, a water supply system in a public way used to distribute water to residential or commercial properties.

**"Water Service"** (Domestic or Fire Supply), shall mean, the lateral pipe from the public water main to primary service shut off valve, except when the meter is inside, then it is to the curb stop. Property Owners are responsible for the service from the property line to the meter.

# SECTION II
# GENERAL PROVISIONS

## CONSTRUCTION & SPECIFICATIONS MANUAL

The latest version of this manual is available digitally at the City of New Bedford Department of Public Infrastructure Engineering Division's web page (https://www.newbedford-ma.gov/public-infrastructure/engineering/).

## INTENT OF THE SPECIFICATIONS

The intent of these standard specifications is to clarify and advise the Contractor of his/her responsibility to perform all work and services as outlined. If, for any reason, a particular phase or phases of any or all of the operations has been omitted, it is not intentional, and it is to be understood that the Contractor must perform the work as fully as if it were described and delineated.

The Commissioner shall, in the case of any discrepancies or questions, interpret the plans and details and direct the Contractor accordingly.

These regulations govern construction within the geographical limits of the City of New Bedford. They include, but are not limited to, old and new subdivisions and where applicable, complement the "Rules and Regulations Governing the Subdivision of Land" by the Planning Board.

## CONTRACTOR'S LEGAL RESPONSIBILITY UNDER STATE LAWS

Attention is hereby directed to the provisions of Section 40, Chapter 82 of the General Laws requiring Contractors to notify public utility companies in writing at least 48 hours before excavating a public way to prevent accidental damage; and to Chapter 131, Section 40, the Wetlands Protection Act.

It shall be the Contractor's responsibility to familiarize themselves with and abide by any applicable local, state and federal laws governing his intended activities.

## CERTIFICATES OF COMPLIANCE

The Contractor shall furnish all Shop Drawings, Catalog Cuts, and a statement, certifying that all materials to be used in the work comply with the requirements of the specifications upon request. These statements shall be prepared by the manufacturer, an approved commercial laboratory, or any other agency acceptable to the Commissioner. In case of question or failure, it shall be the responsibility of the Contractor to arrange any required sampling and testing of the materials at no additional cost to the City.

Unless otherwise approved in writing by the Commissioner, only new materials and equipment shall be incorporated in the work.

## REFERENCE TO SPECIFICATIONS

Where specifications of the American Association of State Highway and Transportation Officials (AASHTO), The American Society of Testing and Materials (ASTM), The American National Standards Institution (ANSI), the Massachusetts Department of transportation (MASSDOT), the American Water Works Association (AWWA), the National Association of Sewer Service Companies (NASSCO), or any other agency are called for, the latest edition of these specifications including all addenda shall be used, unless otherwise noted.

## LAYOUT AND CONTROL OF WORK

The Contractor shall lay out his own work and be responsible for the execution of the work to such lines and grades indicated on the drawings, prescribed in the specifications, or directed by the Commissioner. In no case shall construction be performed without plans that have been approved by the DPI. The Contractor shall furnish, at his expense, all stakes, templates, range markers and other equipment, material and labor as may be required in laying out any part of the work.

The Contractor shall maintain and preserve horizontal and vertical control stakes being used for construction. Control stakes and markers originally set by the City Engineering Division for purposes of establishing horizontal and vertical control that are disturbed will be re-set by the City Engineering Division at the expense of the Contractor.

For property line monuments including City bounds that are to remain in place, the Contractor shall implement best practices to preserve the monuments located within the limits of construction including area used for access to the construction site. In the event that a property line monument, including city bounds, is uncovered by the Contractor and requires removal and replacement, the Contractor shall notify the City and allow sufficient time for the City Engineering Division to locate the monument by instrument survey prior to disturbance. In the event that a property line monument or city bound is disturbed as a result of construction work, the City will re-set the monument in conjunction with a Registered Land Surveyor as needed, at the expense of the Contractor.

## PROTECTION OF PERSONS AND PROPERTY

Contractors are to erect such structures around the locations as may become necessary to allow pedestrians to travel by the locations and to fence in any danger area or other place adjoining the streets where the work is performed constituting a hazard to persons or property, and to properly light and maintain lights at night around the locations in question.

Contractors must obtain Street Disturbance and Obstruction (D&O) permits before work commences. D&O permits will be issued once the property owner (or applicant) has obtained the coordinating permit (e.g. driveway, sewer service, etc.).

## SAFETY PRECAUTIONS

The Contractor shall provide fences, barriers, warning lights, police officers, signs and any other safety features as may be necessary for the protection of the public. These precautions shall apply particularly for open excavations.

Where the Contractor performs work on any public roads or thoroughfares, they shall first obtain permits from the City and then perform the work in accordance with said permits. The Contractor shall be responsible for maintaining traffic control with police officer details, signs, etc. If roads are disturbed, the contractor shall maintain the work until such time that they restore the road base and surface to the satisfaction of the City of New Bedford.

The Contractor shall take all necessary precautions to protect their work from damage by vandalism, storms, ground water infiltration, etc. In case of damage, the Contractor shall make such repairs,
replacements, or rebuild such parts of the work as the Commissioner may require in order that the finish work may be completed as required by the drawings, specifications, and/or permit.

## DIG SAFE REQUIREMENTS

Dig Safe mark outs for all City owned utilities (water, sewer, drainage, streetlight, fiber optics, etc.) will not be marked out until Street Disturbance permits have been signed and administered back to the applicant.

If work is to be performed solely within private property, therefore not requiring D&O permits, Dig Safe mark outs for all City owned utilities will not be marked until the Trench permit has been signed by DPI and administered back to the applicant.

All pre-marks for Dig Safe requests within the downtown area will require chalk paint be used in lieu of standard spray paint. The downtown area is bound by County Street to MacArthur Drive and Elm Street to Walnut Street.

## MATERIALS AND WORKMANSHIP

**Contractors shall be responsible for defects in Materials and Workmanship for a period of two (2) years following the completion with of any Driveway, Sidewalk, Sewer Main or Service, Low Pressure System, Water Main or Service, or any other work which requires permits from the Department of Public Infrastructure.**

It is the sole responsibility of the contractor to conduct a pre-construction survey for existing conditions (including photographed evidence and clear documentation of any pre-existing concerns or issues), of the work zone and adjacent properties. Upon completion of construction, the contractor will be held responsible, and required to repair at their expense, any damage the DPI Inspector deems a result of negligence (including, but not limited to, score marks from equipment tracks, tooth marks from back-hoe buckets and damage to grass ribbons or landscaped areas).

All castings (i.e, manhole covers, frames, grates, cleanouts, boxes and covers, etc.) shall be manufactured in the United States. Materials shall be new and unused. Cast iron shall conform to ASTM A48, Class 30. Contractors may be required to submit certified compliance statements from manufacture verifying compliance with American made products.

## USE OF EXISTING WATER AND SEWER SERVICES

The use of existing water and sewer services shall be at the Owner's own liability. The City does not warrant that existing service connections are in proper working condition nor meet current local, state or federal standards for safe operable and working condition. The following shall apply to all new development or redevelopment property proposing to utilize existing service connections:

1. Any water service smaller than 1-inch shall be replaced and upgraded from the corporation tap at the main to the meter.
2. Any water service identified as having lead (main to curb stop and/or curb stop to meter) shall be fully replaced from the main to the meter in accordance with these construction standards.
3. Any sewer service constructed of vitrified clay pipe, transite pipe or orangeburg pipe shall be replaced from the sewer main to the property line.
4. Documentation in the form of CCTV inspection data, in PACP/LACP format, shall be provided to the DPI for review and to document the condition of any existing service proposed to be reused. Upon review of the CCTV inspection data, the DPI will specify whether the service line must be replaced or provide an approved rehabilitation method. Any defects or identified sources of infiltration shall be repaired by the Contractor prior to use.
5. If a sewer service is being replaced or repaired and the existing water service is located closer than 10-ft horizontally or has less than 18-inch of vertical separation from the sewer service then the sewer service shall be concrete encased. See "Sewer Service Crossing Water Main or Storm Drain" detail for concrete encasement requirements.
6. The use of reducers is prohibited. Water services must be consistent size from main to meter. Sewer services cannot vary in size from main to building.
7. The connection of service laterals into one common, joint line is prohibited. New and/or existing services shall not connect into one another prior to entering the City's main.

## PERMITS

No Contractor shall, in any manner, disturb the surface of any public right of way within the City of New Bedford without first obtaining a permit. Only "City Bonded Contractors" approved by the City of New Bedford are allowed to do work on public right of ways.

No work shall occur in City Streets or Rights of Ways from December 15th to April 1st without prior written approval of the Commissioner.

Any work that occurs in a paved surface or roadway that was paved or improved (excludes crack sealing or fog sealing) within the previous five years shall have written approval of the Commissioner or his/her designee to complete the work and shall have additional requirements for restoration as specified herein which shall be included on the required permit. The City reserves the right to reject any and all requests regarding work in streets, roadways, or rights of ways that have been paved or improved in the previous five year.

Depending on the location, type and extent of work, additional requirements may be mandated and shall be specified by DPI signee on the approved permit.

The following permits are under DPI authority:

1. Street Obstruction: Required when working within the City Right of Way.
2. Street Disturbance: Required when excavating within the City Right of Way.
3. Trench Safety: Required when excavating on private property.
4. Sidewalk/Driveway: Required when installing or reconstructing sidewalks and/or driveways.
5. Sewer: Required when installing new or reconstructing sewer mains or sewer service connections.
6. Stormwater: Required when installing new or reconstructing stormwater mains, service connections or self-contained stormwater mitigation systems.
7. Water: Required when installing water mains or service connections.

Trench Safety & Permits:

TRENCH SAFETY/DISTURBANCE PERMITS for EXCAVATION & TRENCH SAFETY REGULATIONS - 520 CMR 14.00 Effective March 1, 2009

This PUBLIC SAFETY regulation is required by statute and is designed to prevent the public from falling into an unattended trench and suffering an injury or fatality.

Under the regulation, a trench is defined as a subsurface excavation greater than 3 feet in depth and is 15 feet or less between soil walls, as measured at the bottom.

All regulated trenches must be attended, covered, barricaded, or backfilled. Covers must be road plates at least ¾" thick or equivalent, barricades must be fences at least 6' high with no openings greater than 4" between vertical supports and all horizontal supports required to be located on the trench side of the fencing.

This applies to all construction-related trenches on public ways, public property, or private property.

Under the regulation, the DPI will be the designated permitting authority, which will issue the required permits for trenches on public ways or private property within the municipality.

The DPI will have the authority to act, if there is any potential violation, including an immediate shutdown, if violations of the new regulations are identified. Excavators may also be subject to administrative fines issued by the Department of Public Safety for violations.

This new regulation in no way modifies or supersedes existing trench worker safety regulations. Workers in trenches must comply with the existing OSHA Excavation Standard, 29 CFR 1926, Subpart P. This new public safety regulation is entirely separate from and has no relationship to the existing trench worker safety standard.

This is only a summary of the regulation. Please read the full regulation and obtain further information at www.mass.gov/dps or www.mass.gov/dos.

The City of New Bedford has combined the trench permit with the current Street Disturbance Permit to reduce the number of permits required for each site.

## INSPECTION

The Contractor shall notify the DPI or Engineering at least twenty-four hours prior to the construction of any public improvement so that the City can have an Inspector present if the work requires inspection. In general, inspection will be required.

1. For Driveways, Sidewalks and Wheelchair Ramp Construction:

    a. When base course is graded, prior to paving, and
    b. When forms are set and base course is graded, prior to pouring cement concrete.

2. For Drainage, Water and Sewer Construction:

    a. While laying pipe, stormwater infiltration units, stormwater treatment structures or other stormwater Best Management Practices but before backfilling., and
    b. During backfilling operations. (In the case of water main installations, final pressure testing will be required by the Department of Public Infrastructure to assure pipe tightness), and
    c. All water mains must be chlorinated and tested prior to acceptance.

3. For Roadway Construction (i.e. new subdivision to be a City accepted ROW):

    a. When the sub grade is established, and
    b. While placing gravel, and
    c. When final grade of the base course is established, and
    d. During paving operations.

4. Installation of New or Resetting of Existing Curbing

    a. When alignment is established and prior to concrete curb lock placement, and
    b. When concrete curb lock is installed and prior to backfilling.

5. Installation of New or Resetting of Brick, Belgian Pavers, and Bluestone Pavers

    a. When forms are set and base course is graded, prior to pouring cement concrete, and
    b. During the installation of brick, Belgian pavers and bluestone pavers.

**Notes:**

1. Contractor must be present for all scheduled inspections. Failure to notify DPI of a cancellation or a "No-Show" by the contractor will result in a re-inspection fee of up to $70.00/per violation.
2. Should the inspection of work result in a FAILED inspection, the contractor will be responsible for the payment of a $70.00/re-inspection fee which may be assessed multiple times depending on the number of failed inspections.
3. DPI may, at anytime, conduct an inspection of the Contractor's site, without notice, for the purposes of inspecting any and all work including stormwater sedimentation and erosion controls. Refer to the City's Stormwater Management Rules and Regulations for specific requirements regarding compliance and ability for the City to issue any fines or enforcement action.

## SAMPLING AND TESTING

All sampling and testing shall be done by a commercial testing laboratory approved by the City Engineer at the Contractor's expense. The City will require an Inspector at the plant and an Inspector at the site, to record air temperature and material temperature, during the pavement installation. Sampling and materials for tests shall be taken by the testing laboratory, under the direction of the City Engineer and/or his/her authorized representative. Test results shall be reported to the Commissioner in duplicate.

## CONCRETE CONSTRUCTION DURING HOT OR COLD WEATHER

Section 901.64 "Protection from Adverse Weather" of the MassDOT Standard Specifications shall apply to cement concrete sidewalk, driveway construction or other cement concrete items installed.

Any concrete placed during adverse weather shall be placed at the Contractor's risk and any damaged or unsatisfactory concrete shall be removed and replaced at the Contractor's expense. Concrete mixed or placed when the air temperature is below 40° F will be considered cold weather concrete and will require special treatment. The temperature of concrete at the point of discharge shall not exceed 90° F and will require special treatment.

## DEWATERING OPERATIONS

The Contractor is responsible for the proper design and implementation of methods for controlling surface water and groundwater during construction. The Contractor shall lower groundwater to at least 2-feet below the lowest level of the excavation to ensure the excavation is stable with no ponded water, mud, or muck, is able to support construction equipment without rutting or disturbance and is suitable for the placement and compaction of fill material, pipe or concrete foundations. Excavation dewatering shall maintain the subgrade in a natural undisturbed condition and until the fill, structure or pipes to be built therein have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural elevations.

Water from dewatering operations shall be treated by filtration, settling basins, or other method approved by the Engineer to reduce the amount of sediment contained in the water to allowable levels that do not exceed 15 standard turbidity units (STU) or 25 ppm TSS. The Contractor must notify DPI- Permits/Repair office of dewatering activities prior to discharging. Under no circumstances shall water from dewatering systems be discharged into an existing or new sanitary sewer. The Contractor shall be responsible for damage to properties, buildings or structures, sewers and other utility installations, pavements and work that may result from dewatering or surface water control operations. Do not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands or surface water.

The Contractor shall provide inlet protection for catch basins using “Silt Sacks” manufactured by ACF Environmental or approved equal. The Contractor shall provide inlet protection for Bradley head inlets using hay waddles. The Contractor shall comply with all other sediment and erosion control requirements in accordance with the City’s Stormwater Rules and Regulations.

## SECTION II – A
## CURB REMOVAL

When necessary to remove existing curb from a City Street to construct or widen a driveway the Contractor will be required to leave a deposit of $40 per foot of curbing to be removed at time of Street Disturbance Permit being issued and sign a forfeiture slip. The Contractor will have 30 days to deliver all removed curbing to the DPI Stock Yard on Liberty Street. The Contractor must call the DPI office 24-hours prior to delivery of curb to schedule arrangements for a DPI operator to offload the curb and sign for the linear feet of curb returned to the City yard. Curbing must be full length pieces, any pieces less than three (3) feet in length will not be accepted unless proven with pre-existing condition site photos that the curb was less than three feet prior to the contractor beginning work on the site. The Contractor will be issued a refund check for the linear feet of curb returned in good condition.

Failure to deliver the curbing or provide the receipt as required will result in the following:

1.) Removal of the Contractor's name from the City's list of contractors allowed to work on City streets and sidewalks.
2.) Deduction of the value of the curbing from the surety deposit (or a claim against the Contractor's Bonding Company should the value exceed the deposit.
3.) Rejection of the driveway by the City Inspector, which, in the case of a new building, will prevent the owner from obtaining a Certificate of occupancy. A surety deposit will be required and held for a period of 3 years in the amount to be determined by the size of the driveway calculated in the amount of square yards, based on the City Contractor's costs.
4.) Any Homeowner requesting the installation of a stamped concrete driveway brow will need the approval of the Commissioner of Public Infrastructure. If approved, the contractor will be required to install a sand-based sealant over the stamped concrete for the purpose of slip resistance.

### CONTRACTOR'S RESPONSIBILITIES

Please be advised that Contractors are responsible for the size of each driveway they install. The applicant has been given a copy of the Driveway Permit approved by the Engineering Dept. Any driveway apron installed larger than what is listed on the permit or differs from the lines marked in the field by the DPI inspector will result in reinstallation by the Contractor.

### Notes:

1. Contractor must be present for all scheduled deliveries of curb being returned to a DPI facility. DPI staff will wait on site for approximately 30 minutes after the scheduled start time. Failure to notify DPI of a cancellation or a "No-Show" by the contractor will result in a re-scheduling fee of up to $70.00/per violation.

## SECTION II – B
## FLOWABLE FILL REQUIREMENTS

The City requires that Controlled Low Strength Materials (flowable fill) shall be the standard backfill material whenever working within City Right of Way.

It is mandatory to use flowable fill for the backfill in all trench cuts within the paved or gravel road surface.

All work shall conform to the relevant provision of the MassDOT Standards.

Flowable Fill shall meet the requirements of Subsection M4.08.0 Controlled Low-Strength Materials – Excavatable. Flowable Fill shall not contain fly ash.

Contractor is to install ¾" stone conforming to M2.01.4 to a level one (1) foot above the crown of the pipe. Flowable fill will be placed over the ¾" stone.

Trench shall be plated for a minimum of 24-hours after placement of flowable fill. Flowable fill shall be firmly set prior to removal of plates.

Copy of the slips are to be turned into the Inspector or the DPI Repair Shop Office.

# SECTION III
# ROAD CONSTRUCTION

## CLEARING AND GRUBBING

The work shall conform to the relevant provisions of Section 101 of the MassDOT Standards, supplemented by the following:

The entire area of each street right-of-way shall be cleared of all stumps, brush, roots, boulders, like material and all trees not intended for preservation. Individual trees, groups of trees, and other vegetation to be left standing will be marked by the Engineer and shall be thoroughly protected from damage incidental to construction operations.

Care shall be taken by the Contractor to protect all trees to be preserved, and adjacent trees and property of others from damage caused by his clearing or burning operations.

Where individual trees in fill areas are to be saved, the Contractor shall provide adequate tree wells or other protection so that no fill covers the original ground around the tree trunk.

## EXCAVATION

The work shall conform to the relevant provisions of Section 120 of the MassDOT Standards, supplemented by the following:

**General** The Contractor shall perform all excavation and grading of every description, regardless of the material encountered, within the limits of work, in conformity with the lines, grades and dimensions shown on the drawings.

Before rough grading commences, all trees or groups of trees, which are to be left standing, shall be given any additional protection required to prevent damage. Care shall be taken to avoid damaging trunks, branches and roots during construction. All protection shall be removed at the time of landscaping to permit finish grading and seeding around trees.

**Stripping Topsoil** All topsoil shall be stripped from areas to be paved, excavated, or filled and stockpiled for future landscaping. Care shall be taken that loam or topsoil will not be mixed with sand, gravel or clay during stripping operations.

**Unsuitable Material** Unsuitable material, including peat, muck, and soft clay, shall be excavated to such widths and depths as necessary to obtain a firm and stable foundation. Unsuitable material shall be disposed of at an off-site area acquired by the Contractor for such purpose. Where surface or ground water is encountered, provisions shall be made for adequate drainage of the area. Backfilling shall consist of clean sandy material approved by the Engineer.

**Rock Excavation** Rock excavation shall be completed by non-explosive methods only including rock splitting, ripping, expansive chemical slitting or hoe-ramming. When rock excavation requires blasting, the Contractor shall provide written notice requesting permission from the Commissioner prior to initiating any blasting. Blasting shall only be completed upon

written approval from the Commissioner or his/her designee. Contractor shall exercise care not to overshoot and shall remove any material outside the authorized cross section which may be shattered or loosened by such blasting. Blasting operations shall conform to the latest issue of the Corp. of Engineers' Safety Regulations and shall be done by licensed blasters after a blasting permit has been obtained from the Fire Chief having jurisdiction over the area and completing the required pre-blast survey. Any damage to the work or property of others caused by blasting operations shall be repaired at the expense of the Contractor.

**Compacted Earth Fills** Materials for fill shall be obtained from roadway excavation, borrow pits or other approved sources. The material used shall be free from vegetable matter and other deleterious substances and shall not contain rocks larger than 12 inches in any direction.

Areas to be filled shall be scarified to a reasonable depth in order to insure proper bond. The fill material shall be placed in layers which, when compacted, shall not exceed 8 inches. The moisture content of the fill material shall be such that the fill can be compacted to 95-percent of maximum dry density as determined by ASTM D1557, Method D.

After each layer has been placed and evenly spread, it shall be thoroughly compacted to 95-perecnt of maximum dry density as determined by ASTM D1557, Method D. Compaction shall be by means of flat plate compactors, forward and reversible multiple-wheel pneumatic-tired rollers or other types of rollers, which will be able to compact the fill to the desired density.

No fill material shall be placed, spread or rolled while the ground or fill is frozen or thawing or during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations shall not be resumed until the moisture content and density of the fill are as previously specified.

**Dust Control** Proper dust control measures shall be taken by the Contractor to abate dust nuisance to abutting properties of the work site. Calcium chloride shall be furnished and applied, only to areas to be paved, by the Contractor unless this requirement is waived, in writing, by the Engineer. In other areas, sprinkling shall be used and repeated at such intervals as to keep all parts of the disturbed area damp at all times. Calcium chloride shall be commercial grade, furnished in 100 lb., 5-ply bags, stored under a weatherproof cover and stacked alternately for ventilation. Application shall be at the rate of about one-half pound per square yard, unless otherwise directed by the Engineer. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs.

## SUBGRADE PREPARATION

Work shall conform to the relevant provisions of Section 170 of the MHD Standards, supplemented by the following:

The subgrade shall be prepared to the full width of the road right-of-way and any adjacent bank easements, in conformity with the lines, grades, slopes and cross-section of the approved plans. Grades under paved areas shall be held to a tolerance of plus or minus one-tenth (1/10) foot. The shoulders shall be shaped and landscaped so that the entire right-of-way presents a neat and pleasant appearance, but shoulder loaming and seeding shall be postponed until all paving work has been done.

Soft or otherwise unsuitable material in the sub grade, under paved areas, shall be removed and replaced with approved material. All low sections, holes or other depressions shall be brought to grade. After the sub grade is properly shaped, it shall be thoroughly compacted with an approved roller weighing not less than 10 tons. Wetting or settling the sub grade by blading, required along with the rolling of the sub grade, shall be included to obtain proper compaction.

The top six (6) inches of sub grade in paved areas shall be compacted to a minimum of 95 percent of maximum density as defined and measured in ASTM D1557.

The finished sub grade shall pitch from the centerline of road to the edge of pavement at a rate of one quarter (1/4) inch per foot as shown on the typical road cross-section.

## GRAVEL BASE COURSE

Work shall conform to the relevant provisions of Section 150 of the MHD Standards, supplemented by the following:

**General** **The gravel base course shall consist of an eight (8) inch total compacted thickness for sidewalks and a twelve (12) inch total compacted thickness for roadway pavements.** The gravel base course shall be placed only on a sub grade approved, in writing, by the Engineer.

The lines and grades shall be established by the Contractor, in conformity with the drawings and shall be maintained by means of grade stakes, placed in lines parallel to the centerline of the areas to be paved, and spaced a minimum of fifty (50) feet on center and at other locations deemed appropriate so that string lines may be stretched between the stakes.

**Material** Gravel borrow/bank run gravel shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings and deleterious material and shall conform to MassDOT Standard M1.03 Type “B”. The use of Processed Glass Aggregate is not allowed. Gradation requirements shall conform to AASHTO T11 and T27.

**Placing and Mixing** Gravel base courses shall be placed and spread uniformly in layers not exceeding 6 inches after compaction. Care shall be taken while spreading the gravel to rake forward and distribute the largest stones so that they will be at the bottom of the gravel course and be evenly distributed, but under no circumstances will stones larger than three (3) inches be permitted.

The material shall be mixed evenly with blade graders until each layer of gravel is uniform throughout its depth. During this operation, water shall be added by sprinkling equipment in such amounts as are required to obtain optimum moisture for the required density. When uniform, the mixture shall again be spread smoothly to the cross-section as shown on the approved drawings.

**Compaction** Immediately following final spreading and smoothing, all materials placed shall be compacted to the full width by rolling with a self-propelled power roller, weighing not less than ten (10) tons, and having a minimum weight of three hundred (300) pounds per inch width of rear wheel. Rolling shall progress gradually from the sides to the center, parallel with the centerline of

the road and lapping uniformly each preceding track by one-half the width of such track and shall continue until all the surface has been rolled and satisfactory compaction obtained.

Each layer of gravel base course shall be compacted to a minimum of 95 percent of modify proctor density for roadways and sidewalks, as defined and measured in ASTM D1557.

**Smoothness Test** The surface of the top layer of gravel base course shall show no deviations in excess of three-eighths (3/8) inch when tested with a ten (10) foot straight edge applied both parallel with and at right angles to the center line of the area to be paved. Any deviation in excess of this amount, shall be corrected by loosening, adding, or removing material, re-shaping, and compacting to the satisfaction of the Engineer. The surface of underlayers shall be finished to a reasonably even contour as approved by the Engineer. To accomplish a smooth and even surface, the top twelve (12) inches of gravel base shall be placed with processed gravel having no greater gradation than three quarters (¾) inch stones.

## SURFACE COURSE

The work shall conform to the relevant provisions of Section 460 of the MassDOT Standards, supplemented by the following:

**Hot Mix Asphalt** Standard binder for hot mix asphalt surfaces shall be a PGAB meeting the requirements of AASHTO M320. The standard PGAB Grade of PG64-28 shall be used.

Tack coat (RS-1) shall conform to the MassDOT Standards meeting M3.03. Tack coat shall be applied per the requirements of Section 450.43.G.

The surface shall consist of two (2) courses; 2 ½" hot mix asphalt intermediate course and 1 ¾" hot mix asphalt surface course over asphalt emulsion for tack coat cover totaling 4 ¼" of hot mix asphalt for roadways. All materials and workmanship shall conform to Section 460 of the MassDOT Standards.

- Surface Course – SUPERPAVE Surface Course – 12.5 (SSC – 12.5-P)
- Intermediate Course – SUPERPAVE Intermediate Course – 19.0 (SIC – 19.0)

Hot mix asphalt joint sealer shall be applied to all cold joints, longitudinal and traverse and at frames and curbing prior to paving.

Depending on the estimated or measured truck traffic, Engineer may require additional pavement thickness and/or a polymer-based pavement.

Special attention shall be given to the temperature of pavement prior to placement. Any pavement not meeting the required temperature will be rejected and not eligible for payment and shall be immediately removed from the site. Any pavement placed at the incorrect temperature shall be removed and replaced at no cost to the City. In accordance with MassDOT Standards, provide to Engineer prior to the start of construction a QC Plan and any and all information on the mix design including but not limited to the liquid asphalt being used within the manufacture of the hot mix

asphalt. QC Plan shall clearly denote the proper temperature at delivery to the site and placement (i.e., behind the screen). The difference between the highest and lowest temperature measurement shall not exceed 20-degrees F.

## CURBING

Unless otherwise noted herein, curbing shall conform to MassDOT Standards Sections 501 and 580.

Curbing must be sourced from a quarry approved by the MassDOT, color, texture and finish shall be within the range of samples approved by the Engineer. Submit samples to DPI Engineering for review.

Vertical granite curbing shall be 6-inch curbing Type VA-4 as specified in Sections M.9.04.0 and M.9.04.1 of the MassDOT Standards.

Transition curbing for curb ramps and driveways or for varying the curb reveal shall be as specified in Section 501.68 of the MassDOT Standards.

Curbing shall be installed in accordance with Sections 501 and 580 of the MassDOT standards. Installation shall be in accordance with the City's Standard Details including the extra curb lock for support in areas where curb does not directly abut concrete sidewalk or wheelchair ramp (i.e., grass strip or tree well).

## PATCHING TRENCHES

All material for backfilling the trench shall be suitable and free from organic substances, large stones, frost and other deleterious material. Twelve (12) inches of Gravel Borrow Type B conforming to M1.03 shall be compacted to a minimum of 95 percent of modify proctor density (ASTM D1557) for roadway and sidewalk trenches, before permanent patch is applied.

Pavement repairs shall be made by the contractor in accordance with "HMA Pavement Restoration Detail". **All trenches running parallel to roadway must be paved from gutter line to centerline. Perpendicular patches (services) must be paved from gutter to centerline and span two (2) feet beyond the width of the excavation trench on both sides.** All patches shall be of a rectangular shape and not traverse diagonal nor jogged in any way. No material shall be placed over Flowable Fill that has not yet firmly set.

### Temporary Patches

1. It is the responsibility of the contractor to maintain the patch.
2. The patch shall be installed within five (5) days of backfilling the trench.
3. Before placing the patch, the edges of the existing pavement shall be saw cut or blade-cut to a smooth, straight edge, back from the edge of the trench far enough to expose a minimum of twelve (12) inches of undisturbed gravel sub-base.

4. In warm weather, the temporary patch shall be regular hot mix asphalt base course. In cold weather, the temporary patch shall be "Cold Patch" hot mix asphalt or cement concrete as specified in Section III – A, with a minimum thickness of six (6) inches, poured flush with the wearing surface of the adjacent paving.
5. In either case, the temporary patch shall be replaced with a permanent hot mix asphalt repair, not less than thirty (30) or more than sixty (60) days following the original backfilling or upon the opening of the asphalt plant, whichever occurs first.
6. Contractor shall have 150 days from start date of Disturbance Permit to finish all site restoration work.

**Permanent Patches**

Contractors shall contact DPI at 508-979-1550 ext. 67305 to arrange for an inspection at least one full day in advance of placing the permanent paving. Patch paving shall be rolled flush with the surface of the existing pavement. No "feathered" overlap of paving will be allowed.

1. When installing a permanent patch to a pavement cut, the edges of the existing cut shall be "tack" coated to ensure a water-proof seal with the new patch and existing pavement. Tack coat shall conform to and be installed as specified above.
2. The patch paving shall be a minimum thickness of 4 ¼", installed in 2 ½" hot mix asphalt intermediate course and 1 ¾" hot mix asphalt surface over asphalt emulsion for tack coat cover, compacting thoroughly between layers. Must match existing pavement conditions if greater than 4 ¼" inches in depth.
3. Seams shall be sealed with hot mix asphalt joint sealer after the patch is placed.
4. Emphasis is also placed, on the requirement calling for compacted Gravel Borrow Type B (M1.03) as shown in accordance with "HMA Pavement Restoration" detail.

**Infrared Pavement Treatment**

Infrared pavement treatments shall be performed by a fully qualified, experienced paving subcontractor.

Contractor shall supply an approved infra-red pistol thermometer capable of reading between 0 and 750 degrees F.

Infra-red treatment of permanent pavement shall not be performed in less than 120 days after installation of permanent pavement unless otherwise directed by the Engineer.

1. The area to be repaired shall include approximately two feet on either side of the saw cut line (i.e., two feet of existing pavement and two feet of new pavement).

2. Pavement areas to be repaired shall be swept and hosed clean to remove all loose and foreign materials.

3. An approved infra-red heater, not to exceed 15,000 BTU's per square foot per hour, shall be positioned over the areas to be repaired for the period of time required to soften the existing pavement to a depth of two or more inches.

    a. Oxidation of the pavement, caused by excessive heat as determined by the Engineer, shall be avoided.

    b. Remove all unsuitable material in the event of oxidation and replace it with new bituminous concrete at his own expense.

4. The area to be repaired shall be thoroughly scarified to a depth of at least 2-inch.

5. A recycling agent admixture shall be added to the softened area after scarification, in the amount recommended by the manufacturer or approved by the Engineer, and shall be raked to a uniform, workable condition.

6. Any additional bituminous concrete mix (MARIMIX or equal) needed shall be obtained from an infra-red heated storage unit required to keep asphalt at near constant temperature throughout the working day.

    a. The storage unit shall be made entirely of metal (no canvas), shall be thoroughly insulated to reduce the amount of heat required and the contents shall be kept heated with an air circulation system.

    b. Under no circumstances is any asphalt mix to be used that registers a temperature of under 200 degrees F.

7. After the paving mixture has been properly admixed and raked to grade, it shall be compacted by means of a steel-wheeled roller of sufficient weight to establish a uniform density comparable to that of adjacent surface within the work area. The finished patch shall be level with no depression retaining water on any of its surface and shall be perfectly flush with the existing, surrounding pavement.

8. The edges around the perimeter of the newly repaired areas shall be sealed with a suitable asphalt emulsion.

9. A cationic asphalt emulsion shall then be hand-sprayed on the patched area and adjacent edges at the approximate rate of 0.1 gallon per square yard to offset the effects of oxidation and seal the entire newly treated area.

10. Stone dust shall be spread over the newly sealed area.

Contractors may elect to have their pavement repairs completed by a second or sub paving contractor (who must also be bonded as per City requirements), but the contractor initially cutting the pavement shall nevertheless remain responsible for the completion of the pavement repairs within the time periods specified above under temporary patches.

Contractors must notify DPI when all Right-of-Way repairs have been completed (including HMA patches, cement concrete sidewalks/driveways and restoration by loam and seed) for a final inspection. DPI will inspect final repair work and immediately report finish work that is non-compliant with these Construction Standards and Specifications. Contractor is solely responsible for taking corrective action(s) necessary to repair non-compliant work by the deadline specified by DPI.

No work will be allowed in City streets or City rights of ways between December 15 and April 1 without prior approval of the Commissioner.

If a proposed excavation or trench work falls within a cobblestone street or a brick/bluestone sidewalk, the Contractor must:

1. Notify the Department of Public Infrastructure on type and scope of proposed work to be performed.
2. Department of Public Infrastructure will schedule inspections of the removal of said materials.
3. Upon work completion, the Contractor shall properly backfill to the sub-grade elevation of a 4” concrete slab for sidewalks and walkways and 6” concrete slab for roadways or driveways.
4. The Contractor will then be required to safeguard the unfinished surface with steel plates and barriers or as deemed necessary by the City of New Bedford.
5. The Contractor must use brick and paver specifications. See Construction Standards Details.

If a proposed excavation or trench work falls within a roadway, paved surface or right of way that has been improved within the last five years and permission has been granted by the DPI Commissioner or his/her designee to excavate, the following additional requirements shall apply:

1. Limits of paving shall be defined on the Trench Permit or Obstruction and Disturbance Permit. The limits shall be based on the type and extent of work required and shall be at the discretion of the DPI Commissioner or his/her designee.
2. Infrared pavement repairs shall be completed no later than 120 days following completion of the patch.
3. Pavement markings disturbed shall be fully replaced with new thermoplastic pavement markings in accordance with MassDOT Standards.

# SECTION III – A
# CEMENT CONCRETE SIDEWALKS, WHEELCHAIR RAMPS, AND DRIVEWAYS

## SCOPE OF WORK

Concrete sidewalks, wheelchair ramps, and driveways shall be constructed in one course on prepared foundation of gravel in accordance with Section 701 of the MassDOT Standards. In case of conflict between the MassDOT Standards, and the following specifications, the following specifications shall govern. All concrete sidewalks, wheelchair ramps, and driveways shall be constructed in conformity with lines, grades, and typical cross sections shown on the plans or approved by the Engineer.

**General** The Contractor shall be responsible for notification to "Dig Safe" at locations where excavation is scheduled and to call DPI-Repair at 508-979-1550 ext 67305 for water, sewer and drain mark-outs.

The Contractor shall schedule and execute reconstruction operations so as to maintain pedestrian access to abutting property, particularly to the commercial establishments.

See "Protection of Persons and Property" in Section II- General Provisions

The Contractor's attention is called to the fact that driveway and wheelchair ramp construction shall be in accordance with the provisions of the current MassDOT Standards and Americans with Disabilities Act (ADA) Standards. The precise location and dimensions of individual wheelchair ramps shall be reviewed by the Engineer following final determination of profile grades at driveway and ramp locations.

No construction of sidewalks, wheelchair ramps or driveways, shall be allowed from December 15 to April 1 without prior approval and approved in writing by the DPI Commissioner. If approved, then the Contractor must comply with the requirements specified in Section II – General Provisions: Concrete Construction during Cold or Hot Weather

Contractor must notify the DPI twenty-four (24) hours in advance for a pre-inspection before the placement of concrete. Failure of notification for pre-inspection may result in Non-Acceptance of said work. Placement of concrete must be completed within forty-eight (48) hours of the pre-inspection or the Contractor will be required to schedule another pre-inspection.

**Materials** Materials shall meet the requirements specified in the following subsections of Division III. Materials of the MassDOT Standards:

1. Gravel Borrow M1.03.0 Type B or M2.01.7 Dense-graded crushed stone for sub-base.

2. Cement Concrete (air-entrained 4,000 psi. ¾", 610) M4.02.00 with a 4" +/- 1" maximum slump.

3. Preformed Expansion Joint Filler M9.14.0 – Must be grey.

4. Grey, Flexible Joint Sealer

5. Reinforcing mesh. Shall be 6” x 6” 10-gauge, welded wire mesh.

## CONSTRUCTION METHODS

**Sub grade** – The sub grade for the sidewalks shall be shaped parallel to the proposed surface of the walks, wheelchair ramps, and driveways be thoroughly rolled and tamped. All depressions occurring shall be filled with suitable materials and again rolled or tamped until the surface is smooth and hard.

**Foundation** – An (8) inches thick foundation shall be placed upon the prepared sub grade. After being compacted to a minimum of 95 percent of modified proctor density as defined and measured in ASTM D1557, the foundation shall be (4) inches below the proposed surface for sidewalks and (6) inches below the proposed surface for wheelchair ramps and driveways.

**Wire fabric** 6 x 6 mesh, 10 gauge or fibers can be substituted for wire mesh, shall be installed in all commercial driveways and all wheelchair ramps.

**Forms** – Side forms and transverse forms for sidewalks shall be smooth, free from warp, of sufficient strength to resist springing out of shape, of the proposed walk, wheelchair ramps, and driveways, and of a type satisfactory to the Engineer or Inspector.

All mortar and dirt shall be completely removed from forms and from those that have been previously used. The forms shall be well staked and thoroughly braced and set to the established lines with their upper edge conforming to the grade of the finished walk, which shall have sufficient pitch to provide for transverse surface drainage, but which shall not exceed 3/16” per foot of width.

Cement driveway brows at the gutter line shall be ½ inch higher than street surface (plus or minus 1/8”). Driveway brows shall conform to the slopes shown on “Sidewalk Through Driveways” detail. Driveway brows exceeding these limits shall be replaced at the Contractor’s expense.

Saw cuts of concrete sidewalks shall be made in the scored joints and/or in the tooled longitudinal or transverse joints so as to best preserve the tooled edge on the side of the cut to remain. Saw cuts shall be made clean and vertical and care shall be taken to prevent over cutting, spalling, cracking, or other damage.

Reconstruction work limits will most always abut the existing sidewalks at a control joint. Should the Contractor find a fracture at this location or otherwise decide to forego the above procedure, he does so at his own risk, and will be required to replace any sidewalk damaged (to the next control joint) at his own expense.

Delivery and transport of concrete shall be in accordance with MassDOT Standards.

## CONCRETE

The concrete for sidewalks shall be poured in alternate slabs of 30 feet in length except as otherwise ordered. The slabs for the sidewalk shall be separated by transverse preformed expansion joint fillers ½ inch in thickness.

Preformed expansion joint filler shall be placed adjacent to or around existing structures in sidewalks where directed. A flexible joint sealer shall be installed along joints where cement concrete abuts hot mix asphalt, retaining walls, foundations or in other similar circumstances as directed by DPI.

On the foundation as specified, the concrete shall be placed in such quantity that after being thoroughly rammed in place it shall be four (4) inches in depth. At driveways, and wheelchair ramps the sidewalks shall be six (6) inches in depth. The concrete shall be worked and floated. Broom the surface perpendicular to the street, removing the tooled edges (smooth surfaces).

In conveying the concrete from the place of mixing to the place of disposal the operation shall be conducted in such a manner that no mortar will be lost and the concrete shall be so handled that the concrete will be of uniform composition throughout, showing neither excess nor lack of mortar in any one place.

The surface of concrete sidewalks shall be uniformly scored into block units of areas of not more than thirty-six (36) square feet as directed. The depth of the scoring shall be at least one quarter of the thickness of the sidewalk.

The finishing of concrete surface shall be done by experienced and competent cement finishers, approved by the Engineer or Inspector.

**Boundstones, water shutoff gates, sewer cleanouts, gas shutoff gates, handholes, manholes and catch basin frame and covers shall be carefully set to the proposed finished grade, with 3" of document concrete to underside of flange where applicable.**

Utility frame and covers must be covered with plastic or tape with sufficient adherence to prevent concrete from adhering to the covers. The plastic must be removed when the clean up is performed the following day. DPI will not allow removal of concrete from the frame and cover by method of hammer and chisel.

## BOUNDSTONES

Notify DPI at least 24 hours prior to excavation, to allow DPI's Engineer to mark approximate locations where records indicate City boundstones may exist; the Contractor shall use extra caution when excavating these areas and uncover the boundstone without damaging or displacing. Should boundstones be found that are damaged or require resetting to grade, the Contractor will notify DPI, which will complete the resetting. **Exposed City boundstones or street line property bounds destroyed, displaced, damaged, or buried by the Contractor, will be replaced by a Registered Professional Land Surveyor in the Commonwealth of Massachusetts (an outside hire from the Contractor's organization) at the Contractor's expense.**

**PROTECTION OF WORK**

During the procedure of the work, the contractor shall be held entirely responsible for the protection and result of the work and damage to the work that may occur through any cause and shall be repaired by the contractor at his expense.

The Engineer may order random concrete testing by the methods specified in Subsection M4.02.13 of the MassDOT Standards.

Stop signs are not to be removed and left lying on the ground at any time. If they are to be relocated for a wheelchair ramp, they must be immediately relocated or replaced with a temporary stop sign in an area outside the wheelchair ramp.

# SECTION III – B
# HOT MIX ASPHALT SIDEWALKS AND DRIVEWAYS

## SCOPE OF WORK

Hot mix asphalt sidewalks and driveways shall be constructed in two courses on a prepared foundation of gravel in accordance with Section 701 of the MassDOT Standards. In case of conflict between the MassDOT Standards, and the following specifications, the following specifications shall govern.

All hot mix asphalt sidewalks and driveways shall be constructed in conformity with lines, grades and typical cross sections shown on the plans or approved by the Engineer. All driveways installed without transition curb must be perpendicular to the road's edge of pavement, no radius curvature at entrance corners off the street's gutter line. Driveway curb cuts are to be a minimum of three (3) feet from the face of any utility pole, five (5) feet from hydrants and/or street light poles and ten (10) feet from the trunk of a tree.

## GENERAL

The Contractor shall be responsible for notification to "Dig Safe" at locations where excavation is scheduled and to call DPI-Repair at 508-979-1550 ext 67305 for water, sewer and drain mark-outs.

The Contractor shall schedule and execute reconstruction operations so as to maintain pedestrian access to abutting property, particularly to the commercial establishments.

See "Protection of Persons and Property" Section

The Contractor's attention is called to the fact that driveway construction shall be in accordance with the provisions of the current MassDOT Standards and Americans with Disability Act (ADA) Standards. The precise location and dimensions of individual wheelchair ramps shall be reviewed by the Engineer following final determination of profile grades at driveway locations.

No construction of sidewalks, or driveway constructions shall be allowed from December 15th to April 1st without prior approval and approved in writing by the DPI Commissioner.

Contractor must notify DPI, for pre-inspection of the site 24 hours before placing the hot mix asphalt.

## MATERIALS

Materials shall meet the requirements specified in the following subsections of Division III. Materials of the "MassDOT Standards.

- Gravel Borrow M1.03.0 Type B or M2.01.7 Dense-graded crushed stone for sub-base.
- Refer to Section III – Road Construction for Hot Mix Asphalt requirements with the following modifications:

- 1 ½" Surface Course – SUPERPAVE Surface Course – 9.5 (SSC – 9.5)

- 2 ½" Intermediate Course – SUPERPAVE Intermediate Course – 12.5 (SIC – 12.5)

## CONSTRUCTION METHODS

Sub-grade – The sub-grade for the sidewalks shall be shaped parallel to the proposed surface of the walks and driveways, are to be thoroughly rolled and tamped. All depressions occurring shall be filled with suitable material and again rolled or tamped until the surface is smooth and hard.

Base Course – After the sub-grade has been prepared as herein before specified a sub-base of gravel shall be placed upon it which, after being wet and thoroughly rolled and tamped, shall be at least four 4 inches in thickness and three (3) inches below and parallel to the proposed finished surface of the sidewalk and at least six (6) inches in thickness and four (4) inches below and parallel to the proposed finished surface of the driveway.

### Hot Mix Asphalt Sidewalks

Forms – Where walls, curbing or other suitable permanent supports are not present or where an approved mechanical spreader is not used, satisfactory forms shall be installed to assist in securing proper alignment and adequate compaction of the base and surface courses.

Placing Hot Mix Asphalt – The hot mix asphalt walk surface shall be laid in 2 courses to a depth after rolling of four (4) inches. The bottom course shall be 2 ½ inches in thickness after rolling shall. The top course shall be 1½ inches in thickness after rolling.

The surface shall have a pitch towards the gutter line in accordance with ADA regulations (+/- 1.5%) to provide for proper drainage.

The courses shall be constructed in accordance with the applicable requirements of Section 460 of the MassDOT Standards and the following provisions:

1.) Spreading Mixture – The mixture shall be dumped, as needed, in wheelbarrows or on approved steel dump sheets outside the areas on which it is to be placed. It shall then be immediately distributed into place by means of shovels and raked into a uniformly loose layer to the full width required and of such depth that, when the work is completed, it shall conform to the grade and surface contour required. An approved mechanical spreader may be used.

2.) Rolling – The surface shall be rolled with a self-propelled tandem roller weighing not less than 1 ½ tons and not more than five (5) tons. In places inaccessible to a power roller, compaction shall be obtained by means of mechanical rammers or by hand tampers weighing not less than fifty (50) pounds and having a tamping face not exceeding one hundred (100) square inches.

3.) Testing Surface – When tested with a 10-foot straightedge placed parallel to the centerline of the courses, there shall be no deviation from a true surface in excess of ¼ of an inch.

**Hot Mix Asphalt Driveways**

A. NO FORMS WILL BE REQUIRED

B. PLACING BITUMINOUS CONCRETE – The Bituminous Concrete driveway surface shall be laid in 2 courses to a depth, after rolling of 4 inches unless otherwise designated on the plans. The Bottom Course shall be 2-½ inches in thickness, and its surface after rolling, shall be 1 ½ inches below and parallel to the proposed grade of the finished surface. The top course shall be 1-½ inches in thickness after rolling.

1.) Spreading Mixture – The mixture shall be spread with an approved spreader. In areas not accessible to a spreader, the mix shall be placed as specified in Subsection 702.42.E of the MassDOT Standards.

2.) Rolling – The surface shall be rolled with a self-propelled tandem roller weighing not less than 3 tons nor more than 5 tons, or an approved roller as designated by the Engineer.

3.) Testing Surface – When tested with a 10-foot straightedge placed parallel to the centerline of the courses, there shall be no deviation from a free surface in excess of ¼ inch.

**Boundstones, water shutoff gates, sewer cleanouts, gas shutoff gates, handholes, manholes and catch basin frame and covers shall be carefully set to the proposed finished grade.**

## BOUNDSTONES

Prior to excavation, the Engineer will mark approximate locations where records indicate City boundstones may exist, the Contractor shall use extra caution when excavating these areas and uncover the boundstone without damaging or displacing. Should boundstones be found that are damaged or require resetting to grade, the Contractor will notify DPI, which will complete the resetting. Exposed City boundstones or street line property bounds destroyed, displaced, damaged, or buried by the Contractor, will be replaced by the at the Contractor's expense.

## PROTECTION OF WORK

During the procedure of the work, the contractor shall be held entirely responsible for the protection and result of the work and damage to the work that may occur through any use and shall be repaired by the contractor at this expense.

Stop signs are not to be removed and left lying on the ground at any time.

## PROTECTION OF PERSONS AND PROPERTY

Contractors are to erect such structures around the locations as may become necessary to allow pedestrians to travel by the locations and to fence in any danger area or other place adjoining the

streets where the work is performed constituting a hazard to persons or property, and to properly light and maintain lights at night around the locations in question.

# SECTION III - C
# BRICK SIDEWALKS

## DESCRIPTION

This item of work shall consist of setting brick sidewalks on a sand cushion on a concrete base course in accordance with these specifications and in close conformity with the lines and grades established by the Engineer. No bricks will be allowed to be stored at the site when the contractor is not working.

## MATERIALS

Materials shall meet the requirements specified in the following Subsections of Division III. Materials of the MassDOT Standards:

| | |
|---|---|
| 3,000 psi, 1 ½" 470 Cement Concrete | M4.02.00 |
| Expansion and Contraction Joints | |
| Preformed Filler | M9.14.0 |
| Hot Poured Joint Sealer | M3.05.0 |
| Cement Mortar | M4.02.15 |

## CONSTRUCTION METHODS

The sub-base below the concrete base course shall be fine graded and thoroughly compacted after forms are in place; it shall be placed on compacted fill as required under Section 170 of the Standard Specifications.

A. FORMS

Forms shall be placed if directed to the full depth of the combined bricks and concrete base. They shall be of wood, not less than nominal 2 – inch thickness and dressed on all four sides. Forms shall be securely staked and braced and shall be constructed and set so as to resist the pressure of the concrete without springing out of alignment. They shall be oiled before use.

B. PLACING CONCRETE

The concrete base course shall have a minimum depth of 4 inches.

Concrete shall be deposited with minimum rehandling and in one layer. Hand spreading and spading shall be done adjacent to forms and joints.

The concrete shall be struck off and float-finished. Protection and curing shall be done as required in Section 901 of the MassDOT Standards. Laying of bricks shall not be done until at least 24 hours after the final curing period of the concrete base course.
The forms shall remain in place until the bricks are laid, in order to confine the cement mortar.

C. JOINTS IN CONCRETE

Weakened plane transverse contraction joints shall be constructed in the concrete base course every 30 feet or as directed by the Engineer. These joints shall consist of surface slats 2 inches deep, varying in width from ½ inch at top to ¼ inch at bottom.

D. LAYING BRICKS

Bricks shall be carefully laid in 1-inch-thick mortar bed, flat side in a running bond pattern, transversely laid from curb to property line over the concrete foundation as directed and shall be solidly placed in position. Joints between bricks shall be a maximum of 1/4 inch in width. Bricks shall be kept perfectly clean and joints between bricks shall be clean and open to the full depth of bricks until the joint is filled with cement mortar.

After a sufficient area of bricks has been laid, the surface shall be tested with a 10-foot straightedge laid parallel with the curb line and any variation exceeding ¼ inch shall be corrected and brought to proper grade.

Each section of brick surfacing must be acceptable to the Engineer before joints in that section are filled with mortar.

E. FILLING JOINTS

Cement mortar shall be placed and worked in such a manner as to fill the joint to a depth of ¼ inch below the surface. The top surface of bricks shall be kept clean of mortar stains. Immediately after the mortar joints have set sufficiently the brick sidewalks shall be swept clean and any marks on the top surface removed. A spray retarder will be applied to the top finish of the brick sidewalk if directed by the Engineer.

# SECTION III - D
# BELGIAN PAVERS PAVEMENT

## GENERAL

The City of New Bedford reserves the right to claim any items or materials in the roadway or sidewalk which the Contractor must remove to make proper repairs.

These items include but are not limited to: cobblestones, Belgian Paving blocks, curbing, railroad tracks, trolley tracks, loam, Boston pavers, flagstones, and bluestone slates.

## DESCRIPTION

This item of work shall consist of setting Belgian Pavers pavement on a sand cushion on a concrete base course in accordance with these specifications and in close conformity with the lines and grades established by the Engineer. Belgian Pavers shall be provided by the City of New Bedford and to be picked up by the Contractor at the City Yard. No Belgian Pavers will be stored at the side when the contractor is not working.

## MATERIALS

Materials shall meet the requirements specified in the following Subsections of Division III. Materials of the MassDOT Standards:

| | |
|---|---|
| For Sidewalks | |
| 3,000 psi, 1 ½" 470 Cement Concrete | M4.02.00 |
| For Roadways, Driveways and Wheelchair Ramps | |
| 4,000 psi, ¾" 610 Cement Concrete | M4.02.00 |
| Expansion and Contraction Joints | |
| Performed Filler | M9.14.0 |
| Hot Poured Joint Sealer | M3.05.0 |
| Cement Mortar | M4.02.15 |
| Sand Borrow | M1.04.0 Type b |

## CONSTRUCTION METHODS

The sub-base below the concrete base course shall be fine graded and thoroughly compacted after forms are in place; it shall be placed on compacted fill as required under Section 401 of the Standard Specifications.

A. FORMS

Forms shall be placed if directed to the full depth of the combined Belgian Pavers, sand cushion, and concrete base. They shall be of wood, not less than nominal 2 – inch thickness and dressed on all four sides. Forms shall be securely staked and braced and shall be constructed and set so as to resist the pressure of the concrete without springing out of alignment. They shall be oiled before use.

B. PLACING CONCRETE

The concrete base course shall have a minimum depth of 4 inches for sidewalk applications and 6 inches for roadway, driveway, or wheelchair ramp applications.

Concrete shall be deposited with minimum rehandling and in one layer. Hand spreading and spading shall be done adjacent to forms and joints.

The concrete shall be struck off and float finished. Protection and curing shall be done as required in Section 901 of the MassDOT Standards. Placing of 3-inch-thick sand cushion and laying of Belgian Pavers shall not be done until at least 24 hours after the final curing period of the concrete base course.

The forms shall remain in place until the Belgian Pavers are laid, in order to confine the sand cushion and mortar.

C. JOINTS IN CONCRETE

Weakened plane transverse contraction joints shall be constructed in the concrete base course every 30 feet or as directed by the Engineer. These joints shall consist of surface slats 2 inches deep, varying in width from ½ inch at top to ¼ inch at bottom.

D. LAYING BLEGIAN PAVERS

Belgian Pavers shall be carefully laid in a running pattern, transversely curb to curb on a sand cushion over the concrete foundation as directed and shall be solidly rammed in position. Joints between Belgian Pavers shall be a maximum of 1 inch and a minimum of ½ inch in width. Belgian Pavers shall be kept perfectly clean and joints between stones shall be clean and open to the full depth of Belgian Pavers until the joint is filled with mortar.

After a sufficient area of Belgian Paver pavements has been laid, the surface shall be tested with a 10-foot straightedge laid parallel with the centerline and any variation exceeding ½ inch shall be corrected and brought to proper grade.

Belgian Pavers disturbed in making replacements or correcting variations shall be settled into place by carefully ramming or tampering to grade by use of a hand tamper applied upon a 2-inch plank.

Each section of cobles surfacing must be acceptable to the Engineer before joints in that section are filled with cement mortar.

E. FILING JOINTS

Cement mortar shall be placed and worked in such a manner as to fill the joint to a depth of ¼ inch below the surface. The top surface of Belgian Pavers shall be kept clean of mortar stains. Immediately after the mortar joints have set sufficiently the Belgian Pavers

pavement shall be swept clean and any marks on the top surface removed. A spray retarder will be applied to the top finish of the Belgian Pavers pavement if directed by the Engineer.

# SECTION IV
# STORMWATER MAIN CONSTRUCTION

## SCOPE OF WORK

Effective January 25, 2017, all site drainage must comply with the City's new "Storm Water Management Rules and Regulations". Refer to the City's website under Public Infrastructure's Wastewater Division for a copy of the regulations. (http://www.newbedford-ma.gov/public-infrastructure/wastewater/)

The work shall conform to the relevant provisions of Sections 201, 220 and 230 of the MHD Standards, supplemented by the following:

The Contractor shall furnish all materials, perform all work and services necessary for the complete construction of the storm drainage system, e.g.: installation or construction of all storm drains, perimeter, and conductor drains, catch basins, manholes, headwalls, etc., including all related work such as excavation, backfilling and compaction.

The Contractor shall perform his work in accordance with plans approved by DPI.

## MATERIALS

**Pipe.** The type of pipe allowable for storm drains shall be limited to:

1. Reinforced concrete pipe conforming to Section M5-M5.02.1 Reinforced Concrete Pipe of the MHD Standards.

2. Polyvinyl chloride pipe (PVC pipe) shall conform to ASTM Standard D 1784 and D 3034-SDR 35.

    a. The pipe and fittings shall be homogeneous throughout and free from visible cracks, holes, foreign inclusion or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density and other physical properties.
    b. All fittings and accessories shall have dimensions as recommended by the manufacturer and have bell and/or spigot configurations compatible with that of the pipe.
    c. Pipe shall pass impact resistance test in accordance with ASTM D 2444 and minimum pipe stiffness test at 5% deflection in accordance with ASTM D 2412.
    d. The normal length of twelve (12) inch size and smaller shall be twelve and one-half (12 ½) feet and fifteen (15) inch size shall be no longer than twenty (20) feet.
    e. Pipe and fittings shall be manufactured in the United States of America and shall be accompanied by the manufacturer's certificate compliance, in addition to meeting the performance tests specified hereinafter.
    f. No less than three (3) feet of cover from top of pipe to finish grade.

The type of pipe allowable for conductor or perimeter drains shall be a minimum of four (4) inches in diameter and limited to:

1. Cast iron pipe, not less than Class 24, conforming to ANSI A21.8.
2. Ductile iron pipe, not less than Class 52.
3. Polyvinyl chloride pipe conforming to ASTM Standard D 1784 and D 3034-SDR 35.
4. HDPE pipe not allowed within City Layout.

Structures Bricks shall conform to ASTM C-32, Grade MA. Radial concrete blocks shall be not less than eight (8) inches in length and of such shape that the joints can be effectively sealed and bonded with mortar. They shall conform to ASTM C-139. Precast concrete rings shall conform to ASTM C-14.

Concrete for headwalls, footings, and other structures shall have a minimum compressive strength of twenty-five hundred (2500) psi at twenty-eight (28) days.

Reinforcing steel shall conform to ASTM A-305 for bar reinforcement and ASTM A-185 for wire mesh.

Mortar for masonry work and pipe joints shall consist of one (1) part Portland cement to two (2) parts sand. Portland cement shall conform to ASTM C-150, type II. Sand shall conform to ASTM C-144. The mortar shall be used within thirty (30) minutes from the time that the ingredients are mixed with water. Water shall be clean and free from impurities.

See details section “Manhole Frame and Cover”.

## EXCAVATION AND BACKFILLING

Excavation. The Contractor shall excavate whatever material encountered to the depths shown on the drawings. In open cut excavation, the trench width at the top of the pipe shall be no wider than the outside diameter of the pipe, plus one and one-half (1 ½) feet, unless permission is granted by the inspector. The trench above the top of the pipe shall have sufficient slope so that the banks will not slide. Sheeting of trenches will be at the Contractor’s discretion and as may be required by applicable governmental laws and regulations.

Excavation for manholes, catch basins, headwalls or other structures shall be sufficient to leave at least twelve (12) inches in the clear between their outer surfaces and the embankment or timber which may be used to hold and protect the banks. Any over-depth excavation below the footings of such structures shall be filled with concrete or as directed by the Engineer and will be at the Contractor’s expense.

Care must be taken not to damage water pipes, storm drains, sanitary sewers, gas mains, electric conduits, or other structures encountered on the lines of the work. In case of damage to any structures, the Owner of the structures and the DPI shall be notified immediately by the Contractor so that the proper steps may be taken to repair, at the expense of the Contractor, any and all damage done.

Rock Excavation. Rock excavation shall be completed by non-explosive methods only including rock splitting, ripping, expansive chemical slitting or hoe-ramming. When rock excavation requires blasting, the Contractor shall provide written notice requesting permission from the DPI Commissioner prior to initiating any blasting. Blasting shall only be completed upon written approval from the DPI Commissioner or his/her designee. Contractor shall exercise care not to overshoot and shall remove any material outside the authorized cross section which may be shattered or loosened by such blasting. Blasting operations shall conform to the latest issue of the Corp. of Engineers' Safety Regulations and shall be done by licensed blasters after a blasting permit has been obtained from the Fire Chief having jurisdiction over the area and completing the required pre-blast survey. Any damage to the work or property of others caused by blasting operations shall be repaired at the expense of the Contractor.

Whenever the bottom of the trench is rock or boulders, it shall be excavated eight inches below grade and refilled to grade with gravel rammed in place. The sides of the trench in rock shall be excavated to such width that no rock shall be closer to the pipe barrel or other structures than eight inches when the pipe is laid in the trench with a normal alignment or 12-inches from a structure or manhole wall.

Bedding. For drain mains, trenches shall be shaped to give the pipe a continuous and even bearing. Where the bottom of the trench has been taken out to a greater depth than above specified, it shall be refilled with earth, properly compacted and shaped. The Contractor shall undercut unsuitable material and replace it with suitable material.

For drain services, when indicated by the Engineer, bedding shall be comprised of a six (6) inch layer of peastone, three quarter (3/4) inch crushed stone, for proper support and protection from settling.

Backfilling. For drain mains, all materials for backfilling the trench shall be suitable and free from organic substances, large stones and frost. No stones weighing over fifty (50) pounds shall be backfilled anywhere into the pipe trench.

For drain services, when indicated by the Engineer, the pipe shall be completely encased in an envelope of peastone, three quarter (3/4) inch crushed stone, approximately six (6) inches on each side and twelve (12) inches on the top. Stones larger than three (3) inches in diameter shall not be closer than twelve (12) inches to the pipe. Over that, materials for backfilling the trench shall be suitable and free from organic substances, large stones and frost. No stone weighing over fifty (50) pounds shall be backfilled anywhere into the trench.

Compaction shall be either by puddling or by mechanical means as approved by the Commissioner. If compaction by the puddling method is desired, the Contractor shall obtain permission from the Department of Public Infrastructure, who will install a hydrant meter. Charges for water used, shall be made by the Water Division. Care must be taken to prevent excessive run-off or silt infiltration into the pipes or below the discharge end, any materials so deposited must be removed by the Contractor at no cost to the City. While puddling is underway and afterwards, until puddled areas have sufficiently hardened, the Contractor must protect the trench and the public by suitable barriers, lights, etc.

**INSTALLATION**

Pipe Laying. All pipe before being lowered into the trench shall be clean and free from defects. The Contractor shall remove, by pumping or other means, any water accumulated in the trench during the pipe laying period and keep the trench dry until the joints are properly connected.

The pipe shall be laid with bell ends upstream, beginning at the lower end of the pipeline. The pipeline shall be laid to the grades and alignment indicated on the drawings. During construction, precautions are required to protect downstream structures from excess sediment washout e.g. hay bales, silt fence, etc.

Joints.

a. Concrete Pipe (Bell and Spigot, or Tongue and Groove)

The interior surface of the bell (groove) shall be carefully cleaned with a wet brush, and a layer of soft mortar shall be applied to the lower half of the bell (groove). The spigot (tongue) of the second pipe shall then be cleaned carefully with a wet brush, covered with a layer of soft mortar to its upper half, and inserted in the bell (groove) end of the first pipe. Sufficient mortar shall be used to completely fill the joint and to form a bead on the outside. The interior surface at the joint shall be finished smooth and the mortar bead on the outside shall be protected from the air and sun until the mortar is satisfactorily cured. For a tighter joint, the Contractor shall use a jute string in each joint, unless specifically waived in writing by the Engineer.

b. Cast Iron, Ductile Iron Pipe

Joints shall be made in accordance with the latest directions and specifications of the manufacturer.

c. Polyvinyl Chloride Pipe

Joints shall be bell and spigot. The bell shall consist of an integral wall section with a solid cross section rubber ring factory-assembled, securely locked in place to prevent displacement. Joints shall conform to ASTM Standard D 3212.

Structures. All structures shall conform to the dimensions shown on the typical details. When field conditions warrant, as determined by the Engineer, manholes, catch basins, and headwalls shall be constructed on a six (6) inch slab of cast-in-place concrete placed on undisturbed earth; over-excavation shall be compensated for with additional concrete at the Contractor's expense. If a six (6) inch slab is not used, four (4) inch pre-cast sectional plates shall be used for the base and shall conform to the dimensions shown on the typical details. Walls, where not specified, shall be concrete, brick, radial concrete blocks or pre-cast concrete rings. Manholes shall have shaped channels connecting main lines.

Brick and concrete blocks shall be clean and thoroughly wetted before laying. All joints shall be completely filled with mortar and struck to a smooth finish. Brick shall be laid in stretcher courses

with every sixth course laid radially. The outside of brick and concrete block and concrete block structures, and the inside, if required by the Engineer, shall be plastered and troweled smooth with five eights (5/8) inch of mortar.

The bottom section of pre-cast manholes shall be jointed to the concrete footing with mortar, and successive sections shall be jointed together with mortar. The joint space shall be completely filled with mortar and finished smooth on the inside and outside. A tapered section four feet in height shall be placed on top of the uppermost straight section as shown on the typical detail.

Frame castings for catch basins and manholes shall be set in full mortar beds true to the lines and grades.

Stone for Pipe Ends and Rip-rap. Stone for pipe ends shall be sound, durable rock, which is angular in shape. Rounded stones, boulders, sandstone or similar stone or relatively thin slabs will not be acceptable. Each stone shall weigh not less than fifty (50) pounds nor more than one hundred twenty-five (125) pounds and at least 75% of the volume shall consist of stone weighing not less than seventy five (75) pounds each. The remainder of the stones shall be so graded that when placed with the larger stones, the entire mass will be compact. No stone shall have a minimum thickness less than one-third (1/3) of its length or width.

Aprons shall be provided at all headwalls and where necessary, the Contractor shall excavate a ditch, at a slope of 0.5 percent, to existing ground.

Ditches. Drainage ditches shall have a bottom width at least equal to the diameter of the outfall pipe, with side slopes of one (1) vertical to two (2) horizontal. Soil from ditches shall not be deposited along the sides so as to create ponding. Care must be exercised to eliminate water pockets over and adjacent to such ditches.

Storm Water Recharge Systems. Prior to installation of roof leaders and Storm Water Recharge Systems, a plan and stormwater report stamped by a Registered Professional Engineer in the Commonwealth of Massachusetts is required to be submitted to DPI for review and approval. All designs shall conform to the requirements of the MassDEP and the City's Stormwater Management Rules and Regulations – where conflicts exist, the more stringent shall apply.

In accordance with Massachusetts Department of Environmental Protection (MassDEP) requirements, file the appropriate Underground Injection Control (UIC) permit. Notice of application and a copy of the permit shall be submitted to the DPI along with the required stamped plans and stormwater report.

# SECTION V
# SANITARY SEWER MAIN CONSTRUCTION

## SCOPE OF WORK

The Contractor shall furnish all materials and perform all the work and services necessary for the complete construction of the sanitary sewer system, i.e., - installation or construction of all sewer mains, service connections, manholes, encasements, etc., including all related work such as excavation, de-watering, backfilling, testing and flushing of lines.

The Contractor shall perform his/her work in accordance with the plans and specifications, on file with the associated permit that have been approved by the DPI. Any deviation from the approved plan needs authorization from the DPI Engineering prior to installation or request for inspection.

Any new connection or extension where proposed flows exceed 15,000 gallons per day, the Contractor shall submit a plan to the DPI for review addressing compliance with 314 CMR 12.04(d).

Sanitary sewer mains shall be designed in conformance with the latest version of the TR-16 manual and the specifications provided herein – where conflicts occur the more stringent shall apply. Adherence to the requirements of the design plan being built shall be verified and attested to by an as-built plan signed and stamped by a Professional Engineer. The submittal of a stamped as-built shall be required prior to any service connection permits being released by the City.

## MATERIALS

Pipe.

All sanitary sewer piping shall be Polyvinyl chloride (PVC) SDR-35.

1. Polyvinyl Chloride Pipe. PVC sewer pipe for gravity sewers and service connections shall conform to ASTM Standard D 1784 and D 3034-SDR 35, and shall meet the following specific requirements and exceptions:

    a. The pipe and fittings shall be homogeneous throughout and free from visible cracks, holes, foreign inclusion or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density and other physical properties.

    b. Joints shall be bell and spigot. The bell shall consist of an integral wall section with a solid cross section rubber ring factory-assembled, securely locked in place to prevent displacement. Joints shall conform to ASTM Standard D 3212.

    c. All fittings and accessories shall have dimensions as recommended by the manufacturer and have bell and/or spigot configurations compatible with that of the pipe.

d. Pipe shall pass impact resistance test in accordance with ASTM D 2444 and minimum pipe stiffness test at 5% deflection in accordance with ASTM D 2412.

e. The normal length of twelve (12) inch size and smaller shall be twelve and one-half (12 ½) feet and fifteen (15) inch size shall be no longer than twenty (20) feet.

f. Pipe and fittings shall be manufactured in the United States of American and shall be accompanied by the manufactures certificate of compliance, in addition to meeting the performance tests specified hereinafter.

Service connections shall consist of a wye and a six (6) inch diameter pipe from the sewer main to the property line.

Fittings and special couplings for connecting different pipe sizes or materials shall be made by pipe manufacturers and used according to manufacturer's recommendations.

Manholes.

All manholes shall be precast concrete, conforming to standard dimensions or those shown on the typical detail. Brick and concrete block manholes shall not be permitted unless approved by the Commissioner.

Precast manhole cones and sections shall be constructed of reinforced concrete pipe sections, conforming to ASTM C-478.

Concrete for encasements or other uses shall have a minimum compressive strength of twenty five hundred (2500) PSI at twenty-eight (28) days.

Manhole diameter shall be determined based on pipe connection diameter as follows:

| **Pipe Diameter (inches)** | **Manhole Barrel Diameter (feet)** |
|---|---|
| Up to 21 | 4 |
| 24 - 30 | 5 |
| 36 - 42 | 6 |

For manholes connecting more than 2 pipes, consideration shall be given to increasing the manhole barrel diameters noted above. For pipes forty-eight inches and larger in diameter, use of a tee section should be considered. Both scenarios to be approved by DPI.

Brick shall conform to ASTM C-32, grade SS. Mortar for masonry work shall consist of one part Portland Cement and two parts washed sand. Portland Cement shall conform to ASTM C-150, Type II. Sand shall conform to ASTM C-144. The mortar shall be used within thirty (30) minutes from the time the ingredients are mixed with water. Water shall be clean and free from impurities.

See details section "Manhole Frame and Cover".

Flexible sleeve –Integrally cast sleeve in precast manhole section or install sleeve in a formed or cored opening. Fasten Pipe in sleeve with stainless steel clamp(s). Coat stainless steel clamp(s) with bituminous material to protect from corrosion. Flexible sleeve shall be Lock Joint Flexible Manhole Sleeve; Kor-N-Seal connector; PSX Press-Seal Gasket or Dampproofing shall be Hydrocide 648 by Sonneborn Building Products; Dehydratine 4 by A.C. Horn, Inc.; RIW Marine Liquid by Toch Brothers or equal.

Paint outer surface of manholes and structures with two coasts of bituminous dampproofing at the rate of 30 to 60 sq. ft per gallon, in accordance with manufacturer's instructions.

## EXCAVATION AND BACKFILLING

Excavation.

The Contractor shall excavate all materials encountered to the depths shown on the drawings. In open cut excavation, the trench width at the top of the pipe shall be no wider than the outside diameter of the pipe, plus one and one-half (1 ½) feet on either side of the pipe, unless permission is granted by the Inspector. The trench above the top of the pipe shall have sufficient slope so that the banks will not slide. Sheeting of trenches will be at the Contractor's discretion and as may be required by applicable governmental laws and regulations.

Excavation for manholes shall be sufficient to leave at least twelve (12) inches in the clear between their outer surfaces and the embankment or timber, which may be used to hold and protect the banks. Any over-depth excavation below the footings of such manholes shall be filled with concrete or clean selected material and will be at the Contractor's expense.

Care must be taken not to damage water pipes, storm drains, sanitary sewers, gas mains, electric conduits or other structures encountered on the lines of the work. In case of damage to any structures, the Owner of the structures and the DPI shall be notified immediately by the Contractor so that the proper steps may be taken to repair, at the expense of the Contractor, any and all damage done.

All sewer and water installations must be separated by a minimum of ten feet (10). Refer to Watermain Construction – Pipe Installation and Appurtenances for additional specific requirements.

Rock Excavation.

Rock excavation shall be completed by non-explosive methods only including rock splitting, ripping, expansive chemical slitting or hoe-ramming. When rock excavation requires blasting, the Contractor shall provide written notice requesting permission from the DPI Commissioner prior to initiating any blasting. Blasting shall only be completed upon written approval from the DPI Commissioner or his/her designee. Contractor shall exercise care not to overshoot and shall remove any material outside the authorized cross section which may be shattered or loosened by such blasting. Blasting operations shall conform to the latest issue of the Corp. of Engineers' Safety Regulations and shall be done by licensed blasters after a blasting permit has been obtained from the Fire Chief having jurisdiction over the area and completing the required pre-blast survey.

Any damage to the work or property of others caused by blasting operations shall be repaired at the expense of the Contractor.

Whenever the bottom of the trench is rock or boulders, it shall be excavated eight (8) inches below grade and refilled to grade with selected material rammed in place. The side of the trench in rock shall be excavated to such width that no rock shall be closer to the pipe barrel or other structures than eight (8) inches when the pipe is laid in the trench with a normal alignment or 12-in from a manhole or structure wall.

Bedding.

The Contractor shall undercut unsuitable material and replace it with selected material composed of screened gravel with stones not larger than one and one-half (1 ½) inches.

When indicated by the City Engineer, the bedding shall be comprised of a six (6) inch layer of peastone, three quarter (3/4) inch crushed stone, spread to give the pipe a continuous and even bearing. This bedding shall be required for both the sewer main and for all service connections.

Concrete Cradle and Encasement:

Where indicated on the plans or directed by the City Engineer, concrete cradle or concrete encasement shall be built in accordance with the typical detail. In general, a concrete cradle shall be used where the depth of cover over the pipe is from fourteen (14) to twenty-two (22) feet. For sewers having greater depths of cover than twenty-two (22) feet, full concrete encasement shall be used.

Backfilling:

ALL sewer pipe shall be completely encased in an envelope of peastone, three quarter (3/4) inch crushed stone six (6) inches on each side and twelve (12) inches on top. No stones larger than three (3) inches in diameter shall be closer than twelve (12) inches to the pipe. Over that, materials for backfilling the trench shall be suitable and free from organic substances, large stones and frost. No stone weighing over fifty (50) pounds shall be backfilled anywhere into the trench. Compaction shall be either by machine or by the puddling method. If puddling is used, a charge for water will be made by the Department of Public Infrastructure. While puddling is underway and afterwards, until puddled areas have sufficiently hardened, the Contractor must protect the trench and the public by suitable barriers, lights, etc.

## INSTALLATION

Pipe Laying:

The Contractor shall remove by pumping or other means any water accumulated in the trench during the pipe laying period and keep the trench dry until the joints are properly connected.

All pipe before being lowered into the trench shall be clean and free from defects. The pipe shall be laid to grades and alignment indicated on the approved plan but shall maintain self-cleansing velocities of 3 feet per second, and the minimum grades in Table 1 shall apply.

**TABLE 1 SEWER DESIGN FOR SELF-CLEANSING VELOCITIES**

| Sewer Size | Minimum Slope |
|---|---|
| 6” | .020 |
| 8” (terminal sewers only)* | .008 |
| 8” | .004 |
| 10” | .0028 |
| 12” | .0022 |
| 15” | .0015 |

*Terminal sewers require greater minimum slopes because of the low flows and velocities at the head of a terminal line.

A minimum cover of four (4) feet is required over-all sanitary sewer pipes. All sanitary sewer pipes, that cross water mains, shall be placed a minimum of eighteen (18) inches below the water main. Where this is not possible, review is required by the Engineering Department prior to installation.

Changes in direction (vertical or horizontal) shall require a manhole at the point of direction change unless otherwise directed by the Engineer.

When processing from a smaller diameter pipe to one of larger diameter, inside arch surfaces of the pipes shall be made flush (Differences in diameters shall be accommodated by dropping the invert of the larger pipe. Care shall be taken to ensure retention of pitch when so doing).

Pipe shall be properly and uniformly supported in the trench and shall be bedded in coarse sand or processed gravel, which shall have been compacted to a depth of four (4) to six (6) inches below the pipe. Blocking shall not be used to bring pipe to grade, nor shall there be present in the bedding any stone, hard lumps, chunks of frozen material or similar debris having maximum dimension greater than three-quarter (3/4) inch. If trench conditions require three-quarter (3/4) inch, crushed stone may be used for bedding. Such substitution of crushed stone must be approved by the Engineer prior to placing same. Whichever bedding material is used shall be brought to a height of one-half (1/2) the outside diameter of pipe and thoroughly compacted, as shown on the City Standard Details. Initial cover and backfill shall also be as shown on the City Standard Details.

All work must be inspected, prior to backfilling, for adherence to City specifications and requirements with respect to materials, workmanship, type of pipe and appurtenances, proper backfill and compaction, etc.

Manholes:

All manholes shall be precast concrete constructed on a base with a five (5) inch wall and an eight (8) inch slab poured monolithically. The base shall be placed on six (6) inches of selected material. Over-excavation shall be compensated for with additional concrete at the Contractor’s expense.

The joints between sections shall be made using the approved mastic joint material.

Joints between the manhole and pipes shall be made using the approved jointing materials in accordance with the manufacturer’s instructions.

Lifting holes shall be filled solid with non-shrinking mortar.

The top of the cone shall have a minimum of two layers and a maximum of six layers of brick to allow for adjustments of the frames casting. The frame casting shall be set in a full mortar bed, true to line and final grade.

There shall be a minimum of a 0.1 ft drop between the invert in and invert out.

Selected Material:

Selected material shall be screened gravel, consisting of hard, durable particles meeting the requirements of M2.01.4 of the MassDOT Standards

## TESTING

An important part of said inspection shall be a leakage test to verify water tightness of the pipe and appurtenances. Such test may be made with water as an infiltration/ex-filtration test, or a compressed air test may be made. Testing and measuring shall be made in the following manner.

A. Water Testing of Manholes and Pipelines

1. Plug all pipes and other openings into the manhole and brace to prevent blow out. Fill manhole with water to the top of the cone section. Of the excavation has not been backfilled and no water is observed moving down the surface of the manhole, the manhole is satisfactorily watertight. If the test, as described above is unsatisfactory as determined by the Engineer, or if the manhole excavation has been backfilled, continue the test. A period of time many be permitted to allow for absorption. Following this period, refill manhole to the top of the cone again, if necessary and allow at least 8 hours to pass. At the end of the test period, refill the manhole to the top of the cone again, measuring the volume of water added. Extrapolate the refill amount to a 24-hour leakage rate. The leakage for each manhole shall not exceed one gallon per vertical foot for a 24-hour period. If the manhole fails this requirement, but the leakage does not exceed three gallons per vertical foot per day, repairs by approved methods may be made as directed by the Engineer. Retest the manhole and, if satisfactory, fill and paint the interior joints.
2. No adjustment in the leakage allowance will be made for unknown causes such as leaking plugs, absorptions, etc. It will be assumed that all loss of water during the test is a result of leaks through the joints or through the concrete.
3. An infiltration test may be substituted for an exfiltration test if the ground water table is above the highest joint in the manhole. If there is no leakage into the manhole as determined by the Engineer, the manhole will be considered watertight. If the Engineer is not satisfied, testing shall be performed as previously described.
4. The Engineer supervising the test may, at his discretion, require that manholes and other appurtenant structures be tested separately. Such test shall consist of plugging all pipe openings in the structure and filling the structure with clean water to a point above the highest horizontal seam in the structure (in a manhole, usually the joint between the top cone section and the topmost barrel section). Maximum allowable leakage rate shall be the same as for the sewer piping itself, as hereinbefore specified.

5. The Contractor shall furnish all plugs, water and other appurtenances to construct such weirs or other means of measurement as many be required, provide all labor, and do all necessary pumping in enable the test to be properly made.

B. Air Testing of Manholes and Pipelines

1. Testing of sewers with low pressure compressed air is becoming more widespread, and in many cases, may be preferable to water testing, as excessive test pressures resulting from water head in steep sloped sewers is not a factor.
2. Acceptable air testing procedures are presented in American Society of Testing and Materials Standard #C28-90T "Standard Test Method for Low Pressure Air Test of Vitrified Clay Pipe". In lieu of that Standard, the following test procedure is acceptable:

    a. Plug all openings in the section of sewer piping to be tested.
    b. Pressurize the system to be tested to an air pressure of five (5) PSIG (pounds per square inch gauge). Shut off the pressurized air source.
    c. Allow the pressure to stabilize for a minimum of five (5) minutes.
    d. Record the stabilized pressure in the test section. Record the test start time. The minimum test pressure is four (4) PSIG. The minimum test time is five (5) minutes. At the end of the pressure testing time period, record the test pressure and test termination time. If the pressure drop is greater than one (1) PSIG during the duration of the test, the tested section has failed the test.

C. Vacuum Testing of Manholes

A vacuum test may be substituted for a leakage test as follows:

1. Where the excavation has not been backfilled, the filling and pointing of exterior joints shall not be necessary prior to performing this test.
2. The vacuum test shall be conducted as follows:
    a. The compression band shall be inflated to affect a seal between the vacuum base and the top of the manhole. The vacuum pump shall then be connected to the outlet port with the valve open and a vacuum of 10" Hg (20" of Hg absolute) drawn. The valve shall then be closed.
    b. The following test criteria shall apply to 4-ft and 5-ft diameter manholes:
3. A drop of 1" Hg shall be allowed over a 2-minute period of manholes 0-10 feet deep.
4. A drop of 1" Hg shall be allowed over a 2 ½ -minute period for manholes 10-15 deep.
5. A drop of 1" Hg shall be allowed over a 3-minute period for manholes 15-30 feet deep.
6. If the pressure drop exceeds the acceptable limits the Contractor shall be allowed to make necessary repairs, as approved by the Engineer. The manhole shall then be re-tested.
7. If the manhole fails to meet the minimum requirement of the vacuum test when re-tested, it may be water tested as outlined in Section A.
8. Modifications in the procedure may be made as required and approved. But in any event, the Contractor shall be responsible for the ultimate water tightness of the line within the above test requirements.
9. The Contractor shall notify the DPI Office at least two (2) working days in advance of the date on which proposes to perform such tests.

D. Leakage Tests for Drain Manholes and Catch Basins

1. The Engineer will visually inspect drain manholes and catch basins for possible leaks before backfilling is allowed. All joints shall be sealed to the satisfaction of the Engineer.
2. The Engineer may require an exfiltration test as described for sewer manholes on any structure for which he/she deems appropriate.

E. As-Builts

Before final acceptance by the City of any sewer and/or storm drain, the Contractor shall furnish to the City, at no expense to the City, a complete set of drawings showing the location and alignment in plan and profile of all such sewers and/or storm drains, together with such branches, stubs, and connections to individual buildings as have been installed therewith. Such drawings shall show the installations as actually constructed, shall contain sufficient information as will provide the City with a record of the exact location and depth of the pipes and manholes in order to facilitate future maintenance and repair, and shall bear the stamp and signature of a professional engineer registered in the Commonwealth of Massachusetts.

F. Internal CCTV Inspection

1. All sewer pipe and manholes shall be thoroughly cleaned prior to acceptance. Cleaning shall be completed using a combination jetter and vactor.

2. All pipe shall be CCTV inspected in accordance with NASSCO PACP Standards. Manhole identifications shall be provided to the Contractor prior to the start of CCTV work. Coordinate with DPI to obtained required information. Sewer service laterals do not need to be CCTV inspected.

# SECTION VI
# SEWER & STORMWATER SERVICE CONNECTIONS

## GENERAL

Storm Water Recharge Systems. Prior to installation of roof leaders and Storm Water Recharge Systems, a plan and stormwater report stamped by a Registered Professional Engineer in the Commonwealth of Massachusetts is required to be submitted to DPI for review and approval. All designs shall conform to the requirements of the MassDEP and the City's Stormwater Management Rules and Regulations – where conflicts exist, the more stringent shall apply.

In accordance with Massachusetts Department of Environmental Protection (MassDEP) requirements, file the appropriate Underground Injection Control (UIC) permit. Notice of application and a copy of the permit shall be submitted to the DPI along with the required stamped plans and stormwater report.

## SCOPE OF WORK

It shall be the contractor's responsibility to familiarize himself with these requirements, and to keep himself informed of all additions and changes thereto, as well as any special conditions or requirements called for on the sewer/drain permit being acted upon.

Sanitary sewer service connections shall be designed in conformance with the latest version of the TR-16 Manual and the specifications provided herein – where conflicts occur the more stringent shall apply.

## MATERIAL

Pipe shall be of a type and material approved by the Commissioner of Public Infrastructure. High-Density Polyethylene (HDPE) shall not be permitted within the City Right of Way. Any use of HDPE within private property must change in material prior to entering City layout.

**Minimum sizes permitted shall be six (6) inch diameter for sanitary sewer services and four (4) inch diameter for storm drain services.** Storm drains shall be laid with a cover depth not less than thirty-six (36) inches except that, where ledge is encountered, different depth and pipe materials may be used as determined by the Department of Public Infrastructure. Any exception to these minimums must be approved by the City Engineer. Sewer services cannot vary in size from main to building.

A clean-out must be installed with a cast iron "Clean-out" cover with the word "Sewer" or "Drain" accordingly at finish grade, two (2) feet from the property line. See proposed Sewer Stub Diagram in the City Standard Detail Section.

## CONSTRUCTION METHODS

Pipe shall be laid in a workmanlike manner, in as straight a run as possible, with a uniform pitch of at least one-quarter (1/4) inch per foot of horizontal run for sanitary sewer service and one-eighth

(1/8) inch per foot of horizontal run for stormwater service connection (any service pipe installed at a lower slope than specified herein must be approved by the City Engineer prior to installation). A minimum cover of at least four (4) feet is required over all sanitary sewer pipes in City streets and ways.

Changes in direction shall be made with suitable smooth curved pipe sections. So-called "cocked" angle joins shall not be acceptable. Service connections shall be made with suitable saddles or ductile iron wye branch. Service connections at manholes shall enter the manhole at the shelf elevation. In the case of an existing manhole, the connection pipe shall be brought to the edge of the main flow channel, with the top half of the pipe cut back to the manhole wall and the shelf area surrounding the pipe built up with concrete to the level of the cut edge to provide an invert. When a new manhole is being built as a part of the connection, the connection pipe shall be cut off at the wall, and an invert formed in the shelf in such a manner as to receive the discharge from the service connection and channel it in a curved downward sweep to blend into the flow of the main sewer.

Where the depth of the sewer main with respect to the depth required for satisfactory flow in the service connection exceeds three (3) feet, a drop-type connection shall be constructed in order to bring the service into the manhole at the proper elevation (see Inside Drop Connection Detail). An internal drop connection requires a minimum of a five (5) foot manhole. Any connection to a manhole in which the flow from the service pipe exceeds three (3) feet in a freefall drop to the bottom of the manhole shall not be acceptable. External manhole drop connections are not permitted.

Where service connections are made directly to the main, chimneys shall be installed when:

a. The drop between the foundation sill and sewer main invert is thirteen feet or greater.
b. The drop between the house service connection and the main is greater or equal to three feet.

Pipe shall be properly and uniformly supported in the trench. All such pipe laid in City streets and/or sidewalks shall be bedded in three-quarter (¾) inch crushed stone. Substitution of crushed stone must be approved by the Engineer prior to placing same. Whichever bedding material is used shall be brought to a height of one-half (1/2) the outside diameter of the pipe and thoroughly compacted, and initial cover and backfill are performed, as shown on the City Standard Details - Typical Trench Detail.

In all cases where the installation in question is in an area having a so-called "Two-Pipe System" i.e., where separate storm and sanitary mains exist (as indicated on the permit), corresponding separate service connections must be installed and connected at the building. Exception to this policy will be allowed only when, in the opinion of the Commissioner of Public Infrastructure, existing field conditions make such storm drain connection physically impossible due to insufficient pitch or depth, or where the storm main is not ultimately connected to the City's storm drain system.

In all cases where sanitary sewer lateral cross potable water pipes or storm drains, refer to City Standard Details.

## INSPECTIONS

All work must be inspected before backfilling, whether in City streets or in private property. Failure to secure this inspection shall require re-excavation at the contractor's expense so that inspection can be made and/or be fined $1000. Contractors shall notify DPI, at least **one full workday** in advance of the day the work is expected to be ready for inspection in order that an inspection may be scheduled, and an inspector assigned. Inspectors are not available on Saturdays, Sundays, and Holidays, and contractors should plan their work accordingly. A minimum charge will be assessed if contractors are not prepared for scheduled inspections.

Refer to Section III, Road Construction, in the sub-section on the City Standard Details "Patching Trenches" for methods of repairing and patching trenches.

When working in multiple-building developments in which sewer and storm drain mains are being constructed as part of the overall project, such mains, with attendant manholes, structures, etc., must be completed, tested, and approved before any structures will be allowed to be connected thereto. Individual building services may be run from such mains to the abutting lots in order to complete work in the street, but they must be capped and tested as part of the mains construction.

Building Permits for structures along the line of such mains will not receive Department of Public Infrastructure endorsement unless or until the above-described work has been satisfactorily completed.

# SECTION VII
# SEWER SERVICE CURED IN PLACE PIPE (CIPP) LINING

## SCOPE OF WORK

These specifications include the minimum requirements for the rehabilitation of lateral connections and their interface with the main line sewer via cured-in-place pipe (CIPP).

CIPP lining shall only be permitted on service laterals (service lateral lining) that have been approved by the City Engineer for a CIPP lining treatment. Prior to completing any sewer pipe rehabilitation, CIPP lining contractors shall become bonded with the City and familiarize themselves with the requirements specified here.

Contractors are to submit to the City Engineer, upon request, the following which will be attached to the approved permit:

1. System material type and manufacturer to be used including catalog cut sheets, ASTM references, material composition, manufactures recommended specifications, component physical properties and chemical resistance,
2. Manufacturers detailed description of the recommended system installation procedures, including flow management in both mainline and lateral sewers.
3. Manufacturers recommended procedures for handling and storage of materials,
4. Copies of independent testing reports performed on the CIPP liner composite verifying the product meets the requirements specified herein and the manufactures design,
5. CIPP wall thickness design calculations performed based upon ASTM F1216 assuming **fully deteriorated conditions**. The design shall be stamped by a Registered Professional Engineer in the Commonwealth of Massachusetts,
6. Wetout/cure logs per liner providing details pertaining to the resin type and quantity, catalyst type and quantity, tube type, installation pressures, temperatures and times.
7. Warrantee information documenting a two (2) year period from the date of acceptance by the City. During this period, serious defect discovered in the CIPP lining as determined by the City or property owner and which may materially affect the integrity, strength, function and/or operation of the pipe, shall be removed and replaced as recommended by the manufacture in a satisfactory manner at no cost to the City of property owner.

If a sewer flow by-pass is necessary, the Contractor shall submit a by-pass pumping plan to the City Engineer for review. The Contractor shall be responsible for notifying and coordinating with residents if a by-pass is deemed necessary.

The Contractor is responsible for control of the work zone, in accordance with specifications herein and other approved City permits. Police details for traffic control shall be hired, and obstruction permits obtained by the Contractor at the expense of the Contractor, should the work require interruptions in traffic patterns.

If approved for CIPP rehabilitation, the installation of a sewer clean out on the existing sewer lateral will be required where one does not already exist, as specified in SECTION VI.

Pre-rehabilitation and post rehabilitation CCTV documentation in LACP format including the LACP exchange database will be required for final acceptance as specified herein.

## MATERIALS

The Contractor is responsible for proper, accurate and complete installation of the CIPP as specified herein and on the approved permit.

The system shall seal the point of connection from a main line pipe to a connecting lateral pipeline and is normally installed without excavation by the install of resin-impregnated, flexible laminate installed into the existing service lateral, lapping over the main line pipe, sealing the connection.

The minimum length of lateral to be lined shall be determined by the City Engineer based on the pre-inspection video provided by the Contractor. This information will be noted on the approved permit.

Lining shall be completed from the main line sewer. The system to be used shall as follows:

1. Tee/full wrap section with a full circumferential CIPP liner inside the main line pipe and a tube which shall extend continuously from the sewer main into the lateral. This shall be used when main line pipes are 18" and smaller.
2. Flange/brim CIPP connection seal and tube which shall extend continuously from the main line sewer into the lateral. This shall be used for main line pipes larger than 18".
3. A system that is similar to the above and approved by the City Engineer.
4. Lining from a cleanout may be approved by the City Engineer in lieu of the main line sewer.

The system shall be capable of sealing a combination of "tee" and "wye" of varying angles. The resin shall be cured to form the tube into a hard impermeable pipe within-a-pipe.

Systems that use polyester and vinylester resins shall include a method of sealing the connection and the end of the lateral liner as recommended by the manufacturer of the system. The product used in the sealing method shall be installed in accordance with manufacturer recommendations.

Systems that use silicate or epoxy shall prepare the host pipe in accordance with manufacturer's recommendations.

The liner shall extend in a continuous tight fitting, joint-less, watertight new pipe-within-a-host-pipe to eliminate any visible leakage between the lateral and main line and shall provide a leak proof seal to prevent root intrusion, infiltration, and exfiltration between the liner and host pipe.

Actual cured liner thickness shall be -5/+10 percent of approved design thickness and shall not include thickness of any non-structural membrane (inner/pre-liner).

Non-Woven Fabric Tube

Service lateral lining fabric tube shall be a resin-impregnated, one-piece flexible polyester felt, non-woven textile tube, needle punched felt, circular knit or circular braid, glass fiber reinforced plastic or equivalent material tube and meet the requirements of ASTM F1216, ASTM F1743, ASTM D5813 and ASTM F2019. The lining shall be cured-in-place by an acceptable curing method and provide a water-tight liner within the host pipe after wet-out. The liner shall have a service life of 50-years.

The fabric tube shall have a uniform thickness and excess resin distribution that when compressed at installation pressures will meet or exceed the design thickness after cure. The thermo-set synthetic resin shall be suitable for the design conditions as well as the curing process.

The lining shall have the minimum structural properties listed below.

| Mechanical Property | Polyester Resin | Vinylester/Epoxy |
|---|---|---|
| Flexural Strength (ASTM D790) | 4,500 psi | 5,000 psi |
| Flexural Modulus of Elasticity (ASTM D790) | 250,000 psi | 400,000 psi |

The service lateral lining shall be designed, fabricated, and installed for the actual conditions encountered for the application, including the material and condition of the host pipe, in accordance with ASTM F1216, and shall meet the following minimum design conditions:

8. AASHTO H-20 live load with two trucks passing.
9. Soil weight 120 pounds per cubic foot. Coefficient of friction Ku'=0.13.
10. Estimated ground water level at ground surface.
11. Fully detoriated pipe with 2 percent (min.) ovality. If ovality of existing pipe is found to be worse, use actual percent up to 5 percent (max.).
12. Soil modulus 1,000 psi.
13. Factor of Safety = 2.
14. Depth of Cover will be determined by field measurements.

When cured, the service lateral lining shall be manufactured to a size that when installed forms a continuous, tight fitting, hard, impermeable liner which is chemically resistant to domestic sewage over the expected life of the rehabilitated pipe. The tube shall be properly sized to the diameter of the host pipe and the length to be CIPP rehabilitated and be able to stretch to fit irregular pipe sections and negotiate bends.

The liner material and resin shall be completely compatible. The outside and/or inside layer of the fabric tube (before inversion/pull-in, as applicable) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate, vacuum impregnation and monitoring of the resin saturation during the resin impregnation (wet-out) procedure.

The lateral service liner may need to be capable of blind terminations within the service line and capable of navigating bends or other transitions in alignment.

Wall color of the interior pipe surface of the CIPP after installation shall be a light reflective color so that a clear detailed examination with CCTV may be made. No material shall be included in the fabric that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be acceptable upon visual inspection as evident by color contrast between the tube fabric and the activated resin containing a colorant. Hue of color shall be dark enough to distinguish a contrast between fully resin saturated felt fabric and dry or resin lean areas.

The installed liner shall be marked every 5-feet with the name of the manufacturer or CIPP lateral lining system, manufacturing lot and/or production footage on the inside of the cured liner. The print must be visible during the final CCTV inspection.

Seams in the fabric tube, if applicable shall meet the requirements of ASTM D5813 H.

Resin

Resin, when properly cured in the tube composite, shall meet the requirements of ASTM F1216, ASTM F1743, or ASTM F2019. The resin installed shall produce a service lateral liner that complies with the structural requirements specified herein and provides chemical resistance for the flow media in the gravity pipe. The resin shall be compatible with the rehabilitation process, shall be able to cure in the presence or absence of water, and shall have an initiation temperature for cure as recommended by the resin manufacturer. Provide a general purpose or enhanced strength unsaturated, thermosetting polyester, vinylester, or epoxy or silicate resin and a catalyst system compatible with the installation process.

Resins may contain pigments, dyes, or colorants, which shall not interfere with the visual inspection of the cured liner. Quantity of resin used for tube impregnation shall be sufficient to fill volume of air voids in tube with additional allowances for polymerization shrinkage and loss of resin through cracks and irregularities in host pipe.

The method of cure may either be manufacturer recommended heat source, light cure or by ambient temperature.

Lateral Seals

Service lateral connections shall be sealed. An epoxy-sealing component may be used to form a sealing bond between the service lateral liner and the host pipes. However, if the seal utilizes gaskets, the portion of the liner in the mainline pipe shall be embedded with hydrophilic O-rings and an epoxy-sealing component is not required. Use of caulking, rope or band type of an end seal shall not be allowed.

If the service lateral connection is NOT under the phreatic surface, seal the service lateral connection by injecting a chemical hydrophilic grout into the space between the connection and the main line. Chemical grouts shall be with an acrylic based gel chemical sealing material and shall be Avanit AV-118 or approved equal. Grout shall be installed using a pipeline packer than can pneumatically expand and seal the area to isolate it from the rest of the pipeline. No joint shall be considered sealed unless, while under pressure, a minimum of ¼ gallon per inch of pipe diameter has been applied.

If the service lateral connection IS under the phreatic surface, seal the service lateral connection by installing a hydrophilic rubber connection seal. Rubber connection seals shall be composed of a hat made of hydrophilic polymeric neoprene rubber designed with a specified wall thickness to provide a compression seal at the connection of a lateral and a mainline pipe. Acceptable hydrophilic rubber seals are Insignia™ Hydrophilic Connection Hat by LMK Enterprises, or approved equal.

Styrene Reducing Agent

Gelatin, water soluble, biodegradable, non-toxic, FDA approved powder and/or capsule.

Add in a calculated amount according to manufacturer's recommendations into the down-tube for water curing or directly into the water holding tank for steam curing.

StyRedux by Integrated Chemical and Equipment Corporation or approved equal.

## CONSTRUCTION METHODS

The CIPP rehabilitation will be performed from the main line sewer. If approved by the City Engineer, CIPP rehabilitation may be allowed from a cleanout in lieu of the main line.

Lateral service liners shall be pre-measured to line the specified distance identified on the permit as determined by the City Engineer.

If allowed by the City Engineer, lateral service liners installed from a clean out is installed using a blind termination at the mainline connection. In such case, the termination shall allow the CIPP to effectively terminate at or near the mainline without protruding by measuring the lateral length prior to installation.

Lining from the main line shall be coordinated with the City. Contractor will be allowed to use the nearest adjacent sewer manhole to access the main line. A minimum of seven days notice shall be given to the City before the start of work.

If no cleanout exists on the service to be rehabilitated in the public right-of-way, Contractor shall install a cleanout at the location approved by the City Engineer on the approve permit and as specified herein.

The Contractor shall schedule, through the DPI, an inspector that will be present during CIPP liner installation process.

Preparation

The Contractor shall clean the interior of the host service pipe prior to the installation of CIPP liner. Debris and obstructions that will affect the installation and the final CIPP liner, shall be removed and disposed of off-site in accordance with all local, state and federal requirements. Precaution shall be taken by the Contractor in the use of cleaning equipment to avoid damage to the host pipe. Post cleaning and pre-lining CCTV footage shall be completed by certified PACP/LACP personnel and submitted to the City Engineer in standard PACP/LACP format. The LACP exchange database shall also be submitted to the City Engineer. The CIPP lining shall only proceed upon approval by the City Engineer and with an approved permit.

It is the Contractor's responsibility to determine the presence of any lateral or wye branches that exist along the service lateral line to be CIPP rehabilitated.

Existing break-in services and/or hammer tapped services shall be cut flush with the main line sewer using a robotic cutter. Contractor shall proceed with caution to not damage the main line pipe during removal.

Installation

Conduct flow management activities to by-pass or temporarily stop flow during the CIPP lining process.

The service lateral liner shall be vacuum-impregnated with resin (wet-out) under controlled conditions, installed and cured-in-place in the host pipe per the manufacturer's specifications, and in accordance with ASTM standards.

The CIPP shall be installed from the main line pipe using a carrier transport. If approved by the City Engineer, it may be installed from an access pit or cleanout.

1. Main Line Pipe: The system shall be loaded inside and/or on a pressure apparatus. The pressure apparatus, attached to a robotic device, shall be positioned in the main line pipe at the service connection. The robotic device, together with a CCTV camera shall be used to align the lateral portion of the system with the service connection opening. Air pressure, supplied to the pressure apparatus through an air hose, shall be used to invert or expand the resin impregnated CIPP into the lateral pipe, and push the main line portion of the system against the main line pipe. Adjust pressure to manufacture's recommendations.

2. Cleanout or Access Pit: The wet-out tube shall be positioned in the host pipe using the method specified by the manufacturer. Care shall be taken to prevent damage to the tube during installation. The tube shall be pulled-in or inverted through the access pit or cleanout and fully extend up the host pipe from the main to the termination point. When installing from an access pit or cleanout, Contractor shall follow manufacture procedures for terminating the CIPP blind. This approach shall only be used upon approval of the City Engineer.

The volume of resin used shall be sufficient to fill all voids in the textile lining material at nominal thickness and diameter. The volume shall be adjusted by adding 5% to 10% excess resin for the change in resin volume due to polymerization and to allow for any migration of resin into the cracks and joints in the original pipe. No dry or unsaturated area in the main line sheet or lateral tube shall be acceptable upon visual inspection.

For lateral liners with gaskets, the main bladder shall be inflated causing the main sheet to unwrap and expand, embedding the hydrophilic O-rings between the main liner and the main pipe as the main liner is pressed tight against the main pipe.

After insertion is completed, recommended pressure must be maintained on the impregnated service lateral liner, pressing the liner firmly against the inner pipe wall for the duration of the curing process. The liner is chemically cured at ambient temperatures or by a suitable heat source. In no instance will sewage be used to invert or cure liners or calibration tubes.

Temperature sensors or gauges may be placed inside the host pipe to monitor the temperatures during the cure cycle. Liner and/or host pipe interface temperature shall be monitored and logged during curing.

Thermoset resins shall have a cool down period in accordance with the manufacturer's recommendation and noted as part of the cure log.

The finished CIPP shall be free of dry spots, lifts, and delaminations. The system shall not inhibit the CCTV post video inspection of the mainline or service lateral pipes. Frayed ends of the system shall be removed prior to acceptance. For lateral liners with mechanical end seals, the CIPP shall taper at each end providing a smooth transition for accommodating video equipment and maintaining proper flow in the main line. In all cases, the finished product must provide an airtight/water tight verifiable non-leaking connection between the main line sewer and sewer service lateral.

## ACCEPTANCE OF WORK

The installed CIPP shall be continuous over the specified length of the lateral and shall be free from visual defects such as foreign inclusions, dry spots, pinholes, major wrinkles and de-lamination. Any defect, which will or could affect the structural integrity or water tightness of the CIPP shall be repaired by the Contractor. All coupons and excess resin shall be removed from the sewer lateral prior to the acceptance of the CIPP lining. Any identified defects shall be repaired by the Contractor.

The beginning and end of the CIPP shall be sealed to the host pipe. The sealing material shall provide a watertight seal. Ground water infiltration through the wall of the liner shall be zero.

Post lining CCTV shall be completed by PACP/LACP certified personnel and submitted to the City Engineer for final approval and acceptance of rehabilitation work in accordance with the specifications herein.

# SECTION VIII
# LOW PRESSURE SEWER SYSTEMS

## SCOPE OF WORK

The Contractor shall furnish all materials and perform all the work and services necessary for the complete construction of the low-pressure sewer system, i.e., - installation or construction of all low-pressure sewer pipes, service connections, valves, etc., including all related work such as excavation, de-watering, backfilling, testing and flushing of lines.

Prior to the installation of a low pressure sewer system or low pressure sewer service, a plan and supporting calculations stamped by a Registered Professional Engineer in the Commonwealth of Massachusetts is required to be submitted to the DPI for review and approval. The Contractor shall perform their work in accordance with the plans, approved by the DPI.

Should the work require the connection of a new low pressure grinder pump service into an existing low pressure sewer main or the connection of a new low pressure sewer system into an existing low pressure sewer system network (i.e., system expansion or extension), a plan and supporting calculations stamped by a Registered Professional Engineer in the Commonwealth of Massachusetts is required to be submitted to DPI for review and approval. The design should at a minimum:

1. Document that the proposed grinder pump and service and/or main line low pressure sewer system will operate under existing flow and system pressures,

2. That there are no negative impacts on the operation of the existing system (i.e., existing capacity is not impacted, pipeline pressures are not exceeded, or there are no impacts to existing grinder pump operations, etc.) and

3. That the connection of the new service or low pressure sewer main will not impact the operability or lifespan of the existing low pressure sewer system network.

## MATERIALS

Pipe. All low-pressure sewer piping shall be Polyvinyl chloride (PVC) SDR – PR Non-Threaded: SDR 21 Material Class 12454 ASTM D 2241-80

Polyvinyl Chloride (PVC) pipe for the force main sewer shall be of the size indicated on the Plans and shall conform to the requirements of the AWWA C900-81 Standards for PVC C900 DR 18 Pressure Pipe for Water with cast iron pipe equivalent outside diameters. Solvent weld balls shall mean the requirements of ASTM D2122 and ASTM D2241.

1. The standard laying length shall not exceed twenty (20) feet. The minimum “pipe stiffness” (load divided by the change in inside diameter in direction of load application) at five (5) percent deflection shall be at least forty-six (46) psi for pipe tested in accordance with ASTM Specification D2412.

2. All bends and fittings on the force main shall be ductile iron compact mechanical joint type, conforming to AWWA C-153. Joint restraint materials shall be of a type suitable for PVC pipe and shall be used on mechanical joint connections.

3. All pipe and fittings shall be clearly marked on the outside indicating the name of the manufacturer, nominal diameter, and the ASTM or AWWA designation, or both.

4. The pipe and fittings shall be homogeneous throughout and free from visible cracks, holes, foreign inclusion or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density, and other physical properties.

Valves. Valves shall be specifically designed for sewage service. Bronze construction one and one-fourth (1 ¼) inch, one and one-half (1 ½) inch, two (2) inch full ported ball valve with one hundred (100) percent opening, female ip x female ip, minimum one hundred twenty-five (125) psi, use Mueller H10284 or approved equal.

Three (3) inch – Use AWWA type body, double disc, parallel seat gate valve with mechanical joint or gasketed ends. Valves shall include all accessory fittings necessary for connection to PVC pipe. Use valves as manufactured by American Darling, U.S. Pipe Co., Mueller, or approved equal. Valves shall be compatible with valve box foot pieces.

For each type of valve operating nut installed, the Contractor shall supply an operating handle or wheel, according to the manufacturer's recommendation for the size of the valve involved.

Valve Boxes. Valve Boxes shall be of the extension type with arch pattern base. The castings shall be of gray cast iron true to pattern and free of flaws. They shall be thoroughly coated with two coats of asphaltum varnish. Covers shall be extra deep and marked with raised or engraved letters with the word **"SEWER"**. Letters shall be a minimum of one-half (1/2) inch high. Lids shall be provided with a brass pentagon plug. The Contractor shall provide two (2) pentagon wrenches compatible with the pentagon bolt installed in the cover ring.

***FOOT PIECES – Foot pieces shall be used with curb boxes to provide a firm level base for the valve and prevent valve from moving when valve is operated. Foot pieces shall be used on all valves located on PVC lines.

Pipe Clamps and Support. Pipe clamps, bolts, washers and nuts shall be stainless steel and be of the removable type.

Manhole pipe support cradle shall be 4000 psi concrete sufficiently keyed into the base of the manhole. The cradle shall be provided with a PVC half sleeve of suitable size to accommodate the placement of the Low-Pressure Main.

Thrust Blocking. Provide thrust blocking as directed by the Engineer at all bends, tees, and changes of direction.

## CONSTRUCTION METHODS

Installation. Each pipe unit shall be inspected before being installed. Any pipe unit or fitting discovered to be defective either before or after installation shall be removed and replaced with a sound unit.

Each pipe unit shall be handled into its position in the trench only in such a manner and by such means as the Engineer approves as satisfactory.

The pipe shall be supported by selected material placed in a three (3) inch layer to provide a cushion for the pipe. Suitable bell holes shall be provided, so that, after placement, only the barrel of the pipe receives bearing pressure from the supporting material.

All pipes shall be laid upon a trench bottom prepared as shown on the "Force Main Trench" detail.

Sand fill shall be placed twelve (12) inches above the force main pipe.

Ordinary backfill material shall be free of large stones or clods greater than one and one-half (1 ½) inch in diameter or frozen earth. Backfill shall be hand placed and carefully compacted by hand tamping.

At all times when pipe installation is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs or by other approved means. If water is in the trench when work is to be resumed, the plug shall not be removed until all suitable provisions have been made to prevent water, earth, or other materials from entering the pipe.

Pipelines shall not be used as conductors for trench drainage during construction.

## SERVICE CONNECTIONS

Low Pressure Sewer Service Connection One and one-fourth (1 ¼) inch / one and one-half (1 ½) inch sewer service connection shall extend from the low pressure main to grinder pump, as shown on the "Low Pressure Sewer Curb Stop" detail.

The service end shall be equipped with a one and one half (1 ½) inch curb stop. The curb stop shall be properly marked with a cast iron curb box marked **"SEWER"**.

Cleanouts Cleanouts shall be in the form of a wye or a tee and shall be located at the property line of each sewer service and at the terminus of the low-pressure sewer main as shown on the "Sewer Clean Out" detail.

Cleaning Care shall be taken to prevent earth, water and other materials from entering the pipeline. As soon as possible after the pipe is installed, the Contractor shall clean out the pipeline, being careful to prevent soil, water, and debris from entering the pipe.

Testing After the pipes of the force main sewers have been laid, secured in place and jointed as hereinbefore specified, the force main sewers shall be tested for strength and leakage. The tests shall be made when approved by the engineer.

1. The Contractor shall furnish all apparatus, material and labor and the necessary water for making the test.

2. Before testing pipelines having flexible joints, the Contractor must make certain that the pipelines are securely held to prevent movement.

3. The ends of the sections of force main to be tested shall be tightly closed by blank flanges or otherwise for the duration of each test.

4. Strength shall be tested at a pressure of one hundred (100) psi. The pressure for strength test shall be maintained for at least ten (10) minutes by pumping additional water into the pipeline.

5. Leakage shall be tested at fifty (50) psi. The test for leakage shall last for at least one (1) hour and may be required to last for two (2) hours. The additional water needed to maintain the required pressure shall be measured accurately in a manner approved by the Engineer.

    a. The rate of leakage for force main sewers shall not exceed one (1) gallon per day per linear foot of joint.

    b. The Contractor shall repair all leaks discovered.

6. Air testing of force mains will not be allowed.

## GRINDER PUMP SYSTEMS (BUILDING SEWER DRAINS)

1. Individual building drains which cannot be discharged to the sewer by gravity flow due to elevation or excessive distance shall be discharged into a tightly covered and vented pump chamber, basin, or station, from which the contents shall be lifted (pumped) by automatic, grinder type, pumping equipment or by any equally efficient method approved by the Commissioner of Public Infrastructure and discharged into the gravity sewer system or to a Low Pressure Sewer System which shall discharge to a gravity sewer system.

2. Grinder pump stations shall be of the wet pit/dry type and shall consist of a grinder pump suitable mounted in a basin having a minimum capacity of sixty (60) gallons and constructed of fiberglass reinforced polyester (FRP) resin or corrugated high density polyethylene (CHDPE) with a smooth inner surface. Each basin shall be furnished with an EPDM grommet or PVC closet flange to accept a minimum four and one-half (4 ½) inch outside diameter PVC pipe. Discharge piping shall be 304 stainless steel and terminate outside the pump chamber with one and one-quarter (1¼) inch NPT fitting. All penetrations in the tank to be factory installed and sealed.

3. All outside installations shall be provided with a poured-in-place, concrete anti-floatation collar of sufficient size and weight to overcome buoyancy forces. Inlet and discharge piping shall be installed at a minimum depth of four (4) feet to assure maximum frost protection.

4. The Grinder Pump System shall be provided with a NEMA 4X electrical quick disconnect, pump removal system, shut-off valve, anti-siphon valve, and full ported check valve assembled within the basin, with remote NEMA 3R, UL listed electrical alarm/disconnect panel with all necessary internal wiring and controls. Pumps to have alarm light and bell with external silence push-button switch and be capable of connection to emergency power source. Duplex units shall have alarm lights which shall indicate which pump requires service. Pump systems must be capable of either inside or outside installation.

5. The grinder pumping equipment must include an integral grinder capable of handling any reasonable quantity of "foreign objects" such as plastic, wood, paper, glass, rubber and the like which find their way into a building sewer drain as a result of carelessness or accident on the part of the building occupants. The grinder pump must be capable of processing such foreign objects without jamming, stalling, overloading or undue noise. Grinder shall process these materials to particles, which will freely pass through the pump and the one and one-half (1 ½) inch pipe system. The grinder shall be of a configuration to provide a positive flow of solids into the grinding zone with sufficient action to scour the tank free of deposits or sludge banks which could otherwise accumulate and dislodge and impair the operation of the pump.

6. The grinder shall be direct driven by a single, one (1) piece stainless steel motor shaft. The grinder impeller assembly shall be securely fastened to the pump motor shaft. The grinder will be of the rotating type with a stationary hardened and ground chrome steel shredding ring spaced in accurate close annual alignment with the drive impeller assembly, which shall carry two (2) hardened type 400 series stainless steel cutter bars.

7. Pumps for low pressure sewer systems shall be semi-positive displacement, progressing cavity, type rated at eleven (11) gallons per minute against a total dynamic head of ninety-two (92) feet (40 psig) and nine (9) gallons per minute at one hundred thirty-eight (138) feet (60 psig). The pump(s) shall be capable of operating at negative heads without overloading the motor(s). Motor shall be a minimum of 1 HP, 1725 RPM, 240-volt, 60 Hertz, 1 Phase with a high starting torque of 8.4-foot pounds with U.L. certification with protection against locked rotor and overload conditions.

8. All maintenance functions for the Grinder Pump Station must be possible without entry of the grinder pump station under "OSHA 1910.146 Permit Required Confined Spaces". Entry means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space. Therefore, each pump and motor unit shall be provided with double lifting hooks with nylon lift-out harness to facilitate pump removal. Outside or underground installations shall provide access through an integral extension of the wet well assembly and shall be proved with a lockable fiberglass cover. All electrical and mechanical connections must be provided with easy disconnect accessibility.

9. Low pressure sewer systems shall have redundant check valves and anti-siphon valves. Multiple connections to a low-pressure sewer system may be permitted if designed by a qualified Professional Engineer and approved by the City.

10. No more than one (1) single family home may be connected to a single pump unit.

RECOMMENDED GRINDER PUMP DESIGN TABLE

| **Occupancy Type** | **Flow** (gpd*) | **Pump Units** | **Storage** (gallons) |
|---|---|---|---|
| Single Family | 0 - 500 | 1 | 60 |
| Duplex | 500 - 1200 | 1 | 120 |
| Multi Family (3-6 Units)** | 1200 - 1500 | 2 | 120 |

* gpd – Gallons per day

** Applications with greater than six (6) units shall be subject to review on a case-by-case basis.

11. Low pressure sewers shall have pressure sewer cleanouts provided if in excess of between 300 feet.

12. Connection of a low pressure sewer grinder pump service of main line to an existing pumping station force main is not allowed.

13. Drop connections shall be provided when connecting a low pressure force main to an existing manhole. Refer to the standard detail provided. Direct connection of a low pressure force main to a lateral gravity sewer is not allowed; a manhole shall be provided. Connection of a low pressure building service to an existing gravity line is permitted.

# SECTION IX
# WATER MAIN CONSTRUCTION

## SCOPE OF WORK

The Contractor shall furnish all materials and perform all the work and services necessary for the complete construction of the water distribution system, i.e. installation of all pipes, gates valves fittings, hydrants, water services, thrust blocks, etc. including all related work such as excavation, backfilling, compaction, testing and disinfection.

The Contractor shall perform his work in accordance with the plans stamped, signed and dated by a Massachusetts Registered Professional Engineer (Civil), (locations and sizes) approved by the DPI/Water Board and /or the approving authority in the DPI.

## GENERAL

### Connection to City's System:

The DPI will inspect water main connections to the city's distribution system. The Contractor shall furnish all necessary materials and labor needed for such connection. All water work must be done under the supervision of the DPI inspector. Any work done without, will not be accepted by the DPI. Work done outside of normal working hours which are Monday thru Friday 7:30 AM to 4:00 PM, excluding holidays, will be charged at inspector's premium rate.

No water supply will be shut off without giving sufficient notice to the consumers and stating the time when the supply will be turned on. Permission to shut off water shall first be obtained from the DPI, who will shut the water off and turn it on again. Special care shall be taken so as not to damage consumer's appurtenances, if such damages occur, the Contractor shall repair such damages at his own expense.

Water main extensions will be shut off from the city's distribution system at the closest gate valve available. New mains are to be installed fourteen (14) feet from property line on the West side of North and South streets and fourteen (14) feet from property line on the South Side of East and West Streets.

All service connections must be installed perpendicular (90 degrees) from water main to property line and will have a minimum of four feet (4') to a maximum of five feet six inches (5.5') of cover and must not be laid in the same trench with other utilities, i.e., gas, electric, sewer. If the water service cannot be installed perpendicular from the water main, then detector tape must be used from the main to the building foundation. Domestic services and fire suppression services shall be separate piped connections from main to meter/backflow preventor. Services cannot be connected or be tapped off one another.

When installing new water services that have no foundations, the City will require the water service to be installed to the curb stop. Couplings will not be allowed at the property line nor on services less than one hundred (100) feet in length.

No new water services are allowed on the water transmission mains (any water main greater than or equal to 24-inches in diameter). Waiver of this requirement may be granted following a written request by the applicant at the discretion of the Commissioner or his authorized designee.

Any new service that is greater than 75-feet in length measured from the curb stop to the entry point of the building shall have a meter installed in a meter pit located 2-feet from the property line on private property. The meter pit shall be located in an easily accessible location and be designed for H-20 loading regardless of its location. The meter pit shall conform to City standards and requirements and be sized appropriately to handle the meter size of the service required. Meters on services 4-in and larger shall have a by-pass installed around the meter. Valves shall be installed before and after the meter to facilitate removal and installation of the meter. Blocking shall be provided as required to facilitate support of the meter. The City's MIU units shall be installed in a separate below grade structure and not in the meter pit. Plans shall be submitted to DPI Engineering for review and approval as part of the permit process.

All new water services will be kept closed until all testing requirements, are completed. Contractor will test water mains and fire supplies at 200 pounds P.S.I. for one (1) hour without any leakage and have water samples tested for bacteria. A written report must be submitted from the company conducting the pressure, and bacteria test.

All lead water service repairs are to be replaced with copper tubing from the main to the meter. There shall be no couplings between the main and curb stop and between curb stop and meter.

Contractors are required to be knowledgeable and use plumber rods, similar to Aqua-Stop, when renewing a service that has an inoperable curb stop. (Refer to the City Standard Details). Contractors responsible for curb stop cost if service is already copper.

## MATERIALS

### Main Pipe

Pipe to be no less than eight (8) inches in diameter and Class 52 Cast Iron Cement Lined, Ductile Iron, and Tyton Joint. Pipe shall be eighteen (18) feet Normal L/L cement lined, asphaltic coated inside and out, complete with standard joint accessories. Solid rubber rings are to be separate from each length of pipe. Ductile iron pipe shall be by U.S. Pipe and Foundry Co., Inc.; American Cast Iron Pipe co. or equal.
Conform to ANSI/AWWA C151/A21.51 Standards.

### Pipe Joints

Solid rubber rings etc. shall be separated from each length of pipe. Ductile iron pipe shall have rubber- gasket push-on joints or rubber-gasket mechanical joints.
Rubber-gasket joints shall conform to AWWA C111 gasket shall be of SBR.

### Restrained Joints

Restrained joints shall be "Locked – Type" joint manufactured by the pipe and fitting manufacture that utilize restraint independent of the joint gasket. Restrained joints shall be suitable for the specified 200 psi test pressure. Mechanical joint retainer glands as manufactured by EBAA Iron Inc. of Texas can be selected for restraining the mechanical joint of ductile iron pipe. Push - on

restrained joints as manufactured by the pipe supplier or manufacturer may be used subject to approval of the Commissioner.

**Sleeve Type Joints**

Sleeve type couplings shall be Dresser 38,138 or equal.

**Fittings**

Pipefittings shall be ductile iron with pressure rating of 350 psi for 24-in. and small piping and 250 psi for 30-in. and larger piping. Fittings shall meet the requirements of AWWA C110 or AWWA C153 as applicable. Fittings shall have the same pressure rating as a minimum, of the connecting pipe. All fittings shall conform to the latest revision of the City's specifications.

Closures shall be made with mechanical joint ductile iron solid sleeves and shall be located in straight runs of pipe at minimum cover outside the limits of restrained joint sections. Location of closures shall be subject to approval of the DPI.

**Interior linings**

Ductile iron pipe and fittings shall have the same type of lining; cement mortar lining and asphaltic seal coat in accordance with AWWA C104 double thickness.

**Pipe Insulation**

Pipe and fittings shall be insulated where ground cover above the pipe and fittings is less than 4-feet or as directed by the Engineer. Insulated pipe shall be properly restrained. The insulation shall be a foamed in place closed cell polyurethane which completely fills the annular space between the carrier pipe and the exterior casing. The insulation shall have the following physical properties:

| | |
|---|---|
| Minimum Density (lb/cu. St.) 2.1 | ASTM D-1622 |
| "K" Factor BTU/Hr. sq.ft. °F/in. 0.147 | ASTM C-518 |
| 90-95% Closed Cell | ASTM D-2856 |

The exterior casing shall be seamless, extruded white PVC Type 1, Class 12454-B per ASTM D-1784. No tape casings will be allowed. If required at field joints, all straight pipe with PVC jackets shall be covered with a PVC sleeve and wrap of polyken tape.

The pipe insulation shall be structurally strong, water-tight and entirely resistant to corrosive elements. The pipe insulation system shall be manufactured by Tricon Piping Systems, Inc. New York or approved equal.

**Tapping Sleeves**

Tapping sleeves shall be of split mechanical joint design, rating of 200 psi, High–Strength Cast Iron or Steel Bodies with a heavy coat of corrosion resistant coating and separate end and side gaskets. The side gasket shall extend the entire length of the tapping sleeve, forming a watertight joint. Mechanical Joints- for use in connection with pipe having an outside diameter not in excess of Class D pit cast pipe for cast iron. Tapping sleeves conform to ANSI/AWWA standards.

Tapping Sleeves used shall be: A.P. Smith, Darling, Mueller H-615, H-616, and JCM 414 or approved equal and shall be the type used by the City of New Bedford DPI.

**Gate Valves and Valve Boxes**

All valves and appurtenances shall be new and in perfect working condition. Valves shall be designed for continuous use with a minimum of maintenance and service required and shall perform the function without exceeding the safe limits for stress, strain or vibration. In no case will used or damaged valves be acceptable. Both workmanship and material shall be of the very best quality and shall be entirely suitable for the service conditions specified.

Gate valves shall be ductile iron Resilient Seat type, designed for 250 psi working pressure and test pressure of 500 psi.

Valves are to have Double O-ring stuffing box and a Non-Rising Stem. The design and machining of the valve shall allow replacement of O-rings without undue leakage, while the valves are fully opened and in service. Anti-friction washers are to be located above and below the thrust collar portion of the stem to reduce friction and provide more effective conversion or operating torques into seating loads.

Valves shall have 2 in. operating nut. Valve shall Open Right. Thin wall ductile iron valves will not be accepted. Resilient seat valves shall meet the most recent version of AWWA standard specification for gate valves in all respects, AWWA C509-87.

All inside and outside cast iron surfaces are to be Epoxy Coated. Epoxy coating 10 mils nominal. Non-toxic and imparts no taste to water and certified to NSF61(AWWA C550) Standards.

Standard Mechanical Joint ends for cast iron, with end dimensions complying with ANSI/AWWA C11/121.11 Standards.

Gate valves shall be manufactured by: A.P Smith, Darling, and Mueller Co. #A2360-20.

Tapping Valves: Resilient seated tapping valves shall be furnished with the tapping flange having a raised faced or lip designed to engage the corresponding recess in the tapping sleeve flange in accordance with MMS SP60. Tapping valves without the raised face on the tapping flange are not permitted since they do not assure the proper alignment required to prevent damage by misalignment shell cutter. The interior of the waterway body shall be full opening and capable of passing a full size shell cutter.

Butterfly Valves: Shall be in accordance with requirements of AWWA C504–Class 150-B Standard for butterfly valves, a Cast Iron Body design, with mechanical joint fittings (with Joint accessories), Cast Ni-resist disc, 304 Stainless Steel shafts, shaft locking pins to conform to ASTMA304, Gr.3650H Standards, Bronze thrush bearing, fiberglass reinforced Teflon shaft bearings, with Chevron type packing.

Butterfly valve shall be used in sizes 16in and greater, shall Open Right, with a 2 in. square operating nut with a maximum water temperature 125° degree (F), Maximum working pressure 200 psi, Test pressure 300psi, Maximum velocity rating of 16ft./sec.

Valve body exterior and interior shall have a fusion bonded epoxy coating in accordance with AWWA C-555 Standards.

The valve shall be designed so that during operation, or cycling of the valve, there is no friction or abrasion or rubbing together that could wear away any coating material and expose bare metal.

The interior of the valve body shall be free of pockets or ledges where sediment or debris can collect.

"O" ring seal shall be replaceable with the valve under pressure in the full-open position.

Valve shall be capable of operating through 500 full cycles with zero leakage and without regard to direction of valve discharge or operating pressure.

Shall be manufactured by Mueller Model # B-3200-20 and Muller Line Seal Model # B-3200-20 with Mechanical Joint Ends bolts, glands & rubber gaskets complete with operator.

Any proposed deviation to this specification shall be submitted as a special request, in writing, to the commissioner for review and final approval.

Gate Box:

Shall be a heavy-pattern cast iron, three (3) – piece, telescoping type box with dome base suitable for installation on the buried valves. Inside diameter shall be at least a 4 ½ inch barrel length shall be adapted to the depth of cover, with a lap of at least 6 inches when in the most extended position. Cover shall be cast iron with integrally-cast direction – to open arrow. Aluminum or plastic are not acceptable. A means of lateral support for the valve extension shaft shall be provided in the top position of the valve box.

The upper section of each box shall have a top flange of sufficient bearing area to prevent settling. The bottom of the lower section shall enclose the stuffing box and operating nut of the valve and shall be oval.

Shall be manufactured by Buffalo, two (2) piece design, Caldwell No. 10 Gate box – 5 ¼. (Five & one quarter) inch shaft used with 12-inch valves and smaller sliding type: Size – 664, extending from 38 inches to 60 inches, Top Section 26 inches, Bottom Section 36 inches, weight of 110 lbs.

Gate box shall conform to the latest revision of the City's specification.

**Hydrants**

Hydrants shall be designed, manufactured, and tested in compliance with the latest edition of AWWAC-502 "*Standard for Dry Barrel Fire Hydrants*" as published by the American Water works Association.

Hydrants shall be "*Traffic Type",* with a replaceable "breakable" unit immediately above the ground line for minimizing repairs due to traffic damage.

Hydrants shall be of the compression type, constructed such that the main valve closes with the water pressure to assure no loss of water in the event of damage to the upper portion of the hydrant.

The valve shall have a minimum diameter of *5 ¼ inches* to assure optimum flow.

Hydrant shall be of the dry top design with "O" ring seal to ensure that the operating threads will be protected from water entry. Dry top design is to include a factory lubricated operating mechanism, which allows supplemental lubrication to be added in the field without removal of the top section. Standard lubricant shall be oil/grease, suitable for a temperature range of –60 to +150 degree Fahrenheit and shall incorporate a system of forced lubrication of the thrust collar area each time the hydrant is operated.

All hydrants shall have a Weather Shield of an advanced elastomer material to protect the clearance area between the top casting and the operating nut from moisture and possible damage.

The operating nut shall be a one-piece bronze casting. Both the operating nut and nozzle cap nuts are to be pentagon in shape and measure 1 ½ inches from point to flat at the base of the nut and the overall height of the nut shall be not less than 1 inch. Caps are to be provided with rubber gaskets and "non-kinking," type chains and threads shall have a thin even application of a high temperature anti – seize and lubricating compound such as Never – Seize, or equal.

Hydrants shall have two (2) 2 ½ inch NST hose nozzles, and one (1) 4 ½ inch NST pumper nozzle. The threads are to be "National Standard Threads" (NST).

The Hydrant nozzle section shall be capable of rotation through 360 degrees with respect to the standpipe.

The minimum distance allowable between the centerline of the lowest nozzle and the ground line shall be eighteen (18) inches, Hydrants to have five (5) feet ***Bury***.

Each hydrant shall have permanent markings cast into the upper barrel assembly identifying the manufacture, name and size of main valve opening and the year of manufacture.

Each hydrant shall have an identification mark indicating direction of opening and shall be marked **"Open Right"**.

Hydrants shall have an automatic drain that is operated by the main valve rod. Drain valve is to open, as the main valve is closed and close as the main valve is open. The port and seat of the main valve is to be bronze.

The outside of the hydrant top section shall be painted a minimum of one coat of primer and one finished coat of enamel to be "Red". Bonnet to be reflective white and hose and steamer caps shall be painted per flow test results.

The shoe of the hydrant shall be provided with a (FLG) or (MJ) type of inlet six (6) inches in size that will fit old and new Cast iron pipe. The internal surfaces of the shoe, the lower valve plate, and cap nut shall be coated with a factory applied two-part, thermosetting epoxy coating with a minimum thickness of four (4) mils.

The bronze valve seat shall be threaded into a bronze drain ring or shoe housing to prevent electrolysis between these components. The drain channel shall be all bronze.

The hydrant shall have two drain outlets above the lower flange of the hydrant shoe assembly.

Hydrants shall be designed to permit the use of extension sections in a minimum of six (6) inch increments complete with rod extensions couplings, flanges gaskets, and hardware to facilitate raising of the hydrant where necessary and allow all parts to be removable from ground level without requiring excavation of the hydrant.

Installation shall be in accordance with standard detail 500 and testing shall be according to AWWA Standards C-600 and AWWA manual M-17.

All hydrants furnished under the terms of this specification must be accompanied by a certification, signed by an officer of the Manufacturing Co. that the furnished hydrants meet all aspects and standards contained within this specification.

All hydrants must have a standard test pressure of 200 psig Working Water Pressure and 500 psig Test Pressure and be certified as such by the manufacturer.

All hydrants furnished must have a standard ten (10) year warranty certified by the manufacturer.

Hydrants shall have UL-FM approval.

Hydrants shall be manufactured by:

5 ¼ inch AFC Darling B-62-B Fire Hydrant.
5 ¼ inch Mueller A423 Centurion 3-way Fire Hydrant

Automatic Flushing Hydrant shall be manufactured by:

Kupferle #9700

Hydrants shall be manufacturer painted red with white caps and white bonnet. Hydrants shall conform to the latest revision of the City's specification.

Concrete Thrust Blocks

Furnish all labor, materials equipment and incidentals required to install concrete thrust blocks for pipe fittings and hydrants as ordered by the Engineer, as shown on the Plans and as specified.

Concrete Quality

Unless otherwise specified or directed, concrete shall be designed for a minimum allowable compressive strength of 3,000psi at 28 days. Slump shall preferably be between 2 inches and 4

inches and shall not exceed 5 inches. Water shall be kept to a minimum, to obtain the concrete, which is as dense and watertight as possible. The maximum water content shall be 6 gallons per 94 lb. sack and the minimum cement factor shall be 5.7 (94 lb) sacks per cubic yard. The above ratios shall be revised for sacks of cement weighing different from 94 lb. per sack.

Ready-mix concrete shall conform to ASTM C94 and the requirements herein, or as otherwise approved by the engineer. If ready-mix concrete is to be used, the manufacturer shall furnish a statement to the engineer for his approval giving the dry proportions to be used with evidence that these will produce concrete of the quality specified.

Concrete shall be mixed until there is a uniform distribution of the material and shall be discharged completely before the mixer is recharged. The mixer shall be rotated at a speed recommended by the mixer manufacturer and mixing shall be continued for at least one and one-half minutes after all the materials are in the mixer. Concrete shall be placed within 1½ hours of the time at which water was first added; otherwise, it shall be rejected. Concrete which has been remixed or re-tempered or to which an excess amount of water has been added, shall also be rejected.

**Domestic Services**

Corporation Taps, Curb Stop, Couplings & Curb Stop Boxes

Service pipe size shall not be less than 1 inch and shall be soft, annealed seamless copper tubing conforming to ASTM B88, Type K from main to connection point inside of foundation wall. The name and trademark of the manufacturer shall be along the pipe.

Service Saddles

**Bodies:** Double Strap Ductile Iron ASTM-A536, CC Outlets.
**Straps:** Carbon Steel ASTM-A108 (61018) Electro –galvanized with di-chromate seal ASTM-B633.
**Studs:** Type 304 - 5/8” Stainless Steel.
**Nuts:** Cold formed semi-finished heavy hex steel A563 Electro-galvanized with di-chromate seal ASTM-B633, or Type 304 Stainless Steel Teflon coated for stainless steel.
**Washers:** Carbon steel ASTM-A108 Electro-galvanized with di-chromate seal ASTM-B633 or Type 304 Stainless Steel for stainless steel.
**Gaskets:** Grade 60 compounded to resist oil, natural gas, acids, alkalies most (aliphatic) hydrocarbons fluids water and many chemicals.
**Finish:** Fusion bonded nylon to a minimum thickness of 12 mls or optional topcoat enamel.

Corporation stop for service connections shall have standard shop threads conforming to AWWAC800 on inlet end and with required joint or coupling for connection to copper pipe and shall be Muller Style AWWA types H-1500 & H-15008, Red Head style 438 or equal.

Curb stops shall be Water Works inverted-ground-key type, oval or round flow way, tee handle, without drains. Pipe connections shall be suitable for the type of service pipe used. All parts shall be of bronze with female iron-pipe-size connections or compression-pattern tube couplings and shall be designed for a hydrostatic test pressure not less than 200 psi. curb stops shall be Mueller style H-1504-2, Red Heb Style B415G or equal.

**Brass Specification**

**Material:** Material shall be of bronze containing not less than 85% copper; bronze to be known as 85-5-5 metal. Castings to be clean and free from roughness both inside and outside.

**Waterway:** Shall be full size- orifice is to be round- smooth and free from obstructions.

**Washer:** Washers shall be of cast bronze containing not less than 85% copper finished on both sides to true faces.

**Nuts**: Shall be of commercial bronze not less than 89% copper and finished on both sides to true faces.

**Plugs:** All plugs of corporations and curb stop to be solid (except for waterway) size to and including 1½ inches. The bronze in all plugs shall be of a composition harder than that of the body. The material to be known as ingot # 345 Navy M metal with not less than 87% copper.

**Adjusting Nuts:** The adjusting nuts shall also come to a true facing against the bottom of bronze washer and proper adjustment shall be made to assure easy turning and freedom from leakage. The adjusting nuts shall be properly locked to the stop plug to avoid change in position in operation of stop.

**Stop:** The stops shall be subject to a sustained hydraulic pressure of 200 lbs.; tested in both the open and closed position.

All curb stops and corporation must be of compression type. All brass goods must fully conform to specifications and no inferior workmanship or material will be accepted.

Corporation Taps, Curb Stop & Curb Stop Boxes shall conform to the latest revision of the City's specification.

Adapter Couplings:

Adaptor couplings for connecting new copper tubing to existing service connection at a point two (2) feet inside the property line shall be standard straight coupling fittings conforming to AWWA C800 manufactured by Mueller, Red Hed or Dresser Type coupling with epoxy coating and all ductile iron construction or equal. When encountering different pipe materials such as steel, brass, lead etc. couplings used to connect new to existing services shall electrically isolate the two materials and be comprised of corrosion resistant materials.

Line fittings:

Line fittings, if required on new or old service line, shall be standard three-part unions conforming to AWWAC800; shall be Mueller, Red Hed or equal.

Curb Stop Box:

Service boxes shall be cast iron. Service boxes shall be installed for all new curb stops where directed by the Engineer. Curb stop boxes shall be located 1.5-ft back from the curb line. Curb stops shall be furnished with curb boxes of the extension type with stationary rod and arch pattern base. Service boxes of the required length and having a slide-type adjustment shall be installed at all service box locations. The boxes shall have housings of sufficient size to completely cover the curb stop and shall be complete and identifying covers. Service boxes shall be furnished with the cover which reads "WATER".

Curb stop boxes shall be 2 ¾-inch Tyler Union Service Box, adjustable 6500 series, screw type. The top section shall be 30-in and the bottom section shall be 39 inches with an overall adjustable length of 41-in to 64-in. Box shall accommodate curb stops up to 1-1/4-inch. An enlarged base should accommodate curb stops up to 2-inch if required. Top section of the service box shall be recessed to receive the cover.

## INSTALLATION

### Excavation and Backfilling

Scope of work

The contractor shall furnish all labor, materials, equipment and incidentals necessary to perform all trenching for pipelines and appurtenances, including drainage, filling, backfilling, disposal of surplus material and restoration of trench surfaces and easements.

Excavation shall extend to the width and depth shown on the Plans or as specified and shall provide suitable room for installing pipe, structures and appurtenances.

Furnish and place all sheeting, bracing, and supports and shall remove from the excavation all materials which the DPI may deem unsuitable for backfilling. The bottom of the excavation shall be firm, dry and in all respects, acceptable. If conditions warrant, deposit gravel for excavation below grade, directly on the bottom of the trench immediately after excavation has reached the proper depth and before the bottom of the trench has become softened or disturbed by any cause whatever. The length of the open trench shall be related closely to the rate of pipe laying. All excavation shall be made in open trenches.

Contractors installing by-pass piping must have a minimum trench width of one (1) foot.

All excavation, trenching and sheeting, bracing, etc. shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.560Subpart P) and the State requirements. Where conflict between OSHA regulations exists, the most more stringent requirement shall apply.
Trench Excavation

While excavation and backfilling is in progress, traffic shall be maintained or in instances when traffic cannot be maintained a police detail will be required at the contractor expense. Care must be taken not to damage water pipes, drains, sewers gas mains, electric & cable TV conduits, or other structures encountered on the lines of the work. In case of damage to any structures, the structures owner and the DPI shall be immediately notified by the Contractor, so proper steps may be taken

to repair the damage, at the expense of the Contractor, any and all damage. All utilities and other property shall be protected.

Trenches shall be excavated to the depth indicated on the Plans or to allow for a minimum of four (4) feet and no more than five feet-six inches (5.5') cover over the top of the pipe. In open cut excavations, the trench width at the top of the pipe shall be no wider than the outside diameter of the pipe, plus 1.5 feet, or in widths sufficient for laying the pipe, bracing and for pumping and drainage facilities The bottom of the excavation shall be firm and dry and in all respects acceptable to the Inspector. The trench above the top of the pipe shall have sufficient slope so that the banks will not slide. Sheeting of trenches will be at the contractor's discretion and may be required by applicable governmental laws and regulations.

Excavation and dewatering shall be accomplished by methods, which preserve the undisturbed state of sub-grade soils. The trench may be excavated by machinery to, or just below the designated sub-grade. Provide that material remaining in the bottom of the trench is no more than slightly disturbed. Sub-grade soils, which become soft, loose, "quick", or otherwise unsatisfactory as a result of inadequate excavation, dewatering or other construction methods shall be removed and replaced by screened gravel fill as required by the DPI at the Contractor's expense.

Clay and organic silt soils are particular to disturbance due to construction operations. When excavation is to end in such soils, use a smooth-edge bucket to excavate the last one-foot of depth.

Bedding

Pipe shall be bedded to its side centerline in compacted granular material. Granular materials are defined per the AASHTO Soil Classification System (ASTM D3282) or the Unified Soil Classification System (ASTM D2487), with the exception that gravel bedding/backfill adjacent to the pipe is limited to 2" maximum particle size per ANSI/AWWA C600. Compacted granular or select material shall be used to top of pipe. Loose soil or select material is defined as "native soil excavated from the trench, free of rocks, foreign materials, and frozen earth." Approximately 90 percent shall pass Standard Proctor, AASHTO T-99 "Standard Method of Test for the Moisture Density Relations of Soils Using a 5.5 lb (2.5 kg) Rammer and a 12 in. (305 mm) Drop." Available from the American Association of State Highway and Transportation Officials, 444 N. Capital St. N.W., Washington, DC 20001. The clean earth shall be hand shoveled and properly tamped beneath the pipe so that the pipe shall have a continuous and even bearing. The trench may be excavated by machinery to the normal depth of the pipe provided that the material remaining in the bottom of the trench is no more than slightly disturbed.

Where pipe is to be laid directly on the trench bottom, final excavation at the bottom of the trench shall be performed manually, providing a flat-bottom true to grade upon undisturbed material. Bell holes shall be made as required.

Excavation Below Grade and Backfill

Whenever the nature of unstable material is encountered, or when groundwater conditions exist the trench drainage shall be complete and effective. If the Contractor excavates below grade through error or for the contractor's own convenience, or through failure to properly dewater the trench, or disturbs the sub grade before dewatering is sufficiently complete, he may be directed by the

Engineer to excavate below grade as set forth in the following paragraph, in which case the work of excavating below grade and furnishing and placing the refill shall be preformed at his own expense.

If the material at the level of the trench bottom consists of fine sand, sand and silt or soft earth which may work into the screened gravel notwithstanding effective drainage, the sub-grade material shall be removed to the extent directed and the excavation refilled with 6 in. layer of course sand, or a mixture graded from course sand to the fine pea stone, as approved by the Engineer, to form a filter layer preserving the voids in the gravel bed of the pipe. The engineer prior to placement shall approve the composition and gradation of gravel. Screen gravel shall then be placed in 6 in. layers thoroughly compacted up to the normal grade of the pipe. If directed by the Engineer, bank-run gravel shall be used for refill of the excavation below grade. Geotextile filter fabric may be substituted for filter layer if approved by the Engineer. Filter fabric shall be Mirafi 140N, Supac equivalent, or equal.

Backfilling

As soon as practicable after the pipe has been laid, jointed, and inspected, backfilling shall begin and thereafter be prosecuted expeditiously. Bedding gravel, as specified for the type of pipe installed, backfill shall be deposited by hand evenly on both sides to the centerline of the pipe and tampered with suitable tools, then filled in by hand up to 1 foot over the pipe before backfilling with a machine. All materials for backfilling shall be suitable and free from organic substances, large stones and frost. No stone weighing over fifty - lbs. shall be backfilled anywhere into the trench. Stones larger than 3 inches in diameter shall not be closer than 6 inches to the pipe Fill shall not be dropped into the trench in a manner to endanger the pipe. The water into the new mains shall not be turned on until fill material is placed to the proper grade over the pipelines and around hydrants. Flowable Fill will be required during the winter season or when required by the City.

An impervious dam or bulkhead cutoff of clay or other impervious material shall be constructed in the trench as directed; to interrupt the unnatural flow of groundwater after construction is completed. The dam shall be effectively keyed into the trench bottom and sidewalls. Provide at least one clay or other impervious material dam in the pipe bedding between each manhole where directed or every 300 feet, whichever is less.

Where the pipes are laid cross-country, the remainder of the trench shall be filled with common fill material in layers not to exceed 3 feet and mounded 6 inches above the existing grade or as directed. Where a loam or gravel surface exists prior to cross country excavations, it shall be removed, conserved and replaced to the full original depth as part of the work under the pipe items. In some areas it may be necessary to remove excess material during the clean-up process, so that the ground may be restored to its original level and condition.

To prevent longitudinal cracking of the pipe, dumping backfill material into the trench and then spreading will not be permitted until material or screened gravel has been placed to a level 1foot over the pipe.

Backfill shall be brought up evenly on all sides. Each layer of backfill material shall be thoroughly compacted by rolling, tampering, or vibrating with mechanical compacting equipment or hand

tamping, to 92 percent compaction. If rolling is employed, it shall be used of a suitable roller or tractor, being careful to compact the fill throughout the full width of the trench.

Water jetting or puddling may be used unless the refill contains too great a proportion of clay or loam to permit satisfactory drying. Water jetting shall consist of using a suitable length of pipe at least 1¼ inch in diameter fitted with quick acting valve and sufficient hose to connect to a hydrant or pump having adequate pressure and capacity. The full depth of backfill shall be thoroughly inundated by thrusting the pipe into the fill at frequent intervals with the valve open until all slumping ceases. Where backfill is compacted by puddling it shall be done by depositing it in water. Water for jetting or puddling may be obtained from owner hydrants where possible. The owner of the hydrant may furnish water if reasonable care is exercised in its use and when approved by the DPI. If water restrictions are in force, obtain water elsewhere, or compact the backfill by other approved methods.

Where other methods are not practicable, compaction shall be by use of hand or pneumatic ramming with tools weighing at least 20 lbs. The material being deposited shall be spread and compacted in layers not over 6in thick. If necessary, sprinkling shall be employed in conjunction with rolling or ramming.

Backfill around structures shall be selected common fill material, may be compacted by puddling where approved by the Engineer. All Backfill shall be compacted, especially under and over pipes connected to the structures.

While puddling is underway and afterwards, until the puddle areas have sufficiently hardened, the Contractor must protect the trench and the public by suitable barriers, lights, etc. Refer to Section III, Road Construction, in the sub-section on “Patching Trenches” (page 9) for methods of repairing and patching trenches.

## Installation of Pipe & Appurtenances

Scope of work

Contractor to furnish all labor, materials, equipment, and incidentals required install disinfect and test ductile iron pipe, fittings, for distribution system piping. Piping shall be located substantially on drawings. The DPI reserves the right to make such modifications in locations as may be found desirable to avoid interference between pipes or for other reasons.

Installing Cast and Ductile Iron pipe and fittings

Care shall be taken in loading, transporting, and unloading to prevent damage to the pipe or coatings. Pipe and fittings shall not be dropped. All pipe and fittings shall be examined before laying and no piece shall be installed which is found to be defective. Damaged to the pipe coating shall be repaired per manufacturer’s recommendations.

If any defective pipe is discovered after it is layed, it shall be removed and replaced with a sound pipe in a satisfactory manner. All pipe and fittings shall be thoroughly cleaned before laying, shall be kept clean until they are used in the work and when installed or laid, shall conform to the lines and grades required.

Ductile iron pipe and fittings shall be installed in accordance with requirements of AWWA C600, except as otherwise specified herein. A firm even bearing throughout the length of the pipe shall be provided by digging bell holes at each joint and by tampering backfill materials at the side of the pipe to the spring line. Blocking will not be permitted.

All pipes shall be sound and clean before laying. The contractor shall remove, by pumping or other means, any water accumulated in the trench during the pipe laying period and keep the trench dry until the joints are properly connected. When pipe laying is not in progress, open ends of the pipe shall be closed by a watertight plug or other approved means. Sufficient backfill shall be placed to prevent flotation. Any pipe lengths, which have floated, shall be removed from the trench and relayed to the satisfaction of the inspector. The deflection at joints shall not exceed 75percent of allowable deflection recommended by manufacturer.

All ductile pipe underground shall have a minimum of 3-ft. of cover unless otherwise shown on drawings. Pipe shall be laid such that the invert elevations show on the drawings is not exceeded.

Fittings shall be provided where required, in crossing utilities, which may be encountered upon opening the trench. Solid sleeve closures shall be installed at locations approved by the Engineer.

The pipe interior shall be maintained dry and broom clean throughout the construction period. When cutting pipe is required cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be used with a bell shall be beveled to conform to the manufactured spigot end. Cement lining shall be undamaged. Field cut ends shall be sealed with approved epoxy in accordance with manufacturer’s instructions.

Cutting of restrained joint pipe will not be allowed, unless approved at specific joints in conjunction with the use of restrainer glands by EBAA Iron of field adaptable restrained joints.

Wedges supplied with the pipe shall be used according to the manufacturer’s recommendation to effect electrical continuity.

Sewer line and water main separation shall conform to guidelines in TR-16, Guides for the Design of Wastewater Treatment Works, 2011 Edition. Sewers shall be kept remote from public water supply wells or other potable water supply sources and structures. Wherever possible, sewers shall be laid at a minimum of at least 10 feet, horizontally, from any existing or proposed water main. Should local conditions prevent a lateral separation of 10 feet, a sewer may be laid closer than 10 feet to a water main if it is laid in a separate trench and the elevation of the crown is at least 18 inches (18in) below the invert of the water main.

Whenever sewers must cross under water mains, the sewer shall be laid at such an elevation that the crown of the sewer is at least 18 inches below the invert of the water main. When the elevation of the sewer cannot be varied to meet this requirement, the water main shall be relocated to provide this separation or constructed with mechanical-joint pipe for a distance of 10 feet (10 ft) on each side of the sewer. One full length of water main shall be centered over the sewer so that both joints will be as far from the sewer as possible.

When it is impossible to obtain horizontal and/or vertical separation as stipulated above, both the water main and sewer shall be constructed of mechanical-joint cement-lined ductile iron pipe or equivalent that is watertight and structurally sound. Both pipes should be pressure tested to 200 psi to ensure that they are watertight.

Refer to City Standard Details when a sewer service connection is in direct invert conflict with an existing watermain or storm drain.

All dead ended mains shall end with a hydrant assembly and automatic flushing unit approved by the Commissioner and shall discharge into a grated drainage system. If no drainage system exists in the vicinity of the proposed hydrant, contact DPI Engineering.

Thrust Blocks

The contractor shall be responsible to supply and install concrete thrust blocks at all bends, tees, and hydrants as shown on standard detail plans the concrete shall be composed of one part Portland cement, two parts sand and four parts coarse aggregate. The concrete shall be mixed and placed in a manner satisfactory to the inspector. In placing the concrete, care shall be taken not to disturb the alignment of the pipes around or adjacent to the concrete being placed.

Concrete encasements shall be placed as shown and as directed by the Plans. Backfill shall not be placed on the concrete until permitted by the DPI.

The backs of the thrust blocks anchors shall be placed against undisturbed earth. The sides of thrust blocks shall be formed. The Minimum bearing area shall be as called out on the plans or as determined by the Engineer. Felt roofing paper shall be placed to protect pipe joints and hydrant drain ports. Concrete shall not be placed over bolts or nuts, or to prevent the removal of the joints.

Jointing Ductile Pipe

Push-on joints shall be made in accordance with manufacturer's instructions and AWWA C600 standards. Pipe shall be laid with bell ends looking ahead. A rubber gasket shall be inserted in the groove of the pipe. The joint surfaces shall be cleaned and lubricated, and the plain end of the pipe shall be aligned with the bell of the pipe to which it is to be joined and pushed home.

Mechanical joints shall be assembled in strict accordance with the manufacturer's instructions and AWWA C600 Standard. Pipe shall be laid with bell ends looking ahead. To assemble the joints in the field; thoroughly clean and lubricate the joint surfaces and rubber gasket. Bolts shall be tightened to the specified torques. Under no condition shall extension wrenches or pipe over handle of ordinary ratchet wrench be used to secure greater leverage.

Bolts in mechanical or restrained joints shall be tightened alternately and evenly.
Restrained joints shall be installed according to pipe manufacturer's instructions.

All blow-offs, outlets, valve, fittings, and other appurtenances required shall be set and jointed as indicated on the Drawings in accordance with the manufacturer's instructions.

Gate Valves and Boxes

Buried valves shall be cleaned and manually operated before installation. Buried valves and boxes shall be set with the stem vertically (plumb), aligned in the center of the valve box. Gate valves shall be located not more than 500 feet apart in commercial districts and 800 feet in all other areas. Valves shall be set on a firm foundation and supported by tamping pipe bedding material under the sides of the valve and shall be connected with short lengths of pipe when needed.

Valve Box

The valve box shall be supported during backfilling and material in vertical alignment with the top flush with finish grade. The valve box shall be set so as not to transmit traffic loads to the valves. Before Backfilling, all exposed portion of any bolts shall be coated with two coats of bituminous paint.

Adjustments of water gates that disturb the Bituminous Concrete Binder surface, will need to have nine (9) inches of concrete placed around the structure. City of New Bedford Engineers on-site will make the determination. See Mass DPW Specifications – March 1977, Concrete Collars Detail 202.9.0.

## Installing Pipe Insulation

The Contractor shall install insulated pipe where ground cover is less than 4-feet or as directed by the Engineer. The Contractor shall handle the piping system in accordance with the directions furnished by the insulated piping system manufacturer and as approved by the Engineer. All insulated pipe shall be properly restrained. The Contractor shall exercise appropriate care when installing the insulated pipe.

The field application of pipe insulation of fittings and pipe connections shall be in accordance with the manufacturer's instruction and as directed by the manufacturer's trained personnel. Insulated piping systems shall not be installed in standing water. Trenches shall be maintained dry until final closure is complete.

A minimum 4-inch layer of sand or fine gravel, less than ½ inch in diameter shall be placed and tamped in the trench to provide uniform bedding for the insulated piping system. Once the insulated piping system is in place, the trenches shall be carefully backfilled with material as specified and directed by the Engineer and hand tamped in 6-inch layers until a minimum of 12-inches above the top of the insulated piping system has been achieved. The remainder of the backfill shall be flowable fill, as specified.

The water main pipe shall be tested in accordance with "Water Main Filling and Testing" in Section IX.

## Hydrant Installation

Fire hydrants shall be set at a maximum of 500 feet apart unless otherwise specified by DPI. Hydrants shall be bedded on a firm foundation. The hydrants and connecting pipes shall have at least the same depth of cover as the water-distributing pipe.

Hydrants shall have the steamer nozzle facing the roadway. 6 inch diameter cast iron or ductile pipe shall be used for hydrant laterals. Each hydrant must have a 6-inch gate valve, box and cover on the lateral.

A drainage pit as detailed on plans, or it shall be at least 12 inches in depth below the bottom of the hydrant and at least 18 inches in radius shall be dug at each hydrant. This pit and space around the hydrant shall be refilled with ¾" crushed stone compacted. During backfilling, additional crushed stone shall be brought up around and 6 inch over drain port. Each Hydrant shall be set in true vertical alignment and properly braced.

Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil bank at the end of the trench. Minimum bearing area shall be shown on the plans. Felt roofing paper shall be placed around the hydrant elbow before placing concrete care shall be taken to ensure that concrete does not plug the drain ports.

The hydrant shall be tied to the pipe with suitable rods or clamps, galvanized, painted, otherwise rustproof treated. Hydrant paint shall be touchup as required after installation.

Fire hydrants shall be painted in accordance with New Bedford DPI standard practice, red body and white bonnets.

Automatic Flushing Hydrants shall have a locking device, for water discharge to open air to 4 inch concrete pad or pipe with air-gap drainage system, and discharge into a grated drainage system.

**Water Main Filling and Testing**

After installation, the pipe shall be tested for compliance as specified herein. Furnishing all necessary equipment and labor for the pressure test and leakage test on the pipeline'(s). Submit plan for testing to the DPI for review at least 10 days before starting the test.

Testing shall be conducted in accordance with AWWA C600 standard. Pressure pipelines shall be subject to a hydrostatic pressure of 200 psig or 1.5 times the working pressure at the highest point along the test segment. This test pressure shall be maintained for a minimum of 2 hours. The leakage rate shall not exceed those indicated in AWWAC600 standard. Provide suitable restrained bulkheads as required to complete the hydrostatic test specified.

All valves and valve boxes shall be properly located and installed and operable prior to testing. Bulkheads shall be provided with a sufficient number of outlets for filling and draining the line and for venting air.

Hydrostatic pressure and leakage tests shall conform to Section 4 of AWWA C600 standard. Furnish gauges, meters, pressure pumps, and other equipment needed to fill the line slowly and perform the required hydrostatic tests.

The DPI will provide a source of supply from the existing treated water distribution system for Contractor's use in filling the lines. An air brake shall be maintained at all times between the distribution system and the Contractor's equipment to prevent cross-connection.

The line shall be slowly filled with water (so not to disturb existing lines) from the low end if possible; expelling air from the hydrants and taps at the beginning and end of the line. The line shall be shut down and left filled for 24 hours.

Testing

After the line is filled and all air has been expelled and the valves segregating the portion of the system to be tested are secure closed, pressure is applied by pump water into the isolated section until 200 psi is obtained. The pressure should be maintained for not less than (2) two hours. If the line does not have any leakage, then it will maintain the test pressure for the specified time.

All lines that connect to a sprinkler system shall be tested to a pressure of 200 p.s.i. with the same procedure as detailed below.

Specified test pressure shall be maintained in the pipe for the entire test period by means of a pump furnished by the Contractor. Provide accurate means for measuring the quantity of water to maintain this pressure. The amount of water required is a measure of leakage.

The duration of the pressure test shall not be less than Two (2) hours. The leakage test shall be a separate test following the pressure test and shall not be less than two (2) hour duration. All leaks evident at the surface shall be repaired and leakage eliminated regardless of the total leakage as shown by test.

If the pressure drops, the test pressure must be maintained by pumping from calibrated (marked) containers to hold the test pressure for the length of the test period to determine the amount of leakage. If the rate of leakage is greater than that is allowed in the following table, it shall be understood that the test has failed and appropriate repairs should be made before the test is again conducted.

Table I **Allowable Leakage per 1,000 Feet of Pipeline (Gallon Per Hour)**

Average Test Pressure 200 p.s.i.

| Nominal Pipe Diameter in Inches | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 4in | 6in | 8in | 10in | 12in | 14in | 16in | 18in | 20in | 24in |
| 0.37 | 0.55 | 0.74 | 0.92 | 1.10 | 1.29 | 1.47 | 1.66 | 1.84 | 2.21 |

Water lines that fail to meet the test standard shall be repaired and retested as necessary until test requirements are complied with. Defective materials, pipe, valves and accessories shall be removed and replaced.

The general procedure for chlorination shall be first to flush all dirty or discolored water from the lines and then introduce chlorine in approved dosages through a tap at one end, while water is

being withdrawn at the other end of the line. The disinfectant shall be mixed with water in proper proportions to provide a minimum of 50 ppm throughout the main. The chlorine solution shall remain in the pipeline for 24 hrs.

**Water Main Disinfection**

The DPI shall be notified at least 48 hours prior to chlorination and shall witness the procedure. If no one from the DPI is available, the procedure shall be rescheduled to accommodate the DPI.

Before being placed in service, all new water pipelines shall be chlorinated using the continuous feed method specified in AWWA C651. The procedure shall be approved by the DPI.

The location of the chlorination and sampling points shall be taken in intervals of approximately 200 feet; and from the end of the line to assure safe water to all consumers on the line. The locations are to be determined in the field by the Contractor and the DPI. The contractor shall install the chlorination and sampling taps and shall uncover and backfill the taps as required.

Table II **Chlorine Dosage per 100 Feet of Pipe**

| Pipe Size | 100% Chlorine /lb. | 1% chlorine solution /gal. |
|---|---|---|
| 4in | .013 | .16 |
| 6in | .030 | .36 |
| 8in | .054 | .65 |
| 10in | .085 | 1.02 |
| 12in | .120 | 1.44 |
| 16in | .217 | 2.60 |

Solutions of 1% chlorine may be prepared with sodium hypochlorite or calcium hypochlorite. The latter solution requires 1 pound (lb.) of calcium hypochlorite in 8 gallons of water.

Following the 24 hr chlorination period, a minimum residual of 10 ppm shall be present. All treated water shall be slowly (so as not to disturb the existing lines) flushed from the lines at their extremities, residual reading shall be taken at hydrants and taps until or the chorine residual is no higher than that generally prevailing in the system, or the residual has dropped to minimum of 0.3ppm and replaced with water from the distribution system. The main will be kept isolated from the system.

All treated water flushed from the lines shall be disposed of by discharging into the nearest sanitary sewer or by approved means. No discharge to any storm drains or natural watercourse will be allowed.

24 hours after flushing is completed a sample shall be taken of the water that has stood in the isolated main. A chlorine residual test will be measured prior to the collection of a sample. If the residual measures less than 0.10mg/l, then a heterotrophic plate count (48-hour test) will be performed in addition to the coli form bacteria.

Bacteriological sampling and analysis shall be collected in a sterile bottle treated with sodium thiosulfate in accordance with procedures of Standard Methods for the Examination of Water and Wastewater 18th edition. A sample of the replacement water may then be made by the DPI in full accordance with AWWA C651.

A copy of the test report shall be given to the Contractor and the DPI foreman. If the chlorination test fails the Contractor will be required to re-chlorinate, if necessary and the line shall not be placed in service until the requirements of the Commonwealth of Massachusetts are met.

Special disinfecting procedures shall be used in connection to existing mains and where the method outlined above is not practical.

**Domestic Service Installation**

Services from main to the property line shall be set perpendicular (90 degrees) to the water main. Shall have a minimum of 4 feet cover and shall not be laid in the same trench with gas, electric or sewer. Water services within the street Cul-de-sac area, these water services are not allowed to have bends. If the water service cannot be installed perpendicular from the water main, then detector tape must be used from the main to the building foundation. The water service cannot be under any structure from the curb stop to the mechanical room. The area where the water service enters through the foundation shall be 3 feet away from the main circuit breaker panel. Meter stops, meter connection and blanks will be furnished, but not installed, by the DPI. Requests for meters to be set and water turned on shall be made to the DPI at least 48 hours in advance. Water service numbers will be required before turning on the water service. Well water residents converting from septic to sewer will be required to have a city water meter installed for billing purposes. When laterals are reconnected to existing services, a Reconnection Fee (same as new service fee) is required prior to work commencing.

**Tapping Saddle Installation**

Saddle shall be made from coated stainless steel and designed for a working pressure of at least 200 psi. Outlets shall be CC tapping outlets. The watertight seal shall be accomplished by the use of a gasket placed in a recess between the sleeve body and pipe barrel. Coating on steel sleeve/saddles shall be **Thermo-set Epoxy coating, 8-10 mil D.F.T.,** and free of holidays.

Taps for all services up to 2 inches shall be made with a double-strap service saddle tapped to the desire size with a corporation and a gooseneck in the copper, close to the corporation stop for expansion. Taps shall be made in the upper quadrant of the pipe. All services domestic or fire ¾ inch and larger that are tapped on Transite, Asbestos Cement Pipe etc., shall be made with a double strap service saddle.

No Person is allowed to Shut-off or Turn-on a water service. It is required that you call into the DPI Repair Shop for a representative to perform this function. Anyone caught using the curb stops shall be fined $50.00, per the Water Board.

## Corporation Stop Installation

Corporation stops shall be installed for connecting all services to the new water mains. Keep a record of the locations of all corporations stops installed and shall indicate on the record those corporation stops that have not been connected to service piping. A copy of this record shall be given to the Water Foreman at the completion of the work. Copper tubing, curb stops and necessary adapters shall be used to make connections between new corporation stops and new and existing service piping.

The tapping machine shall be rigidly fastened to the pipe as near the horizontal diameter as possible. The length of travel of the tap should be so established that when the stop is inserted and tightened with a 14 inch wrench, not more than one to three threads would be exposed on the outside.

When a wet tapping machine is used, the corporation cock shall be inserted with the machine while it is still in place. Stops shall be tightened only sufficiently to give water tightness and care must be constantly exercised not to over tighten them.

## Installation of Straight Couplings

Install straight couplings to existing water mains of the sizes required in the locations designed by the Engineer. Utilize the manufacturer's recommended installation procedures while performing the work. Care shall be taken to ensure a watertight connection.

Couplings shall have a protective wrapping of "Denso" material by DENSO Inc. of Texas or approved equal. Where Denso material is used, the joint shall be packed up with "Densyl mastic" to give an even contour for wrapping with "Densopol" tape. A 1.5mm thick coating of "Denso" paste shall be applied followed by 100mm or more wide "Densopol" tape wound spirally around the joint with at least 50 percent overlap.

## Curb Stop Installation

Shall be installed 1.5 feet from the curb line or pavement limit. Install the curb stops and boxes in a workman like manner as described herein.

## Curb Box Installation

Shall be set true vertical position and if they are within the limits of the roadway or within limits where the plowing of snow will take place in the winter, top of the boxes shall be set about ½ inch below the top of the finished grade. In locations where these boxes are not likely to be disturbed, the tops shall be set flush with the adjoining ground.

## Installation of Copper Tubing

Care shall be exercised in the placing and laying of copper tubing to be sure that the pipe does not have kinks or sharp bends and to assure against it being in contact with sharp stones or ledge which would cause damage to the pipe. At least 6 in. of selected fill shall be placed adjacent to and

above the pipe and no stones shall be placed over the pipe until the depth of backfill above the latter is in excess of 1ft.

**Installation of Fire Services**

The tap for a fire service shall be inspected by the DPI. The Contractor shall furnish all necessary materials and labor needed for the installation. Between the main and the property line, the service shall not be less than six (6) inch in diameter and shall be controlled at the tee by a gate valve, box and cover. Property owners may submit a Certified Engineer's Report to be reviewed by the DPI, for use of a smaller size fire supply service.

Fire supply lines shall be considered water main extensions and require proper testing, flushing and chlorination as described in these specifications.

**Lead Service Renewals**

When lead services are replaced or repaired, Contractor shall provide all residents connected to service with Lead Education letter from DPI. Contractor shall notify DPI when lead services are replaced or repaired and confirm delivery of letter to residents.

**PIPING PLANS**

**Main Pipe Plans**

All main pipe extension plans shall be stamped signed and dated by a Massachusetts Registered Professional Engineer (Civil). (Prints shall be stamped individually and submitted in duplicate.)

All plans shall show all existing and proposed utilities and pertinent construction details with materials of construction.

When contract is completed the DPI shall receive AS BUILT drawings stamped, signed and dated by a Massachusetts Registered Professional Engineer.

**Looping/Easement Requirements:**

15. It is required to loop all new main extensions.

16. All private easements necessary for this purpose shall be acquired prior to final approval.

17. If easements are un-acquirable reason(s) and proof of the same are requires to be submitted prior to final approval.

18. Installation of automatic flushing devices will be required where looping cannot be achieved.

**Department of Public Infrastructure**

**Jamie Ponte**
**Commissioner**

**CITY OF NEW BEDFORD**
**Jonathan F. Mitchell, Mayor**

**Water**
**Wastewater**
**Highways**
**Engineering**
**Cemeteries**
**Park Maintenance**
**Forestry**
**Energy**

# HYDRANT METER RENTAL FORM

## Meter Information

Meter Number: _____

Date Out: _____ Out Reading:_____

Date Returned: _____ In Reading: _____

## Applicant Information

Name: _____

Address: _____

Telephone Number: _____

Billing Name & Address if different: _____

Location of hydrant used: _____

What will the water be used for: _____

Date you plan on having meter set: _____

Length of time you need the meter: _____

The purpose of this policy is to clearly define the rules and charges for any person when renting a hydrant meter.



## Policy Statement:

Hydrant meters are rented on a first come, first serve basis from the DPI. Twenty-four (24) hours notice shall be required prior to needing the meter set. Meters may not be set due to adverse weather conditions, i.e. freezing temperatures or drought conditions. Hydrant meters shall not be issued for a seasonal account or where the use of the fire hydrant meter in obtaining water is not temporary in nature (unless approved by the Commissioner). Meter shall require renewal every six (6) months, penalty for failure to renew or return shall be in the amount of the surety deposit. DPI shall be responsible to install the meter on the fire hydrant and provide any requested standard connection fitting when available. DPI shall also be responsible to provide an operating in-line valve at the meter for the Renter to use. DPI and not the Renter shall operate the main valve on the fire hydrant. The service call fee will be charged per meter install and uninstall. During freezing temperatures, the meter is required to be uninstalled at the end of each work day to prevent freezing over night, the fee will be charged for each day of installation/uninstallation needed. It shall be the responsibility of the Renter to protect the meter from damage, loss and tempering. The Renter shall be responsible to provide all hoses and special fittings needed for utilizing the water supply. The Renter shall be responsible for notifying the Police and the Fire Department when Public Safety is affected, i.e. by use of hoses crossing the public way or extended sole use of the hydrant. The Renter will also be responsible for all water, which passes through the meter, whether it is used or wasted.

**The schedule of fees is as follows:**

| | |
|---|---|
| **Surety Deposit (separate check)** | **$3,000.00** |
| **Monthly Rental Fee** | **$150.00** |
| **Service Call – Fee for each install or uninstall activity** | **$150.00** |
| **After Hours Service Call- Fee for each install or uninstall activity** | **$200.00** |
| **Water Consumption Charge** | **Call office for current rate** |

Sign Out:

_____ _____

Signature of Renter/Agent: Date:

_____

Print Name:

Returned:

_____ _____

Signature of Renter/Agent: Date:

_____

Print Name:

# DEMOLITION PERMIT REQUIREMENTS

1. Demolition Permit is brought to D.P.I. – it may be attached to Building Permit Application.

2. Demolition Form signed and dated as received by D.P.I.

1. Petitioner to be instructed to seal sewer stub 10 feet from existing foundation or at property line in order to keep demolition debris out of the system.

2. All abandoned water services 2" and less must be cut and disconnected at corporation cock located on the main line for lead services. For services larger than 2" and up to and including 12", the gate valve and the tee must be removed completely. Services larger than 12" will need to be determined by the Department of Public Infrastructure.

   All copper services shall be cut off at the main, if there is no immediate use for the service. Copper services can be disconnected inside the property line if the service is going to be reused within 1 year.

   A letter written by the owner to the Commissioner to request the reuse of the service is required along with a surety deposit of $2500.00 for services 2" and smaller and $5000.00 for services larger than 2".

   If the service is not reused within 1 year of the request, the water service is to be removed at the corp. tap by the owners' Bonded Contractor. After the water service is removed then the surety deposit will be returned.

# SECTION X
# LANDSCAPING

## Qualifications

The Contractor shall hire an arborist with an International Society of Arboriculture (ISA) certification and/or a Massachusetts Certified Arborists for any tree plantings within the City's right of way. All work for this section will conform to the relevant provisions of the ISA best management practices.

Planting: Shall be done by experienced workmen familiar with planting procedures under the supervision of a qualified foreman.

## Warranty

The Contractor will provide a 1-year warranty on all plantings from the date of install.
At the end of this period, any plant that is missing, dead, not true to name or size as specified, or not in satisfactory growth, as determined by the City Arborist, shall be replaced. In case of any question regarding the condition and satisfactory establishment of a rejected plant, the City Arborist's decision is final. Furnish a guarantee for all replacement plants for at least one full growing season.

All replacements shall be plants of the same kind and size as specified. They shall be furnished and planted as specified herein. The cost of replacement shall be borne by the Contractor except where it can be definitely shown that loss resulted from vandalism.

## Location

Tree planting(s) must be a minimum distance of 5' from all sewer and/or water lines. Tree(s) will be planted a minimum of 10' from all driveway openings and street intersections. Tree planting(s) shall be placed no closer than 30' from any other tree within the City's right of way. Tree planting(s) shall be placed no closer than 10' from canopy to canopy from any other tree.
Plants shall be set in center of pits plumb and straight and at such a level that after settlement, the crown of the plant ball will be at the surrounding finished grade.
***(It is recommended to keep plantings a minimum distance of 5' from ALL underground utilities.)***

## Tree Specification

Trees will be planted with a caliper between 2" and 3" measured at breast height. The contractor will only be permitted to plant trees from the list of Open Space Tree Species. The allowance of alternate trees is at the discretion of the City Arborist and Engineer. No other plantings are allowed in place of tree(s) within the City right of way. The contractor shall plant the tree in native parent soil. If there is insufficient parent material onsite, loam will be allowed. The contractor shall tag the tree with a metal name tag which will include the species and plant date.

A GatorBag tree watering bag shall be provided for each tree installed.

Plants shall be nursery grown under climatic conditions similar to those in the locality of the project. All plants shall be freshly dug. No heeled-in plants or plants from cold storage shall be used. All plants shall be typical of their species or variety and shall have a normal habit of growth. Plants shall be sound, healthy and vigorous, well-branched and densely foliated when in leaf; shall be free of disease, insect pests, eggs or larvae and shall have healthy, well-developed root systems. All parts of the plant shall be moist and shall show active green cambium when cut.
Plants shall be accompanied by State Nursery inspection certificates.
Roots or balls of plants shall be adequately protected at all times from sun and from drying winds. Plants which cannot be planted immediately upon delivery shall be set on the ground and be well-protected with soil, wet moss, bark mulch, or other acceptable material.
All tree plantings proposed underneath existing overhead wire(s) must be of a species from the list Overhead Wire Tree Species:

**Overhead Wire Tree Species**

- Ostrya Virginiana-Hop Horn
- Cercis Candensis-Eastern Red Bud
- Prunus-Cherry
- Cretagus-Hawthorn
- Prunus Cerasifera-Purple Leaf Plum
- Parrotia persica-Persian Ironwood

**Open Space Tree Species**

- Platanus Acerfolia-London Plane
- Ulmus Americana-Elm
- Quercus Palustrus-Pin Oak
- Quercus Palustrus-Green Pillars
- Gleditsia Triacanthos-Locust
- Liquidambar Styraciflua-Sweet Gum
- Umlmus Parvifolio-Chinese Elm
- Tilia-Linden
- Ostrya Virginiana-Hop Horn
- Cercis Candensis-Eastern Red Bud
- Prunus-Cherry
- Cretagus-Hawthorn
- Prunus Cerasifera-Purple Leaf Plum
- Parrotia persica-Persian Ironwood

***(If a contractor wishes to select a tree not on the list, a written request may be submitted to the City Arborist and City Engineer)***

**Planting Dates**

The start of the planting season and therefore plantings will be dependent on weather patterns. It is the contractor's responsibility to contact the City Arborist to find out when planting can begin each

year. **(Planting start dates will change year to year).** Plantings are not allowed from June 30th to September 1st, planting may resume after September 1st and can continue planting until the first frost. If the season(s) are out of character of the average year and the City Arborist sees issue with planting during the allowed time period, a written notice will be supplied to the contractor asking planting(s) to be suspended until a later date.

## Tree Box

The tree box planting area will be a minimum of 5' by 5'. If this minimum conflicts with ADA compliance standards or other specifications a 4' by 4' area may be used. Any tree box area smaller than the before mentioned shall require prior written approval to the City Arborist and/or the City Engineer.

Mulch will be placed in the area around the base of the tree known as the tree box. The mulch within a 1' radius of the tree trunk will have a depth of 1". The mulch in the remaining tree box will be a depth of 2" to 3". No mulch is to be placed at the direct base of the tree, leaving a 2" gap in mulch around the trunk. The mulch shall be natural, black in color, and organic.

Adequate drainage will be supplied for the tree and tree box. If sitting water is a concern to the contractor, it is the responsibility of the contractor to make the City Arborist and City Engineer aware of the concern.

## Tree Filter Boxes

Shall be manufactured by StormTree (Model # ST-10X7). This is used throughout the City for consistency and maintenance purposes.

## Tree Support

Tree plantings will be supported with a minimum of three 4' or 5' - 2"x2" wooden stakes. The tree will be secured to the wooden stakes using arbor lock, arbor tie or approved equal. Stakes shall be buried at a minimum depth of half of their length. After 1 full calendar year it is the contractor's responsibility to remove the stakes and ties from the city's right of way.

No plant shall be bound with wire or rope at any time so as to damage the bark or break branches. Plantings must be flooded with water twice within the first 24 hours of the time of planting and not less than twice per week until provisional acceptance.

After provisional acceptance the contractor will water the plantings at a minimum once per week during the months of June 30th, to September 1st, plantings will be watered on a biweekly schedule for the time period March 1st to June 30th and September 1st to the first frost, regardless of planting date. In lou of watering on a weekly/bi-weekly schedule the contractor can use a gator bag. It is the contractor's responsibility to refill the gator bag as necessary. The gator bag will be removed by the contractor at the time of the first forecasted frost.

**General**

Other sections in this construction spec book take precedence over this section.
The contractor will contact the City Arborist about dead or damaged trees or other vegetation concerns before construction begins.

Any neglect of the above-mentioned specifications will cause the Tree to remain the contractor's responsibility until the tree is either removed or replaced by the City or issues are resolved to satisfaction of the City Arborist at the contractor's expense.

# SECTION XI
# ELECTRIC AND TRAFFIC SIGNALS

## SCOPE OF WORK

Electric equipment, materials and installation shall comply with the latest edition of the National Electric Code (NEC) and with the latest edition of the following codes and standards:

1. National Electric Safety Code (NESC)
2. OSHA
3. National Fire Protection Association (NFPA)
4. National Electric Manufacturers Association (NEMA)
5. ANSI
6. Insulated Cable Engineers Association (ICEA)
7. Instrument Society of America (ISA)
8. Underwriters Laboratories (UL)
9. Factory Mutual (FM)
10. National Electric Testing Association (NETA)
11. Massachusetts Electrical Code (MEC)

Excavations and installations of electrical or traffic structures/fixtures shall be completed by a Bonded Contractor. The Electrical Contractor performing work must be on the MassDOT approved contractor list and also be certified by the International Municipal Signal Association (IMSA) for Traffic Signal Electrician Level II or Level III if applicable.

All work to be buried, shall be inspected by the DPI prior to backfilling in accordance with the specifications herein. The City Electrician shall be present for connections to new and/or relocated electric or traffic structures/fixtures.

It is the Contractor's responsibility to obtain required permits and request work orders with local agencies and utility companies respectively.

Direct bury wires and/or splicing or wires between access structures is prohibited. When direct bury wires are encountered, they shall be replaced with new conduit and re-wired in accordance with the specifications herein. When a break in wires is encountered in between connection points or structures, the reach shall be replaced as a continuous run. Alternatively, a structure may be installed at the location of the break with approval from the DPI Comissioner.

Detectable warning tape, per APWA standards, shall be installed over conduit as specified in the details herein. An as-built is required for work that includes the installation of new features including light poles, traffic signals, conduit runs, etc. As-builts shall be submitted to the DPI. The Contractor must notify the DPI upon completion of work for final inspection of electrical work and testing of equipment.

## MATERIALS

Conduits and Fittings

Conduit diameter shall be as designed and approved by the DPI. Conduit shall be a minimum of 1.5-in electrical trade size (smaller diameter conduit may be approved by the DPI for some applications). Conduit shall not have more than the equivalent of three 90 degree bends in any one run (handholes shall be provided as required or directed by the DPI). Conduit and fittings shall be Schedule 80 Electric Conduit Type NM-Plastic (UL), unless otherwise specified and approved by the DPI. Conduit fittings and connections shall be sealed and watertight.

Handholes

Handholes shall be polymer concrete and reinforced with heavy weave fiberglass, grey finish, open bottom and minimal dimensions of 18-in long by 12-in wide by 18-in deep. Handholes and covers shall be rated for H-20, covers shall be marked "ELECTRIC" for electrical or "FIBER" for fiber lines. Handhole boxes and covers shall be manufactured in the USA and stamped with "MADE IN THE USA". Handhole covers shall be secured with tamper proof screws.

Wire, Cable and Accessories

Wires and cables shall be of annealed, 98 percent conductivity, soft drawn copper. Conductors shall be stranded except that receptacle wiring may be solid.

Except for control, signal, and instrumentation circuits, wire smaller than No.12 AWG shall not be used. Wire for lighting, receptacles, and other circuits not exceeding 150 Volts to ground shall be NEC type THHN/THWN as manufactured by Okonite Co.; Southwire Co.; Pirelli Corp.; or approved equal.

Wire for circuits over 150 Volts to ground shall be NEC type XHHW for sizes upp to No. 4/0 AWG and type RHW for sizes greater than No. 4/0 AWG as manufactured by Okonite Co.; Southwire Co.; or approved equal.

Wire markers shall be "Omni-Grip" as manufactured by W.H. Brady Co.; Thomas & Betts Co.; 3M Co.; or approved equal.

Wire shall be color coded or coded using electrical tape in sizes where color insulation is not available. Where tape is used as the identification system, it shall be applied in all junction boxes and other accessible intermediate locations, as well as at each termination. The following coding shall be used:

| System | Wire | Color |
|---|---|---|
| 240/120 Volts | Neutral | White |
| 1-Phase, 3-Wire | Line 1 | Black |
| | Line 2 | Red |

| | | |
|---|---|---|
| 208Y/120, Volts | Neutral | White |
| 3-Phase, 4-Wire | Phase A | Black |
| | Phase B | Red |
| | Phase C | Blue |

| | | |
|---|---|---|
| 240/120 Volts<br>3-Phase, 4-Wire<br>delta, center tap<br>ground on phase<br>coil A-C | Neutral<br>Phase A<br>Phase B (High)<br>Phase C | White<br>Black<br>Orange<br>Blue |
| 480Y/277 Volts<br>3-Phase, 4-Wire | Neutral<br>Phase A<br>Phase B<br>Phase C | White<br>Brown<br>Orange<br>Yellow |

Street Lighting

Lighting systems shall generally consist of the following:

1. Luminaires: Luminaires shall be CK 118R-B2AR-III-100 (SSL) by King Luminaire as detailed. Quick disconnect shall be provided.

2. Cast Aluminum Poles: Pole style shall be as specified by the DPI Comissioner on permit approvals or site plan review memorandums. Poles shall be black finish and may be: Washington 17 style, 10-ft height by Alloy Castings; Washington 21 style, 12-ft height by Alloy Castings; or, New Bedford style 10-ft height by Alloy Castings.

   When banner arms are required, they shall be bolt on type, suitable for 23-in by 4-ft banners and be black in color.

   Poles shall have a 120 Vac receptacle with in-use wet location cover designated “Holiday Lighting”.

   When required, poles shall have a 240 Vac receptacle mounted inside the base of the pole. The outlet shall be accessible through a second access plate in the building side of the post. Second plate shall have a cutout as specified by the DPI with a water-resistant guard.

3. Historic District Lighting: When specified by the DPI Dartmouth Style, 7-ft, 10-in height by Alloy Castings poles shall be used. Only “Copperhead” Historic Square Lantern Luminaires shall be installed on Dartmouth Style Poles as specified in the construction detail herein.

   Poles shall have a 120 Vac receptacle with in-use wet location cover designated “Holiday Lighting”.

Mast Arm, Pedestal and Light Pole Foundations

Foundations shall be cement concrete and as specified for the application based on the design drawings in accordance with the latest MassDOT standards and details herein. Foundation details for light poles are provided herein are to be used a reference. Site conditions may require modification to those details. A minimum of a 4-foot clear pedestrian pathway on the sidewalk must be maintained around foundations, mast arms, pedestals and poles.

Traffic Signals
Traffic Signal Controller shall include the installation of Eagle (Siemens) M60 Controller.

Video Traffic Detection shall be achieved via video components to include Iteris RZ4A-WDR cameras, Iteris Vantage Next video processor, a four-channel video encoder which shall be either an Avigilon 4 Port H.264 Analog Video Encoder (Part Number ENC-4P-H264) or Vantage Next video encoder plus recording device consistent with the city's current recording system.

All traffic signal equipment (mast arms, posts, pedestrian equipment, mounting brackets, traffic cabinets, etc) must be powder coated black per City standard.

An uninterrupted power supply (UPS) shall be provided.

Controller units shall include internal time of day, day of week, week of month programming and be programmed with the latest daylight savings time adjustments. Daylight savings time begins at 2:00 am on the second Sunday in March and reverts to standard time on the first Sunday in November (pending any changes to this approach).

Emergency preemption shall be provided. GPS capability shall also be provided.

Handholes and Pull Boxes for traffic signals will be constructed of precast concrete with cast iron frame and covers. The covers for traffic signals will include marking plates to designate "SIGNAL". Eversource handholes and Pull Boxes shall be in conformance with Eversource Standard Specifications.

## CONSTRUCTION METHOD

All Eversource utility work must be performed by an Eversource approved contractor and will require a work order through the Eversource Electric office for connection.

Electric equipment shall be protected at all times against mechanical injury or damage by water.

Conduits and Fittings
Except where otherwise specified, all wiring shall be within PVC conduit. Conduit wall seals shall be used where underground conduits penetrate walls. Conduit sealing bushings shall be used to seal conduit ends exposed to the weather and ends of conduits shall be tightly plugged to exclude dust and moisture during construction.

No wire shall be pulled until the conduit system is complete.

Conduit supports shall be spaced at intervals of 8-ft or less. All conduit shall be run at right angles to and parallel with the roadway (no diagonal runs will be allowed). Bends in parallel runs shall be concentric.

Handholes
Pull boxes and handholes shall be placed at a finished grade level with the sidewalk surface (if placed within the sidewalk) or finished grade level if placed within loam and seed areas. Pull

boxes and handholes shall be placed on a 6" layer of ¾" crushed stone for proper drainage of the pull box/handhole. No pull boxes or handholes are to be constructed within the roadway.

Wire, Cable and Accessories

Use UL approved lubricants to facilitate wire pulling. No splices will be allowed in below grade located boxes. Splices shall not be made in push button control stations, control devices, conduit bodies, etc.

Shields shall be grounded as recommended by the instrument manufacturer and isolated at all other locations. Terminal blocks shall be provided for inter-connecting shield drain wires at all junction boxes. Where individual circuit shielding is required, each shield circuit shall be provided with its own block.

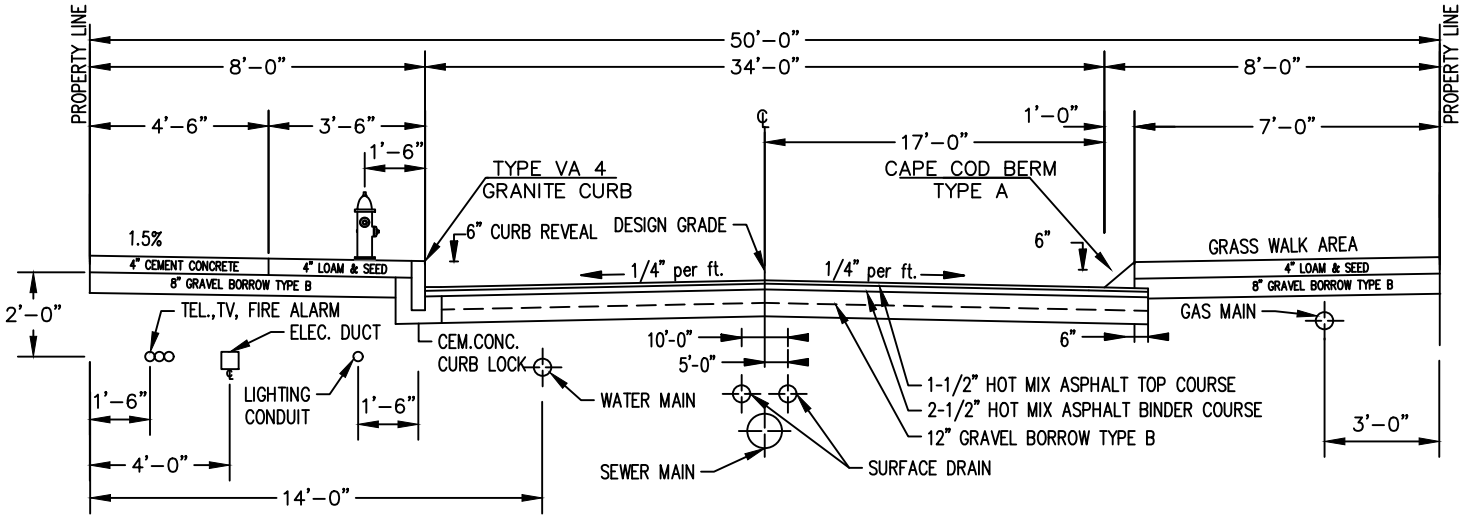
# APPENDIX A

# CONSTRUCTION STANDARD DETAILS

lighting the way
new bedford

# TYPICAL STREET SECTION

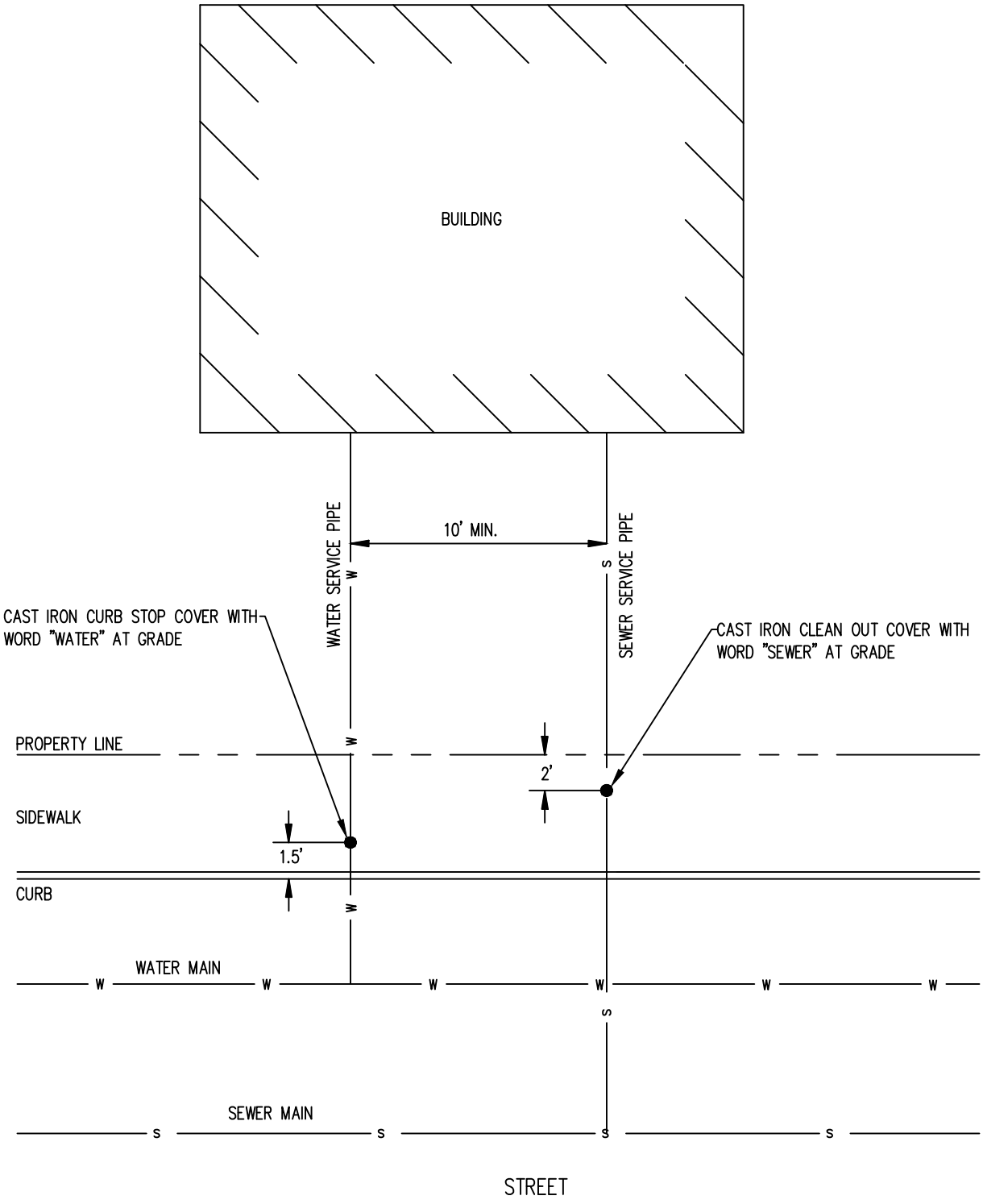
NTS




a. WATER MAIN TO BE 14' FROM SOUTH OR WEST PROPERTY LINE WITH 4' COVER (MINIMUM) & 5.5' COVER (MAX), (WATER DEPT. WRITTEN REQUIREMENTS).
b. CURB STOPS TO BE 1'–6" BEHIND FACE OF CURB LINE.
c. GAS MAINS TO BE 3' FROM NORTH OR EAST PROPERTY LINES WITH 4' OF COVER.
d. TELEPHONE LINES, CABLE T.V. & FIRE ALARM DUCT TO BE 1'–6" FROM SOUTH OR WEST PROPERTY LINES WITH 2' MIN COVER.
e. ELECTRIC LINES TO BE 4' FROM SOUTH OR WEST PROPERTY LINES WITH 2'–6" OF COVER (CONCRETE ENCASED).
f. SEWER MAINS TO BE ON CENTER LINE OF STREET WITH MINIMUM COVER OF 4'.
g. STORM LINES TO BE A MAXIMUM OF 5' EITHER SIDE OF SEWER MAIN WITH MINIMUM COVER OF 3'.
h. WATER HYDRANTS CENTER LINE OF HYDRANT TO BE 1'–6' FROM CURB LINE.
i. STREET PAVEMENT SHALL MEET CITY SPECIFICATIONS LAID IN TWO COURSES (1.5" TOP COURSE, 2.5" BASE COURSE).
j. TREES OF A VARIETY APPROVED BY D.P.I., IN ACCORDANCE WITH CITY OF NEW BEDFORD REGULATIONS (3" CALIPER).
k. UTILITY POLES, STREET LIGHTS (WITH ATTENDANT CONDUIT) CENTER LINE OF SAME TO BE 1'–6" FROM CURB LINE.
l. CAPE COD BERM AND GRASS WALK AREA SHOWN ON CROSS–SECTION TO BE USED ONLY IF WAVIER GRANTED BY PLANNING BOARD ON GRANITE CURB AND CONCRETE RIBBON WALKS.

DETAILED SPECIFICATIONS ON ROAD WIDTH, SIDEWALK WIDTH, PAVING, CURBING, TREES, ETC. ARE AVAILABLE FROM D.P.I. ENGINEERING DIVISION.

1




NOTES:

1. ALL CASTING SHALL BE MADE IN THE USA.
2. SEE "SEWER CLEAN OUT" AND "WATER SERVICE DETAIL".

## SEWER AND WATER SERVICE DIAGRAM

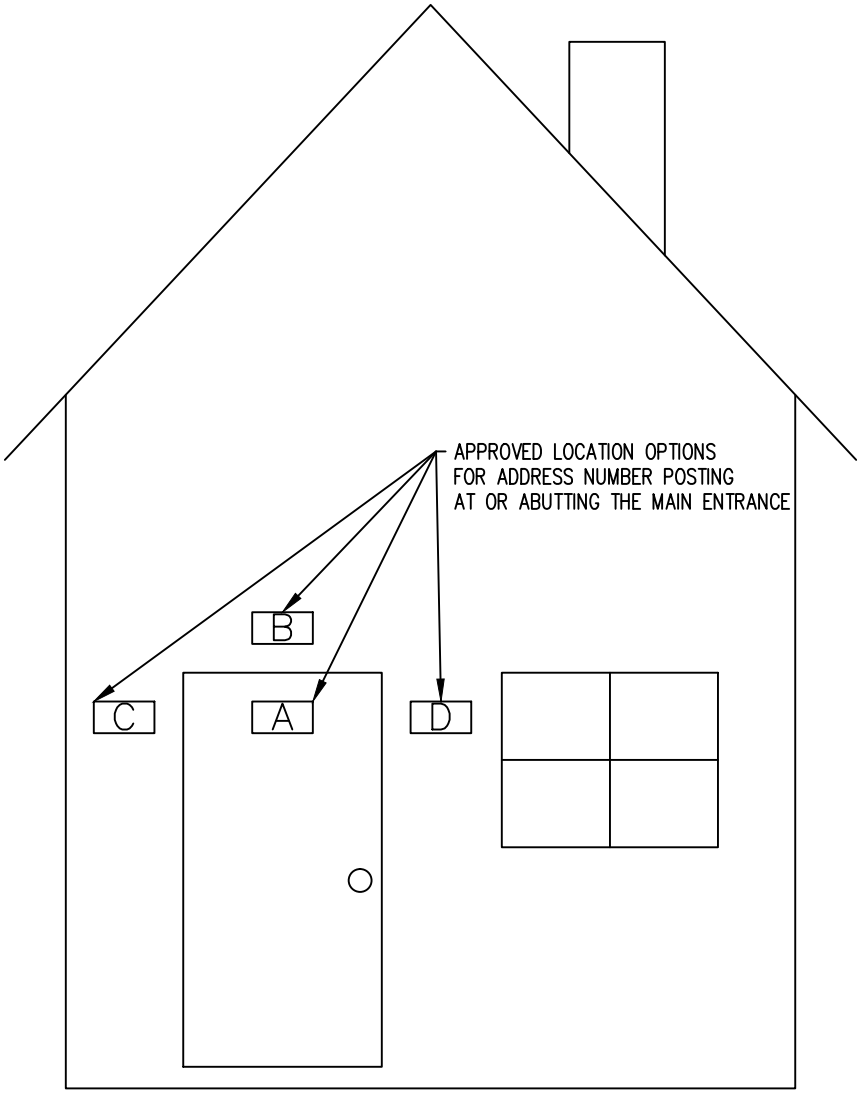
NTS

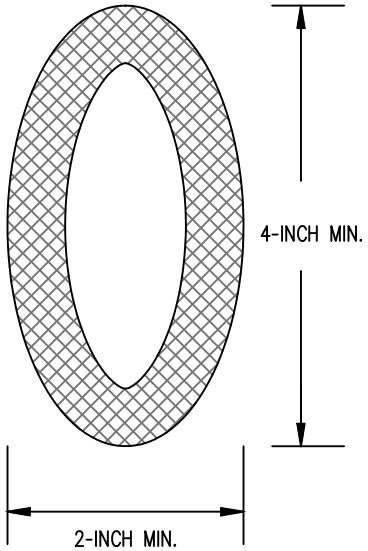
lighting the way
new bedford

# ADDRESS NUMBER DETAIL

NTS

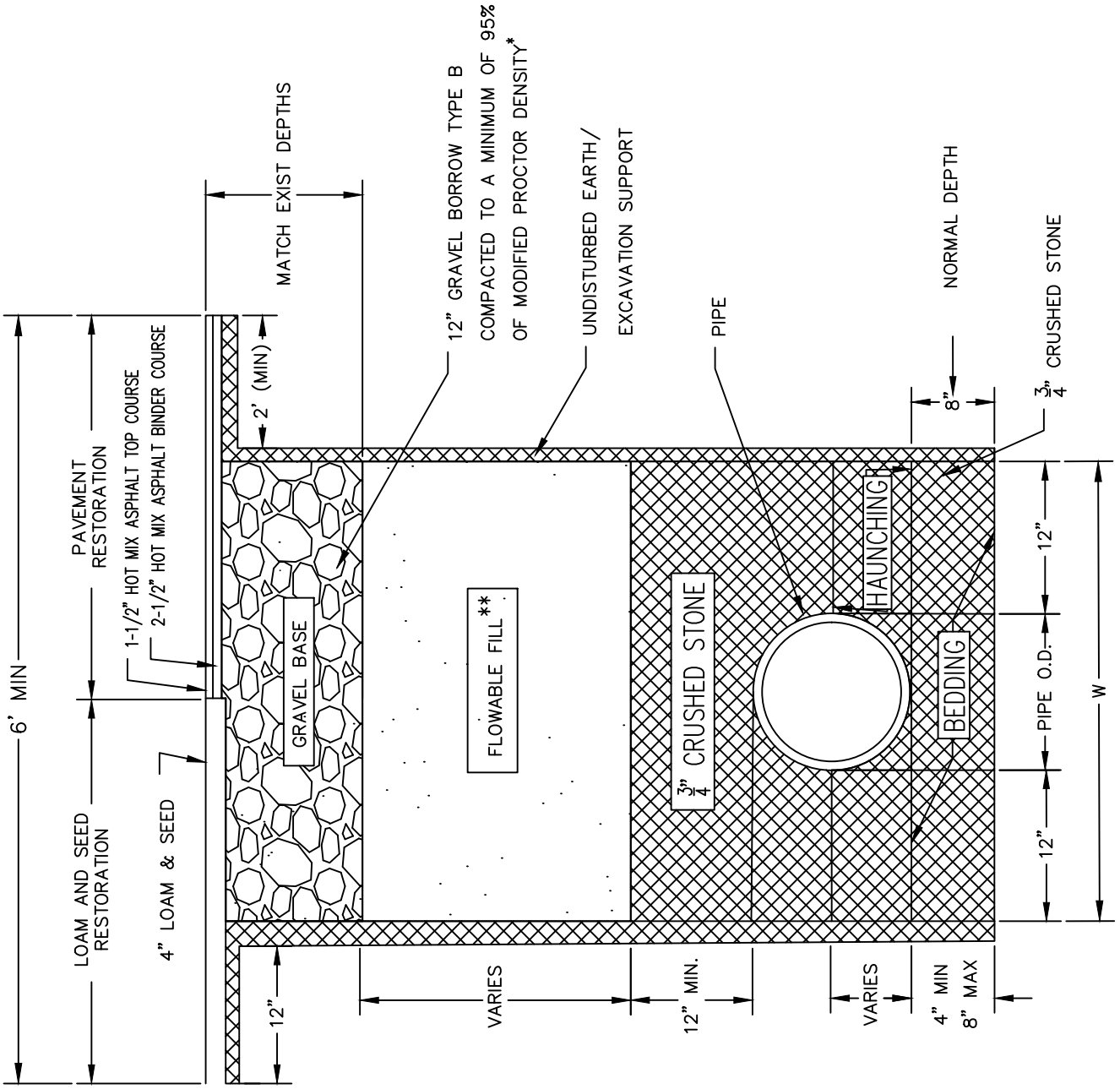
3




NOTES:

1. NUMBERS MUST BE PERMANENTLY AFFIXED TO THE STRUCTURE AS SHOWN.
2. COLOR OF NUMBERS MUST BE OF CONTRASTING COLOR FROM THE SURFACE THEY ARE BEING AFFIXED.
3. IF NUMBERS POSTED AT THE DOOR CAN NOT BE CLEARLY SEEN FROM THE ROADWAY, THEN A SECONDARY POSTING IS REQUIRED WITH THE DOOR POSTING. ALL SECONDARY SIGNS MUST BE INSTALLED ON PRIVATE PROPERTY, CONTACT DPI - ENGINEERING FOR SITE SPECIFIC REQUIREMENTS.
4. ADDRESS NUMBERS ARE ASSIGNED BY DPI-ENGINEERING. ONLY NUMBERS ASSIGNED BY THIS DEPARTMENT ARE LEGAL AND SHALL BE POSTED.
5. ADDRESS NUMBERS MUST ONLY BE POSTED AT THE ASSIGNED, MAIN ENTRANCE. NO OTHER DOORS ON THE STRUCTURE CAN CARRY THIS ADDRESS ASSIGNMENT.




NOTES:

1. CONTRACTOR MUST MATCH INTO EXISTING PAVEMENT DEPTH IF MORE THAN 4" TOTAL.
2. WHEN IN ROCK, 8" CLEARANCE SHALL BE PROVIDED.

*SEE SPECIFICATIONS IN SECTION III

**SEE SPECIFICATIONS IN SECTION II–B

| Depth from Ground Surface to Pipe Invert (D) | Excavation Width (W) [Nominal Pipe Diameter] | | |
|---|---|---|---|
| | [0 to 6in] | [6in to 24in] | [Over 24in] |
| 0 to 6ft | 2ft | 4ft | D + 3ft |
| 6ft to 12ft | 4ft | 5ft | D + 3ft |
| 12ft to 20ft | 7ft | 7ft | D + 5ft |
| 20ft to 24ft | 8ft | 8ft | D + 5ft |

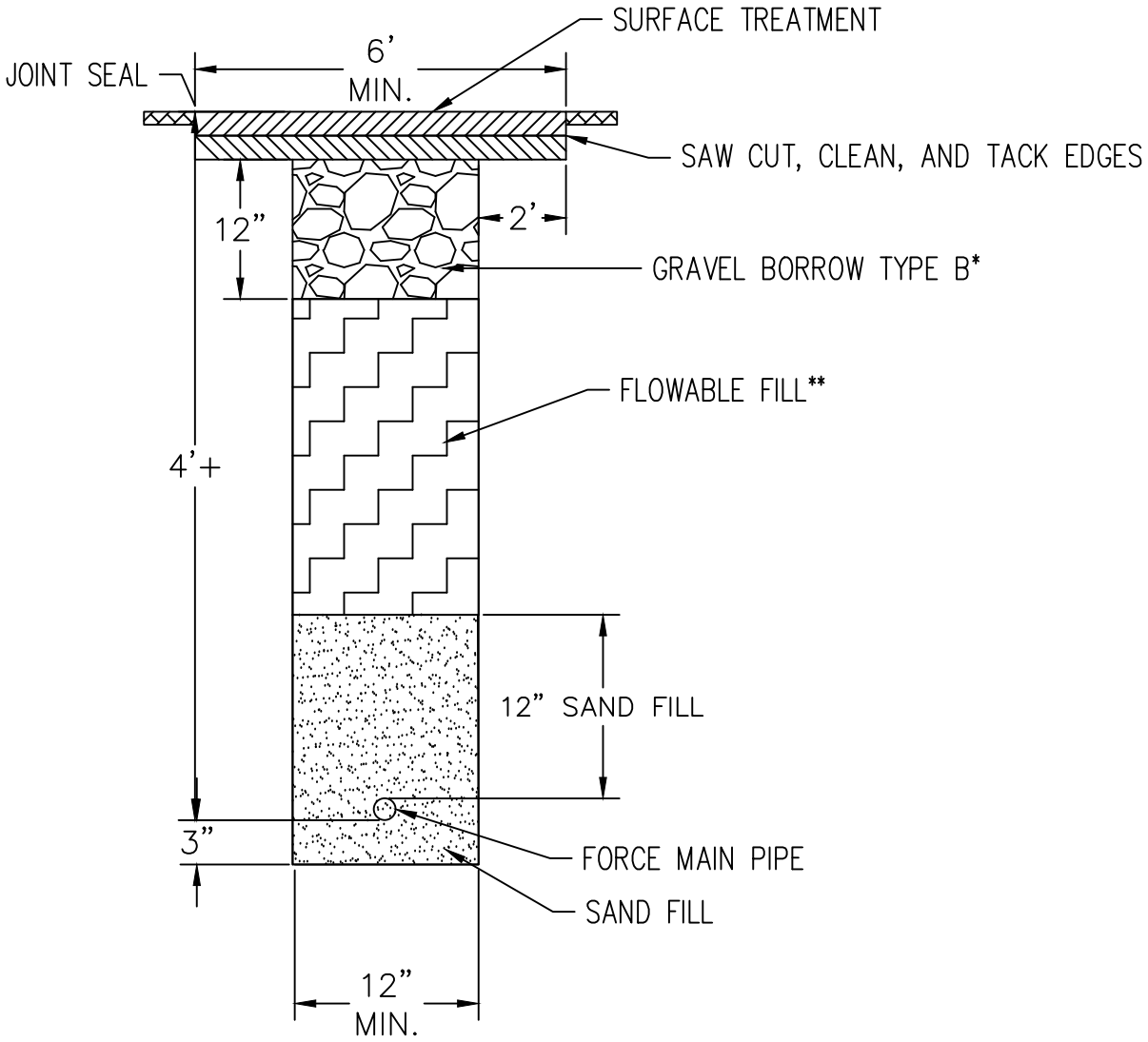
## TYPICAL TRENCH DETAIL

NTS

lighting the way
new bedford

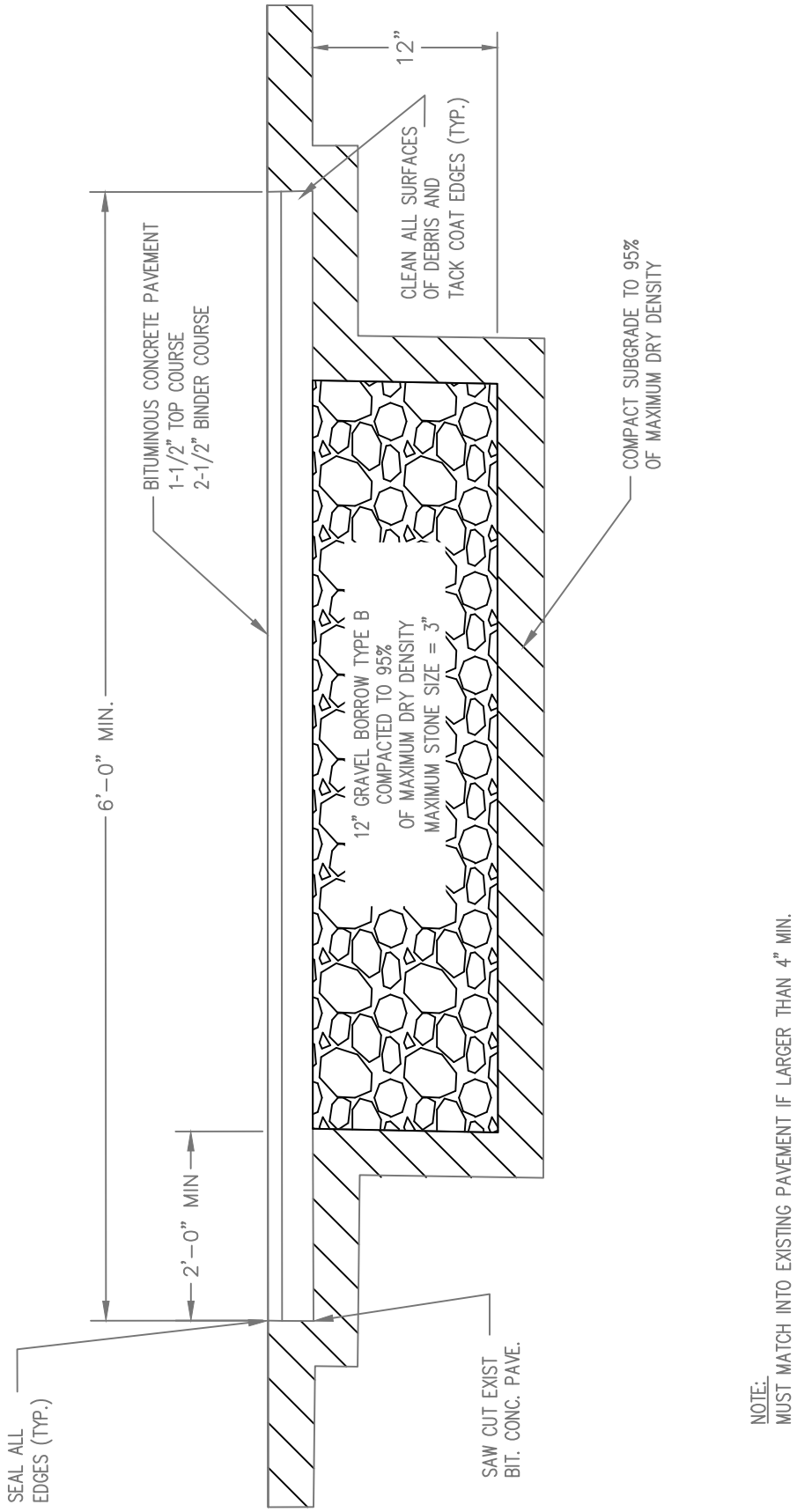
# FORCE MAIN TRENCH

NTS




NOTES
1. CONSTRUCT A FORMED INVERT FROM NEW SEWER LINE TO ALLOW FLOW TO THE EXISTING PIPE
2. POUR A SHELF TO THE LOWER HALF OF THE EXISTING PIPE
3. CUT AND REMOVE THE TOP HALF OF EXISTING PIPE TO WITHIN 6" OF THE MANHOLE WALLS AFTER THE INVERT AND SHELF HAVE BEEN FORMED AND THE MH HAS BEEN FULLY TESTED IN ACCORDANCE WITH THESE SPECIFICATIONS

*SEE SPECIFICATIONS IN SECTION III
**SEE SPECIFICATIONS IN SECTION II-B




NOTE:
MUST MATCH INTO EXISTING PAVEMENT IF LARGER THAN 4" MIN.

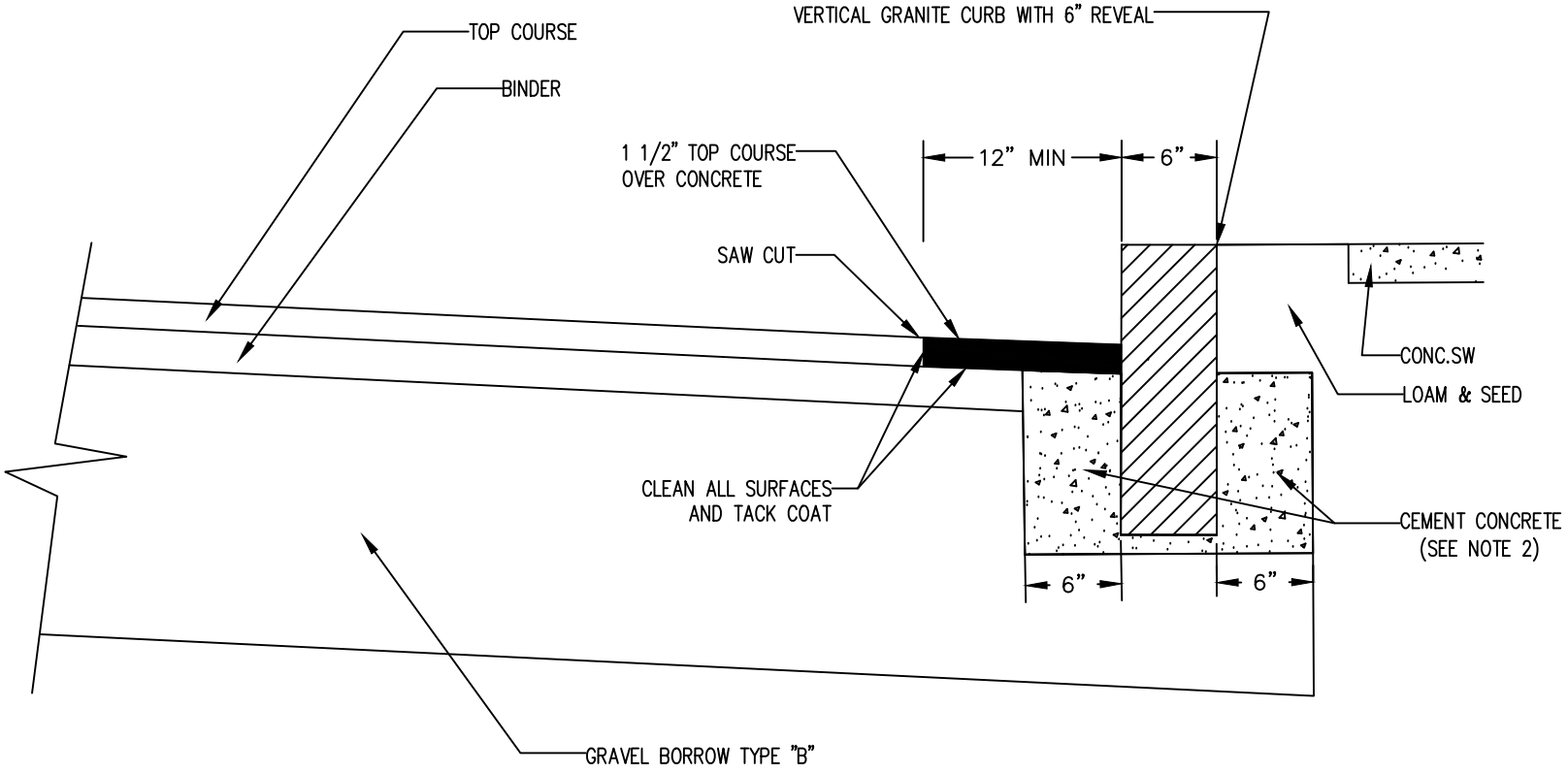
## HMA PAVEMENT RESTORATION

NTS

# METHOD OF SETTING VERTICAL CURB

NTS

7a

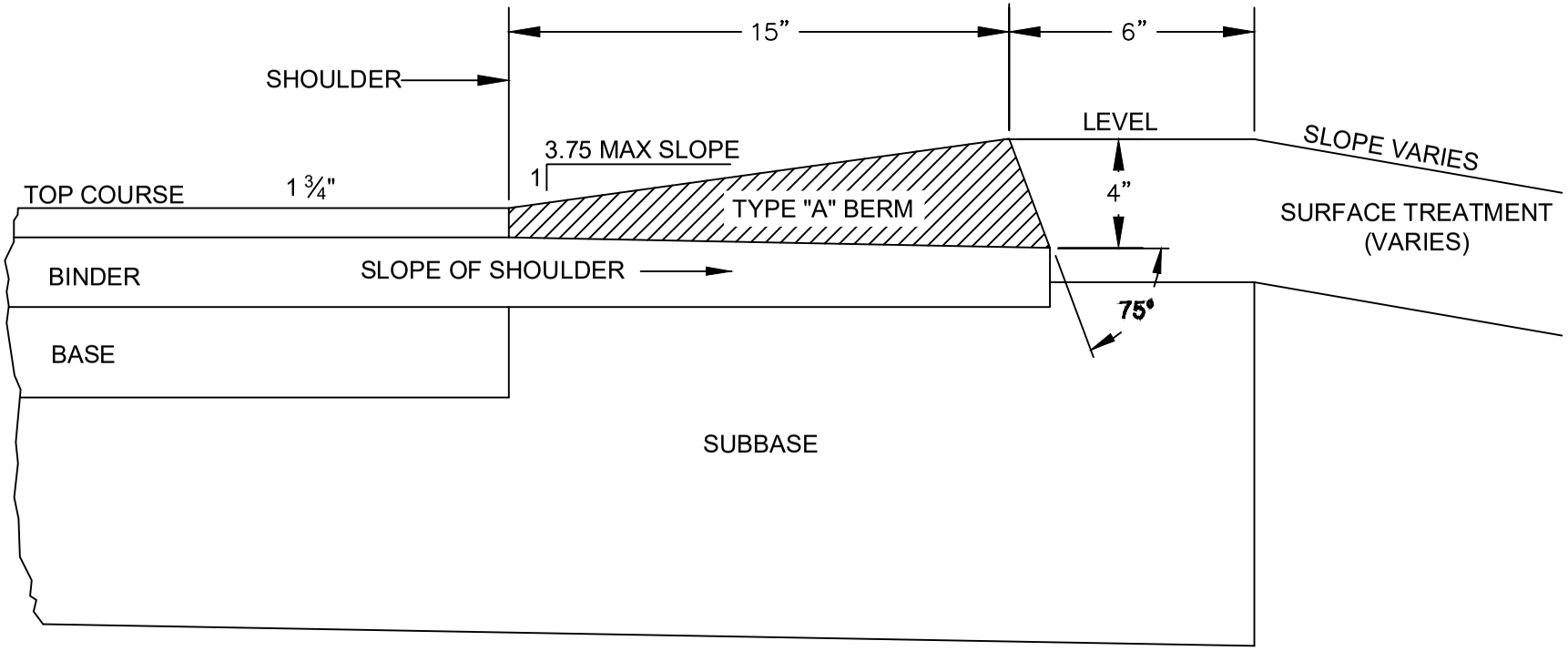



NOTES:

1. SAW CUT NEAT LINE 12" FROM CURB LINE AND REMOVE BINDER, BASE COURSE GRAVEL AND REPLACE WITH CONCRETE
2. ALL CEMENT CONCRETE TO MEET OR EXCEED SPECIFICATIONS OF THIS MANUAL.

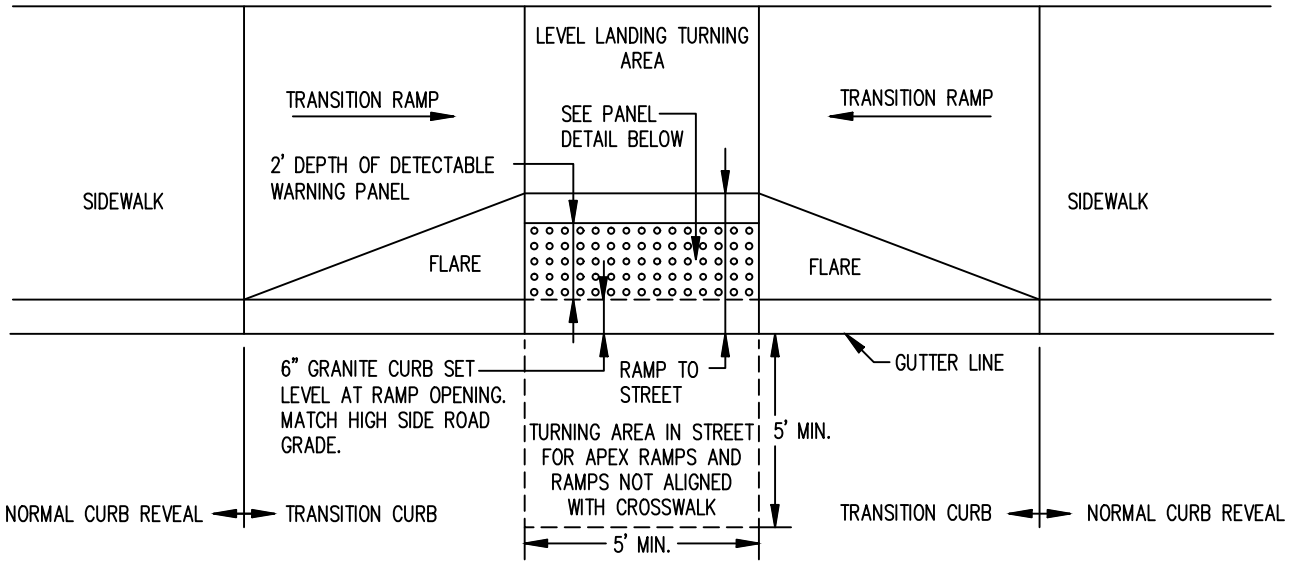
# HOT MIX ASPHALT BERM TYPE A

NTS

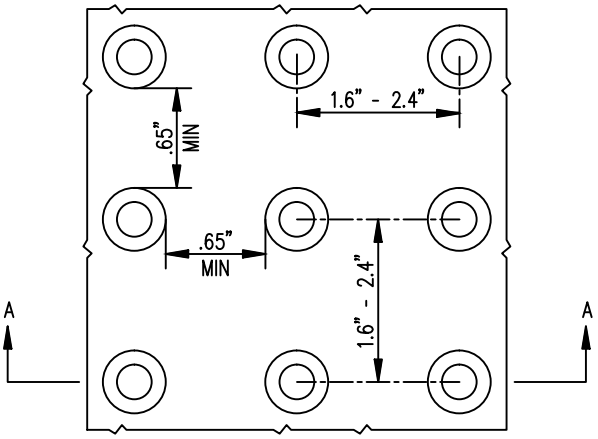



NOTES:

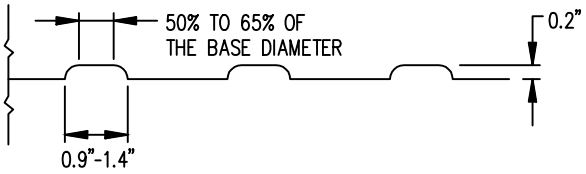
1. FOR MODIFIED BERM, THE SLOPE REMAINS CONSTANT AT 1 (V) TO 3.75 (H)
2. TO AVOID COLD JOINTS, INSTALLATION OF BERM IS TO BE COMPLETED WITH THE TOP COURSE PAVING. BERM SHALL NOT BE INSTALLED SEPARATELY FROM THE TOP COURSE.




TYPICAL INSTALLATION




DETAIL OF DETECTABLE WARNING PANEL




SECTION A-A

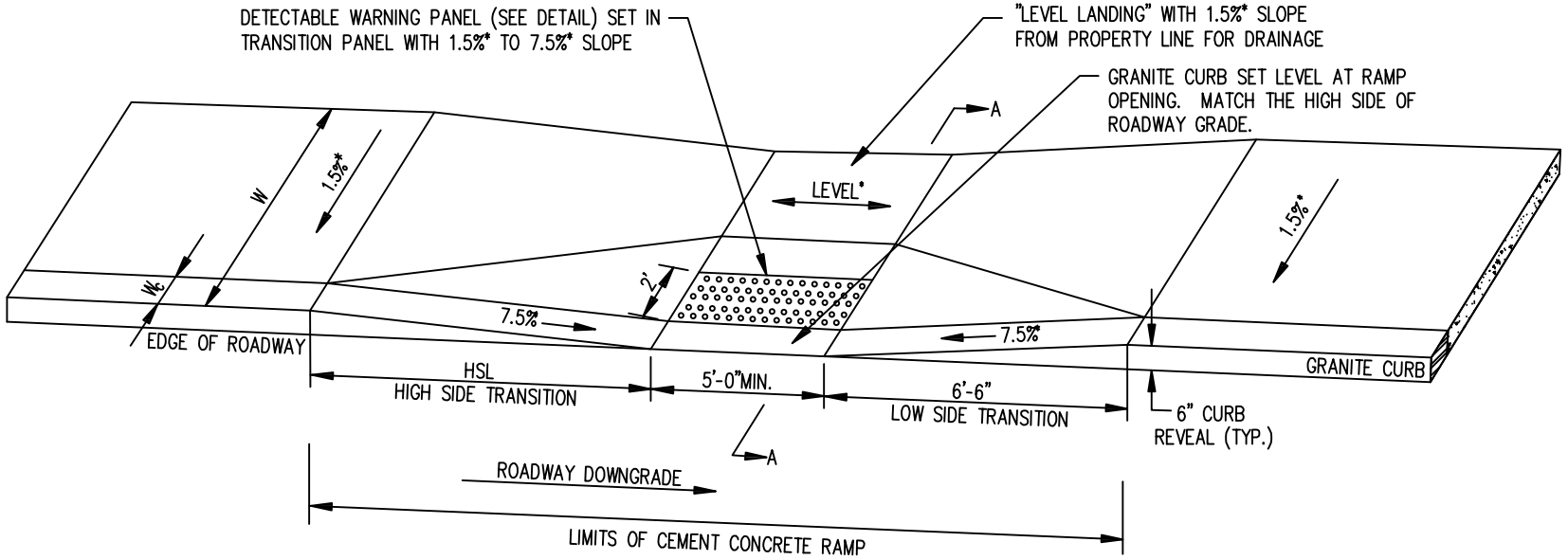
NOTE:
ALL DETECTABLE WARNING SURFACES SHALL BE YELLOW (UNLESS OTHERWISE SPECIFIED FOR THE HISTORIC DISTRICT) AND ORDERED OR FABRICATED TO MATCH THE WIDTH OF THE RAMP OPENING.

## DETECTABLE WARNING PANEL FOR WHEELCHAIR RAMPS AND STANDARD RAMP TERMINOLOGY

NTS

# WHEEL CHAIR RAMP (STANDARD)

NTS

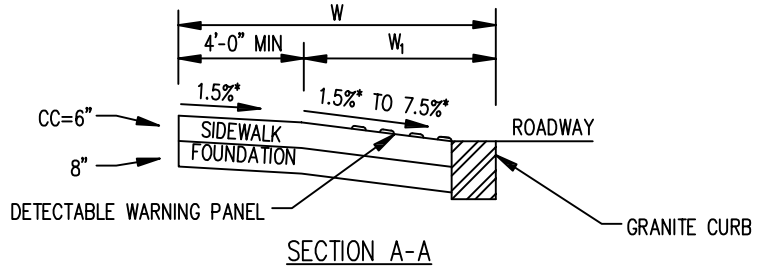



LEGEND

W = SIDEWALK WIDTH
$W_C$ = CURB WIDTH
$W_1$ = PERPENDICULAR RAMP LENGTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%
HSL = HIGH SIDE TRANSITION LENGTH (SEE MASSDOT DRAWING E 107.9.0)

NOTES:

1. USABLE SIDEWALK WIDTH PER AAB = $W-W_C$
2. INSTALL WIRE FABRIC (6 X 6 MESH = 10 OR FIBERS) FOR ALL WHEEL CHAIR RAMPS

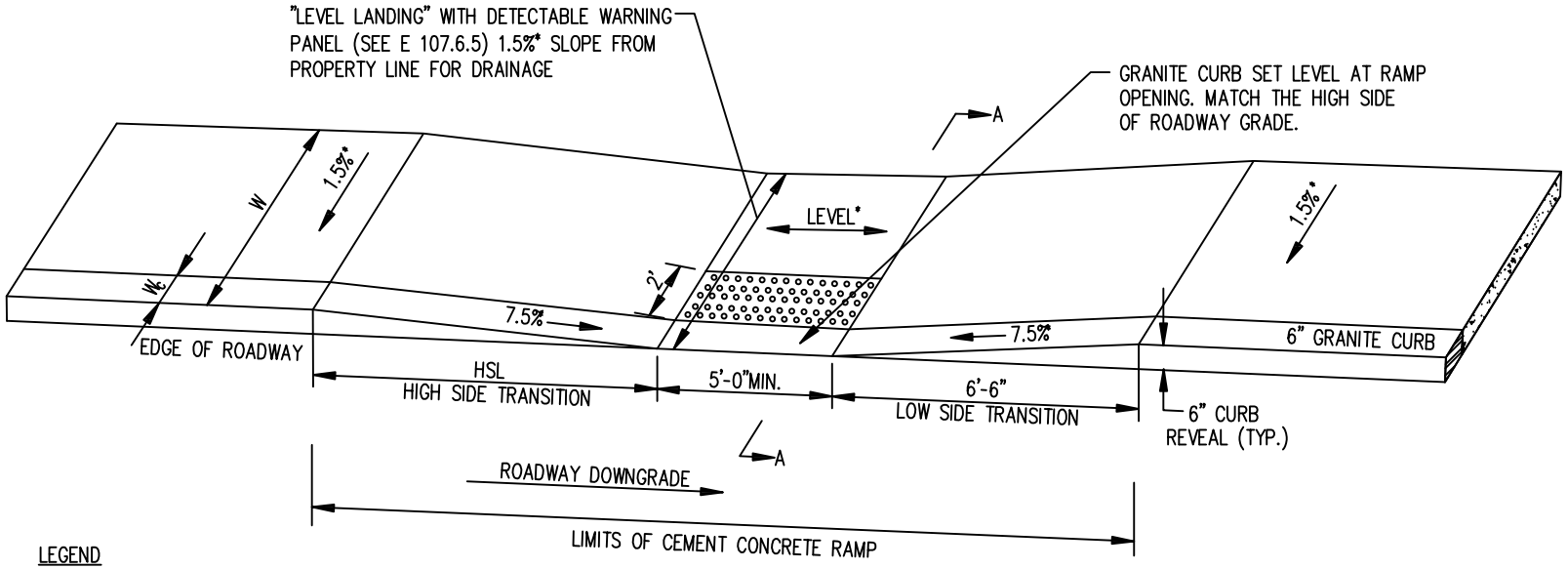



SECTION A-A

lighting the way
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# WHEELCHAIR RAMP
## LESS THAN 6' SIDEWALK

NTS

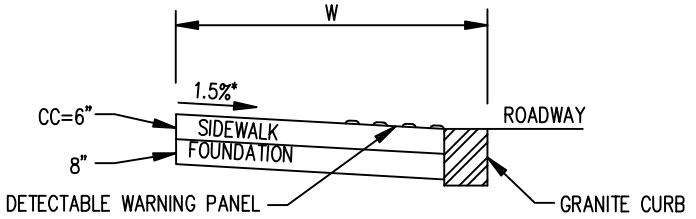



LEGEND

W = SIDEWALK WIDTH
$W_C$ = CURB WIDTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%
HSL = HIGH SIDE TRANSITION LENGTH (SEE MASSDOT DRAWING E 107.9.0)

NOTE:

1. USABLE SIDEWALK WIDTH PER AAB = W-$W_C$.
2. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'0".
3. ROADWAY, GUTTER AND FIRST 6" OF SIDEWALK TO BE ADJUSTED FOR FIELD CONDITIONS.
4. INSTALL WIRE FABRIC (6 X 6 MESH = 10 OR FIBERS) FOR ALL WHEEL CHAIR RAMPS.



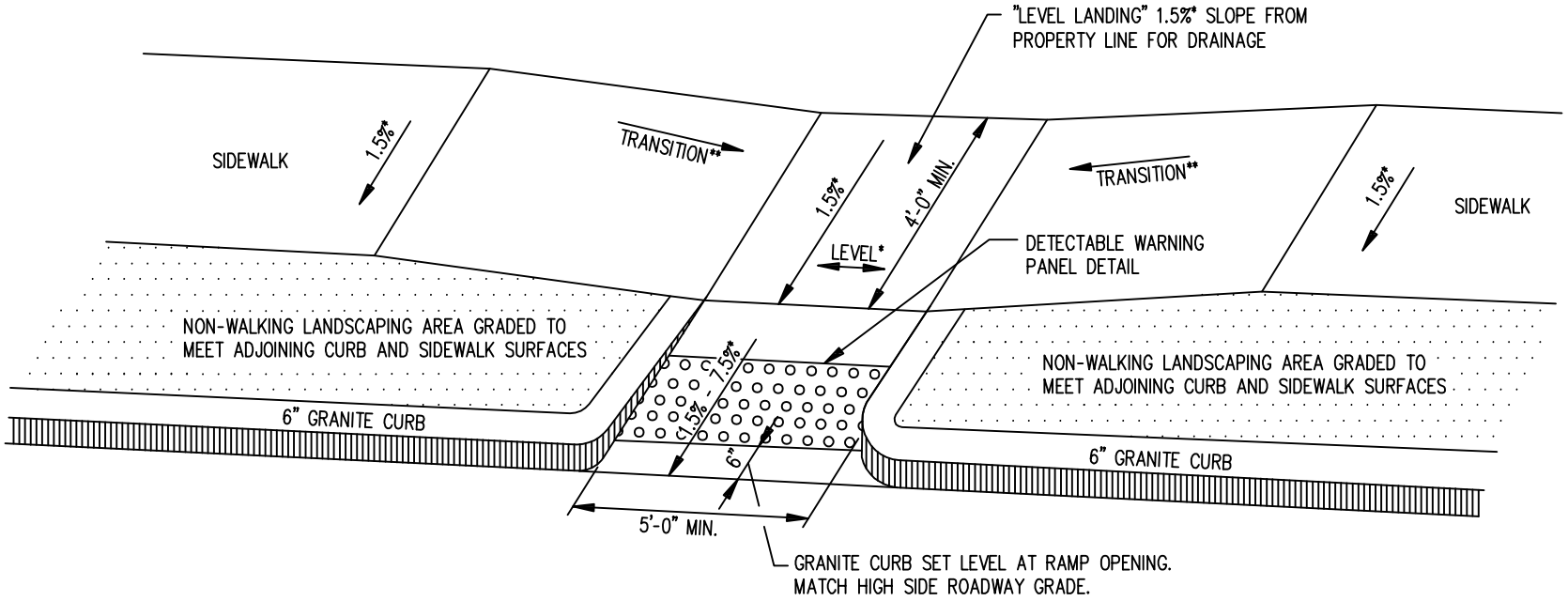

SECTION A-A

lighting the way
new bedford

# WHEELCHAIR RAMP WITH LANDSCAPING STRIP

SLN

NTS




LEGEND:

* = TOLERANCE FOR CONSTRUCTION ±0.5%
** = SEE MASSDOT DRAWING E 107.9.0 FOR TRANSITION LENGTH

NOTE:

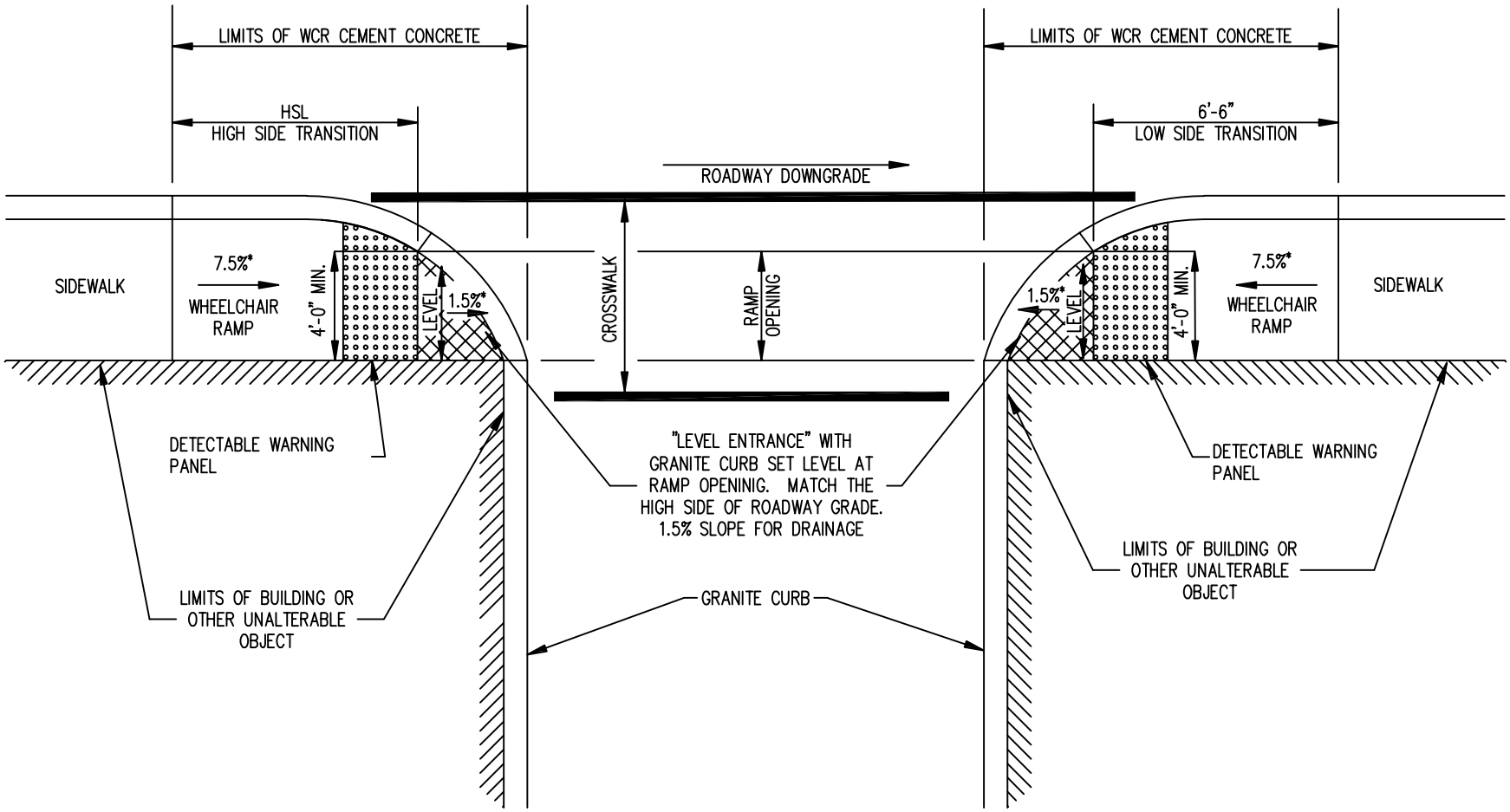
1. INSTALL WIRE FABRIC (6 X 6 MESH = 10 OR FIBERS) FOR ALL WHEEL CHAIR RAMPS

11

lighting the way
new bedford

# WHEELCHAIR RAMP FOR ONE CONTINUOUS DIRECTION OF PEDESTRIAN TRAVEL

NTS

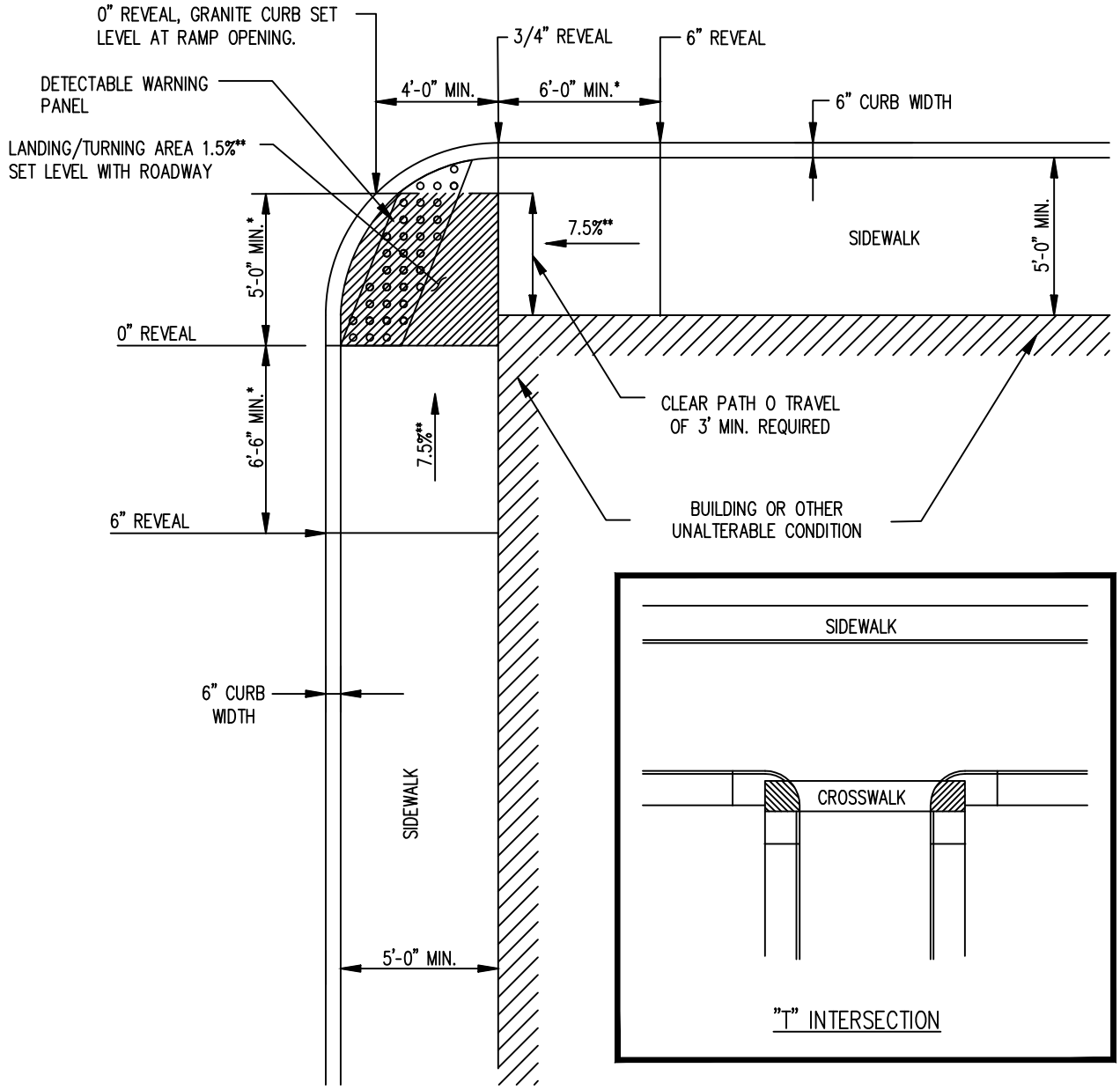



LEGEND

* = TOLERANCE FOR CONSTRUCTION ±0.5%
HSL = HIGH SIDE TRANSITION LENGTH (SEE MASSDOT DRAWING E 107.9.0)

NOTES:

1. DETECTABLE WARNING PANEL LOCATED NOT LESS THAN 6" OR MORE THAN 24" FROM ROADWAY EDGE (GUTTER LINE). TRUNCATED DOMES TO BE ALIGNED WITH DIRECTION OF TRAVEL.
2. FOR DETAILS OF TRUNCATED DOMES SEE MASSDOT DRAWING E 107.6.5 (DETAIL 5E).
3. ROADWAY, GUTTER AND FIRST 6" OF SIDEWALK TO BE ADJUSTED FOR FIELD CONDITIONS.
4. INSTALL WIRE FABRIC (6 X 6 MESH = 10 OR FIBERS) FOR ALL WHEEL CHAIR RAMPS.




LEGEND:

** = TRANSITION LENGTH SHOWN IS MINIMUM (SEE MASSDOT DRAWING E 107.9.0)
** = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:

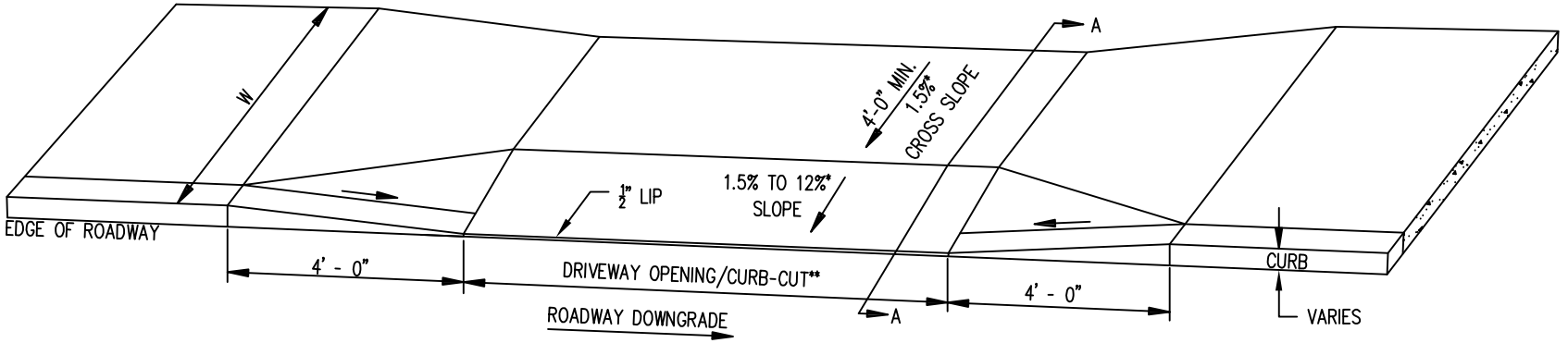
1. ROADWAY, GUTTER AND FIRST 6" OF SIDEWALK TO BE ADJUSTED FOR FIELD CONDITIONS.
2. INSTALL WIRE FABRIC (6 X 6 MESH = 10 OR FIBERS) FOR ALL WHEEL CHAIR RAMPS.

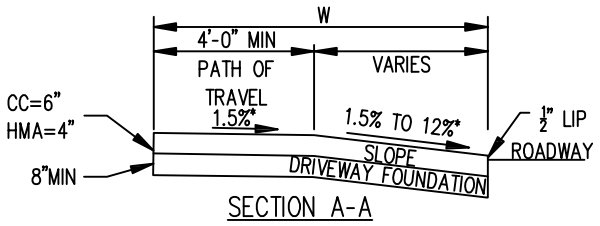
# "T" INTERSECTION WHEELCHAIR RAMP

NTS

# SIDEWALK THROUGH DRIVEWAYS

NTS




SECTION A-A

LEGEND

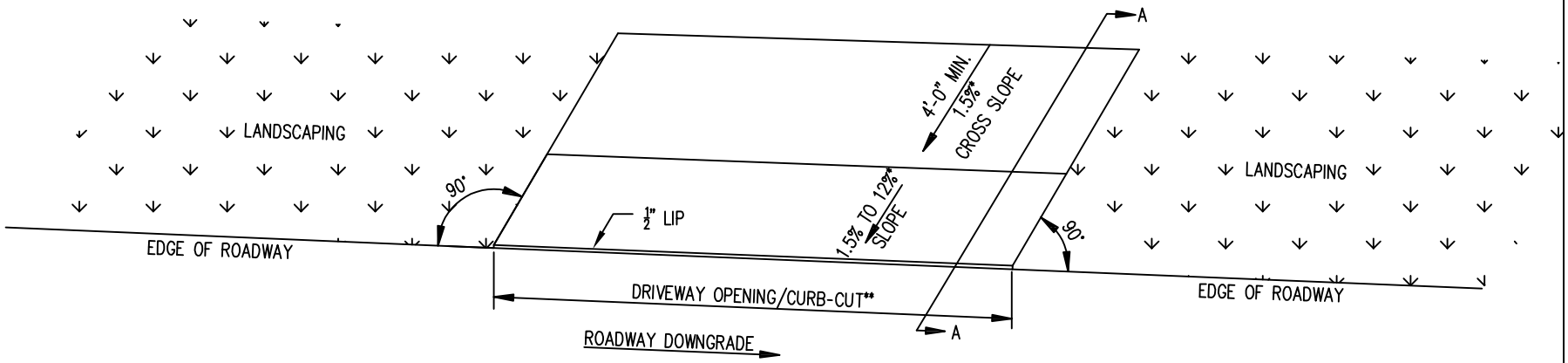
CC =CEMENT CONCRETE
HMA =HOT MIX ASPHALT
* =TOLERANCE FOR CONSTRUCTION ±0.5%
** =18' MAX. FOR RESIDENTIAL DRIVEWAYS. COMMERCIAL DRIVEWAYS REQUIRE TRAFFIC COMMISSION APPROVAL.

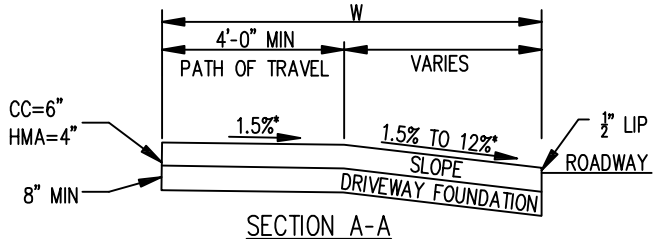
NOTE:

1. FOR COMMERCIAL DRIVEWAYS INSTALL WIRE FABRIC (6 X 6 MESH = 10 OR FIBERS).

# DRIVEWAYS WITH NO CURB RETURN

NTS




SECTION A-A

LEGEND

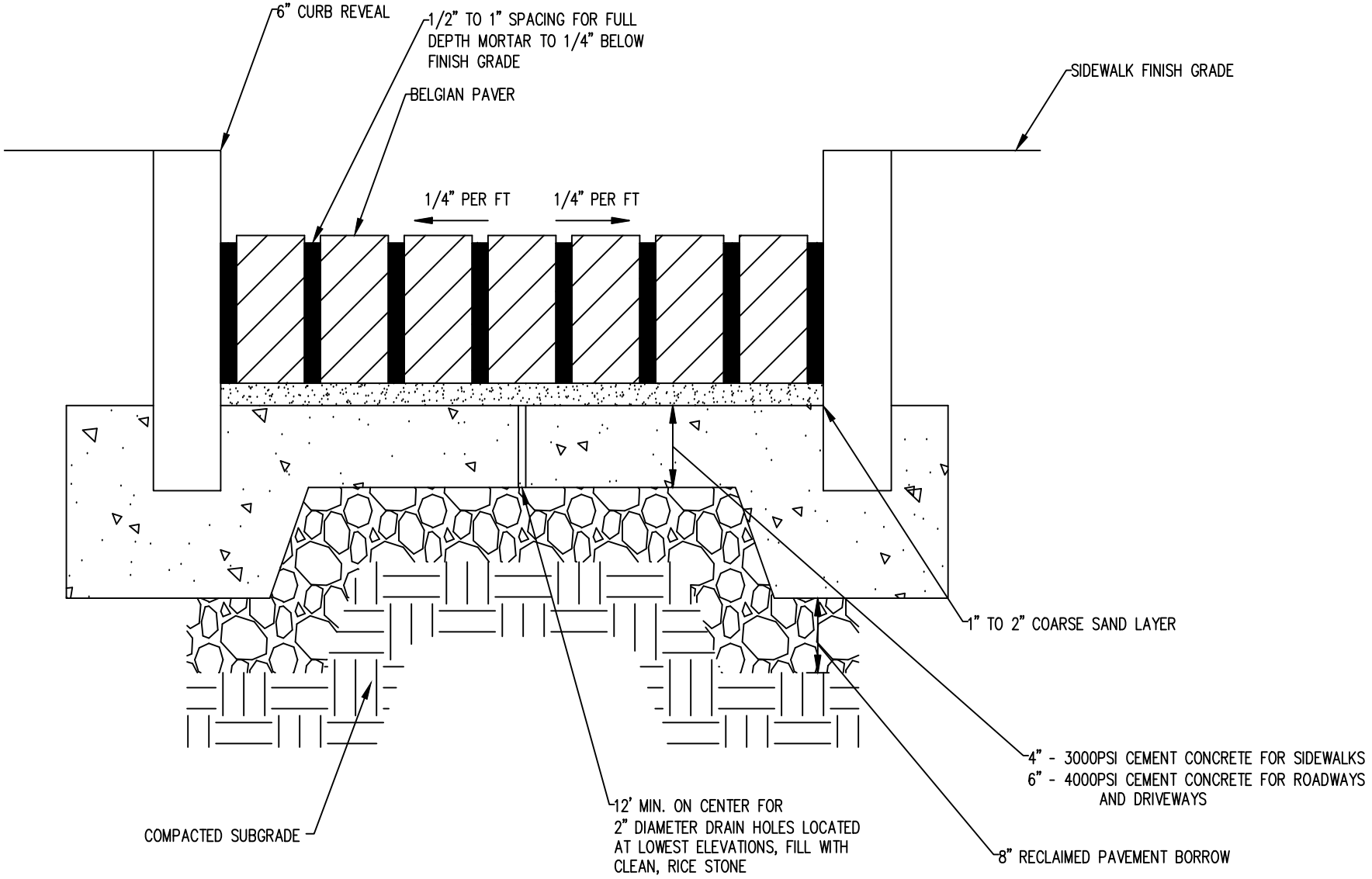
CC =CEMENT CONCRETE
HMA =HOT MIX ASPHALT
* =TOLERANCE FOR CONSTRUCTION ±0.5%
** =18' MAX. FOR RESIDENTIAL DRIVEWAYS. COMMERCIAL DRIVEWAYS REQUIRE TRAFFIC COMMISSION APPROVAL.

NOTES:

1. DRIVEWAY APRONS MUST BE PERPENDICULAR TO THE EDGE OF ROADWAY AND RECTANGULAR IN SHAPE.
2. FOR COMMERCIAL DRIVEWAYS INSTALL WIRE FABRIC (6 X 6 MESH = 10 OR FIBERS)

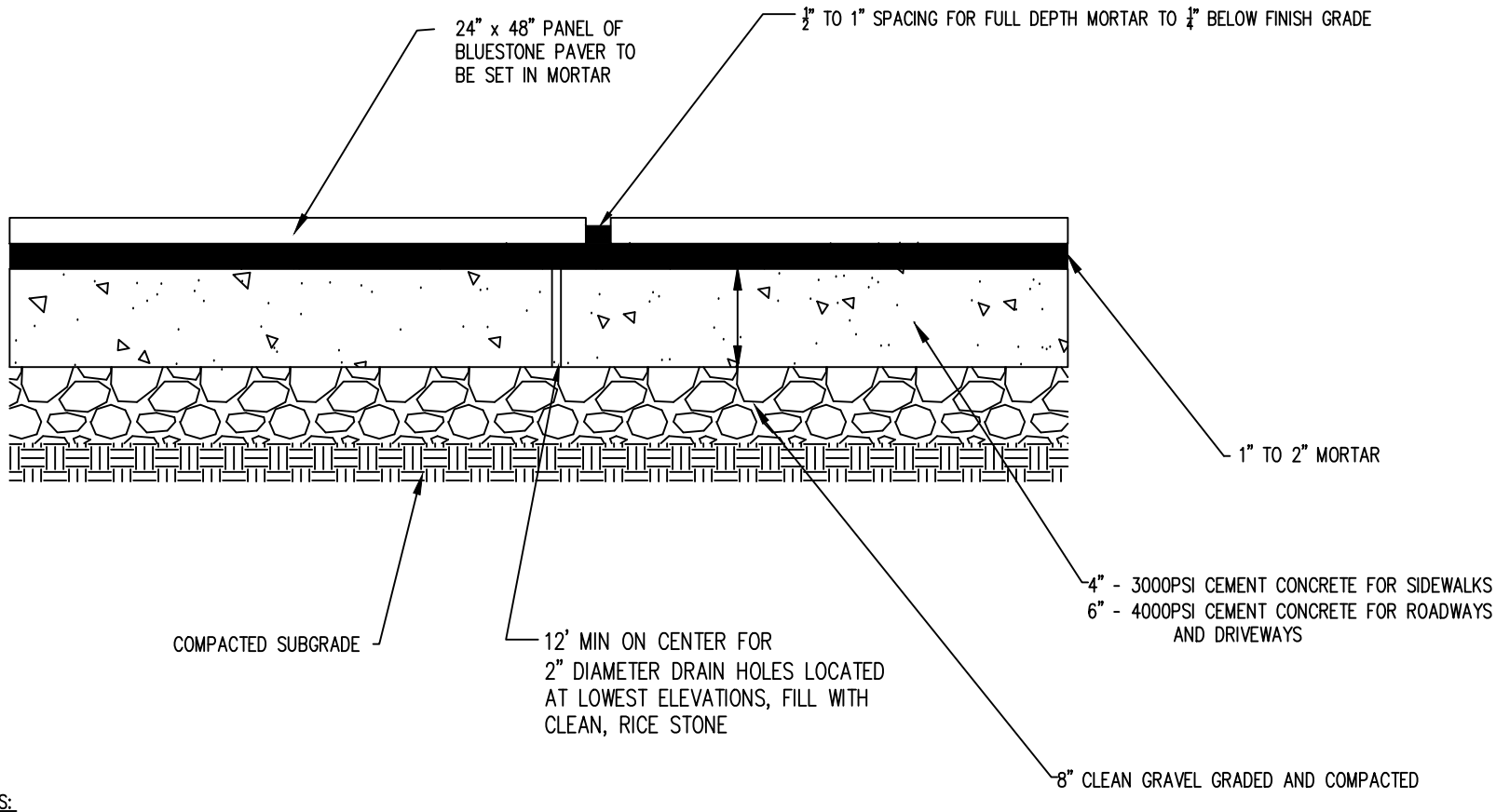
# BELGIAN PAVERS

NTS



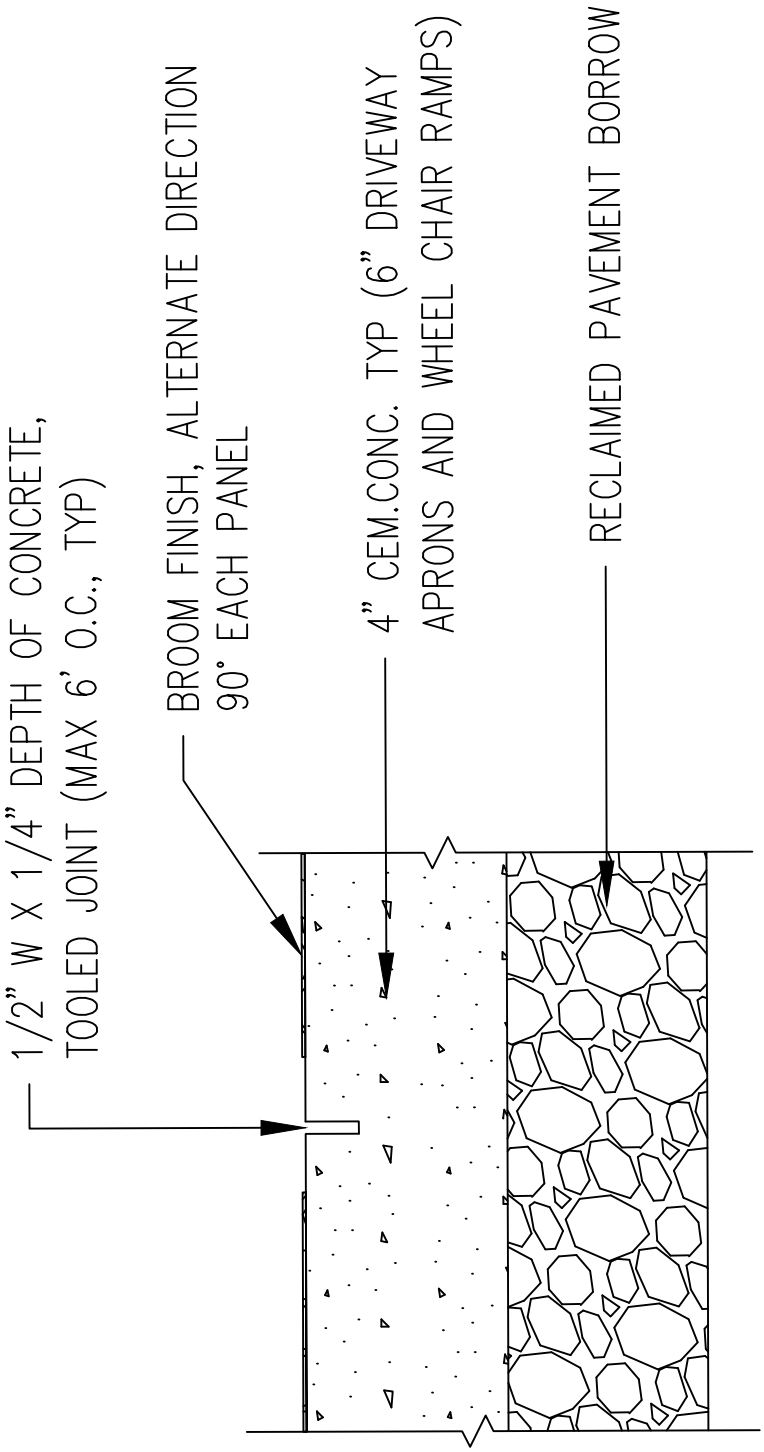
# BLUESTONE PAVERS

NTS




NOTES:

1. 2" THICK BLUESTONE PAVER FOR SIDEWALK APPLICATIONS AND 3" THICK BLUESTONE PAVER FOR DRIVEWAY, WHEELCHAIR RAMP AND ROADWAY APPLICATIONS.
2. 1.5% CROSS SLOPE AWAY FROM PROPERTY LINE FOR SIDEWALK PANELS
3. SEE "SIDEWALK THROUGH DRIVEWAYS" DETAIL FOR GRADING AND DIMENSIONAL REQUIREMENTS OUT A DRIVEWAY APRON.

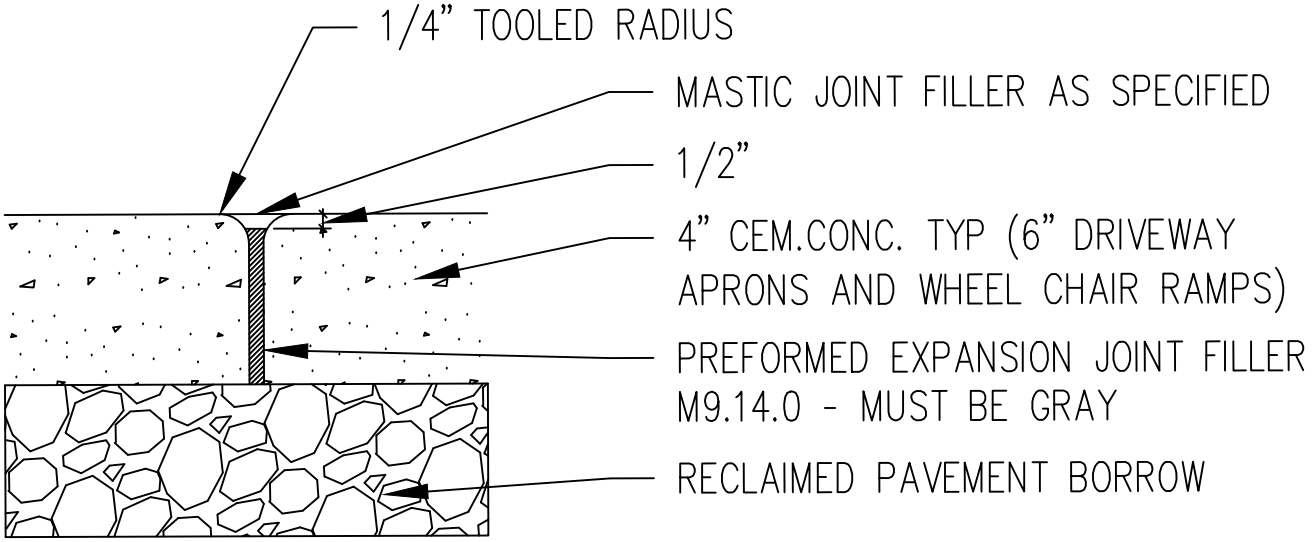


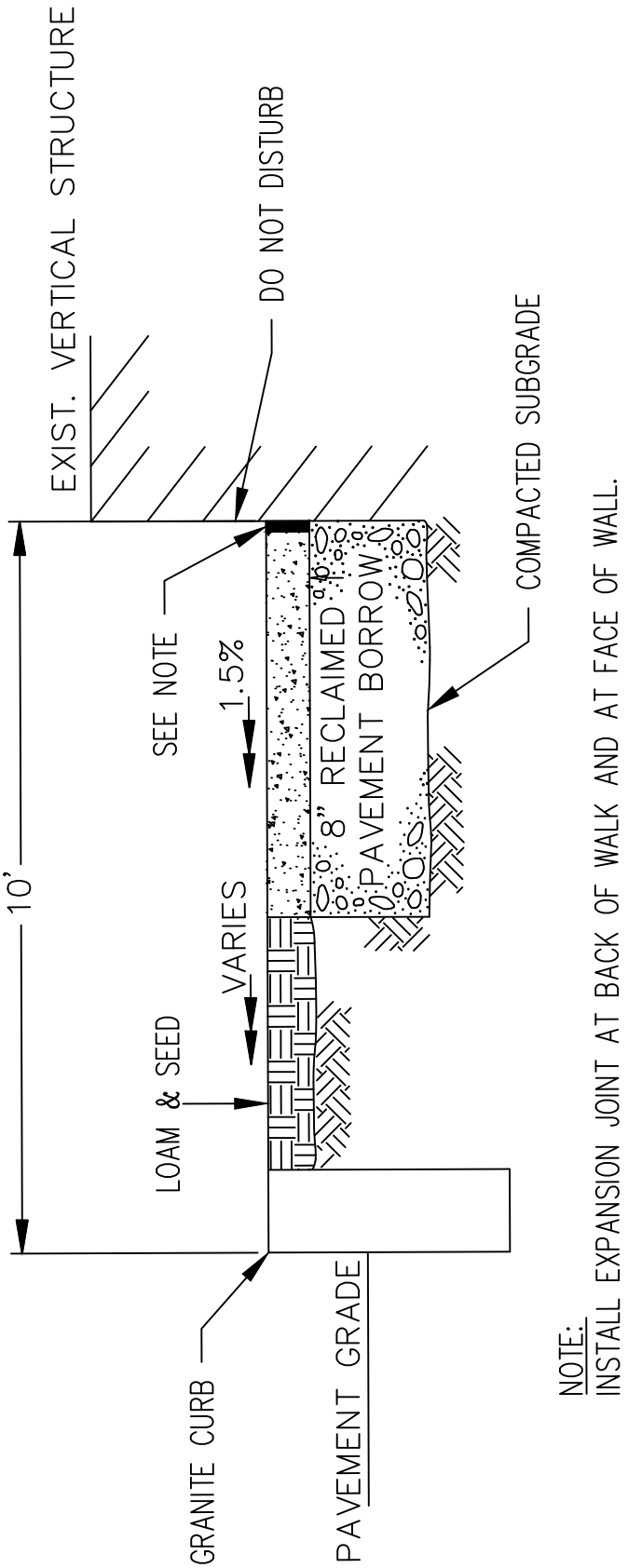

**CONCRETE SIDEWALK EXPANSION JOINT**

NTS

# CONCRETE SIDEWALK CONTROL JOINT

NTS



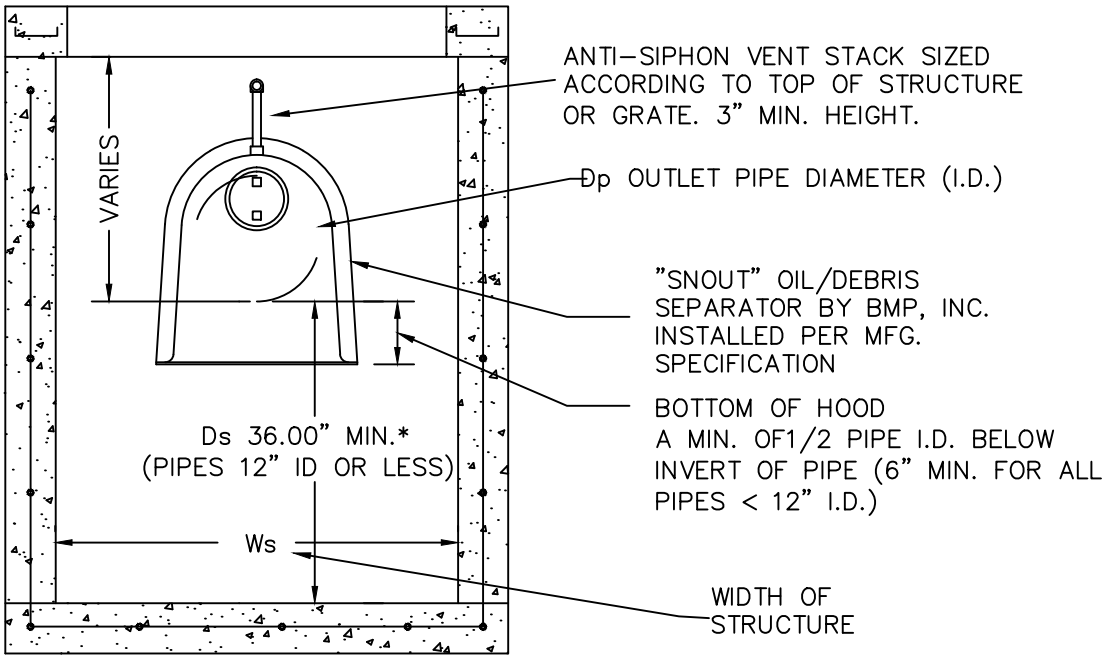



NOTE:
INSTALL EXPANSION JOINT AT BACK OF WALK AND AT FACE OF WALL.

## CEMENT CONCRETE SIDEWALKS AT WALLS

NTS

# STRUCTURE DESIGN FOR WATER QUALITY IMPROVEMENT




**RULE # 1-** AT AN ABSOLUTE MINIMUM, STRUCTURE INTERNAL DIMENSIONS MUST BE AT LEAST LARGE ENOUGH TO ACCOMMODATE EXTERNAL DIMENSIONS OF THE SNOUT, AND ALLOW FOR A PERSON TO INSTALL IT. REFER TO BMP, INC. CAD DETAILS FOR PART DIMENSIONS. BMP RECOMMENDS STRUCTURE WALL TO BE AT LEAST 12" WIDER THAN MAXIMUM SNOUT WIDTH. FOR TRASHSCREEN, STRUCTURE MUST BE AT LEAST 6" WIDER THAN TRASHSCREEN WIDTH.

**RULE #2-** USE ONLY "F" SERIES SNOUTS FOR RECTANGULAR OR SQUARE STRUCTURES, AVAILABLE IN 12", 18", 24", 30", 36", 48", 72" AND 96" SIZES. USE ONLY "R" SERIES SNOUTS FOR ROUND STRUCTURES, AVAILABLE IN 12", 18", 24", 30", 42", 52" AND 72" SIZES.

***SUMP DEPTH (Ds)-** SUMP DEPTH SHOULD BE A MINIMUM OF 36" FOR ANY NEW CONSTRUCTION FOR PIPES 12" AND LESS. FOR 15"-18" PIPE MIN. DEPTH SHOULD BE 48". OPTIMAL SIZING IS AT LEAST 2.5X TO 3X OUTLET PIPE DIAMETER (Dp) FOR MAXIMUM POLLUTANT REMOVAL EFFICIENCY AND MINIMAL CLEANOUT FREQUENCY.

**STRUCTURE DIMENSIONS-** PLAN DIMENSIONS FOR A STRUCTURE SHOULD BE UP TO 7X AREA OF OUTLET PIPE FOR MAXIMUM POLLUTANT REMOVAL EFFICIENCY AND MINIMAL CLEANOUT FREQUENCY. FOR MANHOLES, SEE SIZING EXAMPLES BELOW FOR "R' SERIES SNOUTS.

**IMPORTANT NOTICE:** *DO NOT CONFUSE PIPE SIZE WITH SNOUT SIZE.* A SNOUT FITS OVER A PIPE, NOT IN IT. THUS, THE CORRECT SNOUT SIZE WILL ALWAYS BE BIGGER THAN THE PIPE SIZE. SNOUTS ARE AVAILABLE FOR ROUND STRUCTURES TO ACCOMMODATE PIPES OF 60" ID ( 71.9" OD). MAX. FOR PIPES 72" OD AND ABOVE, USE SQUARE STRUCTURES.

**SIZING EXAMPLES:**

| OUTLET HOLE SIZE | SNOUT SIZE |
|---|---|
| 11.9" O.D. OR LESS | 12 F or R (R FITS 36"-48" DIAM STRUCTURE) |
| 12.0"-17.9" O.D. | 18 F or R (R FITS 48"-60" DIAM STRUCTURE) |
| 18.0"-23.9" O.D. | 24 F or R (R FITS 48"-60" DIAM STRUCTURE) |
| 24.0"-29.9" O.D. | 30 F or R (R FITS 60"-72" DIAM STRUCTURE) |
| 30.0"-35.9" O.D. | 36FTB |
| 30.0"-41.9" O.D. | 42RTB/60 (FITS 60" DIAM STRUCTURE ONLY) |
| 30.0"-47.9" O.D. | 48 FTB |
| 30.0"-51.9" O.D. | 52RTB/72 OR /84 (FITS 72" OR 84" DIAM STRUCTURE ONLY) |
| 48.0"-71.9" O.D. | 72FTB OR 72RTB/96 (FITS 96" DIAM STRUCTURE ONLY) |
| 72"-95.9" O.D. | 96 FTB OR 96FTBB |

**NPSNOUT (FOR PVC OR SMALL DIAM. STRUCTURE)**

UP TO 12" PIPE IN 18" ID STRUCTURE NP1218
UP TO 15" PIPE IN 24" ID STRUCTURE NP1524
UP TO 18" PIPE IN 30" ID STRUCTURE NP1830
UP TO 18" PIPE IN 36-42" ID STRUCTURE NP1836
UP TO 24" PIPE IN 30" ID STRUCTURE NP 2430

SNOUT ®

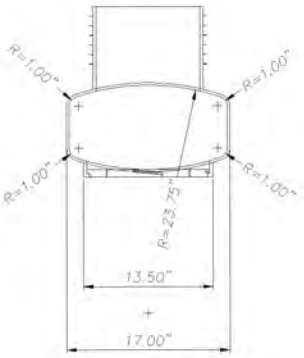
**BMP, INC.**
*9 MATHEWS DR, UNIT A1-A2, E. HADDAM, CT*
*(800) 504-8008 FAX: (877)434-3197*

| DESCRIPTION | DATE | SCALE |
|---|---|---|
| SNOUT SIZING CHART | 09/09/18 | NONE |
| | DRAWING NUMBER | SP–SI |

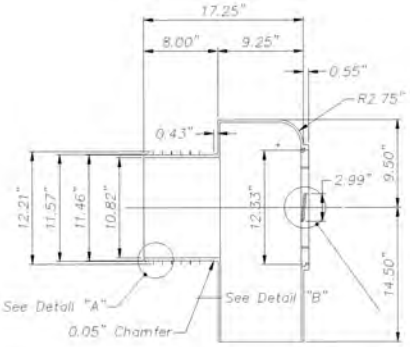
## THE SNOUT OIL CATCHER

NTS

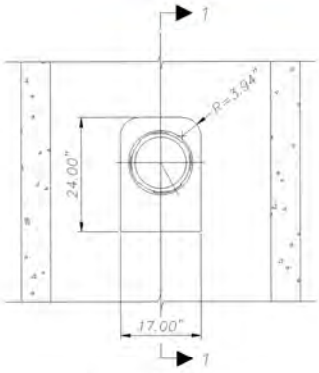





Enlarged Section 2–2

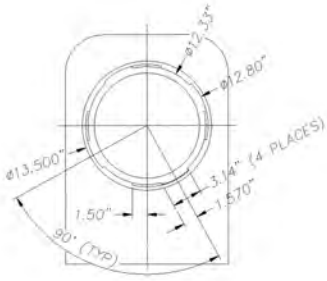



Enlarged Section 1–1




Front View

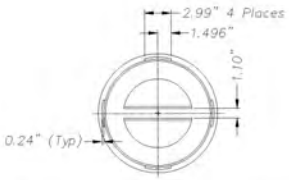
# The Eliminator Catch Basin Oil & Debris Trap



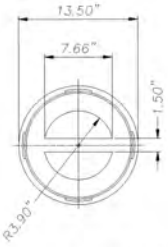

Enlarged Front View




Side View of Cover



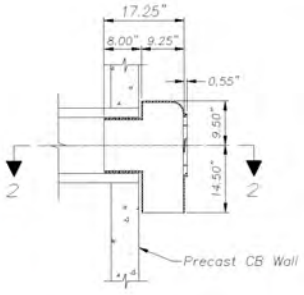

Rear View of Cover w/ Integral Handle



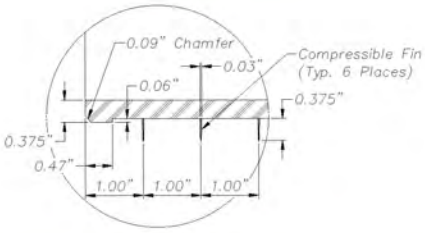

Front View of Cover w/ Integral Handle








Section 1–1




Detail "A"


Ground Water Rescue, Inc.
24 Ryden St., Quincy, MA 02169
Tel: 617-773-1128 Fax: 617-773-0510
www.kleanstream.com


MADE IN USA

# Downstream Defender®

## Downstream Defender® Design

**Drainage Profile**

The Downstream Defender® is designed with a submerged tangential inlet to minimize turbulence within the device. Turbulence increases system headlosses and reduces performance by keeping pollutant particles in suspension.

The inlet elevation of the Downstream Defender® is located one inlet pipe diameter lower than the elevation of the outlet invert (**Fig.2**). This arrangement ensures that influent flows are introduced to the treatment chamber quiescently below the water surface elevation, minimizing turbulence.

The unique flow-modifying internal components also minimize hydraulic losses. There are no internal weirs or orifices; large clear openings ensure low headloss at peak flow rates with little risk of blockages that cause upstream flooding.

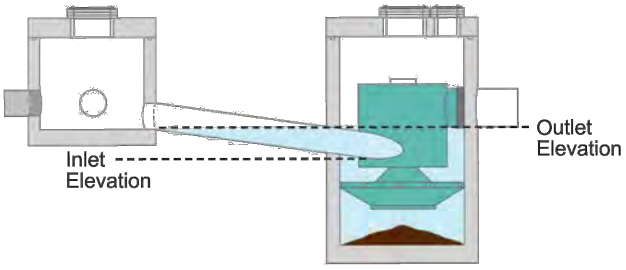



**Fig.2** The Downstream Defender® has a submerged inlet that reduces headloss and improves efficiency of pollutant capture.

**Sizing & Design**

The Downstream Defender® can be used to meet a wide range of stormwater treatment objectives. It is available in 5 precast models that fit easily into the drainage network (**Table 1**). Selection and layout of the appropriate Downstream Defender® model depends on site hydraulics, site constraints and local regulations. Both online (**Fig.3a**) and offline (**Fig.3b**) configurations are common.

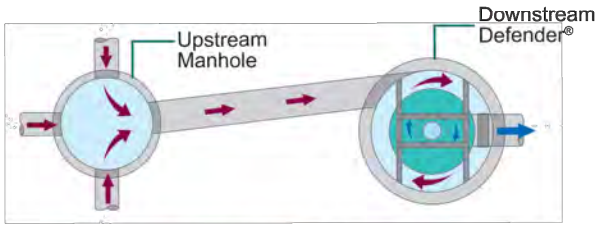



**Fig.3a** The Downstream Defender® in an online configuration.

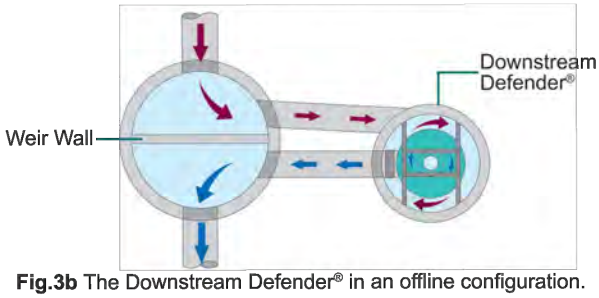



**Fig.3b** The Downstream Defender® in an offline configuration.



**Free *Stormwater Separator Sizing Calculator* for Engineers**

This simple online tool will recommend the best separatror, model size and online/offline arrangement based on site-specific data entered by the user.

Go to hydro-int.com/sizing to access the tool.

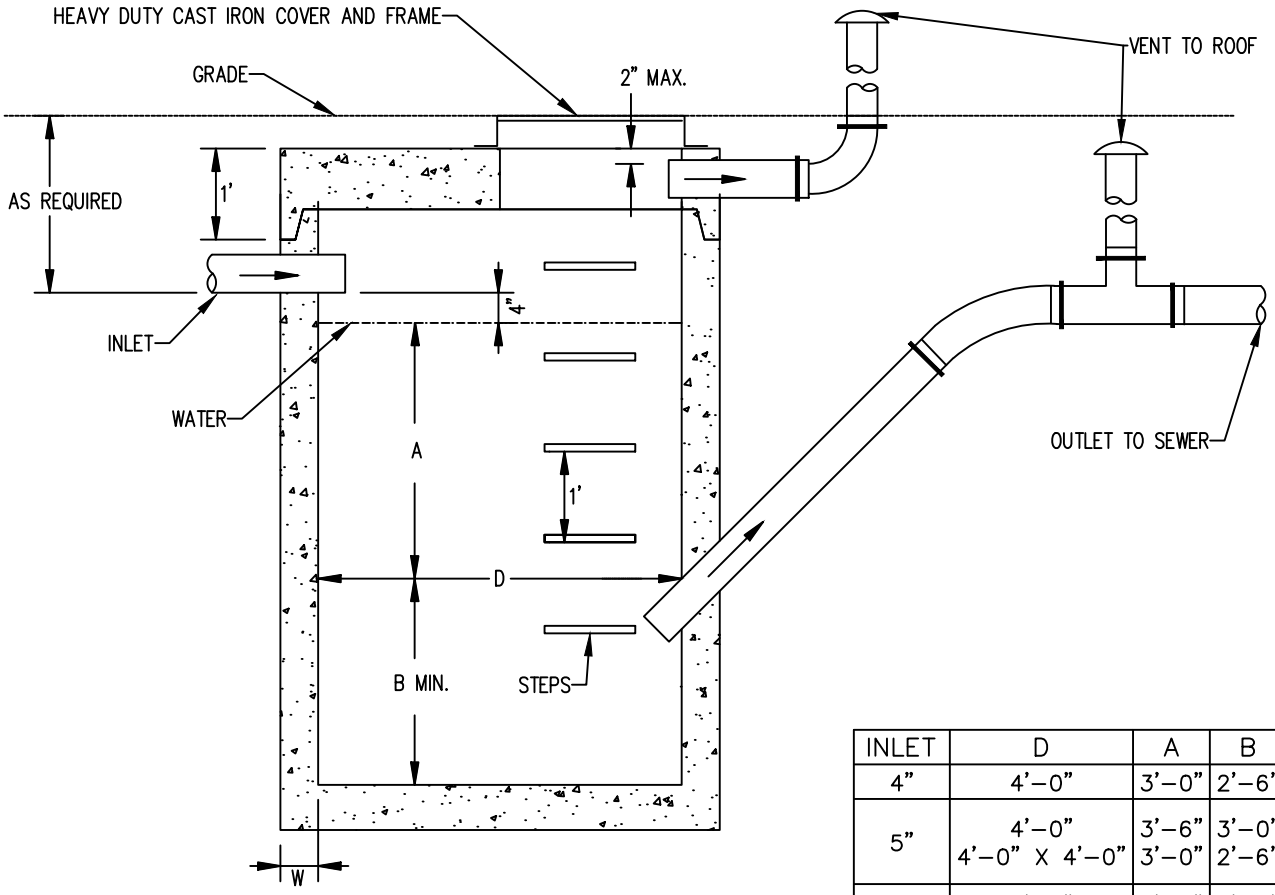
**Table 1.** Downstream Defender® Design Chart.

| Model Number and Diameter | | Peak Treatment Flow Rate | | Maximum Pipe Diameter | | Oil Storage Capacity | | Sediment Storage Capacity | | Minimum Distance from Outlet Invert to Top of Rim | | Standard Height from Outlet Invert to Sump Floor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (ft) | (m) | (cfs ) | (L/s) | (in) | (mm) | (gal) | (L) | ($yd^3$) | ($m^3$) | (ft) | (m) | (ft) | (m) |
| 4 | 1.2 | 3.0 | 85 | 12 | 300 | 70 | 265 | 0.70 | 0.53 | 2.8 | 0.85 | 4.1 | 1.25 |
| 6 | 1.8 | 8.0 | 227 | 18 | 450 | 216 | 818 | 2.10 | 1.61 | 3.2 | 0.98 | 5.9 | 1.80 |
| 8 | 2.4 | 15.0 | 425 | 24 | 600 | 540 | 2,044 | 4.65 | 3.56 | 4.2 | 1.28 | 7.7 | 2.35 |
| 10 | 3.0 | 25.0 | 708 | 30 | 750 | 1,050 | 3,975 | 8.70 | 6.65 | 5.0 | 1.52 | 9.4 | 2.85 |
| 12* | 3.7 | 38.0 | 1,076 | 36 | 900 | 1,770 | 6,700 | 14.70 | 11.24 | 5.6 | 1.71 | 11.2 | 3.41 |

*Not available in all areas. Contact Hydro International for details.

Hydro International, 94 Hutchins Drive, Portland, ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212
Email: stormwaterinquiry@hydro-int.com Web: www.hydro-int.com

**Stormwater Solutions**
hydro-int.com/dsdefender
DDScreenSS1906




| INLET | D | A | B | W |
|---|---|---|---|---|
| 4" | 4'–0" | 3'–0" | 2'–6" | 5" |
| 5" | 4'–0"<br>4'–0" X 4'–0" | 3'–6"<br>3'–0" | 3'–0"<br>2'–6" | 5"<br>6" |
| 6" | 4'–0"<br>4'–0" X 4'–0"<br>5'–0" | 5'–0"<br>4'–0"<br>3'–6" | 4'–6"<br>3'–6"<br>3'–0" | 5"<br>6"<br>6" |
| 8" | 5'–0"<br>6'–0"<br>8'–0" | 6'–0"<br>4'–0"<br>3'–0" | 5'–0"<br>3'–6"<br>2'–6" | 6"<br>7"<br>9" |
| 10" | 6'–0"<br>8'–0" | 6'–6"<br>5'–0" | 5'–6"<br>4'–0" | 7"<br>9" |

NOTES:

1. CONCRETE: 4,000 PSI MIN. AFTER 28 DAYS.
2. MANHOLE DESIGN SPECIFICATIONS CONFORM TO LATEST ASTM SPEC FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."
3. BUTYL RESIN SECTION JOINT CONFORMS TO LATEST ASTM C443 SPEC.
4. STEEL REINFORCED COPOLYMER POLYPROPYLENE PLASTIC STEP CONFORMS TO LATEST ASTM C478 SPEC.
5. CONE SECTION AVAILABLE IN 4'-0" I.D. ONLY.
6. FOR INLETS LARGER THAN 10" THE DESIGN AND DIMENSION WILL BE DETERMINED FOR EACH PARTICULAR CASE.

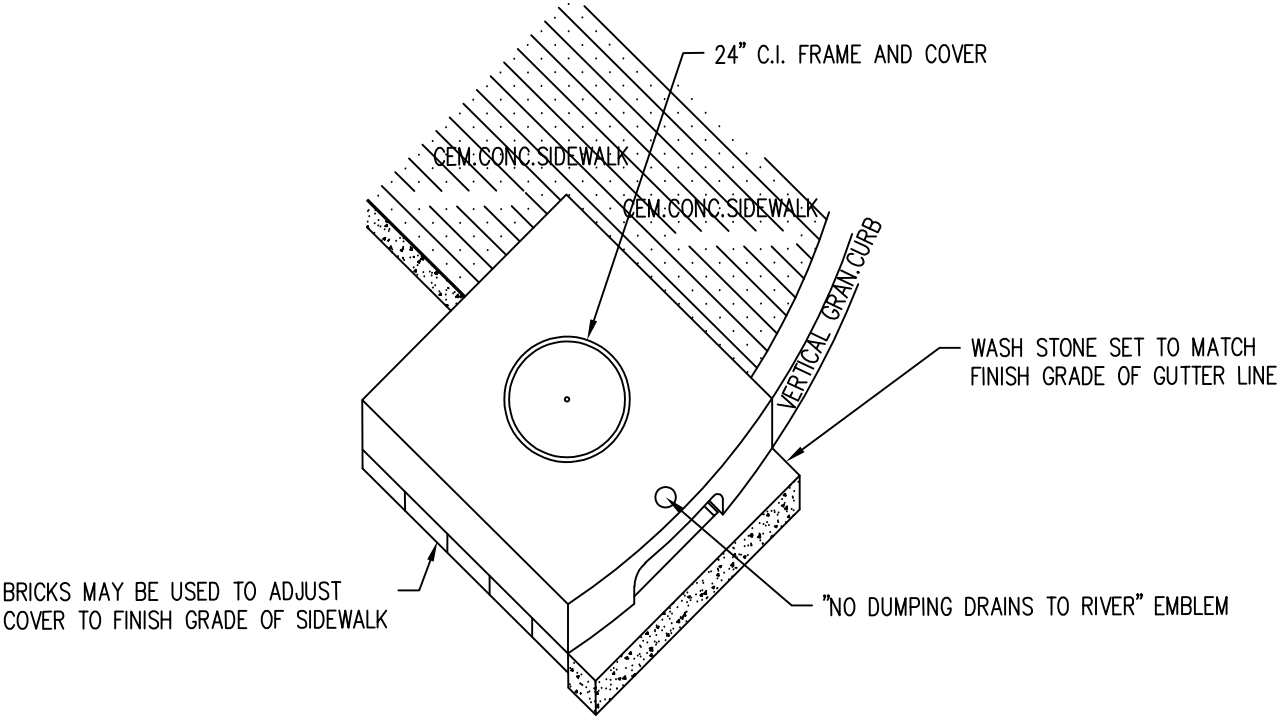
## OIL AND GREASE SEPARATOR

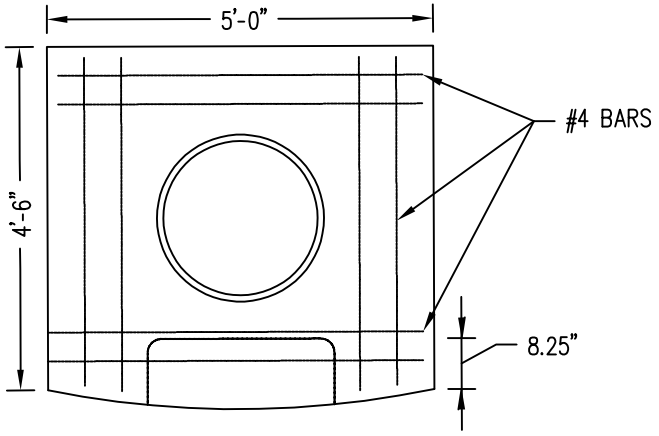
NTS

lighting the way
new bedford

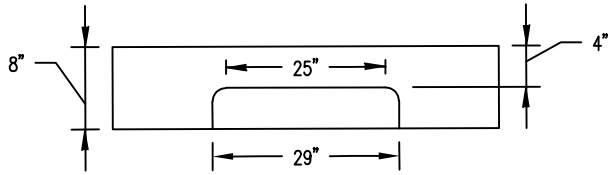
# MUNICIPAL STANDARD
## BRADLEY HEAD STYLE CATCH BASIN COVER

NTS

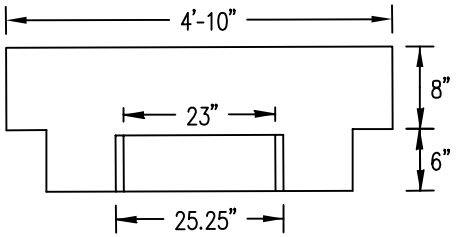


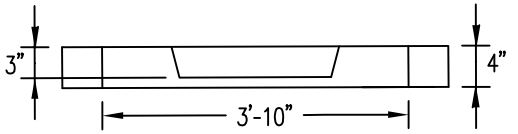

TOP VIEW BRADLEY HEAD COVER




FRONT VIEW BRADLEY HEAD COVER



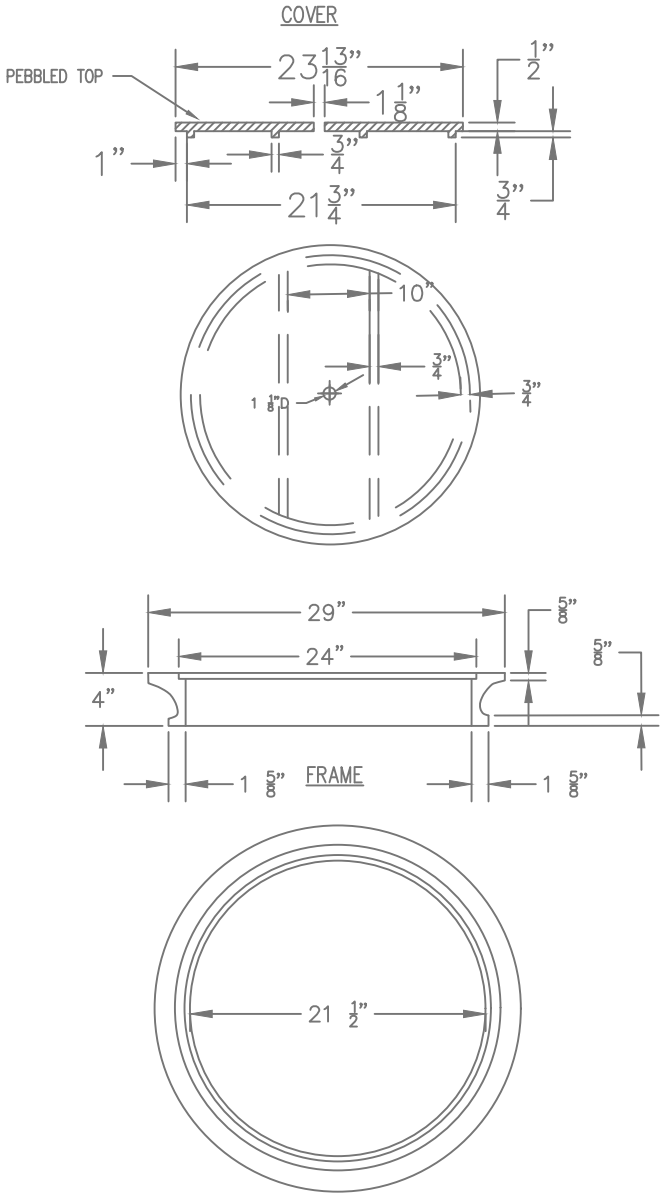

TOP VIEW WASH STONE




FRONT VIEW WASH STONE

NOTES:

1. MINIMUM COVER WEIGHT - 73 LBS
2. MINIMUM FRAME WEIGHT - 113 LBS
3. MATERIAL - CAST IRON
4. SIDEWALK AREA USE ONLY

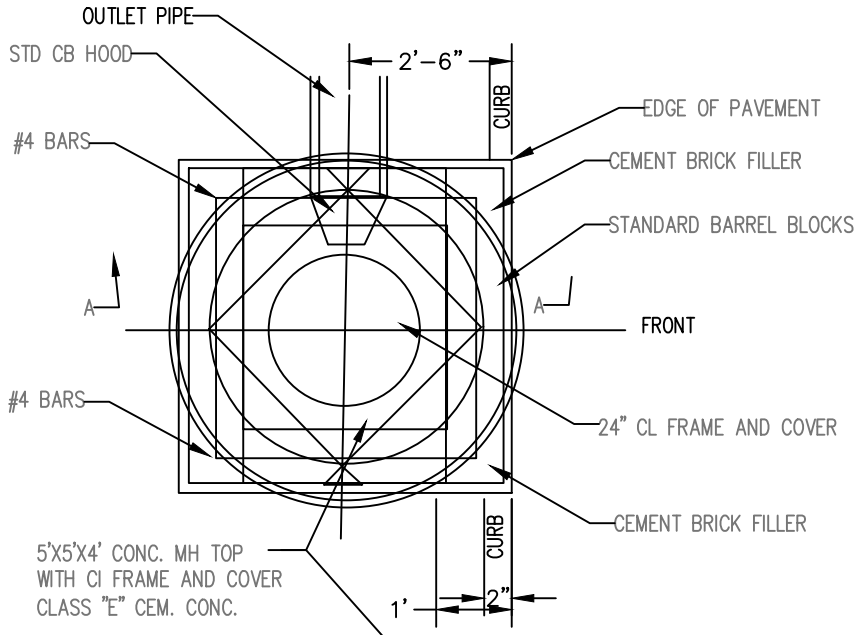


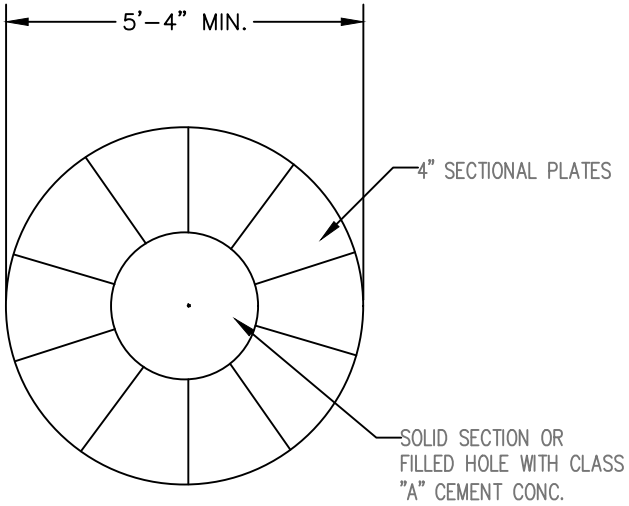

## CAST IRON CATCH BASIN COVER FOR MUNICIPAL STANDARD (BRADLEY HEAD)

NTS

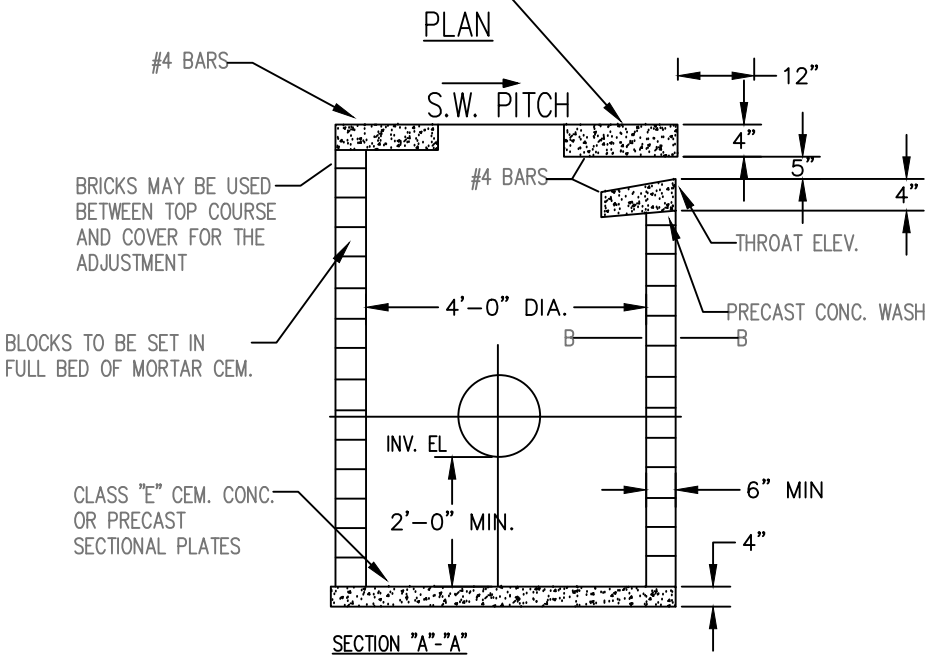
# CATCH BASIN MUNICIPAL STANDARD

NTS

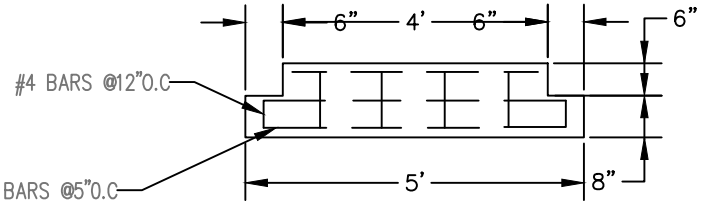


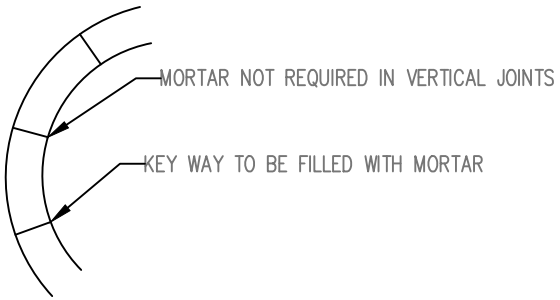

PLAN OF BASE




SECTION "A"-"A"




PLAN OF WASH STONE




SECTION "B"-"B"

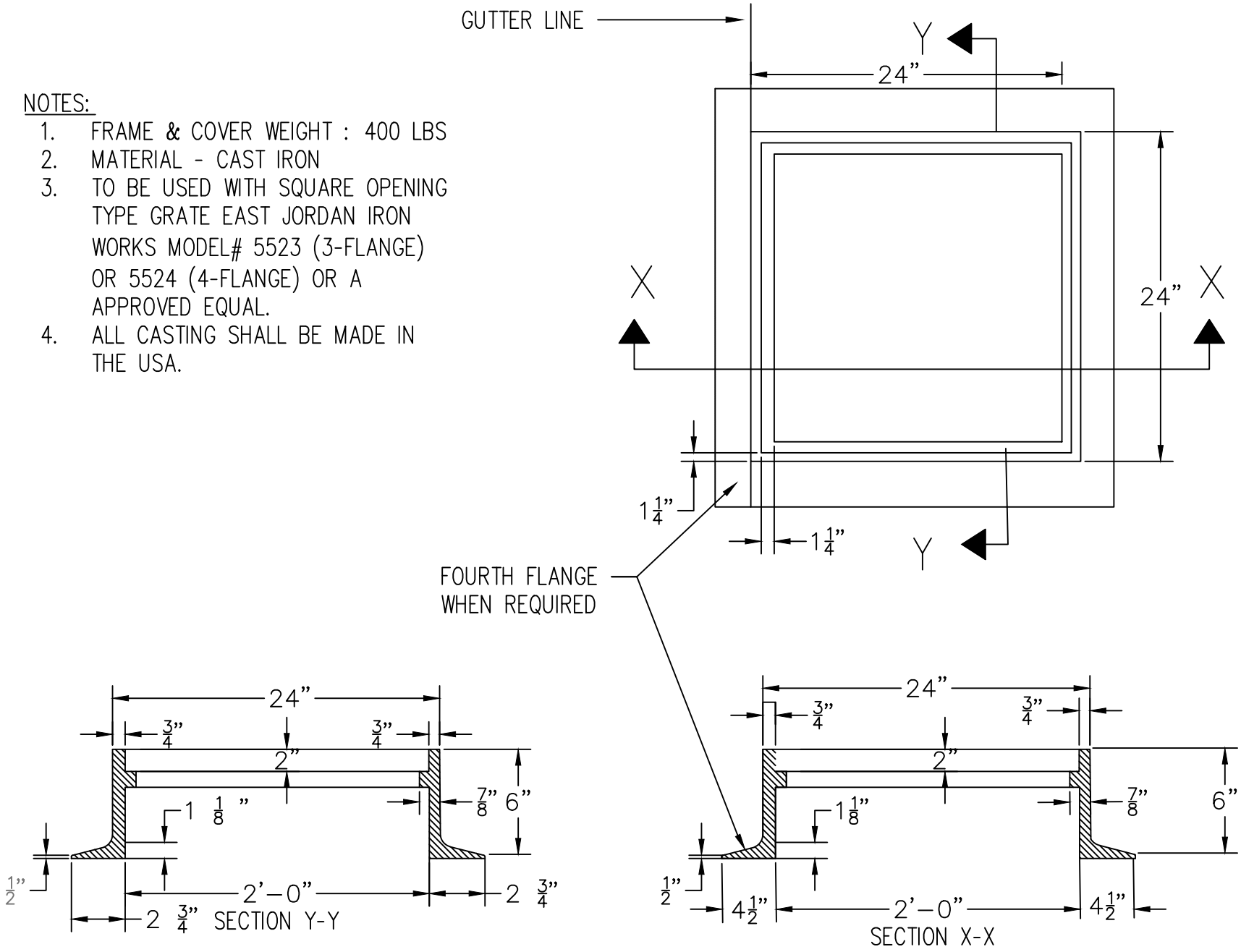
NOTES:
PRECAST SECTIONS ARE AN ACCEPTABLE EQUAL TO BLOCK SECTIONS.

# CATCH BASIN FRAME

NTS

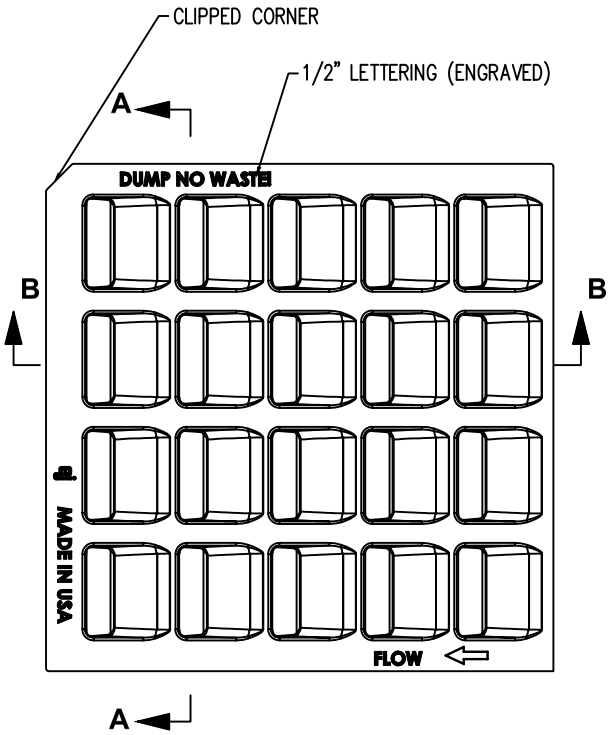
NOTES:

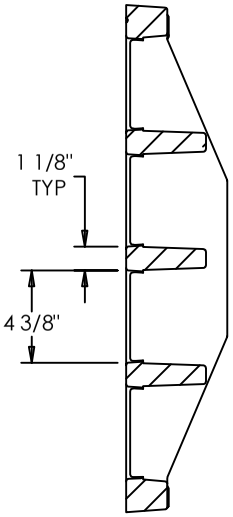
1. FRAME & COVER WEIGHT : 400 LBS
2. MATERIAL - CAST IRON
3. TO BE USED WITH SQUARE OPENING TYPE GRATE EAST JORDAN IRON WORKS MODEL# 5523 (3-FLANGE) OR 5524 (4-FLANGE) OR A APPROVED EQUAL.
4. ALL CASTING SHALL BE MADE IN THE USA.



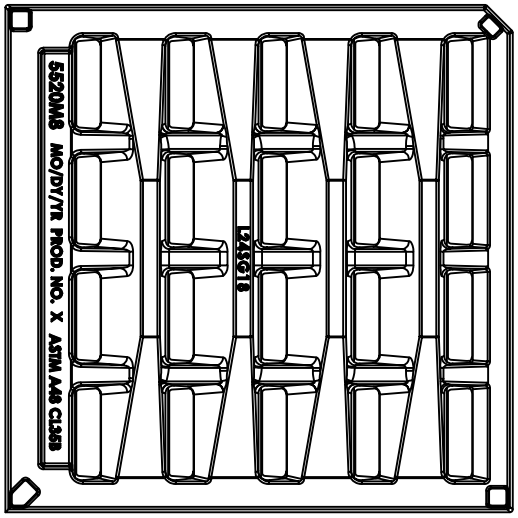
# CASCADING GRATE DETAIL

NTS

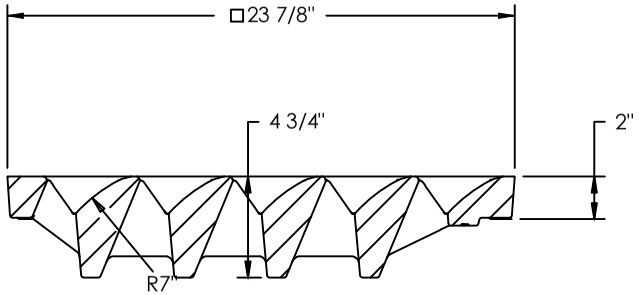



SECTION A-A



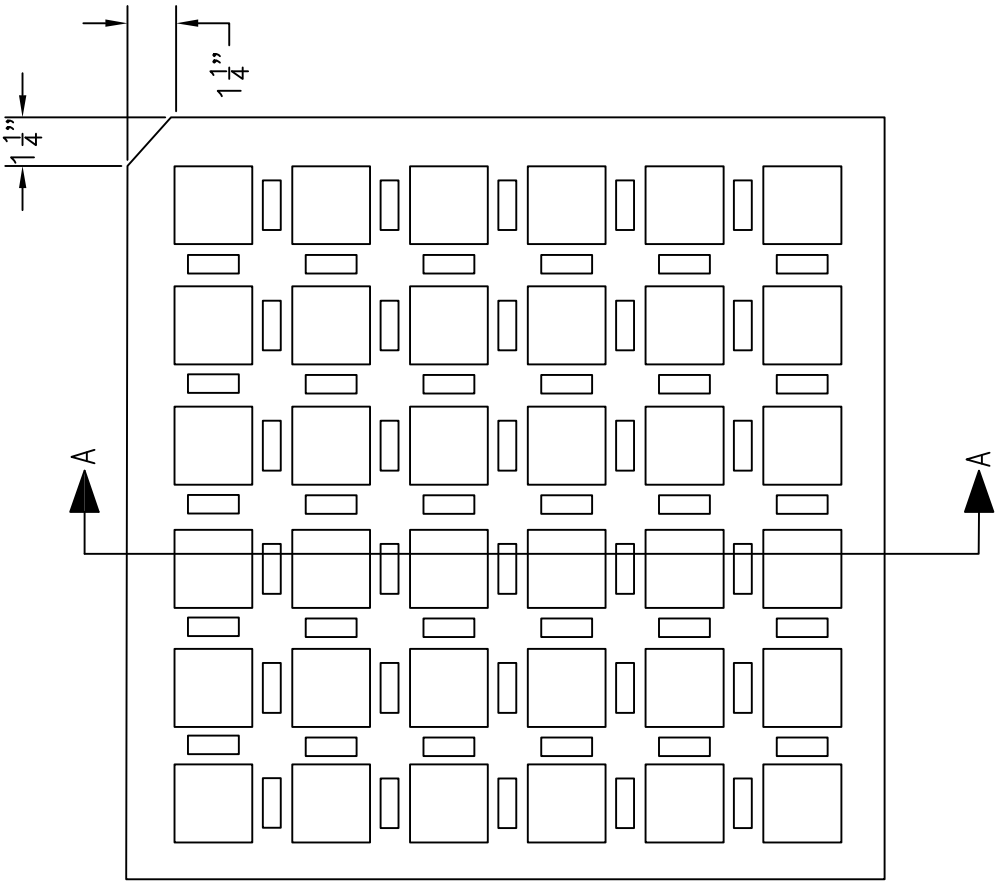

BOTTOM VIEW

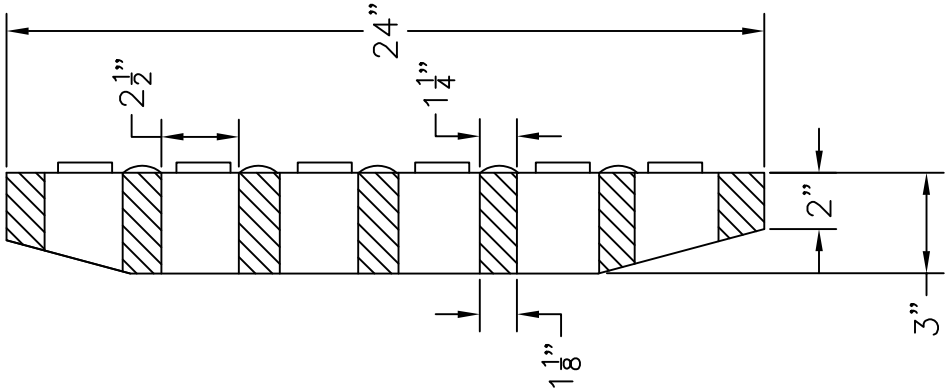



SECTION B-B

NOTES:

1. MINIMUM GATE WEIGHT - 220± LBS
2. MATERIAL - CAST
3. TO BE USED WITH STANDARD CATCH BASIN FRAME, EAST JORDAN IRON WORKS MOD# 5520M5 OR APPROVED EQUAL.
4. ALL CASTING SHALL BE MADE IN THE USA.
5. GRATE NOT TO BE USED IF LOCATED IN PEDESTRIAN ACCESS ROUTE



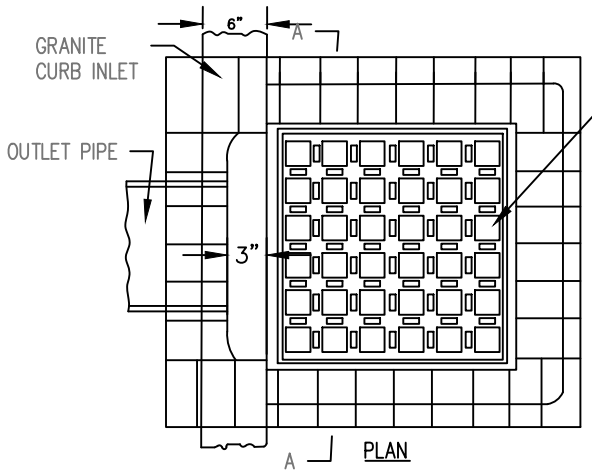

NOTES:
1. MINIMUM GATE WEIGHT - 220± LBS
2. MATERIAL - CAST
3. TO BE USED WITH STANDARD CATCH BASIN FRAME, EAST JORDAN IRON WORKS MOD# 5520M5 OR APPROVED EQUAL.
4. ALL CASTING SHALL BE MADE IN THE USA.
5. GRATE NOT TO BE USED IF LOCATED IN PEDESTRIAN ACCESS ROUTE

## CATCH BASIN GRATE SQUARE OPENING

NTS

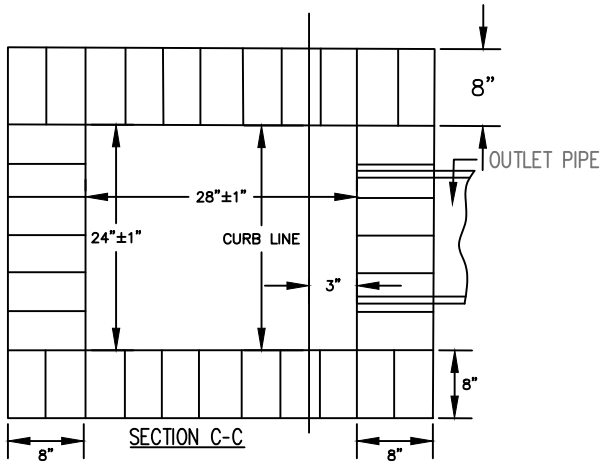
# BRICK GUTTER INLET

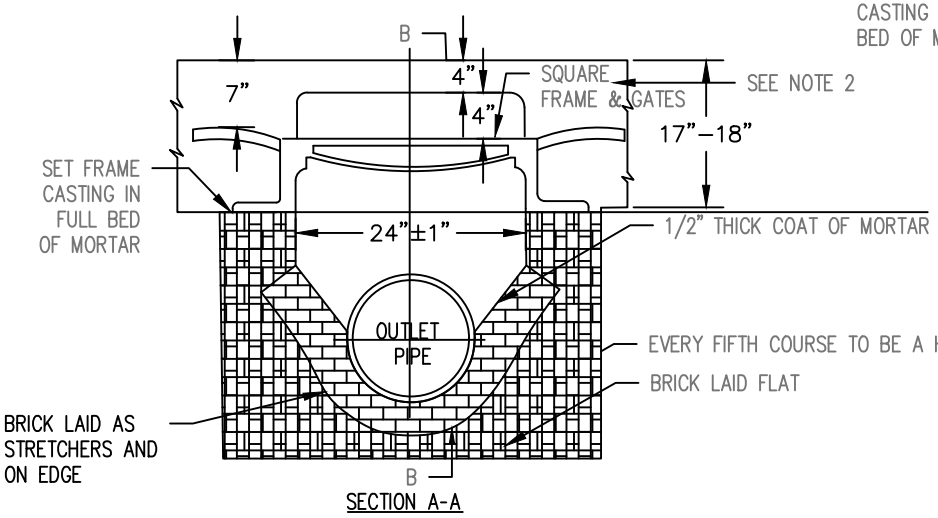
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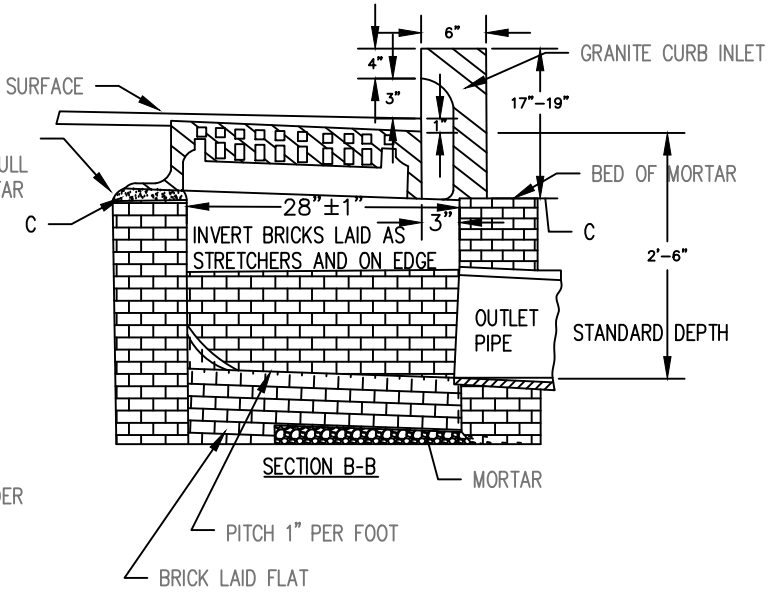


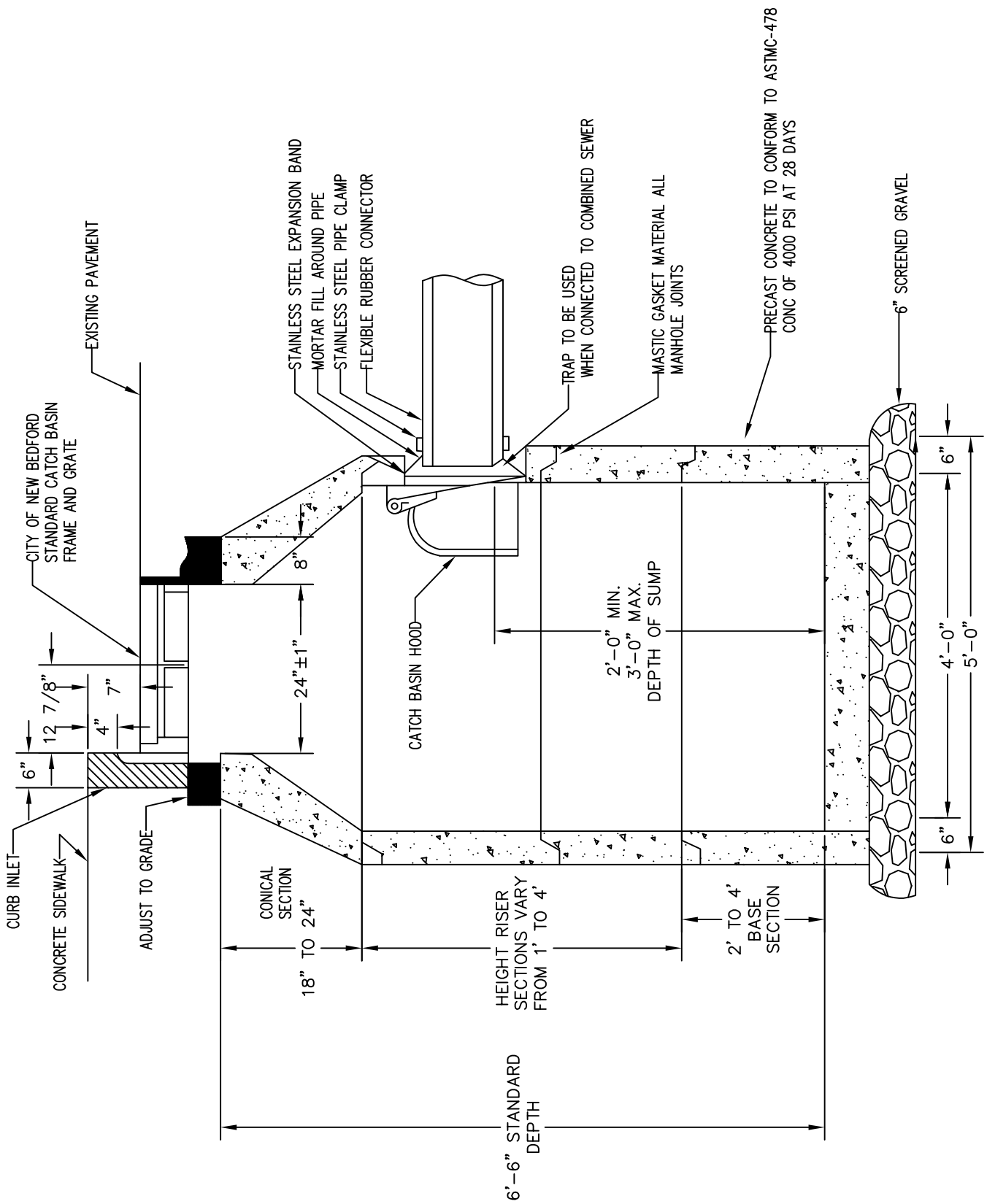

PARALLEL BAR GRATE
SEE NOTE 2

NOTES:
1.WHEN THE CURB INLET IS NOT USED THE INSIDE HORIZONTAL DIMENSION OF GUTTER INLET TO 24"±1"X24"±1" IN WHICH CASE AND UNLESS OTHERWISE DIRECTED, A STANDARD 4-FLANGE FRAME IS TO BE USED.
2.A CASCADE GATE IS TO BE USED WHERE BICYCLE TRAFFIC IS ALLOWED TO SEE 201.7.0 THROUGH 201.9.0
3.FOR DESCRIPTION, MATERIAL AND CONSTRUCTION METHODS SEE LATEST SPECIFICATIONS



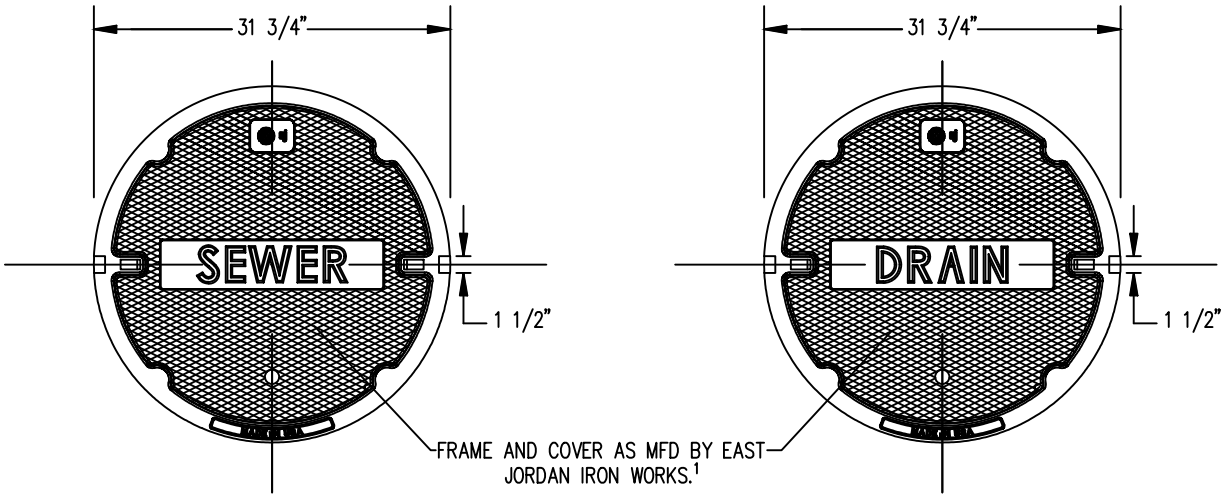



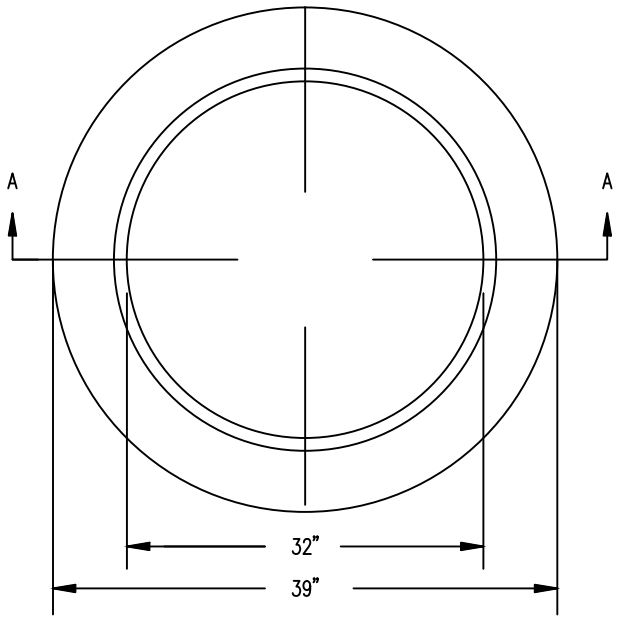



## PRECAST CONCRETE CATCH BASIN

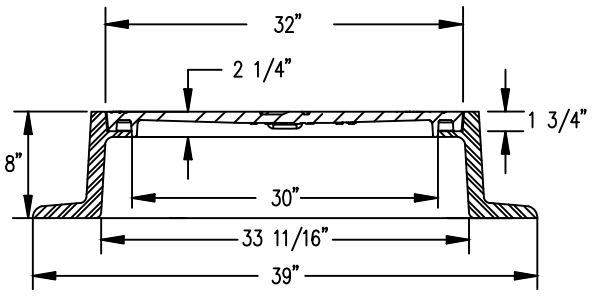
NTS




STANDARD COVER




FRAME TOP VIEW

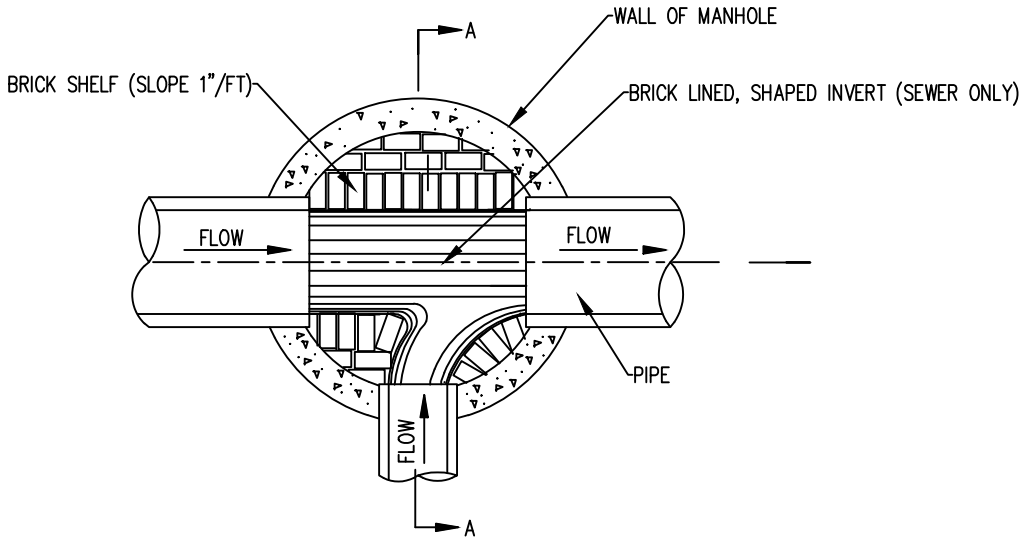



SECTION A-A

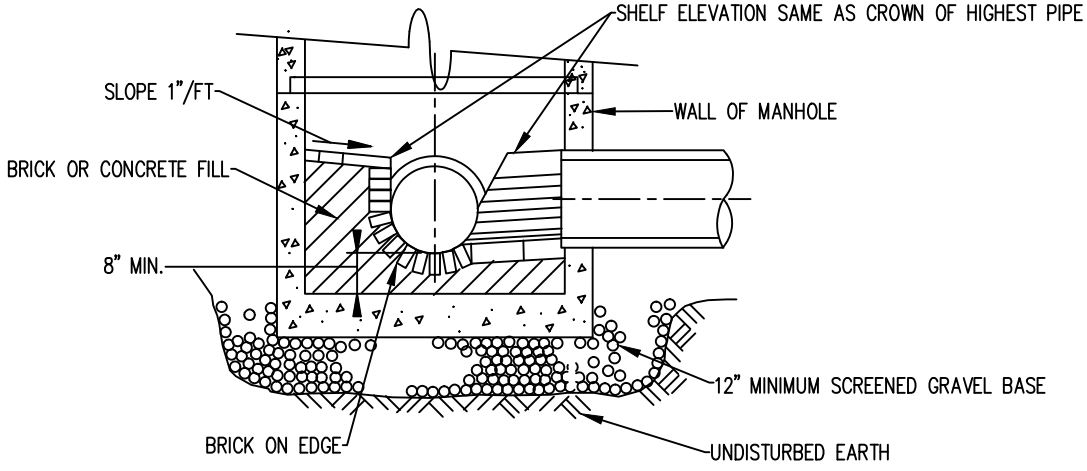
1. ORDER MANHOLE COVERS WITH THE WORD "SEWER" OR "DRAIN" CAST IN 3-INCH LETTERS IN THE CENTER OF THE COVER AS SHOWN AND TO PROPERLY LABEL THE UTILITY SERVICED BY THE MANHOLE.
2. ALL CASTINGS MUST BE MADE IN THE USA AND APPROVED BY CITY ENGINEER.

## MANHOLE FRAME AND COVER

NTS




PLAN

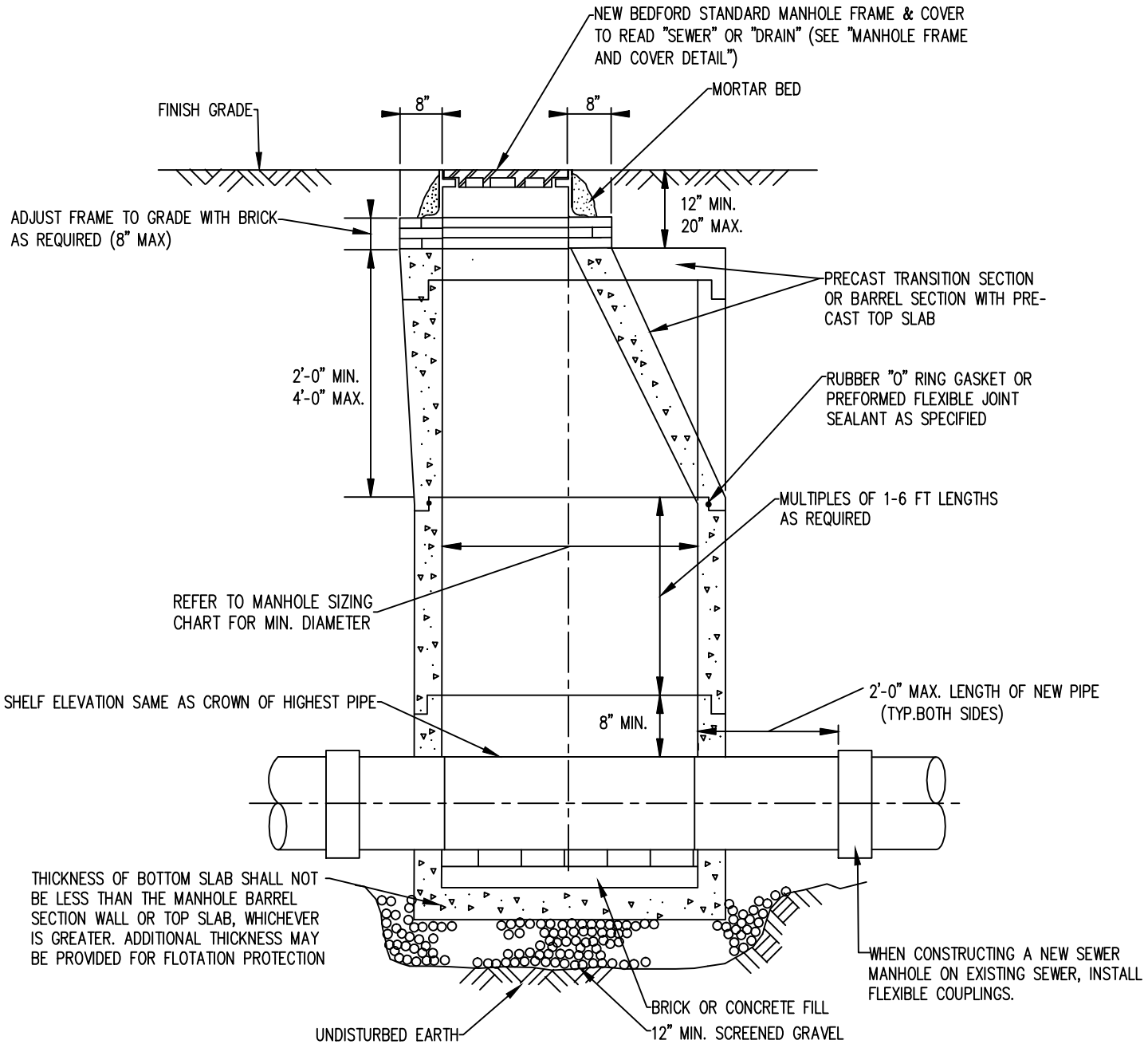



SECTION A-A

NOTE:
CHANNELS FOR DRAIN MANHOLES SHALL BE CONCRETE

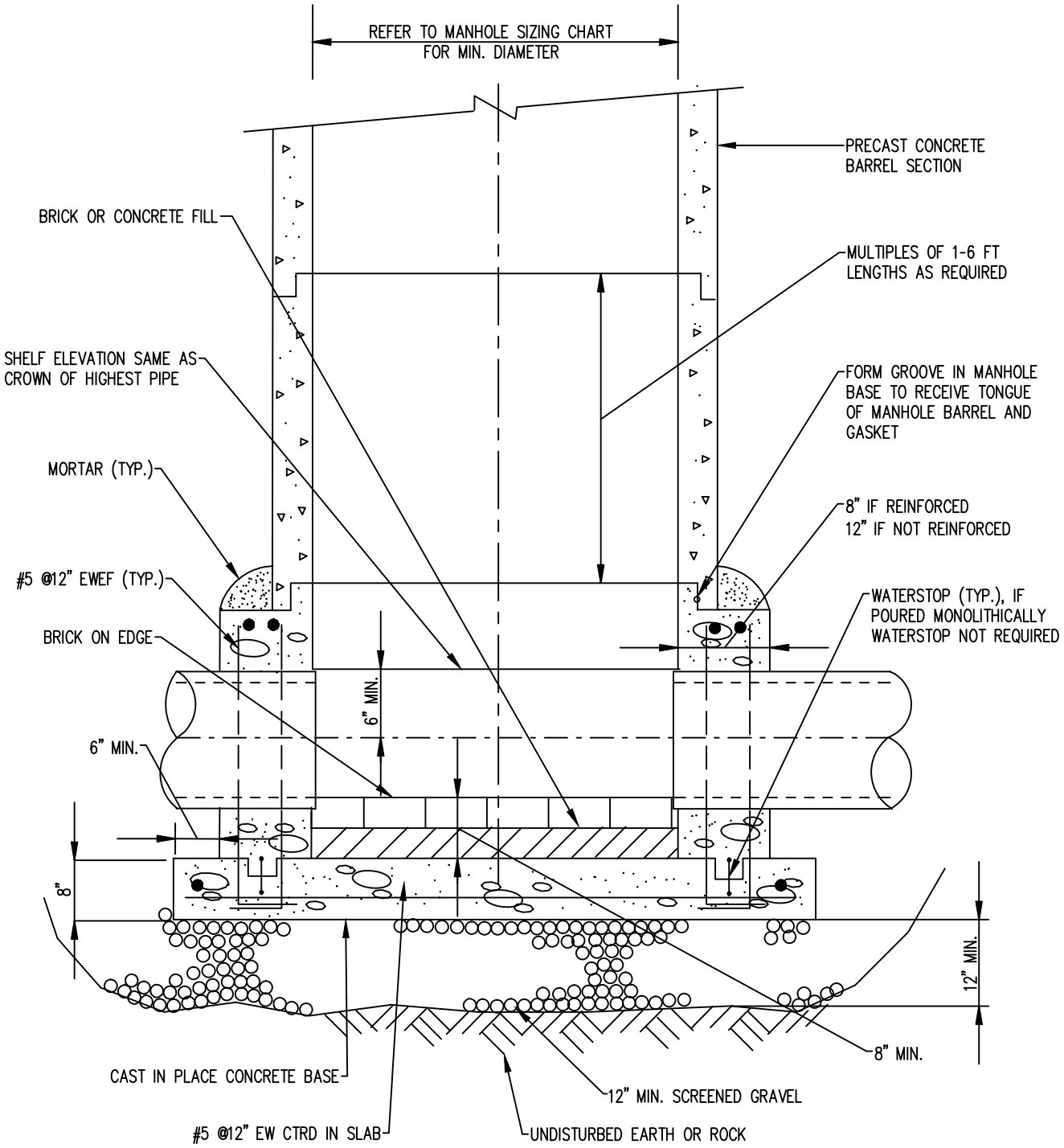
## MANHOLE SHELF

NTS




## PRECAST MANHOLE WITH PRECAST BASE

NTS




## PRECAST MANHOLE WITH CAST-IN-PLACE BASE

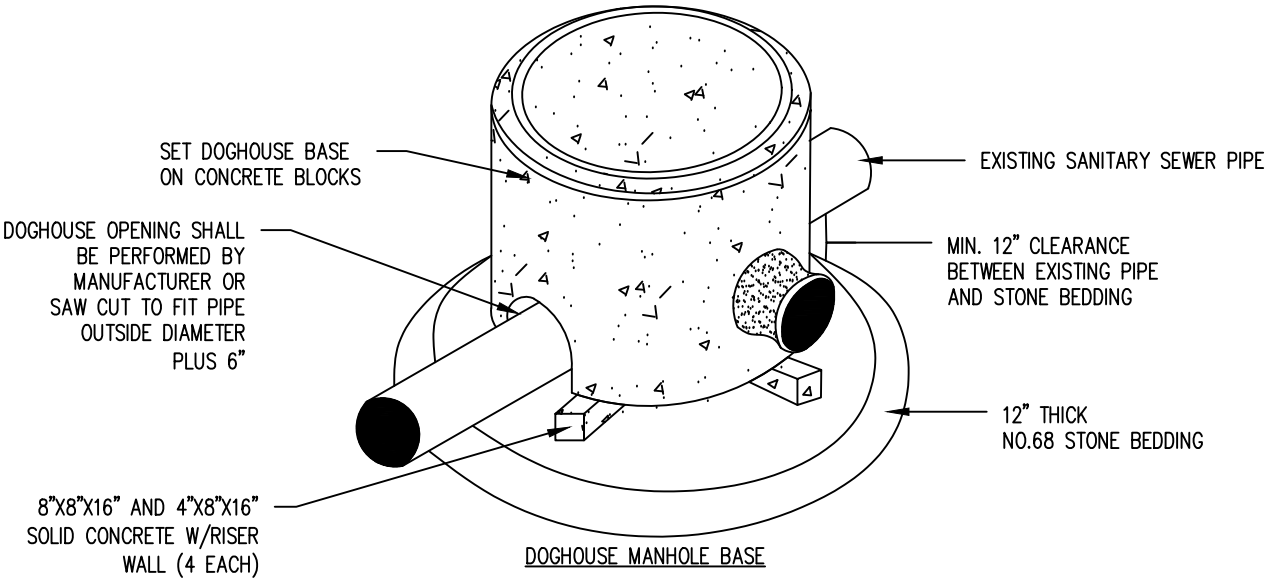
NTS

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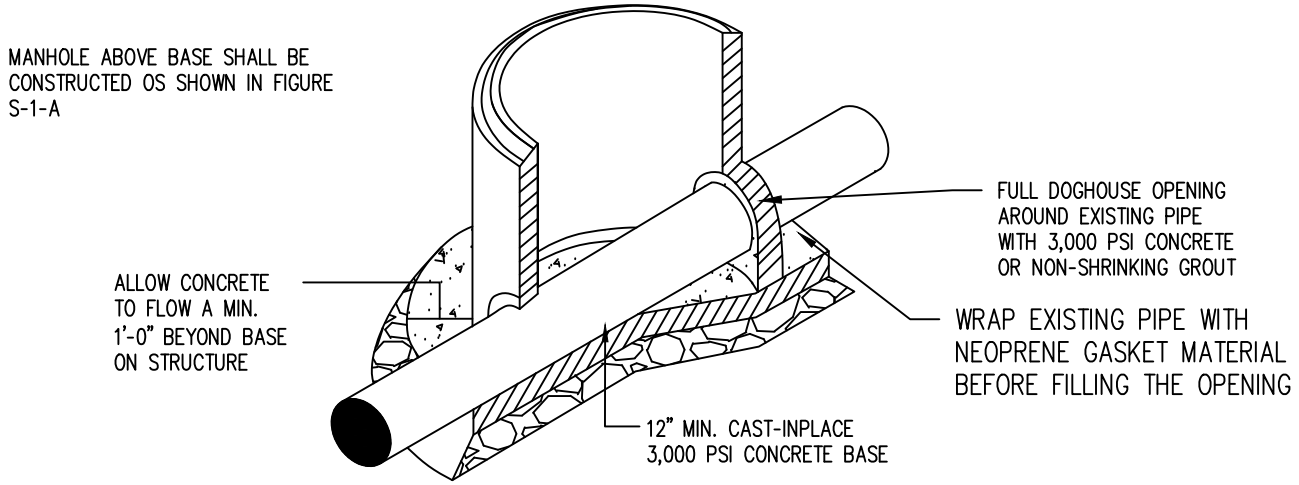
# MANHOLE BASE DOGHOUSE INSTALLATION

SLN

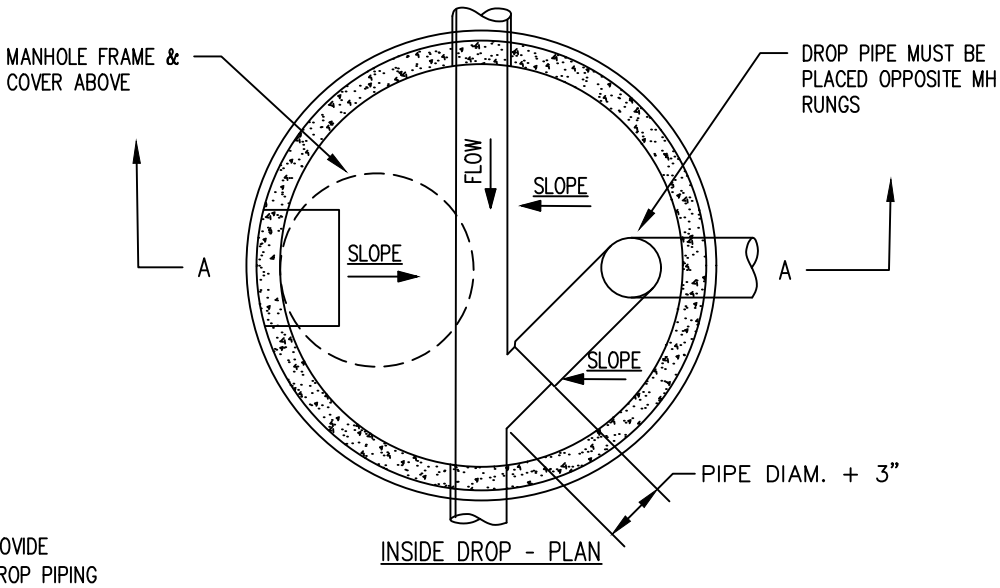
NTS




DOGHOUSE MANHOLE BASE

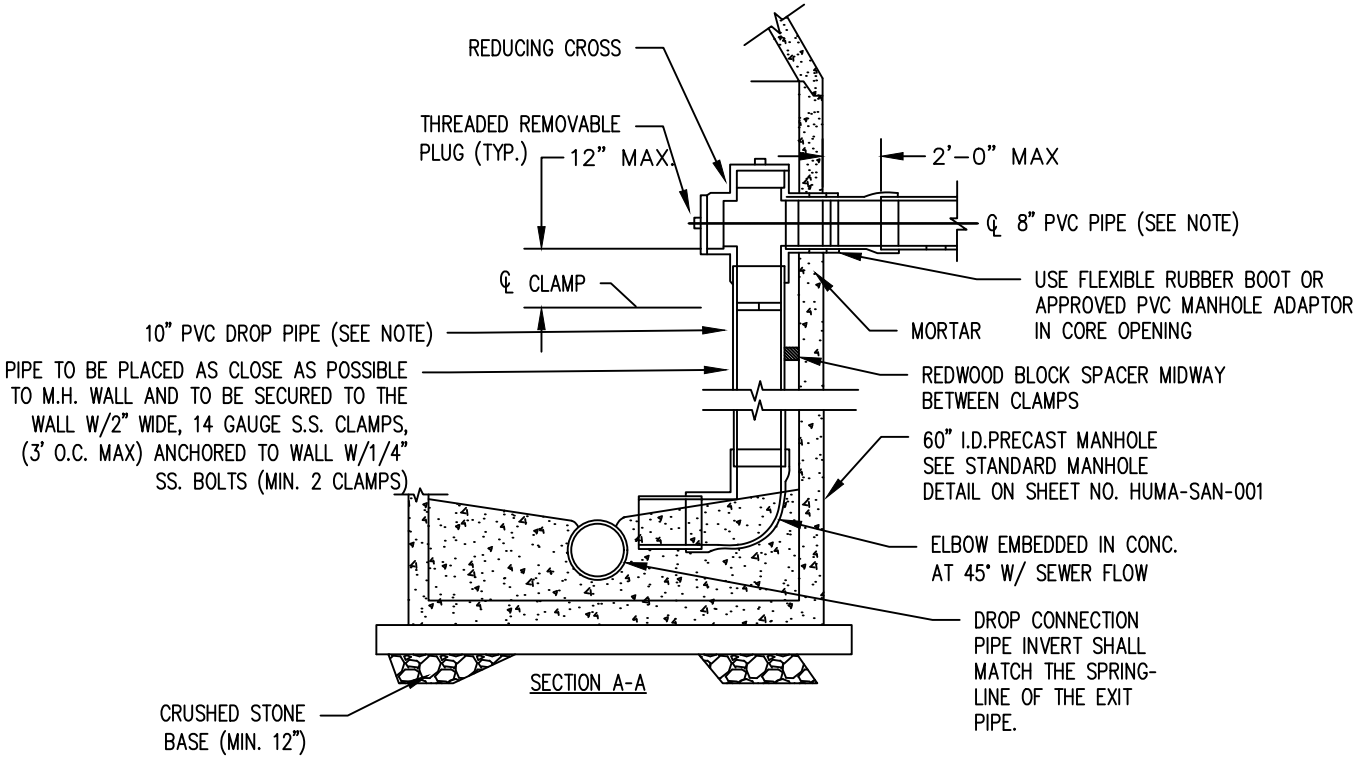



FOUNDATION SECTION VIEW




INSIDE DROP - PLAN

NOTES:
FOR 8" PVC PIPE PROVIDE
10" PVC INTERNAL DROP PIPING
12" PVC INTERNAL DROP PIPING

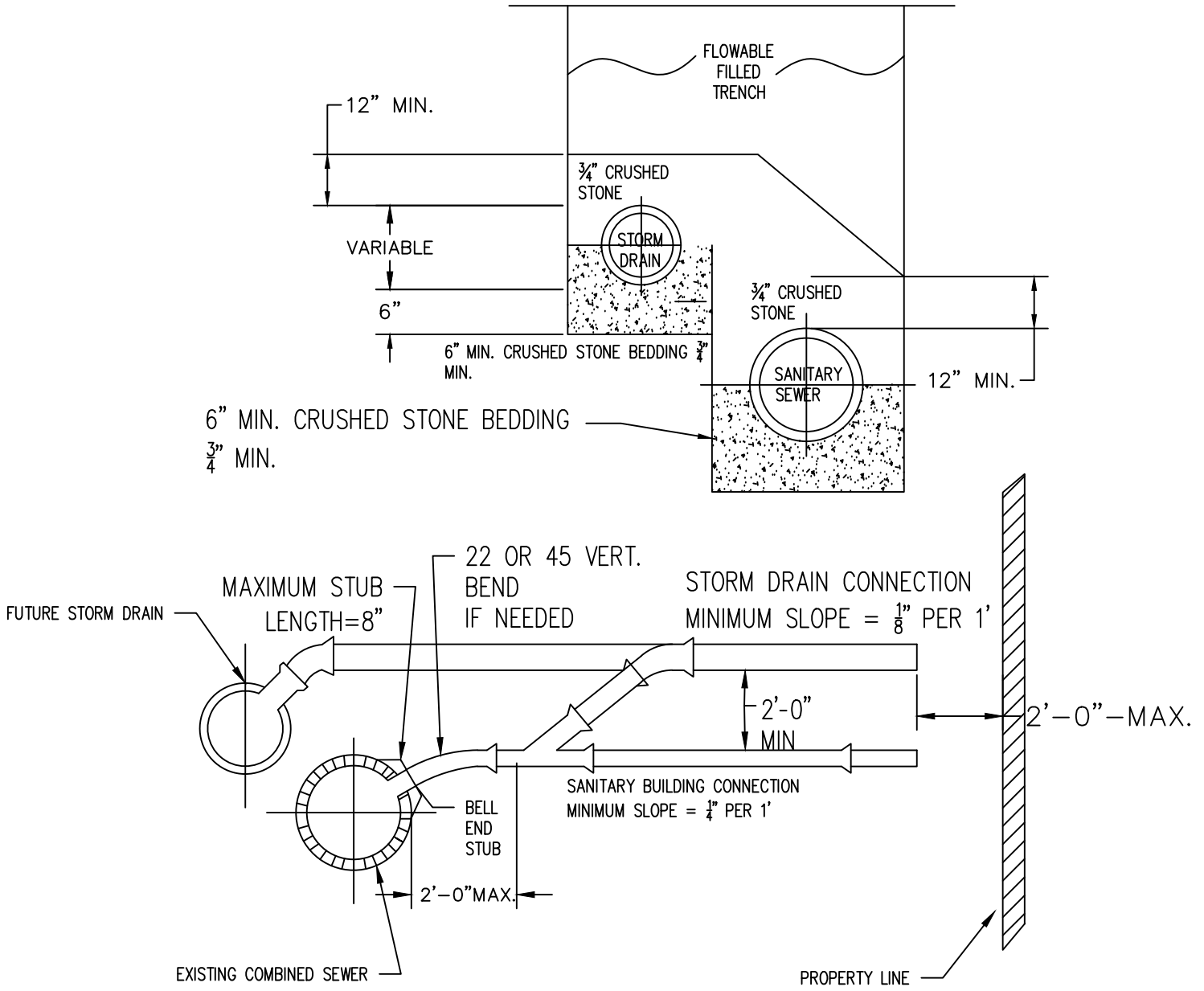



# INSIDE DROP MANHOLE DETAIL

NTS

# SEWER CONNECTION (DETAIL 1)

NTS

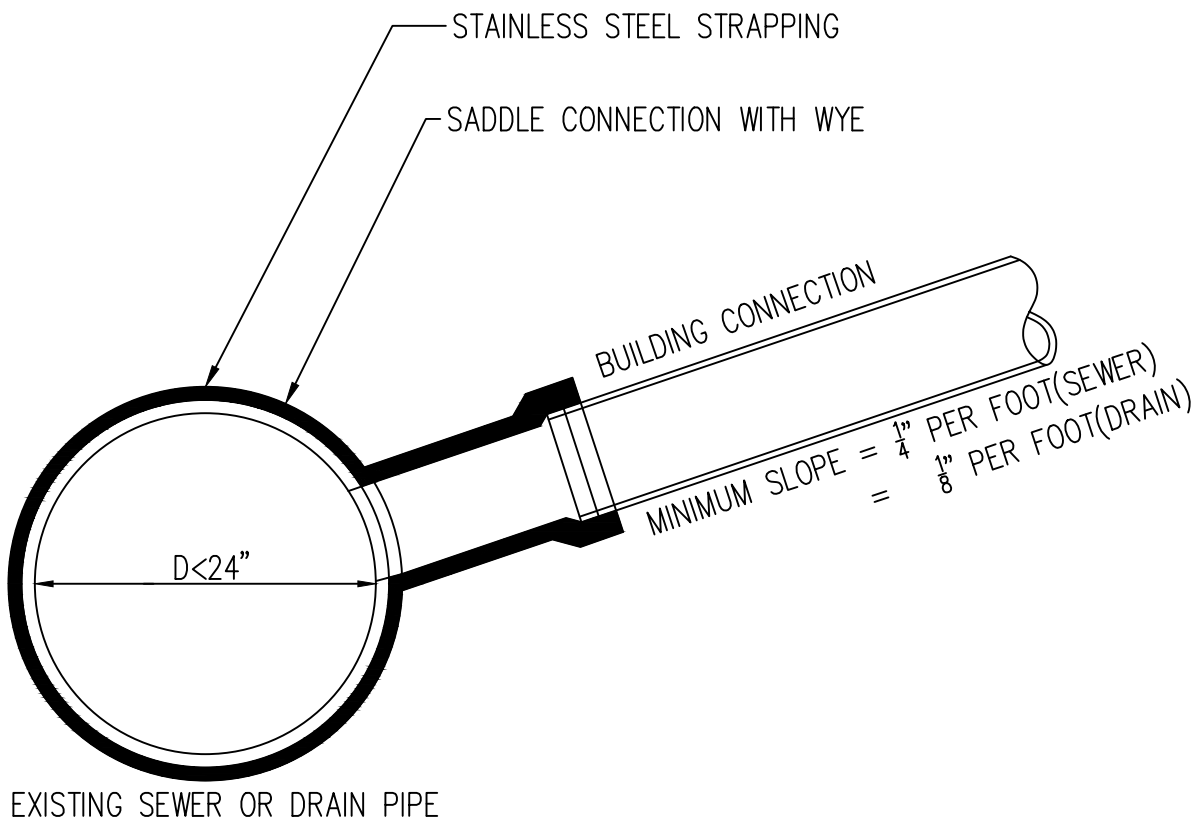



NOTES:

1. ENCASE SEWER IN CONCRETE ONLY IF UNABLE TO ATTACH SADDLE CONNECTION
2. CONNECTION TO CLAY, PVC, CONCRETE AND IRON PIPES SHALL BE MADE BY CORING EXISTING CONDUIT AS INDICATED BELOW OR BY USING AN APPROVED GASKET SADDLE

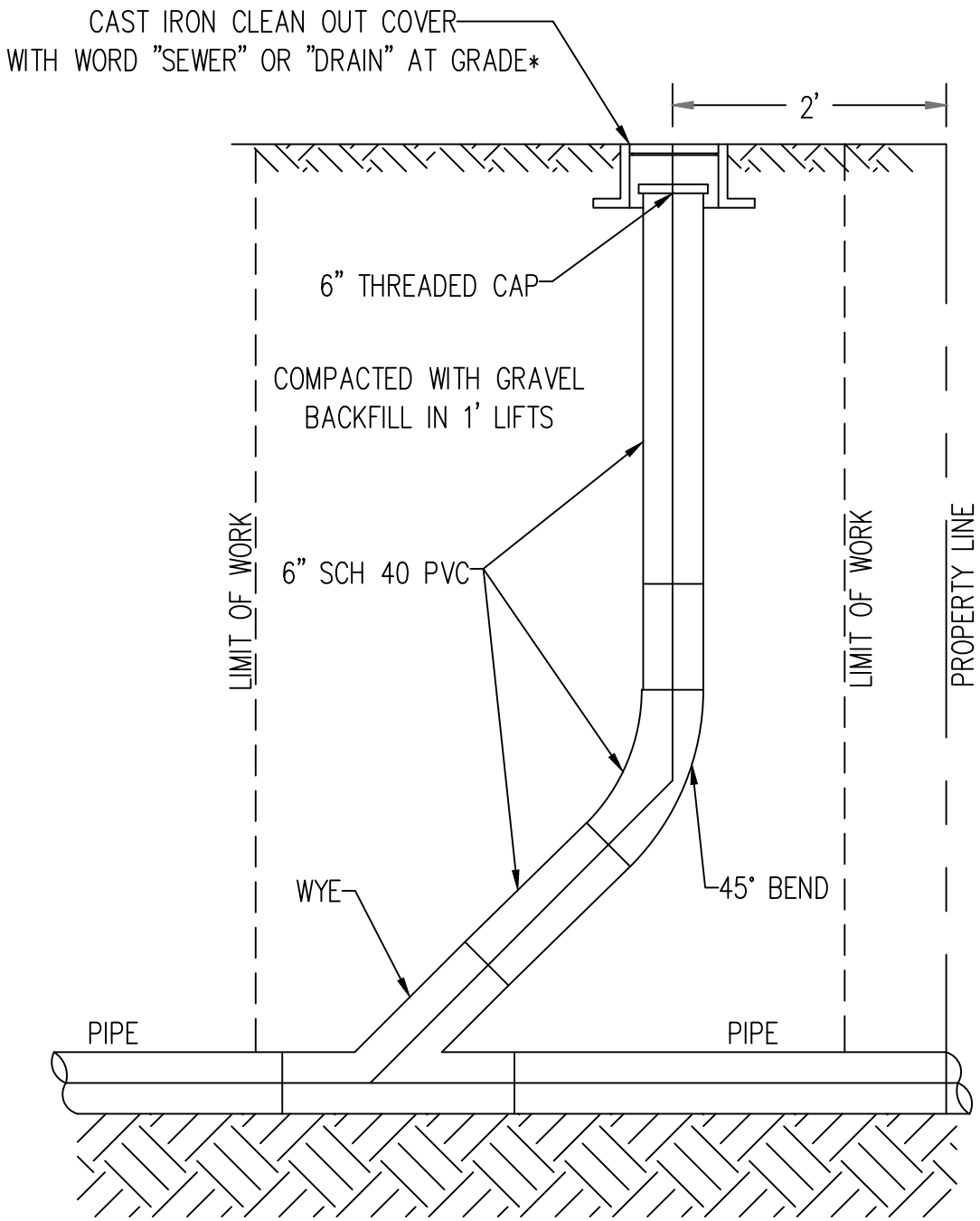
# SEWER CONNECTION (DETAIL 2)

NTS




NOTES:

1. FULL PVC OR IRON SADDLE MAY BE USED TO CONNECT TO EXISTING PVC, CLAY, CONCRETE, OR IRON PIPE
2. SADDLES MUST HAVE RUBBER GASKETS AND SHALL BE TIGHTENED WITH STRAPS. SADDLES WILL NOT BE CEMENTED ONTO THE PIPE
3. FULL WYE CONNECTION FITTINGS MAY BE USED
4. PIPE SHALL BE CORED TO CONFORM TO THE OPENING IN THE SADDLE
5. CONNECTIONS DIRECTLY INTO THE EXISTING PIPE WITHOUT A SADDLE OR A FULL WYE FITTING ARE NOT ALLOWED, UNLESS APPROVED BY THE CITY ENGINEER



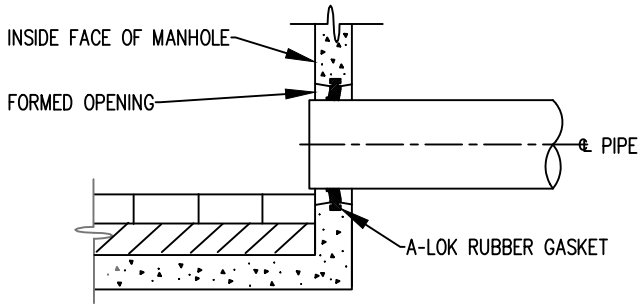

* All CASTINGS SHALL BE MADE IN THE USA

## SERVICE CLEAN OUT

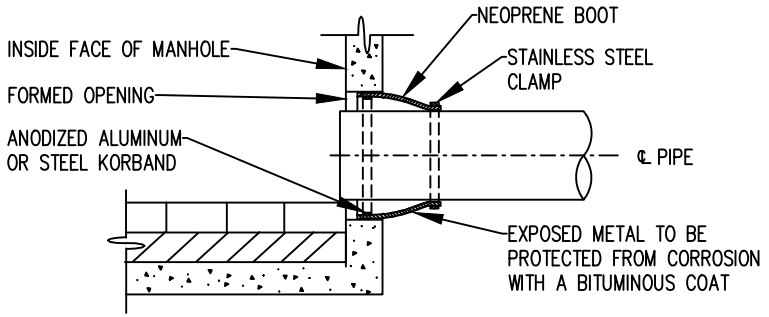
NTS

# SEWER LINE CONNECTIONS

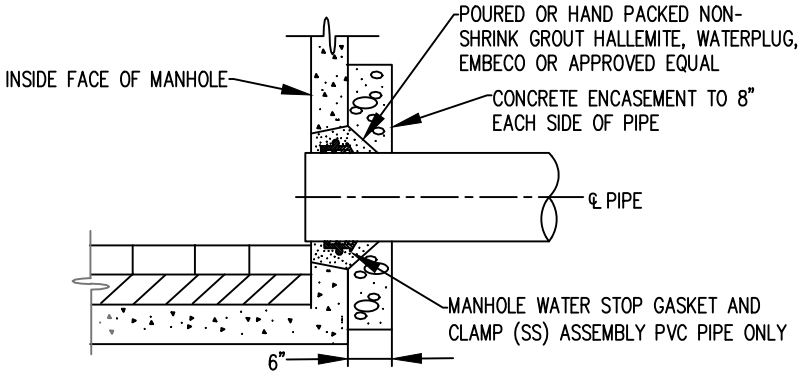
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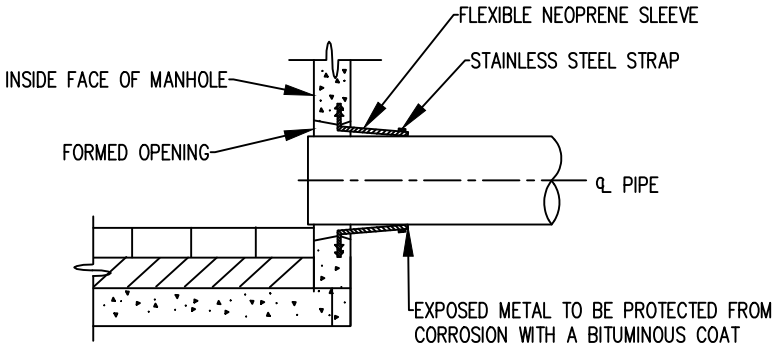

A-LOK SYSTEM




KOR-N-SEAL BOOT



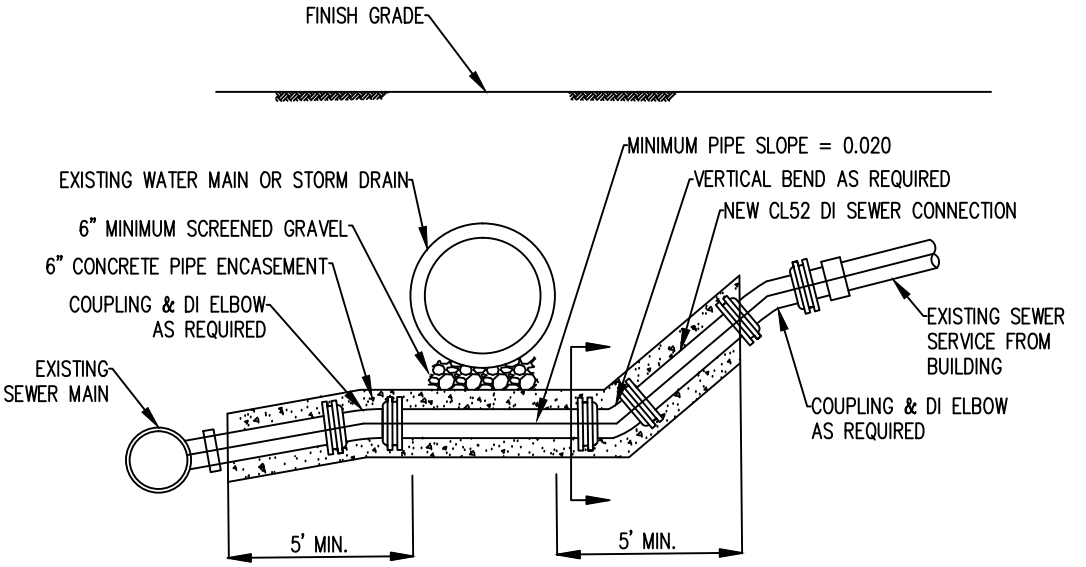

CONCRETE ENCASEMENT



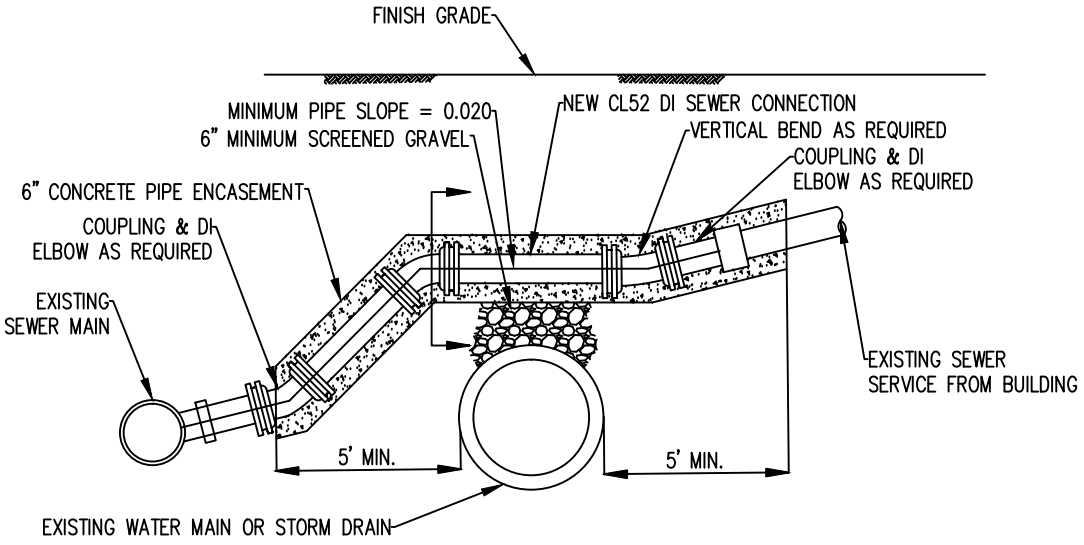

FLEXIBLE SLEEVE

# SEWER SERVICE CROSSING
## WATER MAIN OR STORM DRAIN

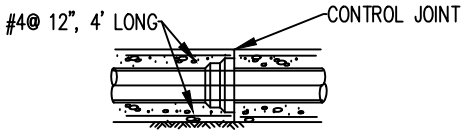
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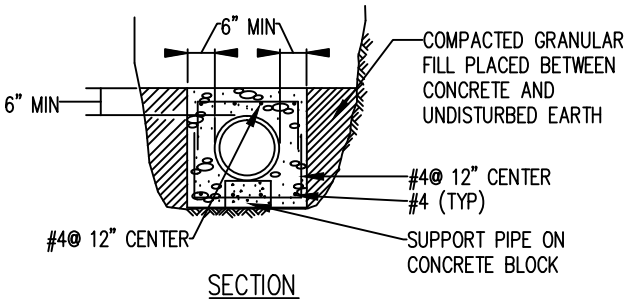

METHOD A




METHOD B



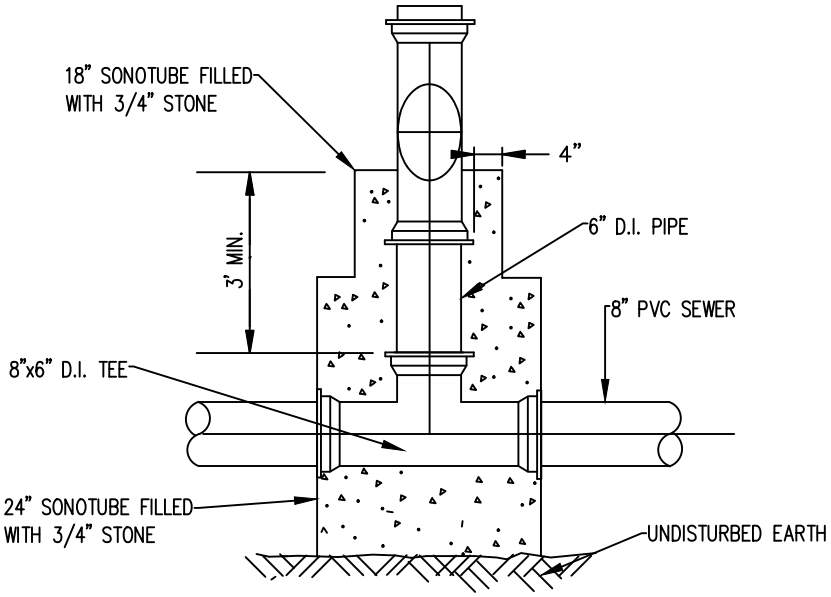

PLAN



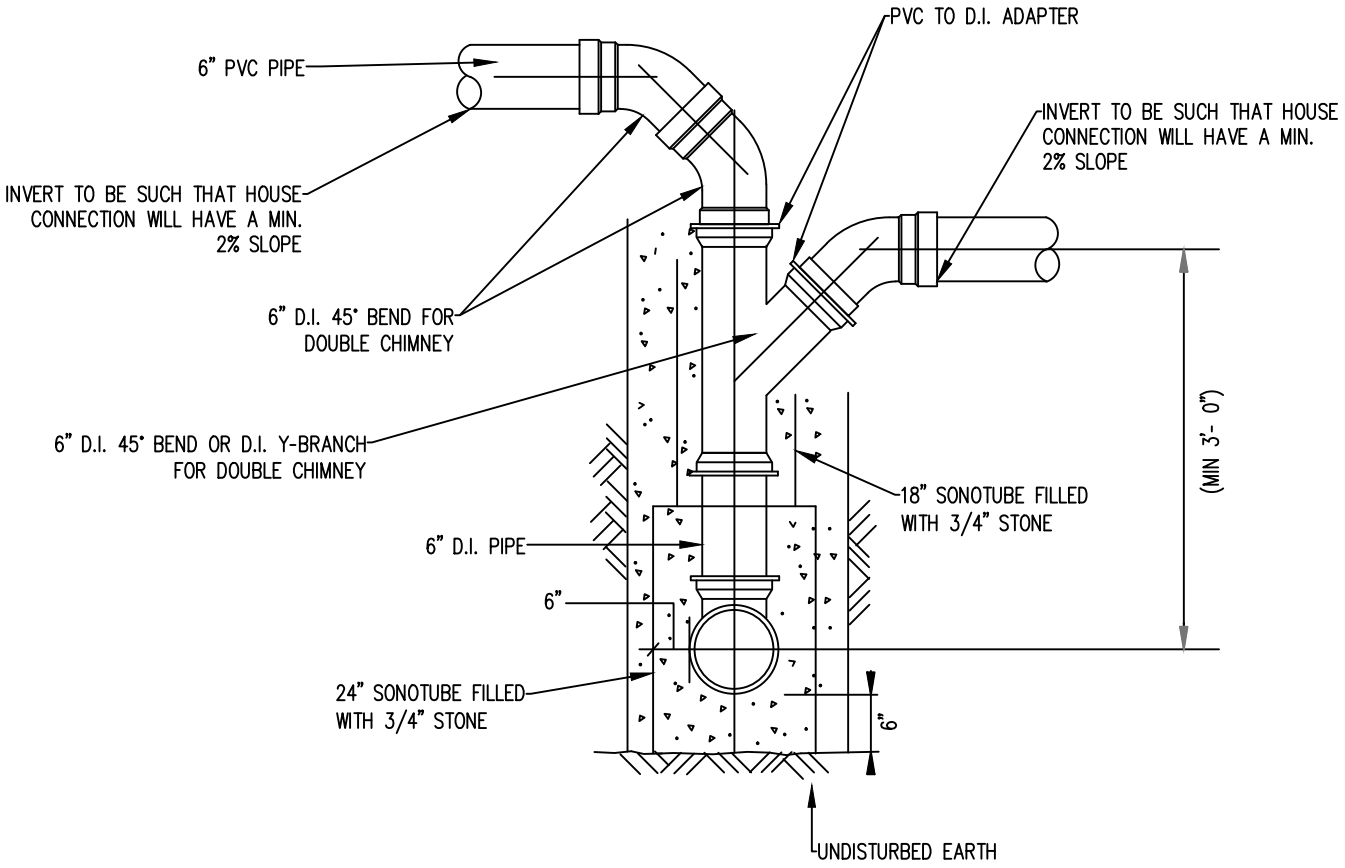

SECTION

NOTES:

1. CONTROL JOINTS AND PIPE JOINTS FOR ARCHES AND ENCASEMENT SHALL COINCIDE FOR SPACING. MAX. DISTANCE BETWEEN CONTROL JOINTS SHALL BE 24'.
2. REINFORCING STEEL TO BE USED ONLY WHEN DEPTH OF COVER TO TOP OF SURFACE OF CONCRETE IS 5'-0" OR LESS.
3. WHEN CONNECTING DI SERVICE CONNECTION TO NEW SEWER, INSTALL PVC WYE BRANCH AND 6" PVC NIPPLE PIECE (LENGTH AS REQUIRED). CONNECT 6" DI SEWER TO NIPPLE PIECE WITH COUPLING AS REQUIRED.
4. ENGINEER TO VERIFY CLASS OF PIPE. CLASS 52 IS THE MIN CLASS OF PIPE. PRICE CALCULATE TO OUNCE FOR REVIEW.




PLAN




SECTION

NOTES:
D.I. PIPE USED FOR CONSTRUCTION OF CHIMNEYS SHALL BE CLASS 52

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# CHIMNEY

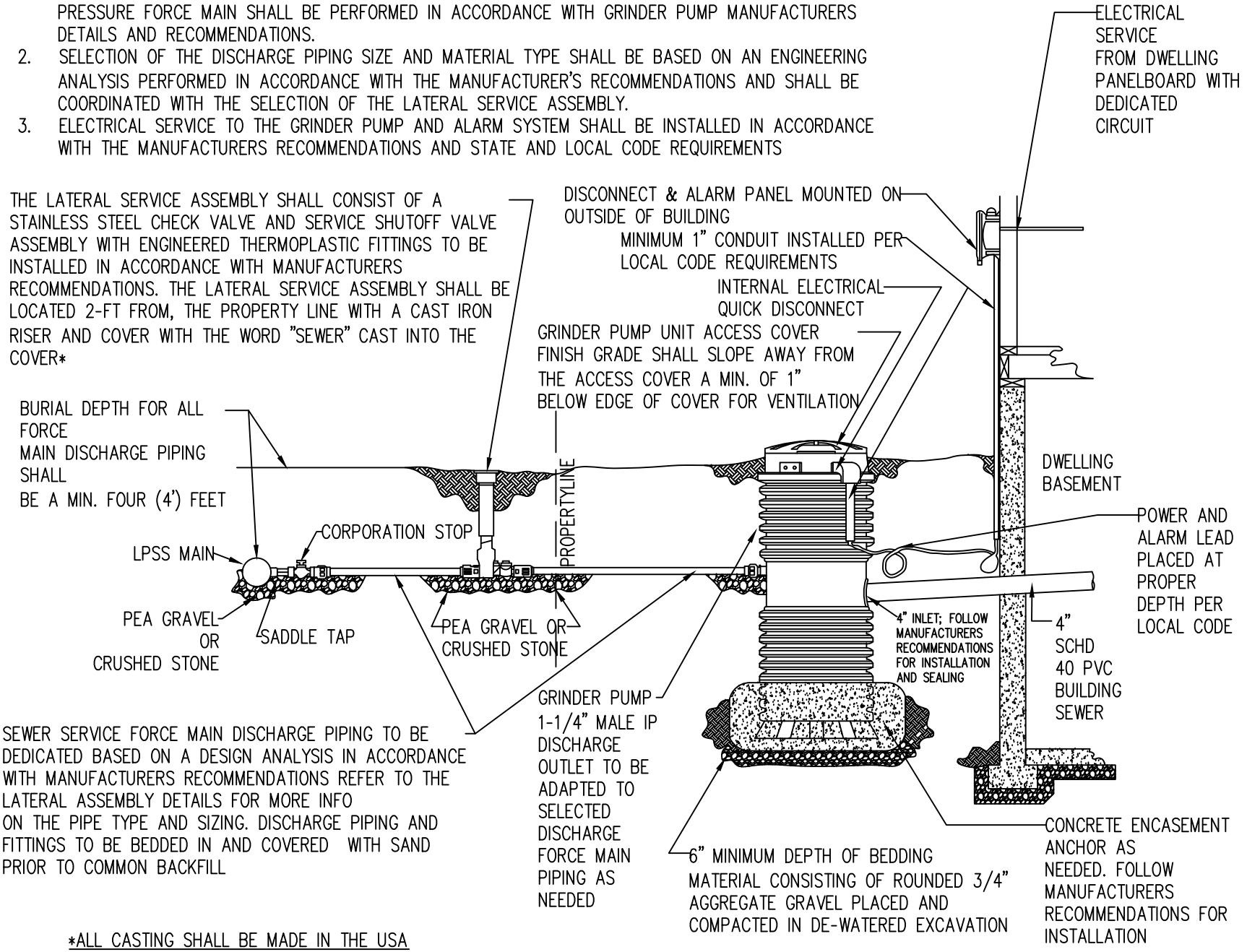
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# TYPICAL GRINDER PUMP AND LATERAL ASSEMBLY INSTALLATION

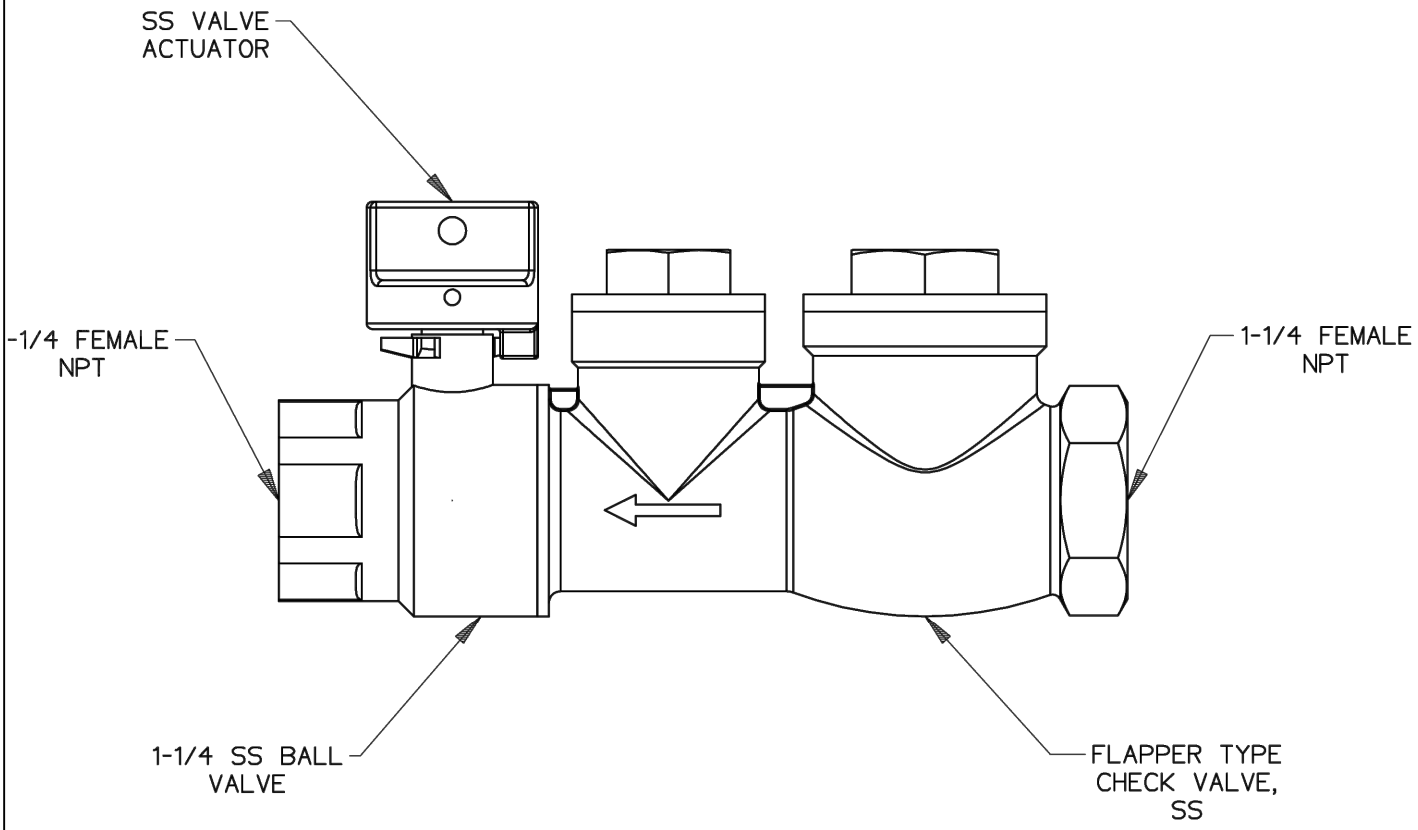
NTS

NOTES TO INSTALLER

1. ALL WORK ASSOCIATED WITH THE INSTALLATION OF THE GRINDER PUMP ELECTRICAL SERVICE, INLET SANITARY PIPING, DISCHARGE PIPING, LATERAL SERVICE ASSEMBLY, AND CONNECTION TO THE LOW PRESSURE FORCE MAIN SHALL BE PERFORMED IN ACCORDANCE WITH GRINDER PUMP MANUFACTURERS DETAILS AND RECOMMENDATIONS.
2. SELECTION OF THE DISCHARGE PIPING SIZE AND MATERIAL TYPE SHALL BE BASED ON AN ENGINEERING ANALYSIS PERFORMED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND SHALL BE COORDINATED WITH THE SELECTION OF THE LATERAL SERVICE ASSEMBLY.
3. ELECTRICAL SERVICE TO THE GRINDER PUMP AND ALARM SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND STATE AND LOCAL CODE REQUIREMENTS




*ALL CASTING SHALL BE MADE IN THE USA




PART IS A BALL VALVE CURB STOP WITH FEMALE PIPE THREADS,
VALVE POSITION STOPS (OPEN/CLOSED), AND INTEGRAL CHECK VALVE
MATERIAL: STAINLESS STEEL

PRESSURE RATING: 235 PSI

TO ORDER SS LATERAL, NO FITTINGS
USE PART NUMBER NB0184P01

NOTES:

1. FOR SS FITTING INTO SS THREAD, USE PIPE DOPE OR TEFLON TAPE, NOT BOTH
2. FOR PLASTIC FITTINGS INTO SS THREAD, USE BOTH PIPE DOPE AND 2 LAYERS OF TEFLON TAPE

| SGS | DN | 09/20/11 | A | 3/16 |
|---|---|---|---|---|
| DR BY | CHK'D | DATE | ISSUE | SCALE |

eone SEWER SYSTEMS

STAINLESS STEEL LATERAL ASSEMBLY
NO FITTINGS

NA0330P05

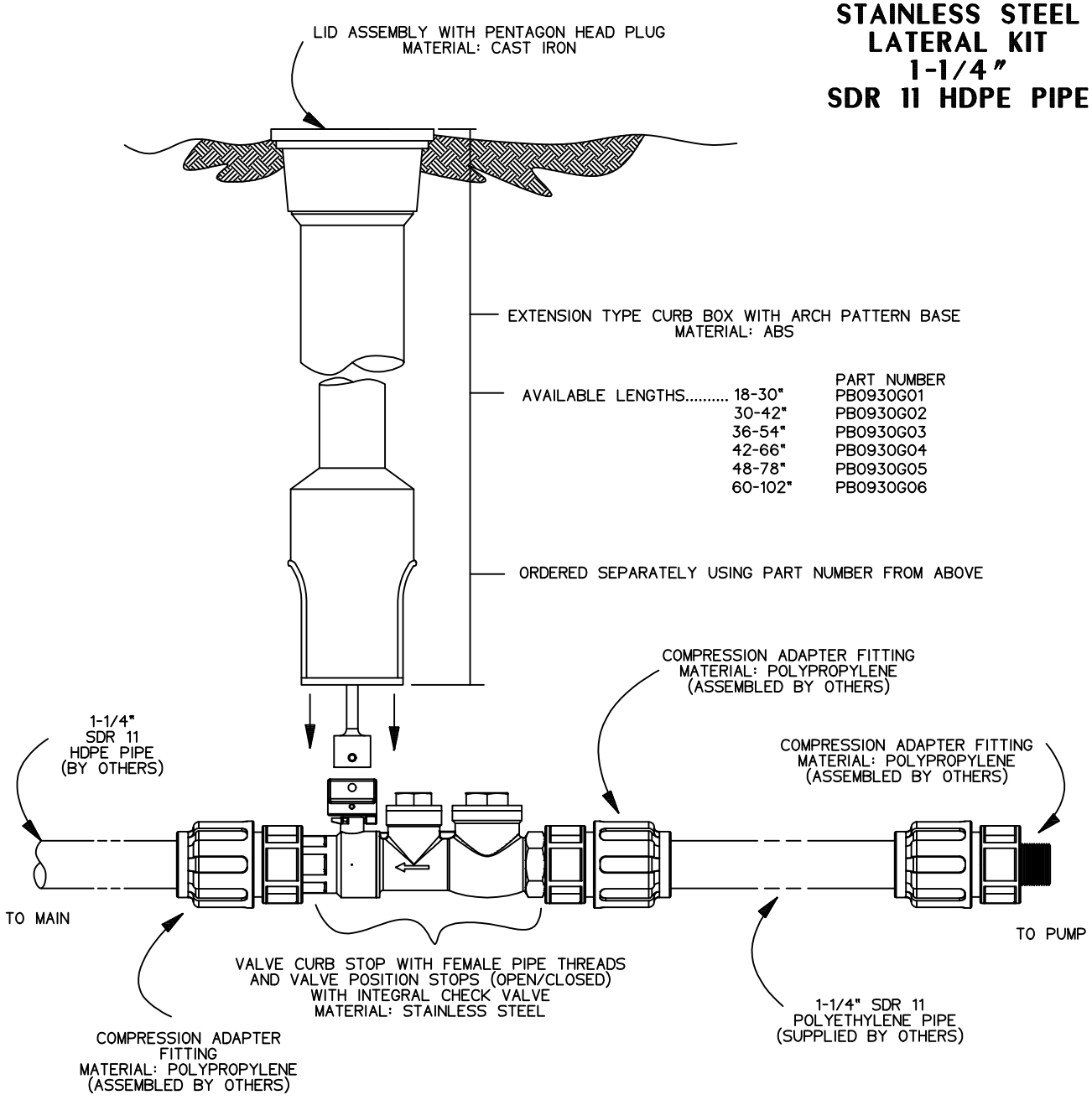
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**STAINLESS STEEL LATERAL ASSEMBLY**

**NO FITTINGS**

NTS

# STAINLESS STEEL LATERAL KIT 1-1/4" SDR 11 HDPE PIPE




NOTES:

1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY OTHERS
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
   *FOR SS FITTING INTO SS THREAD, USE PIPE DOPE OR TEFLON TAPE, NOT BOTH
3. ASSEMBLY IS TO BE PRESSURE TESTED (BY OTHERS)
4. ASSEMBLY IS TO BE USED WITH SDR11 HDPE PIPE
5. TO ORDER SS LATERAL KIT, USE PART NUMBER NC0193G01
6. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

KIT PARTS ARE NOT ASSEMBLED

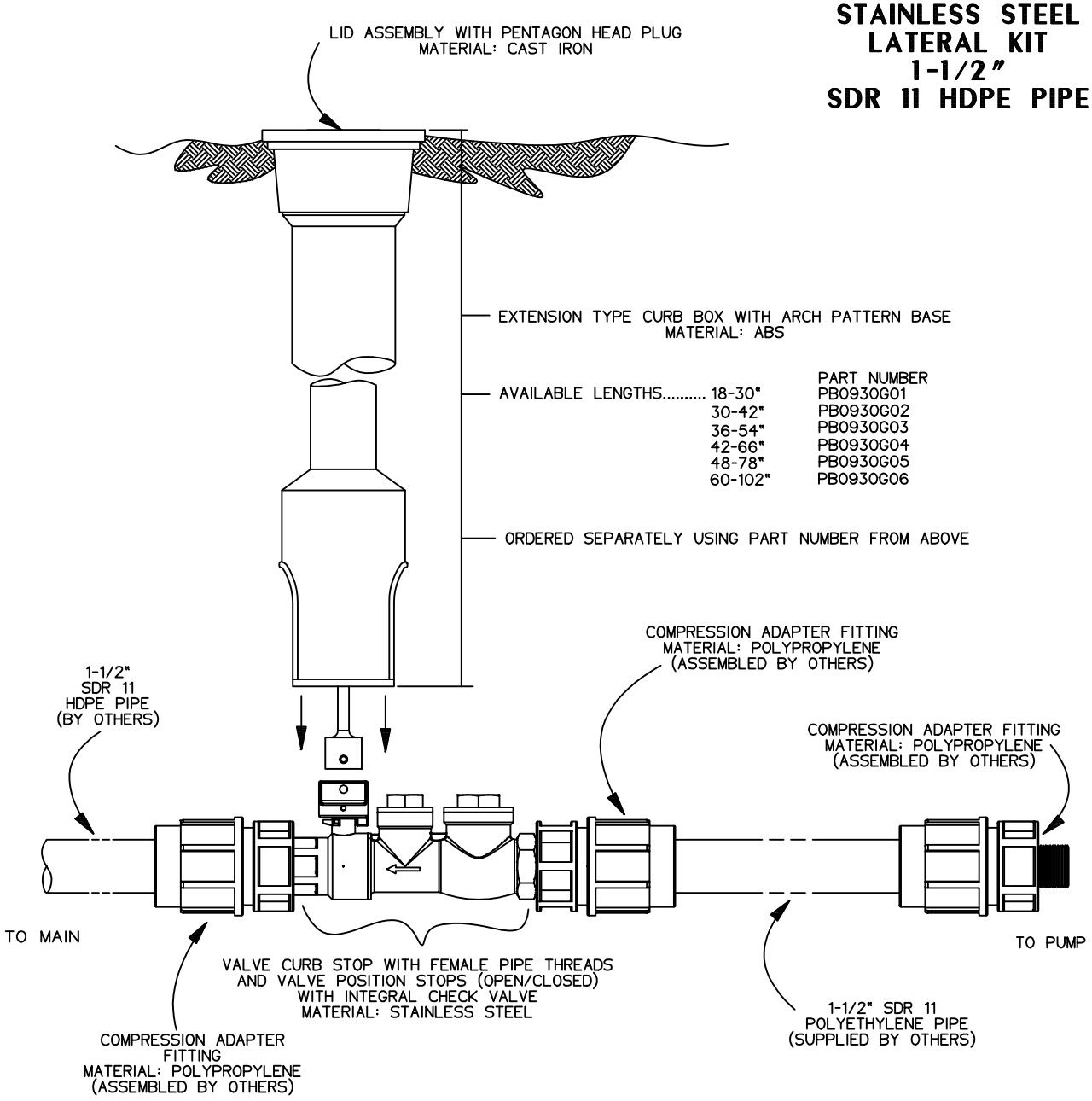
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| DR BY | CHK'D | DATE | ISSUE | SCALE |

SEWER SYSTEMS

STAINLESS STEEL LATERAL KIT
1-1/4" SDR 11 HDPE PIPE

NA0330P02

# STAINLESS STEEL LATERAL KIT 1-1/2" SDR 11 HDPE PIPE




NOTES:

1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY OTHERS
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
   *FOR SS FITTING INTO SS THREAD, USE EITHER PIPE DOPE OR TEFLON TAPE, NOT BOTH
3. ASSEMBLY IS TO BE PRESSURE TESTED (BY OTHERS)
4. ASSEMBLY IS TO BE USED WITH SDR11 HDPE PIPE
5. TO ORDER SS LATERAL KIT, USE PART NUMBER NC0193G02
6. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

KIT PARTS ARE NOT ASSEMBLED

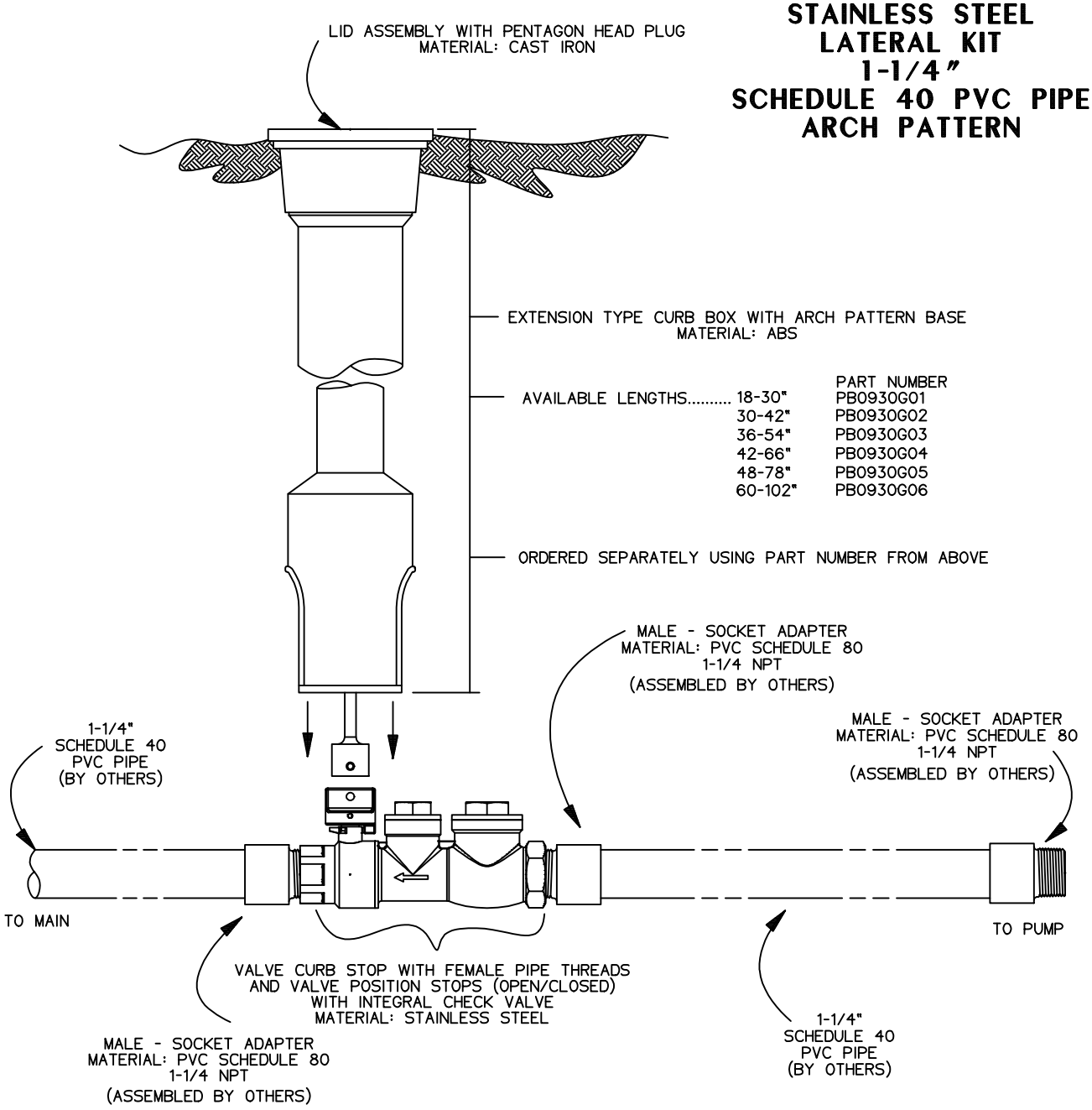
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| DR BY | CHK'D | DATE | ISSUE | SCALE |

SEWER SYSTEMS

STAINLESS STEEL LATERAL KIT
1-1/2" SDR 11 HDPE PIPE

NA0330P03

# STAINLESS STEEL LATERAL KIT 1-1/4" SCHEDULE 40 PVC PIPE ARCH PATTERN




NOTES:

1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY OTHERS
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
   *FOR SS FITTING INTO SS THREAD, USE EITHER PIPE DOPE OR TEFLON TAPE, NOT BOTH
3. ASSEMBLY IS TO BE PRESSURE TESTED (BY OTHERS)
4. ASSEMBLY IS TO BE USED WITH SCHEDULE 40 PVC PIPE
5. TO ORDER SS LATERAL KIT, USE PART NUMBER NC0193G03
6. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

KIT PARTS ARE NOT ASSEMBLED

| SGS | DN | 11/02/11 | C | 3/16 |
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| DR BY | CHK'D | DATE | ISSUE | SCALE |

eone SEWER SYSTEMS

STAINLESS STEEL LATERAL KIT
1-1/4" SCHEDULE 40 PIPE

NA0330P04

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## STAINLESS STEEL LATERAL KIT
## 1-1/4" ARCH PATTERN

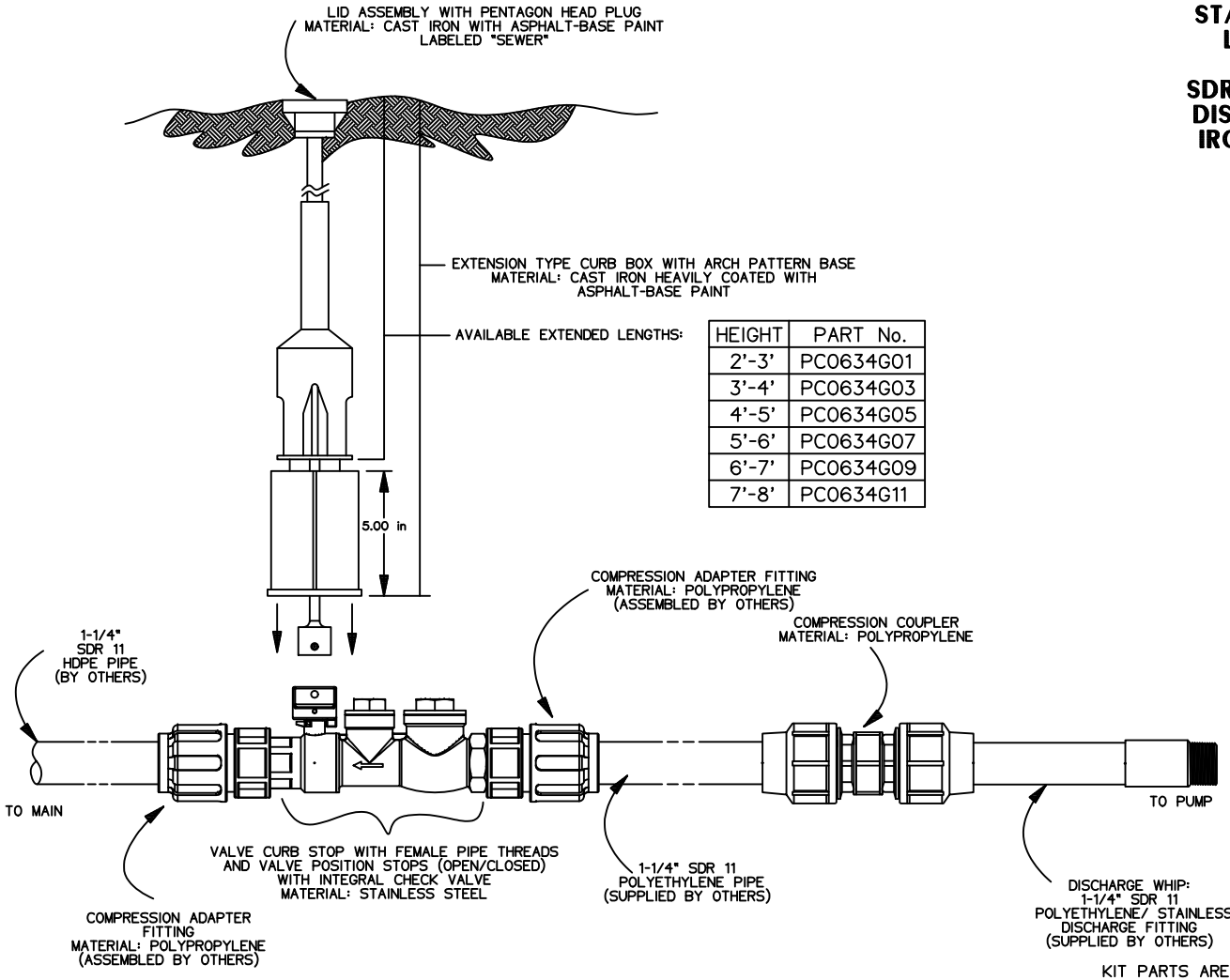
NTS

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STAINLESS STEEL LATERAL KIT
1-1/4" SDR 11 HDPE PIPE
NTS

50

# STAINLESS STEEL LATERAL KIT 1-1/4" SDR 11 HDPE PIPE DISCHARGE WHIP IRON CURB BOX




| HEIGHT | PART No. |
|---|---|
| 2'-3' | PC0634G01 |
| 3'-4' | PC0634G03 |
| 4'-5' | PC0634G05 |
| 5'-6' | PC0634G07 |
| 6'-7' | PC0634G09 |
| 7'-8' | PC0634G11 |

NOTES:

1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY OTHERS
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
3. ASSEMBLY IS TO BE PRESSURE TESTED (BY OTHERS)
4. ASSEMBLY IS TO BE USED WITH SDR11 HDPE PIPE
5. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | NA0184P01 | VALVE ASM,LAT,SS,1-1/4 NPT |
| 2 | 2 | PA1365P01 | ADAPTER, MALE,1-1/4"NPT X 1-1/4" SDR11 |
| 3 | 1 | PA1836P05 | DISCHARGE WHIP, 1-1/4" SS NPT X 1-1/4 PE |
| 4 | 1 | PA1864P02 | COMPRESSION COUPLING, 1-1/4" X 1-1/4" |

KIT PARTS ARE NOT ASSEMBLED

| SGS | DN | 02/18/14 | 1 | 3/16 |
|---|---|---|---|---|
| DR BY | CHK'D | DATE | ISSUE | SCALE |

e one
SEWER SYSTEMS

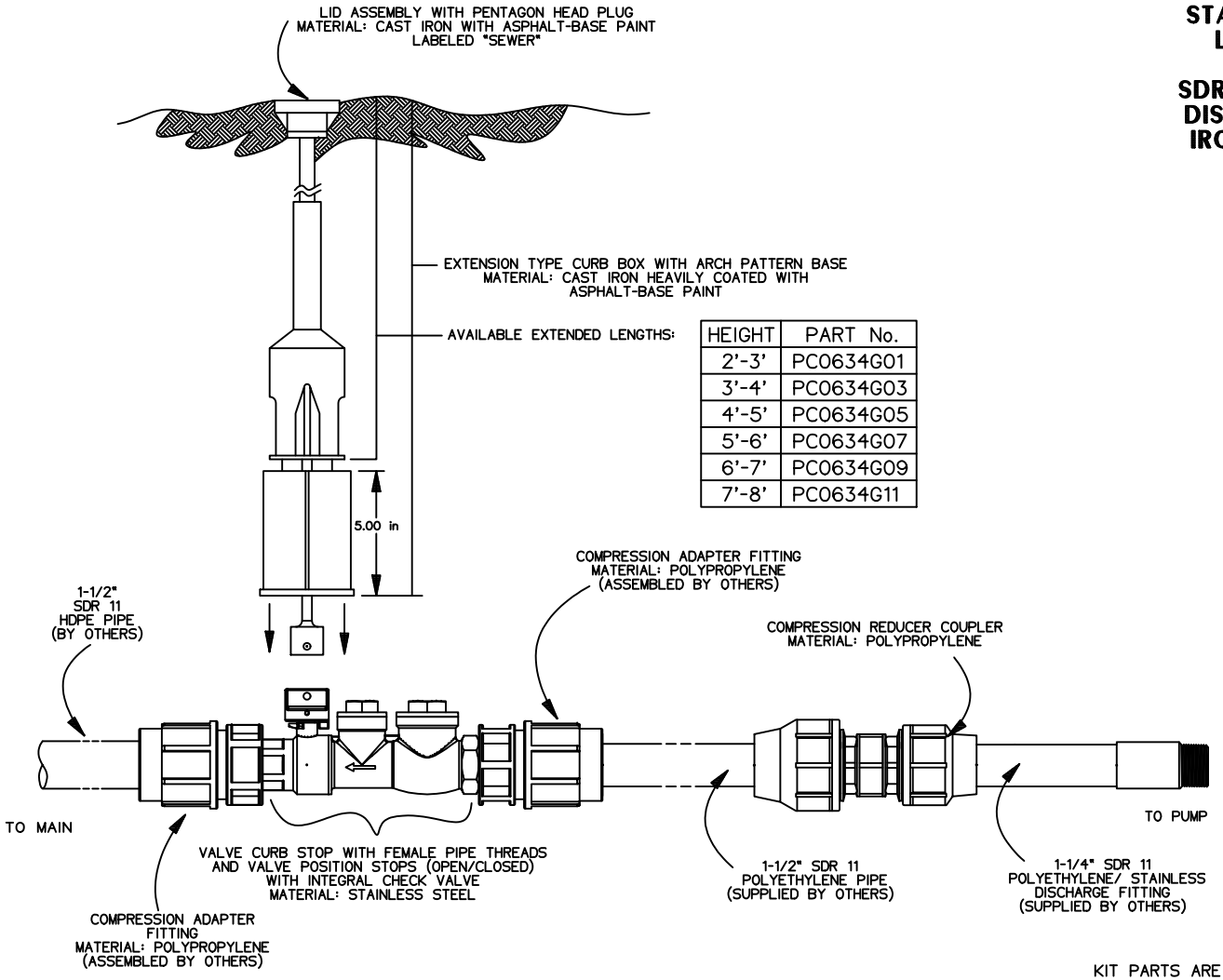
STAINLESS STEEL LATERAL KIT
1-1/4", DISCH WHIP, COUPLING

ESD 14-0020

lighting the way
new bedford

STAINLESS STEEL LATERAL KIT
1-1/2" SDR 11 HDPE PIPE
NTS

# STAINLESS STEEL LATERAL KIT 1-1/2" SDR 11 HDPE PIPE DISCHARGE WHIP IRON CURB BOX




| HEIGHT | PART No. |
|---|---|
| 2'-3' | PC0634G01 |
| 3'-4' | PC0634G03 |
| 4'-5' | PC0634G05 |
| 5'-6' | PC0634G07 |
| 6'-7' | PC0634G09 |
| 7'-8' | PC0634G11 |

NOTES:

1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY OTHERS
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
3. ASSEMBLY IS TO BE PRESSURE TESTED (BY OTHERS)
4. ASSEMBLY IS TO BE USED WITH SDR11 HDPE PIPE
5. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | NA0184P01 | VALVE ASM,LAT,SS,1-1/4 NPT |
| 2 | 2 | PA1365P03 | ADAPTER, MALE,1-1/4"NPT X 1-1/2" SDR11 |
| 3 | 1 | PA1836P05 | DISCHARGE WHIP, 1-1/4" SS NPT X 1-1/4 PE |
| 4 | 1 | PA1864P01 | COMPRESSION COUPLING, 1-1/2" X 1-1/4" |

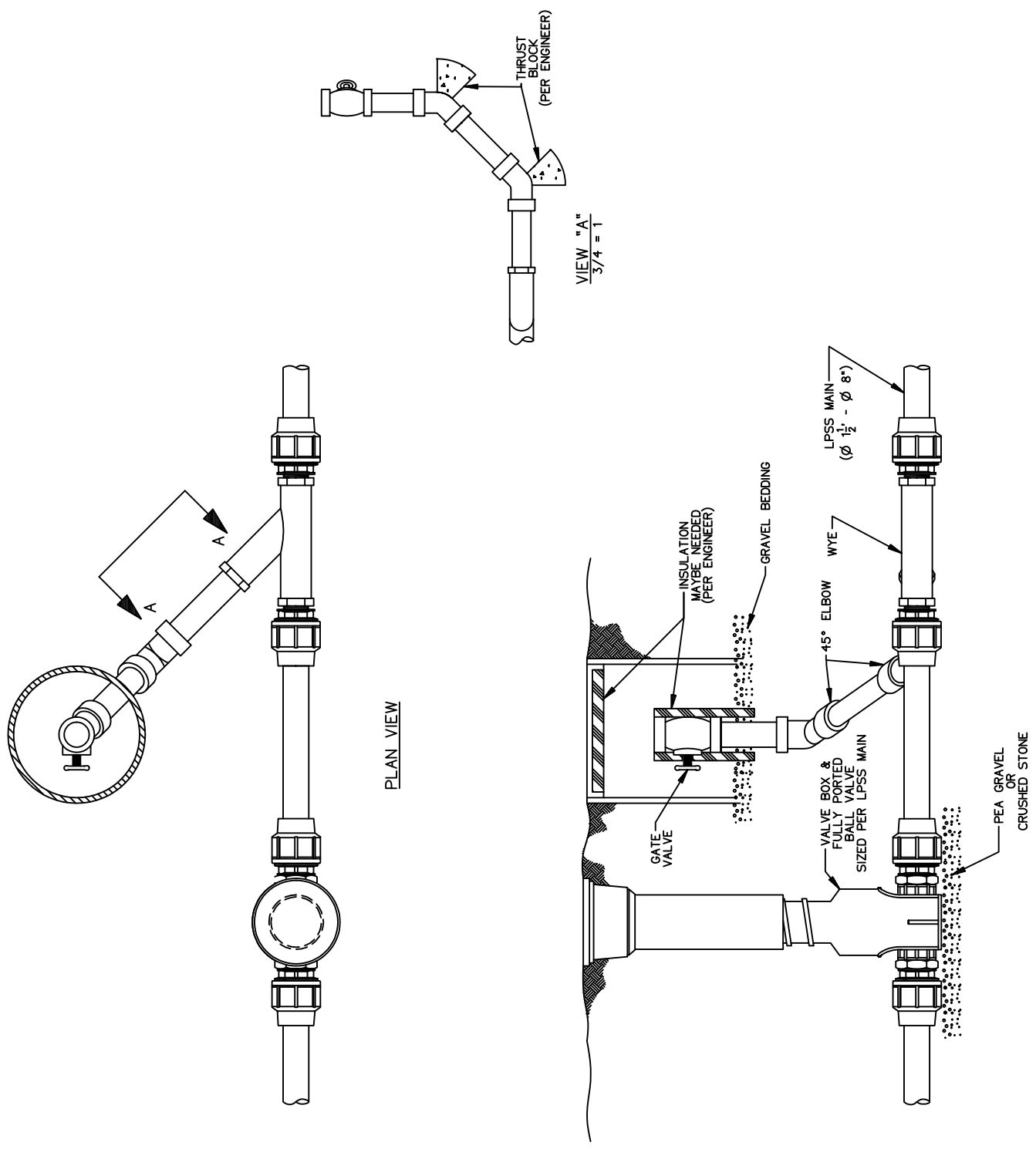
KIT PARTS ARE NOT ASSEMBLED

| SGS | DN | 08/19/13 | 1 | 3/16 |
|---|---|---|---|---|
| DR BY | CHK'D | DATE | ISSUE | SCALE |

eone
SEWER SYSTEMS

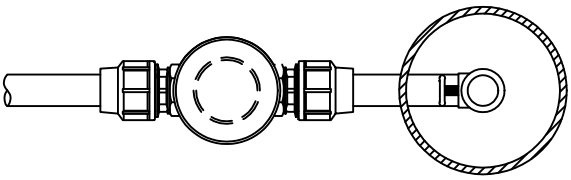
STAINLESS STEEL LATERAL KIT
1-1/2", DISCH WHIP, COUPLING

ESD 13-0091

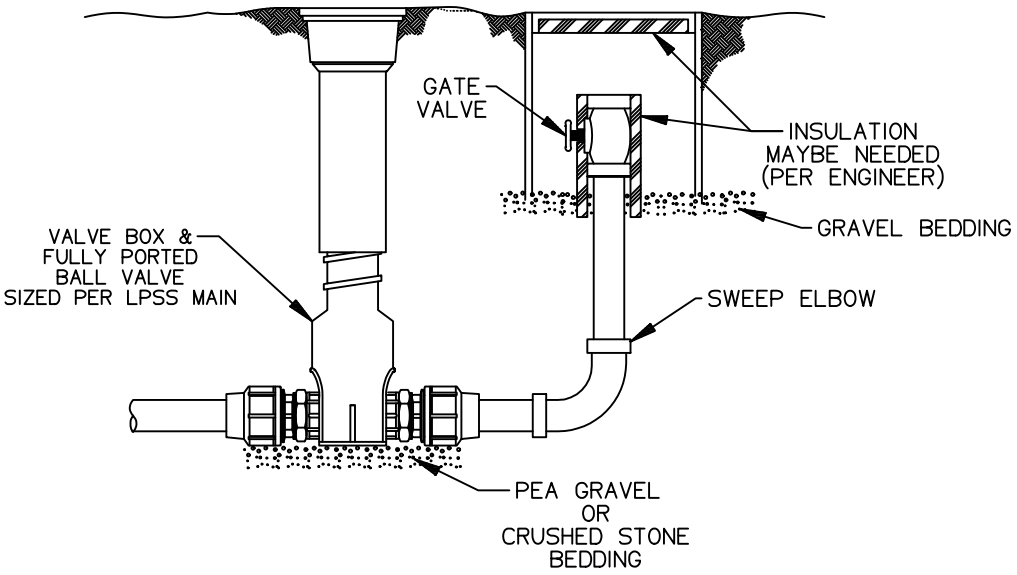



## TYPICAL FLUSHING CONNECTION ON LPSS MAIN

NTS



PLAN VIEW




# TYPICAL TERMINAL FLUSHING CONNECTION

| SGS | | 05-13-10 | 1 | 1/32 |
|---|---|---|---|---|
| DR BY | CHK'D | DATE | ISSUE | SCALE |

eone SEWER SYSTEMS

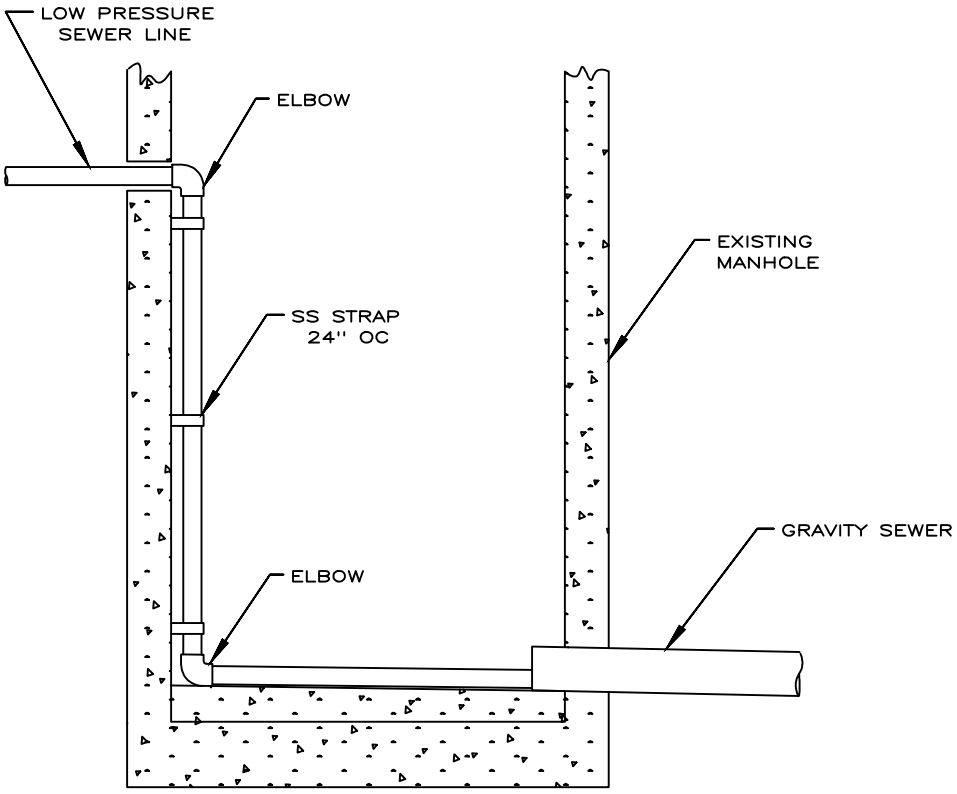
TYPICAL TERMINAL
FLUSHING CONNECTION

ESD 10-0094

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**TYPICAL FLUSHING CONNECTION ON LPSS MAIN**

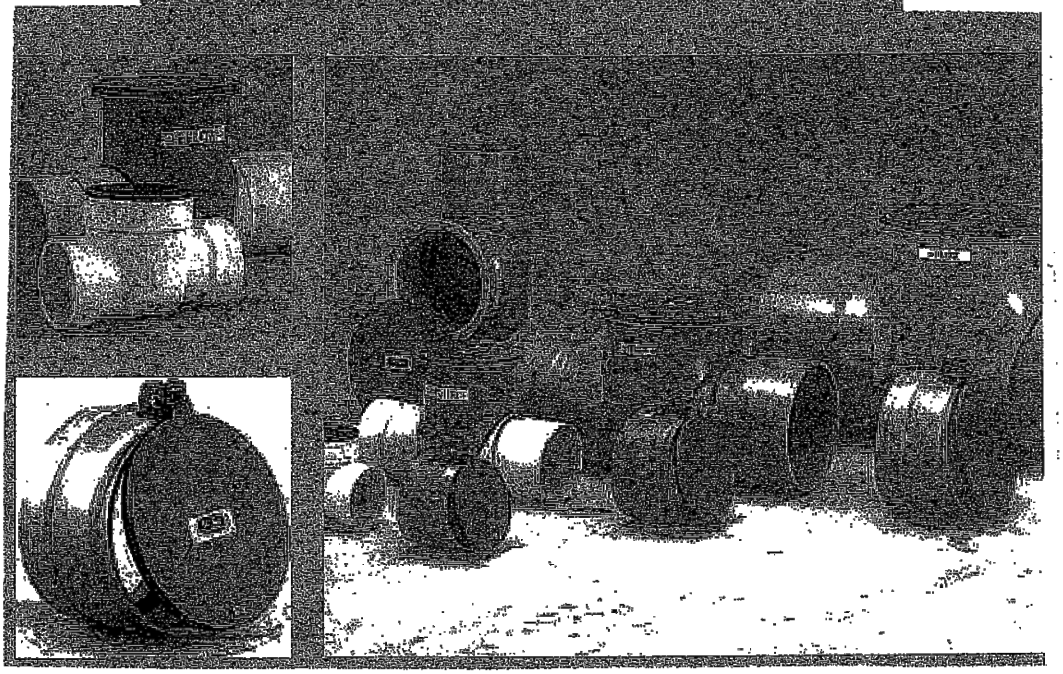
NTS



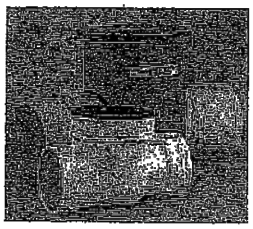

## TYPICAL DROP CONNECTION
## LPSS IN EXISTING MANHOLE

NTS

# Backwater Valves
# & Terminal Backwater Valves

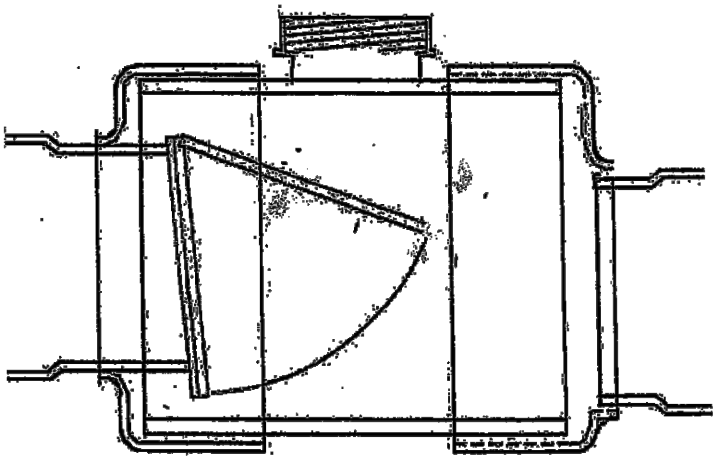


**In Line Backwater Valve** - *with Solvent Weld Sewer Hubs*



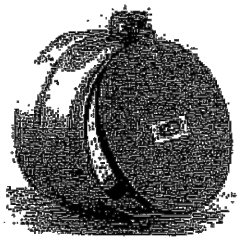
| | |
|---|---|
| 79ABWV04 | 79ABWV06 |
| 79ABWV08 | 79ABWV10 |
| 79ABWV12 | 79ABWV15 |
| 79ABWV18 | 79ABWV21 |
| 79ABWV24 | 79ABWV27 |
| 79ABWV30 | 79ABWV36 |

**Also available in:**
Sewer Gasket Bells
IPS Gasket Bells
IPS Solvent Weld Hubs
CIOD Gasket Bells



SDR35 PVC

**Terminal Backwater Valve** - *with Sewer Gasket Bell*



| | |
|---|---|
| 79ATBWV04G | 79ATBWV06G |
| 79ATBWV08G | 79ATBWV10G |
| 79ATBWV12G | 79ATBWV15G |
| 79ATBWV18G | 79ATBWV21G |
| 79ATBWV24G | 79ATBWV27G |
| 79ATBWV30G | 79ATBWV36G |

**Also available in:**
Sewer Gasket Bells
IPS Gasket Bells
IPS Solvent Weld Hubs
CIOD Gasket Bells

PLASTIC TRENDS .COM
ROYAL Building Products
56400 Mound Road, Shelby Township, MI 48316
Phone (586)781-2700 Fax (586)781-0888

PRINTED COPIES ARE FOR REFERENCE ONLY

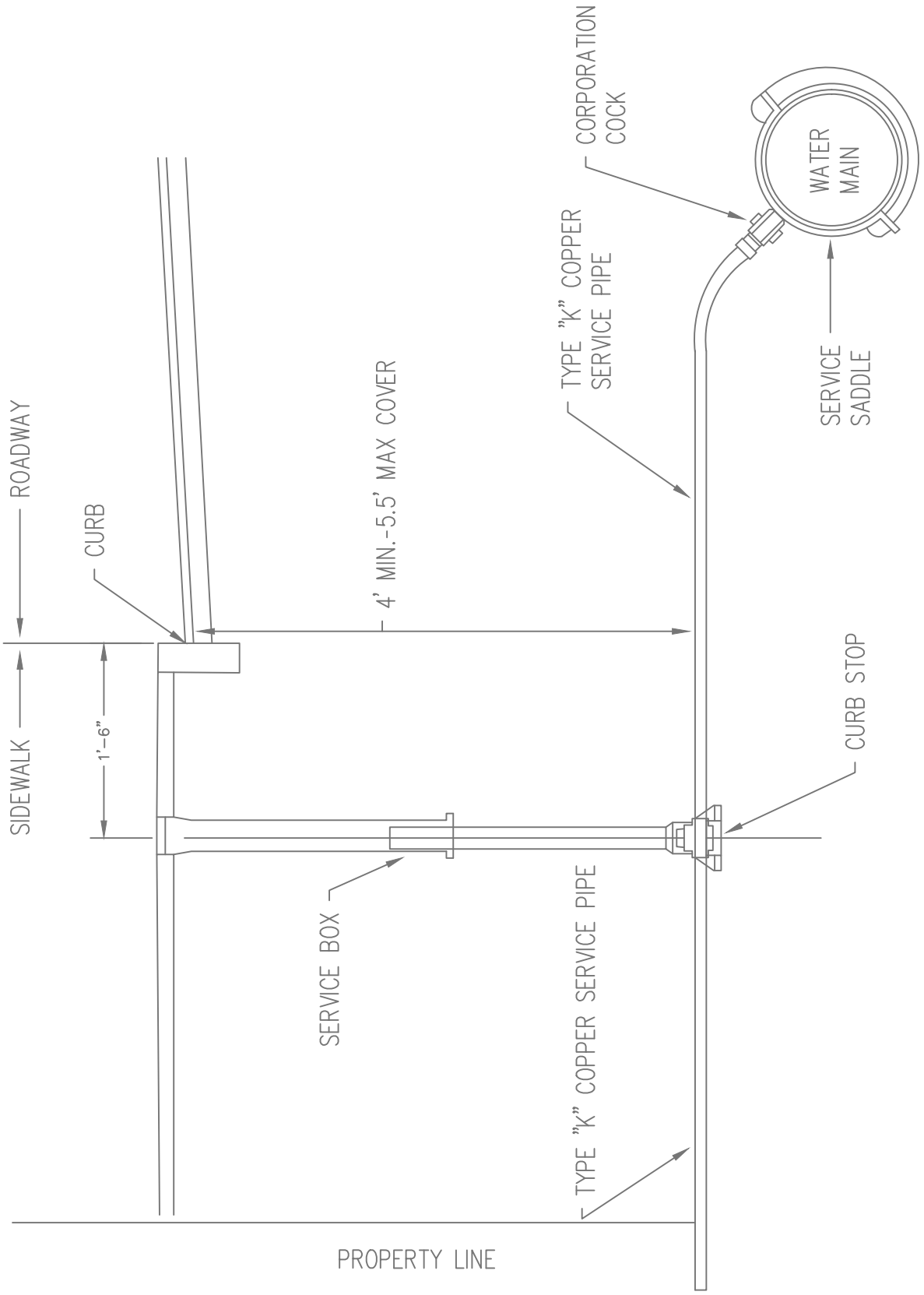
OR

EQUAL

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**BACKWATER VALVES**

NTS




## WATER SERVICE DETAIL

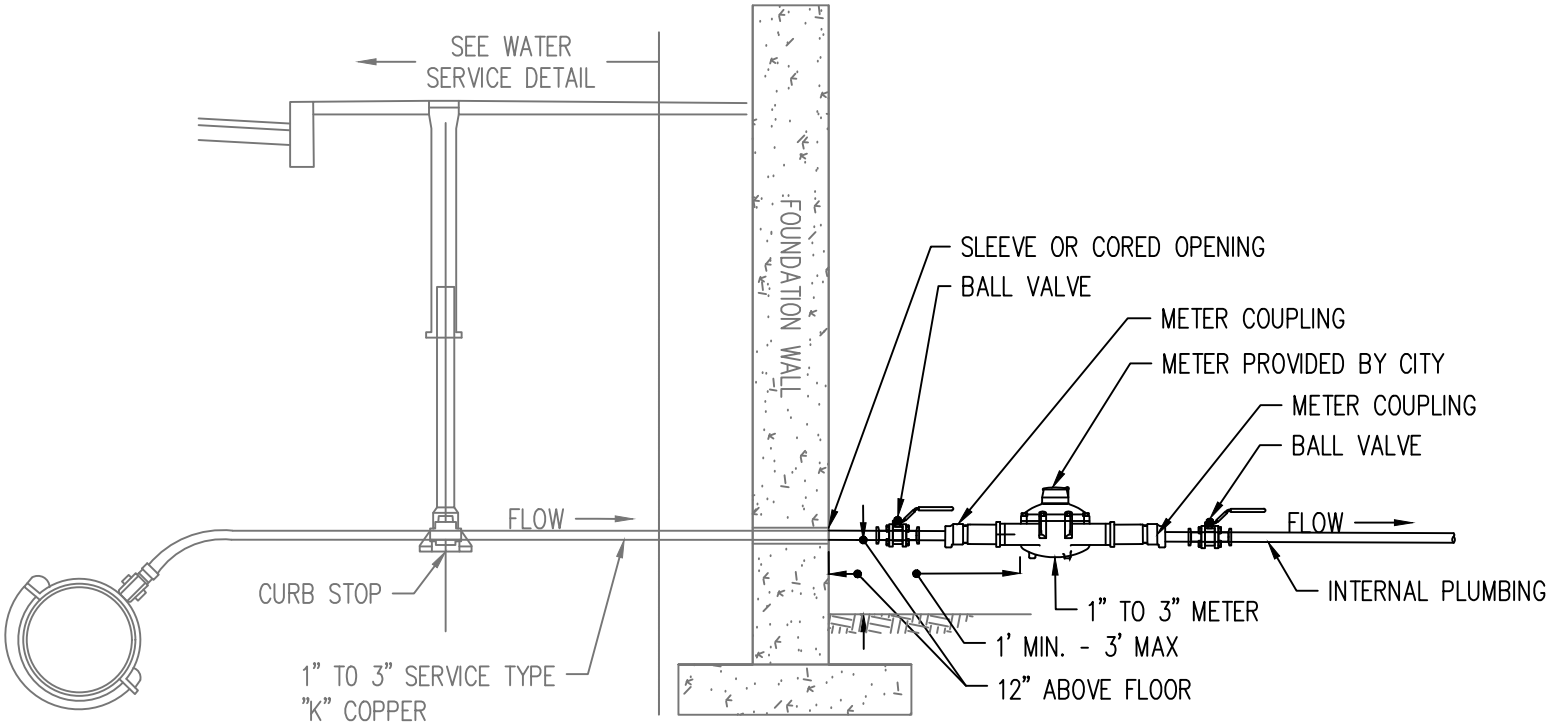
NTS

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# STANDARD WATER METER INSTALLATION

## 1" TO 3" SERVICE SIZE

NTS



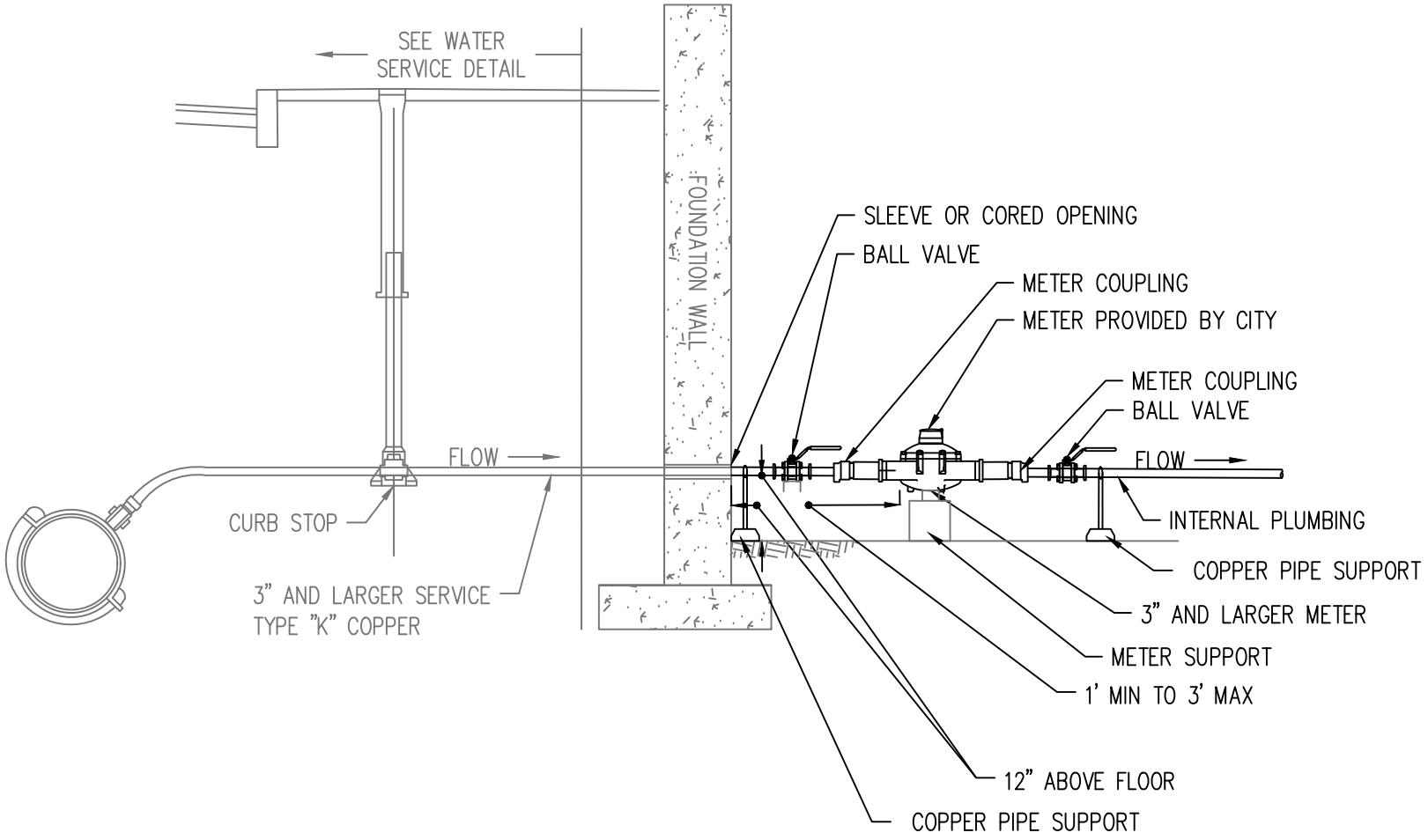

NOTES:

1. METER TO BE FURNISHED AND INSTALLED BY CITY. CITY WILL PROGRAM MIU.
2. METER SHALL BE SET IN THE HORIZONTAL POSITION.
3. DOMESTIC WATER METER SHALL BE 1", UNLESS OTHERWISE APPROVED BY THE CITY.
4. METER SHALL BE LOCATED IN ACCESSIBLE LOCATION AND AT THE POINT WHERE THE WATER SERVICE ENTERS THE STRUCTURE.
5. MANTAIN 12" FROM THE FLOOR, UNLESS OTHERWISE APPROVED BY THE OWNER.
6. CONNECTIONS PRIOR TO THE OUTLET SHUTOFF VALVE ARE PROHIBITED.
7. ALL FITTINGS AND VALVES THROUGH THE OUTLET SHUTOFF VALVE SHALL BE A BRASS OR BRONZE BODY. SOLDERING JOINTS ARE PROHIBITED. LEAD FITTINGS AND VALVES ARE PROHIBITED.
8. ELECTRICAL GROUND CLAMPS ARE NOT PERMITTED ON METER SET-UP OR PLUMBING.

# STANDARD WATER METER INSTALLATION

## 3" AND LARGER SERVICE SIZE

NTS



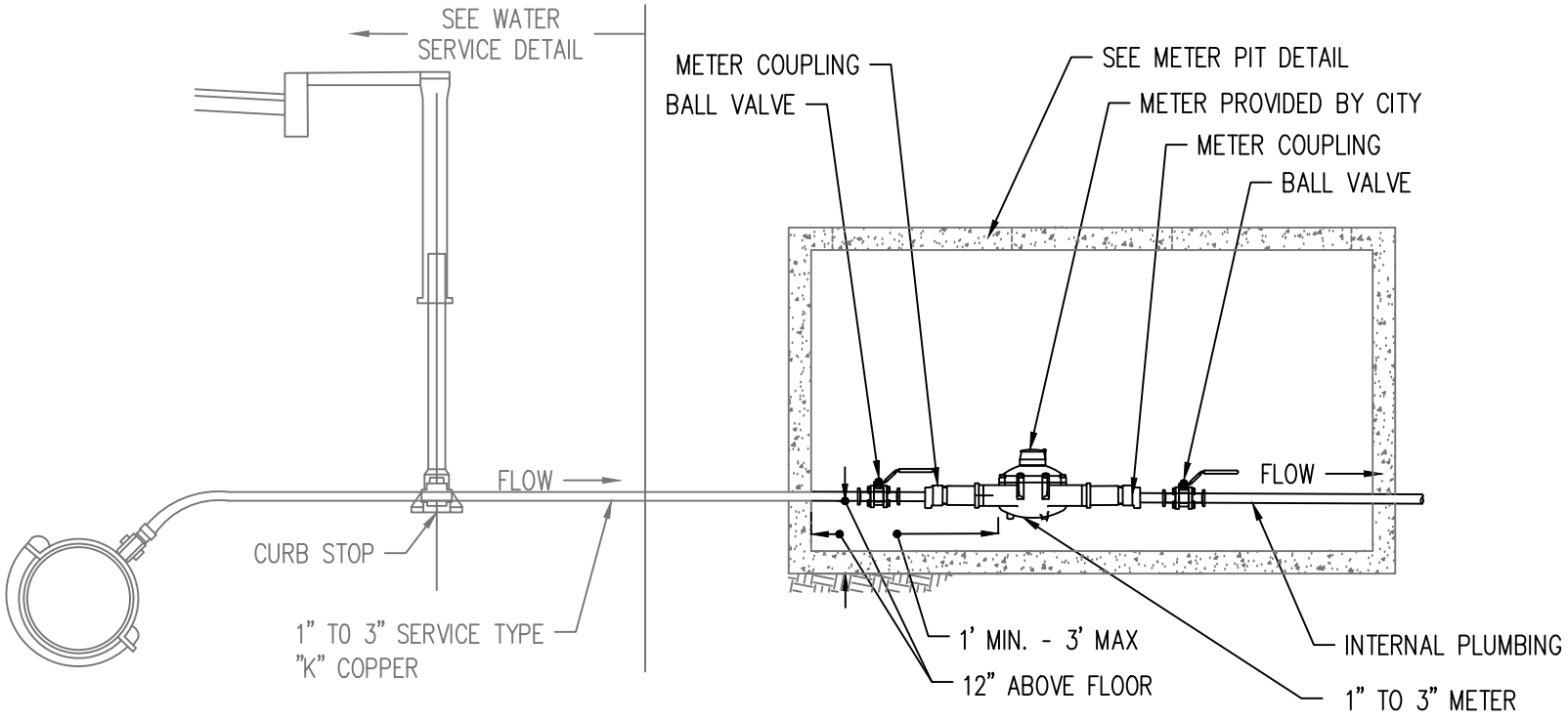

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# STANDARD WATER METER INSTALLATION

## IN METER PIT 1" TO 3" SERVICE SIZE

NTS

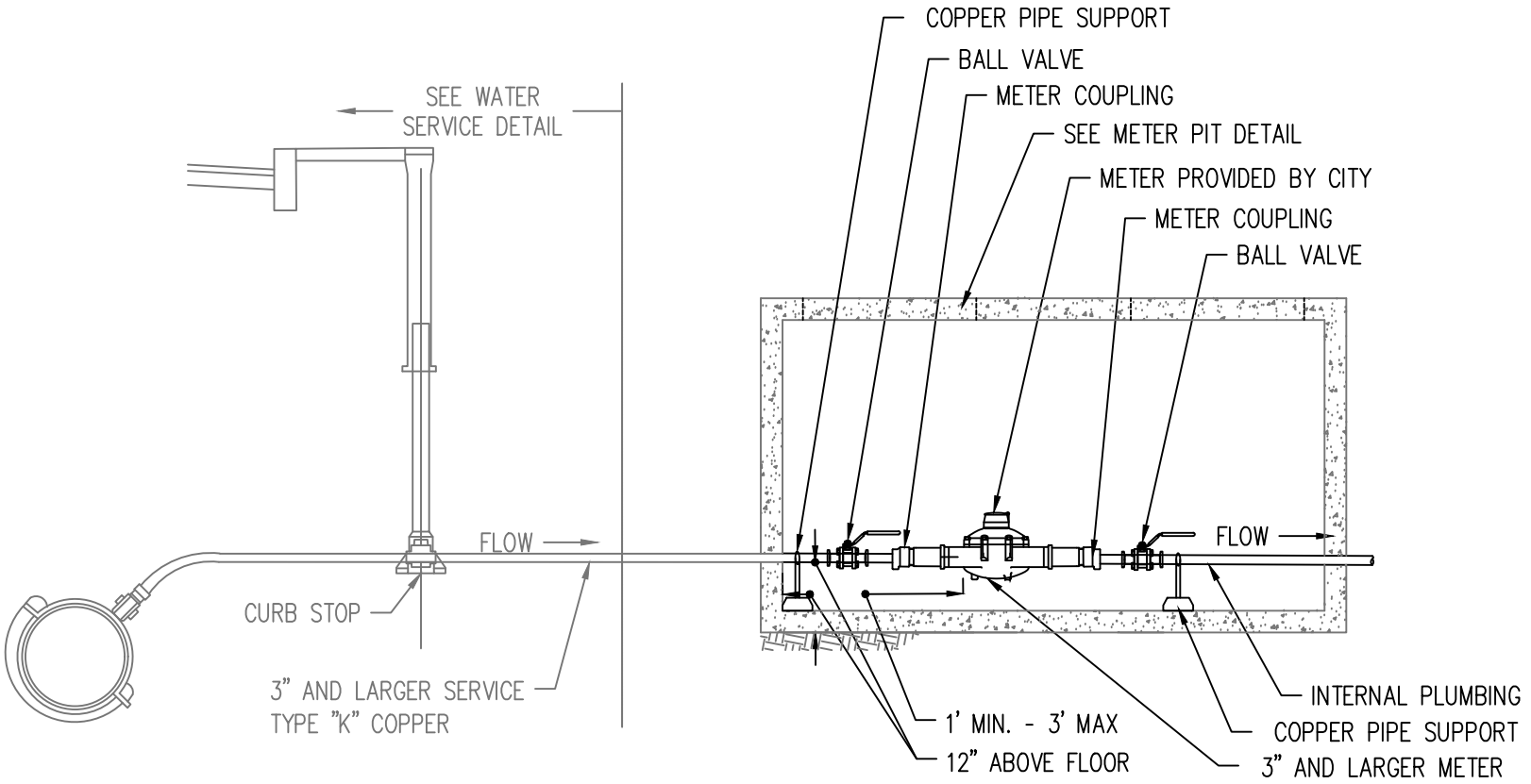



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# STANDARD WATER METER INSTALLATION
## IN METER PIT 3" AND LARGER SERVICE SIZE

NTS




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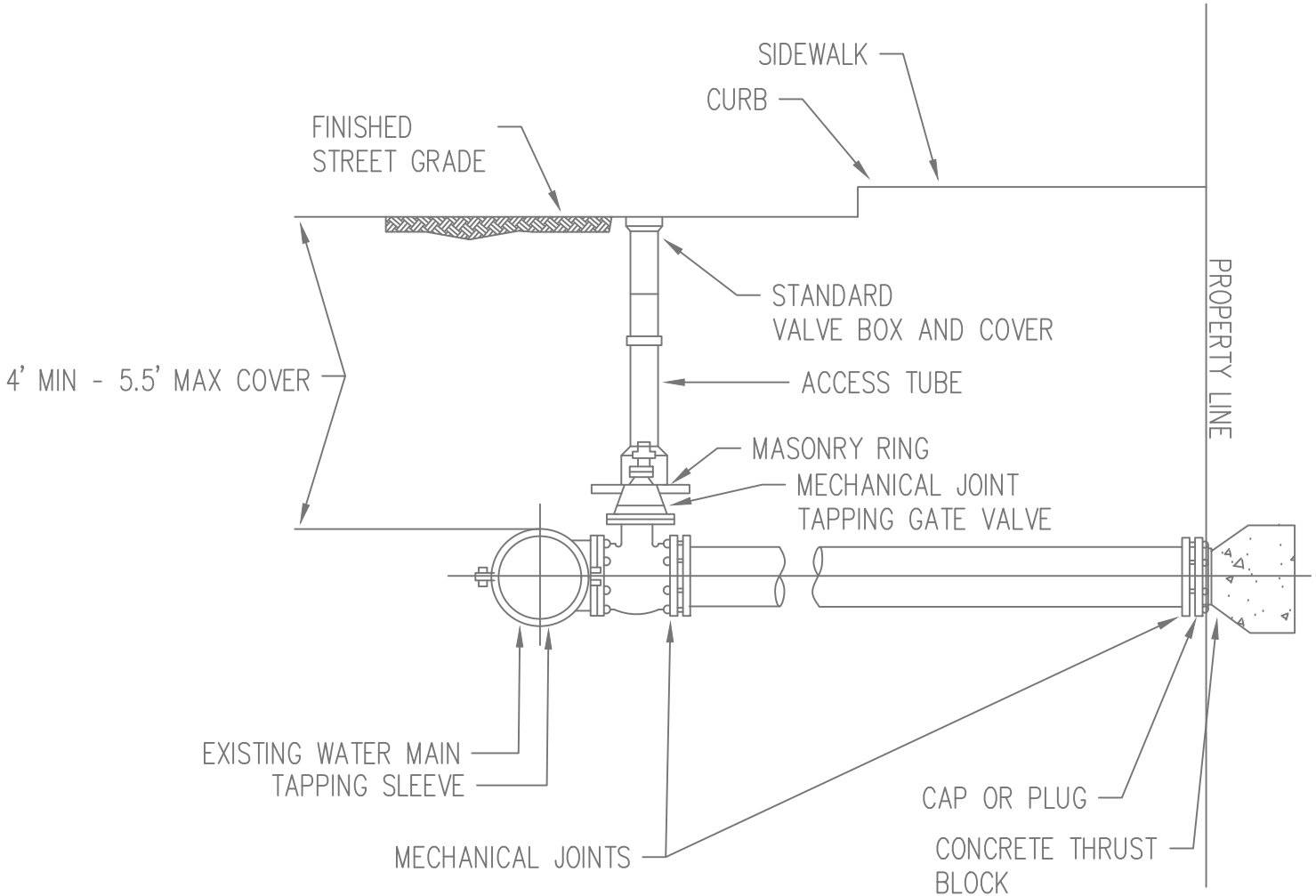
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new bedford

# TAPPING SLEEVE AND GATE VALVE

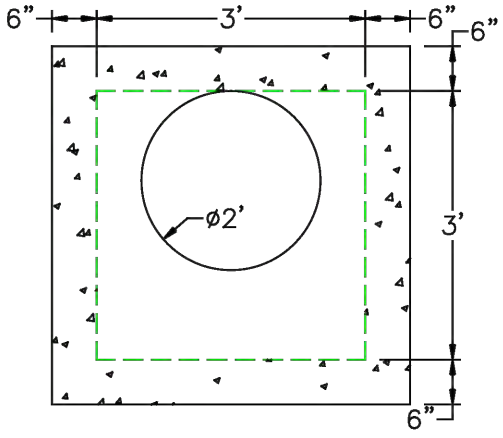
NTS

NOTES:

1. CONCRETE THRUST BLOCK TO BE USED ONLY WHERE IT WILL BE ON UNDISTURBED EARTH
2. USE RE JOINT FITTINGS (MEGALUG OR APPROVED EQUAL) WHERE CONCRETE THRUST BLOCK IS UNACCEPTABLE
3. SIZE OF BLOCK OR MEGALUG TO BE DESIGNED FOR SPECIFIC CONDITION

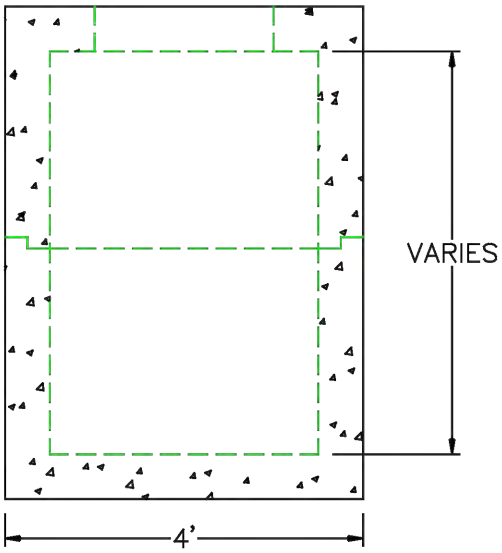


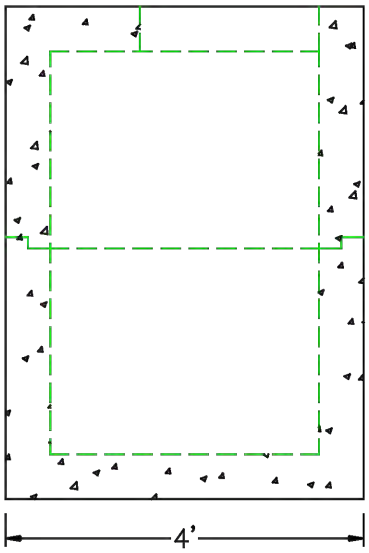
# 3' X 3' METER PIT




NPCA
Precast ... The Concrete Solution.

DESIGN NOTES:
1. CONCRETE 5,000 PSI @ 28 DAYS
2. REINFORCEMENT ASTM A-615 GRADE 60, 1" MIN. COVER
3. DESIGNED FOR H-20 LOADING
4. OPENINGS AS REQUIRED




SCITUATE COMPANIES

SCITUATE RAY PRECAST
120 CLAY PIT ROAD
MARSHFIELD, MA 02050
PHONE # 1-800-440-0009
FAX # 781-837-4320

| CONTRACTOR: | JOB NAME: | |
|---|---|---|
| DATE: | DRAWING: SRP-MP33 | DRAWING BY: C. J. SCOTT |

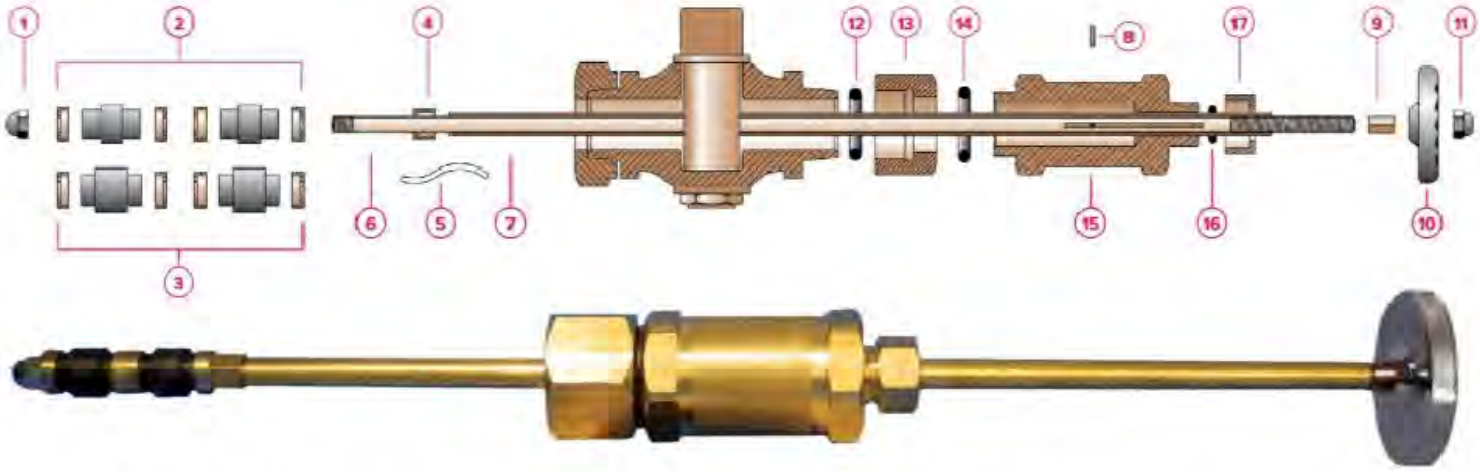
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**3' x 3' METER PIT**

NTS

# AQUA-STOP

Pollardwater



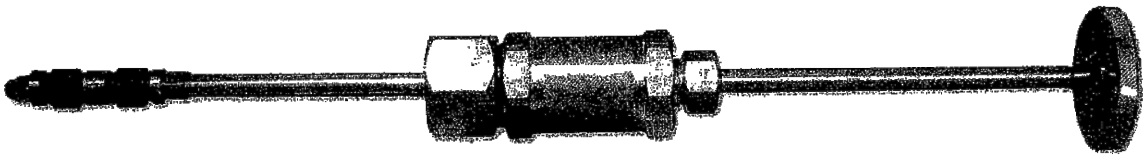

- Change round port curb stops and other valves under pressure
- Stops complete flow on service lines, allowing the swapping of valves or downstream removal of tubing
- Works on 3/4" copper, but the addition of PP64602 allows the tool to work on 1" copper
- Works on flare type and compression connections
- Easy to use; shut water off at curb or straight meter valve, remove downstream nut and connection, attach Aqua-Stop and open valve, insert operation valve and turn handwheel to compress expander nut to shut off flow of water, replace valve and reverse process to backout Aqua-Stop

| SKU | Type | Price |
|---|---|---|
| PP645 | | - |
| **Parts & Accessories** | | |
| PP64602 | Adapter Kit Increasing to 1" | - |
| B1420ACORNPLA | #1 Expander Nut | - |
| PP64502 | #2 Expander; 3/4" | - |
| PP64503 | #3 Expander; 1" | - |
| PP64504 | #4 Tube Packing Nut | - |
| PP64505 | #5 Tube Packing | - |
| PP64506 | #6 Operation Rod | - |
| PP64507 | #7 Tube | - |
| PP64508 | #8 Tube Pin | - |
| PP64509 | #9 Operating Nut | - |

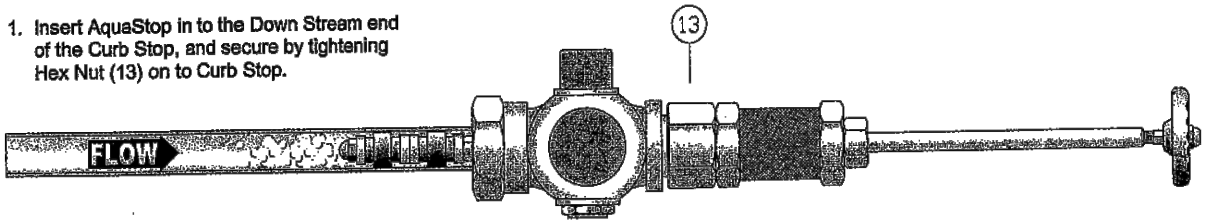
| SKU | Type | Price |
|---|---|---|
| **Parts & Accessories** | | |
| PP64510 | #10 Handwheel | - |
| PP64511 | #11 Handwheel Nut | - |
| PP64512 | #12 Copper Adapter O-Ring; 3/4" | - |
| PP64513 | #13 Copper Adapter; 3/4" | - |
| PP64514 | #14 Body O-Ring | - |
| PP64515 | #15 Body | - |
| PP64516 | #16 Body O-Ring | - |
| PP64517 | #17 Body O-Ring Nut | - |
| PP64603 | #20 Copper Adapter; 1" | - |
| PP64604 | #21 Pipe Adapter; 1" | - |
| PP64605 | #22 Adapter O-Ring; 1" | - |
| M18G4F | Fiber Gasket | - |

S-1001

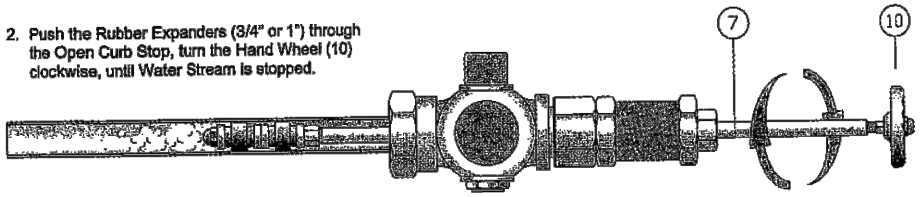
## Aqua-Stop



1. Insert AquaStop in to the Down Stream end of the Curb Stop, and secure by tightening Hex Nut (13) on to Curb Stop.

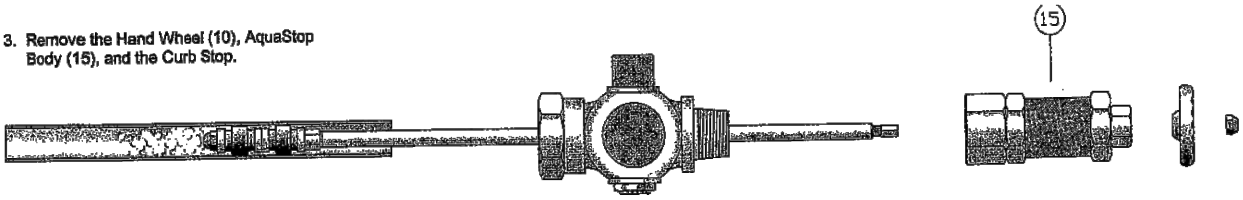



2. Push the Rubber Expanders (3/4" or 1") through the Open Curb Stop, turn the Hand Wheel (10) clockwise, until Water Stream is stopped.

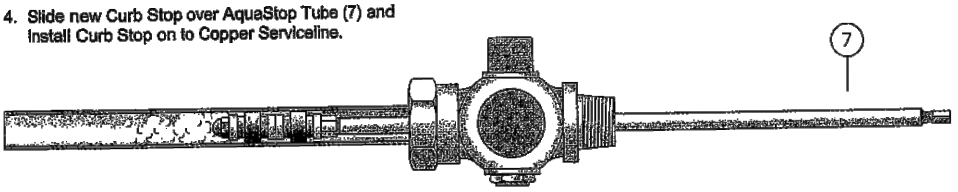



2a. While turning the Hand Wheel (10) clockwise, make certain that the AquaStop Tube (7) is secure and will not slide inside Copper Tubing.

3. Remove the Hand Wheel (10), AquaStop Body (15), and the Curb Stop.




4. Slide new Curb Stop over AquaStop Tube (7) and install Curb Stop on to Copper Serviceline.



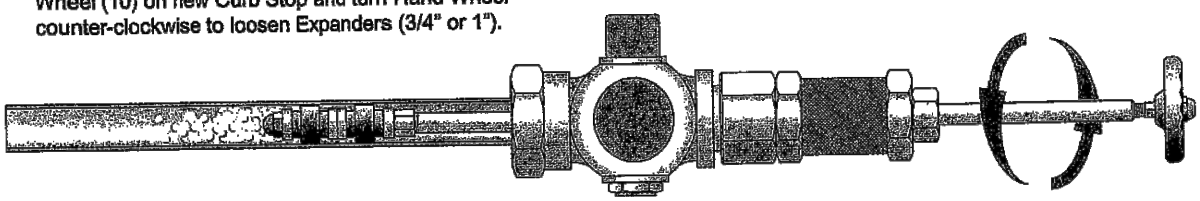



P64701 = 3/4" CTS
P64702 = 1" CTS

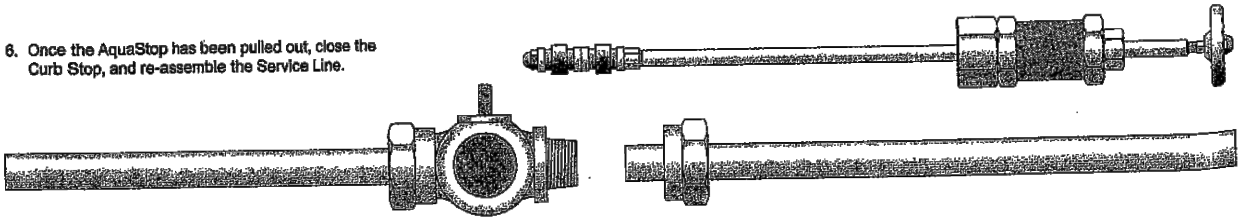
P648 Hollow Hammer

Use Pollard's Hollow Hammer and Hollow Flaring Tools for connecting Curb Stop with Flare Ends.

5. Re-assemble AquaStop Body (15) and Hand Wheel (10) on new Curb Stop and turn Hand Wheel counter-clockwise to loosen Expanders (3/4" or 1").



6. Once the AquaStop has been pulled out, close the Curb Stop, and re-assemble the Service Line.



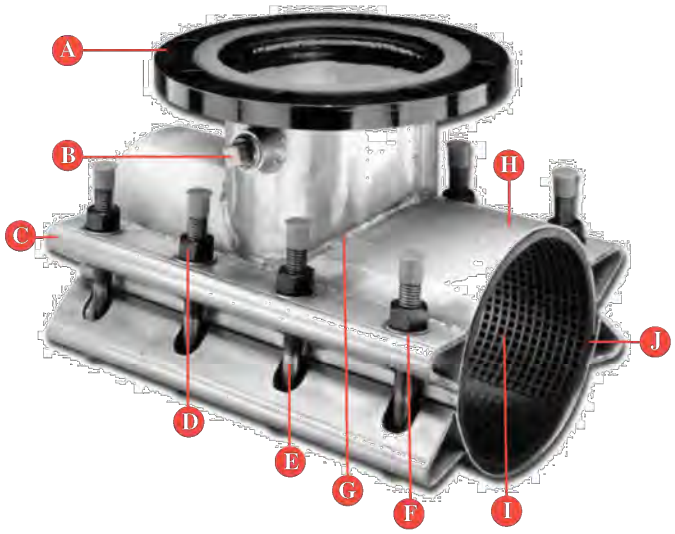
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# AQUA STOP OPERATION

NTS

# MUELLER® Stainless Steel Tapping Sleeve 4"-24"

## Corrosion resistance / High pressure sealing




**A. 304 Stainless Steel, Carbon Steel or Ductile Iron Flanges**
ANSI B16.1, Class 125 drilling with a machined centering recess for tapping valves in accordance with MSS-SP 60. Fully machined flange face for precise alignment of gate valve and drilling machine. Carbon steel and ductile iron flanges are factory-coated with a water base enamel for corrosion protection.

**B. Test Plug**
3/4" NPT brass plug for pressure testing is standard. Optional stainless steel plug available. Plug has a square head for easy removal and installation.

**C. Side Bars**
Heavy gauge 304L stainless steel construction for maximum bending resistance. All side bars are drop-in bolt design for ease of installation.

**D. Nuts**
Heavy hex 304 stainless steel.

**E. Bolts**
Bolts are 304 stainless steel, coated with an anti-galling compound. Rolled threads facilitate spin assembly of nuts.

**F. Washers**
304 stainless steel washers prevent galling and facilitate tightening.

**G. Welding**
Welds are continuous bead (MIG), utilizing state-of-the-art robotic welding equipment. Robotic welding provides a consistently superior weld versus the manual method.

**H. Shell**
The shell is plasma cut to exacting tolerances. 304L stainless steel is low carbon to minimize carbide precipitation corrosion. The entire sleeve is fully passivated (not just the weld sections) to maintain optimum corrosion resistance.

**I. Gasket**
Provides full 360° seal. Made of virgin NBR (R78) material, the "waffle" design provides an optimal watertight seal. An integral sealing ring with two concentric raised surfaces surrounds the outlet (at the base of the pipe), which enhances high pressure sealing capability.

**J. Integral Gap Bridging**
Unique design eliminates the need for separate gap bridges and makes installation easier. This design reduces deformation of the bridge at high torques and aids in the assembly of the sleeve.

**High Pressure Sealing**
250 psig 4"-12"
200 psig 14"-24"

**NSF 61 Certified**



**New MJ Outlet Option**

- Connects directly to standard MJ valve end.
- Uses standard MJ gasket provided with valve.
- Saves time, material and reduces inventory.

The following are standard sleeve ranges. Other ranges are available by contacting Mueller Customer Service at 800-423-1323.

## Sleeve O.D. Range

| Nominal Pipe Size | Outlet Flange | Sleeve O.D. Range (inches) |
|---|---|---|
| 4" | 4" | 4.50-4.90 |
| 6" | 4",6" | 6.59-6.99 |
| | | 6.89-7.30 |
| | | 7.10-7.50 |
| | | 7.40-7.80 |
| 8" | 4",6" | 7.90-8.30 |
| | 4",6",8" | 8.62-9.06 |
| | | 9.04-9.45 |
| | | 9.20-9.60 |
| | | 9.60-10.00 |
| 10" | 4",6",8" | 9.90-10.30 |
| | 4",6",8",10" | 10.73-11.13 |
| | | 11.05-11.45 |
| | | 11.70-12.10 |
| | | 12.00-12.40 |
| 12" | 4",6",8",10",12" | 12.50-12.90 |
| | | 13.16-13.56 |
| | | 13.60-14.09 |
| | | 14.10-14.58 |
| 14" | 4",6",8",10",12" | 15.25-15.65 |
| | | 15.60-16.00 |
| | | 16.38-16.73 |
| | | 16.48-16.88 |
| 16" | 4",6",8",10",12" | 17.40-17.80 |
| | | 17.54-17.94 |
| | | 17.85-18.25 |
| | | 18.15-18.55 |
| | | 18.60-19.00 |
| 18" | 4",6",8",10",12" | 19.30-19.70 |
| | | 19.70-20.10 |
| 20" | 4",6",8",10",12" | 21.40-21.80 |
| | | 21.90-22.30 |
| | | 22.30-22.70 |
| 24" | 4",6",8",10",12" | 23.30-23.70 |
| | | 23.80-24.10 |
| | | 25.60-26.00 |

## Dimensions

| Size Main | Size Outlet | Outlet Flange Dimensions (inches)† A | B | Sleeve Dimensions (inches) C | D | E | Bolts Per Side F |
|---|---|---|---|---|---|---|---|
| 4" | 4" | 5.0315 | .25 | 7.00 | 15 | 4.50 | 4 |
| 6" | 4" | 5.0315 | .25 | 7.50 | 15 | 4.50 | 4 |
| 6" | 6" | 7.0315 | .31 | 8.00 | 15 | 6.50 | 4 |
| 8" | 4" | 5.0315 | .25 | 8.50 | 15 | 4.50 | 4 |
| 8" | 6" | 7.0315 | .31 | 9.00 | 15 | 6.50 | 4 |
| 8" | 8" | 9.0315 | .31 | 9.50 | 18 | 8.50 | 6 |
| 10" | 4" | 5.0315 | .25 | 10.00 | 15 | 4.50 | 4 |
| 10" | 6" | 7.0315 | .31 | 10.50 | 15 | 6.50 | 4 |
| 10" | 8" | 9.0315 | .31 | 11.00 | 18 | 8.50 | 6 |
| 10" | 10" | 11.0315 | .31 | 11.50 | 24 | 10.50 | 8 |
| 12" | 4" | 5.0315 | .25 | 12.00 | 15 | 4.50 | 4 |
| 12" | 6" | 7.0315 | .31 | 12.00 | 15 | 6.50 | 4 |
| 12" | 8" | 9.0315 | .31 | 12.00 | 18 | 8.50 | 6 |
| 12" | 10" | 11.0315 | .31 | 12.00 | 24 | 10.50 | 8 |
| 12" | 12" | 13.0315 | .31 | 12.00 | 30 | 12.50 | 8 |
| 14" | 4" | 5.0315 | .25 | 13.63 | 15 | 4.50 | 4 |
| 14" | 6" | 7.0315 | .31 | 13.63 | 15 | 6.50 | 4 |
| 14" | 8" | 9.0315 | .31 | 13.63 | 18 | 8.50 | 6 |
| 14" | 10" | 11.0315 | .31 | 13.63 | 24 | 10.50 | 8 |
| 14" | 12" | 13.0315 | .31 | 13.63 | 30 | 12.50 | 8 |
| 16" | 4" | 5.0315 | .25 | 14.59 | 15 | 4.50 | 4 |
| 16" | 6" | 7.0315 | .31 | 14.59 | 15 | 6.50 | 4 |
| 16" | 8" | 9.0315 | .31 | 14.59 | 18 | 8.50 | 6 |
| 16" | 10" | 11.0315 | .31 | 14.59 | 24 | 10.50 | 8 |
| 16" | 12" | 13.0315 | .31 | 14.59 | 30 | 12.50 | 8 |
| 18" | 4" | 5.0315 | .25 | 16.00 | 15 | 4.50 | 4 |
| 18" | 6" | 7.0315 | .31 | 16.00 | 15 | 6.50 | 4 |
| 18" | 8" | 9.0315 | .31 | 16.00 | 18 | 8.50 | 6 |
| 18" | 10" | 11.0315 | .31 | 16.00 | 24 | 10.50 | 8 |
| 18" | 12" | 13.0315 | .31 | 16.00 | 30 | 12.50 | 8 |
| 20" | 4" | 5.0315 | .25 | 16.88 | 15 | 4.50 | 4 |
| 20" | 6" | 7.0315 | .31 | 16.88 | 15 | 6.50 | 4 |
| 20" | 8" | 9.0315 | .31 | 16.88 | 18 | 8.50 | 6 |
| 20" | 10" | 11.0315 | .31 | 16.88 | 24 | 10.50 | 8 |
| 20" | 12" | 13.0315 | .31 | 16.88 | 30 | 12.50 | 8 |
| 24" | 4" | 5.0315 | .25 | 19.00 | 24 | 4.50 | 8 |
| 24" | 6" | 7.0315 | .31 | 19.00 | 24 | 6.50 | 8 |
| 24" | 8" | 9.0315 | .31 | 19.00 | 24 | 8.50 | 8 |
| 24" | 10" | 11.0315 | .31 | 19.00 | 24 | 10.50 | 8 |
| 24" | 12" | 13.0315 | .31 | 19.00 | 30 | 12.50 | 10 |

†With MJ option, this flange is replaced by an integral SS outlet pipe extension and MJ gland welded permanently in place allowing the sleeve to bolt directly to the outlet of any standard MJ valve. Dimensions for MJ option are compatible with standard MJ connections, and A and B dimensions in chart do not apply.

## How to determine a Mueller® Tapping Sleeve Part Number

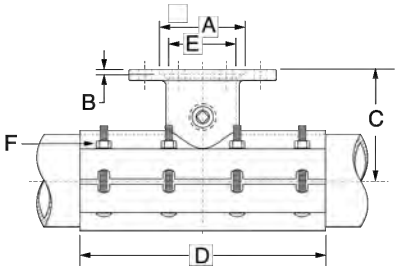
Select the appropriate numbers from the chart.
Example:

| Pipe Size | Outlet Size | Model No. | Flange Material | Maximum O.D. Range |
|---|---|---|---|---|
| 06 | 06 | H304* | SS** | 0750 |

Resulting Part No. 0606H304SS0750

*Model H304 is constant for all Mueller® Stainless Steel Tapping Sleeves listed here.

**SS=stainless steel flange, CS=carbon steel flange, DI=ductile iron flange
MJ=stainless steel MJ gland and pipe extension welded in place




Mueller Co.

Main Office — Decatur, IL
Water Division: 800-423-1323
www.muellercompany.com
Canada — Mueller Canada Inc., Barrie, Ontario 705-719-9965

All products must be installed and maintained in accordance with applicable instructions and/or standards.

Form 11963-Rev. 5/07-2.5M-2
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# STAINLESS TAPPING SLEEVE 4"-24"

NTS

# SST III STAINLESS STEEL TAPPING SLEEVE

ROMAC INDUSTRIES, INC.

## MATERIAL SPECIFICATIONS

**SHELL & LUGS:** Stainless steel per ASTM A240, type 304 and type 304L.

**TEST PLUG:** 3/4" NPT type 304 Stainless Steel. Plug threads coated to prevent galling.

**BOLTS:** 5/8" UNC rolled thread, stainless steel per ASTM A193, type 304.

**NUTS:** Heavy hex, stainless steel per ASTM A194, type 304,coated to prevent galling

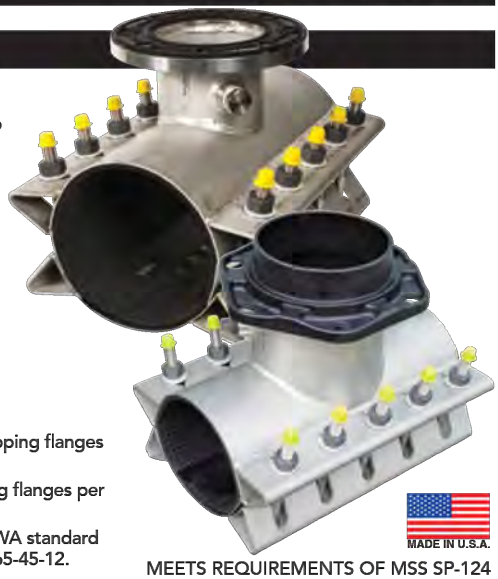
**WASHERS:** Stainless steel, type 304 and plastic lubricating washer.

**GASKETS:** SBR per ASTM D2000 MAA 610, compounded for water and sewer service. Other compounds available on request.

**MJ BOLTS & NUTS:** 3/4" UNC T-Bolts, heavy hex nuts, high strength low alloy steel per AWWA C111.

**OUTLET OPTIONS**

1. **DUCTILE IRON FLANGE** per ASTM A536, Grade 65-45-12. Will accommodate tapping flanges per MSS SP-60.
2. **STAINLESS STEEL FLANGE** per ASTM A240, type 304. Will accommodate tapping flanges per MSS SP-60.
3. **DUCTILE IRON MECHANICAL JOINT OUTLET** MJ style in accordance with AWWA standard C111. Cast from ductile (nodular) iron, meeting or exceeding ASTM A536, Grade 65-45-12.
4. **STAINLESS STEEL MECHANICAL JOINT OUTLET** MJ style in accordance with AWWA standard C111. Stainless steel per ASTM A351 CF3 (Type 304L).



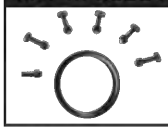
MADE IN U.S.A.

MEETS REQUIREMENTS OF MSS SP-124

**NOTE:** SSTIII is designed for rigid pipe. It is not recommended for thin or brittle pipe such as high DR C900, IPS PVC, PIP, SDR35. For these applications see SST or FTS419 product pages.

NSF61 certified upon request.

**SST III SLEEVES WITH MJ OUTLETS**



MJ Gasket and HSLA T-bolts & Nuts are included with SST-MJ and SST-SS-MJ

| NOM. PIPE SIZE | SLEEVE O.D. RANGE (inches) | SLEEVE # | BY | BRANCH SIZE | D.I. FLANGE | 304 S.S. FLANGE | D.I. MJ OUTLET | 304 S.S. MJ OUTLET | APPROX. WEIGHT (lbs.) |
|---|---|---|---|---|---|---|---|---|---|
| 4" | 4.40 - 4.60<br>4.50 - 4.80<br>4.70 - 5.00<br>5.00 - 5.30<br>5.30 - 5.60<br>5.60 - 5.90 | SSTIII- 4.60<br>SSTIII- 4.80<br>SSTIII- 5.00<br>SSTIII- 5.30<br>SSTIII- 5.60<br>SSTIII- 5.90 | × | 3"<br>4" [1] | NA<br>1,679.00 | $2,088.71<br>2,088.71 | NA<br>1,751.70 | $2,383.30<br>2,394.60 | 37#<br>42# |
| 6" | 5.90 - 6.25 [2]<br>6.25 - 6.60 [2]<br>6.60 - 7.00<br>6.82 - 7.12<br>6.90 - 7.30<br>7.10 - 7.50<br>7.50 - 7.90 | SSTIII- 6.25<br>SSTIII- 6.60<br>SSTIII- 7.00<br>SSTIII- 7.12<br>SSTIII- 7.30<br>SSTIII- 7.50<br>SSTIII- 7.90 | × | 3"<br>4"<br>6" | NA<br>1,768.93<br>1,804.99 | 2,123.22<br>2,123.22<br>2,153.28 | NA<br>1,841.62<br>1,887.43 | 2,383.30<br>2,394.60<br>2,585.51 | 50#<br>54#<br>59# |
| 8" | 7.90 - 8.30 [3]<br>8.30 - 8.63<br>8.62 - 9.06<br>8.97 - 9.37<br>9.04 - 9.45<br>9.20 - 9.60<br>9.55 - 9.95<br>9.90 - 10.30 | SSTIII- 8.30<br>SSTIII- 8.63<br>SSTIII- 9.06<br>SSTIII- 9.37<br>SSTIII- 9.45<br>SSTIII- 9.60<br>SSTIII- 9.95<br>SSTIII-10.30 | × | 3"<br>4"<br>6"<br>8" | NA<br>1,838.14<br>2,000.30<br>2,585.23 | 2,141.01<br>2,141.01<br>2,316.35<br>2,833.15 | NA<br>1,910.87<br>2,082.70<br>2,700.60 | 2,435.63<br>2,446.93<br>2,748.53<br>3,315.45 | 56#<br>60#<br>63#<br>83# |
| 10" | 10.33 - 10.73 [4]<br>10.73 - 11.13<br>11.02 - 11.42<br>11.06 - 11.45<br>11.45 - 11.85<br>11.79 - 12.19<br>12.10 - 12.50 | SSTIII- 10.73<br>SSTIII- 11.13<br>SSTIII- 11.42<br>SSTIII- 11.45<br>SSTIII- 11.85<br>SSTIII- 12.19<br>SSTIII- 12.50 | × | 3"<br>4"<br>6"<br>8"<br>10" | NA<br>2,055.94<br>2,106.89<br>2,597.85<br>3,662.22 | 2,467.05<br>2,467.05<br>2,488.61<br>3,263.78<br>4,777.27 | NA<br>2,128.65<br>2,189.29<br>2,713.23<br>3,807.32 | 2,761.65<br>2,772.96<br>2,920.83<br>3,746.10<br>5,411.62 | 60#<br>64#<br>68#<br>88#<br>121# |

[1] For 4" flanged outlets, the recommended cutter size is 3 1/2"
[2] Not Available with 6" branch.
[3] Not Available with 8" branch.
[4] Not Available with 10" branch.

**TO ORDER:** Specify Sleeve Number x Branch Size x Outlet Type. **EXAMPLE: SSTIII - 9.45 x 6" D.I. FLG** Other sizes are available on request - P.O.A



Manufactured with Domestic and Import material. For Domestic requirements please contact our Quotations Department.
JANUARY 10, 2022

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**SST III STAINLESS TAPPING SLEEVE**

NTS

ROMAC INDUSTRIES, INC.

# SST III STAINLESS STEEL TAPPING SLEEVE

| NOM. PIPE SIZE | SLEEVE O.D. RANGE (inches) | CATALOG NUMBER SLEEVE # | BY | BRANCH SIZE | LIST PRICE EACH D.I. FLANGE | 304 S.S. FLANGE | D.I. MJ OUTLET | 304 S.S. MJ OUTLET | APPROX. WEIGHT (lbs.) |
|---|---|---|---|---|---|---|---|---|---|
| 12" | 12.35 - 12.75 [5,6]<br>12.45 - 12.85 [5,6]<br>12.70 - 12.90 [5,6]<br>12.75 - 13.20 [5,6]<br>12.90 - 13.30<br>13.12 - 13.52<br>13.16 - 13.56<br>13.40 - 13.80<br>13.70 - 14.10<br>13.98 - 14.38<br>14.38 - 14.80 | SSTIII - 12.75<br>SSTIII - 12.85<br>SSTIII - 12.90<br>SSTIII - 13.20<br>SSTIII - 13.30<br>SSTIII - 13.52<br>SSTIII - 13.56<br>SSTIII - 13.80<br>SSTIII - 14.10<br>SSTIII - 14.38<br>SSTIII - 14.80 | × | 3"<br>4"<br>6"<br>8"<br>10"<br>12" | NA<br>2,368.81<br>2,423.81<br>3,128.45<br>4,057.97<br>4,800.53 | $2,762.38<br>2,762.38<br>3,057.67<br>3,728.42<br>4,881.86<br>5,407.82 | NA<br>2,441.51<br>2,506.24<br>3,243.85<br>4,203.09<br>5,012.53 | $3,056.97<br>3,068.28<br>3,489.86<br>4,210.75<br>5,516.23<br>6,109.08 | 65#<br>68#<br>72#<br>93#<br>123#<br>159# |
| 14" | 14.80 - 15.20<br>15.20 - 15.60<br>15.60 - 16.00<br>15.80 - 16.20<br>16.00 - 16.40<br>16.38 - 16.78 | SSTIII - 15.20<br>SSTIII - 15.60<br>SSTIII - 16.00<br>SSTIII - 16.20<br>SSTIII - 16.40<br>SSTIII - 16.78 | × | 3"<br>4"<br>6"<br>8"<br>10"<br>12" | NA<br>2,910.12<br>2,996.08<br>3,315.46<br>4,225.24<br>5,310.67 | 3,005.74<br>3,005.74<br>3,556.02<br>4,451.16<br>5,497.08<br>6,023.05 | NA<br>2,982.80<br>3,167.58<br>3,430.83<br>4,370.41<br>5,409.98 | 3,118.46<br>3,129.77<br>3,988.24<br>4,933.46<br>5,642.25<br>5,642.25 | 70#<br>75#<br>80#<br>103#<br>134#<br>174# |
| 16" | 16.78 - 17.20<br>17.15 - 17.55<br>17.40 - 17.80<br>17.55 - 17.95<br>17.85 - 18.25<br>18.20 - 18.60<br>18.58 - 18.98<br>18.90 - 19.30 | SSTIII - 17.20<br>SSTIII - 17.55<br>SSTIII - 17.80<br>SSTIII - 17.95<br>SSTIII - 18.25<br>SSTIII - 18.60<br>SSTIII - 18.98<br>SSTIII - 19.30 | × | 3"<br>4"<br>6"<br>8"<br>10"<br>12" | NA<br>2,913.77<br>3,290.22<br>3,708.80<br>4,596.62<br>6,040.75 | 3,903.61<br>3,903.61<br>4,426.57<br>4,811.12<br>5,703.19<br>6,595.23 | NA<br>3,362.95<br>3,372.66<br>3,824.19<br>4,741.69<br>6,252.79 | 4,229.83<br>4,241.14<br>4,858.80<br>5,293.43<br>6,337.51<br>7,296.53 | 92#<br>96#<br>102#<br>110#<br>140#<br>205# |
| 18" | 19.30 - 19.70<br>19.70 - 20.10<br>19.80 - 20.20<br>20.20 - 20.60<br>20.60 - 21.00<br>21.00 - 21.40 | SSTIII - 19.70<br>SSTIII - 20.10<br>SSTIII - 20.20<br>SSTIII - 20.60<br>SSTIII - 21.00<br>SSTIII - 21.40 | × | 3"<br>4"<br>6"<br>8"<br>10"<br>12" | NA<br>3,096.00<br>3,348.53<br>3,665.76<br>4,312.65<br>6,458.47 | 3,965.16<br>3,965.16<br>4,734.18<br>5,118.71<br>6,010.80<br>7,210.50 | NA<br>3,168.66<br>3,430.95<br>3,858.74<br>4,795.10<br>6,670.51 | 4,259.74<br>4,271.04<br>5,166.38<br>5,678.60<br>6,982.49<br>7,911.76 | 97#<br>102#<br>107#<br>115#<br>152#<br>230# |
| 20" | 21.40 - 21.80<br>21.70 - 22.10<br>21.90 - 22.30<br>22.30 - 22.70<br>22.70 - 23.10<br>23.00 - 23.40 | SSTIII - 21.80<br>SSTIII - 22.10<br>SSTIII - 22.30<br>SSTIII - 22.70<br>SSTIII - 23.10<br>SSTIII - 23.40 | × | 3"<br>4"<br>6"<br>8"<br>10"<br>12" | NA<br>3,208.17<br>3,460.60<br>3,777.93<br>4,703.39<br>6,531.80 | 4,122.04<br>4,122.04<br>4,888.01<br>5,189.47<br>6,318.41<br>7,825.73 | NA<br>3,280.85<br>3,543.04<br>3,893.29<br>4,848.48<br>6,670.51 | 4,416.61<br>4,427.92<br>5,320.22<br>5,671.76<br>7,159.18<br>8,453.67 | 104#<br>109#<br>114#<br>120#<br>155#<br>232# |
| 24" | 23.30 - 23.70<br>23.60 - 24.00<br>23.80 - 24.20<br>24.20 - 24.60<br>24.60 - 25.00<br>24.90 - 25.30<br>25.30 - 25.70<br>25.60 - 26.00<br>25.90 - 26.30<br>26.10 - 26.50 | SSTIII - 23.70<br>SSTIII - 24.00<br>SSTIII - 24.20<br>SSTIII - 24.60<br>SSTIII - 25.00<br>SSTIII - 25.30<br>SSTIII - 25.70<br>SSTIII - 26.00<br>SSTIII - 26.30<br>SSTIII - 26.50 | × | 3"<br>4"<br>6"<br>8"<br>10"<br>12" | NA<br>3,302.88<br>3,316.78<br>3,596.00<br>4,451.23<br>7,224.22 | 4,340.46<br>4,340.46<br>5,041.80<br>5,663.18<br>6,626.02<br>8,440.95 | NA<br>3,375.60<br>3,956.97<br>4,400.98<br>5,164.86<br>7,436.26 | 4,635.08<br>4,646.38<br>5,474.00<br>6,145.48<br>7,426.87<br>9,142.23 | 107#<br>112#<br>117#<br>124#<br>158#<br>236# |
| 28" | 27.20 - 27.80 [6]<br>27.80 - 28.40 [6]<br>28.40 - 29.00 [6]<br>29.00 - 29.60 [6] | SSTIII - 27.80<br>SSTIII - 28.40<br>SSTIII - 29.00<br>SSTIII - 29.60 | × | 3"<br>4"<br>6"<br>8"<br>10"<br>12" | NA<br>4,734.44<br>4,979.67<br>5,464.31<br>6,636.57<br>9,006.57 | 5,771.99<br>5,771.99<br>6,704.66<br>7,530.98<br>8,811.38<br>11,224.86 | NA<br>4,807.12<br>5,062.07<br>5,579.68<br>6,781.68<br>9,218.59 | 6,066.58<br>6,077.88<br>7,136.86<br>8,013.28<br>9,445.73<br>11,926.15 | 185#<br>190#<br>195#<br>202#<br>236#<br>314# |
| 30" | 29.60 - 30.20 [6]<br>30.20 - 30.80 [6]<br>30.80 - 31.40 [6]<br>31.40 - 32.00 [6] | SSTIII - 30.20<br>SSTIII - 30.80<br>SSTIII - 31.40<br>SSTIII - 32.00 | × | 3"<br>4"<br>6"<br>8"<br>10"<br>12" | NA<br>5,202.43<br>5,523.25<br>6,074.44<br>7,351.01<br>9,916.67 | 6,239.95<br>6,239.95<br>7,248.24<br>8,141.57<br>9,525.80<br>12,134.99 | NA<br>5,275.12<br>5,605.67<br>6,189.77<br>7,496.08<br>10,128.69 | 6,534.54<br>6,545.85<br>7,136.86<br>8,623.83<br>10,160.11<br>12,836.27 | 232#<br>237#<br>242#<br>249#<br>283#<br>361# |

[5] For 12" flanged outlets, the recommended cutter size is 11 1/2". [6] Not available with 12" MJ Outlet. [6] Three piece sleeve.

**TO ORDER:** Specify Sleeve Number x Branch Size x Outlet Type.

**EXAMPLE:** **SSTIII - 9.45 x 6" D.I. FLG** Other sizes are available on request - P.O.A

JCM INDUSTRIES
P. O. Box 1220, Nash, TX 75569-1220
Phone 800-527-8482 or 903-832-2581
Fax 800-874-9524 or 903-838-6260
www.jcmindustries.com

**Typical Specification**

**JCM 452 All Stainless Steel Tapping Sleeve with Stainless Steel Flange**

Tapping Sleeve shall be of the high strength type with a body made of corrosion resistant, 304 stainless steel, which conforms to and reinforces the pipe. The sleeve shall have a wide gasket of Nitrile Butadiene Rubber (NBR, Buna-N) per ASTM D2000 with hydromechancial activated lip, captured in a groove around the outlet; 18-8 Type 304 stainless steel hardware and nuts. Stainless steel tapping sleeve shall be furnished with a 304 stainless steel test plug in the test outlet. Sleeve shall be fully passivated to return the stainless steel to its highest corrosion resistance.

Flanged outlets shall be 304 stainless steel and shall be recessed per MSS-SP60 to accept tapping valve and have the equivalent O.D. and drilling as Class 125 Cast-Iron Flanges (ANSI/ASME B16.1) and Class 150 Steel-Ring Flanges (ANSI/ASME B16.5).

For outlet sizes 14" and larger, the gasket groove must be consistently positioned about throat of tapping waterway. The inside diameter of the gasket groove must be set back a minimum of 1" from the waterway to allow dispersal of forces generated by gasket compression. Gasket grooves machined in a circle and formed to an elliptical shape will not be an accepted equal.

Tapping Sleeves shall be JCM 452 or approved equal.

*Higher test and working pressure ratings available upon request, contact JCM Industries.
JCM 400 Series Tapping Sleeves are ANSI/NSF Standard 61, Annex G & ANSI/NSF 372 Certified.
JCM 400 Series Tapping Sleeves meet MSS-SP124 and ANSI/AWWA Standard C223 Fabricated Steel and Stainless Steel Tapping Sleeves, ANSI/AWWA Standard C228 Stainless Steel Pipe Flanges for Water Service as applicable.



JCM 452 Tapping Sleeve
Image reflects 6” x 4”

*This typical specification, provided by JCM Industries, is a proposed guideline for use by specifying agencies to ensure significant design and material features of this product are included within the agencies’ individual specifications.*

Effective 09.03.19

JCM INDUSTRIES
P. O. Box 1220, Nash, TX 75569-1220
Phone 800-527-8482 or 903-832-2581
Fax 800-874-9524 or 903-838-6260
www.jcmindustries.com

**Material Specification**

**JCM 452 All Stainless Steel Tapping Sleeve with Stainless Steel Flange**

| | |
|---|---|
| **Body:** | Stainless Steel 18-8 Type 304. |
| **Bolts:** | Stainless Steel 18-8 Type 304.<br>Sleeve sizes 14.20 and smaller = 5/8", sizes 14.75 and larger = 3/4" |
| **Flange:** | 304 Stainless Steel or equivalent, per ANSI/AWWA C228 Class SD. Flange outlets shall be indexed per MSS-SP60 to accept tapping valve and have the equivalent O.D. and drilling as Class 125 Cast-Iron Flanges (ANSI/ASME B16.1) and Class 150 Steel-Ring Flanges (ANSI/ASME B16.5). Other flanges available upon request. |
| **Branch Outlet:** | Schedule 10 Stainless Steel Pipe Type 304 |
| **Gasket:** | Nitrile Butadiene Rubber (NBR, Buna-N) per ASTM D2000. Molded virgin rubber with a pressure activated hydro mechanical design. Gasket is bonded into a cavity for internal and external retention. Gasket temperature range -40ºF to 212ºF (-40ºC - 100ºC) Gasket suitable for water, salt solutions, mild acids, bases, and sewage. |
| **Service Rating**: | 2" - 12" Outlets: 175 PSI, per ANSI/AWWA C228.<br>For higher service ratings, contact JCM Technical Services. |

JCM 400 Series Tapping Sleeves are ANSI/NSF Standard 61, Annex G & ANSI/NSF Standard 372 Certified.

JCM 400 Series Tapping Sleeves meet MSS-SP124 and ANSI/AWWA Standard C223 Fabricated Steel and Stainless Steel Tapping Sleeves, ANSI/AWWA Standard C228 Stainless Steel Pipe Flanges for Water Service as applicable.

NSF Certified to NSF/ANSI 61-G & 372

Effective 09.03.19

JCM INDUSTRIES
P. O. Box 1220, Nash, TX 75569-1220
Phone 800-527-8482 or 903-832-2581
Fax 800-874-9524 or 903-838-6260
www.jcmindustries.com

## JCM 452 All Stainless Steel Tapping Sleeve with Stainless Steel Flange Dimensions

**Nominal Pipe Sizes 4" - 12"***
**Outlet Sizes 2" - 12"***

| Outlet | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 2 | 9 | 4 | 3-1/32 | 2-1/16 | 6 | 5/8 |
| 3 | 9 | 5 | 4-1/32 | 3-1/4 | 6 | 5/8 |
| 4 | 12 | 5 | 5-1/32 | 4-1/4 | 8 | 5/8 |
| 6 | 12 | 5 | 7-1/32 | 6-5/16 | 8 | 5/8 |
| 8 | 15 | 5-1/8 | 9-1/32 | 8-5/16 | 10 | 5/8 |
| 10 | 21 | 5-1/2 | 11-1/16 | 10-3/8 | 14 | 5/8 |
| 12 | 24 | 5-3/4 | 13-1/16 | 12-3/8 | 16 | 5/8 |

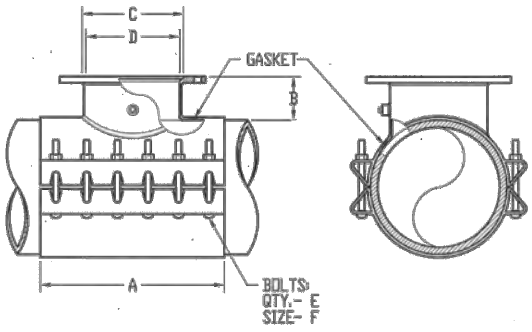
Dimensions represented in inches
3 x 3 Size on Size fittings available upon request.



**Nominal Pipe Sizes 14" - 30"**
**Outlet Sizes 2" - 12"**

| Outlet | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 2 | 12 | 4 | 3-1/32 | 2-1/16 | 6 | 3/4 |
| 3 | 12 | 5 | 4-1/32 | 3-1/4 | 6 | 3/4 |
| 4 | 12 | 5 | 5-1/32 | 4-1/4 | 6 | 3/4 |
| 6 | 12 | 5 | 7-1/32 | 6-5/16 | 6 | 3/4 |
| 8 | 16 | 5-1/8 | 9-1/32 | 8-5/16 | 8 | 3/4 |
| 10 | 20 | 5-1/2 | 11-1/16 | 10-3/8 | 10 | 3/4 |
| 12 | 24 | 5-3/4 | 13-1/16 | 12-3/8 | 12 | 3/4 |

Dimensions represented in inches



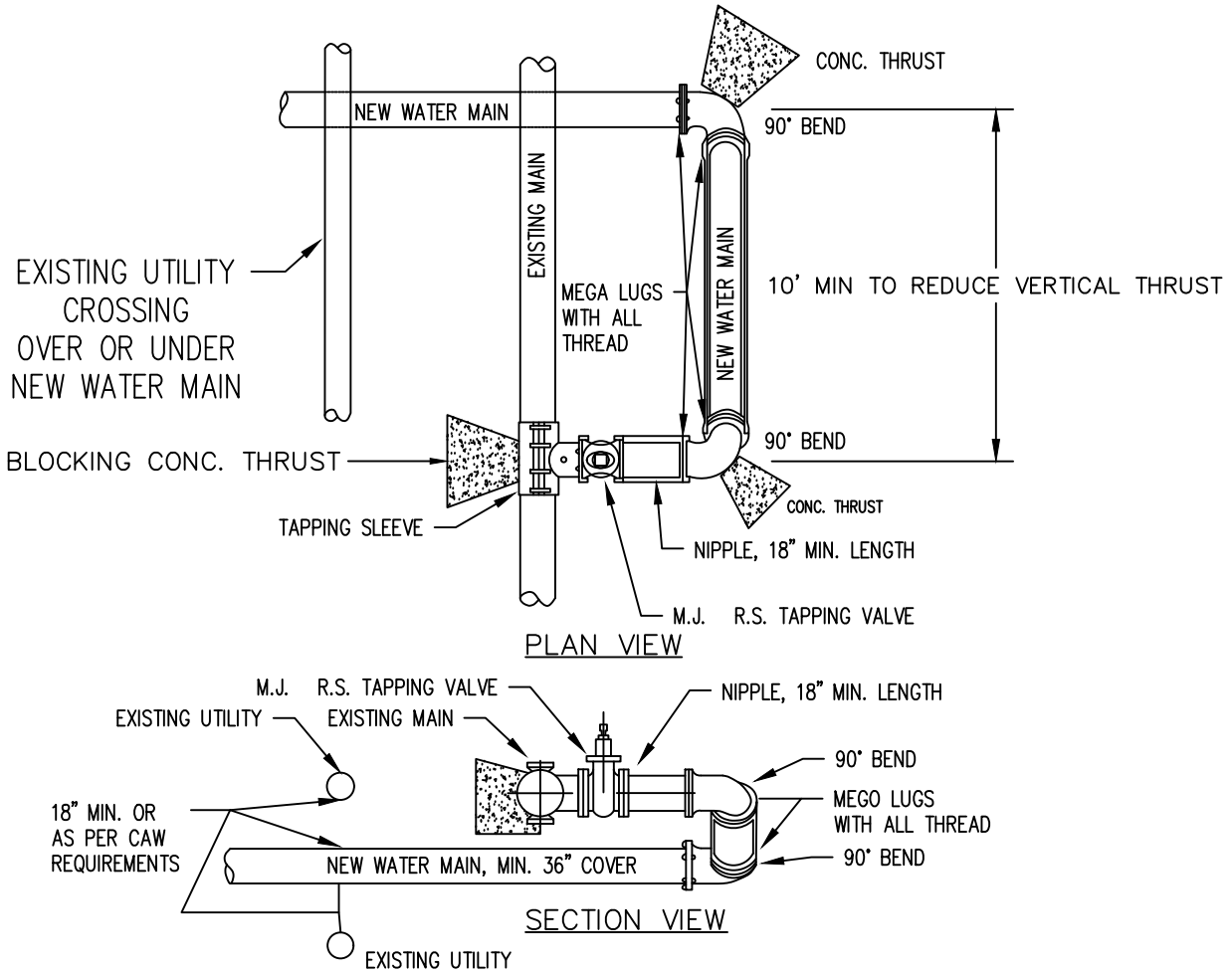

Effective 09.03.19

## SST III STAINLESS TAPPING SLEEVE

NTS

# BACKSIDE TAP SWING CONNECTION

NTS




NOTES:

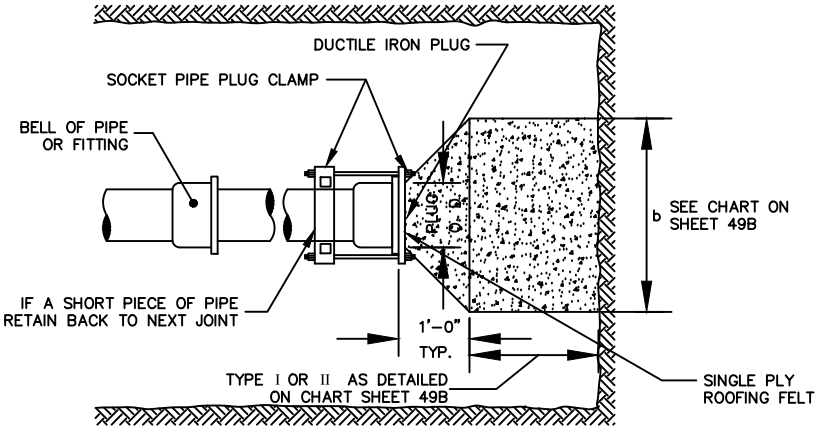
1. CONTRACTOR SHALL LOCATE EXISTING MAIN IN ADVANCE OF LAYING NEW LINE IN ORDER TO ASSURE ADEQUATE LENGTH TO ADJUST DEPTH OF NEW MAIN.
2. DIMENSIONS SHOWN ARE RECOMMENDED MINIMUMS TO PROVIDE ADEQUATE ROOM FOR TIGHTENING BOLTS ON JOINTS (OTHER DIMENSIONS MAY BE USED)
3. USE TIE RODS IF ADEQUATE THRUST BLOCKING AGAINST UNDISTURBED SOIL IS NOT POSSIBLE
4. ALL TIE RODS AND NUTS FOR PERMANENT PLACEMENT SHALL BE STAINLESS STEEL. USE $\frac{3}{4}$" RODS FOR 6" THRU 24". USE 1" RODS FOR 30" THRU 36". USE 1 $\frac{1}{4}$" RODS FOR 42" THRU 48".
5. RODS SHALL BE FIELD CUT TO FIT & SHALL BE PROTECTED WITH POLYWRAP.
6. ROTATE TEE UP & ELBOW DOWN AS REQUIRED TO MATCH

225 PSI STAINLESS STEEL

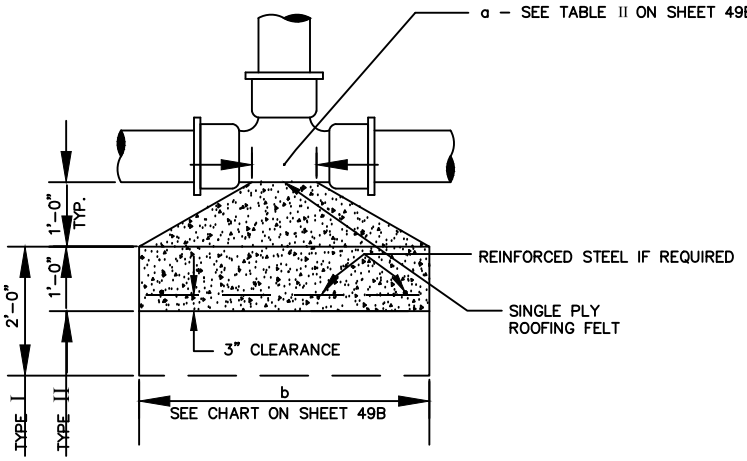
| PIPE SIZE | 6" | 8" | 10" | 12" | 16" | 20" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RODS/NIPPLE | 2 | 2 | 4 | 4 | 8 | 12 | 16 | 14 | 18 | 16 | 20 |

# THRUST BLOCK LAYOUTS

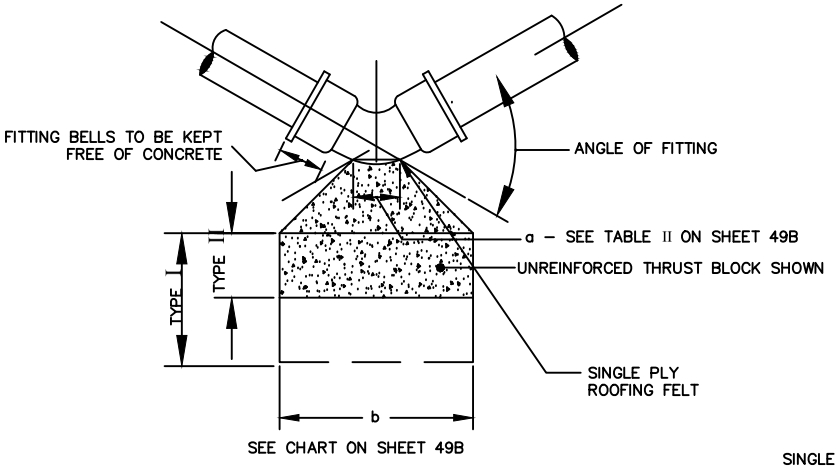
NTS



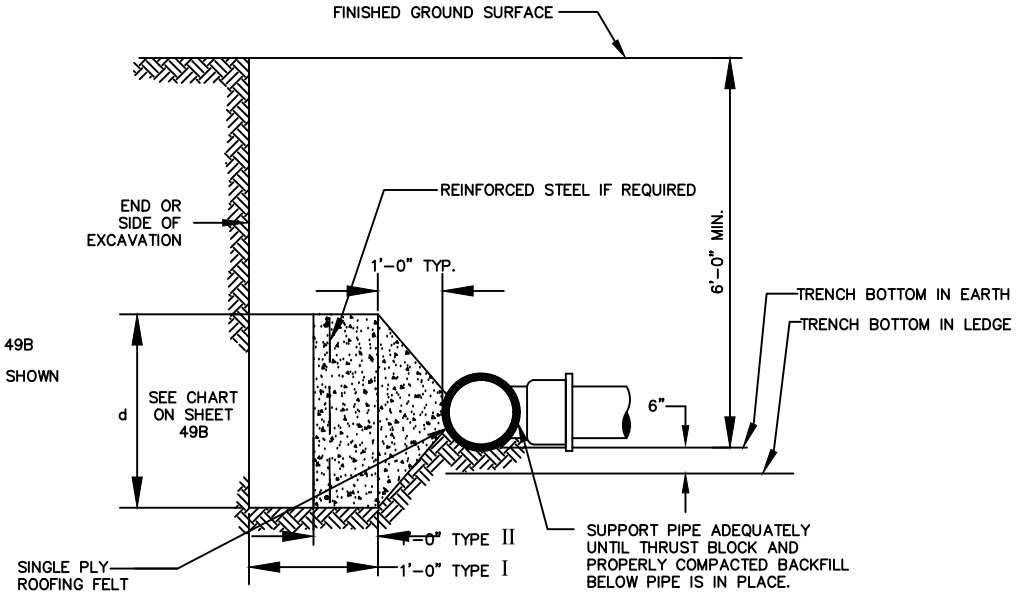

PLAN – DEAD END




PLAN – TEE




PLAN – BEND

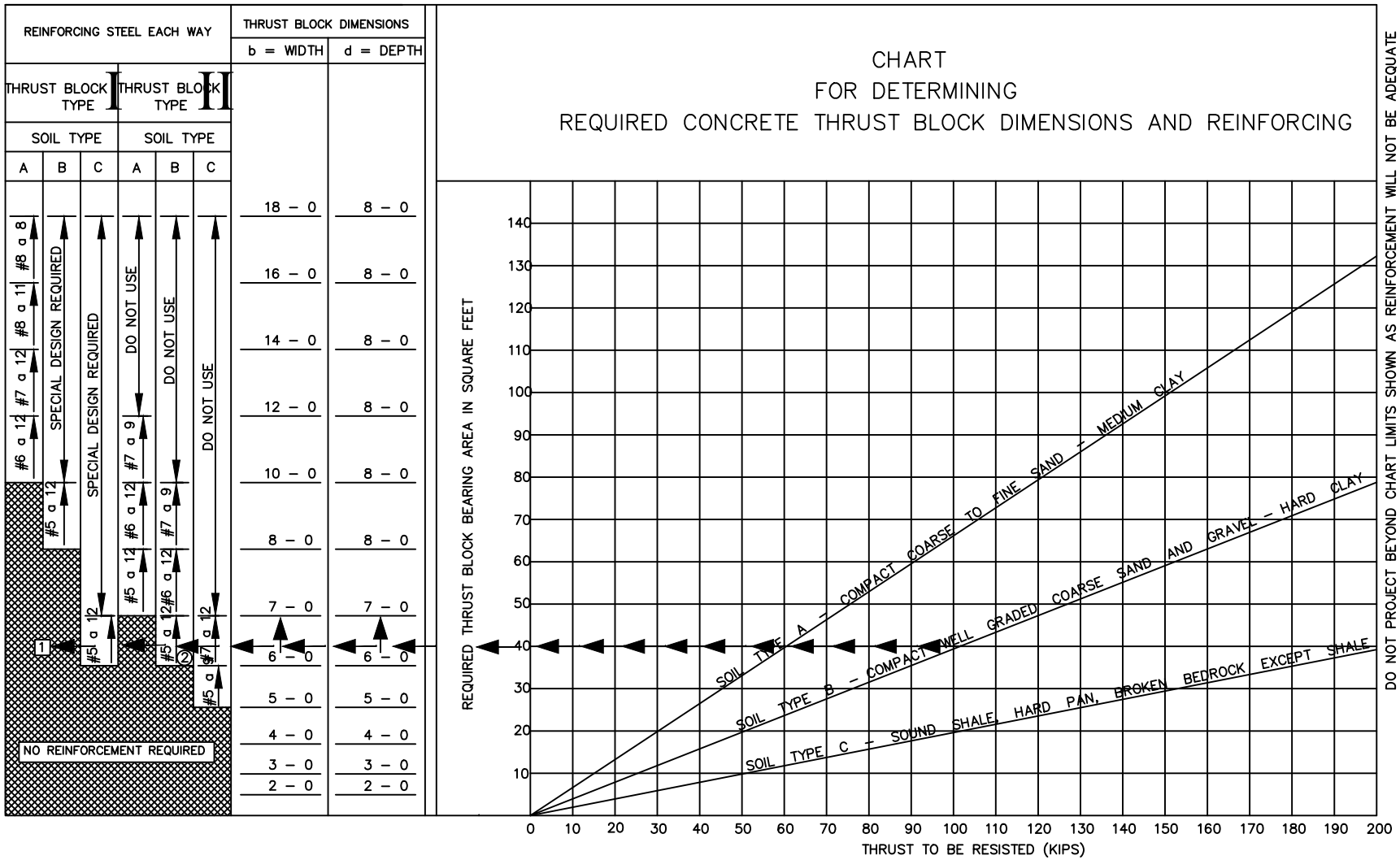



TYPICAL SECTION
(FOR TEES, BENDS & DEAD ENDS)

lighting the way new bedford

# THRUST BLOCK SIZING CHART

SLN



# THRUST BLOCK GUIDE

NTS

## ILLUSTRATIVE PROBLEM

DESIGN A THRUST BLOCK FOR A 67–1/2° BEND,
A 24–INCH DIAMETER WATER MAIN,
CARRYING A MAXIMUM PRESSURE OF 200 P.S.I.
SOIL CLASSIFIED AS A WELL GRADED COMPACT COARSE SAND AND GRAVEL.

SOLUTION

1. ENTER TABLE I AT 24–INCH PIPE DIAMETER – GO VERTICALLY DOWN COLUMN
   UNTIL OPPOSITE 67–1/2° ANGLE FITTING. READ THRUST = 100.2 KIPS.
2. SEE CHART IMMEDIATELY BELOW TABLE I – SELECT SOIL TYPE CURVE
   REFLECTING ACTUAL SOIL CLASSIFICATION. TYPE B FOR THIS PROBLEM.
3. ENTER CHART AT THRUST TO BE RESISTED AND GO VERTICALLY TO SOIL TYPE
   CURVE SELECTED IN 2 ABOVE – SEE CHART AND FOLLOW ILLUSTRATIVE
   PROBLEM ARROW LINE FROM 100.2 KIP THRUST TO SOIL TYPE B CURVE.
4. FROM THIS INTERSECTION GO HORIZONTALLY FOLLOWING ARROW LINE TO
   INTERSECTION WITH REQUIRED THRUST BLOCK BEARING AREA IN SQUARE
   FEET – 40 SQUARE FEET MINIMUM IS REQUIRED TO RESIST THRUST.
5. CONTINUE HORIZONTALLY TO "THRUST BLOCK DIMENSIONS" COLUMN AND
   SELECT DIMENSIONS "b" AND "d" IMMEDIATELY ABOVE HORIZONTAL
   ARROW LINE PROJECTION.
   7' – 0" SQUARE THRUST BLOCK REQUIRED FOR THIS PROBLEM.
6. CONTINUE HORIZONTALLY TO "REINFORCING STEEL – EACH WAY" COLUMN,
   NOTING COLUMNS FURTHER CLASSIFICATION BY SOIL TYPE AND FOOTING TYPE.
   (SEE "THRUST BLOCK DETAIL", FOR TYPE I AND TYPE II REQUIREMENTS.)
   TWO SOLUTIONS TO ILLUSTRATIVE PROBLEM ARE ACCEPTABLE:
   SOLUTION 1 – TYPE I THRUST BLOCK AND SOIL TYPE B INDICATE
   NO REINFORCEMENT REQUIRED.
   SOLUTION 2 – TYPE II THRUST BLOCK AND SOIL TYPE B INDICATES
   #5 @ 12 EACH WAY REQUIRED.

## SCHEDULE OF TIE RODS

| PIPE SIZE | NUMBER OF RODS PER FITTING | DIAMETER OF RODS |
|---|---|---|
| 4" – 12" | 2 | 3/4" |
| 16" | 4 | 3/4" |
| 20" – 24" | 4 | 1 1/2" |
| 36" | 6 | 1 1/2" |

## TABLE II – "a" DIMENSION – FEET

| PIPE DIAMETER – INCHES | 90° FITTING | OTHERS |
|---|---|---|
| 6, 8, 10 & 12 | 1 – 6 | 1 – 0 |
| 16 & 20 | 2 – 0 | 1 – 6 |
| 24" – 30" | 3 – 0 | 2 – 0 |

## NOTES :

ALL FITTINGS SHALL BE ANCHORED BY MECHANICAL MEANS OR BY CONCRETE THRUST BLOCKS, OR BOTH, IF REQUIRED BY THE BOSTON WATER AND SEWER COMMISSION OR AS NOTED ON THE CONTRACT PLANS.
ALL EXPOSED METAL SHALL BE PAINTED OR COATED. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRESS OF 3,000 P.S.I. AT 28 DAYS. REINFORCING STEEL SHALL BE A.S.T.M. A615 GRADE 40.
WATER PRESSURE IN TABLE 1 INCLUDES WATER HAMMER ALLOWANCE.

THE ACTUAL METHOD OF RESTRAINT MUST BE DETERMINED BY ACTUAL FIELD CONDITIONS. THESE ARE TYPICAL INSTALLATIONS TO BE USED AS A GUIDE TO THE DESIGNER.
FINAL DESIGNS ARE SUBJECT TO REVIEW BY BOSTON WATER AND SEWER COMMISSION.

## TABLE I – THRUST – KIPS (WATER PRESSURE = 200 P.S.I.)

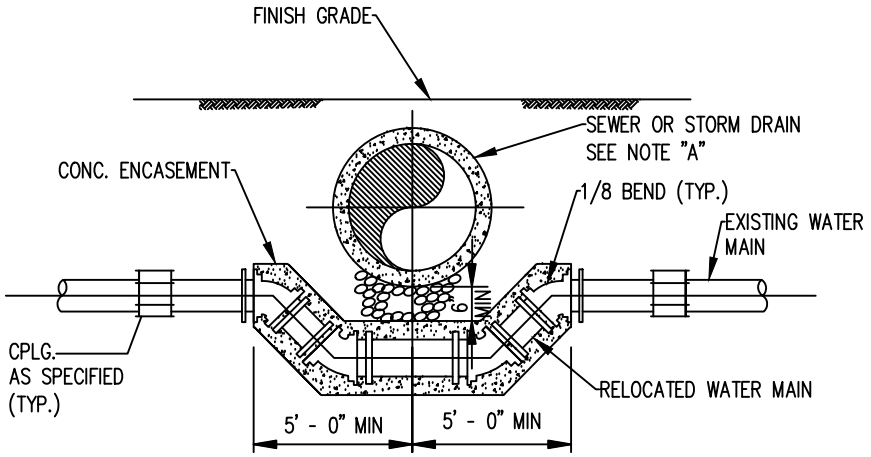
| | PIPE DIAMETER INCHES | 6 | 8 | 10 | 12 | 16 | 20 | 24 | 30 | 36 | 42 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | DEAD ENDS AND TEES | 5.6 | 10 | 15.8 | 22.6 | 40.2 | 62.8 | 90.4 | 141.0 | 203.6 | 277.0 |
| ANGLE FITTINGS | 90° | 7.9 | 14.2 | 22.4 | 32.0 | 56.8 | 88.8 | 127.7 | 199.0 | 288.0 | 392.0 |
| | 67 1/2° | – | 11.1 | 17.6 | 25.1 | 44.7 | 70.0 | 100.2 | 157.0 | 226.0 | 308.0 |
| | 56 1/4° | – | – | 14.9 | 21.2 | 37.9 | 59.2 | 85.1 | 133.0 | 192.0 | 261.0 |
| | 45° | – | – | – | 17.3 | 30.8 | 48.1 | 69.0 | 108.0 | 156.0 | 212.0 |
| | 33 3/4° | – | – | – | 13.1 | 23.3 | 36.5 | 52.5 | 82.0 | 118.0 | 161.0 |
| | 22 1/2° | – | – | – | 8.8 | 15.7 | 24.5 | 35.2 | 55.0 | 79.5 | 108.0 |

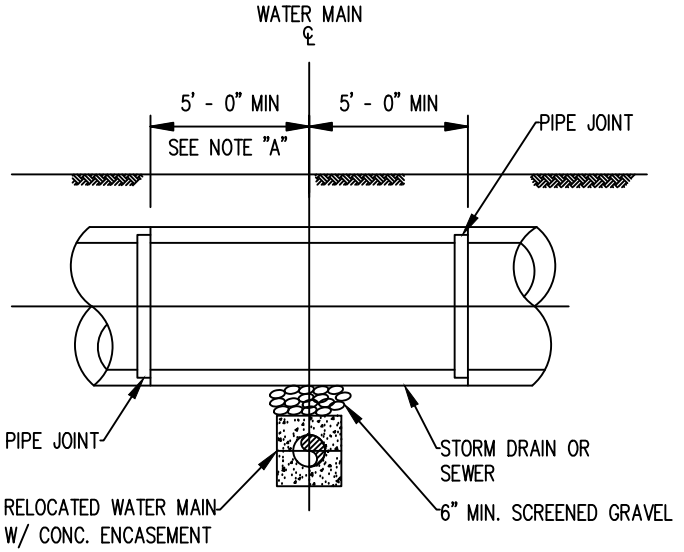
DESIGN THRUST BLOCKS OR OTHER SUITABLE ANCHORAGE TO SUIT ACTUAL CONDITIONS

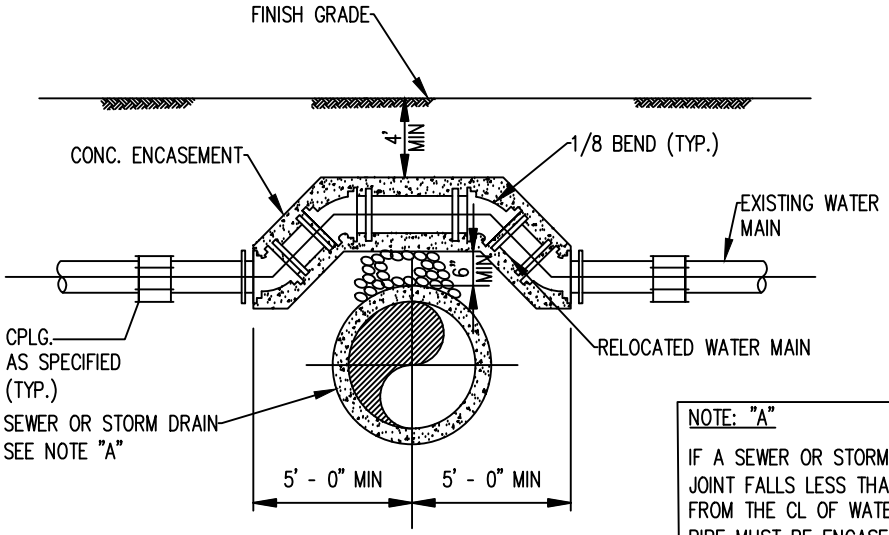
| CONCRETE THRUST BLOCK REQUIREMENTS | |
|---|---|
| FITTING | MINIMUM BEARING SURFACE AREA |
| 30" $\frac{1}{8}$ BENDS | 30 SQ. FT. |
| 12" $\frac{1}{8}$ BENDS | 9 SQ. FT. |
| 16" $\frac{1}{16}$ BENDS | 8 SQ. FT. |
| 10" $\frac{1}{8}$ BENDS | 8 SQ. FT. |
| 8" $\frac{1}{16}$ BENDS | 4 SQ. FT |
| 8" $\frac{1}{8}$ BENDS | 6 SQ. FT |
| 8" $\frac{1}{4}$ BENDS | 10 SQ. FT |
| 6" $\frac{1}{8}$ BENDS | 4 SQ. FT |
| 30" X 12" TEE | 16 SQ. FT |
| 30" X 10" TEE | 12 SQ. FT |
| 30" X 8" TEE | 10 SQ. FT |
| 16" X 8" TEE | 10 SQ. FT |
| 12" X 8" TEE | 10 SQ. FT |
| 12" X 6" TEE | 6 SQ. FT |
| 8" X 8" TEE | 10 SQ. FT |
| 8" X 6" TEE | 6 SQ. FT. |
| 8" X 4" TEE | 4 SQ. FT. |

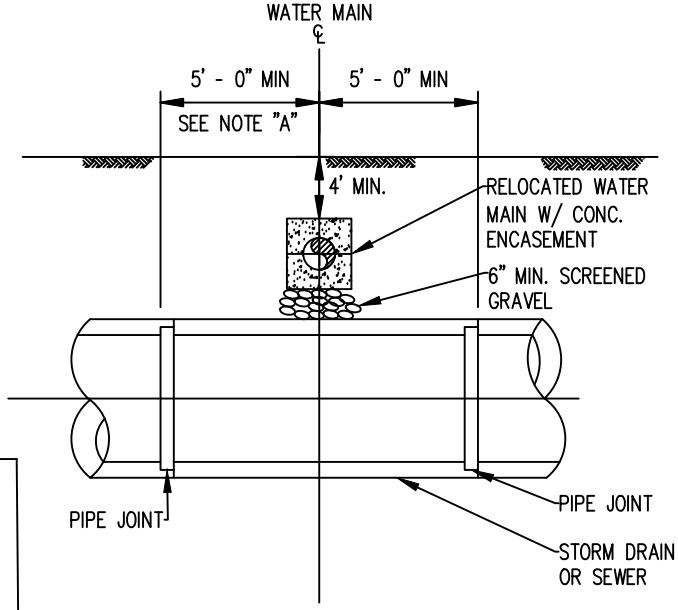
# WATER MAIN RELOCATION

NTS



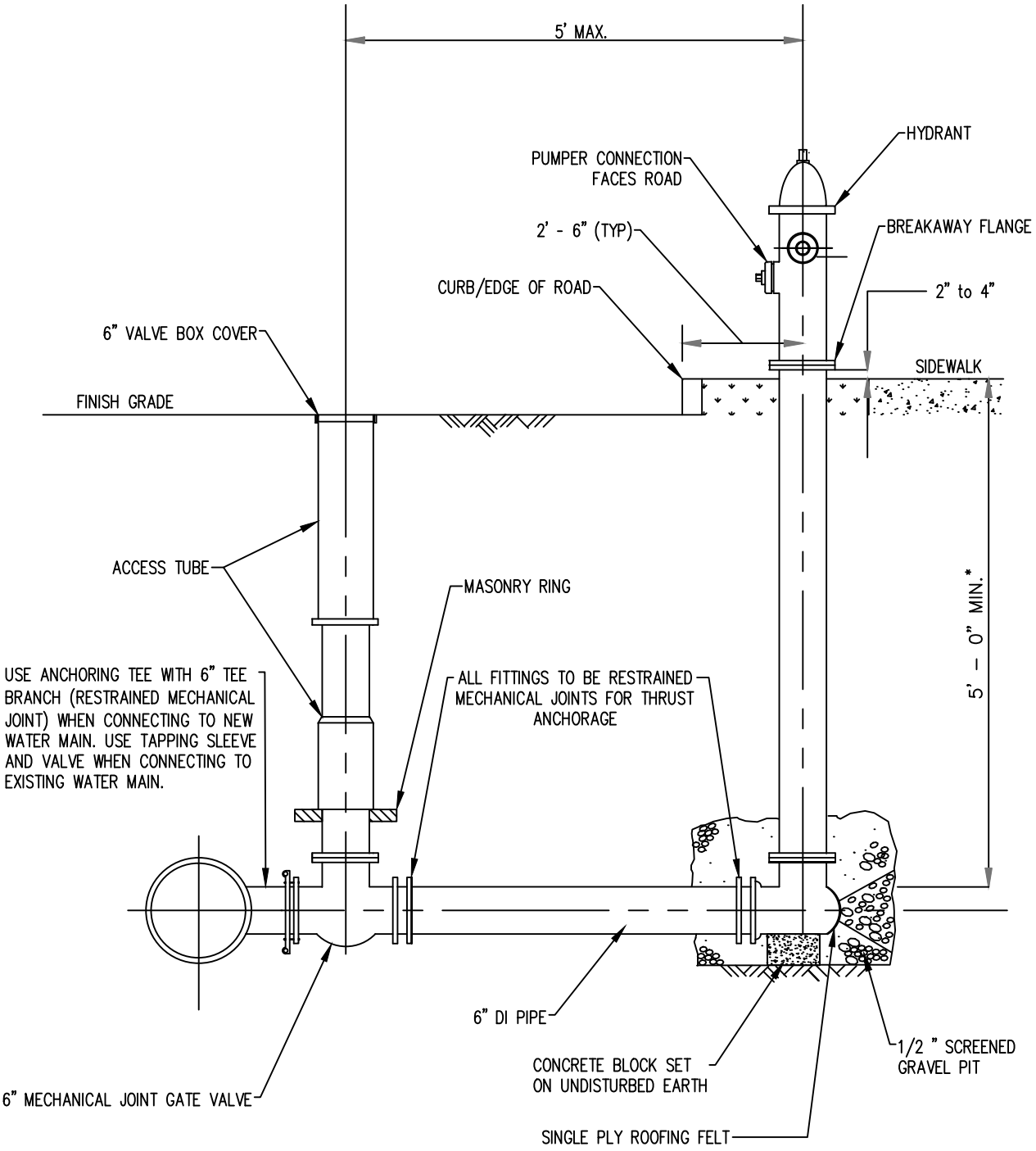




NOTE: "A"

IF A SEWER OR STORM WATER PIPE JOINT FALLS LESS THAN 5' - 0" FROM THE CL OF WATER MAIN, THE PIPE MUST BE ENCASED IN 6" OF CONCRETE 5' - 0" EACH SIDE OF THE WATER MAIN.

NOTES:
ALL JOINTS SHALL BE RESTRAINED




NOTE:

* VERIFY DEPTH OF WATER MAIN PRIOR TO ORDERING HYDRANT.

## HYDRANT

NTS

# Eclipse #9700

## Portable Automatic Flushing Device



*For non-freezing temps only!*

- Attached to any 2.5" NST Nozzle
- Maintains Consistently Safe Residuals
- Remove stagnant water before DBPs Form
- Flush at night when demand is low
- Adjustable flow rates up to 200GPM
- Valve rated up to 220 PSI
- Powder-coated aluminum enclosure
- Swivel collar lock
- EPA approved for water conservation
- Approved for GPR funding
- Available in red or yellow

**Sizes Available**

2" Valve: flows of approximately 200 GPM

1" Valve: flows of approximately 60 GPM

**Controllers Options**

- Handheld Digital Controller

- Bluetooth Controller

Ask about our 30-Day Pilot Program

Patented
# 6,820,635
# 6,048,512

KUPFERLE
Since 1857

2511 North 9th Street / St. Louis, MO 63102

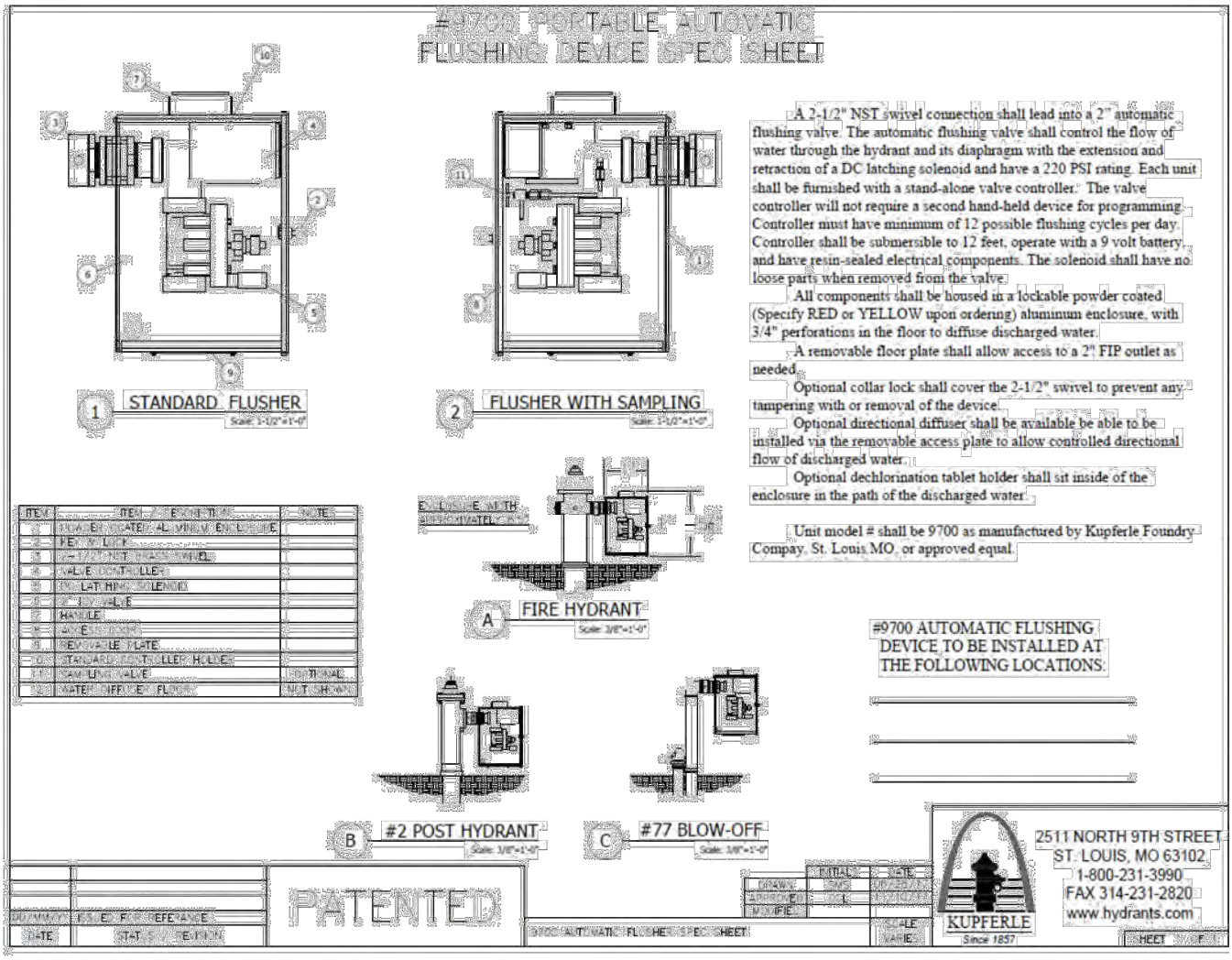
800-231-3990 / www.hydrants.com / 314-231-2820 fax

lighting the way NB new bedford

**HYDRANT WITH AUTO FLUSHER**

NTS

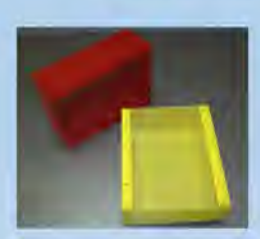
# Eclipse #9700




## *Optional Accessories:*



**Sampling Point Bibb**



**Dechlorination Basket**



**Directional Diverter**



**Meter Stand**

2511 North 9th Street / St. Louis, MO 63102

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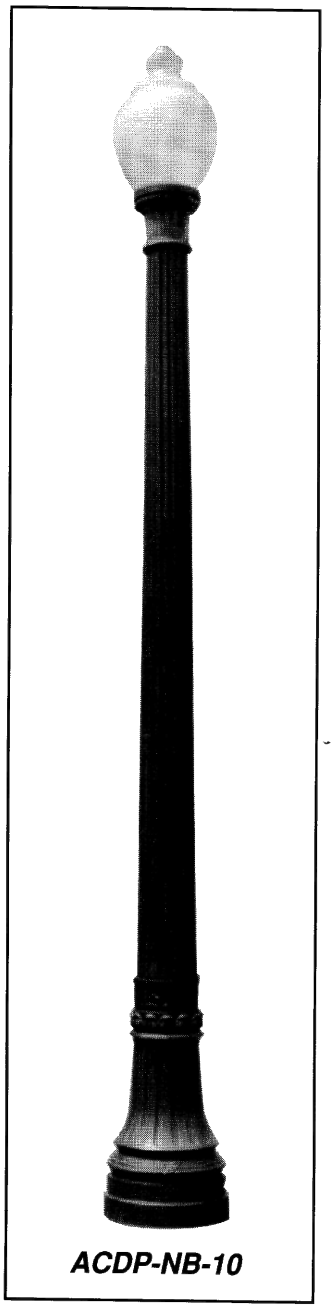
**HYDRANT WITH AUTO FLUSHER**

NTS

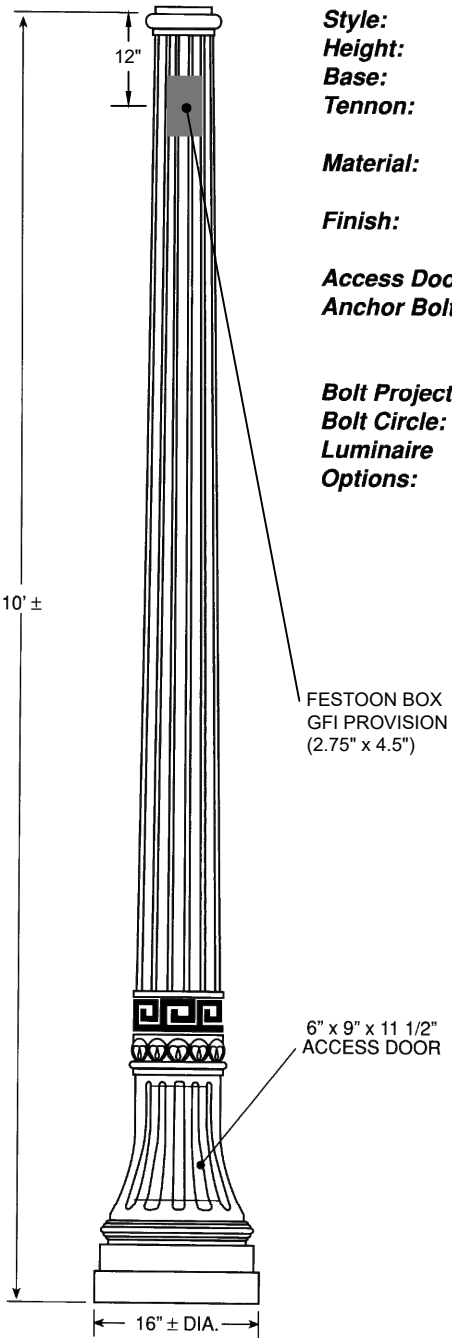
**From: ALLOY CASTINGS CO., INC.**
*Quality Aluminum Castings Since 1948*

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# New Bedford Style Decorative Pole

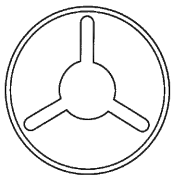


***ACDP-NB-10***




| | |
|---|---|
| ***Style:*** | New Bedford |
| ***Height:*** | 10' ± |
| ***Base:*** | 16" ± diameter, round |
| ***Tennon:*** | 3" x 2-7/8" diameter. Optional tenon heights and diameters available. |
| ***Material:*** | Heavy Wall Cast Aluminum 356 Allov. |
| ***Finish:*** | Black - Thermostat Powder Coating |
| ***Access Door:*** | 6"x9"x11 1/2", located in base. |
| ***Anchor Bolts:*** | (3) 3/4" x 24" plus 3" hook including 1 lock washer, 2 flat washers and 2 nuts. Fully galvanized. |
| ***Bolt Projection:*** | 3" above foundation. |
| ***Bolt Circle:*** | 9" to 11" ± Diameter. |
| ***Luminaire Options:*** | Refer to detail "Quick Disconnect Light Fixture and Bulb" |

ANCHOR BOLT DETAIL



(3) 3/4" ANCHOR BOLTS
ON 9 to 11"± BOLT CIRCLE

***POLE MODEL TO BE SPECIFIED BY THE DPI**

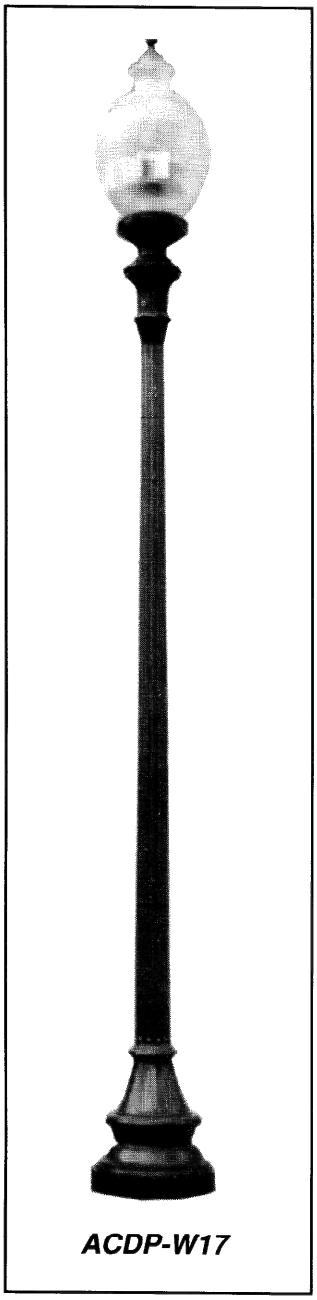
## NEW BEDFORD DECORATIVE POLE

NTS

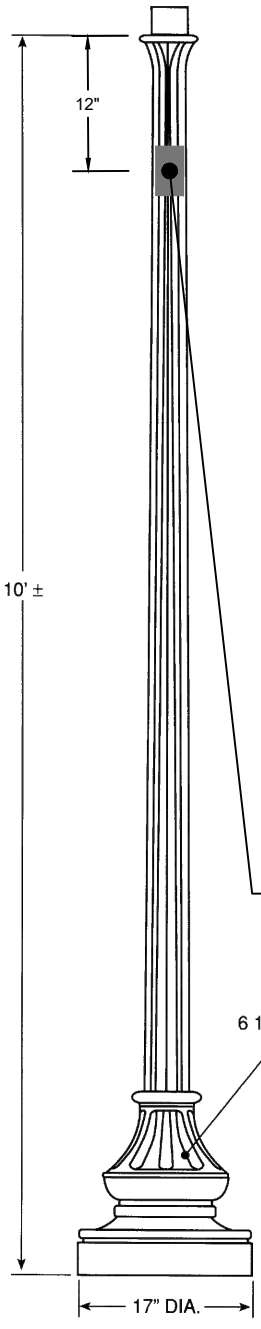
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# Washington 17 Style Decorative Pole



***ACDP-W17***

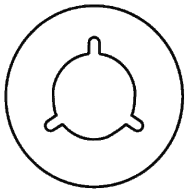



| | |
|---|---|
| ***Style:*** | Washington 17 |
| ***Height:*** | 10' ± |
| ***Base:*** | 17" ± diameter, round |
| ***Tennon:*** | 3" x 2-7/8" diameter. Optional tenon heights and diameters available. |
| ***Material:*** | Heavy Wall Cast Aluminum 356 Alloy. |
| ***Finish:*** | Black - Thermostat Powder Coating |
| ***Access Door:*** | 6 1/4" x 4", located in base. |
| ***Anchor Bolts:*** | (3) 3/4" x 24" plus 3" hook including 1 lock washer, 2 flat washers and 2 nuts. Fully galvanized. Template included with each order. |
| ***Bolt Projection:*** | 3" above foundation. |
| ***Bolt Circle:*** | 12 1/4" ± Diameter. |
| ***Features:*** | A variety of heights are available in straight shafts and extruded shafts. A variety of bolt circles are also available. |
| ***Luminaire Options:*** | Refer to detail "Quick Disconnect Light Fixture and Bulb" |
| ***Accessory Options:*** | Ladder rest and decorative brackets are available. |

FESTOON BOX
GFI PROVISION
(2.75"x4.5")

6 1/4" X 4" ACCESS DOOR

ANCHOR BOLT DETAIL



(3) 3/4" ANCHOR BOLTS
ON 12 1/4"± BOLT CIRCLE

***POLE MODEL TO BE SPECIFIED BY THE DPI**

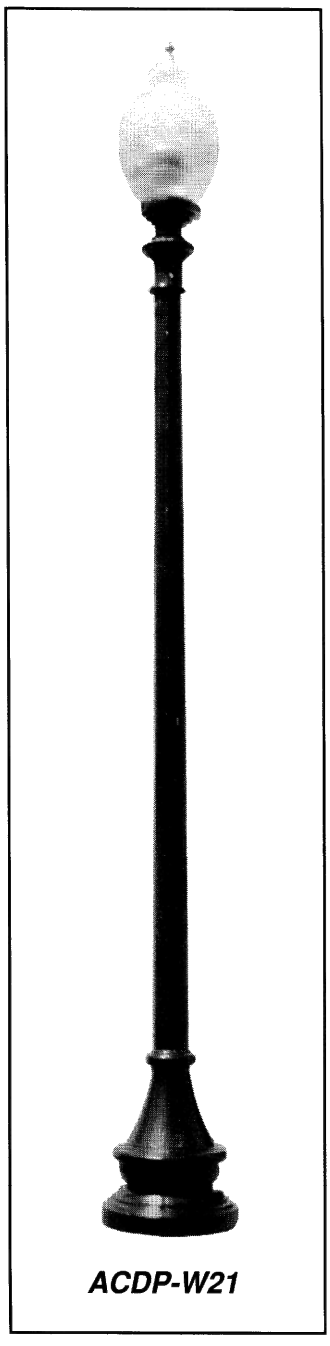
## 10-FT WASHINGTON STYLE LIGHT POLE

NTS

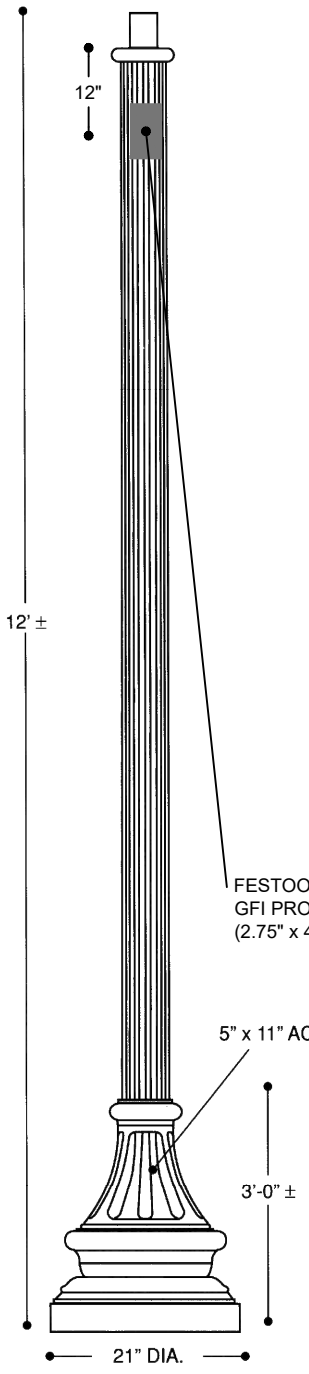
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# Washington 21 Style Decorative Pole

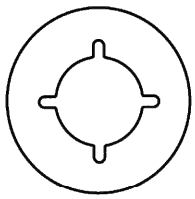


***ACDP-W21***




| | |
|---|---|
| ***Style:*** | Washington 21 |
| ***Height:*** | 12' ± |
| ***Base:*** | 21" ± diameter, round |
| ***Tennon:*** | 3" x 2-7/8" diameter. Optional tenon heights and diameters available. |
| ***Material:*** | Heavy Wall Cast Aluminum 356 Alloy. |
| ***Finish:*** | Black - Thermostat Powder Coating |
| ***Access Door:*** | 5" x 11", located in base. |
| ***Anchor Bolts:*** | (4) 3/4" x 24" plus 3" hook including 1 lock washer, 2 flat washers and 2 nuts. Fully galvanized. Template included with each order. |
| ***Bolt Projection:*** | 3" above foundation. |
| ***Bolt Circle:*** | 12" ± Diameter. |
| ***Features:*** | A variety of heights are available using extruded shafts or straight aluminum shafts. |
| ***Luminaire Options:*** | Refer to detail "Quick Disconnect Light Fixture and Bulb" |
| ***Accessory Options:*** | Ladder rest and decorative brackets are available. |

ANCHOR BOLT DETAIL



(4) 3/4" ANCHOR BOLTS
ON 12"± BOLT CIRCLE

***POLE MODEL TO BE SPECIFIED BY THE DPI**

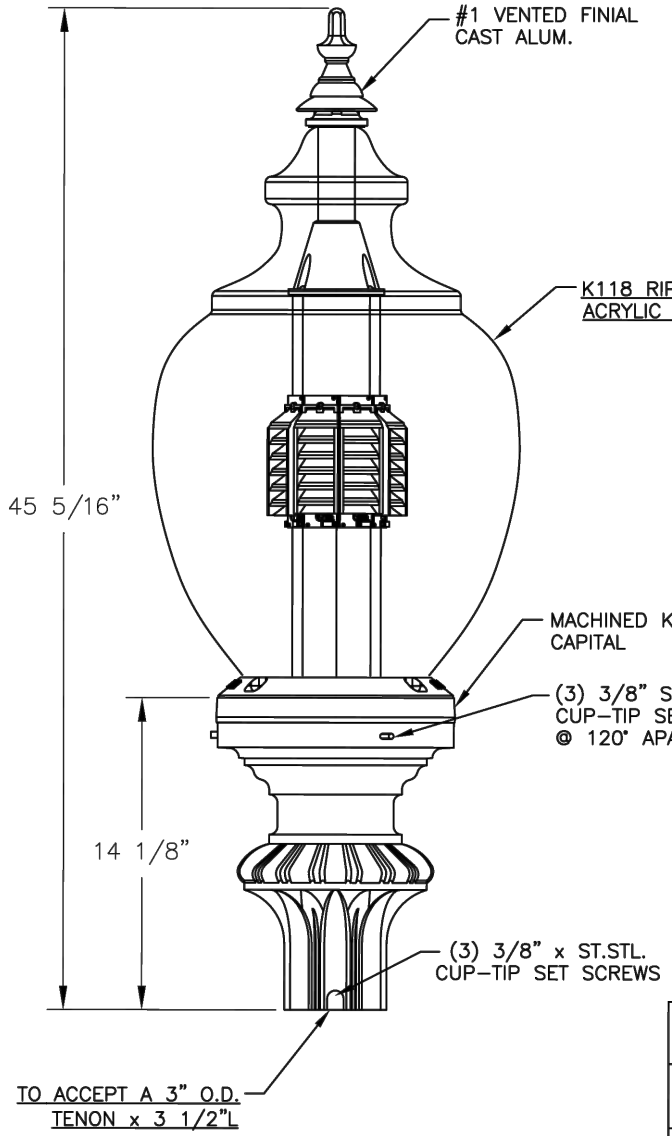
## 12-FT WASHINGTON STYLE LIGHT POLE

NTS

lighting the way new bedford

# QUICK DISCONNECT LIGHT FIXTURE AND BULB

NTS




NOTES:

1. 100W MEANWELL DRIVER DIALED DOWN TO 40W.
2. FOR USE ON NEW BEDFORD STYLE AND WASHINGTON STYLE LIGHT POLES

| REV. | ALTERATION | DATE | BY |
|---|---|---|---|
| A | WATTAGE SELECTOR ADDED | 02/01/21 | V.V. |

## LUMINAIRE SPECIFICATIONS

| | |
|---|---|
| CATALOGUE NO.: | K118R-B2AR-III-100(SSL)-1063 -120:277-K16/K4-4K-WS |
| QUANTITY: | |
| OPTICAL SYSTEM: | BAFFLED ARRAY ACRYLIC RIPPLED |
| IES CLASS.: | TYPE III |
| WATTAGE: | 100W (1063 SERIES) SOLID STATE LIGHTING |
| LINE VOLTAGE: | 120:277V |
| CCT: | 4000K |
| POLE ADAPTOR: | K16/K4 (MACHINED) |
| PAINT: | TEXTURED BLACK |
| OPTIONS: | #1 VENTED FINIAL<br>*** HEAVY DUTY GLOBE ***<br>WATTAGE SELECTOR |

## OPTIONS

QUICK DISCONNECT ☒

WATTAGE SELECTOR STICKER

| | WS OPTION | WATTAGE |
|---|---|---|
| ☐ | 0 | 100W |
| ☐ | 1 | 90W |
| ☐ | 2 | 80W |
| ☐ | 3 | 70W |
| ☐ | 4 | 60W |
| ☐ | 5 | 50W |
| ☐ | 6 | 40W |

CUSTOMER APPROVAL & DATE: _____

| | |
|---|---|
| CUSTOMER ORDER No: | |
| STRESSCRETE ORDER No: | |
| KMFG. ORDER No: | |
| KING U.S. ORDER No: | |

KING

King Luminaire • StressCrete • Est. 1953

STRESSCRETE GROUP

*Manufacturing Locations:*

*Burlington, Ontario 1-800-268-7809*

*Northport, Alabama 1-800-435-6563*

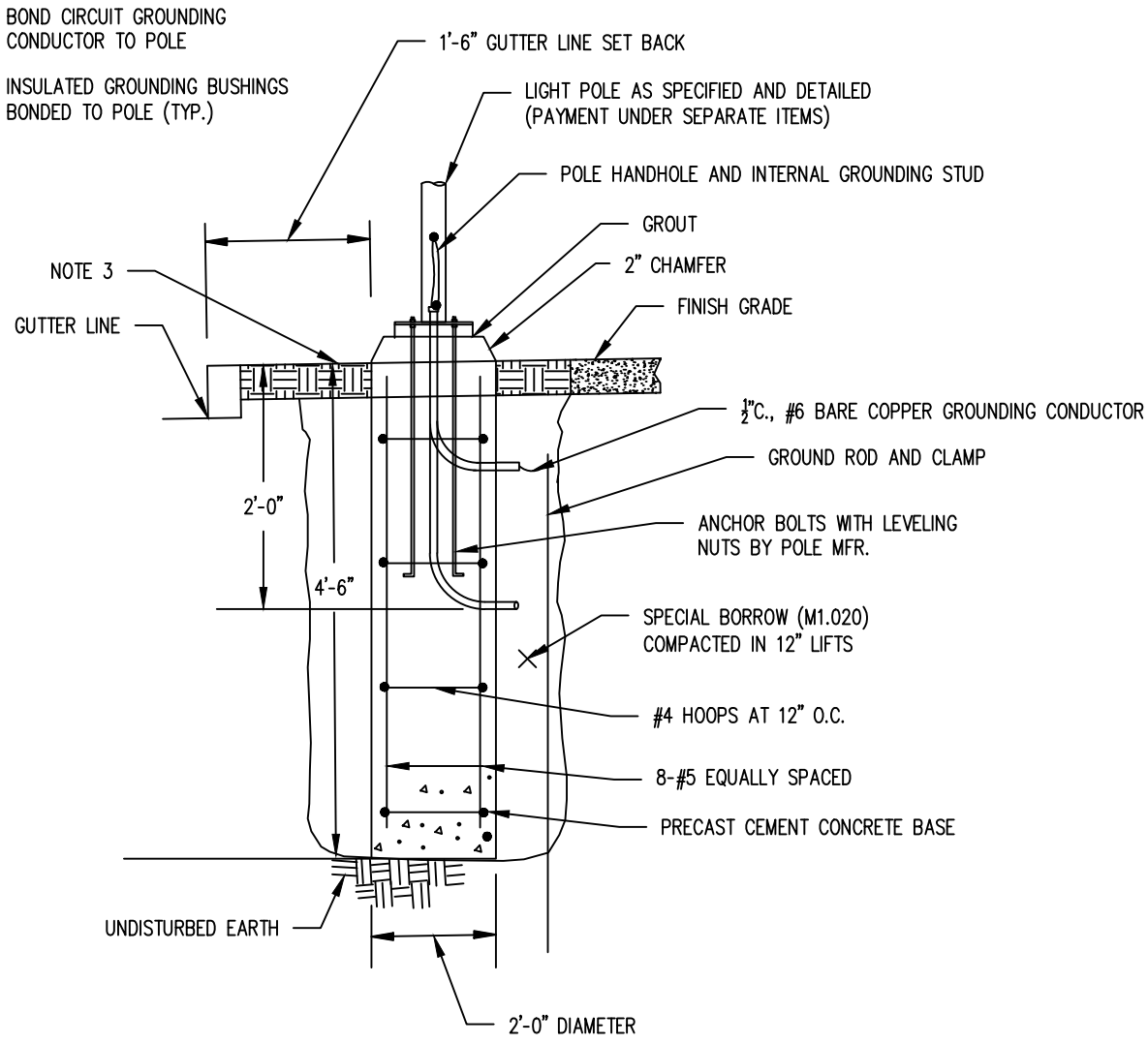
*Atchison, Kansas 1-800-837-1024*

*Jefferson, Ohio 1-800-268-7809*

PROJECT/CUSTOMER: CITY OF NEW BEDFORD

| DRAWN BY: | AT: | CHECKED BY: | DATE: | REVISION: |
|---|---|---|---|---|
| V.V. | SC1 | | 01/26/21 | A |

| DRAWING TYPE: | DRAWING NUMBER: |
|---|---|
| APPROVAL/MFG. DWG. | NEW-BEDFORD-LED-5 |




NOTES:

1. COORDINATE LIGHT POLE BASE AND BOLT LOCATION WITH LIGHT POLE STYLE.
2. TO BE USED FOR WASHINGTON STYLE OR NEW BEDFORD STYLE.
3. NO CHAMFER EDGE FOR LIGHT POLES TO BE SET WITHIN BRICK RIBBON. TO BE FLUSH WITH FINISH GRADE.

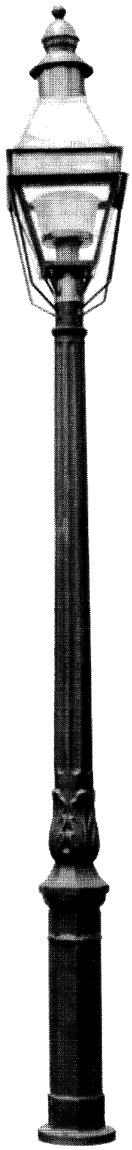
## STANDARD LIGHT BASE

NTS

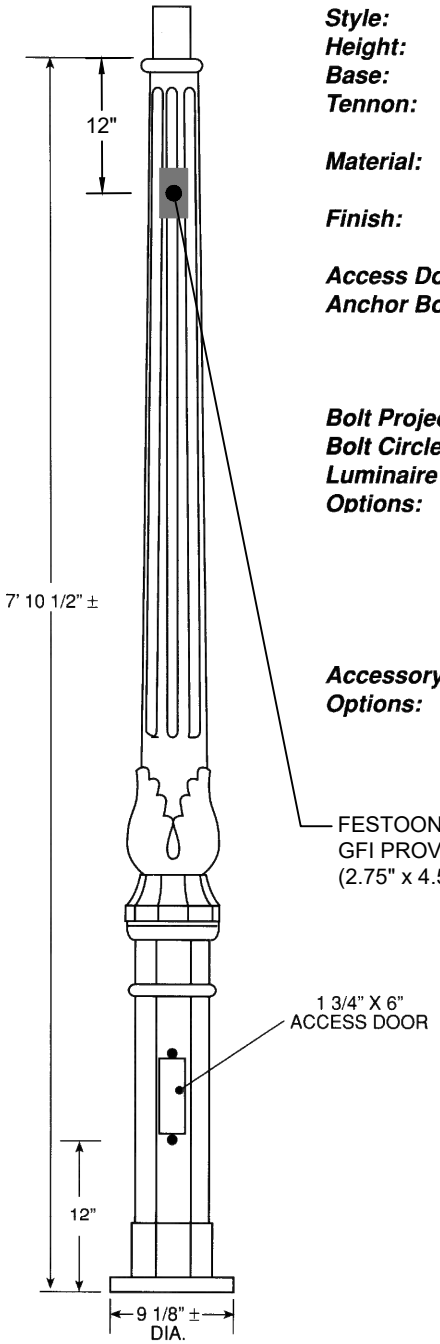
**From: ALLOY CASTINGS CO., INC.**
*Quality Aluminum Castings Since 1948*

151 West Union Street • East Bridgewater, MA 02333
Telephone: (508) 378-2541 • FAX: (508) 378-1240
www.alloycastings.com

# Dartmouth Style Decorative Pole

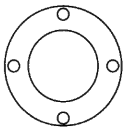


***ACDP-P-7'-10"***




| | |
|---|---|
| ***Style:*** | Dartmouth |
| ***Height:*** | 7' 10 1/2" ± |
| ***Base:*** | 9 1/2" ± diameter, round |
| ***Tennon:*** | 4 3/4" x 2-7/8" diameter. Optional tenon heights and diameters available. |
| ***Material:*** | Heavy Wall Cast Aluminum 356 Alloy. |
| ***Finish:*** | Black - Thermostat Powder Coating |
| ***Access Door:*** | 1 3/4" x 6", located in base. |
| ***Anchor Bolts:*** | (4) 3/4" x 24" plus 3" hook including 1 lock washer, 2 flat washers and 2 nuts. Fully galvanized. Template included with each order. |
| ***Bolt Projection:*** | 3" above foundation. |
| ***Bolt Circle:*** | 7 3/4" ± Diameter. |
| ***Luminaire Options:*** | Refer to detail "Copper Head Luminaire" |
| ***Accessory Options:*** | Ladder rest and decorative brackets are available. |

ANCHOR BOLT DETAIL

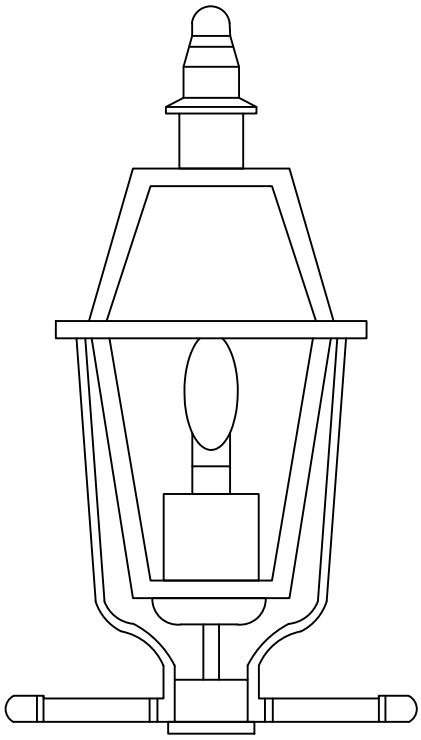


(4) 3/4" ANCHOR BOLTS
ON 7 3/4"± BOLT CIRCLE

***POLE MODEL TO BE SPECIFIED BY THE DPI**

## DARTMOUTH STYLE LIGHT POLE

NTS

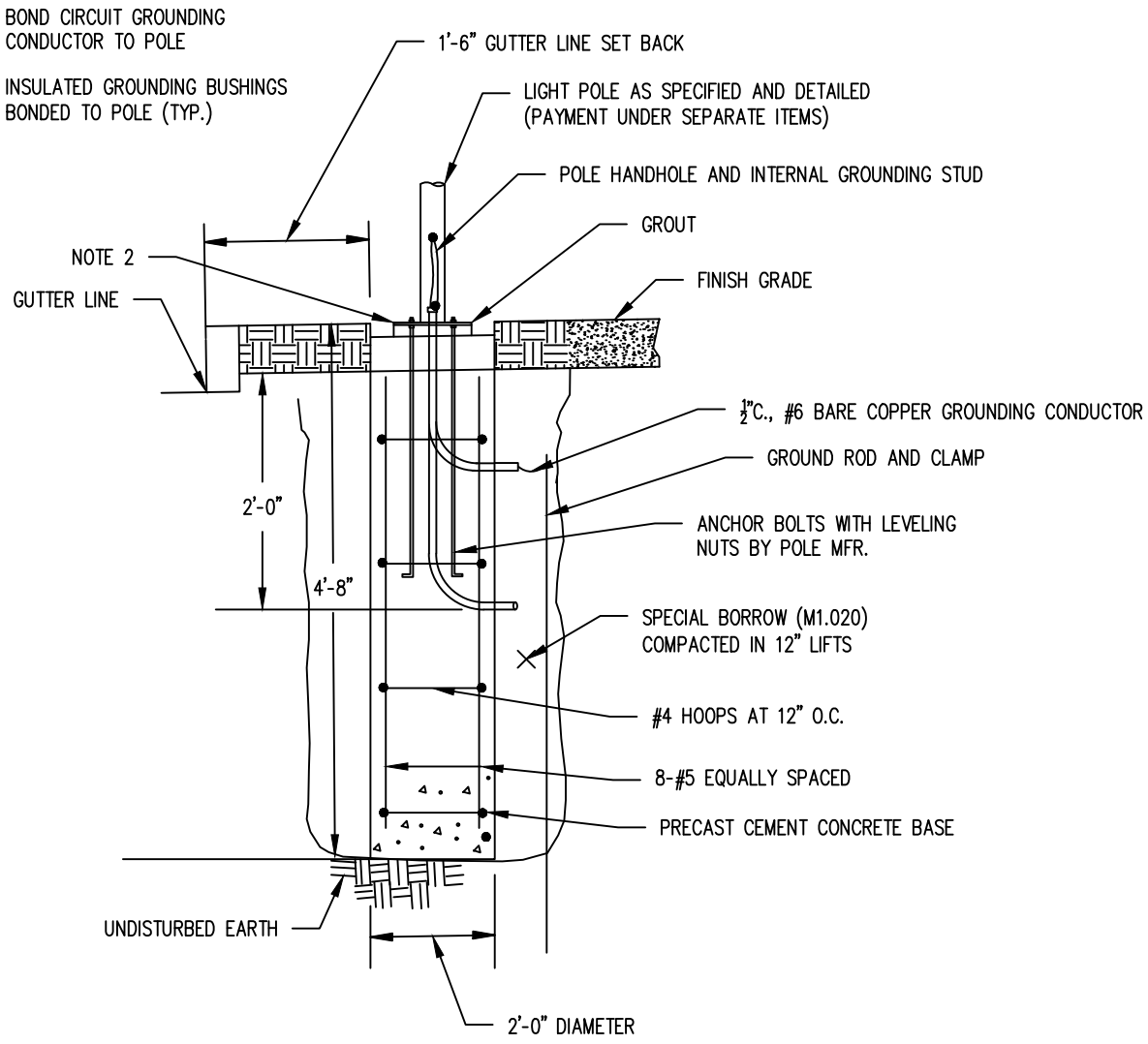


SPECIFICATIONS

| | |
|---|---|
| STYLE: | "COPPERHEAD" HISTORIC SQUARE LANTERN |
| LAMP SPEC: | 23 W CFL |
| VOLTAGE: | 120 VAC |
| COLOR TEMP: | 3000K (WARM WHITE) |
| LUMEN OUTPUT: | 1650 LUMENS |
| BASE MATERIAL: | COPPER WITH ROUND STEEL CRADLE |
| LENS SPEC: | DOUBLE WIDTH THICK CLEAR GLASS |
| ACCESSORIES: | 10" HIGH FROSTED HURRICANE CHIMNEY |

**COPPER HEAD LUMINAIRE**

NTS




NOTES:
1. TO BE USED FOR DARTMOUTH STYLE
2. NO CHAMFER EDGE FOR LIGHT POLES TO BE SET WITHIN BRICK RIBBON. TO BE FLUSH WITH FINISH GRADE.

## HISTORIC DISTRICT LIGHT BASE

NTS

PELCO PRODUCTS, INC.
PH: 405-340-3434
FAX: 405-340-3435
Edmond, OK 73013
www.pelcoinc.com

This drawing is the property of Pelco and is not to be used in whole or in part without Pelco's written permission.

# ASSEMBLY CUT SHEET

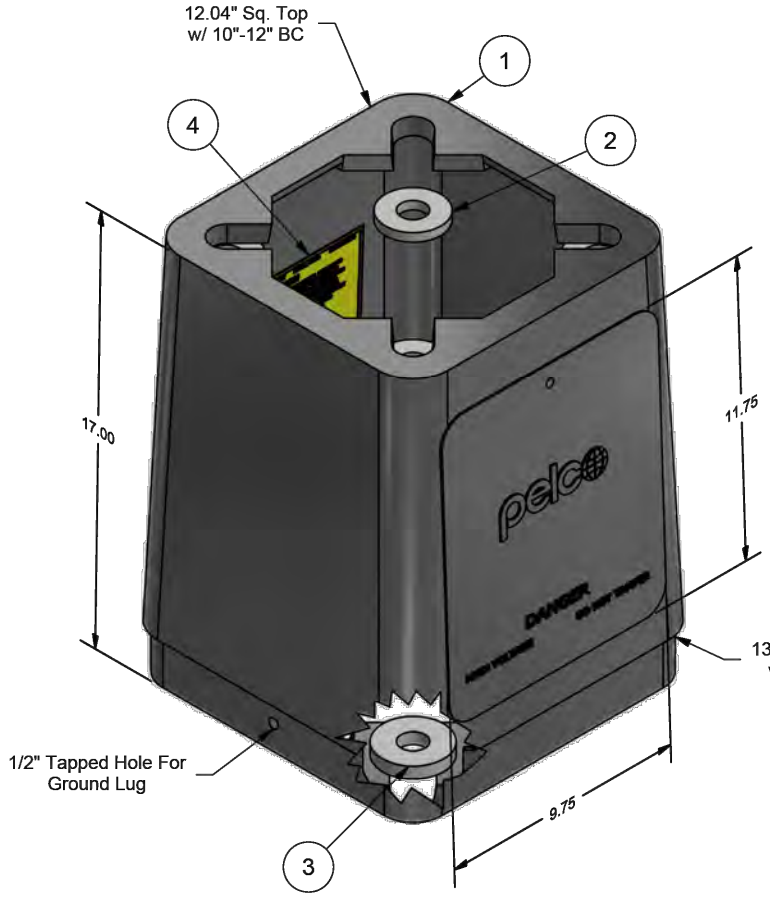
REF:

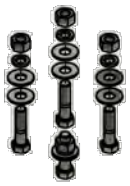
TITLE: Transformer Base Assy w/ Pelco Door & Washers, TB 2-17, Alum

PART NO.: PB-5514

| Example Part No. |
|---|
| PB-5514-PXX |
| PB-5514-HK-PXX |

w/ Hardware Kit
Process No Color=PNC
Paint=PXX



PB-5437-GLV
Hardware Kit Option

| Options |
|---|
| HK = w/ Hardware Kit |
| Paint BLACK |

| ITEM | PART NUMBER | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | PB-5514 | Transformer Base w/ Pelco Door, TB 2-17, Alum. "CAUTION" Label Shipped Loose | 1 |
| 2 | PB-5439-GLV | Hardware Kit, T-Base Washers,1-1/6" ID x 2-1/2" OD x 3/8" Thk, Set of 4, Steel, Galv | 1 |
| 3 | PB-5440-GLV | Hardware Kit, T-Base Washers,1-1/6" ID x 2-3/4" OD x 1/2" Thk, Set of 4, Steel, Galv | 1 |
| 4 | O-3236 | Label, Akron Foundry, TB2-17 Base (supplied w/ base) | 1 |

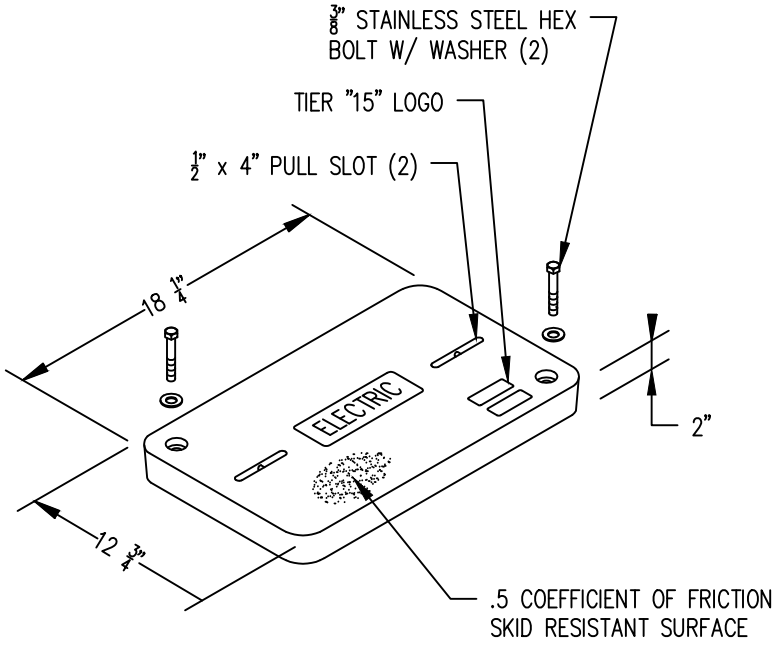
| DRAWN: | DATE: | CHECKED: | DATE: | MFG ENG: | DATE: | QA: | DATE: | REV: | DATE: | REV CHK'D: | DATE: | SHEET 1 OF 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chris.Opie | 7/14/2011 | KAK | 7/14/2011 | JLH | 5/8/2014 | ZSM | 5/8/2014 | F | 5/31/19 TRL | BPM | 6/3/2019 | |

Pelco Assy.idw 8/20/18

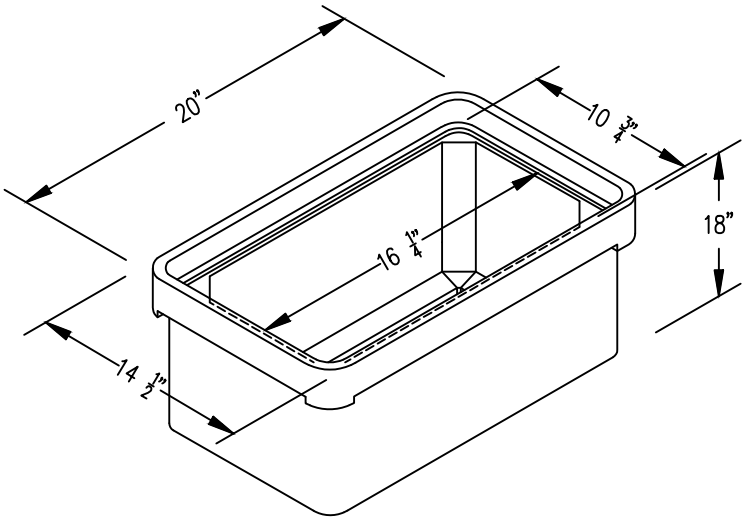
lighting the way NB new bedford

## COBRA HEAD LIGHT BASE

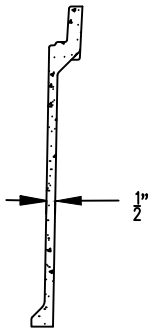
NTS




COVER




BOX




WALL

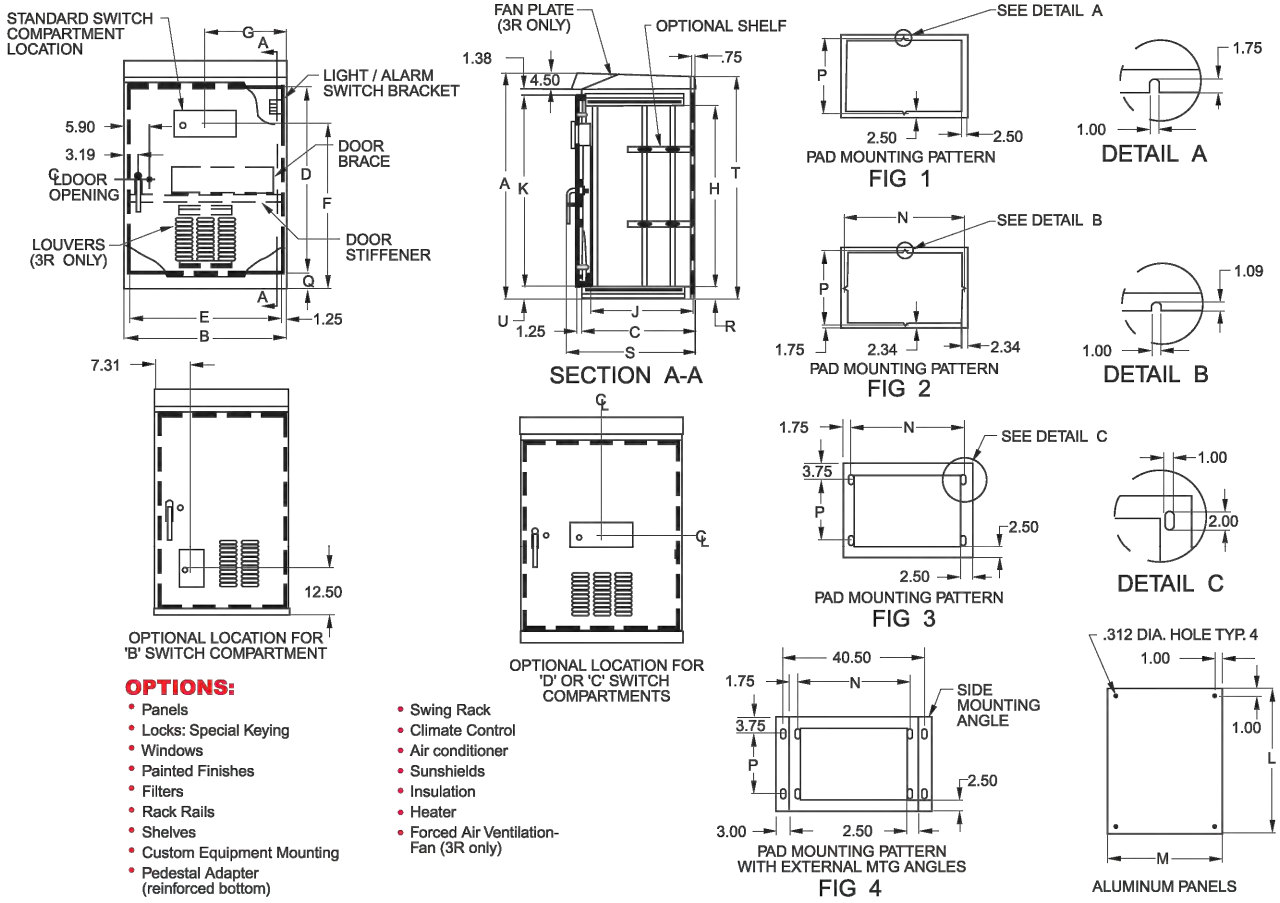
NOTES:
ELECTRIC BOX SHALL BE MADE IN THE USA.

## STANDARD ELECTRIC BOX

NTS

# Large Single Door

APX Enclosures, Inc.




**OPTIONS:**

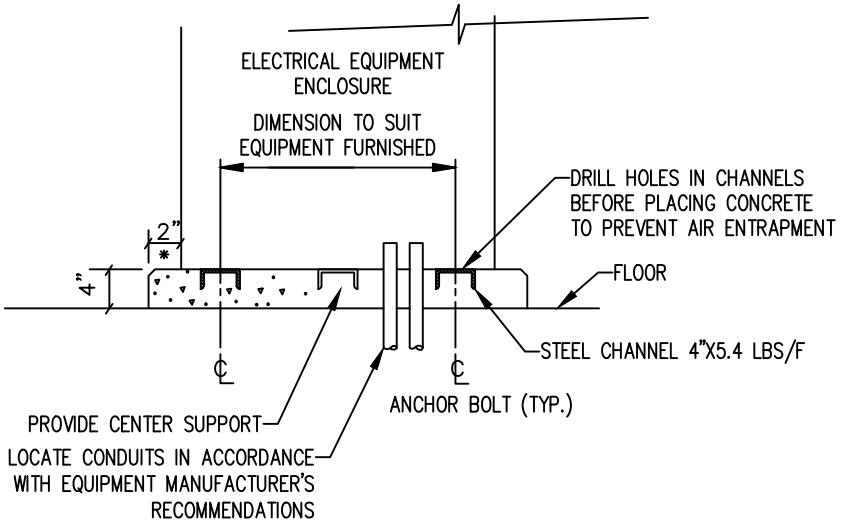
- Panels
- Locks: Special Keying
- Windows
- Painted Finishes
- Filters
- Rack Rails
- Shelves
- Custom Equipment Mounting
- Pedestal Adapter (reinforced bottom)
- Swing Rack
- Climate Control
- Air conditioner
- Sunshields
- Insulation
- Heater
- Forced Air Ventilation-Fan (3R only)

MODEL TC503617 OR APPROVED EQUAL WITH THE FOLLOWING FEATURES:

OVERALL DIMENSIONS OF
50" HEIGHT (A) X 36" WIDTH (B) X 17" DEPTH (C)

UL LISTED ENCLOSURE
NEMA 3R
BLACK POWDER COAT FINISH

3 PT. MAIN DOOR LATCH, CORBIN # LOCK, TWO KEYS, STAINLESS STEEL PAD LOCKABLE HANDLE, ADJUSTABLE EQUIPMENT CHANNELS ON SIDE AND REAR WALLS, FAN/LIGHT MOUNTING PLATE, CONTINUOUS STYLE HINGE, SLOPED LID, PLYWOOD BACK PANEL KIT, DOOR GASKETS, DOOR SWITCH BRACKET, LOUVERED DOOR, DISPOSABLE AIR FILTER, EXHAUST VENTS IN OVERHANG, PROVISIONS FOR PAD MOUNTING. (WITH OPEN BOTTOM FOR CONDUIT ENTRY)

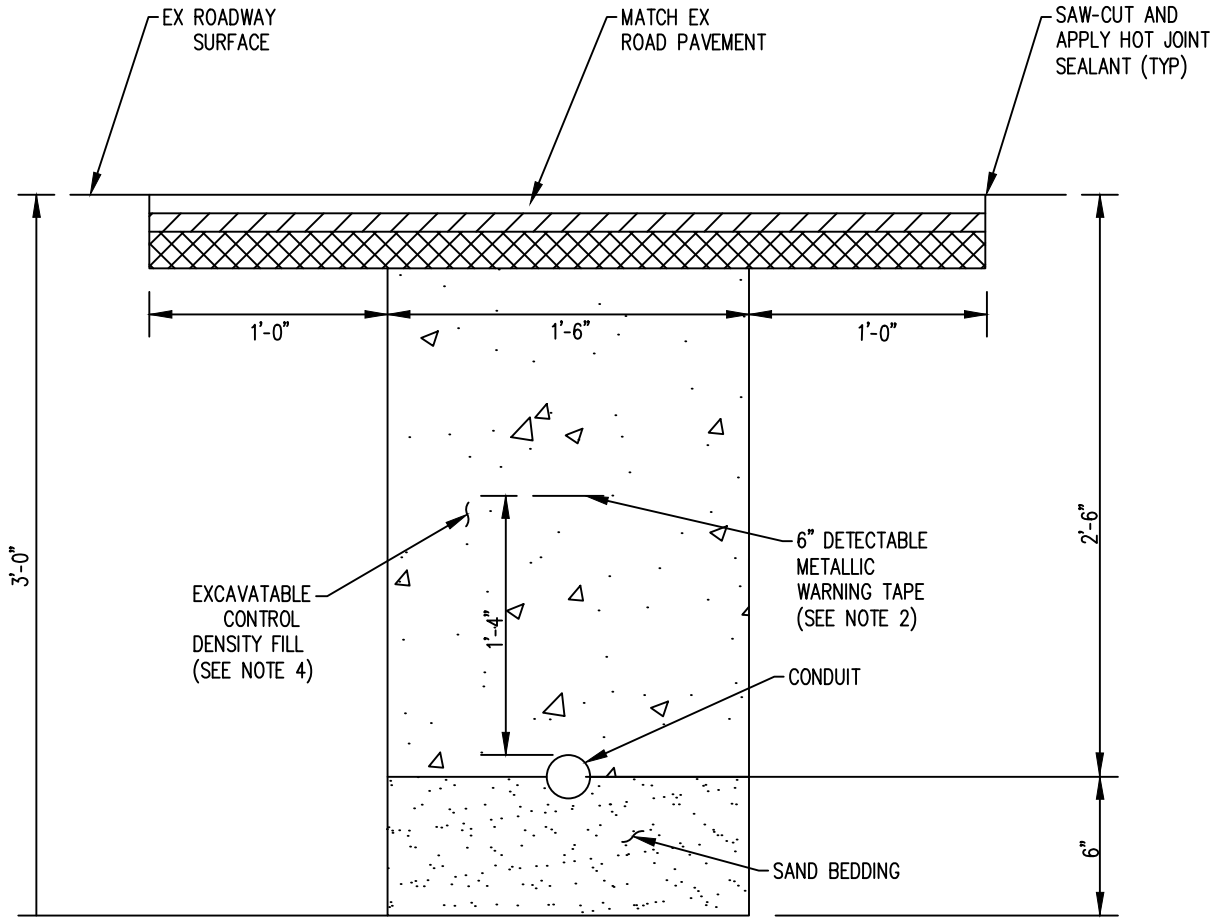



ELECTRICAL EQUIPMENT PAD

lighting the way NB new bedford

## STANDARD ELECTRIC CABINET

NTS

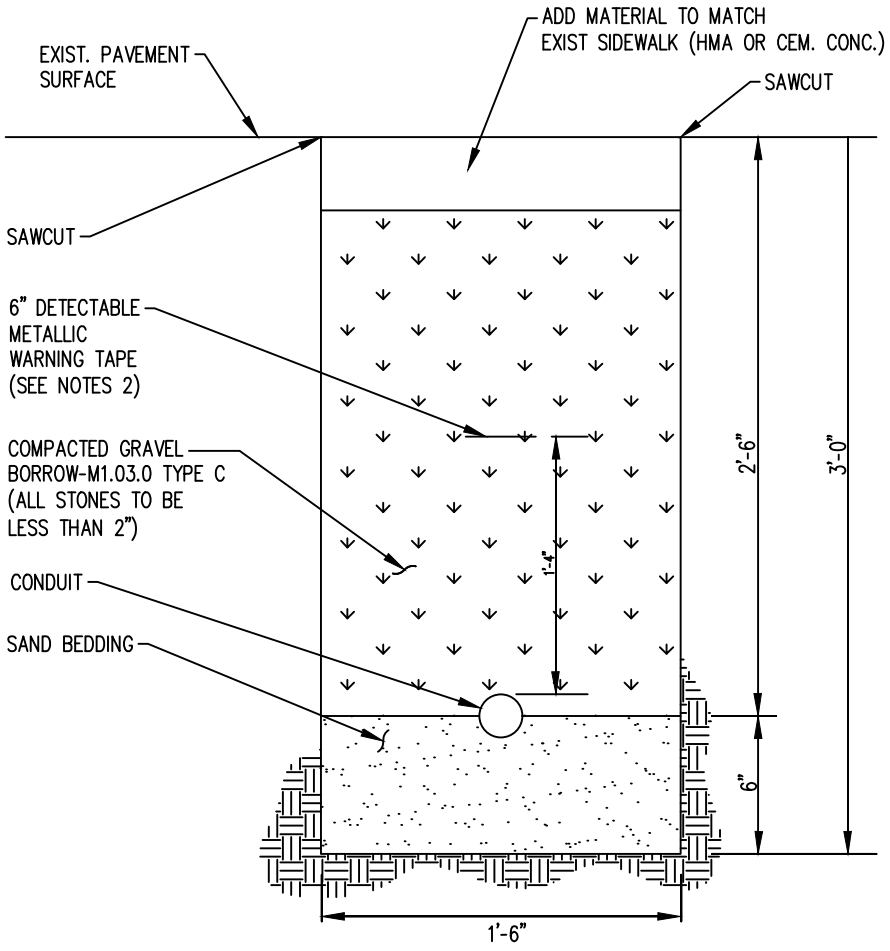



NOTES:

1. SCHEDULE 80 ELECTRICAL CONDUIT TYPE NM-PLASTIC (UL), WITH PULL ROPE, UNLESS OTHERWISE APPROVED BY CITY OF NEW BEDFORD DPI.
2. WARNING TAPE SHALL BE PER CURRENT APWA STANDARDS.
3. FOR DOUBLE CONDUIT INSTALLATIONS, SEPARATE CONDUIT BY 3". IN THE EVENT THAT A POWER CONDUIT IS ADJACENT TO A NON-POWER CONDUIT, SEPARATE BY 12".
4. CONTROL DENSITY FILL SHALL MEET THE REQUIREMENTS OF SUBSECTION MA.08.0. OF THE MASSDOT STANDARDS.

## CONDUIT CROSSING UNDER PAVEMENT

NTS

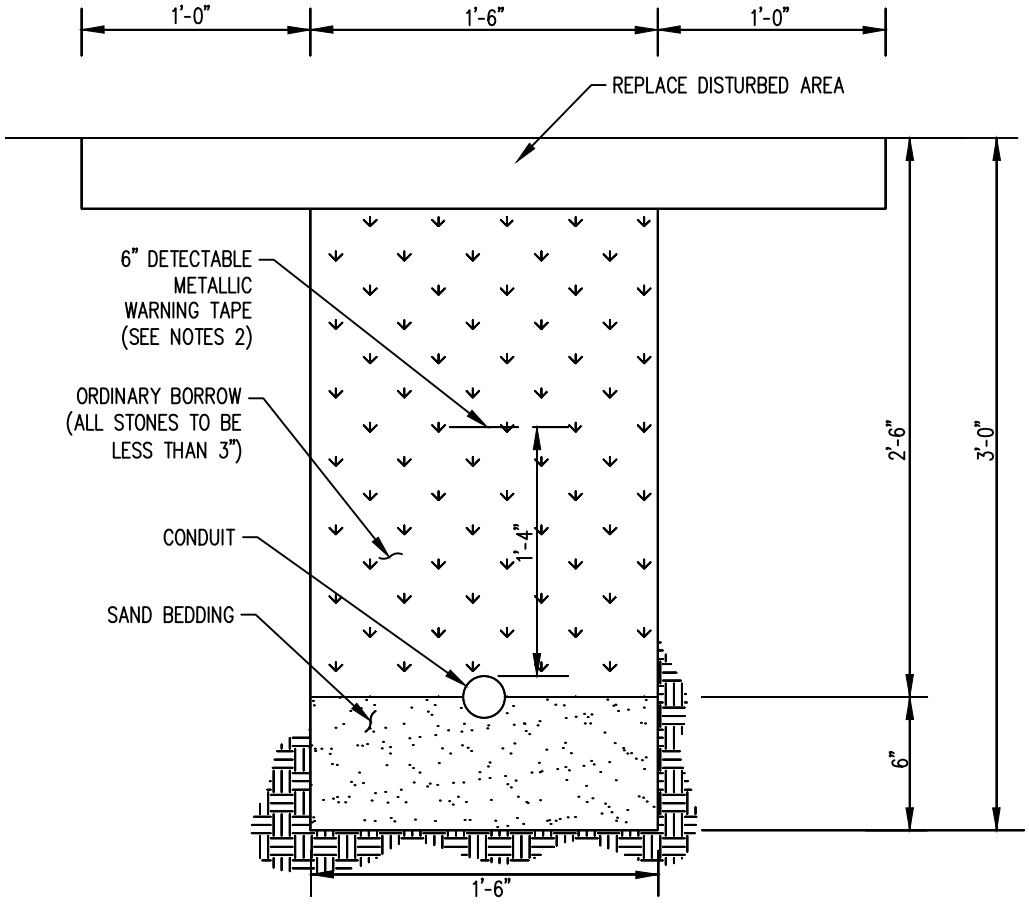



NOTES:

1. SCHEDULE 80 ELECTRICAL CONDUIT TYPE NM-PLASTIC (UL), WITH PULL ROPE, UNLESS OTHERWISE APPROVED BY MASSDOT.
2. WARNING TAPE SHALL BE PER CURRENT APWA STANDARDS.
3. FOR DOUBLE CONDUIT INSTALLATIONS, SEPARATE CONDUIT BY 3". IN THE EVENT THAT A POWER CONDUIT IS ADJACENT TO A NON-POWER CONDUIT, SEPARATE BY 12".

## CONDUIT CROSSING UNDER SIDEWALK

NTS

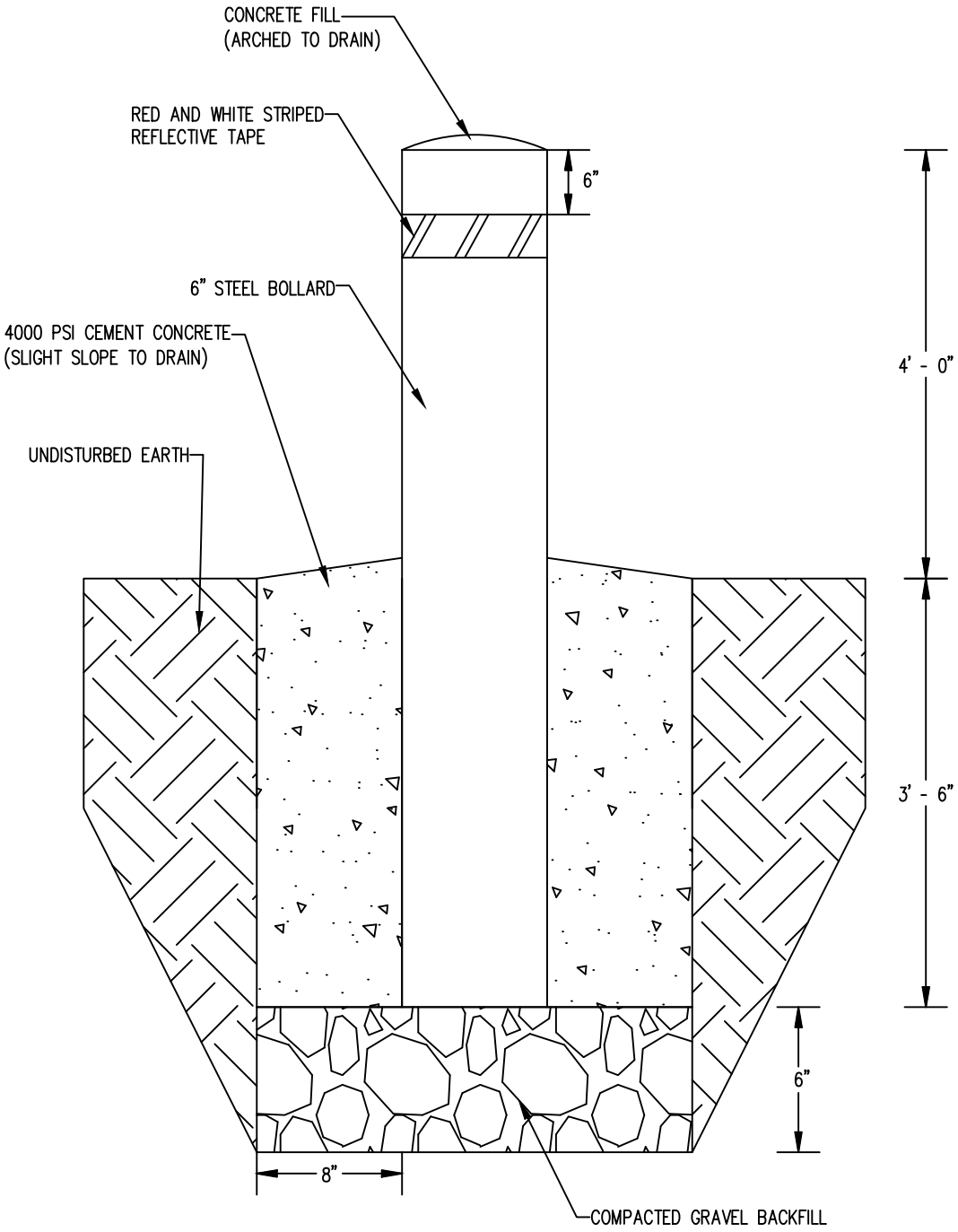



NOTES:

1. SCHEDULE 80 ELECTRICAL CONDUIT TYPE NM-PLASTIC (UL), WITH PULL ROPE, UNLESS OTHERWISE APPROVED BY MASSDOT.
2. WARNING TAPE SHALL BE PER CURRENT APWA STANDARDS.
3. FOR DOUBLE CONDUIT INSTALLATIONS, SEPARATE CONDUIT BY 3". IN THE EVENT THAT A POWER CONDUIT IS ADJACENT TO A NON-POWER CONDUIT, SEPARATE BY 12".

## CONDUIT CROSSING IN GRASS AREAS

NTS




NOTES:

1. BOLLARDS SHALL BE POWDER COATED BLACK (WITH REFLECTIVE TAPE AT THE TOP, IF SPECIFIED BY DPI).
2. FINISH DETAILS SHALL BE SPECIFIED BY DPI.

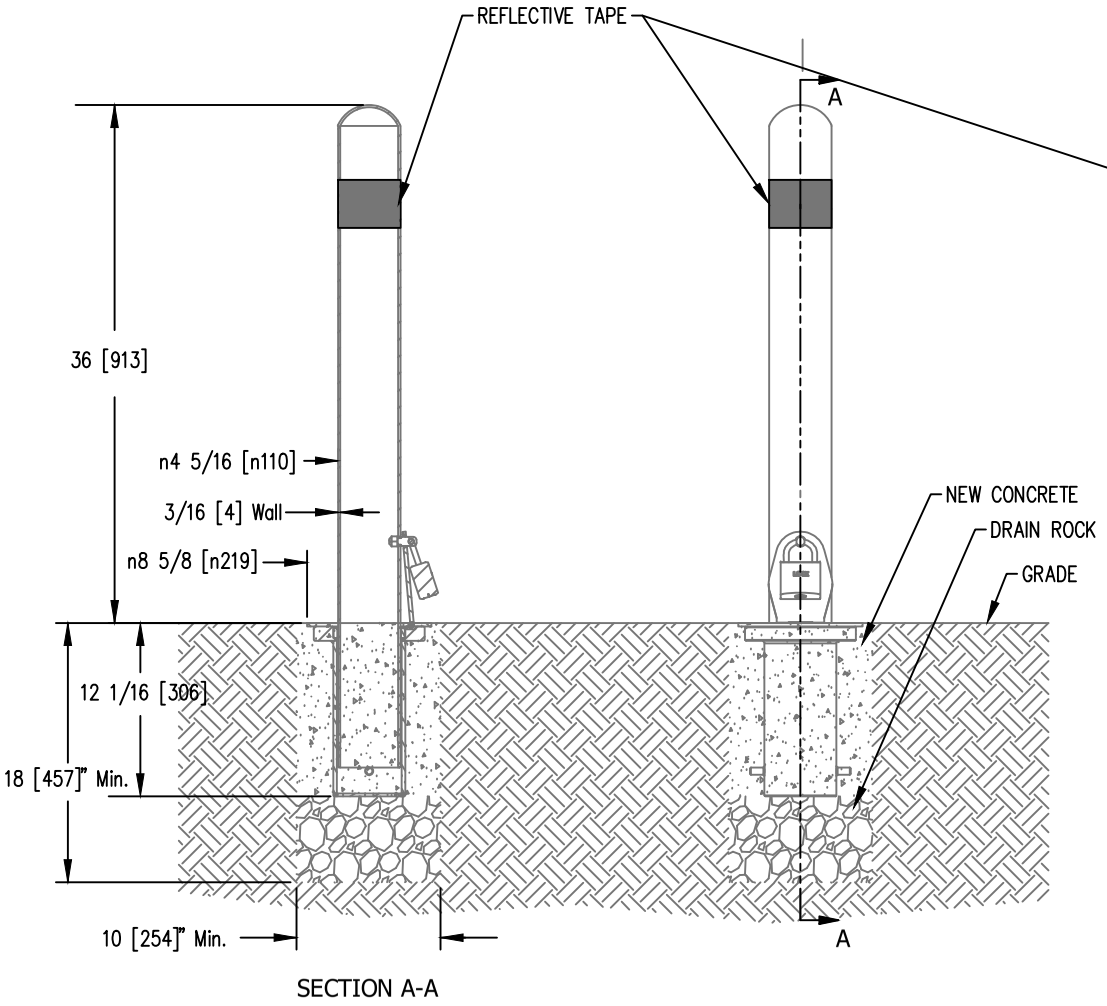
## STEEL BOLLARD

NTS

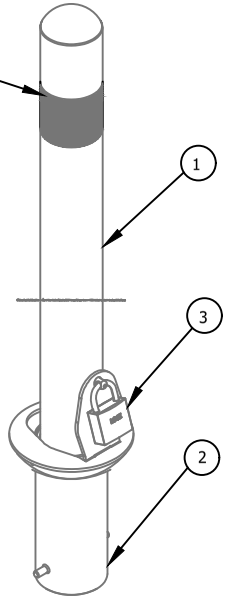
lighting the way new bedford

# REMOVABLE BOLLARD WITH LID AND RECEIVER

NTS




SECTION A-A




SPECIFICATIONS:

HEIGHT ABOVE GRADE: 36" [914]

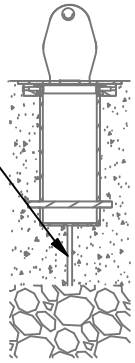
DIAMETER: 4 5/16" [110]

Weight: 31 lbs [14Kg]
(BOLLARD POST FULL LENGTH)

MATERIAL: STEEL (ASTM A36)

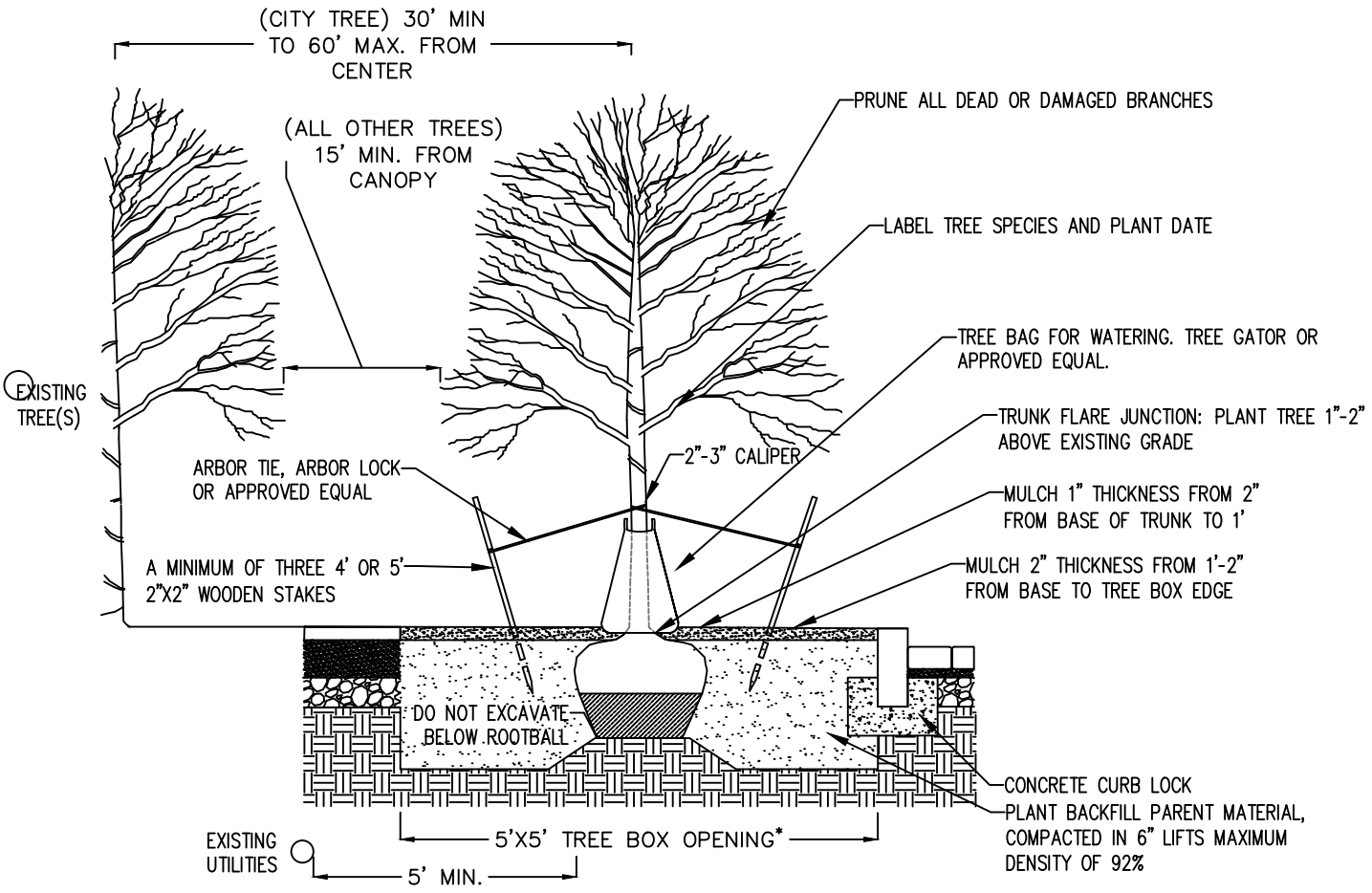
FINISH OPTIONS:
POLYSTER
POWDERCOATED_BLACK

* IF LOCAL FROST LINE EXEEDS 12" DEEP, PROVIDE ADEQUATE DRAINAGE BY PIPING THROUGH CONCRETE, CONNECT TO DRAIN ROCK LAYER UNDERNEATH.



NOTES:

1. EMBEDMENT DETAILS ARE FOR REFERENCE ILLUSTRATION ONLY. MINIMUM FOUNDATION SIZES DEPEND ON LOCAL SOIL CONDITIONS, WEATHER CONDITIONS, AND ENGINEERING REQUIREMENTS.
2. INCORPORATE REFLECTIVE TAPE ON ALL BOLLARDS TO IMPROVE VISIBILITY IN LOW-LIGHT CONDITIONS.




OVERHEAD WIRE TREE SPECIES

- Ostrya Virginiana-Hop Horn
- Cercis Candensis-Eastern Red Bud
- Prunus-Cherry
- Cretagus-Hawthorn
- Prunus Cerasifera-Purple Leaf Plum
- Parrotia persica-Persian Ironwood

OPEN SPACE TREE SPECIES

- Platanus Acerfolia-London Plane
- Ulmus Americana-Elm
- Quercus Palustrus-Pin Oak
- Quercus Palustrus-Green Pillars
- Gleditsia Triacanthos-Locust
- Liquidambar Styraciflua-Sweet Gum
- Umlmus Parvifolio-Chinese Elm
- Tilia-Linden
- Ostrya Virginiana-Hop Horn
- Cercis Candensis-Eastern Red Bud
- Prunus-Cherry
- Cretagus-Hawthorn
- Prunus Cerasifera-Purple Leaf Plum
- Parrotia persica-Persian Ironwood

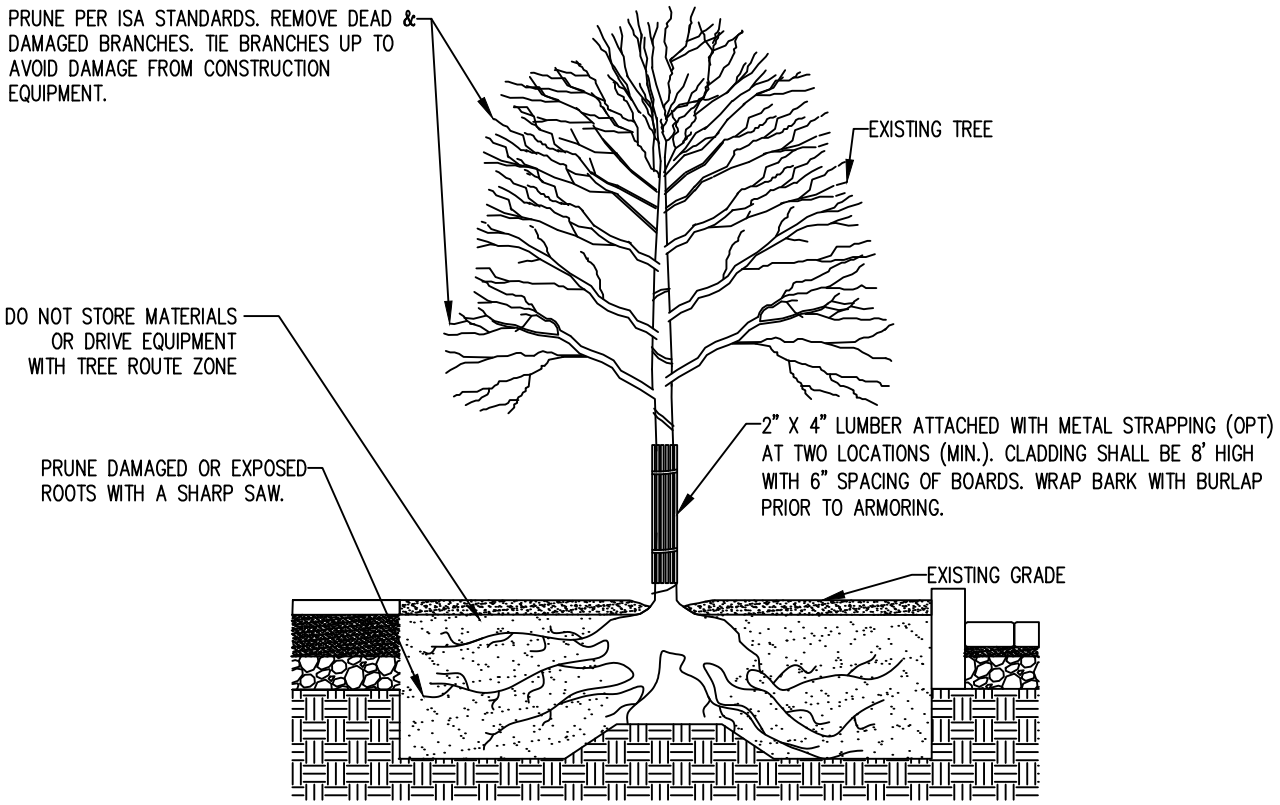
NOTES:

**CONTACT THE CITY ARBORIST FOR ALLOWABLE PLANTING DATES.**

*UNLESS NOTED ON PLANS TO MAINTAIN ADA COMPLIANCE OF ABUTTING SIDEWALK/PATH OF TRAVEL.

## PLANTING PIT

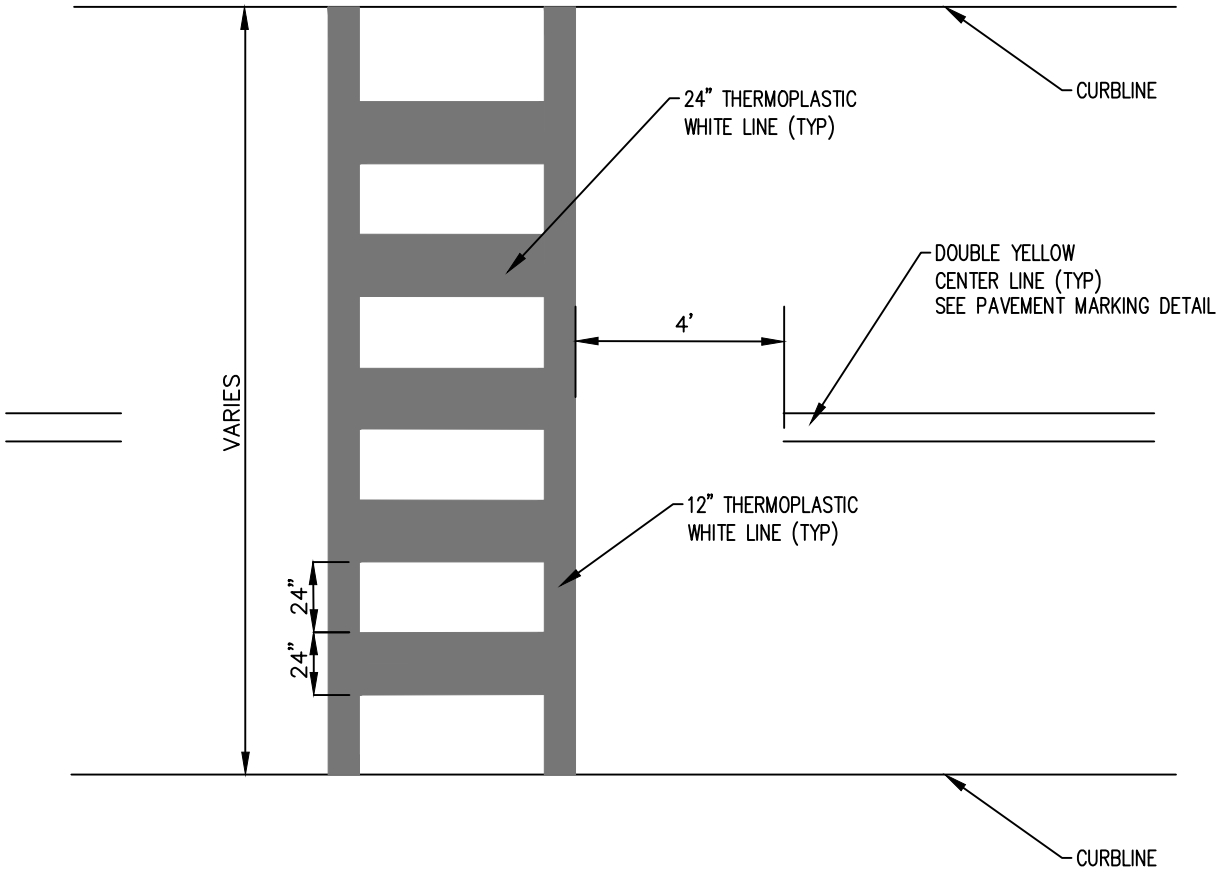
NTS




NOTES:
NO STORAGE OF EQUIPMENT OR STOCKPILING OF MATERIALS WITHIN DRIPLINE.

## TREE PROTECTION

NTS

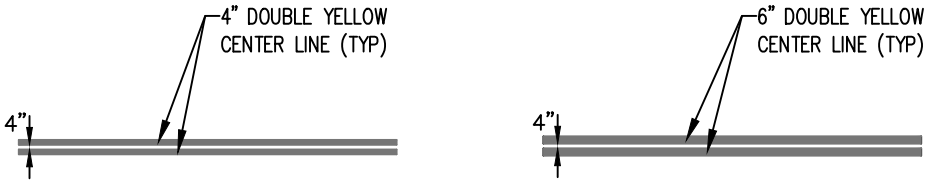



NOTES:

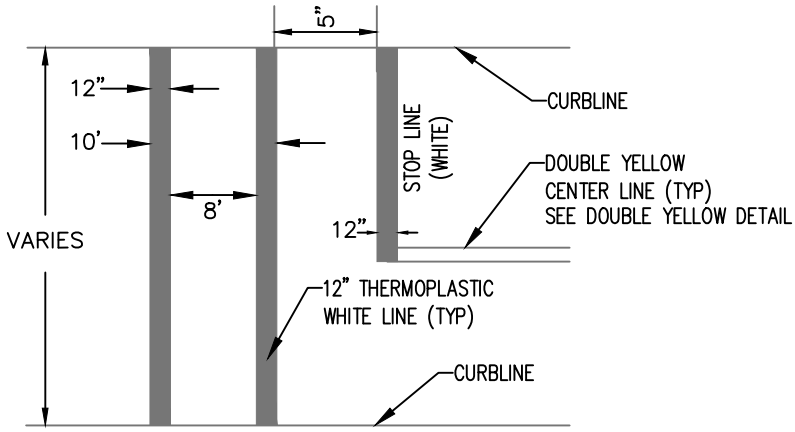
1. ALL 12" LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6" LINES) WILL BE ACCEPTED.
2. LAYOUT OF CROSSWALKS SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION.

## HIGH VISIBILITY MIDBLOCK CROSSWALK PAVEMENT MARKING

NTS



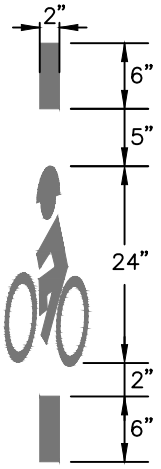

## DOUBLE YELLOW CENTERLINE



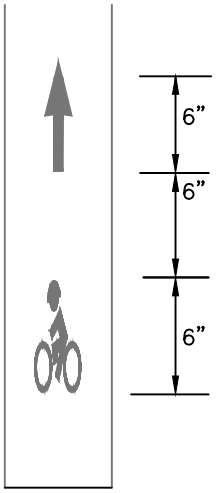

## STANDARD CROSSWALK

NOTES:

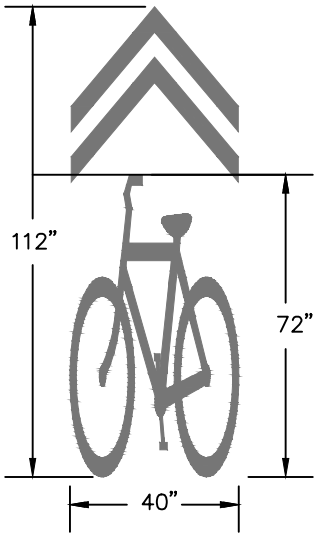
1. ALL 12" LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6" LINES) WILL BE ACCEPTED.
2. LAYOUT OF CROSSWALKS SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION.




**BICYCLE DETECTOR MARKINGS**




**BIKE LANE MARKINGS**




**SHARROW SYMBOL**

NOTES:

1. ALL 12” LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6” LINES) WILL BE ACCEPTED.
2. LAYOUT OF CROSSWALKS SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION.

## BIKE PAVEMENT MARKINGS-SYMBOLS

NTS

# APPENDIX B

# SAMPLE FORMS

**CITY OF NEW BEDFORD**
**Jonathan F. Mitchell, Mayor**

**Department of Public Infrastructure**

**Jamie Ponte**
**Commissioner**

**Water**
**Wastewater**
**Highways**
**Engineering**
**Cemeteries**
**Park Maintenance**
**Forestry**

# DEMOLITION FORM FOR FUTURE USE

I, _____, am the owner of the property located at _____ and understand that a deposit is required to be left with the Department of Public Infrastructure in order to have the services temporarily cut and capped at the property line. If the water and sewer services are not reconnected within twelve (12) months after being cut and capped, I will forfeit my deposit in order to have said services killed at the mains.

_____ _____
Property Owner Print Property Owner Signature

_____
Date

1105 Shawmut Avenue, New Bedford, MA 02746 Telephone 508-979-1550 Fax 1-508-961-3054

**CITY OF NEW BEDFORD**
**Jonathan F. Mitchell, Mayor**

**Department of Public Infrastructure**

**Jamie Ponte**
**Commissioner**

**Water**
**Wastewater**
**Highways**
**Engineering**
**Cemeteries**
**Park Maintenance**
**Forestry**

# PERMISSION SLIP

I hereby authorize _____ of
(Applicant Name)

_____ at the address of
(Company Name & Telephone Number)

_____ to act on my behalf including affixing
(Company Address)

my signature in securing permits for Plot _____, Lot _____

_____
(Address for permit location)

_____Sewer Service Permits
_____Stormwater Permits
_____Water Service Permits
_____Driveway Installation Permits
_____Sidewalk Installation Permits

I further agree to conform to, and abide by, all City rules and regulations applicable to the permit(s) being applied for.

Property Owner Information:

_____
Printed Name Signature

_____
Address City State Zip Code

_____
Today's Date Telephone Number



1105 Shawmut Avenue, New Bedford, MA 02746 Telephone 508-979-1550 Fax 1-508-961-3054

**CITY OF NEW BEDFORD**
**Jonathan F. Mitchell, Mayor**

**Department of Public Infrastructure**

**Jamie Ponte**
**Commissioner**

**Water**
**Wastewater**
**Highways**
**Engineering**
**Cemeteries**
**Park Maintenance**
**Forestry**

## Release of Liability for Sump Pump Discharge and Ground Infiltration

I _____ of _____
Owner Name — Business Name (If Applicable) and Address

hereby release the City of New Bedford of liability for the discharge of the sump pump installed at _____.
Release of Liability for Property Address and Parcel ID (Plot/Lot)

I have taken precautions to protect the sump pump pit from possible spill contamination by including the installation of a 6-inch lip around the sump pit. If it is identified by government agencies that pollutants are intentionally being dumped and/or have been discharged into the sump pump pit therefore causing ground contamination, the property owner is deemed the responsible party for any and all cleanup.

In signing below, I, being the current owner of the property aforementioned, accept and agree to the terms of this affidavit. Additionally, I agree to disclose this Release of Liability document in future ownership transfer of the parcel to the new property owner.

_____ _____
Owner Name (Printed/Signed) Date

_____ _____
Witness Name (Printed/Signed) Date

_____
Witness Title and Department Name

# APPENDIX C

# PLAN SUBMITTAL REQUIREMENTS

## How to use the DPI Site Plan Requirements Checklist

This checklist should be used in the development of site plans that are to be reviewed by the City of New Bedford (City) Department of Public Infrastructure (DPI). Use this checklist as a guide when finalizing a site plan that is to be submitted with an application for a building permit for new construction, redevelopment, additions/alterations, garages/carports, stormwater management permits, and other projects/permit types requiring DPI review.

Read through this guide in its entirety and use the checklist provided to ensure your plan meets the minimum requirements for a DPI approval. Upon receiving an application and a site plan that achieves the required standard, the DPI Engineering Division will review the project, provide feedback accordingly, and update the status of your permit application.

## Please Note:

I. The number of sheet(s) in a site plan will vary depending upon the scope of the project being proposed. As an example, smaller scale projects may only require one sheet with existing conditions, proposed site layout, demolition and erosion control, grading and drainage, utility and detail plans condensed to a couple of viewports on one sheet. All pertinent elements outlined below must be included in submitted site plans regardless of the number of sheets utilized.

II. The following site plan elements are minimum requirements for the DPI to accept and review a site plan. Other City entities may require different components on site plan(s) for respective review and approval(s).

III. Additional supporting information/documents may be required for stormwater management permit applications and is outlined separately below.

IV. The following is intended only as a guide and is subject to change.

# DPI Site Plan Checklist

## I. General Plan Elements

**All plans shall have:**

- ☐ A Locus Map at a scale of 1"= 1000'
- ☐ A Plan Sheet Index (If Applicable)
- ☐ Parcel identification, legal reference, name, and address of property owner
- ☐ Name and address of developer

**All sheets shall have:**

- ☐ Title block: project title, plan issue date, revision block, parcel identification, site address (if it is a former address, then it needs to be noted as "f/k/a")
- ☐ Sheet title and number
- ☐ North arrow
- ☐ Written and graphical scale
- ☐ Appropriate legend, notes, labels, line weights, and distinct symbology
- ☐ Show appropriate elements from existing conditions plan
- ☐ Plan sheets shall be prepared and stamped by a Commonwealth of Massachusetts Registered Professional Engineer
- ☐ Plans shall be drawn at a scale between 1"=10', 1"=20', or 1"= 40'

### A. Existing Conditions Information

**(shall be in a grayscale and called out/labeled accordingly)**

- ☐ Property lines with bearings and distances
- ☐ Parcel identification, name of owner and address number of subject parcel and abutting properties

☐ Easements and/or deed restrictions

☐ Benchmarks (based on USGS NGVD-shown year)

☐ Total site area in square feet

☐ Buildings and other structures (dimensioned) and their property line setbacks with callout "to remain" or "to be razed"

☐ Parking/Paved areas

☐ Pavement markings

☐ Site utilities, municipal utilities and stormwater features above and below ground (include pipe material, sizes, lengths, slopes, rim and invert elevations, access vaults, handholes, hydrants, gates, shutoffs, tees, transformer locations, etc.)

☐ Adequate utility information outside the site to verify proposed connections

☐ Trees and vegetation (types and sizes)

☐ Features: walls, curbing, curb cuts, walkways, fences, lighting, poles, guys, signs, fire hydrants, fire alarm boxes, waste receptacles, known buried slab, etc.

☐ Site grading (topo at 2-ft intervals)

☐ Test Pit/Soil Boring locations and cross reference to log

☐ Street names (notated public or private)

☐ Wetlands, flood zones, containment zones, if applicable

## B. Proposed Site Layout Information

**(shall be in bold and called out/labeled accordingly)**

☐ Property lines with bearings and distances

☐ Easements and/or deed restrictions with bearings and distances

☐ Benchmarks (based on USGS NGVD-shown year)

☐ Buildings and other structures (area, number of stories, and dimensions) and setbacks from property lines

☐ Parking/Paved areas (include pavement types and critical dimensions such as aisle width/parking space dimensions)

☐ Site utilities, municipal utilities and stormwater features above and below ground (include pipe types, sizes, lengths, slopes, rim and invert elevations, access vaults, handholes, hydrants, gates, shutoffs, tees, transformer locations)

☐ Indicate all items to be demolished, removed, relocated, transplanted, or protected

☐ Landscaped areas

☐ Waste receptacle storage areas

☐ Features: walls, curbing, curb cuts, walkways, fences, lighting, poles, guys, signs, fire hydrants, fire alarm boxes, waste receptacles, known buried slab, etc.

☐ Site grading (topo at 2-ft intervals)

☐ Spot grades for driveways and driveway aprons

☐ General circulation plan for vehicles and pedestrians (include pavement markings and directional signage)

☐ Provide construction details for proposed elements*:

1. Proprietary designs elements

2. Stormwater BMPs
3. Sediment and erosion controls

**All other project features that fall under the jurisdiction of the DPI shall conform to the specifications and details in the most recent revision of the City Construction Standards and Specifications Manual (Construction Manual). Since work under the DPI's jurisdiction must be conducted by a City of New Bedford Bonded Contractor those details already provided in the Construction Manual are not required to be included on the site plan.*

☐ Include the following standard notes on the proposed site layout plan:

1. Any modification(s) made to the plan approved by the DPI as the "final site plan(s)" shall be submitted to the DPI as a plan revision for review and approval prior to the work being performed.
2. Any work and material in public right of way and/or for water, sewer or stormwater shall conform to the most recent revision of the City of New Bedford Department of Public Infrastructure Construction Standards and Specifications and be completed by a contractor on the City of New Bedford Bonded Contractor List.
3. The contractor shall obtain a street disturbance and obstruction permit prior to any construction within the public right-of-way.
4. The contractor shall obtain a trench permit for any excavation three feet or deeper within a private way/property prior to any excavation.
5. All sediment and erosion control measures shall be in place prior to construction and conform to:
   i. US EPA, NPDES, MA DEP, Massachusetts Erosion and Sedimentation Control Guidelines for Urban and Suburban areas, and the City of New Bedford Stormwater Rules and Regulations.
   ii. Conditions of the approved stormwater management permit.
   iii. The City of New Bedford Conservation Commission requirements as stated in the Order of Conditions date "XX-XX-XXXX"
6. Commercial driveway permits are subject to Traffic Commission Approval.
7. Permits for sidewalks, driveways, water, fire supplies, sewer, and stormwater must be obtained from the DPI on the OpenGov permitting platform.
8. All driveway/sidewalk, water, fire supply, sewer, and stormwater construction shall be inspected by the City of New Bedford DPI before being back filled in conformance with the City of New Bedford Construction Standards and Specifications. Photographs will NOT be accepted in lieu of the DPI inspecting the work performed. The DPI shall be notified at least one full business day prior to required inspections.

## II. Stormwater Management Permit Supporting Document Checklist

☐ Include stormwater management site plan key elements:

1. Stormwater Management BMP(s) layout
2. All Connection Points into and out of the Stormwater Management BMP(s)
3. Overflows and clean outs for the system
4. Pipe Sizes and Materials
5. Sediment and erosion control plan to include materials stockpile location on site, construction entrances, perimeter controls, and site security plan
6. Test pit/soil boring locations identified on the site plan

☐ Test pit/soil boring results

☐ Stormwater calculations in accordance with the Stormwater Rules and Regulations

☐ Operations and maintenance plan for both the construction phase and the post construction phase of the project

☐ Planting plan (if applicable)

☐ If it is anticipated a sump pump will be required as permenant feature on the property, additional information is required including:

1. Point of discharge for the sump pump must be clearly identified.
2. If it is intended that the sump pump be connected into a stormwater BMP proposed on the site layout, then supporting calculations to support the additional inflow must be submitted with the site plan and stormwater permit application accompanied by a letter from the Registered Professional Engineer certifying that the system will not be overtaxed by the added inflow.
3. The following additional notes are required on the site plan if the applicant intends to utilize a sump pump on site:
    i. A sealed 6-inch vertical lip must be constructed around the sump pump pit. The lip must be inspected by the DPI prior to the issuance of a certificate of occupancy.
    ii. A sump pump discharge release of liability waiver must be signed by the property owner prior to the issuance of the final certificate of occupancy.

## How to use the UTILITY AS-BUILT Plan Checklist

This checklist should be used in the development of UTILITY AS-BUILT plans that are to be reviewed by the City of New Bedford (City) Department of Public Infrastructure (DPI). Use this checklist as a guide for submitting an UTILITY AS-BUILT plan to the DPI.

Read through this guide in its entirety and use the checklist provided to ensure your plan meets the minimum requirements for a DPI acceptance. Projects that have an UTILITY AS-BUILT requirement stipulated in the site plan review process or permit review process will only receive approval of a certificate of occupancy from the DPI after an UTILITY AS-BUILT is received and accepted.

## Please Note:

I. The following UTILITY AS-BUILT plan elements are minimum requirements for the DPI to accept an UTILITY AS-BUILT plan. Other City entities may require different components on as-built plan(s) for respective review and approval(s). The DPI may require additional information/details if deemed necessary by the City Engineer.

II. Utilities depicted in an UTILITY AS-BUILT plan must be shown as installed (as-built). As-builts will be field verified and compared to inspection reports for accuracy.

III. The following is intended only as a guide and is subject to change.

IV. The UTILITY AS-BUILT plan shall not include disclaimers and/or notes that dis-credit the plan being a true as-built.

# DPI Site Plan Checklist

## General Plan Elements

**Plans shall have:**

- ☐ A Locus Map at a scale of 1"= 1000'
- ☐ Parcel identification, legal reference, name, and address of property owner
- ☐ Name and address of developer

**Sheet(s) shall have:**

- ☐ Title block: project title, plan issue date, revision block, parcel identification, site address (assigned by the DPI Engineering Division)
- ☐ Sheet title "UTILITY AS-BUILT"
- ☐ North arrow
- ☐ Written and graphical scale
- ☐ Appropriate legend, notes, labels, line weights, and distinct symbology
- ☐ Plan sheets shall be prepared and stamped by a Commonwealth of Massachusetts Registered Professional Engineer
- ☐ Plans shall be drawn at a scale of 1"=10', 1"=20', or 1"= 40'

## UTILITY AS-BUILT Information

**(shall be in a line type and called out/labeled accordingly such that the reviewer can distinguish as-built information from existing condition information)**

- ☐ Property lines with bearings and distances
- ☐ Parcel identification, name of owner and address number of subject parcel and abutting properties
- ☐ Easements and/or deed restrictions (new utility easements also require record of easement recording)

- ☐ Benchmarks (based on USGS NGVD-shown year)
- ☐ Total site area in square feet
- ☐ Buildings and other structures (dimensioned) and their property line setbacks with callout "to remain" or "to be razed"
- ☐ Parking/Paved areas
- ☐ Pavement markings
- ☐ Existing and as-built site utilities including: municipal utilities, private utilities and stormwater features above and below ground (include pipe material, sizes, lengths, slopes, rim and invert elevations, access vaults, handholes, hydrants, gates, shutoffs, tees, transformer locations, etc.)
- ☐ Call-out connections of the utilities including roof drain connection points, inspection ports, clean outs, valves, meter location, etc.
- ☐ Identify pervious areas that were installed as a condition of the stormwater management permit
- ☐ Trees and vegetation (types and sizes)
- ☐ Test pit location(s) and data
- ☐ Features: walls, curbing, curb cuts, walkways, fences, lighting, poles, guys, signs, fire hydrants, fire alarm boxes, waste receptacles, known buried slab, etc.
- ☐ Street names (notated public or private)
- ☐ Wetlands, resource areas, flood zones, containment zones, if applicable

## SEWER/SURFACE DRAIN RECORD PLANS

AN INTEGRAL PART OF ANY SEWER/SURFACE DRAIN INSTALLATION IS AN AS-BUILT RECORD DRAWING SHOWING THE FACILITY IN BOTH PLAN AND PROFILE VIEWS, TOGETHER WITH ITS CONNECTION(S) TO EXISTING LINES.

SUCH DRAWINGS MUST BE PREPARED IN ACCORDANCE WITH DPI ENGINEERING STANDARDS AS OUTLINED BELOW.

FAILURE TO MEET THESE REQUIREMENTS IN ANY WAY SHALL RESULT IN A REJECTED AND RETURNED DRAWING TO THE APPLICANT OR PERSON(S) SUBMITTING RECORDS.

1. SIZE
   DRAWING SHALL BE 24" x 36" OVERALL, INCLUDING A ¾" MARGIN
2. MEDIUM
   DRAWING SHALL BE ON MYLAR DRAFTING FILM, DOUBLE MATTE FINISH, 3-MILS MINIMUM THICK RESULTING IN A PLAN WITH LONG-TERM DURABILITY.
3. FORMAT
   DRAWING SHALL HAVE A TITLE BLOCK ARRANGED AS FOLLOWS:

(STREET NAME) AS-BUILT SEWER (& SURFACE DRAIN)
PLAN FROM (POINT OF ORIGIN) TO (POINT OF TERMINATION)

-SCALES-

HORIZONTAL: 1" = 40' VERTICAL: 1" = 4'
CONDUCTED BY: (NAME OF DEVELOPER)
CONSTRUCTION COMPLETED: (DATE)

_____
DPI COMMISSIONER

SCALES SHALL BE 1"=40' HORIZONTAL AND 1"=4' VERTICAL. STREET NAME SHALL BE IN LETTERS 3/8" TO 1/2" HIGH, AND TITLE BLOCK SHALL BE IN THE CENTER OF SHEET, BETWEEN PLAN VIEW AND PROFILE. OTHER INFORMATION, i.e. BENCHMARK NOTATION, APPURTENANCE DESCRIPTION, LOCUS MAP, STATE COORDINATE SYSTEM, GRAPHIC SCALE, REFERENCE POINTS, etc. MAY BE ARRANGED AS SPACE PERMITS.

4. CONTENT
   DRAWING MUST BEAR THE NOTATION "AS-BUILT" OR "RECORD PLAN" AND MUST CONTAIN THE STAMP AND SIGNATURE OF THE PROFESSIONAL ENGINEER OR PROFESSIONAL SURVEYOR GUARANTEEING THE ACCURACY AND CORRECTNESS OF THE DRAWING. THE DRAWING MUST CONTAIN THE FOLLOWING INFORMATION, IN EITHER BLACK OR COLORED INK AS INDICATED BELOW:

   ON PLAN VIEW: (PLAN VIEW SHALL SHOW ALL PIPE SIZES, IN APPROPRIATE COLOR)

   A. STREET LINE(S) AND NAME(S) INVOLVED, ASSESSOR'S PLOT NUMBER, LOT NUMBERS, SIDE LINES, AND FRONTAGE DISTANCE OF ABUTTING LOTS, NORTH ARROW - BLACK COLOR.
   B. EXISTING SEWER AND STORM DRAIN MAINS, WITH EXISTING MANHOLES AND CATCH BASINS (IDENTIFIED AS "EXISTING"). SHOW AS DASHED LINES - GRAY COLOR.
   C. NEW SEWER AND/OR STORM DRAIN MAINS, WITH MANHOLES AND CATCH BASINS (IDENTIFIED AS "NEW"). SHOW AS SOLID LINES - BLACK COLOR.

   ON PROFILE VIEW: (PROFILE SHALL SHOW PIPE SIZES, SLOPES, MATERIAL TYPE, MANHOLE INVERTS IN PROPER COLOR)

   D. DATUM LINE, ROAD/GROUND SURFACE AT LOCATION OF NEW PIPE, LOCATION OF INTERSECTING STREETS, ELEVATION OF DATUM LINE AND MANHOLE STATIONS - BLACK COLOR.
   E. EXISTING SEWER AND STORM DRAIN MAINS, WITH EXISTING MANHOLES TO WHICH THE NEW PIPING CONNECTS (IDENTIFIED AS "EXISTING"). SHOW AS DASHED LINES - GRAY COLOR.
   F. NEW SEWER/STORM DRAIN MAINS WITH MANHOLES AND CATCH BASINS (IDENTIFIED AS "NEW"). SHOW AS SOLID LINES - BLACK COLOR.

5. SCOPE
   AS-BUILT DRAWINGS ARE INTENDED TO SHOW A COMPLETE SYSTEM OF MAINS, AND INDIVIDUAL LOT SERVICES, DRAINAGE AREAS AND EASEMENTS. THE LOCATION OF THE WYES ON THE MAIN, TOGETHER WITH THE POINT AT WHICH THE SERVICES CROSS THE STREET SIDELINES. THE SERVICE LINES AT STREET LINES SHALL BE ACCURATELY TABULATED BY STATIONS AND OFFSETS ON THE SHEET IN A CONVENIENT LOCATION. ZERO STATION CAN BE THE POINT OF CONNECTION OF THE NEW PIPE(S) WITH THE EXISTING LINES, OR THE STATIONING AS LAID OUT ON THE SUBDIVISION PROFILES.
6. SUBMIT THE MYLAR ORIGINAL ALONG WITH A CAD.DWG FILE.

## WATER RECORD PLANS

AN INTEGRAL PART OF ANY WATER INSTALLATION IS AN AS-BUILT RECORD DRAWING, SHOWING THE FACILITY IN PLAN VIEW, TOGETHER WITH ITS CONNECTION(S) TO EXISTING LINES.

SUCH DRAWINGS MUST BE PREPARED IN ACCORDANCE WITH DPI ENGINEERING STANDARDS AS OUTLINED BELOW.

FAILURE TO MEET THESE REQUIREMENTS IN ANY WAY SHALL RESULT IN A REJECTED AND RETURNED DRAWING TO THE APPLICANT OR PERSON(S) SUBMITTING RECORDS.

1. SIZE
   DRAWING SHALL BE 24" x 36" OVERALL, INCLUDING A ¾" MARGIN
2. MEDIUM
   DRAWING SHALL BE ON MYLAR DRAFTING FILM, DOUBLE MATTE FINISH, 3-MILS MINIMUM THICK RESULTING IN A PLAN WITH LONG-TERM DURABILITY.
3. FORMAT
   DRAWING SHALL HAVE A TITLE BLOCK ARRANGED AS FOLLOWS:

   AS-BUILT WATER PLAN OF
   (STREET NAME)
   PLAN FROM (POINT OF ORIGIN) TO (POINT OF TERMINATION)

   -SCALE-
   HORIZONTAL: 1" = 60'
   CONDUCTED BY: (NAME OF DEVELOPER)
   CONSTRUCTION COMPLETED: (DATE)

   _____
   DPI COMMISSIONER

   SCALES SHALL BE 1"=60' HORIZONTAL. STREET NAME SHALL BE IN LETTERS 1/4" TO 1/2" HIGH, AND TITLE BLOCK SHALL BE IN THE CENTER OF SHEET, BETWEEN PLAN VIEW AND PROFILE. OTHER INFORMATION, i.e. BENCHMARK NOTATION, APPURTENANCE DESCRIPTION, LOCUS MAP, STATE COORDINATE SYSTEM, GRAPHIC SCALE, REFERENCE POINTS, etc. MAY BE ARRANGED AS SPACE PERMITS.
4. CONTENT
   DRAWING MUST BEAR THE NOTATION "AS-BUILT" OR "RECORD PLAN" AND MUST CONTAIN THE STAMP AND SIGNATURE OF THE PROFESSIONAL ENGINEER GUARANTEEING THE ACCURACY AND CORRECTNESS OF THE DRAWING. STREET ACCEPTANCE INFORMATION (i.e., STREET DIMENSIONS, CURVE DATA, AREAS, ABUTTERS' NAMES, SURFACE PROFILE ELEVATIONS, etc., ARE NOT PART OF A WATER RECORD DRAWING AND SHALL NOT BE SHOWN THEREON) THE DRAWING MUST CONTAIN THE FOLLOWING INFORMATION, IN EITHER BLACK OR COLORED INK AS INDICATED BELOW:

   ON PLAN VIEW: (PLAN VIEW SHALL SHOW ALL PIPE SIZES, IN APPROPRIATE COLOR)
   - A. STREET LINE(S) AND NAME(S) INVOLVED, ASSESSOR'S PLOT NUMBER, LOT NUMBERS, SIDE LINES, AND FRONTAGE DISTANCE OF ABUTTING LOTS, NORTH ARROW - BLACK COLOR.
   - B. EXISTING SEWER AND STORM DRAIN MAINS, WITH EXISTING MANHOLES AND CATCH BASINS (IDENTIFIED AS "EXISTING"). SHOW AS DASHED LINES - GRAY COLOR.
   - C. NEW SEWER AND/OR STORM DRAIN MAINS, WITH MANHOLES AND CATCH BASINS (IDENTIFIED AS "NEW"). SHOW AS SOLID LINES - BLACK COLOR.

5. SUBMIT THE MYLAR ORIGINAL ALONG WITH A CAD.DWG FILE.

# ATTACHMENT 7: STATE ENHANCED REMEDY PERFORMANCE STANDARDS

# NEW BEDFORD PORT AUTHORITY / NEW BEDFORD MARINE COMMERCE TERMINAL SHUSTER BULKHEAD REMOVAL OF SUBMERGED FILL WITH PLACEMENT IN CAD CELLS

## State Enhanced Remedy – Performance Standards

### I Introduction

1. These performance standards (Performance Standards) shall apply to the New Bedford Marine Commerce Terminal (NBMCT) Shuster Bulkhead Project.

2. The Commonwealth of Massachusetts is the lead agency for this State Enhanced Remedy (SER) work and has a designated SER Project Manager (SER PM).

### II MADEP 401 Water Quality Program Standards:

1. Anti-degradation provisions of the Massachusetts Department of Environmental Protection (MADEP/DEP) Surface Water Quality Standards protect all waters, including wetlands. The Contractor shall take all steps necessary to assure that the proposed activities will be conducted in a manner, which will avoid violations of said standards.

2. Prior to the start of in-water work, the SER PM shall be notified of any proposed change(s) in plans that may affect waters or wetlands.

3. As proposed, silt curtains and absorbent booms shall be deployed to enclose the area being dredged. The contractor's plan for deployment of the silt curtains/absorbent booms shall be submitted to the SER PM for review prior to the start of in-water work. Should the deployment of silt curtains prove not feasible or be unsuccessful, the SER PM will be notified prior to any dredging without silt curtains.

4. The Commonwealth shall ensure that the contractor shall implement the use of silt curtains and absorbent booms outlined below for the dredging of existing sediment at the NBMCT Site:

    a. **Dredging within Existing Cofferdam:** At all times of year, when dredging below Mean High Water occurs in association with removal of the cofferdams, the area being dredged shall either be completely encircled with steel sheet piling or completely encircled with a combination of steel sheet piling and silt curtains or completely encircled with silt curtains.

        i. Monitoring: Turbidity monitoring must be conducted outside of and within 15 feet from the silt curtain and at a reference site located 200 feet from the silt curtain. Turbidity standards outlined in Section II.5 must be satisfied.

5. Water Quality Monitoring:

   a. **When the dredging operation is contained within a silt-curtained area,** the following water-quality monitoring program shall be carried out daily for the first three days of dredging and once a week thereafter:

      i. A reference location shall be established outside of and approximately 200 feet down current from the silt-curtained area ("mixing zone") and a monitoring location shall be established outside of and within 15 feet of the silt curtain.

      ii. Turbidity shall be measured, using an optical backscatter sensor, at both the reference and monitoring locations, at established depths: near the water's surface, at the mid-point of the water column and near the bottom. The three values obtained shall be averaged, such that a single, representative turbidity value is calculated for the monitoring site and a single, representative value is calculated for the reference site.

      iii. Turbidity shall be measured at both the monitoring and reference site prior to the start of dredging, and once every two hours during dredging, for a period of 8 hours.

      iv. An exceedance of the project turbidity standard shall be attributed to project activities when the average turbidity at the monitoring site exceeds the average reference site turbidity plus the permissible turbidity increase, as outlined in the following table:

| Reference Site Turbidity (NTUs) | Permissible Turbidity Increase |
|---|---|
| <10 | Reference plus 20 NTUs |
| 11-20 | Reference plus 15 NTUs |
| >21 | Reference plus 30% of reference |

      v. If, in two consecutive monitoring events, the average turbidity at the monitoring site exceeds the average turbidity at the reference site by more than the permissible turbidity increase, then water samples, composited over the entire water column, from both the monitoring and reference sites shall be collected and submitted for analysis of Total Suspended Solids, dissolved PCBs, arsenic, cadmium, copper, chromium, lead, mercury, nickel, and zinc. When samples are submitted to the laboratory, a 36-hour turn-round time shall be requested. Additionally, the Proponent, or their contractor, shall take operational action(s) designed to limit such exceedences, such as increasing the dredge cycle time, inspection and any necessary repair, of the silt curtains, deployment of an additional row of silt curtains or other mitigation measures. Turbidity monitoring shall continue on the schedule outlined in Section 6.a.iii, until compliance is reestablished.

      vi. If compliance cannot be reestablished within 48 hours, dredging shall cease and Department and any other interested local, state, or federal agency staff, in consultation with the Proponent, their contractors and/or consultants shall review the operational actions

undertaken, the results of the analyses of the water samples and evaluate the biological significance of the available data and determine the requirements for additional mitigation, if any.

b. **Should the deployment of silt-curtains prove not possible or be unsuccessful,** the following water-quality monitoring program shall be carried out daily for the first three days of dredging and twice a week thereafter:
    i. A reference location shall be established approximately 200-feet up-current from the dredge and a monitoring location shall be established 200-feet down-current from the dredge ("mixing zone").
    ii. Turbidity shall be measured, using an optical backscatter sensor, at both the reference location and the monitoring location, at established depths: near the water's surface, at the mid-point of the water column and near the bottom. The three depth values obtained shall be averaged, such that a single, representative turbidity value is calculated for the reference location and a single, representative turbidity value is calculated for the monitoring location.
    iii. Turbidity shall be measured at both the reference location and at the edge of the mixing zone prior to the start of dredging, and once every two hours of dredging, and once every two hours during dredging, for a period of 8 hours.
    iv. An exceedance of the project turbidity standard shall be attributed to project activities when the average turbidity at the edge of the mixing zone exceeds the reference site turbidity plus the permissible turbidity increase, as outlined in the following table:

| Reference Site Turbidity (NTUs) | Permissible Turbidity Increase |
|---|---|
| <10 | Reference plus 20 NTUs |
| 11-20 | Reference plus 15 NTUs |
| 21-30 | Reference plus 10 NTUs |
| >31 | Reference plus 30% of reference |

    v. If, in two consecutive monitoring events, the average turbidity at the edge of the mixing zone exceeds the average turbidity at the reference site plus the permissible turbidity increase, then water samples, composited over the entire water column, from both the reference location and the edge of the mixing zone shall be collected and submitted for analysis of Total Suspended Solids, dissolved PCBs, arsenic, cadmium, copper, chromium, lead, mercury, nickel, and zinc. When samples are submitted to the laboratory, a 36-hour turn-round time shall be requested. Additionally, the Proponent, or their contractor, shall take operational action(s) designed to limit such exceedences, such as increasing the dredge cycle time, inspection and any necessary repair, of the silt curtains, deployment of an additional row of silt curtains or other mitigation measures. Turbidity monitoring shall

continue on the schedule outlined in Section 6.b.iii, until compliance is reestablished.

vi. If compliance cannot be reestablished within 48 hours, dredging shall cease and the Department and any other interested local, state or federal agency staff, in consultation with the Proponent, their contracts and/or consultants shall review the operational actions undertaken, the results of the analyses of the water samples and evaluate the biological significance of the available data and determine the requirements for additional mitigation, if any.

6. As proposed, dredging of contaminated, silty sediment shall be done using a closed, environmental, clamshell bucket. Where pilings or other debris are found to interfere with environmental bucket closure or equipment operation, a conventional clamshell bucket may be used to extract the pilings/debris. Sediment removal during such activity shall be minimized to the greatest extent practicable. Should dredging with the environmental bucket become unfeasible or unsuccessful, the SER PM must be notified prior to any contaminated sediment dredging not using the environmental bucket, and the contractor must also continue to meet the project water quality standard performance standards.

7. Water discharged from the barge shall be appreciably free of suspended sediment and meet the water quality criteria established in Section 4 (above). Any free liquid flowing from the barge in the harbor shall be passed through a sand media filter or equivalent filtration system (which must be approved by the project Resident Engineer) prior to discharge.

8. Diesel-powered equipment shall be fitted with after-engine emissions controls such as oxidation catalysts or particulate filters.

9. Within 30 days of the completion of the initial dredging, a bathymetric survey of the dredge footprint, depicting post-dredge conditions, shall be sent to the MADEP SER PM.

## II <u>MADEP Chapter 91 Waterways Standards:</u>

1. Acceptance of these Waterways Conditions shall constitute an agreement by the Proponent to conform to all terms and conditions herein.

2. After completion of the work authorized, the Proponent shall furnish to the Department a suitable plan showing the depths at mean low water over the area dredged. Dredging under this Project shall be conducted so as to cause no unnecessary obstruction of the free passage of vessels, and care shall be taken to cause no shoaling. If, however, any shoaling is caused, the Proponent shall, at his/her expense, remove the shoal areas. The Proponent shall pay all costs of supervision, and if at any time the Department deems necessary a survey or surveys of the area dredged, the Proponent shall pay all costs associated with such work.

3. The Proponent shall, at least 3 days prior to the commencement of any dredging in tide water, give written notice to the Department of the time, location, and amount of the proposed work.

Special Waterways Conditions

1. Dredged material shall be transported to suitable disposal facilities; unregulated dumping of dredged materials is not permitted.

2. The Proponent shall develop and implement a Navigation Plan to address and mitigate temporary impacts to navigation during dredging activities.

3. The Proponent shall provide and maintain in good working order appropriate United States Coast Guard (USCG) approved navigation aids to assist mariners in avoiding work areas as required by the USCG.

4. Modification to this Project: the SER PM, may review on an individual basis, modifications to construction activities and/or temporary structures which represent an insignificant deviation from original specifications, in terms of configuration, materials or other relevant design or fabrication parameters as determined by DEP within all areas of construction. Such a review shall be in accordance with the following procedure:
    a. The Proponent shall submit a written request describing the proposed modifications to the work accompanied by plans, for prior review of the DEP. The DEP will consider comments submitted within 10 days of the DEP's receipt of the request. The DEP will send any significant modifications to the Resource Agencies for review and comment and to identify any future Performance Standards, if necessary. The Environmental Protection Agency will also have the opportunity to make a consistency determination if the change is significant, as necessary. The DEP will notify the Resource Agencies of any minor modifications.

5. After completion of the work authorized the Proponent shall furnish the Department with a suitable plan showing the depths at mean low water over the areas dredged within 90 days of completion of each phase of the dredging.

## III MADEP Noise Standards:

1. Division of Air Quality Control Policy (DAQC Policy 90-001):

   A source sound will be considered to be in violation of the Departments noise regulation (310 CMR 7.10) if the sources:
    a. Increases the broadband sound level by more than 10 dB(A) above ambient, or
    b. Produces a "pure tone" condition – when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.

**ATTACHMENT 8: STATE ENHANCED REMEDY WORK PLAN**
**(FOTH INFRASTRUCTURE & ENVIRONMENT, LLC, AUGUST 22, 2025)**

**NEW BEDFORD PORT AUTHORITY /**
**MASSACHUSETTS CLEAN ENERGY CENTER**
**STATE ENHANCED REMEDY**

# WORK PLAN FOR:

# NEW BEDFORD PORT AUTHORITY / NEW BEDFORD MARINE COMMERCE TERMINAL SHUSTER BULKHEAD REMOVAL OF SUBMERGED FILL WITH PLACEMENT IN CAD CELLS

**New Bedford, Massachusetts**

August 2025

Prepared by:

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Attachment A 1998 Record of Decision – State Enhanced Remedy Excerpt
Attachment B State Enhanced Remedy – Performance Standards
Attachment C New Bedford Marine Commerce Terminal Phase 3 Bulkhead Replacement – Work Plan Drawings
Attachment D Massachusetts Clean Energy Center Site 4 – Shuster Bulkhead: Boring Location Plan with Analytical Results

## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ARAR | Applicable, Relevant and Appropriate Requirements |
| CAD | Confined Aquatic Disposal |
| CAD Cell No. 3 | MassCEC CAD Cell Number 3 |
| CAD Cell No. 4 | NBPA CAD Cell Number 4 |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CY | cubic yards |
| CZM | Coastal Zone Management |
| DMMP | Dredge Material Management Plan |
| EFHA | Essential Fish Habitat Assessment |
| EOEA | Executive Office of Environmental Affairs |
| ESD | Explanation of Significant Differences |
| FEIR | Federal Environmental Impact Report |
| Foth | Foth Infrastructure & Environment, LLC |
| HASP | Health and Safety Plan |
| LF | linear feet |
| MassCEC | Massachusetts Clean Energy Center |
| MassDEP | Massachusetts Department of Environmental Protection |
| MA DMF | Massachusetts Division of Marine Fisheries |
| MADPH | Massachusetts Department of Public Health |
| mg/kg | milligram per kilogram |
| MLLW | mean lower low water |
| MOA | Memorandum of Agreement |
| NBHDC | New Bedford Harbor Development Commission |
| NBPA | New Bedford Port Authority |
| O&M Plan | Operations and Maintenance Plan |
| PCB | polychlorinated biphenyls |
| PPM | parts per million |
| QA | Quality Assurance |
| QA/QCP | Quality Assurance/Quality Control Plan |
| QC | Quality Control |

## ABBREVIATIONS AND ACRONYMS (CONTINUED)

| | |
|---|---|
| ROD | Record of Decision |
| SAP | Sampling and Analysis Plan |
| SER | State-Enhanced Remedy |
| Site | New Bedford Harbor |
| TSCA | Toxic Substance Control Act |
| USACE | U.S. Army Corps of Engineers |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Services |

# 1.0 GENERAL INFORMATION

## 1.1 Introduction

This document is being submitted by the New Beford Port Authority (NBPA) on behalf of The Massachusetts Clean Energy Center (MassCEC), along with their consultant, Foth Infrastructure & Environment, LLC (Foth) have prepared this Work Plan for the removal of submerged fill within the footprint of the cellular cofferdam structure at the site commonly known as the "Shuster Bulkhead", as part of the New Bedford Marine Commerce Terminal (Terminal) facility located at 4 Wright Street, New Bedford, MA. This proposed work was outlined in the Statement of Work approved in December of 2024[1].

This work is to be performed under the State Enhanced Remedy (SER) which was authorized by the September 1998 Record of Decision (ROD) for the New Bedford Harbor Superfund Site – See Attachment A. The work is also to follow the guidelines set forth by the State Enhanced Remedy – Performance Standards, See Attachment B.

This Work Plan details the activities to be completed during the design and construction phases for the Removal of Submerged Fill and disposal into existing CAD Cells. See Attachment C – New Bedford Marine Commerce Terminal (NBMCT) Phase 3 Terminal Expansion Work Plan Drawings for datum conversion chart.

## 1.2 Project Purpose and Summary

Foth has prepared this Work Plan for the Removal of Submerged Fill within existing cellular cofferdam structures at the end of their service life, in support of the Terminal Expansion associated with the Shuster Bulkhead rehabilitation. The Terminal Expansion construction will be done through conventional permitting. The intent of this project is to enhance the remedy of the New Bedford Harbor Superfund Site through ongoing rehabilitation of failing structures with contaminated material being disposed of into existing CAD Cells.

Work will be conducted under the SER process as set forth in the Record of Decision for the New Bedford Superfund Site. This Work Plan is divided into four sections. **Section 1.0** provides an introduction and overview of the project. Section 2.0 Discusses the SER approach and the identification of Performance Standards. **Section 3.0** is the Scope of Work. **Section 4.0** presents the Project Schedule for the referenced work. The Work Plan is intended to present an outline of the project flow and process that will be undertaken to achieve the stated project goals. Project-specific design elements, field data collection, and construction activities will be determined and detailed in subsequent design documents as the project progresses. These activities are summarized in Section 3.0 of this document.

[1] Refer to the report entitled "Statement of Work for the Removal of Submerged Fill with Placement in CAD Cells" dated November 18, 2024,

## 1.3 Site Description and Background Information

The New Bedford Harbor Superfund Site (Site) consists of approximately 1,000 acres of urban tidal estuary and shoreline areas along the Acushnet River Estuary and New Bedford Harbor (the Upper and Lower Harbor); and approximately 17,000 acres in Buzzards Bay, or the Outer Harbor. From the 1940s until the mid-1970s, polychlorinated biphenyls (PCBs) were directly discharged into the Estuary, Harbor, and Bay and the sewer system of the city of New Bedford. These discharges contaminated the sediments at levels ranging from a few parts per million or milligrams per kilogram (ppm or mg/kg) to over 200,000 mg/kg of PCBs. Other contaminants (such as heavy metals and polycyclic aromatic hydrocarbons or PAHs) were also discharged into the Site at various times since the 1800s. After a 2013 settlement with a major responsible party, USEPA has made significant progress regarding subtidal contamination in both the Upper and Lower Harbor. USEPA has completed remediation of intertidal sediments and wetland/saltmarsh areas in the Lower and Upper Harbor. The current human health risks from the Site are from frequent ingestion of local fish and shellfish, and frequent direct contact with PCBs in the intertidal sediments. In addition, the Harbor's marine ecosystem remains severely damaged from the historic widespread PCB-contaminated sediment. However, because of the dredging by the USEPA and NB Port Authority, a significant amount of the PCB at the Site have been remediated, resulting in improvement to the marine ecosystem.

In addition to the public health and environmental impacts, contamination of the harbor area has had tremendous economic impacts on the local communities. The local shellfish/fishing and commercial lobster industry has suffered from the Massachusetts Department of Public Health (MADPH) fish taking and consumption ban in the Upper, Lower, and Outer Harbor. Also, contaminated sediments have made it difficult to conduct any maintenance dredging for navigational purposes. Lack of maintenance dredging has resulted in limiting the size of commercial ships that can safely enter the harbor, thus limiting its potential use as a regional port facility. Superfund-related dredging is intended to remove contaminated sediments from the harbor, so that post-remedial concentrations of hazardous materials in bottom sediments no longer poses a risk to human health and the environment.

NBPA understands that previously, before USEPA's adoption of CAD Cell technology, the cleanup was estimated to cost over $400 million (net present value) or $1.7 billion in actual costs and take up to 46 years to complete, depending on USEPA's level of funding for this effort. However, the use of CAD Cell technology enabled the USEPA to dispose of approximately 300,000 cubic yards (cy) of mechanically dredged sediments with PCB levels above the 1998 ROD action levels in a matter of years, as opposed to the several decades it would otherwise take to clean up the navigable portions of the Harbor. Because the NBPA is experienced at building CAD Cells in the Harbor efficiently and cost-effectively, the NBPA can enhance the Harbor cleanup and reclaim the Harbor bottom for navigable interests and ecologic benefits sooner.

### 1.3.1 A History of CAD Cells in New Bedford Harbor

The Dredge Material Management Plan (DMMP), Executive Office of Environmental Affairs (EOEA) No. 11669 Final Environmental Impact Report (FEIR), was prepared for the Office of

Coastal Zone Management (CZM) and the cities of New Bedford and Fairhaven, MA to provide a state designation of a disposal site in New Bedford/Fairhaven Harbor for dredged material determined to be unsuitable for conventional disposal methods due to PCB contamination. The FEIR identifies confined aquatic disposal (CADs) facilities at Popes Island North site (one of the areas to the north of Route 6 Bridge in New Bedford Harbor) as the preferred alternative disposal site, as well as the least environmentally damaging practicable alternative under the Clean Water Act.

NBPA has constructed three CAD Cells (CAD Cells No. 1, No. 2, and No. 4) and Massachusetts Clean Energy Center constructed one cell (CAD Cell No. 3) within the footprint of the DMMP disposal site. These CAD Cells have received contaminated sediment generated by navigational dredging projects at several locations throughout New Bedford Harbor. Dredge sediments from NBPA's New Bedford Harbor Dredging – Phase IV, and from the Commonwealth of Massachusetts South Terminal Dredge Project, were placed into CAD Cell No. 3. USEPA has constructed the Lower Harbor CAD Cell in two phases – USEPA LHCC Phase I and USEPA LHCC Phase II – within the footprint of the DMMP disposal site to assist the USEPA in their efforts to clean up the New Bedford Harbor and have since received contaminated sediment from the top sediment layers of the harbor in the cells. CAD Cell No. 4 was constructed with approximately 500,000 cy of available disposal capacity and has received sediments from the NBPA Phase V Dredging Project, North Terminal Phase 1 and Phase 2 Expansion projects, and the Leonard's Wharf Rehabilitation and Expansion project. At the completion of the Leonard's Wharf project the CAD Cell is expected to have approximately 170,000 CY of available capacity for disposal of contaminated sediments.

## 1.4 Summary of Scope of Work

The Scope of Work for this Work Plan involves dredging and disposal of the fill that was placed in 1970-1971within the cellular cofferdams, three major and three minor cells. This is a critical aspect of the required marine infrastructure reconstruction. Due to the current condition of the cells, which are deteriorated with numerous holes, this tidally influenced area is losing fill material into the harbor, causing sinkholes, and significantly reducing the site's allowable load capacity. The dredging of the cells, and replacement of the cellular cofferdam system with a bulkhead landward (to the west) of the existing cells and a pile-supported relieving platform will provide a structurally stable facility with increased load capacity and resilience against storm surges and sea level rise. The structures will be authorized through traditional permitting.

The request for the dredging and disposal through the SER process is based on the need to eliminate the continued release of submerged fill materials into New Bedford/Fairhaven Harbor, requiring frequent dredging to maintain berth clearance. The deteriorated cell sheets will no longer be required and will no longer be accessible after constructing the new pile supported structure. Therefore, after installing the landward bulkhead, which will stabilize the shoreline, approximately ±9,750 cubic yards (CY) of fill material will be dredged from within the existing cellular cofferdams and placed in CAD Cell #3, which was constructed by MACEC. The remaining material within the footprint of the cellular cofferdams will be left at a 2.5:1 slope. After dredging, the steel sheeting that comprises the cells will be removed, and the slope will be stabilized with a

concrete mattress covering the area from the face of the existing bulkhead to the face of the proposed landward bulkhead (as detailed in Attachment 1). Following sheet removal, materials from within the footprint of the cells that entered the berth as a result of construction activities will be dredged and also placed in CAD Cell #3 or #4.

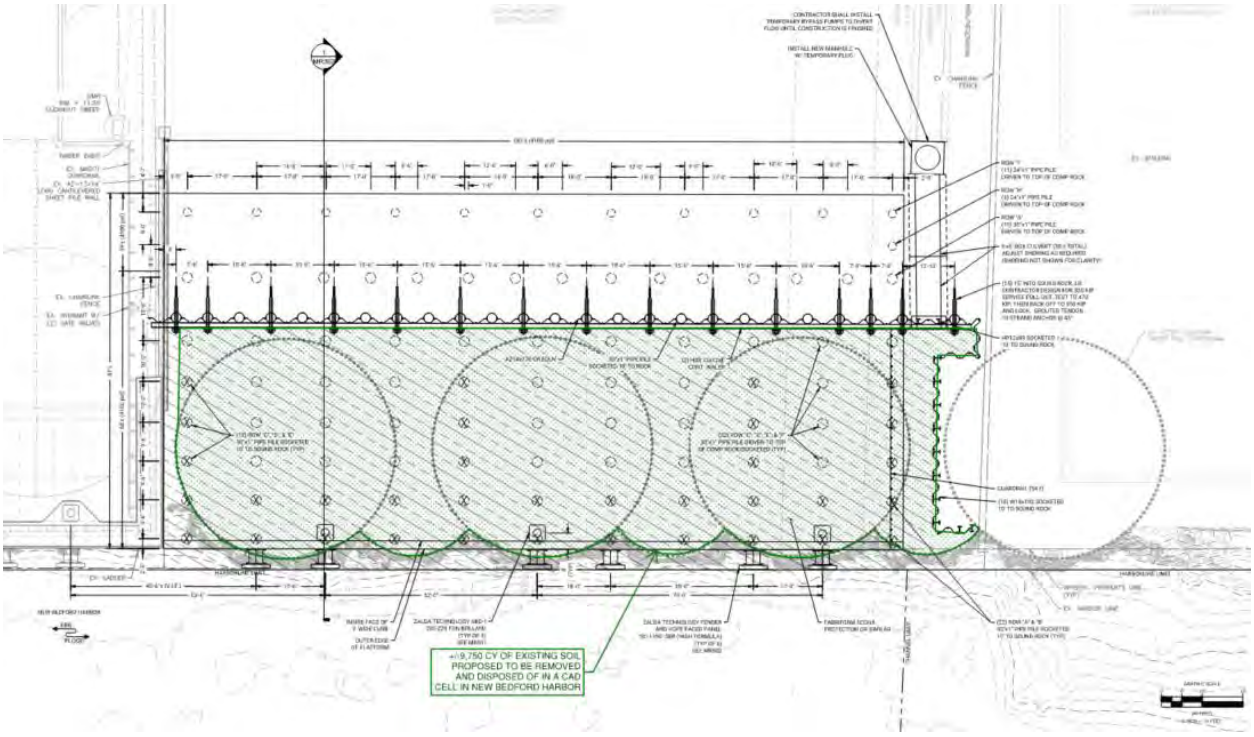



**FIGURE 1: SHUSTER BULKHEAD FILL REMOVAL FOOTPRINT**

**PROPOSED SITE LAYOUT**

Regulatory engagement will be required to ensure that the SER process is followed and that all data collection activities conducted are consistent with the enhanced remedy. The Massachusetts Department of Environmental Protection (MassDEP) Project Manager will act as the regulatory point-of-contact, and will interact with the project stakeholders, the USEPA, and other state, federal, and local resource agencies, as appropriate to ensure that all agencies are afforded appropriate review of SER submittals and input regarding project planning. In addition, the Scope of Work includes the following tasks:

- Obtain approval by the MassDEP SER Committee Chair,

## 1.5 Assumptions

This section outlines the major assumptions made during the preparation of this Work Plan.

NBPA / MassCEC has developed this Work Plan based upon the following assumptions:

- CAD Cell construction has proceeded through the SER since passage of the DMMP without separate on-site permitting requirements. As a result, it is currently assumed that additional on-site permitting tasks will not be required for CAD Cell Disposal.

- In accordance with the Memorandum of Agreement (MOA) described in **Section 2.2**, Performance Standards have been identified for all tasks included in this Work Plan. Performance Standards and associated actions are outlined in **Sections 2.3** and **2.4**.

- Quality assurance/quality control (QA/QC), engineering, construction and monitoring requirements were based on currently listed SER Performance Standards and any additional requirements MassDEP deems necessary.

- MassCEC will team with its current Port SER dredging consultant, Foth, under the current Master Services Agreement amended March 25, 2025, to perform the Engineering, Design, and Engineering Oversight Tasks in this Work Plan.

## 1.6 Deliverables

As described in **Section 3.2 Task Plan** of this Work Plan, the following documents and plans will be prepared (as required) and will be provided to MassDEP/USEPA as the work progresses:

- Work Plan Narrative and Drawings

- Contractor Submittals
    - Project Specific Contractor Work Plan /Dredging Work Plan
    - Site Specific QA/QCP
    - Health and Safety Plan
    - Environmental Protection Plan
    - Spill Response Plan
    - Navigation Plan
    - Dredging Work Plan

- Contractor Oversight Plan

- Operations and Maintenance Plan (O&M Plan)

- After Action Report with As-Built Plans

## 2.0 STATE ENHANCED REMEDY PROCESS

The sections below discuss various decisions and/or agreements that preceded and/or are part of the implementation of the SER.

### 2.1 Discussion of the State Enhanced Remedy Process

Attachment A presents sections from the USEPA 1998 ROD for the New Bedford Harbor Superfund Site regarding the SER.

The regulation covering Superfund, the National Contingency Plan, contains a provision called Enhancement of Remedy (40 CFR 300.515 (f)). This provision allows a state to propose extending the scope of a remedy to cover additional remediation not otherwise required by the ROD. MassDEP requested the use of this provision to link Navigational Dredging to the Superfund process, and this enhancement is referred to as the SER. While this request did not ask USEPA to pay for the additional remediation, it does provide many benefits. It allows the state to coordinate certain activities with the Superfund work and utilize work already being done, thereby avoiding duplication of efforts. Since Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) allows for the on-site disposal of remedial contamination, the SER will also help provide options for the on-site disposal of contaminated sediments, not already being remediated by the USEPA's Superfund cleanup, but necessary for the navigational dredging, a major impediment to maintenance dredging in any harbor. And it will also help to reduce the administrative requirements of doing this type of dredging outside of the Superfund process. These factors together could lead to significant time and cost savings for the local communities and the Commonwealth, to help restore the harbor economy of the New Bedford area.

MassDEP, as the lead regulatory authority for the SER enhancement, will provide oversight and review of the project documents, inspections and audit functions, interpretation and coordination with other resource agencies and serve as technical liaison relative to state or federal agencies. MassDEP will have overall approval authority for the projects conducted by the NBPA/MassCEC under the SER and will also have stop-work authority for actions that it interprets are in conflict with this agreement, the Performance Standards, or the federal and state laws and/or regulations. MassDEP will name a SER Project Manager, who will coordinate communications, approvals, and oversight with MassDEP, other appropriate state and federal agencies as required by the Memorandum of Understanding between MassDEP and USEPA. Off-site disposal or reuse of dredged sediment will be conducted in compliance with the permitting requirements of the appropriate regulatory agencies.

### 2.2 Memorandum of Agreement

NBHDC/MassDEP MOA establishes a relationship between the NBHDC and MassDEP, lays the framework for the SER process and establishes the roles, responsibilities, and relationships between NBHDC, MassDEP and the other federal and state agencies involved as set forth in the USEPA 1998 ROD for the New Bedford Harbor Superfund Site. Projects conducted under the auspices of the SER will be conducted as phases (specific areas in New Bedford and Fairhaven

will be New Bedford Harbor Dredge Phase V). (Note: Phase I was conducted by the city of New Bedford and did not fall under the SER process. Phase II was completed in 2005, Phase III completed in 2009, and Phase IV completed in 2015 were all performed using the SER process. All subsequent SER phases will include the preparation of various documents that detail the plan for the work to be conducted under this phase.

The following agencies will be involved in the SER process, with MassDEP in its role as the lead agency:

- USEPA
- U.S. Army Corps of Engineers (USACE)
- U.S. Fish and Wildlife Services (USFWS)
- National Marine Fisheries Service/NOAA
- EOEA
- MassDEP
- Massachusetts Board of Underwater Archaeology
- The Office of CZM
- Massachusetts Division of Marine Fisheries (MA DMF)
- Other state, local, and/or federal agencies as necessary

## 2.3 Applicable or Relevant and Appropriate Requirements

Under the Superfund process, section 121(e) of CERCLA exempts response actions conducted entirely on site from having to obtain federal, state, or local permits; these actions need only comply with the substantive aspects of applicable or relevant and appropriate requirements (ARARs). ARARs are cleanup standards, standards of control or other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that either apply to the remediation at the site or address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the particular site. Because the SER was included in the New Bedford Harbor Site ROD, the SER will benefit from the permit exemption for activities conducted entirely on site. Likewise, the substantive requirements of the regulations identified as Performance Standards must be complied with for on-site actions. For any off-site activities (such as offshore disposal), all administrative and substantive requirements of all standard regulatory laws must be met. NBPA/MassCEC and MassDEP Project Manager have met and will continue to meet with all the Resource Agencies to identify and discuss the Performance Standards for this project in accordance with the memorandum between MassDEP and USEPA.

## 2.4 Performance Standards

Identified below are the significant performance standards and a brief description of the actions to be taken to ensure compliance. NBPA/MassCEC will be the entity to perform coordination and consultation tasks. Additional Performance Standards are included in Attachment B.

- Clean Water Act, Sections 404, Dredge and Fill Activities, including Section 401 Water Quality Certification and State Water Quality Standards (314 CMR 4.00), Massachusetts Certification for Dredging, Dredged Material Disposal and Filling in Waters (314 CMR 9.06 (1-2)):
  The substantive water quality standards identified in the Project Performance Standards (Attachment B) will be incorporated in contract documents. Dredge and fill activities will be implemented to minimize to the maximum extent possible any adverse environmental impacts through environmental controls.

- Rivers and Harbors Act, Section 10:
  Dredging and disposal activities will comply with the substantive requirements and conditions normally associated with the issuance of a USACE regulated dredging project. These activities will be carried out in coordination with the Corps and other Resource Agencies.

- Endangered Species Act, Magnuson-Stevens Act, Massachusetts Natural Heritage and Endangered Species Program, and Fish and Wildlife Coordination Act:
  Consultations will occur with the National Marine Fisheries Service, the USFWS and the MA DMF. NBPA will review the previously submitted Essential Fish Habitat Assessment (EFHA) for prior work and update it with project-specific information and evaluate essential fish habitat impacts associated with this project, along with any endangered species affected by the project. Avoidance where possible and mitigation measures will be proposed to address any EFHA and endangered species impacts.

- Preservation of Historical and Archaeological Data Act of 1974 and Massachusetts Board of Underwater Archaeological Resources (MGL Ch. 6 Section 179-180):
  Coordination will occur with the appropriate tribal entities concerning the project in accordance with the act (in the spirit of the Memorandum of Understanding between the New Bedford Superfund Project and the local Native American Tribes. Additionally, coordination will occur with the Massachusetts Board of Underwater Archaeology and cultural surveys will be completed where necessary.

- Massachusetts Coastal Zone Management Federal Consistency:
  Project documents will be provided to the Massachusetts Office of CZM for review and comment relative to consistency with CZM enforceable program policies.

- Massachusetts Administration of Waterways Licenses Law, Chapter 91:
  Activities will comply with the substantive standards as well as any appropriate special waterways permit conditions identified in the Project Performance Standards in Attachment B.

- Wetland Protection – Federal Executive Order 11990, 44 CFR 9, Massachusetts Wetland Protection Act (310 CMR 10):

The New Bedford Office of Environmental Stewardship will be informed through meetings with NBPA/MassCEC and the SER of the intended project plans. Concerns and comments will be incorporated into contract documents as appropriate.

- Wetland Protection – Federal Executive Order 11990, 44 CFR 9, Massachusetts Wetland Protection Act, Floodplain Management – Executive Order 11988:
  Due to the nature of the terminal and its intended uses, the Shuster Bulkhead project site is entirely within the floodplain; therefore, federal floodplain regulations require an assessment of potential impacts of the work up to the 500-year floodplain elevation. Additionally, the 1999 ROD Amendment states that "potential effects of any action must be evaluated to ensure that the planning and decision making reflect consideration of flood hazards and floodplain management, including restoration and preservation of natural and beneficial values, wherever feasible."

  The entire site is included within the 500-year floodplain, although at reduced risk of flooding because it is protected by the New Bedford Hurricane Barrier. Within the hurricane barrier flood protection zone[2], the primary objective of floodplain management is preservation of storage capacity within the barrier's flood storage elevations. Flood storage during a precipitation event is available from approximately 3.0 feet to 7.0 feet MLLW.

  The removal of the cellular cofferdam system and replacement with a bulkhead and pile-supported structure will beneficially restore ±11,000 square feet of existing solid fill to tidal waters. The proposed structure will also elevate the facility by ±4.5 feet, thereby improving the site's resilience to storm surge and sea level rise. This increased elevation will provide ±2.0 feet of clearance between the bottom of the concrete deck and the Annual High Tide Line (AHTL), enhancing the Harbor's flood storage capacity by over 30,332 cubic-feet

- Toxic Substances Control Act:
  Because some of the dredged sediments contain elevated PCB concentrations, a risk-based disposal method that will not pose an unreasonable risk of injury to human health or the environment will be utilized under a determination previously secured (from USEPA) under 40 CFR 761.61(c). Sampling results presented on Attachment D – Massachusetts Clean Energy Center Site 4 – Shuster Bulkhead: Boring Location Plan with Analytical Results show that PCB concentrations do not exceed the 50-ppm cleanup level under the 1998 ROD.

- Division of Air Quality Control Policy (DAQC Policy 90-001):
  A source sound will be in violation of the Department's noise regulation (310 CMR 7.10) if the sources:

[2] Calculated based on data provided in the 1986 Flood Plain Assessment completed by USACE.

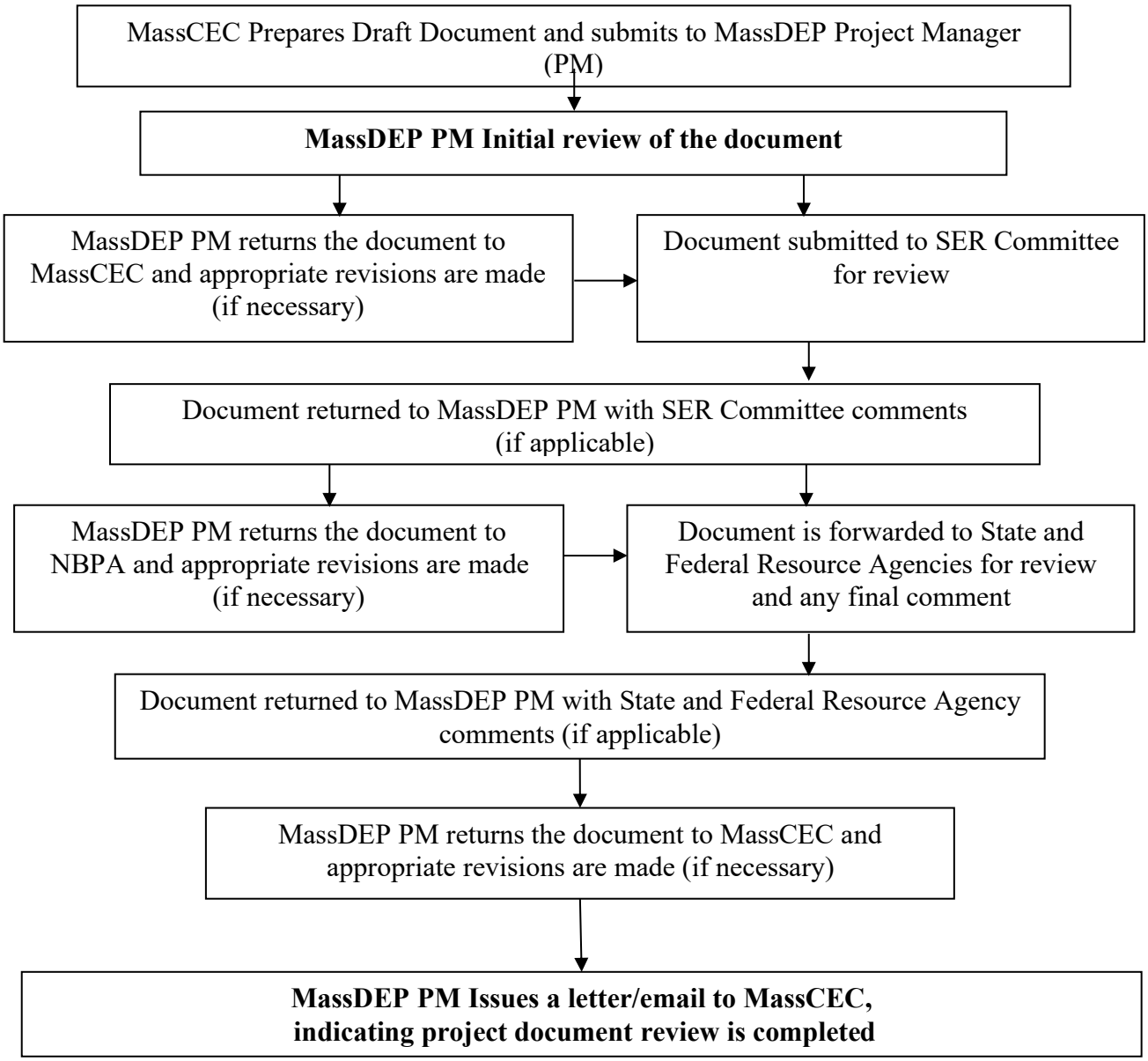
- Increases the broadband sound level by more than 10 A-weighted decibels above ambient, or
- Produces a "pure tone" condition – when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.

## 2.5 Submittals for SER Review

Key documents will be submitted for agency review at appropriate design milestones. The MassDEP SER Project Manager will first route the Scope of Work to USEPA for a consistency review in order to ensure that the work plan does not conflict with nor is it inconsistent with the Superfund remedy. The Scope of Work will then be returned to the MassDEP SER Project Manager with comments (if applicable) or with a Scope of Work Consistency Determination. If USEPA has not issued a determination, USEPA comments will be given to the NBPA (and NBPA agents) for consideration and/or incorporation into the document, then returned to the USEPA for Scope of Work Consistency Determination.

Once the Determination is issued, MassDEP Project Manager will forward the Determination to MassCEC, which will then submit a draft Work Plan to the MassDEP Project Manager. The MassDEP Project Manager will coordinate with Resource Agencies review and comment, and identification of Performance Standards. All comments will then be returned by the MassDEP Project Manager to MassCEC for consideration and/or incorporation into the Draft Work Plan. All comments will be returned by the MassDEP Project Manager to the NBPA for consideration and/or incorporation in the Draft Work Plan. Upon completion, MassDEP will send the Draft Work Plan to USEPA for a Work Plan Consistency Determination to determine that the Work Plan and Performance Standards do not conflict with nor are inconsistent with the Superfund remedy. The Draft Work Plan will be returned to the MassDEP Project Manager with USEPA comments or with a Work Plan Consistency Determination. If USEPA has not issued a determination, USEPA comments will be given to the MassCEC (and MassCEC agents) for consideration and/or incorporation into the Draft Work Plan, then returned to USEPA for a Work Plan Consistency Determination. Upon receiving the Determination, the MassDEP Project Manager will issue a letter to the Foth/MassCEC to proceed. Figure 2 presents the SER document review process as a flow chart diagram. It should be noted that the review process described herein is the formal SER review process. It is anticipated and encouraged those informal discussions, reviews, and information sharing occur to expedite the review and approval process when appropriate and possible.

FIGURE 2: SER DOCUMENT REVIEW PROCESS



## 3.0 SCOPE OF WORK

As stated earlier in this document, the Scope of Work for this Work Plan involves dredging and disposal of the fill that was placed in 1970-1971within the cellular cofferdams, three major and three minor cells. This is a critical aspect of the required marine infrastructure reconstruction. Due to the current condition of the cells, which are deteriorated with numerous holes, this tidally influenced area is losing fill material into the harbor, causing sinkholes, and significantly reducing the site's allowable load capacity. The dredging of the cells, and replacement of the cellular cofferdam system with a bulkhead landward (to the west) of the existing cells and a pile-supported relieving platform will provide a structurally stable facility with increased load capacity and resilience against storm surges and sea level rise. The structures will be authorized through traditional permitting.

The request for the dredging and disposal through the SER process is based on the need to eliminate the continued release of submerged fill materials into New Bedford/Fairhaven Harbor, requiring frequent dredging to maintain berth clearance. The deteriorated cell sheets will no longer be required and will no longer be accessible after constructing the new pile supported structure. Therefore, after installing the landward bulkhead, which will stabilize the shoreline, approximately ±9,750 cubic yards (CY) of fill material will be dredged from within the existing cellular cofferdams and placed in CAD Cell #3, which was constructed by MassCEC. The remaining material within the footprint of the cellular cofferdams will be left at a 2.5:1 slope. After dredging, the steel sheeting that comprises the cells will be removed, and the slope will be stabilized with a concrete mattress covering the area from the face of the existing bulkhead to the face of the proposed landward bulkhead (as detailed in Attachment 1). Following sheet removal, materials from within the footprint of the cells that entered the berth as a result of construction activities will be dredged and placed in CAD Cell #3 or #4.

Samples have been collected at the MassCEC project site and testing has been completed. The dredged material will be transported using split-hull dump scows. The scow will be positioned within the designated disposal area utilizing GPS capabilities to ensure the accurate placement of materials at the disposal site. See Work Plan Drawings (Attachment C) for more information.

The regulatory interface, stakeholder and abutter interface, and the design work discussed above will be conducted in a manner consistent with USEPA/MassDEP MOA. In addition, the Scope of Work includes tasks required to obtain regulatory approvals for the dredging to move into the construction stage. The following is a more detailed description of the activities included in the Scope of Work:

- Perform geotechnical investigation, and sediment sampling program to obtain information as needed to identify the exact location and develop the design of the sites (COMPLETED 11/2024 & 5/2024).

- Prepare Work Plan documents for SER Review and Approval (Permit level drawings).

- Prepare bid documents to include engineering plans and specifications for public procurement of a contractor to construct the Terminal Expansion (September 2025).

- Advertise the Request-for-Bid and solicit bid responses from qualified contractors and select the contractor that has demonstrated its ability to perform the work at lowest bid cost to award the contract (October 2025).

- Provide Resident Engineer services for the oversight of construction of each phase of the project to ensure conformance with design specifications and confirm satisfactory completion of the project by conducting post-dredge surveys (Autumn 2025).

## 3.1 Task Plan and Sequence to Work

MassCEC/Foth has prepared the following pages to detail the services in this Work Plan, which defines the major work elements performed at the task/subtask level along with a discussion of the work completed, or scheduled to be performed, under each task/subtask.

### 3.1.1 Investigations

#### 3.1.1.1 New Bedford Marine Commerce Terminal Bathymetric Survey (January of 2023)

A bathymetric survey of the New Bedford Marine Commerce Terminal area was performed to determine the site conditions below water at the existing cofferdams.

Prior to construction, a pre-dredge survey will be conducted at the Shuster Bulkhead Berth and within the CAD Cell designated for disposal to document the pre-dredge conditions of the berth and CAD Cell. Following the removal of material from within the cellular cofferdams, a post dredge survey will be conducted at the berth to determine if any material was lost from within the cells into the berth and if any clearing of the berth is required. Prior to demobilization the contractor will conduct a post-dredge survey of CAD 4 to ensure all placement are within the limits of the CAD Cell and below the minimum elevations provided in the bid documents.

#### 3.1.1.2 Geotechnical Borings (Completed 11/2023 & 05/2024)

This task includes characterization of the subsurface material that will be removed from the Project Site during the construction of Terminal Expansion, and determination of the anticipated side slopes for design purposes. Knowledge of the underlying sediment layers will help inform the contractor of the composition of material to be handled during construction.

This task involved the completion of Eighteen (18) land borings at the Terminal Expansion site location for use in the design of the structure, as well as, evaluating the anticipated consolidation rate of the contaminated material to be transported to CAD Cell No. 4. Land Borings, CEC 1A through CEC 18A, were extended to refusal or bedrock. Rock elevations ranged from approximately -11 to -36 feet (MLW). Rock cores were performed at eleven boring locations. The rock encountered at the site is similar to previous efforts in the vicinity. The bedrock description

is “Black and grey gneiss, very strong, slightly decomposed, competent, and slightly fractured.” The RQD values, from 12% to 100%, indicate a wide variety of rock cores sampled, with the average RQD of 66.1% giving it a “Fair” Quality. RQD values were based on recovered sample not total penetration. The borings were standard penetration test with split spoon sampling at 5-foot intervals.

The soils were placed within the cofferdam structure of the bulkhead during its construction. There is no known source of the contaminants, however, the concentrations of contaminants reported may be present due to historical industrial operations in the area, the somewhat ubiquitous presence of PCBs in the area of New Bedford Harbor, and unregulated infilling of the harbor throughout the years.

#### 3.1.1.3 Sediment Sampling Program (Completed 11/2023 & 5/2024)

As part of the MassCEC Shuster Bulkhead rehabilitation, sediment samples were collected from soil borings designated 1a through 13a. These borings were sampled at various depths, ranging from the surface down to 36 feet. Samples were obtained using grab sampling techniques, where material was collected with a jar. All samples were preserved and stored in accordance with Massachusetts Department of Environmental Protection (MassDEP) Analytical Protocols. Documentation provided through the protocol certification forms confirms that all procedures for sample collection, handling, and storage were properly followed. The Massachusetts Clean Energy Center Site 4 – Shuster Bulkhead: Boring Location Plan with Analytical Results are included in Attachment D.

### 3.1.2 Statement of Work and Work Plan

This task includes preparation of planning documents to guide project activities and determine the exact scope of work and authorizations required. MassCEC submitted a Statement of Work document outlining the general scope of the overall project and the plan to execute the project through the SER process. In addition to finalizing this Work Plan submittal, Foth/MassCEC developed other site-specific and project-specific plans as necessary to guide activities related to the design, engineering, and construction of NBMCT Expansion site.

### 3.1.3 Terminal Expansion Design

This task includes the design of the Shuster Bulkhead rehabilitation in association with the Terminal Expansion. NBPA has been involved with several terminal rehabilitations within New Bedford Harbor and is therefore qualified to oversee this phase of the MassCEC Terminal Expansion. Final design engineering for construction of Terminal Expansion includes the following subtasks:

- Review of historical information and data related to the proposed site.
- Assessment of the subsurface geotechnical data collected from within the project footprint in order to determine structural requirements of the proposed bulkhead improvements.

- Plans, cross-sections, and detail drawings were prepared for the final design in order to accurately inform bidders on the dredging specifications of the Shuster Bulkhead rehabilitation.

#### 3.1.3.1 Construction Considerations

Foth/MassCEC will manage and oversee dredging activities. Dredging will be performed in such a manner as to comply with the specific performance criteria established during the design phase of the project. Construction methods will be selected to achieve water quality standards. Where possible, the intent will be to allow the Contractor to determine appropriate means and methods, subject to the controls and performance criteria contained in the project specifications. Proposed means and methods along with adherence to design and performance criteria will be evaluated using the pre-construction submittal review process (Contractor's Work Plan submittal). A control plan, or Contractors Oversight Plan, along with a HASP will ensure conformance to performance criteria. Construction may require implementation of controls such as use of an environmental silt curtain, oil absorbent booms, haybales, and silt fence, etc.

#### 3.1.3.2 Dredging

Dredging will be implemented in such a manner as to adhere to established performance standards governing the project, including water quality criteria. Dredge methods will be selected to achieve water quality standards. Dredging contaminated material may require implementation of controls such as use of an environmental (sealed) bucket, silt curtains, oil absorbent booms, reduced cycle times, etc. Material from within the cellular cofferdams may require different dredge equipment depending primarily on density of material to be dredged. Water quality criteria will apply to all dredged material. Specifications and requirement details will be determined through the design process. Preliminary dredge volumes have been calculated to determine the approximate volume of material proposed to be dredged within the cellular cofferdam and placed within the existing CAD Cells. Approximately +/-9,750 cy of PCB and heavy metal impacted sediments within the dredge footprint, will be disposed of in the CAD Cell No. 4 footprint within New Bedford Harbor. The proposed footprint includes dredging to -32 MLLW within the Cellular Cofferdam.

Water quality monitoring will be conducted during dredging operations, following a predetermined schedule. Monitoring will likely include measurement of turbidity or total suspended solids, as well as sampling and analysis of the water column for contaminants of concern if performance standards are exceeded. It is anticipated that the specific monitoring requirements and schedule will be in accordance with Attachment B. All dredging and disposal will be performed in such a manner as to minimize impacts to fish, critical habitats, and other wildlife. Contingency plans detailing engineering controls will be prepared by the Contractor in the event that water quality is impacted.

The dredged material will be transported using split-hull dump scows. The scow will be positioned within the designated disposal area utilizing GPS capabilities to ensure the accurate placement of materials at the disposal site.

#### 3.1.3.3 CAD Cell Filling

CAD Cell Filling operations will be subject to existing operational controls developed and implemented for existing CAD Cells in the Harbor, and thus project-specific water quality criteria developed by MassDEP will apply to filling operations as well as dredging and other performance standards. Some combination of operational controls may be required during filling operations, such as dewatering or the use of silt curtains with oil-absorbent booms.

### 3.1.4 Prepare Contractor Procurement Packages

This task includes activities related to the process of procuring a contractor to perform the proposed Shuster Bulkhead rehabilitation and removal of material from within the cellular cofferdams. MACEC proposes to complete the design for the Terminal Expansion project, including design plans and specifications, and prepare bid documents for work, which are anticipated to include the contract agreement, drawings, and technical specifications. The bid procurement package will provide specifications for excavation of contaminated sediment to be disposed of in the CAD Cells within New Bedford Harbor.

#### 3.1.4.1 Preparation of Bid Documents

These documents will be developed to bid the project out and will ultimately form the legal agreement between the MassCEC and the Contractor. MassCEC contract language will be drafted as required for specific applicability to the construction of the Terminal Expansion project and will include instructions to bidders, notice to bidders, a sample contract, bond requirements, general conditions, supplementary conditions, a milestone schedule, and a bid quotation form.

Foth will prepare the required contract drawings for inclusion in a package suitable for bidding. Contract drawings will include existing conditions at the proposed Terminal Expansion site, limits of work, proposed construction, and sections and details as required to define the Scope of Work. Technical specifications will be prepared for inclusion in the bid package. Specification sections that will be developed to convey performance requirements are expected to include, but not be limited to the following: Bidding Schedule, Summary of Work, Field Engineering and Control, Submittal Procedures, Construction Progress Schedules, Contractor QC, Temporary Construction Facilities, General Safety Requirements, Sheetpiles, Concrete, Earthwork, Dredging, Disposal, Dredge Material Management, Plant and Equipment, Environmental Protection, Water Quality Monitoring and Control, and Measurement and Payment.

#### 3.1.4.2 Oversight of the Solicitation for Bid Process

Foth will conduct the contractor procurement process, including publication of the Bid Package, participating in a pre-bid meeting for contractors, responding to written questions posed by potential bidders, and preparing Addenda to the Bid Package as necessary.

#### 3.1.4.3 Selection of Contractor

Following a competitive review of all submittals, MassCEC will evaluate the bid submissions and select a contractor to award the contract for the Terminal Expansion project. To receive the award, the successful contractor must not only submit the bid from the lowest eligible, responsible, and responsive bidder but also provide satisfactory qualifications. These qualifications should demonstrate a proven history of effective work performance, supported by positive references from previous customers.

### 3.1.5 Construction Oversight

#### 3.1.5.1 Resident Engineer Services

When a signed contract with a qualified contractor has been executed, NBPA's engineering consultant, Foth, will provide Construction Oversight of the Terminal Expansion project and will serve as Resident Engineer to document conformance with contract specifications and the requirements of the SER process and other site-specific performance standards. It is assumed that construction activities on the New Bedford side of the harbor will be conducted within a commercial industrial area where 24-hour activities are authorized. If there is a noise or other complaints, the 24-hour schedule may have to be adjusted, or the work modified to reduce noise or other complaint issues. Work hour restrictions will be included for disposal activities within CAD Cell No. 4, which is adjacent to Fairhaven Residential Properties. Work hours are from 7am to 11pm.

These services will include:

- Review and approval of contractor submittals.
- Water quality monitoring during dredging.
- Oversight of the dredge operations and scows during dredging.
- Oversight of the dredge material disposal.
- As-built topographic and bathymetric surveys.
- Documentation and oversight of the construction process, including daily logs.
- Health and safety and quality control logs, and progress assessments.

#### 3.1.5.2 Project Close-Out

As a guidance document of the SER process, the Performance Standards also require the submission of an after-action close-out report when the dredge project has been completed to summarize relevant project information for use by the USEPA and the appropriate regulatory agencies. A post-dredge bathymetric survey will be conducted to examine the conditions of the area following the dredge work and summarized on as-built plans. To properly document conditions resulting from the CAD Cell disposals, Foth will develop water quality data, pre- and post-dredge surveys, as-built plans, and a narrative of the findings of the information for presentation within a summary report.

### 3.1.6 Task Plan Submittals for SER Review

- Work Plan Narrative and Drawings
- Contractor Submittals
    - Project Specific Contractor Work Plan /Dredging Work Plan
    - Site Specific QA/QCP
    - Health and Safety Plan
    - Environmental Protection Plan
    - Spill Response Plan
    - Navigation Plan
    - Dredging Work Plan
- O&M Plan
- After Action Report with As-Built Plans of MassCEC Terminal Expansion

## 4.0 PROJECT SCHEDULE

The following critical path project milestones have been identified:

- Investigations
  - MassCEC Bathymetric Survey (Completed 01/2023)
  - MassCEC Shuster Bulkhead Geotechnical Borings (Completed 11/2023 & 05/2024)
  - Sediment Sampling Program (Completed 11/2023 & 05/2024)

- NBPA/Foth submits the Work Plan for SER approval

- Foth/MassCEC complete engineering and design of Terminal Expansion project

- Foth/MassCEC Prepares Contracts (09/2025)
  - Foth/MassCEC prepare Final Bid Documents
  - Foth/MassCEC conduct a public procurement process.
  - Foth/MassCEC select qualified contractor/NBPA Award dredging contract.
  - Foth/MassCEC prepare Final Construction Documents

- Foth/MassCEC provide construction Oversight (Q2/Q3 2026)
  - Foth/MassCEC submits the updated Work Plan Contractor Oversight Plan, HASP, and Water Quality Monitoring Plan
  - Begin dredging of Cellular Cofferdams at Shuster Bulkhead site
  - Complete dredging of Cellular Cofferdams at Shuster Bulkhead site
  - Project Closeout

The schedule will be developed during design and in coordination with NBPA, MassCEC, and the Contractor. The project will be dynamic, with actual schedule dates being altered as certain items may be added and/or deleted along the way or influenced by other ongoing construction activities in the Harbor, or subject to change due to weather-related delays. The Project Schedule will be updated as needed to reflect on actual work.

# Attachment A

# 1998 Record of Decision – State Enhanced Remedy Excerpt

EPA/ROD/R01-98/126
1998

# EPA Superfund
# Record of Decision:

**NEW BEDFORD**
**EPA ID: MAD980731335**
**OU 01**
**NEW BEDFORD, MA**
**09/25/1998**

EPA 541-R98-126
<IMG SRC 981260>

**DECLARATION FOR THE RECORD OF DECISION**
**NEW BEDFORD HARBOR SUPERFUND SITE**
**UPPER AND LOWER HARBOR OPERABLE UNIT**
**NEW BEDFORD, MASSACHUSETTS**

**Statement of Purpose**

The attached Record of Decision sets forth the selected remedial action for the Upper and Lower Harbors of the New Bedford Harbor Superfund Site in New Bedford, Massachusetts, developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. Sections 9601 et. seq. and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) as amended, 40 C.F.R. Part 300. The Administrator for EPA-New England has been delegated the authority to approve this Record of Decision (ROD). The Regional Administrator has redelegated this authority to the Director of the Office of Remediation and Restoration.

The Commonwealth of Massachusetts has concurred with the selected remedy.

**Statement of Basis**

This decision is based on the Administrative Record which has been developed in accordance with Section 113(k) of CERCLA and which is available for public review at the New Bedford Public Library in New Bedford, Massachusetts, and at the EPA-New England Records Center in Boston, Massachusetts. The Administrative Record Index (Appendix C to the ROD) identifies each of the items comprising the Administrative Record upon which the selection of the remedial action is based.

**Assessment of the Site**

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, present an imminent and substantial endangerment to the public health or welfare or to the environment.

**Description of the Selected Remedy**

The major components of the selected remedy include the following:

- Approximately 450,000 cubic yards of sediment contaminated with polychlorinated biphenyls (PCBs) will be removed. In the upper harbor north of Coggeshall Street, sediments above 10 parts per million (ppm) PCBs will be removed, while in the lower harbor and in saltmarshes, sediments above 50 ppm will be removed.

- In certain shoreline areas prone to beach combing, sediments between the high and low tide levels will be removed if above 25 ppm PCBs. In areas where homes directly abut the harbor and where contact with sediment is expected, sediments between the high and low tide levels will be removed if above 1 ppm PCBs.

- Four shoreline CDFs will be constructed to contain and isolate the dredged sediments. Three of these facilities will be in the upper harbor, and one will be in the lower harbor. Archaeological surveys will be performed prior to construction of the CDFs and before dredging is started.

- Once the dredged sediments are placed in the CDFs, the large volumes of water brought in by the dredging process will be decanted and treated to low levels before discharge back to the Harbor.
- Once full, first an interim and then a final cap will be constructed at each CDF. Where possible, cleaner sediment from the harbor's navigational channels will be used as part of the interim caps.

- The capped CDFs will be monitored and maintained over the long term to ensure their integrity.

- Institutional controls, including seafood advisories, no-fishing signs and educational campaigns will be implemented to minimize ingestion of local PCB-contaminated seafood until PCBs in seafood reach safe levels. State fishing restrictions will also be in effect until such time as the Commonwealth deems it appropriate to amend them. Additional controls will protect

the capped CDFs and allow for certain future uses.

- Once completed, the CDFs will be available for beneficial reuse as shoreline open space, parks or, in the case of the lower harbor CDF, a commercial marine facility.

- A review of the Site will take place every five years after the initiation of the remedial action to assure that the remedy continues to protect human health and the environment.

**Special Findings**

Issuance of this ROD embodies specific determinations made by the Regional Administrator pursuant to CERCLA and the Toxic Substance Control Act (TSCA). Under section 121 (d)(4) (B) of CERCLA, the Regional Administrator hereby waives 40 CFR 122.4(i) of the Clean Water Act (a regulation regarding discharges to polluted water bodies) and 21 CFR 109.30 of the federal Food, Drug and Cosmetic Act (a regulation regarding PCB levels in seafood). Due to the nature of the New Bedford Harbor site, full compliance with these requirements would result in greater risk to human health and the environment than non-compliance. Further, under TSCA, the Regional Administrator finds that the site meets the standards of 40 CFR 761.50(b)(3)(i)(A) for remediation and that the selected remedy will not pose an unreasonable risk of injury to health or the environment pursuant to 40 CFR 761.61(c) or 40 CFR 761.75(c)(4).

**Declaration**

The selected remedy is protective of human health and the environment, attains or waives federal and state requirements that are applicable or relevant and appropriate for this remedial action, and is cost effective. The selected remedy provides a permanent solution to the widespread and persistent PCB contamination in, the upper and lower harbor sediments. While it does not satisfy the statutory preference for remedies that utilize treatment as a principal element to reduce the toxicity, mobility or volume of hazardous substances, it does permanently isolate these sediments from human and environmental receptors by containing them in shoreline CDFs in perpetuity in a safe and protective fashion. In addition, water decanted from the dredged sediments will be treated to meet stringent discharge standards.

As this remedy will result in hazardous substances remaining on site above health-based levels, site reviews will be conducted every five years after commencement of remedial action to ensure, that the remedy continues to provide adequate protection of human health and the environment.

<IMG SRC 98126A>

# Record of Decision

# for the

# Upper and Lower Harbor Operable Unit

# New Bedford Harbor Superfund Site

# New Bedford, Massachusetts

# September 1998

# U.S. Environmental Protection Agency - Region I

# New England

## Abstract

After years of study, public debate and consensus-building for a solution to the widespread PCB contamination in and around New Bedford Harbor, EPA has selected a cleanup remedy for the entire upper and lower harbor areas. This remedy involves the dredging and containment of approximately 450,000 cubic yards of PCB-contaminated sediment spread over about 170 acres. In the upper harbor north of Coggeshall Street, sediments above 10 ppm PCB s will be dredged, while in the lower harbor and in saltmarshes, sediments above 50 ppm PCBs will be dredged. Intertidal sediments in specific areas adjacent to homes or in areas prone to beach combing will be removed if PCB levels are above 1 and 25 ppm, respectively. The overall goals of the remedy are to a) reduce health risks due to consumption of PCB-contaminated local seafood, b) reduce health risks due to contact with PCB-contaminated shoreline sediments and c) improve the quality of the Harbor's highly degraded marine ecosystem.

The dredged sediments will be placed in four shoreline confined disposal facilities (CDFs) and seawater decanted from these sediments will be treated before discharge back to the harbor Upon reaching storage capacity, first an interim and then a final cap will be installed at each CDF and a long term maintenance and monitoring program will be implemented. Institutional controls, including the continuation of a state-sanctioned fishing ban, will be required until PCB levels in seafood reach acceptable criteria. The total present worth cost of the remedy is estimated to be between $120 and $130 million. Pursuant to 40 CFR 430(f)(5), this Record of Decision further describes the remedy and the rationale for it, as well as pertinent site characteristics and other cleanup alternatives considered.

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## XI. The State-Enhanced Remedy

In addition to the selected remedy described above, the Commonwealth of Massachusetts has petitioned EPA to allow the inclusion of navigational dredging in New Bedford Harbor as an enhancement of the remedy. Such enhancements are envisioned in the implementing regulations of CERCLA at 40 CFR 300.515(f). The enhancement requested by the Commonwealth would link as appropriate the dredging and disposal of sediments dredged from the harbor's navigational channels (located in the lower and outer harbors) with CERCLA and the Superfund program. Although these navigational sediments fall below the 50 ppm lower harbor TCL (and thus do not overlap with sediments stated for remedial dredging), they are nevertheless contaminated with heavy metals, and lower levels of PCBs. Thus these navigational sediments, approximately 1.7 million cy in volume, are most likely unsuitable for open water disposal (Maguire Group, 1997), and alternative disposal approaches are required if shipping channels are to be maintained to their federally-approved depths. As discussed further below, and provided consistency with 40 CFR 300.515(f)(1)(ii) as well as other dredging-related regulations is maintained, EPA accepts the Commonwealth's request to include navigational dredging as an enhancement of the selected remedy.

EPA believes that the primary benefits of linking the two dredging programs, while not sacrificing the normal regulatory review process for federal navigational projects, will be a streamlined permitting process for on-site navigational disposal facilities (if any),coordinated rather than separate environmental monitoring programs, where feasible, and increased overall coordination between the two dredging projects. In fact, the overall environmental benefit of the remedial CDFs is increased by using the CDFs to contain a portion of the navigational sediments (as part of the interim caps) as well as the more highly contaminated remedial sediments. Such a scenario should also reduce cleanup costs since at least some of the costs for the clean fill that would otherwise be required for the preliminary caps would no longer be necessary.

Incorporating the enhanced remedy shall not jeopardize or delay the overall implementation or funding of the selected remedy. Rather, implementation of the navigational dredging project, including solicitation of public comment on it, will be the responsibility of those parties normally involved in such projects, namely the MA Coastal Zone Management office, the US Army Corps of Engineers, the National Fisheries Management Service and other relevant state and federal regulatory programs. Consistent with 40 CFR 300.515(f)(1)(ii)(A), the EPA Superfund program will not be responsible for funding any part of the enhanced remedy.

## XII. Statutory Determinations

The remedial action selected herein for implementation at the New Bedford Harbor Site is consistent with CERCLA and, to the extent practicable, the NCP.

### A. The Selected Remedy is Protective of Human Health and the Environment

The selected remedy will be protective of human health and the environment through a combination of remedial action and institutional controls. Removal and permanent isolation of contaminated sediments above the remedy's cleanup levels will reduce human health risks from dermal contact with and incidental ingestion of these sediments to within EPA's acceptable risk range, and will reduce benthic organisms' exposure to PCBs to levels that approach if not achieve the 1 ppm ecologically-protective PCB level in the upper harbor. Achievement of this 1 ppm level Site-wide through direct remedial action is believed to cause more harm than good due to the radical alterations of the harbor and adverse environmental impacts that would result from such an effort. Naturally occurring sedimentation within the upper and lower harbor, estimated to average 3 mm per year for the upper harbor (Teeter, 1988), should assist in lowering residual PCB levels further over time.

Institutional controls will be required to protect human health against consumption of PCB-contaminated seafood until such time as edible seafood reaches safe, Site-specific risk based PCB levels. These controls - consisting of seafood advisories, no-fishing signs, and educational campaigns - are necessary since it could take many years before certain seafood species reach safe levels, and since not all seafood species are expected to reach safe levels within the ten year time frame considered in Site modeling (Battelle, 1990). These institutional controls shall continue until protective levels in edible biota are consistently achieved throughout the Site. In addition to these controls, the continuation of the state-sanctioned fishing restrictions (Figure 2) will assist in the minimization of seafood consumption risks.

A key measurement of the ecological protectiveness of the remedy, in addition to the long term ecological monitoring program, will be achievement of the 0.03 ug/l PCB water quality standard for the protection of marine organisms. The Site modeling performed by Battelle (1990) for Site-wide TCLs of 10 and 50 ppm indicates that the selected remedy, which incorporates both of these TLCs, should achieve this threshold throughout most if not all of the upper and lower harbor approximately ten years after completion of the ROD 2 dredging operations. As described in section X, the remedy will include long term monitoring to evaluate

# Attachment B

# State Enhanced Remedy – Performance Standards

# NEW BEDFORD PORT AUTHORITY / NEW BEDFORD MARINE COMMERCE TERMINAL SHUSTER BULKHEAD REMOVAL OF SUBMERGED FILL WITH PLACEMENT IN CAD CELLS

## State Enhanced Remedy – Performance Standards

### I Introduction

1. These performance standards ("Performance Standards") shall apply to the New Bedford Marine Commerce Terminal (NBMCT) Shuster Bulkhead Project.

2. The Commonwealth of Massachusetts is the lead agency for this State Enhanced Remedy work and has a designated State Enhanced Remedy Project Manager ("SER PM").

### II MADEP 401 Water Quality Program Standards:

1. Anti-degradation provisions of the Massachusetts Surface Water Quality Standards protect all waters, including wetlands. The Contractor shall take all steps necessary to assure that the proposed activities will be conducted in a manner, which will avoid violations of said standards.

2. Prior to the start of in-water work, the SER Project Manager (SER PM) shall be notified of any proposed change(s) in plans that may affect waters or wetlands.

3. As proposed, silt curtains and absorbent booms shall be deployed to enclose the area being dredged. The contractor's plan for deployment of the silt curtains/absorbent booms shall be submitted to the SER PM for review prior to the start of in-water work. Should the deployment of silt curtains prove not feasible or be unsuccessful, the SER PM will be notified prior to any dredging without silt curtains.

4. The Commonwealth shall ensure that the contractor shall implement the use of silt curtains and absorbent booms outlined below for the dredging of existing sediment at the NBMCT Site:

    a. **Dredging within Existing Cofferdam:** At all times of year, when dredging below Mean High Water occurs in association with removal of the cofferdams, the area being dredged shall either be completely encircled with steel sheet piling or completely encircled with a combination of steel sheet piling and silt curtains or completely encircled with silt curtains.

        i. Monitoring: Turbidity monitoring must be conducted outside of and within 15 feet from the silt curtain and at a reference site located 200 feet from the silt curtain. Turbidity standards outlined in Section II.5 must be satisfied.

5. Water Quality Monitoring:

   a. **When the dredging operation is contained within a silt-curtained area,** the following water-quality monitoring program shall be carried out daily for the first three days of dredging and once a week thereafter:
      i. A reference location shall be established outside of and approximately 200-feet down current from the silt-curtained area ("mixing zone") and a monitoring location shall be established outside of and within 15-feet of the silt-curtain.
      ii. Turbidity shall be measured, using an optical backscatter sensor, at both the reference and monitoring locations, at established depths: near the water's surface, at the mid-point of the water column and near the bottom. The three values obtained shall be averaged, such that a single, representative turbidity value is calculated for the monitoring site and a single, representative value is calculated for the reference site.
      iii. Turbidity shall be measured at both the monitoring and reference site prior to the start of dredging, and once every two hours during dredging, for a period of 8 hours.
      iv. An exceedance of the project turbidity standard shall be attributed to project activities when the average turbidity at the monitoring site exceeds the average reference site turbidity plus the permissible turbidity increase, as outlined in the following table:

| Reference Site Turbidity (NTUs) | Permissible Turbidity Increase |
|---|---|
| <10 | Reference plus 20 NTUs |
| 11-20 | Reference plus 15 NTUs |
| >21 | Reference plus 30% of reference |

      v. If, in two consecutive monitoring events, the average turbidity at the monitoring site exceeds the average turbidity at the reference site by more than the permissible turbidity increase, then water samples, composited over the entire water column, from both the monitoring and reference sites shall be collected and submitted for analysis of Total Suspended Solids, dissolved PCBs, arsenic, cadmium, copper, chromium, lead, mercury, nickel, and zinc. When samples are submitted to the laboratory, a 36-hour turn-round time shall be requested. Additionally, the Proponent, or their contractor, shall take operational action(s) designed to limit such exceedences, such as increasing the dredge cycle time, inspection and any necessary repair, of the silt curtains, deployment of an additional row of silt curtains or other mitigation measures. Turbidity monitoring shall continue on the schedule outlined in Section 6.a.iii, until compliance is reestablished.
      vi. If compliance cannot be reestablished within 48 hours, dredging shall cease and Department and any other interested local, state, or federal agency staff, in consultation with the Proponent, their contractors and/or consultants shall review the operational actions

undertaken, the results of the analyses of the water samples and evaluate the biological significance of the available data and determine the requirements for additional mitigation, if any.

b. **Should the deployment of silt-curtains prove not possible or be unsuccessful,** the following water-quality monitoring program shall be carried out daily for the first three days of dredging and twice a week thereafter:
    i. A reference location shall be established approximately 200-feet up-current from the dredge and a monitoring location shall be established 200-feet down-current from the dredge ("mixing zone").
    ii. Turbidity shall be measured, using an optical backscatter sensor, at both the reference location and the monitoring location, at established depths: near the water's surface, at the mid-point of the water column and near the bottom. The three depth values obtained shall be averaged, such that a single, representative turbidity value is calculated for the reference location and a single, representative turbidity value is calculated for the monitoring location.
    iii. Turbidity shall be measured at both the reference location and at the edge of the mixing zone prior to the start of dredging, and once every two hours of dredging, and once every two hours during dredging, for a period of 8 hours.
    iv. An exceedance of the project turbidity standard shall be attributed to project activities when the average turbidity at the edge of the mixing zone exceeds the reference site turbidity plus the permissible turbidity increase, as outlined in the following table:

| Reference Site Turbidity (NTUs) | Permissible Turbidity Increase |
|---|---|
| <10 | Reference plus 20 NTUs |
| 11-20 | Reference plus 15 NTUs |
| 21-30 | Reference plus 10 NTUs |
| >31 | Reference plus 30% of reference |

    v. If, in two consecutive monitoring events, the average turbidity at the edge of the mixing zone exceeds the average turbidity at the reference site plus the permissible turbidity increase, then water samples, composited over the entire water column, from both the reference location and the edge of the mixing zone shall be collected and submitted for analysis of Total Suspended Solids, dissolved PCBs, arsenic, cadmium, copper, chromium, lead, mercury, nickel, and zinc. When samples are submitted to the laboratory, a 36-hour turn-round time shall be requested. Additionally, the Proponent, or their contractor, shall take operational action(s) designed to limit such exceedences, such as increasing the dredge cycle time, inspection and any necessary repair, of the silt curtains, deployment of an additional row of silt curtains or other mitigation measures. Turbidity monitoring shall

continue on the schedule outlined in Section 6.b.iii, until compliance is reestablished.

vi. If compliance cannot be reestablished within 48 hours, dredging shall cease and the Department and any other interested local, state or federal agency staff, in consultation with the Proponent, their contracts and/or consultants shall review the operational actions undertaken, the results of the analyses of the water samples and evaluate the biological significance of the available data and determine the requirements for additional mitigation, if any.

6. As proposed, dredging of contaminated, silty sediment shall be done using a closed, environmental, clamshell bucket. Where pilings or other debris are found to interfere with environmental bucket closure or equipment operation, a conventional clamshell bucket may be used to extract the pilings/debris. Sediment removal during such activity shall be minimized to the greatest extent practicable. Should dredging with the environmental bucket become unfeasible or unsuccessful, the SER PM must be notified prior to any contaminated sediment dredging not using the environmental bucket, and the contractor must also continue to meet the project water quality standard performance standards.

7. Water discharged from the barge shall be appreciably free of suspended sediment and meet the water quality criteria established in Section 4 (above). Any free liquid flowing from the barge in the harbor shall be passed through a sand media filter or equivalent filtration system (which must be approved by the project Resident Engineer) prior to discharge.

8. Diesel-powered equipment shall be fitted with after-engine emissions controls such as oxidation catalysts or particulate filters.

9. Within 30 days of the completion of the initial dredging, a bathymetric, survey of the dredge footprint, depicting post-dredge conditions, shall be sent to the MADEP SER Project Manager.

## II <u>MADEP Chapter 91 Waterways Standards:</u>

1. Acceptance of these Waterways Conditions shall constitute an agreement by the Proponent to conform to all terms and conditions herein.

2. After completion of the work authorized, the Proponent shall furnish to the Department a suitable plan showing the depths at mean low water over the area dredged. Dredging under this Project shall be conducted so as to cause no unnecessary obstruction of the free passage of vessels, and care shall be taken to cause no shoaling. If, however, any shoaling is caused, the Proponent shall at his/her expense, remove the shoal areas. The Proponent shall pay all costs of supervision, and if at any time the Department deems necessary a survey or surveys of the area dredged, the Proponent shall pay all costs associated with such work.

3. The Proponent shall, at least three days prior to the commencement of any dredging in tide water, give written notice to the Department of the time, location, and amount of the proposed work.

Special Waterways Conditions

1. Dredge material shall be transported to suitable disposal facilities; unregulated dumping of dredge materials is not permitted.

2. The Proponent shall develop and implement a Navigation Plan to address and mitigate temporary impacts to navigation during dredging activities.

3. The Proponent shall provide and maintain in good working order appropriate United States Coast Guard (USCG) approved navigation aids to assist mariners in avoiding work areas as required by the USCG.

4. Modification to this Project: the SER PM, may review on an individual basis, modifications to construction activities and/or temporary structures which represent an insignificant deviation from original specifications, in terms of configuration, materials or other relevant design or fabrication parameters as determined by DEP within all areas of construction. Such a review shall be in accordance with the following procedure:
    a. The Proponent shall submit a written request describing the proposed modifications to the work accompanied by plans, for prior review of the DEP. The DEP will consider comments submitted within ten (10) days of the DEP's receipt of the request. The DEP will send any significant modifications to the Resource Agencies for review and comment and to identify any future Performance Standards, if necessary. EPA will also have the opportunity to make a consistency determination if the change is significant, as necessary. The DEP will notify the Resource Agencies of any minor modifications.

5. After completion of the work authorized the Proponent shall furnish the Department with a suitable plan showing the depths at mean low water over the areas dredged within 90 days of completion of each phase of the dredging.

## III MADEP Noise Standards:

1. Division of Air Quality Control Policy (DAQC Policy 90-001):
A source sound will be considered to be in violation of the Departments noise regulation (310 CMR 7.10) if the sources:
    a. Increases the broadband sound level by more than 10 dB(A) above ambient, or
    b. Produces a "pure tone" condition – when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.

# Attachment C

## New Bedford Marine Commerce Terminal
## Phase 3 Bulkhead Replacement (Site 4) – Work Plan Drawings

(NOT FOR CONSTRUCTION)

# SER WORK PLAN
# NEW BEDFORD MARINE COMMERCE TERMINAL
# PHASE 3 BULKHEAD REPLACEMENT (SITE 4)
## NEW BEDFORD, MA
## AUGUST 2025


**OWNER/APPLICANT**

MASSACHUSETTS CLEAN ENERGY
TECHNOLOGY CENTER
63 FRANKLIN STREET
3RD FLOOR
BOSTON, MA 02110

**PROGRAM MANAGER & MARINE STRUCTURAL ENGINEERING**

FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
15 CREEK ROAD
MARION, MA 02738
PH: (508) 748-0937
FX: (800) 668-3220

DOUGLAS ERNST
MASSCEC PROGRAM MANAGER
PH: (515) 251-2585
CELL: (515) 491-8852

**ENVIRONMENTAL, GEOTECHNICAL, AND CIVIL ENGINEERING**

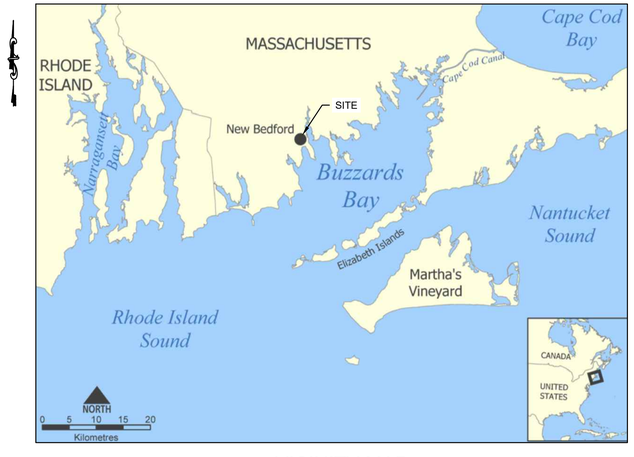
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
31 BELLOWS ROAD
RAYNHAM, MASSACHUSETTS 02767
PH: (774) 501-2176
PH: (866) 312-2024
FX: (774) 501-2669

**TERMINAL ELECTRICAL ENGINEERING**

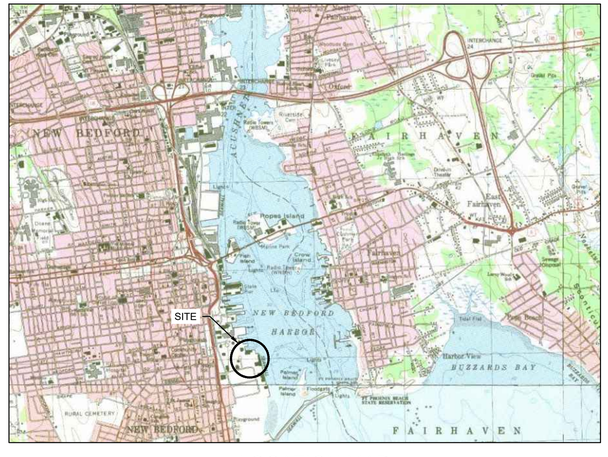
LKB INC, A VERTEX COMPANY
ONE AERIAL WAY
SYOSSET, NY 11791
PH: (516) 938-0600

**SURVEYING**

CHA CONSULTING INC.
141 LONGWATER DRIVE
SUITE 104
NORWELL, MA 02061
PH: (781) 982-5400


VICINITY MAP
NOT TO SCALE




LOCATION MAP
NOT TO SCALE

| DRAWING INDEX | |
|---|---|
| Sheet Number | Sheet Title |
| G-001 | COVER |
| G-006 | KEY MAP |
| G-100 | EXISTING CONDITIONS |
| B-001 | GEOTECHNICAL EXPLORATION PLAN |
| B-002 | GEOTECHNICAL BORING LOGS |
| CG-100 | BULKHEAD GRADING PLAN |
| CG-300 | BULKHEAD TRANSITION AREA SECTIONS 1 OF 2 |
| CG-301 | BULKHEAD TRANSITION AREA SECTIONS 2 OF 2 |
| MR-006 | COFFERDAMN EXCAVATION EXTENTS |
| MR-301 | COFFERDAM EXCAVATION EXTENTS X-SECTION |
| MR-100 | BULKHEAD RE-CONFIGURATION PLAN |
| MR-303 | BULKHEAD RE-CONFIGURATION PLAN X-SECTION |

811 Know what's below. Call 811 before you dig.

SHEET TITLE:
COVER SHEET

ISSUANCE:
**SER WORK PLAN**

PROJECT NO: 0024M070.04

SHEET NUMBER
G-001

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MACARTHUR DR

WRIGHT ST

**SITE 1**
(TERMINAL HEAVY-LIFT EXPANSION)
54 WRIGHT STREET 18 WRIGHT STREET
N.I.C

**SITE 3**
(TERMINAL HEAVY-LIFT EXPANSION)
4 WRIGHT STREET

**SITE 4**
(BULKHEAD REPLACEMENT)

MARINE CONSTRUCTION STAGING AREA

200'

POTOMSKA ST

(OFFICE
350 S. FRONT STREET)

**SITE 2**
(FUTURE OFFICE/WAREHOUSE EXPANSION)

(360-382 SOUTH FRONT STREET)
N.I.C

RADIO TOWER

LIGHT INDUSTRIAL TERMINAL ACCESS
(FUTURE GATE NO. 2)

**MASSACHUSETTS CLEAN ENERGY CENTER**
**NEW BEDFORD MARINE COMMERCE TERMINAL (NBMCT)**

APPROX. PROPERTY LINE
(TYP)

APPROX. NEW BEDFORD MARINE COMMERCE TERMINAL BOUNDARY

ACUSHNET RIVER

EBB
FLOOD

JFK MEMORIAL HWY

S. FRONT ST

BLACKMER ST

BLACKMER ST

N

NAD 83

GRAPHIC SCALE
0 35 70 140
(IN FEET)
1 INCH = 70 FEET

Foth

PROJECT:
**STATE ENHANCED REMEDY WORK PLAN**
**PHASE 3 BULKHEAD REPLACEMENT AND TERMINAL EXPANSION (SITES 3 & 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL**
**NEW BEDFORD, MA**

| REVISIONS | | | |
|---|---|---|---|
| NO | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 5/30/2025 |
| DESIGNED | MXS6 | 5/30/2025 |
| CHECKED | PSR | 8/1/2025 |

PE STAMP

SHEET TITLE:
KEY MAP

ISSUANCE:
**SER WORK PLAN**

PROJECT NO: 0024M070.04

SHEET NUMBER
G-006

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N

12" HDPE

GRAVEL

EDGE OF PAVEMENT (TYP)

VGC

BITUMINOUS PARKING LOT

EX. GRAVEL/VEGETATION

30.00' DRAINAGE EASEMENT

EX. CHAINLINK FENCE

8' TALL

RIM=10.93
CLEANOUT SWEEP

EX. HEAVY LIFT TIMBER

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

EX. AZ-13x14' LONG CANTILEVERED SHEET PILE WALL

EX. MASSDOT GUARDRAIL

EX. CHAINLINK FENCE

EX.HYDRANT W/ (2) GATE VALVES

EX. MZ-27 SHEET PILE BULKHEAD (TYP)

EX. DOUBLE CHANNEL WALER

EX. 1 ¾" 150 KSI TIE-BACK ROD

EX. AZ-13 SHEET PILES

EX. W33x201
EX. 36" DIA.x⅝" KING PILE SOCKETED 2' INTO SOUND ROCK

EX. 4,000 PSI JET GROUT

EX. CONC. PLATFORM BELOW (TYP)

EX. HP14x73 (TYP)

±53'-10"

EX. LIGHT POLE

S 14°26'15" E 201.40'

LADDER

N 75°39'17" E
5.00'

EX. 6'ø RCP W/ CONC. COLLAR

EX. DRAINAGE MANHOLE 37
RIM=8.38

EX. PZ28 CELLULAR SHEET PILE COFFERDAM (TYP)

EX. 6'x6' BOX CULVERT W/ 9'-2" COLLAR

PARCEL ID: 031 0254
N/F
R.C.P. REALTY LLC
BOOK 4852, PG. 258

EX. BUILDING

PARCEL ID: 031 0254
N/F
R.C.P REALTY LLC
BOOK 4852, PG. 258

APPROX. PROPERTY LINE (TYP)

EX. BOLLARD (TYP)

EX. 6'x6' CULVERT OUTFALL (9'-2" CONC. COLLAR)
APPROX. INV = 6' BELOW EX. CONC. PIER CAP

EX. MINOR CELL (TYP)

EX. CLEAT (TYP)

EX. TIMBER CURB (TYP)

EX. FENDERING (TYP)

NEW BEDFORD HARBOR

EBB

FLOOD

CHANNEL LIMIT

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
**STATE ENHANCED REMEDY WORK PLAN**
**PHASE 3 BULKHEAD REPLACEMENT AND TERMINAL EXPANSION (SITES 3 & 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL**
**NEW BEDFORD, MA**

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
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DATE OF PREPARATION

| | BY | DATE |
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| SURVEYED | FOTH | 1/4/2023 |
| DRAWN | ---- | ---- |
| DESIGNED | ---- | ---- |
| CHECKED | ---- | ---- |

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SHEET TITLE:

EXISTING CONDITIONS

ISSUANCE:

**SER WORK PLAN**

PROJECT NO: 0024M070.04

SHEET NUMBER

G-100

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GRAVEL

EDGE OF PAVEMENT (TYP)

BITUMINOUS PARKING LOT

EX. GRAVEL/VEGETATION

30.00' DRAINAGE EASEMENT

EX. CHAINLINK FENCE

PARCEL ID: 031 0254
N/F
R.C.P. REALTY LLC
BOOK 4852, PG. 258

EX. BUILDING

RIM=10.93
CLEANOUT SWEEP

EX. HEAVY LIFT TIMBER

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

EX. AZ-13x14' LONG CANTILEVERED SHEET PILE WALL

EX. MASSDOT GUARDRAIL

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EX. 36" DIA.x⅝" KING PILE SOCKETED 2' INTO SOUND ROCK

EX. 4,000 PSI JET GROUT

LADDER
N 75°39'17" E
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RIM=8.38

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EX. 6'x6' BOX CULVERT W/ 9'-2" COLLAR

±53'-10"

S 14°26'15" E 201.46'

EX. BOLLARD (TYP)

EX. MINOR CELL (TYP)

EX. CLEAT (TYP)

EX. TIMBER CURB (TYP)

EX. FENDERING (TYP)

A-2010-B1

EX. 6'x6' CULVERT OUTFALL (9'-2" CONC. COLLAR)
APPROX. INV = 6' BELOW EX. CONC. PIER CAP

APPROX. PROPERTY LINE (TYP)

NEW BEDFORD HARBOR

EBB

FLOOD

CHANNEL LIMIT

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

| | |
|---|---|
| 2 B-002 | 0+00 |
| CEC-18A | 1+60 |
| CEC-17A | 1+50 |
| CEC-27A | 1+00 |
| CEC-16A | 0+00 |
| CEC-15A | 0+50 |
| CEC-14A | 0+00 |
| 1 B-002 | 2+00 |
| SB-1 | 1+50 |
| SB-2 | 1+00 |
| 4 B-002 | 0+00 |
| 3 B-002 | 0+00 |
| 5 B-002 | 1+50 |

| | |
|---|---|
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| CEC-13A | 0+50 |
| A-2011-LB-B10 | 0+50 |
| CEC-25A | 0+50 |
| CEC-12A | 0+50 |
| SB-5 | 0+50 |
| CEC-11A | 0+50 |
| CEC-24A | 0+50 |
| CEC-10A | 0+50 |
| CEC-9A | 0+50 |
| CEC-22A | 1+00 |
| CEC-3A | 1+00 |
| CEC-21A | 1+00 |
| CEC-1A | 0+50 |
| CEC-23A | 0+50 |
| CEC-2A | 0+00 |
| CEC-8A | 1+00 |
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| CEC-6A | 1+00 |
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| CEC-4A | 0+50 |
| SB-4 | 0+50 |
| SB-3 | 1+00 |
| A-2011-B18 | 1+50 |

Foth

PROJECT:
**STATE ENHANCED REMEDY WORK PLAN**
**PHASE 3 BULKHEAD REPLACEMENT AND TERMINAL EXPANSION (SITES 3 & 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL**
**NEW BEDFORD, MA**

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
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DATE OF PREPARATION

| | BY | DATE |
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| SURVEYED | | |
| DRAWN | CJP/MXS6 | 5/30/2025 |
| DESIGNED | MXS6 | 5/30/2025 |
| CHECKED | PSR | 8/1/2025 |

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SHEET TITLE:

# GEOTECHNICAL EXPLORATION PLAN

ISSUANCE:

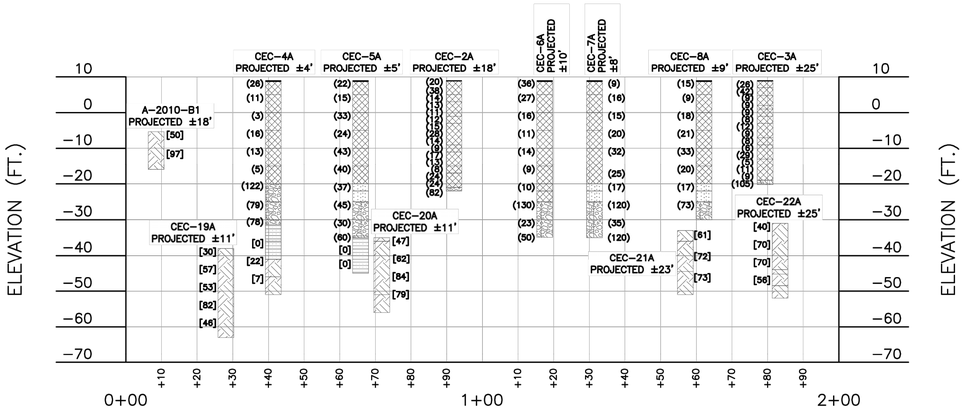
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PROJECT NO: 0024M070.04

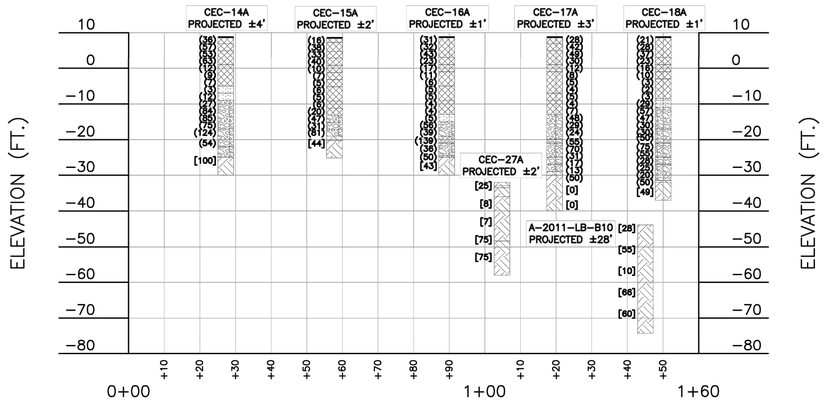
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B-001

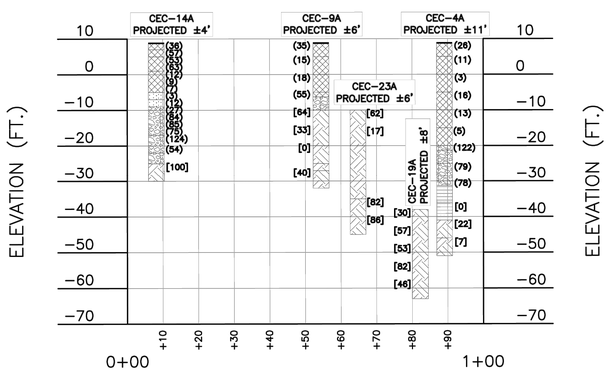
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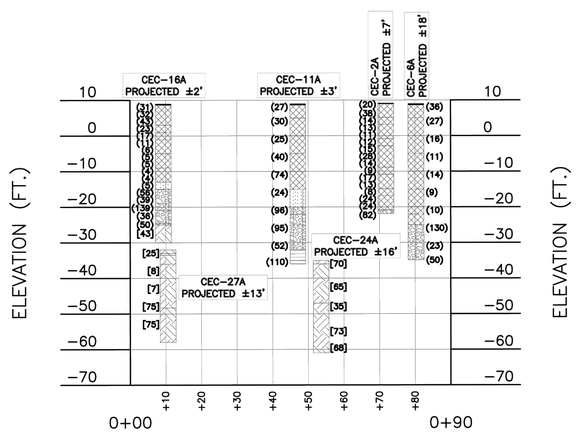

## ALIGNMENT 1 PROFILE



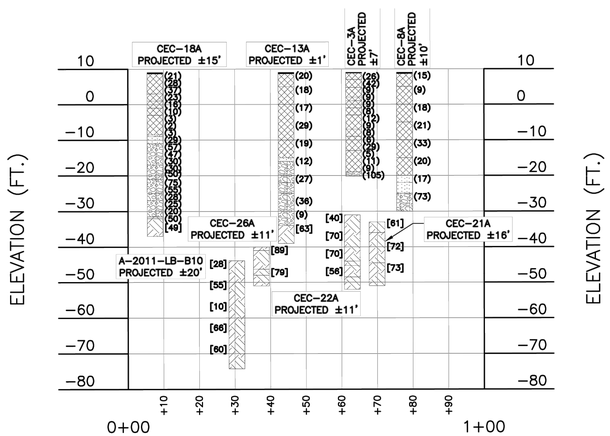

## ALIGNMENT 2 PROFILE




## ALIGNMENT 3 PROFILE




## ALIGNMENT 4 PROFILE




## ALIGNMENT 5 PROFILE

LEGEND

- ASPHALT
- FILL
- GLACIAL OUTWASH
- GLACIAL TILL
- WEATHERED ROCK
- BEDROCK
- (50) SPT "N–VALUE"
- [50] ROCK QUALITY DESIGNATION

NOTES:

1) FOR SOIL PROFILE LOCATIONS, SEE SHEET B-001

Foth

PROJECT:
STATE ENHANCED REMEDY WORK PLAN
PHASE 3 BULKHEAD REPLACEMENT AND
TERMINAL EXPANSION (SITES 3 & 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL
NEW BEDFORD, MA

| REVISIONS NO | BY | DATE | DESCRIPTION |
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| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 5/30/2025 |
| DESIGNED | MXS6 | 5/30/2025 |
| CHECKED | PSR | 8/1/2025 |

PE STAMP

SHEET TITLE:
GEOTECHNICAL BORING LOGS

ISSUANCE:
**SER WORK PLAN**

PROJECT NO: 0024M070.04

SHEET NUMBER
B-002

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DWG Folder Location: PW:\\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

BITUMINOUS CONCRETE PAVEMENT

10' DRAINAGE EASEMENT

10" 72" RCP STORM DRAIN (CONC. COLLAR SHOWN FOR CLARITY)

GATE

PARCEL ID: 031 0263
N/F
MASSACHUSETTS CLEAN ENERGY TECHNOLOGY CENTER
BK 12222 PG 204

S 14°18'15" E 207.11'

RIM=10.88

TOP OF WATER=5.67'

TOP OF PIPE=6.52'

S 75°38'48" W 24.63'

12" HDPE

RIM=10.93
CLEANOUT SWEEP

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

N

NAD 83

N 75°39'17" E
5.00'

LADDER

Monday, August 4, 2025 12:28:40 PM
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Foth

PROJECT:
**STATE ENHANCED REMEDY WORK PLAN**
**PHASE 3 BULKHEAD REPLACEMENT AND TERMINAL EXPANSION (SITES 3 & 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 5/30/2025 |
| DESIGNED | MXS6 | 5/30/2025 |
| CHECKED | PSR | 8/1/2025 |

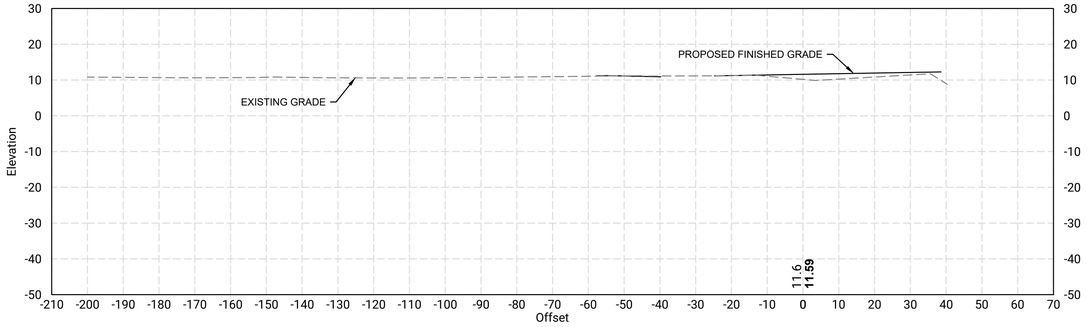
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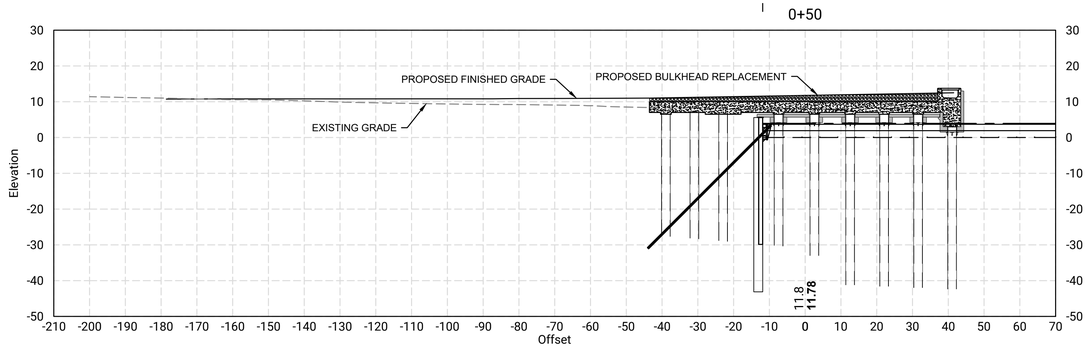
SHEET TITLE:
BULKHEAD GRADING PLAN

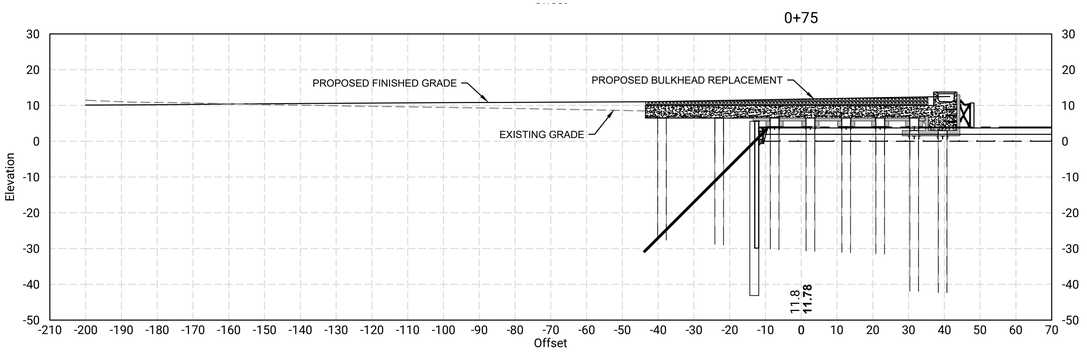
ISSUANCE:
**SER WORK PLAN**

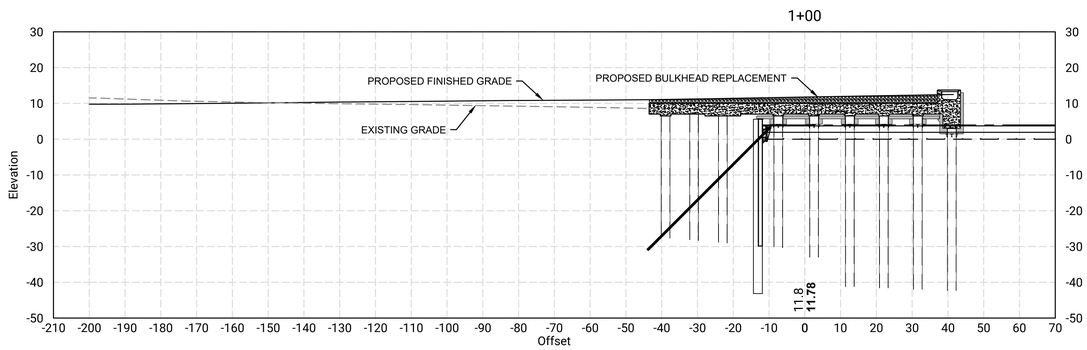
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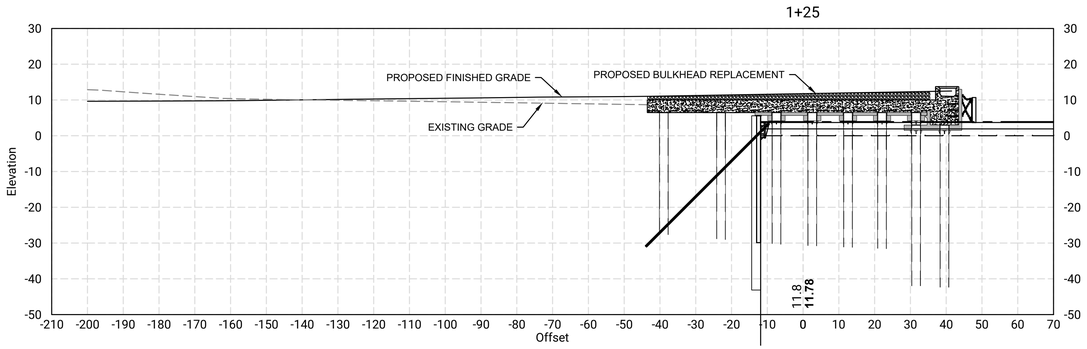
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CG-100

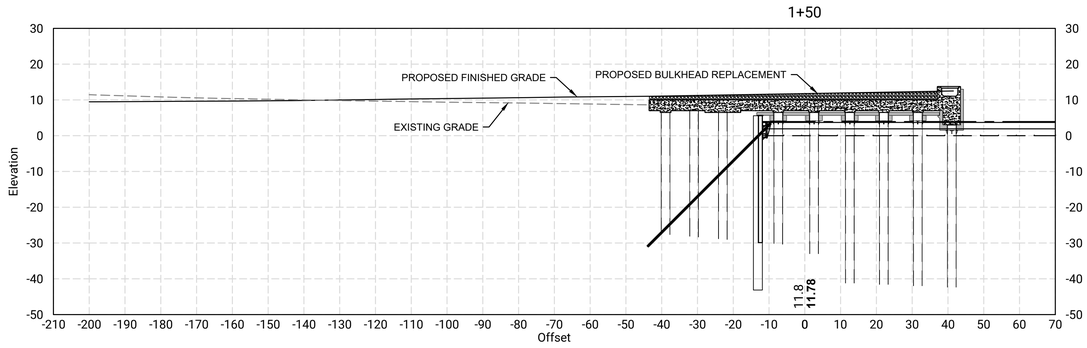


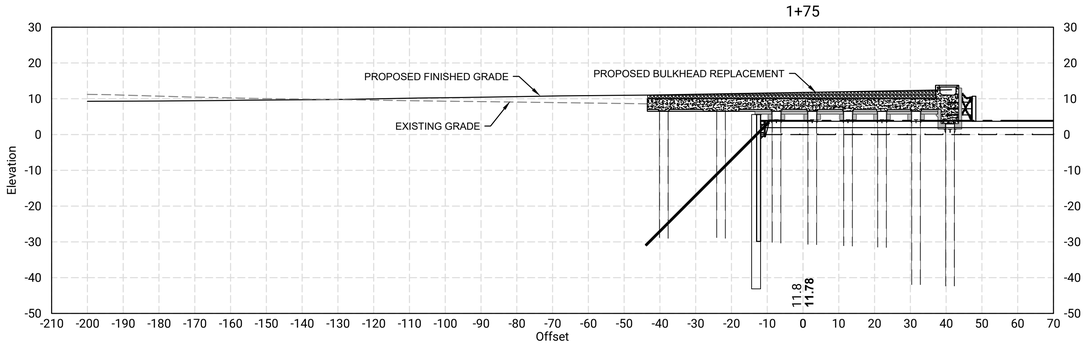



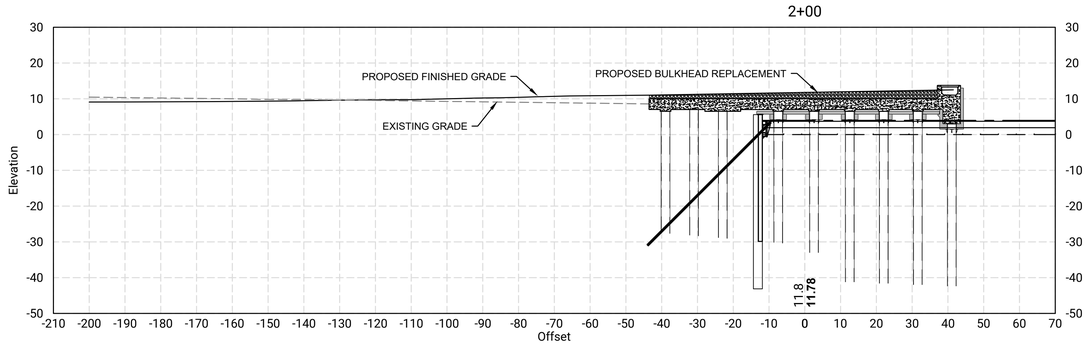



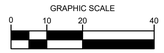




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PROJECT:
**STATE ENHANCED REMEDY WORK PLAN**
**PHASE 3 BULKHEAD REPLACEMENT AND TERMINAL EXPANSION (SITES 3 & 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL**
**NEW BEDFORD, MA**

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 5/30/2025 |
| DESIGNED | MXS6 | 5/30/2025 |
| CHECKED | PSR | 8/1/2025 |

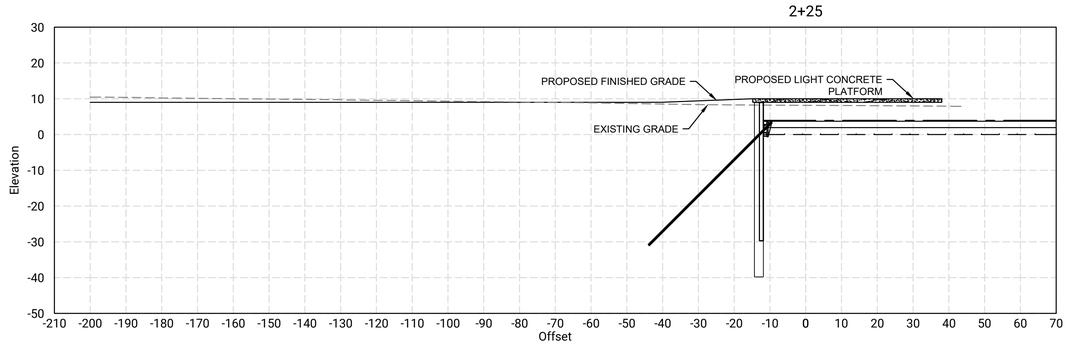
PE STAMP

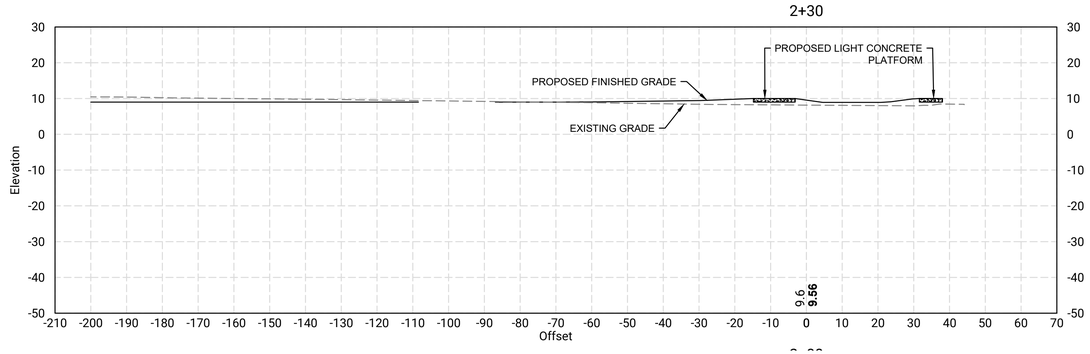
SHEET TITLE:
BULKHEAD TRANSISTION ARES SECTOINS 1 OF 2

ISSUANCE:
**SER WORK PLAN**

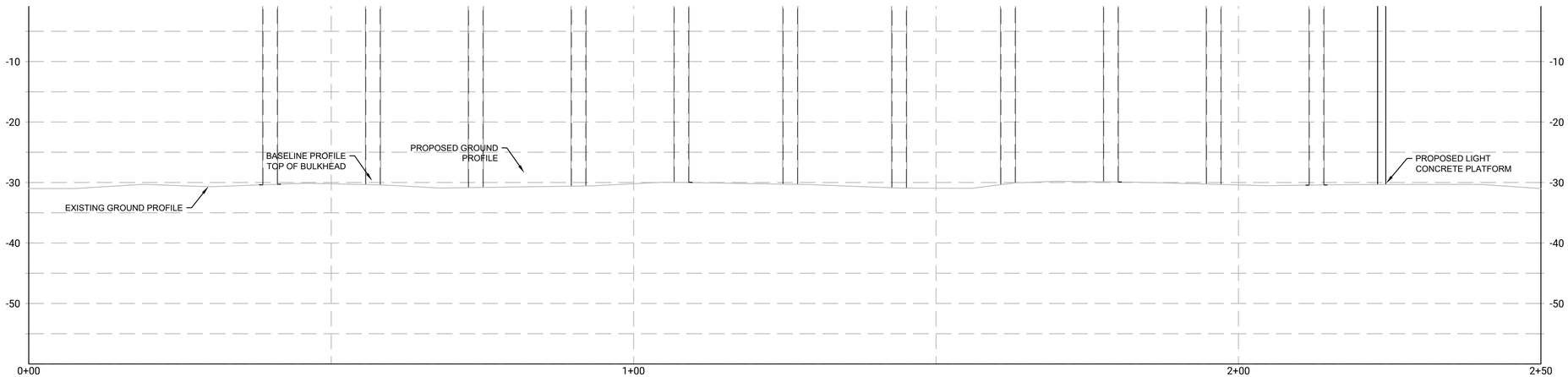
PROJECT NO: 0024M070.04

SHEET NUMBER
CG-300




GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET




GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Foth

PROJECT:
**STATE ENHANCED REMEDY WORK PLAN**
**PHASE 3 BULKHEAD REPLACEMENT AND TERMINAL EXPANSION (SITES 3 & 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL**
**NEW BEDFORD, MA**

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
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|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 5/30/2025 |
| DESIGNED | MXS6 | 5/30/2025 |
| CHECKED | PSR | 8/1/2025 |

PE STAMP

SHEET TITLE:
BULKHEAD TRANSITION AREA SECTIONS 2 OF 2

ISSUANCE:
**SER WORK PLAN**

PROJECT NO: 0024M070.04

SHEET NUMBER
CG-301

Monday, August 4, 2025 12:31:06 PM
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N

GRAVEL

12" HDPE

EDGE OF PAVEMENT (TYP)

VGC

BITUMINOUS PARKING LOT

EX. 6Ø RCP STORM DRAIN W/ CONC. COLLAR

EX. GRAVEL/VEGETATION

30.00' DRAINAGE EASEMENT

EX. CHAINLINK FENCE

PARCEL ID: 031 0254
N/F
R.C.P. REALTY LLC
BOOK 4852, PG. 258

EX. BUILDING

8' TALL

RIM=10.93
CLEANOUT SWEEP

EX. HEAVY LIFT TIMBER

A
MR301

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

EX. AZ-13x14' LONG CANTILEVERED SHEET PILE WALL

EX. MASSDOT GUARDRAIL

EX. CHAINLINK FENCE

EX.HYDRANT W/ (2) GATE VALVES

EX. PZ28 CELLULAR SHEET PILE COFFERDAM

AZ14-770

(7) W14x311 SOCKETED 10' TO SOUND ROCK

S 14°26'15" E 201.47'

LADDER
N 75°39'17" E
5.00'

HARBORLINE LIMIT

HARBORLINE LIMIT

APPROX. PROPERTY LINE (TYP)

PHASE 6:
EXCAVATE AND REMOVE MINOR AND MAJOR CELLS SEQUENTIALLY FROM SOUTH TO NORTH. ESTABLISH SLOPE OF 2.5H:1V FROM SEA TOWARD SHORE

CHANNEL LIMIT

NEW BEDFORD HARBOR

EBB
FLOOD

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

NOTES:
1. REFER TO G-003 AND G-004 FOR GENERAL NOTES.
2. REFER TO G-100 FOR EXISTING CONDITIONS AND BATHYMETRY PLAN.
3. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83; 2011 ADJUSTMENT) IN U.S. SURVEY FEET.
4. ELEVATION REFERS TO MEAN LOW LOWER WATER MARK (MLLW) VERTICAL DATUM BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008.

Foth

PROJECT:
**STATE ENHANCED REMEDY WORK PLAN**
**PHASE 3 BULKHEAD REPLACEMENT AND TERMINAL EXPANSION (SITES 3 & 4)**

OWNER:
**NEW BEDFORD MARINE COMMERCE TERMINAL**
**NEW BEDFORD, MA**

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 5/30/2025 |
| DESIGNED | MXS6 | 5/30/2025 |
| CHECKED | PSR | 8/1/2025 |

PE STAMP

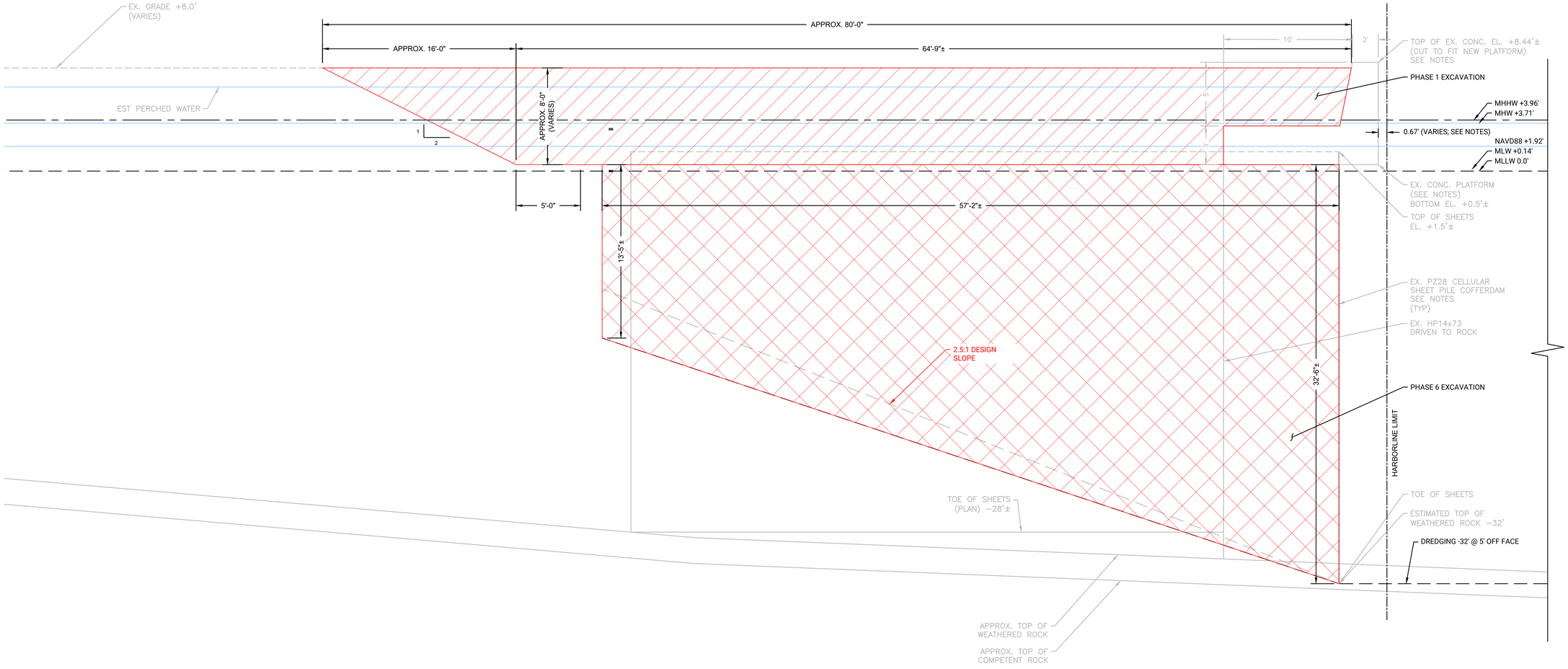
SHEET TITLE:
COFFERDAMN EXCAVATION EXTENTS

ISSUANCE:
**SER WORK PLAN**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR-006

Monday, August 4, 2025 12:31:32 PM
DWG Filename: 24m070.04 mr-006.dwg Layout: mr006
DWG Folder Location: PW:\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\




A / MR301 EX. SECTION W/ EXCAVATION EXTENTS
SCALE: 1" = 4'

GENERAL NOTES:

1. COMBI-WALL AND ANCHORS SHOWN FOR CLARITY ON EXCAVATION EXTENTS.
2. ALIGNMENT OF EXISTING CELLS AND CONCRETE PLATFORM VARIES ALONG PROPOSED PLATFORM DEPENDING ON WHERE THE SECTION IS CUT. CONTRACTOR SHALL PERFORM SURVEY TO VERIFY LOCATION OF EXISTING STRUCTURES PRIOR TO PERFORMING WORK.

DATUM OFFSETS

| MLLW | NAVD 88 | |
|---|---|---|
| 3.96 | 2.04 | MHHW |
| 3.71 | 1.79 | MHW |
| 1.92 | 0.00 | NAVD 88 |
| 0.14 | -1.78 | MLW |
| 0.0 | -1.92 | MLLW |

OFFSETS TAKEN FROM
FROM USACE GUIDANCE IN QUALITY
CONTROL REPORT BY JACOBS
ENGINEERING, PROVIDED BY USACE

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

Foth

PROJECT:
STATE ENHANCED REMEDY WORK PLAN
PHASE 3 BULKHEAD REPLACEMENT AND
TERMINAL EXPANSION (SITES 3 & 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 5/30/2025 |
| DESIGNED | MXS6 | 5/30/2025 |
| CHECKED | PSR | 8/1/2025 |

PE STAMP

SHEET TITLE:
COFFERDAM EXCAVATION EXTENTS X-SECTION

ISSUANCE:
**SER WORK PLAN**

PROJECT NO: 0024M070.04

SHEET NUMBER
MR-301

Monday, August 4, 2025 12:31:56 PM
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NOTES:
1. REFER TO G-003 AND G-004 FOR GENERAL NOTES.
2. REFER TO G-100 FOR EXISTING CONDITIONS AND BATHYMETRY PLAN.
3. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83; 2011 ADJUSTMENT) IN U.S. SURVEY FEET.
4. ELEVATION REFERS TO MEAN LOW LOWER WATER MARK (MLLW) VERTICAL DATUM BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008.

EX. 6'Ø RCP STORM DRAIN W/ CONC. COLLAR

30.00' DRAINAGE EASEMENT

PARCEL ID: 031 0254
N/F
R.C.P. REALTY LLC
BOOK 4852, PG. 258

EX. BUILDING

CONTRACTOR SHALL INSTALL TEMPORARY BYPASS PUMPS TO DIVERT FLOW UNTIL CONSTRUCTION IS FINISHED

INSTALL NEW MANHOLE W/ TEMPORARY PLUG

RIM=10.93
CLEANOUT SWEEP

12" HDPE

RIM=11.18
APPROX. BOTTOM ELBOW=5.38

EX. AZ-13x14' LONG CANTILEVERED SHEET PILE WALL

MASSDOT GUARDRAIL

EX. CHAINLINK FENCE

EX.HYDRANT W/ (2) GATE VALVES

182'± (4100 psf)

5'-9" | 7'-10" | 7'-0" | 9'-6" | 11'-0" | 5'-6" | 12'-6" | 6'-0" | 12'-0" | 4'-6" | 10'-6" | 6'-0" | 2'-9"
17'-0" | 17'-0" | 17'-0" | 17'-0" | 17'-0" | 18'-0" | 18'-0" | 18'-0" | 17'-0" | 17'-0" | 17'-0"
1'-0"

4'-7"

19'± (4100 psf)

8'-0" | 8'-0" | 3'

87'±

68'± (4100 psf)

10'-0" | 10'-0" | 9'-6" | 9'-6" | 9'-6" | 9'-6"

2'-5"

ROW "G"
10' WIDE x 42" DEEP BEAM

7'-9" | 15'-6" | 15'-6" | 15'-6" | 15'-6" | 15'-6" | 15'-6" | 15'-6" | 15'-6" | 15'-6" | 15'-6" | 7'-9" | 7'-9"

ROW "I"
(11) 24"x1" PIPE PILE
DRIVEN TO TOP OF COMP ROCK

ROW "H"
(1) 24"x1" PIPE PILE
DRIVEN TO TOP OF COMP ROCK

ROW "G"
(17) 30"x1" PIPE PILE
DRIVEN TO TOP OF COMP ROCK

6'x6' BOX CULVERT (38'± TOTAL)
ADJUST SHORING AS REQUIRED
(SHORING NOT SHOWN FOR CLARITY)

12'-10"

(15) 15' INTO SOUND ROCK, LR.
CONTRACTOR DESIGN FOR 350 KIP
SERVICE PULL-OUT, TEST TO 470
KIP, THEN BACK OFF TO 350 KIP
AND LOCK. GROUTED TENDON
10 STRAND ANCHOR @ 45°

19'-3"

11'-8"

(2) HP12x89
SOCKETED 10' TO
SOUND ROCK

10'-0"

EX. PZ28 CELLULAR SHEET PILE COFFERDAM

AZ14-770 OR EQUIV.

30"x1" PIPE PILE
SOCKETED 10' TO ROCK

(2) HSS 12x12x5/8
CONT. WALER

(12) ROW "C", "D", & "E"
30"x1" PIPE PILE SOCKETED
10' TO SOUND ROCK (TYP)

(32) ROW "C", "D", "E", & "F"
30"x1" PIPE PILE DRIVEN TO TOP
OF COMP ROCK (TYP)

AZ14-770

GUARDRAIL (54'±)

(7) W14x311 SOCKETED
10' TO SOUND ROCK

8'-0"

19'-3"

14°26'15" 201.40'

HARBORLINE LIMIT

LADDER

N 75°39'17" E
5.00'

45'-6"± (V.I.F.)
62'-6"

17'-0"

52'-0"

18'-0" (TYP)

35'-0"
70'-0"

17'-0"

(22) ROW "A" & "B"
30"x1" PIPE PILE SOCKETED
10' TO SOUND ROCK (TYP)

HARBORLINE LIMIT

APPROX. PROPERTY LINE (TYP)

B
MR303

A
MR302

BEAM EXTENSION FOR BOLLARD (LOCATED AT AXIS A3, A6, AND A10) SEE MR501

INSIDE FACE OF 2' WIDE CURB

OUTER EDGE OF PLATFORM

ZALDA TECHNOLOGY SBD-1 200-225 TON BOLLARD (TYP OF 3)

ROW "B", "C", "D", "E", "F", AND "I" 3' WIDE x 42" DEEP BEAM

ROW "A" 5' WIDE x 48" DEEP BEAM

ZALDA TECHNOLOGY FENDER AND HDPE FACED PANEL "SC-1150" SER (HIGH FORMULA) (TYP OF 6) SEE MR504

NOTE: FABRIFORM SCOUR PROTECTION NOT SHOWN FOR CLARITY

CHANNEL LIMIT

NEW BEDFORD HARBOR
EBB
FLOOD

NEW BEDFORD HARBOR
EBB
FLOOD

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET

Monday, August 4, 2025 12:32:21 PM
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Layout: mr100

Foth

PROJECT:
STATE ENHANCED REMEDY WORK PLAN
PHASE 3 BULKHEAD REPLACEMENT AND TERMINAL EXPANSION (SITES 3 & 4)

OWNER:
NEW BEDFORD MARINE COMMERCE TERMINAL
NEW BEDFORD, MA

REVISIONS

| NO | BY | DATE | DESCRIPTION |
|---|---|---|---|
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DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 5/30/2025 |
| DESIGNED | MXS6 | 5/30/2025 |
| CHECKED | PSR | 8/1/2025 |

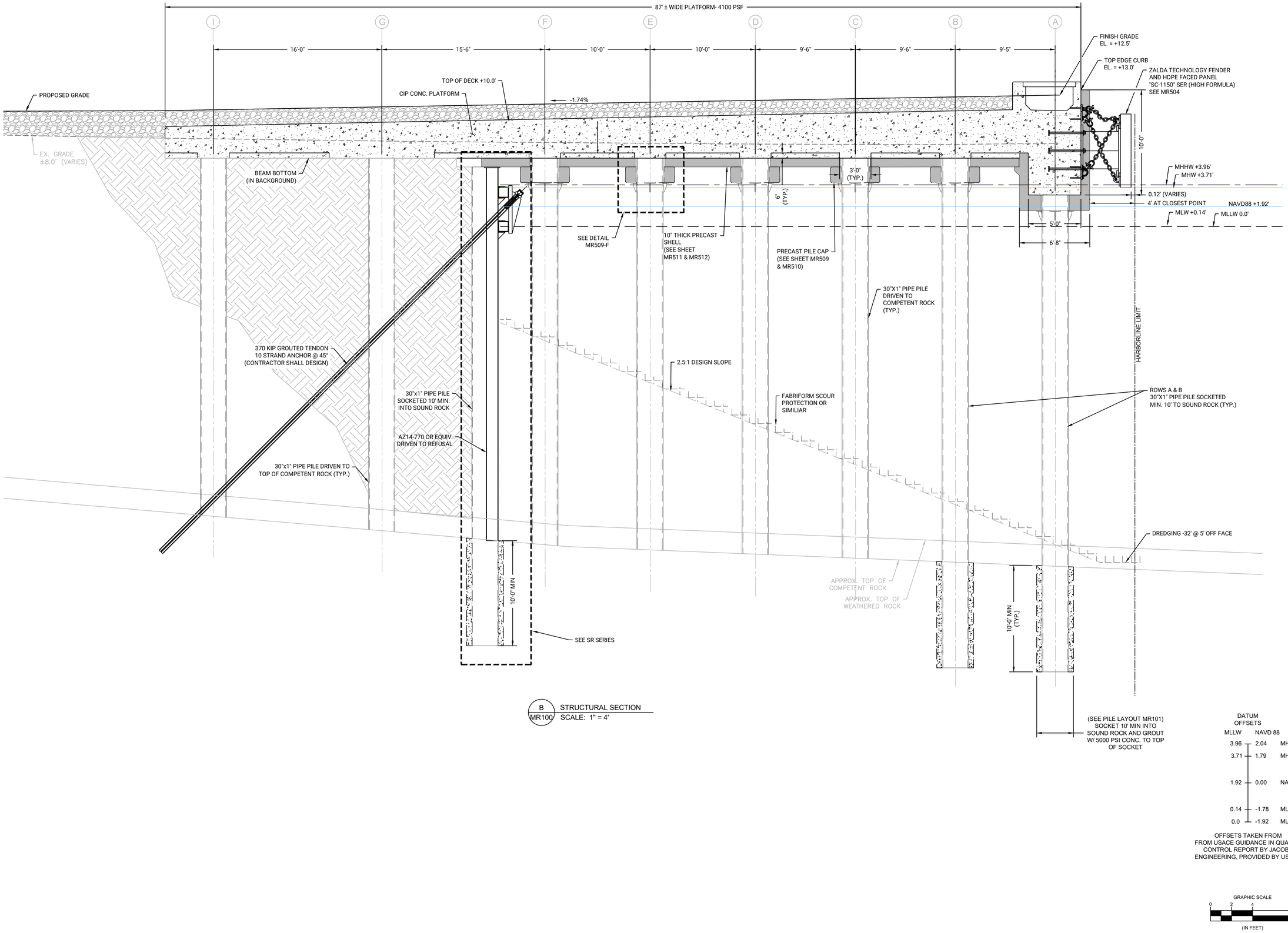
PE STAMP

SHEET TITLE:
BULKHEAD CONFIGURATION PLAN

ISSUANCE:
SER WORK PLAN

PROJECT NO: 0024M070.04

SHEET NUMBER
MR-100




B / MR100 STRUCTURAL SECTION
SCALE: 1" = 4'

DATUM OFFSETS

| MLLW | NAVD 88 | |
|---|---|---|
| 3.96 | 2.04 | MHHW |
| 3.71 | 1.79 | MHW |
| 1.92 | 0.00 | NAVD 88 |
| 0.14 | -1.78 | MLW |
| 0.0 | -1.92 | MLLW |

OFFSETS TAKEN FROM
FROM USACE GUIDANCE IN QUALITY
CONTROL REPORT BY JACOBS
ENGINEERING, PROVIDED BY USACE

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

Foth

PROJECT:
STATE ENHANCED REMEDY WORK PLAN
PHASE 3 BULKHEAD REPLACEMENT AND
TERMINAL EXPANSION (SITES 3 & 4)

OWNER:
NEW BEDFORD MARINE
COMMERCE TERMINAL
NEW BEDFORD, MA

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | CJP/MXS6 | 5/30/2025 |
| DESIGNED | MXS6 | 5/30/2025 |
| CHECKED | PSR | 8/1/2025 |

PE STAMP

SHEET TITLE:
BULKHEAD
CONFIGURATION
PLAN
X-SECTION

ISSUANCE:
**SER WORK PLAN**

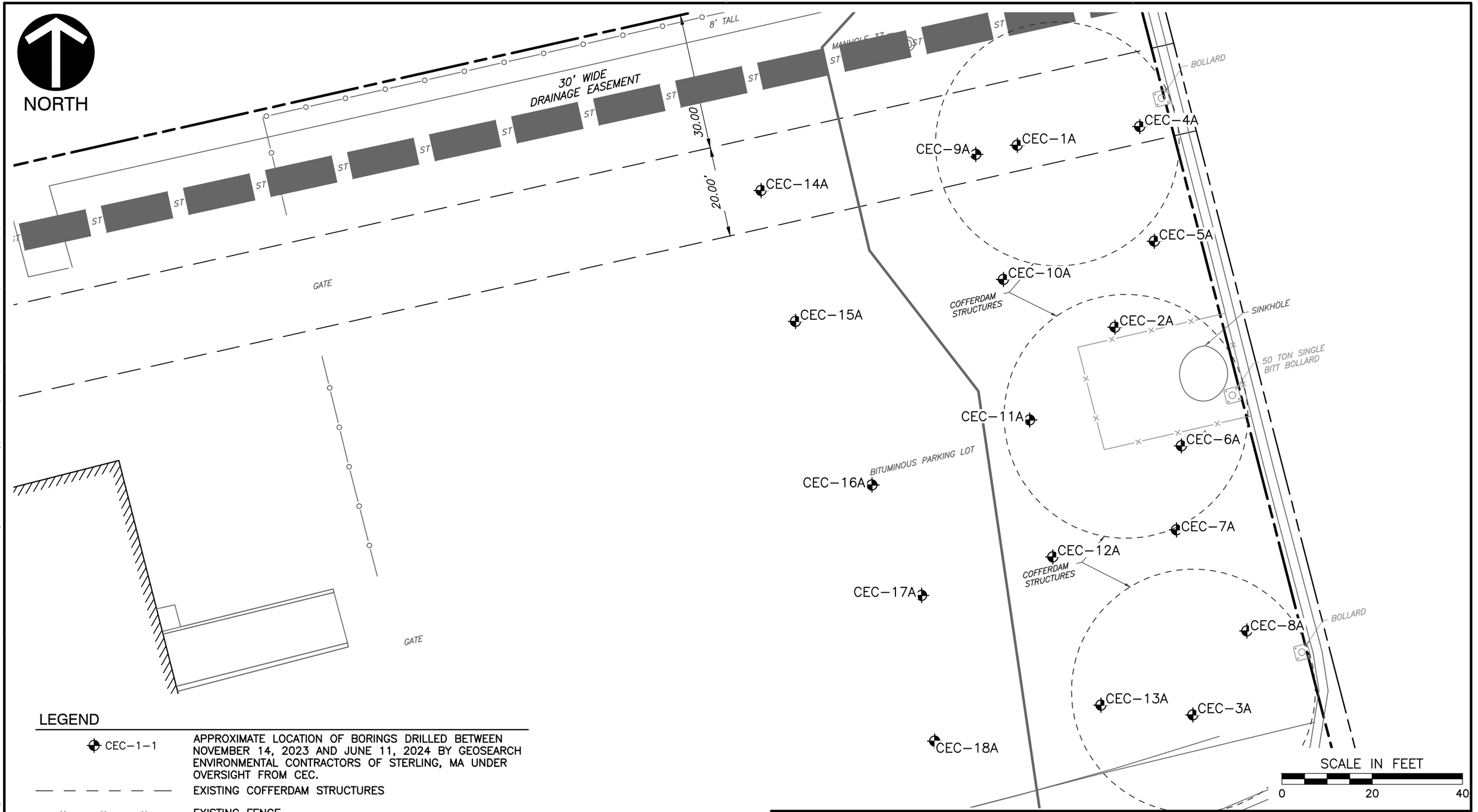
PROJECT NO: 0024M070.04

SHEET NUMBER
MR-303

Monday, August 4, 2025 12:32:45 PM
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DWG Folder Location: PW:\FOTH-PW.BENTLEY.COM:FOTH-PW-01\DOCUMENTS\CLIENTS\MA CLEAN ENERGY\0024M070.04\CAD\DRAWINGS\

**Attachment D**

**Massachusetts Clean Energy Center Site 4 – Shuster Bulkhead:**
**Boring Location Plan with Analytical Results**




## LEGEND

| | |
|---|---|
| CEC-1-1 | APPROXIMATE LOCATION OF BORINGS DRILLED BETWEEN NOVEMBER 14, 2023 AND JUNE 11, 2024 BY GEOSEARCH ENVIRONMENTAL CONTRACTORS OF STERLING, MA UNDER OVERSIGHT FROM CEC. |
| — — — — — — | EXISTING COFFERDAM STRUCTURES |
| ——×——×——×—— | EXISTING FENCE |
| ——————— | EXISTING SINKHOLE |

## REFERENCE

1. EXISTING SITE INFORMATION WAS OBTAINED FROM PLANS ENTITLED "MASSCEC MAIN TERMINAL AS-BUILTS", DATED 5/10/2023, BY FOTH, AND PROVIDED ELECTRONICALLY TO CEC BY FOTH. CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.


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MASSACUSETTS CLEAN ENERGY CENTER
SITE 4 - SHUSTER BULKHEAD
4 WRIGHT STREET, NEW BEDFORD, MA

BORING LOCATION PLAN

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | FIGURE NO.: | 1 |
| DATE: | AUGUST 2024 | DWG SCALE: | 1"=20' | PROJECT NO: | 332-344 | | |

P:\330-000\332-344\-CADD\Dwg\ENO5 - Site 4 - Shuster Bulkhead\332344 - ENO5 - Boring Location Plan.dwg[FIGURE 1] LS:(8/5/2024 - abucco) - LP: 8/5/2024 10:09 AM

# TABLE 1: SOIL ANALYTICAL DATA (CEC-1A, CEC-2A, AND CEC-3A) – DETECTIONS ONLY

Table 1
Soil Analytical Data (CEC-1-A, CEC-2-A, and CEC-3-A) – Detections Only
MassCEC - Shuster Bulkhead
New Bedford, MA

| | Reuse Levels | | MCP Concentrations | | Shuster Bulkhead - 4 Wright Street, New Bedford, Massachusetts | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | CEC-1-A 0-6 | CEC-1-A 10-12 | CEC-1-A 16-18 | CEC-1-A 22-24 | CEC-2-A 0-4 | CEC-2-A 12-14 | CEC-2-A 24-26 | CEC-2-A 26-28 | CEC-3-A 0-4 | CEC-3-A 6-8 | CEC-3-A 18-20 | CEC-3-A 24-26 |
| Sample Depth (feet) | | | | | 0-6 | 10-12 | 16-18 | 22-24 | 0-4 | 12-14 | 24-26 | 26-28 | 0-4 | 6-8 | 18-20 | 24-26 |
| PID Reading (ppmv) | | | | | 0.0 | 0.4 | 0.1 | 0.1 | 0.2 | 0.2 | 0.1 | 0.1 | 0.3 | 0.1 | 0.2 | 0.1 |
| Sample Date | | | | | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 |
| Laboratory Sample ID | Unlined Landfills | Lined Landfills | RCS-1 | RCS-2 | 23K0532-01 | 23K0532-02 | 23K0532-03 | 23K0532-04 | 23K0532-05 | 23K0532-06 | 23K0532-07 | 23K0532-08 | 23K0532-09 | 23K0532-10 | 23K0532-11 | 23K0532-12 |
| **SVOCSs (mg/kg)** | 100 | 100 | varies | varies | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | | | |
| Barium | NS | NS | 1,000 | 3,000 | 7.50 | 5.77 | 5.86 | 5.72 | 6.81 | 6.60 | 12.90 | 7.19 | 11.60 | 6.57 | 7.87 | 3.38 |
| Beryllium | NS | NS | 90 | 200 | 0.16 | 0.14 | 0.15 | <0.11 | 0.15 | 0.15 | 0.23 | 0.21 | 0.15 | 0.17 | 0.15 | <0.1 |
| Chromium | 1000 | 1000 | 100 | 200 | 4.65 | 3.36 | 3.56 | 4.18 | 4.58 | 4.04 | 14.50 | 9.08 | 7.05 | 4.35 | 8.94 | 3.21 |
| Lead | 2000 | 1000 | 200 | 600 | 4.71 | <4.54 | <4.93 | <4.95 | 6.95 | <4.92 | 22.5 | 8.88 | 7.97 | <5.04 | <5.18 | 8.53 |
| Mercury | 10 | 10 | 20 | 30 | <0.031 | <0.038 | <0.037 | <0.033 | <0.034 | <0.035 | 0.138 | <0.037 | <0.031 | <0.036 | <0.038 | <0.037 |
| Nickel | NS | NS | 600 | 1,000 | 4.65 | 3.82 | 3.82 | 3.38 | 4.54 | 4.41 | <6.3 | 5.30 | 5.81 | 4.77 | 5.28 | <2.2 |
| Vanadium | NS | NS | 400 | 700 | 5.24 | 4.61 | 4.52 | 5.07 | 5.15 | 4.63 | 9.34 | 6.89 | 6.58 | 5.69 | 4.94 | 2.93 |
| Zinc | NS | NS | 1,000 | 3,000 | 15.1 | 11.4 | 12.6 | 12.0 | 14.5 | 12.8 | 46.0 | 25.4 | 16.2 | 16.6 | 14.1 | 18.0 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | | | |
| Aroclor 1248 | NS | NS | - | - | <0.05 | <0.06 | <0.06 | <0.05 | <0.05 | <0.06 | 0.6 | 0.3 | <0.05 | <0.06 | <0.06 | 0.3 |
| Aroclor 1254 | NS | NS | - | - | <0.05 | <0.06 | <0.06 | <0.05 | <0.05 | <0.06 | 0.5 | 0.2 | <0.05 | <0.06 | <0.06 | 0.2 |
| **Total PCBs** | <2 | <2 | 1 | 4 | <0.05 | <0.06 | <0.06 | <0.06 | <0.05 | <0.06 | 1.1 | 0.5 | <0.05 | <0.06 | <0.06 | 0.5 |

Notes:
Laboratory analytical results compared to RCS-2 Massachusetts Contingency Plan Reportable Concentrations
Table shows only detected analytes
PCBs = Polychlorinated Biphenyls;
PID = photo ionization detector; ppmv = parts per million volumetric;
All data reported in mg/kg = milligrams per kilogram.
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
**Bold** = exceeds applicable MassDEP MCP Standard RCS-2
PID calibrated with Isobutylene with a Response Factor of 1.0
Reuse levels based on Massachusetts Department of Environmental Protection's "Reuse and Disposal of Contaminated Soil at Massachusetts Landfills Department of Environmental Protection Policy # Comm-97-001"

# TABLE 2: SOIL ANALYTICAL DATA (CEC 4A THROUGH CEC-13A) - DETECTIONS ONLY

Table 2
Soil Analytical Data (CEC-4A through CEC-13A) - Detections Only
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels | | MCP Concentrations | | Sample Information | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lined Landfill[1] | Unlined Landfill[2] | RCS-1[3] | RCS-2[4] | CEC-10A 5/30/2024 0-12 ft | CEC-10A 5/30/2024 12-24 ft | CEC-11A 6/7/2024 0-12 ft | CEC-11A 6/7/2024 12-24 ft | CEC-12A 5/29/2024 0-12 ft | CEC-12A 5/30/2024 12-24 ft | CEC-13A 5/20/2024 0-12 ft | CEC-13A 5/20/2024 12-24 ft | CEC-4A 6/3/2024 0-12 ft | CEC-4A 6/3/2024 12-24 ft | CEC-4A 6/3/2024 24-36 ft | CEC-5A 6/5/2024 0-12 ft |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | | | | | | | | | | |
| Acetone | EPA8260 | mg/kg | -- | -- | 6 | 50 | < 0.0386 | < 0.0421 | 0.392 | < 0.0495 | 0.272 | < 0.0475 | < 0.0463 | < 0.0466 | < 0.0412 | 0.113 | < 0.0467 | 0.202 |
| Naphthalene | EPA8260 | mg/kg | -- | -- | 4 | 20 | < 0.0039 | < 0.0042 | < 0.0045 | < 0.0049 | < 0.0041 | < 0.0048 | < 0.0046 | < 0.0047 | < 0.0041 | < 0.0044 | < 0.0047 | < 0.0044 |
| Toluene | EPA8260 | mg/kg | -- | -- | 30 | 1000 | < 0.0039 | < 0.0042 | < 0.0045 | 0.0056 | < 0.0041 | < 0.0048 | < 0.0046 | < 0.0047 | < 0.0041 | < 0.0044 | < 0.0047 | < 0.0044 |
| Total VOCs | EPA8260 | mg/kg | 10 | 4 | -- | -- | < 0.0771 | < 0.0421 | 0.392 | 0.0056 | 0.272 | < 0.019 | < 0.0925 | < 0.0931 | < 0.0823 | 0.113 | < 0.0467 | 0.202 |
| **Semi-volatile Organic Compounds (SVOCs)** | | | | | | | | | | | | | | | | | | |
| Total SVOCs | EPA8270 | mg/kg | 100 | 100 | -- | -- | < 1.12 | < 1.13 | < 1.12 | < 1.1 | < 1.06 | < 1.16 | < 1.11 | < 1.11 | < 1.07 | < 1.18 | < 1.09 | < 1.14 |
| **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | EPA8015 | mg/kg | 5000 | 2500 | -- | -- | 21.7 | 13.7 | 23.1 | 20.8 | 11.5 | 71.9 | 50.5 | < 11.1 | 33.8 | 105 | 53.8 | 39.8 |
| **Pesticides/Herbicides** | | | | | | | | | | | | | | | | | | |
| No Detections | EPA8081 | mg/kg | -- | -- | -- | -- | | | | | | | | | | | | |
| **Polychlorinated Biphenyls (PCBs)** | | | | | | | | | | | | | | | | | | |
| PCB Aroclor 1248 | SW-8082A | mg/kg | -- | -- | -- | -- | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 |
| PCB Aroclor 1254 | SW-8082A | mg/kg | -- | -- | -- | -- | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | 0.06 | < 0.06 | < 0.05 | < 0.06 |
| Total PCBs | SW-8082A | mg/kg | 2 | 2 | 1 | 4 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | 0.06 | < 0.06 | < 0.05 | < 0.06 |
| **Inorganics and Metals** | | | | | | | | | | | | | | | | | | |
| Arsenic | SW-6010D | mg/kg | 40 | 40 | 20 | 20 | 3.85 | < 2.22 | < 2.1 | 2.25 | 1.49 | 2 | 3.77 | 4.29 | < 1.89 | 2.69 | < 2.06 | 2.97 |
| Barium | SW-6010D | mg/kg | -- | -- | 1000 | 3000 | 41 | 13.9 | 12.1 | 16.3 | 10.9 | 10.1 | 12.1 | 10.3 | 16.4 | 11.9 | 24.7 | 23.2 |
| Chromium | SW-6010D | mg/kg | 1000 | 1000 | 100 | 200 | 22.7 | 9.86 | 8.75 | 11.7 | 6.22 | 6.78 | 7.85 | 7.44 | 17 | 9.63 | 9.8 | 13.2 |
| Lead | SW-6010D | mg/kg | 2000 | 1000 | 200 | 600 | 22.9 | 7.4 | 16.8 | 11.4 | 9.48 | 5.99 | 8.85 | 7.38 | 11.2 | 10.8 | 5.67 | 14 |
| Mercury | EPA7471 | mg/kg | 10 | 10 | 20 | 40 | < 0.033 | < 0.033 | 0.072 | < 0.034 | < 0.031 | < 0.033 | < 0.036 | < 0.034 | < 0.035 | < 0.037 | < 0.035 | < 0.034 |
| **Anions and General Chemistry** | | | | | | | | | | | | | | | | | | |
| Corrosivity | EPA9040 | SU | -- | -- | -- | -- | 7.04 | 7.65 | 7.77 | 7.57 | 8.6 | 8.23 | 6.89 | 8.55 | 7.4 | 7.82 | 7.93 | 7.3 |
| **Physical Conditions** | | | | | | | | | | | | | | | | | | |
| Specific Conductance @ 25C | EPA9050 | umhos/cm | 8000 | 4000 | -- | -- | 180 | 345 | 98 | 225 | 116 | 498 | 299 | 1090 | 607 | 973 | 1570 | 191 |

Notes:

1. COMM-97-001 Table 1 (8/15/1997) Lined Landfills
2. COMM-97-001 Table 1 (8/15/1997) Unlined Landfills
3. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-1
4. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-2

-- In a standards value column denotes that no standard is available.
Table only shows detected constituents

Table 2
Soil Analytical Data (CEC-4A through CEC-13A) - Detections Only
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels | | MCP Concentrations | | Sample Information | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lined Landfill[1] | Unlined Landfill[2] | RCS-1[3] | RCS-2[4] | CEC-5A 6/5/2024 12-24 ft | CEC-5A 6/6/2024 24-36 ft | CEC-6A 6/11/2024 0-12 ft | CEC-6A 6/11/2024 12-24 ft | CEC-6A 6/11/2024 24-36 ft | CEC-7A 6/10/2024 0-12 ft | CEC-7A 6/10/2024 12-24 ft | CEC-7A 6/11/2024 24-36 ft | CEC-8A 6/10/2024 0-12 ft | CEC-8A 6/10/2024 12-24 ft | CEC-8A 6/10/2024 24-36 ft | CEC-9A 5/31/2024 0-12 ft |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | | | | | | | | | | |
| Acetone | EPA8260 | mg/kg | -- | -- | 6 | 50 | 0.137 | < 0.0396 | 0.246 | 0.124 | 0.259 | 0.195 | < 0.0464 | 0.327 | 0.27 | < 0.0452 | < 0.0482 | < 0.0444 |
| Naphthalene | EPA8260 | mg/kg | -- | -- | 4 | 20 | < 0.0043 | < 0.004 | < 0.004 | < 0.0045 | < 0.0045 | 0.0054 | < 0.0046 | < 0.0048 | < 0.0041 | < 0.0045 | < 0.0048 | < 0.0044 |
| Toluene | EPA8260 | mg/kg | -- | -- | 30 | 1000 | < 0.0043 | < 0.004 | < 0.004 | < 0.0045 | < 0.0045 | < 0.0041 | < 0.0046 | < 0.0048 | < 0.0041 | < 0.0045 | < 0.0048 | < 0.0044 |
| Total VOCs | EPA8260 | mg/kg | 10 | 4 | -- | -- | 0.137 | < 0.0792 | 0.246 | 0.124 | 0.259 | 0.2004 | < 0.0929 | 0.327 | 0.27 | < 0.0904 | < 0.0964 | < 0.0888 |
| **Semi-volatile Organic Compounds (SVOCs)** | | | | | | | | | | | | | | | | | | |
| Total SVOCs | EPA8270 | mg/kg | 100 | 100 | -- | -- | < 1.17 | < 1.14 | < 1.16 | < 1.18 | < 1.14 | < 1.13 | < 1.16 | < 1.21 | < 1.11 | < 1.17 | < 1.18 | < 1.11 |
| **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | EPA8015 | mg/kg | 5000 | 2500 | -- | -- | 22.9 | 20.8 | 19.4 | < 11.3 | 27.7 | 15.7 | 43.3 | 17.7 | 12.2 | 26.6 | 25.1 | 48.5 |
| **Pesticides/Herbicides** | | | | | | | | | | | | | | | | | | |
| No Detections | EPA8081 | mg/kg | -- | -- | -- | -- | | | | | | | | | | | | |
| **Polychlorinated Biphenyls (PCBs)** | | | | | | | | | | | | | | | | | | |
| PCB Aroclor 1248 | SW-8082A | mg/kg | -- | -- | -- | -- | < 0.06 | 0.09 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | 0.3 | < 0.05 | < 0.05 | 0.06 | < 0.06 |
| PCB Aroclor 1254 | SW-8082A | mg/kg | -- | -- | -- | -- | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | 0.3 | < 0.05 | < 0.05 | 0.06 | < 0.06 |
| Total PCBs | SW-8082A | mg/kg | 2 | 2 | 1 | 4 | < 0.06 | 0.09 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | 0.6 | < 0.05 | < 0.05 | 0.12 | < 0.06 |
| **Inorganics and Metals** | | | | | | | | | | | | | | | | | | |
| Arsenic | SW-6010D | mg/kg | 40 | 40 | 20 | 20 | 2.91 | < 6.09 | 11.5 | < 2.04 | < 1.96 | 4.5 | < 2.32 | < 2.01 | 2.56 | 2.05 | 2.44 | 2.87 |
| Barium | SW-6010D | mg/kg | -- | -- | 1000 | 3000 | 27.2 | 74.6 | 10.7 | 8 | 52.4 | 30.6 | 13.3 | 53.6 | 13.7 | 11.5 | 10.7 | 13.8 |
| Chromium | SW-6010D | mg/kg | 1000 | 1000 | 100 | 200 | 17.2 | 13 | 10.1 | 7.49 | 9.69 | 23.2 | 12.4 | 21.2 | 7.61 | 7.25 | 6.53 | 9.14 |
| Lead | SW-6010D | mg/kg | 2000 | 1000 | 200 | 600 | 13.2 | < 12.2 | 13.3 | 9.55 | 8.59 | 26.5 | 10.1 | 35.3 | 8.52 | 7.43 | 6.69 | 10.4 |
| Mercury | EPA7471 | mg/kg | 10 | 10 | 20 | 40 | < 0.034 | < 0.035 | < 0.037 | < 0.035 | < 0.036 | < 0.03 | < 0.035 | 0.131 | < 0.028 | < 0.028 | 0.038 | < 0.036 |
| **Anions and General Chemistry** | | | | | | | | | | | | | | | | | | |
| Corrosivity | EPA9040 | SU | -- | -- | -- | -- | 7.24 | 8.1 | 8.55 | 8.94 | 8.98 | 9.04 | 8.03 | 8.29 | 7.79 | 7.42 | 7.94 | 7.69 |
| **Physical Conditions** | | | | | | | | | | | | | | | | | | |
| Specific Conductance @ 25C | EPA9050 | umhos/cm | 8000 | 4000 | -- | -- | 1580 | 2470 | 214 | 1550 | 848 | 234 | 714 | 2900 | 231 | 1700 | 2990 | 465 |

Notes:

1. COMM-97-001 Table 1 (8/15/1997) Lined Landfills
2. COMM-97-001 Table 1 (8/15/1997) Unlined Landfills
3. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-1
4. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-2

-- In a standards value column denotes that no standard is available.
Table only shows detected constituents

**ATTACHMENT 9: 72-INCH STORM DRAIN AND MANHOLE INSPECTION USING A REMOTELY OPERATED VEHICLE (ASI MARINE L.P., SEPTEMBER 3, 2025)**

**NOTE: Two inspection videos are available upon request.**




# REPORT

**72-Inch Storm Drain and Manhole Inspection Using a Remotely Operated Vehicle**
New Bedford, MA
ASI Project No. RU25-054

SUBMITTED TO:

**Foth Infrastructure & Environment, LLC**
2121 Innovation Court, Suite 300
P.O. Box 5095
De Pere, WI 54115

SUBMITTED BY:

**ASI Marine L.P.**
3176 Abbott Road
Building A, Suite 100A
Orchard Park, NY 14127

3 September 2025

Data Collection Completed: 25 June 2025

# CONFIDENTIALITY

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| Rev No. | Description | Prepared By | Checked By | Approved By | Approval Date |
|---|---|---|---|---|---|
| 0 | Issued to client for comments | A. Longua | I. Luong<br>W. Brooks-Joiner | E. Pelfresne | 2025-07-11 |
| 1 | Updates to Executive Summary and Conclusion | A. Longua | K. Ebert | E. Pelfresne | 2025-09-03 |
| | | | | | |

# EXECUTIVE SUMMARY

ASI Marine L.P. (ASI) was subcontracted by Foth Infrastructure & Environment, LLC (Foth) to perform an underwater inspection of the 72-inch by 1,700-foot-long storm drain in New Bedford, MA. The objective of the inspection was to report on overall structural and operational conditions and identify anomalies such as corrosion, cracking, sediment accumulation, and debris accumulations. Data collection within the storm drain was understood to include remotely operated vehicle (ROV) video footage, sonar data, and cross-sectional profiles, as well as 360-degree above-water imagery of the manhole chambers.

The inspection operations were planned and executed during a high tide event to provide a flooded condition inside the storm drain. ASI personnel arrived on site with the inspection equipment on 25 June 2025. After acquiring the necessary access badges and completing a pre-work safety tailboard meeting, the inspection equipment was staged within proximity of Manhole #5, where the manhole cover was subsequently removed to facilitate access to the storm drain.

The ROV was deployed into the storm drain system and piloted upstream to Manhole #1, then downstream to Manhole #6. Throughout the deployment, high-resolution video footage, sonar imaging, and pipe profile data were continuously recorded for condition assessment Following the conclusion of ROV data collection, the ROV was recovered to deck and the 360-degree drop camera inspection of the manholes commenced, beginning at Manhole #5. Similar data was collected at each manhole, with the exception of Manhole #2, which could not be located—presumably due to it being paved over, as reported by Foth personnel.

The inspection data was backed up to an external hard drive and later uploaded to ASI's internal network and duplicated for redundancy. The data was then processed and compiled for this report.

Cross-sectional profiles were captured approximately every 50 feet within the storm drain, starting at STA 0+34 and ending at STA 16+79, for a total of 34 profiles. Each profile was overlaid with a 72-inch reference circle, accompanied by dimensional annotations indicating sediment depths.. The average sediment depth throughout the entirety of the storm drain system measured approximately 13.3 inches. The maximum sediment depth observed in the storm drain was approximately 21 inches, recorded at STA 8+27 and STA 16+28.

High-resolution video footage and two-dimensional (2D) navigational sonar data was captured throughout the storm drain. Video and 2D sonar stills were isolated and sheeted to highlight specific features observed over the course of the inspection. Structural elements such as pipe joints, manhole chambers, and the outfall were documented, along with observed features including sediment accumulation, debris, air pockets, and aquatic life.

A drop camera provided 360-degree video coverage in five manhole risers. These recordings were processed into both video and still images. Above and below-water footage was collected and processed from each manhole inspected. A smaller-diameter pipe was observed within Manholes #1, #3, and #4. In Manhole #4, three concrete spalls were identified between two distinct concrete layers within the shaft. Manhole #5 exhibited one spall and three vent pipe openings within its shaft. Sediment and debris were observed on pipe invert beneath Manhole #6.

ASI successfully and safely completed the storm drain inspection in accordance with the project scope. No observable damage or major deficiencies were noted at the time of inspection.

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Appendix 6: Video & 2D Sonar Stills

Appendix 7: 360-Degree Stills

Appendix 8: Media

# 1.0 INTRODUCTION

ASI Marine L.P. (ASI) is pleased to provide Foth Infrastructure & Environment, LLC (Foth) with the following report detailing inspection services of the 72-inch by 1,700-foot-long storm drain located in New Bedford, MA.

This report outlines our scope of services, methodology, and equipment utilized and includes select annotated images extracted from the collected data.

Your primary contact at ASI is:

**Eric Pelfresne, Project Manager**
3176 Abbott Road Building A, Suite 100A, Orchard Park, NY 14126
Office: 716-667-3507 | Mobile: 716-572-2475
Email: epelfresne@asi-group.com

## 1.1 Scope

Based on the proposal issued to Foth, the following inspection parameters were understood:

- The inspection would focus on the 72-inch storm drain and five associated manholes, with the objective of assessing overall structural and operational conditions and identifying anomalies such as corrosion, cracking, sediment accumulation, and debris presence. Manholes were identified as Manhole #1 through Manhole #6, with Manhole #1 being the upstream limit of the inspection and Manhole #6 being the downstream limit of the inspection.
- Access to the storm drain would be obtained from Manhole #3 and Manhole #5 utilizing a gantry/tripod deployment system.
- As part of the inspection, ASI would provide continuous recorded high-definition (HD) video, underwater two-dimensional (2D) sonar imaging data, 2D cross-sectional profiles at 50-foot intervals, 360-degree video of the manholes, and measurements of all observed features or anomalies.
- Deliverables would include an electronic copy of this written report, inspection videos, stills, and 2D sonar imagery of any anomalies or points of interest.

## 1.2 Site Description

Access to the 72-inch storm drain was established through Manhole #5, located adjacent to the parking lot in front of 4 Wright Street, New Bedford, MA (refer to Figure 1). On-site assessment determined that access via Manhole #5 was sufficient to complete the entirety of the ROV inspection, eliminating the need for recovery and redeployment through a secondary access point. Manhole #2 was unable to be located by Foth personnel, indicating that the manhole was buried or paved over.

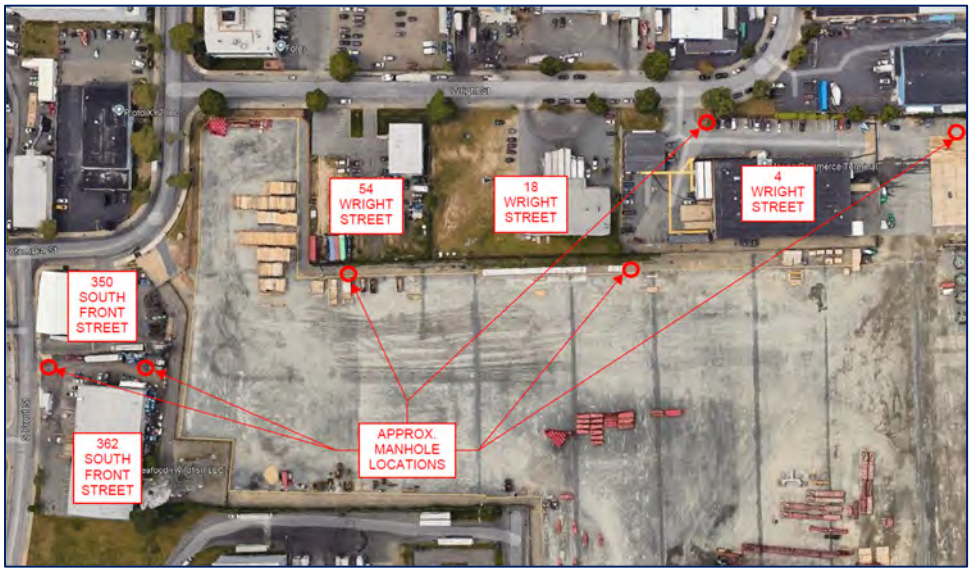



**Figure 1: Satellite imagery of storm drain location with approximate manhole locations**

Site drawings and annotated images were provided by Foth to facilitate with the planning, execution, and reporting phases of the inspection. The information provided can be found in Appendix 1 – Site Information.

## 2.0 NOMENCLATURE

The following definitions of various terms are used throughout the inspection report.

**Cable Payout:** The measured amount of cable from the ROV to the zeroed location (set by pilot and winch operator) at the opening of a pipeline.

**Clock Positions:** Indicates the circumferential section of a round pipe or tunnel (refer to Figure 2). Clock positions remain constant as viewed by an observer facing downstream; they do not change during ROV recovery. For example: a feature located at 4 o'clock on the outbound travel does not become 8 o'clock when the ROV is being recovered back to the deployment location.

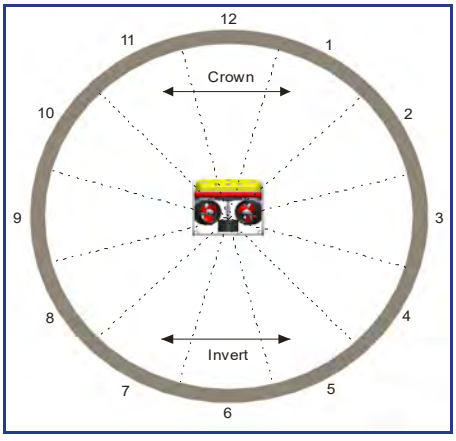



**Figure 2: Clock positions of tunnel, ROV traveling into the page, facing downstream**

**Crown:** The highest point of the tunnel or pipeline cross-section (11 o'clock to 1 o'clock).

**Debris:** Material left in the pipe or tunnel that could cause reduction in hydraulic capacity (this includes organic and in-organic materials). Debris can be silt or types of rock. A comment is included if the type of debris can be positively identified.

**Invert:** This portion of the pipe or tunnel is also referred to as the floor (5 o'clock to 7 o'clock).

**Joints:** Joints are features created in construction of the tunnel where two forms meet, two sections abut, or two sections are mechanically joined.

**Sediment:** A naturally occurring material that is broken down by processes of weathering and erosion and is subsequently transported by the action of wind, water, or ice, and/or by the force of gravity acting on the particles.

**Tunnel-Left:** The left wall of a tunnel or pipe from the perspective of looking downstream.

**Tunnel-Right:** The right wall of a tunnel or pipe from the perspective of looking downstream.

## 3.0 EQUIPMENT

All equipment used for the inspection was assembled, prepared, and mobilized from ASI's office. All equipment statements of qualifications can be found in Appendix 2 – Equipment Specifications.

### 3.1 Remotely Operated Vehicle / Vessel

ASI provided its Seabotix vLBV300 ROV due to its capabilities and size (refer to Figure 3). The vehicle is ballasted to be neutrally buoyant in fresh water and uses six electric thrusters to propel itself through the water. Four vectored thrusters are used for forward travel, capable of pulling long tether lengths and lateral movement in the water. The Seabotix vLBV300 uses two vertical thrusters which enable the operator to move vertically through the water column. The vehicle is equipped with two 3800-lumen LED lights to illuminate the area of inspection for the high-definition color camera.



**Figure 3: vLBV300 ROV in inspection configuration in New Bedford, MA**

For this inspection, the system utilized ASI's 2,400-foot high-visibility umbilical. This umbilical houses both signal and power conductors (fiber-optic and copper, respectively), along with a Kevlar strength member and abrasion resistant protective jacket. The umbilical is neutrally buoyant in fresh water, which reduces drag and allows for longer penetration distances. The ROV pilot controls the vehicle movement, lighting, and camera position from the surface with the use of a hand-held control console.

Both video and data signals are routed to the surface through a fiber optic cable in the umbilical. The video signal is also recorded in real-time onto a video recording computer. Audio commentary is added to document points of interest and anomalies as they are seen during the inspection.

### 3.1.1 Navigation Sonar

A 2D imaging sonar was integrated onto the tilt tray of the ROV. The 2D multibeam imaging sonar delivers real-time plan view information directly ahead of the ROV, which makes it a highly effective navigation and obstacle-avoidance tool during inspection.

The sonar also provides valuable feature detection capabilities (refer to Figure 4). The imaging sonar is best used for identifying smaller features and anomalies in low visibility conditions but also generates useful information on surface texturing and joints/cracks in concrete or steel.

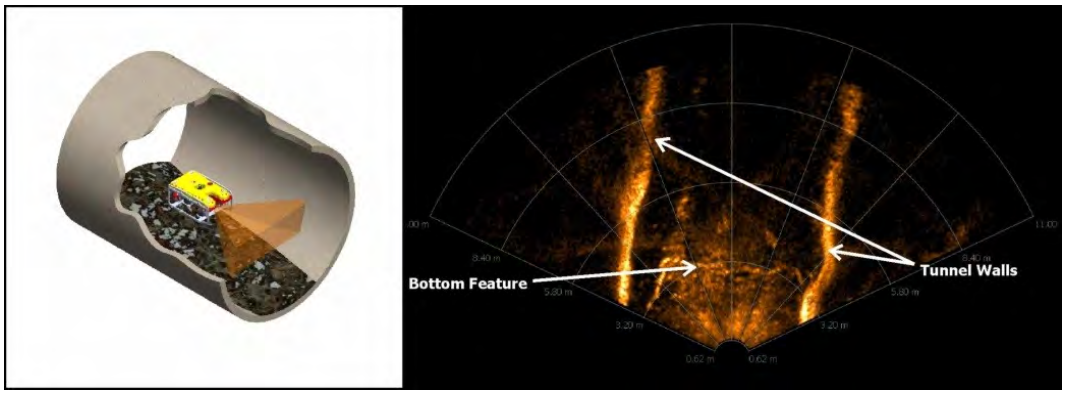



**Figure 4: 2D multibeam imaging sonar on ROV (representative image only – not from this project)**

### 3.1.2 Profiling Sonar

A profiling sonar was mounted on the ROV for the purpose of collecting measurements to define the cross-sectional shape of the clear opening at select locations (refer to Figure 5). Typically, profile measurements are collected while the ROV is stationary against the crown of the structure. Through experience, this practice minimizes the stirring-up of sediments deposited on the invert of a structure. It also provides good geometry for accurate measurements to the structure's invert, where there commonly are accumulations of sediment/debris.

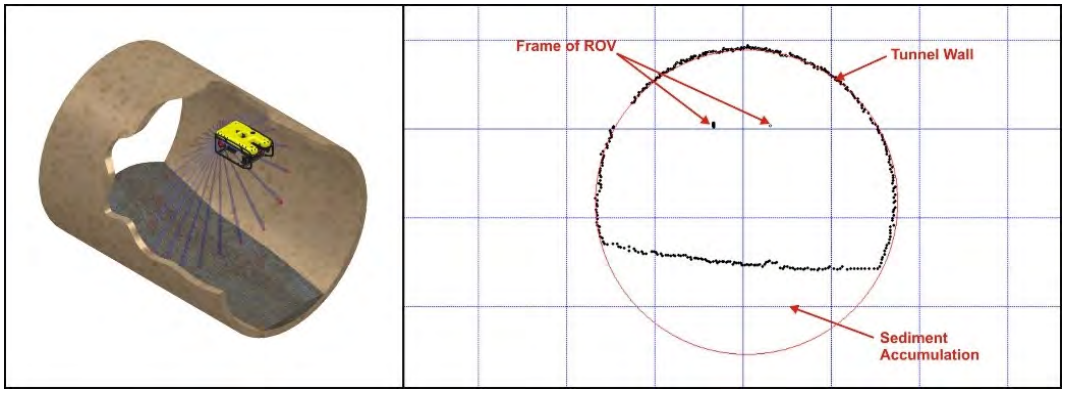



**Figure 5: Profiling sonar mounted on ROV (representative image only)**

## 3.2 Umbilical Metering Sheave

ASI has developed a metering sheave for small ROV systems that outputs to the video overlay system so the excursion distance of the ROV is measured and displayed as part of the inspection (refer to Figure 6). The battery-operated sheave utilizes wireless technology to transmit the data to the pilot station. This enables the station to be located several hundred feet from the sheave with intervening concrete walls and floors. Additionally, this provides accurate location and logging of defects or items of interest identified during the inspection.

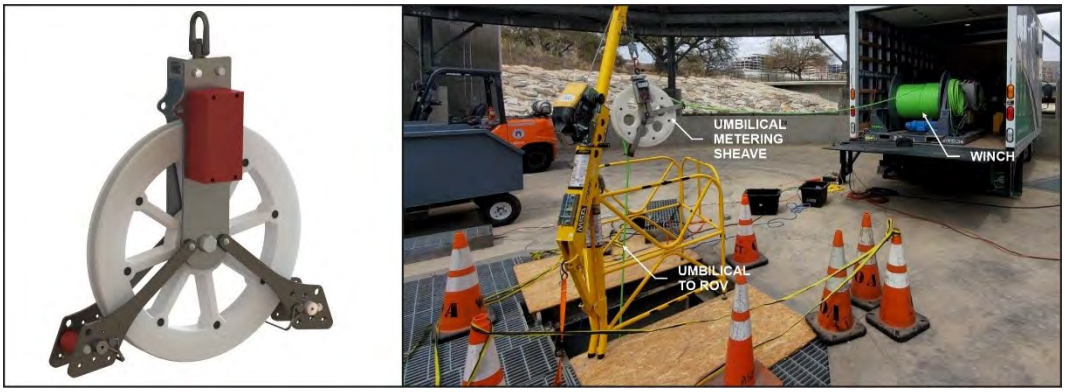



**Figure 6: Umbilical metering sheave (representative image only – not from this project)**

## 4.0 METHODOLOGY

ASI prepared the specified equipment in-shop, mobilized to site, completed the requested storm drain inspection within the designated timeframe, and subsequently demobilized from site. Data collected during the inspection was backed up to a portable hard drive. This hard drive was transported back to ASI's office, where the site data was uploaded to the internal network, duplicated for backup, and later processed. ASI and Foth maintained continuous communication before, during, and after the inspection to coordinate and address any changes to the scope or procedures.

## 4.1 Shop Preparation and Mobilization

Inspection equipment was prepared and tested in ASI's office on 23 June 2025. The ROV was equipped with a navigation sonar and profiler before being ballasted for freshwater. The inspection computer was prepared for data collection and organization. The umbilical metering sheave (UMS) was also powered and tested for functionality. Following this, all inspection tools and equipment were packed into a company vehicle for mobilization to site.

All crew and equipment mobilized to New Bedford, MA on 24 June 2025.

## 4.2 Site Operations

ASI personnel arrived on site at 0600 on 25 June 2025. After obtaining the required access passes to perform site work, inspection equipment was unloaded and prepped in the vicinity of Manhole #5 in advance of the inspection. The inspection was scheduled to coincide with a new moon high tide event, optimizing tidal conditions to ensure maximum water elevation within the storm drain system, thereby maintaining sufficient submergence for optimal ROV maneuverability and data collection. Since the position of Manholes #3 and #4 were located within the industrial yard behind 4 Wright Street, it was determined that deployment via Manhole #5 would have sufficient access to complete the inspection. The manhole cover was removed by FCS personnel and barriers were erected around the opening. Once all inspection equipment was prepared, ASI personnel deployed the ROV into Manhole #5 using appropriate fall protection, including a restraint harness.

The ROV was initially flown upstream to Manhole #1, capturing video and sonar data along the way. While returning downstream to Manhole #5, cross-sectional profiles were captured every 50 feet. After returning to Manhole #5, it was flown downstream to Manhole #6 and stopped upstream of the outfall. Returning from the outfall to Manhole #5, profiles were again captured every 50 feet. Once the ROV returned to Manhole #5, it was recovered back to deck. Subsequently, ASI and Foth personnel visited Manholes #1 through #6, with the exception of Manhole #2. At each accessible location, the manhole cover was removed before the deployment of ASI's 360-degree drop camera. Two above-water recordings were captured using the drop camera within each manhole. Following the final recording captured at Manhole #1, all inspection equipment was packed, and ASI personnel demobilized from site on 26 June 2025.

An overview of each day of the inspection process can be found in the table below (refer to Table 1).

**Table 1: Inspection Events**

| Date | Events |
|---|---|
| 23 June 2025 | Equipment is prepared at ASI's office. |
| 24 June 2025 | ASI personnel mobilize to New Bedford, MA. |
| 25 June 2025 | ROV inspection of the 72-inch storm drain with 360-degree drop camera inspections of manholes. |
| 26 June 2025 | ASI personnel demobilize from New Bedford, MA to ASI's office. |

## 4.3 Reporting

The collected inspection data was reviewed at ASI's office, after which this report was assembled and finalized. The report includes documentation methodology, inspection observations, cross-sectional profiles, video and sonar stills, manhole inspection stills, and inspection videos.

The following information is provided in appendices to supplement observations reported herein:

Appendix 1 – Site Information

Appendix 2 – Equipment Specifications

Appendix 3 – Daily Logs & Safety Documentation

Appendix 4 – Inspection Log

Appendix 5 – Profiles

Appendix 6 – Video & 2D Sonar Stills

Appendix 7 – 360-Degree Stills

Appendix 8 – Media

### *4.3.1 Inspection Logs*

A log of inspection observations was updated over the course of the inspection. Given the use of multiple sensors to detect various features, it is important to document which sensors were responsible for each specific observation. Accordingly, the inspection log includes a "Sensor Flag" column to indicate which sensor was used for each observation. A legend for these sensor flags can be found below (refer to Table 2).

**Table 2: Sensor flag legend**

| Sensor Flag | Description |
|---|---|
| GEN_NTE | General Note |
| HDC_TLT | Video |
| MBI_TLT | Tilt-Tray Multi-beam Imaging Sonar |
| PRO_AFT | Aft Profiler |

The inspection log can be found in Appendix 4 – Inspection Log.

### *4.3.2 Profiles*

Cross-sectional profiles were collected every 50 feet in the storm drain, starting at STA 0+34 and ending at STA 16+79, making up a total of 34 profiles (refer to Figure 7). These profiles were later sheeted, scaled, and overlaid with a 72-inch reference circle to show any deviations from the nominal pipe profile. Overlays of measured sediment levels were added to the sheeted images. Apparent sonar data falling outside of the 72-inch reference circle overlay is virtual noise (sonar pings reflected off of water surface) and can be ignored.

All sheeted profiles are orientated from the downstream perspective, with tunnel-left positioned on the left side of the profile, and tunnel-right on the right side of the profile. Profiles between STA 0+34 and STA 12+23 (upstream of Manhole #5) were initially recorded looking upstream and were subsequently mirrored along the vertical axis to ensure a consistent downstream perspective. Profiles ranging from STA 12+77 to STA 16+79 (downstream from Manhole #5) were recorded looking downstream and required no adjustment.

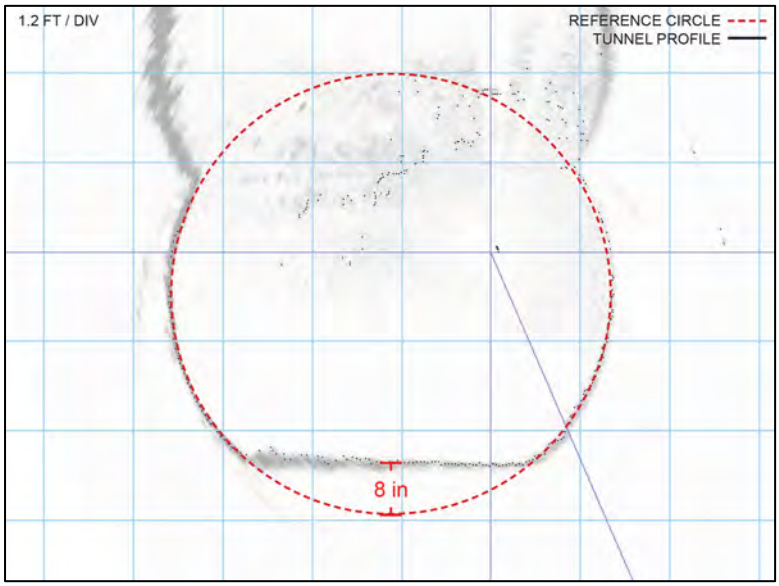



**Figure 7: Example of cross-sectional profile**

All sheeted cross-sectional profiles can be found in Appendix 5 – Profiles.

### *4.3.3 Video & 2D Sonar Stills*

Video stills were taken from the footage collected during the inspection. To review the video footage preceding or following a video still, open the corresponding video and navigate to the timestamp displayed in the top right corner of each still (refer to Figure 8).

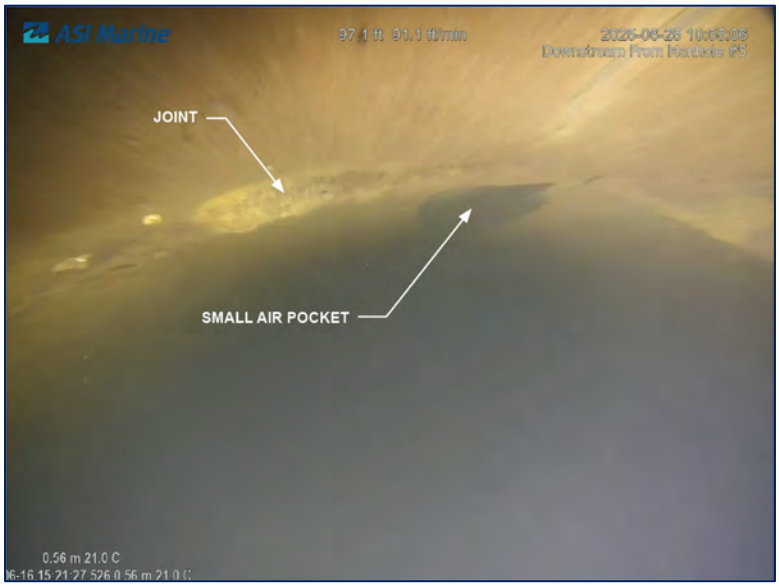



**Figure 8: Example video still**

All video and 2D navigational sonar stills can be found in Appendix 6 – Video & 2D Sonar Stills. Processed ROV inspection video can be found in Appendix 8 – Media.

### *4.3.4 360-Degree Video Stills*

Above-water 360-degree footage was captured in Manholes #1 through Manhole #6, apart from Manhole #2. At each manhole, the manhole cover was removed and the drop camera was deployed by ASI personnel. Two recordings were captured in each manhole chamber for redundancy. These recordings were later processed and exported into videos and video stills. The 360-degree stills feature highlighted slices from the recordings to provide an accurate photographic representation of the condition of each manhole chamber (refer to Figure 9). The video displays an ultrawide viewing mode of the 360-degree camera footage, reformatted from its original equirectangular projection (360-degree video) to a standard rectangular frame. This allows the viewer to see all 360 degrees of footage simultaneously.



**Figure 9: Example of 360-degree video still**

All 360-degree manhole chamber stills can be found in Appendix 7 – 360-Degree Manhole Stills. All manhole inspection videos can be found in Appendix 8 – Media.

### 4.3.5 Inspection Observation References

During the storm drain inspection, all positional references and callouts were based on cable payout distances measured from Manhole #5. The measuring sheave was zeroed at this location, corresponding to STA 12+34. These raw payout values were subsequently converted into station numbers using an engineering drawing provided by the client (refer to Figure 10). The resulting station values were validated by cross-referencing the observed locations of manhole chambers with the corresponding station labels indicated in the drawing.

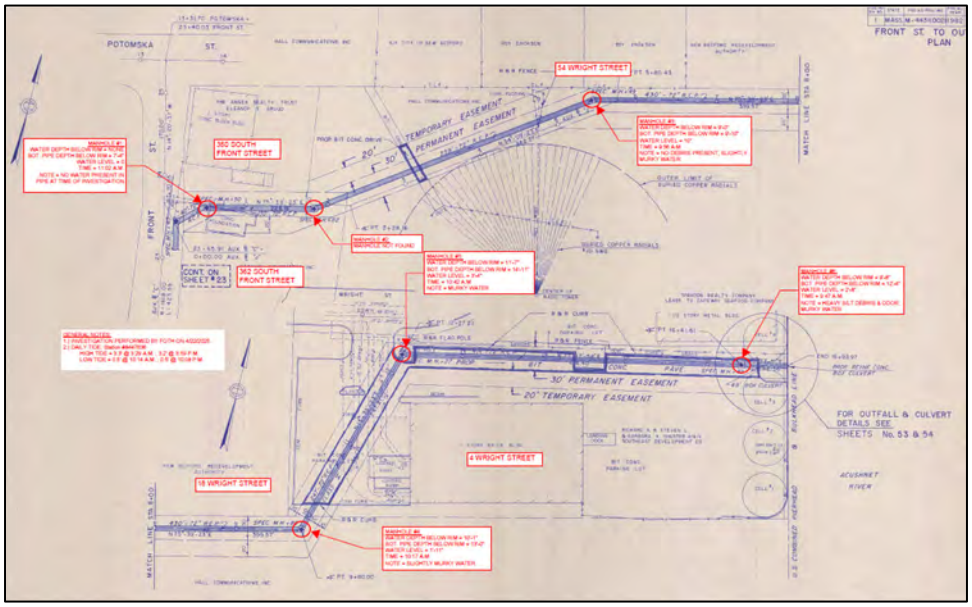



**Figure 10: Client-provided drawing of storm drain and manhole locations**

## 5.0 INSPECTION OBSERVATIONS

Visual observations and cross-sectional profile data were collected throughout the storm drain between STA 0+34 and STA 16+87.Sediment depths on the pipe invert were measured using profile data. These measurements from each station were compiled into a chart and graphically represented for visual analysis (refer to Figure 11).. The graph itself is not to scale and merely provides a representative view of the change in deposited sediment levels throughout the storm drain extending from Manhole #1 to Manhole #6 (STA 16+79 information not included due to change in tunnel profile and lack of dimensioning information).

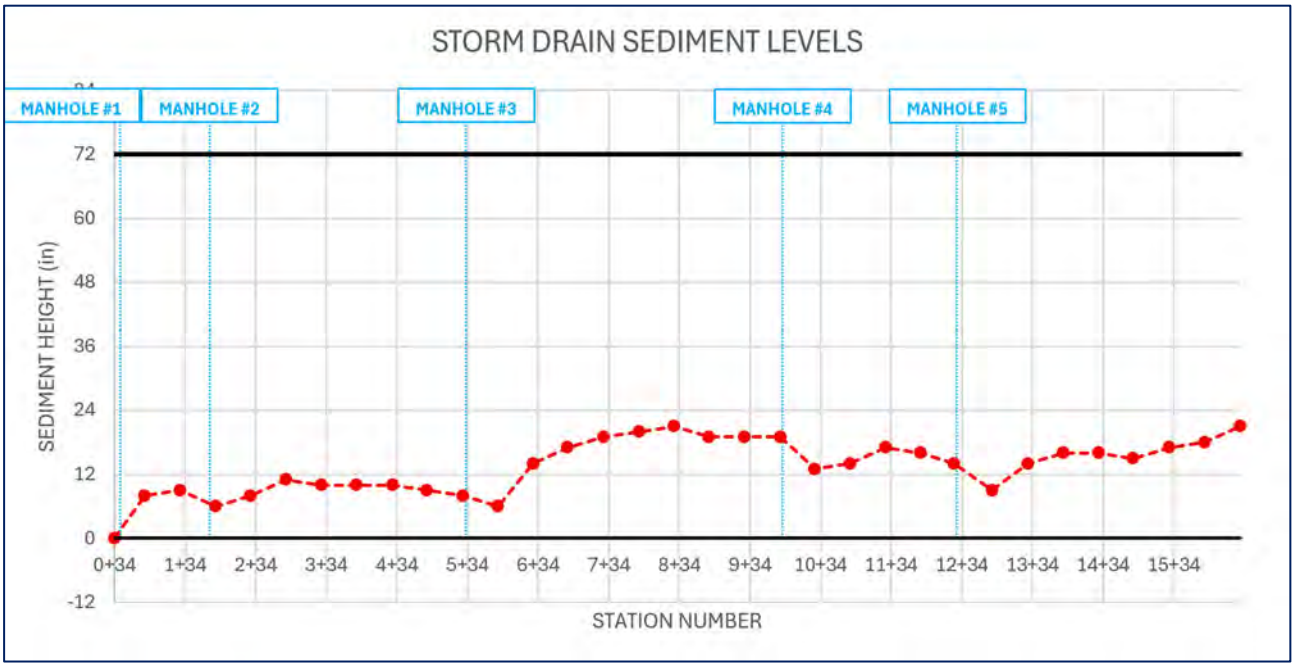



**Figure 11: Sediment levels in storm drain (not to scale - representative only)**

## 5.1 72-Inch Storm Drain

Sediment accumulation was observed along the invert of the storm drain (refer to Figure 12). From the sediment level dataset calculated using cross-sectional profiles, average sediment level observed measured at an approximate depth of 13.3 inches. The maximum sediment level was observed at both STA 8+21 and STA 16+28, measuring at a depth of 21 inches (refer to Figure 13).




**Figure 12: Example of sediment on storm drain invert seen at STA 15+47**

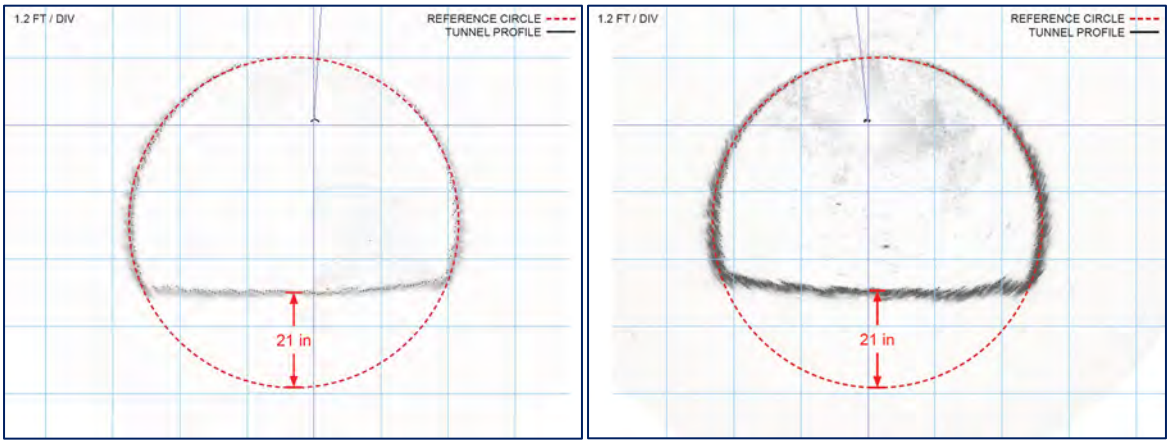



**Figure 13: Profile at STA 8+27 (left); profile at STA 16+28 (right)**

Sediment levels observed at each profile station in the storm drain were charted in numerical order according to station number. These charted values were later used to generate a representative graph of sediment levels across the storm drain (refer to Figure 11 above). The charted dataset can be found below (refer to Table 3).

Sediment levels were observed to increase from STA 0+34 to STA 8+27, decrease from STA 8+27 to STA 12+77, then increase again from STA 12+77 to STA 16+28. A trend was observed where sediment levels continued to decrease downstream of each manhole (excluding Manhole #1) before beginning to increase again.

**Table 3: Storm drain sediment levels**

| STORM DRAIN SEDIMENT LEVELS | | |
|---|---|---|
| **STA** | **Pipe Profile (in)** | **Sediment (in)** |
| 0+34 | 72 | 0 |
| 0+77 | 72 | 8 |
| 1+27 | 72 | 9 |
| 1+78 | 72 | 6 |
| 2+27 | 72 | 8 |
| 2+77 | 72 | 11 |
| 3+27 | 72 | 10 |
| 3+77 | 72 | 10 |
| 4+28 | 72 | 10 |
| 4+76 | 72 | 9 |
| 5+28 | 72 | 8 |
| 5+77 | 72 | 6 |
| 6+27 | 72 | 14 |
| 6+76 | 72 | 17 |
| 7+27 | 72 | 19 |
| 7+77 | 72 | 20 |
| 8+27 | 72 | 21 |
| 8+76 | 72 | 19 |
| 9+26 | 72 | 19 |
| 9+77 | 72 | 19 |
| 10+26 | 72 | 13 |
| 10+76 | 72 | 14 |
| 11+26 | 72 | 17 |
| 11+76 | 72 | 16 |
| 12+23 | 72 | 14 |
| 12+77 | 72 | 9 |
| 13+28 | 72 | 14 |
| 13+78 | 72 | 16 |
| 14+28 | 72 | 16 |
| 14+77 | 72 | 15 |
| 15+28 | 72 | 17 |
| 15+78 | 72 | 18 |
| 16+28 | 72 | 21 |
| 16+79 | N/A | N/A |
| **AVG** | - | **13.4** |
| **MAX** | - | **21.0** |

Some regions of sediment in the storm drain were observed to be against the tunnel walls of the pipe. This behavior was most notable at STA 9+77 with sediment pushed against tunnel-right, after which sediment shifted back to the invert and settled out at STA 12+23 (refer to Figure 14).

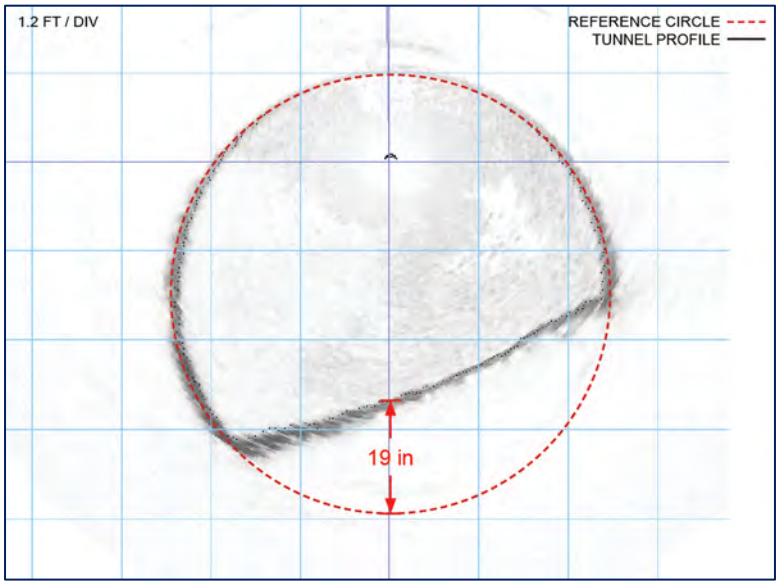



**Figure 14: Sediment against tunnel-right at STA 9+77**

Foreign debris was observed throughout the storm drain (refer to Figure 15). Instances of trash were seen resting on invert – some partially buried by deposited sediment – or floating against crown at various locations. Ropes were also observed hanging from the Manhole #4 chamber; these ropes were noted to be free-hanging and were only tied-off at one end.




**Figure 15: Debris on invert at STA 9+57 (left); ropes hanging from crown of Manhole #4 chamber (right)**

Several eels were observed present in the storm drain at the time of inspection (refer to Figure 16). The presence of eels in the storm drain can be seen most notably towards the outfall at the downstream end of the pipe. For more details regarding the eels observed in the storm drain, reference the inspection video in Appendix 8 – Media starting at timestamp 23:13.

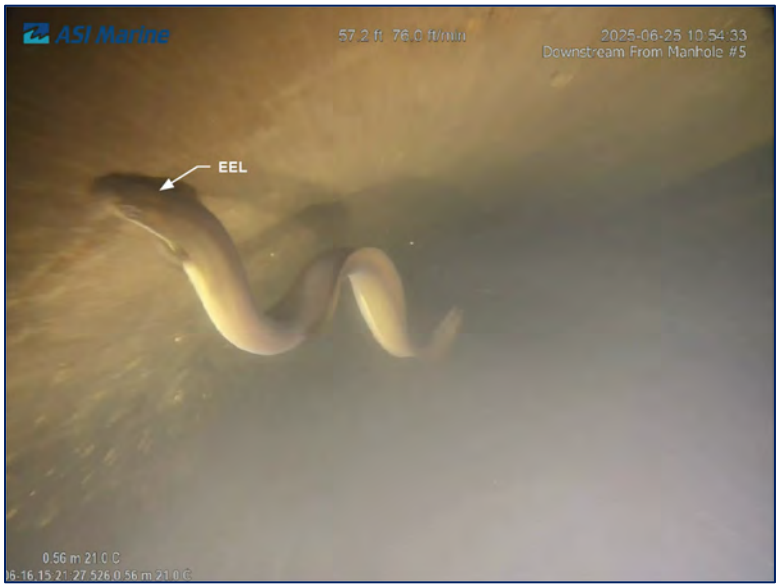



**Figure 16: Example of eel observed in storm drain**

## 5.2 Manholes

Above-water 360-degree footage was recorded in each manhole (excluding Manhole #2). At the time that the drop camera inspections were performed, Manhole #1 and Manhole #3 were in complete dewater. Manholes #4 through #6 were observed holding water.

A pipe of smaller diameter than 72 inches was observed within the chambers of Manhole #1, #3, and #4 (refer to Figure 17).

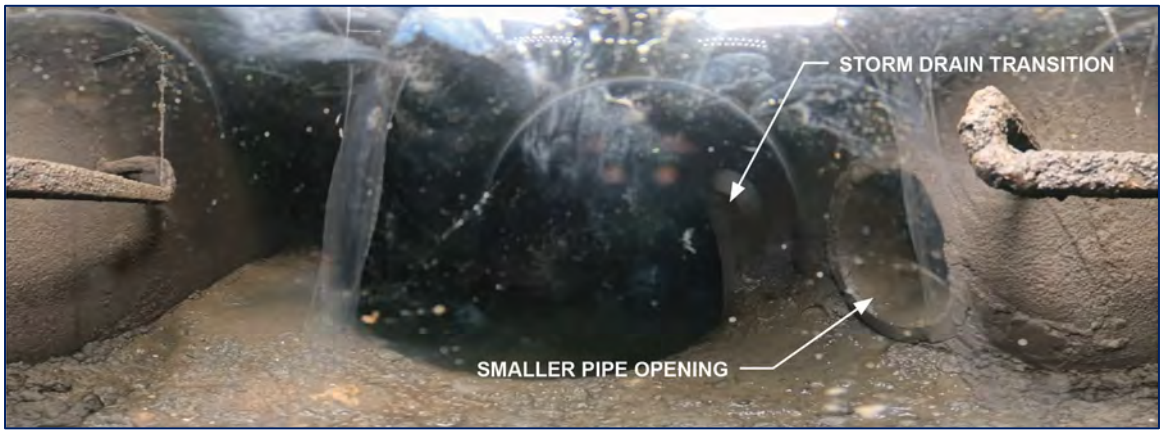



**Figure 17: Example of smaller-diameter pipe as seen in Manhole #1 chamber**

Small spalls between two layers of concrete were observed in the Manhole #4 shaft (refer to Figure 18). Three spalls in total were noted here.

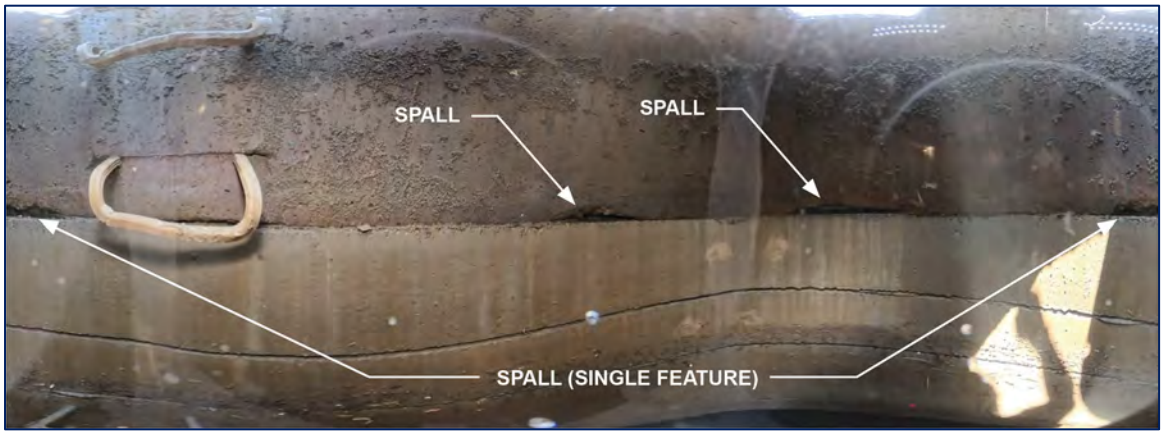



**Figure 18: Small spalls between concrete layers in Manhole #4 shaft**

Cent pipe openings and a spall were observed in the shaft of Manhole #5 (refer to Figure 19). Three vent pipe openings in total were noted here.

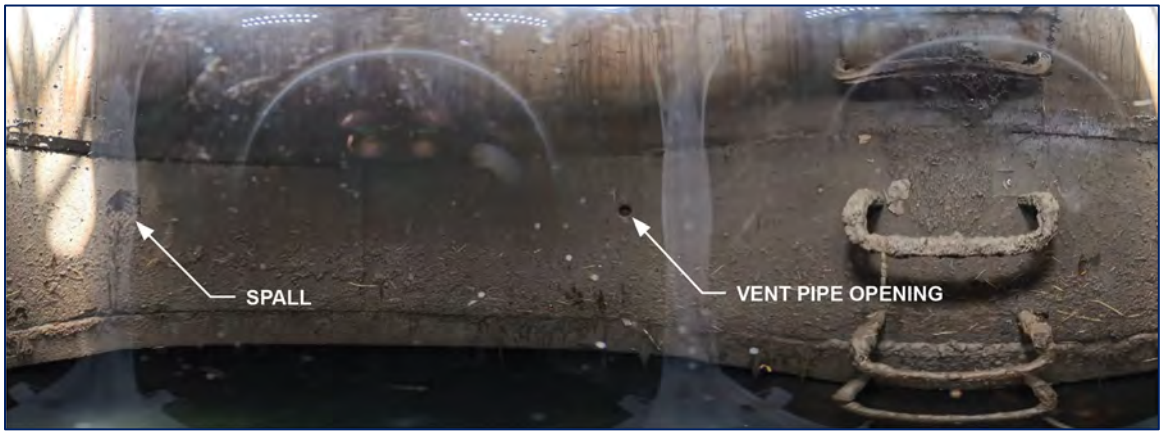



**Figure 19: Spall and one of three vent pipe openings in the Manhole #5 shaft**

Sediment and debris on the invert of the storm drain pipe were seen beneath Manhole #6 (refer to Figure 20). This corroborates the presence of sediment identified in the pipe during the ROV inspection.

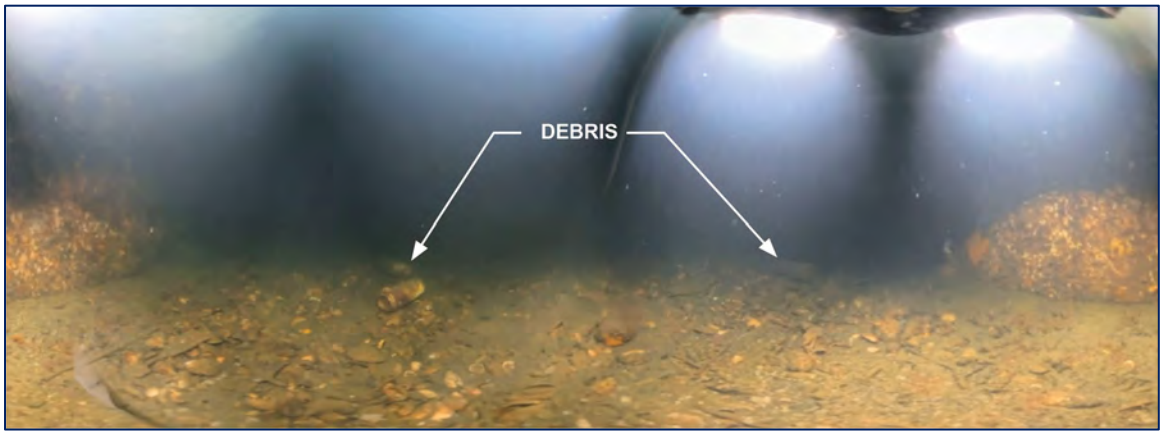



**Figure 20: Sediment and debris on pipe invert below Manhole #6**

## 6.0 CONCLUSION

ASI successfully completed an inspection of the 72-inch storm drain. Video footage, sonar data, and cross-sectional profiles were captured throughout the storm drain from Manhole #1 to Manhole #6, and 360-degree footage and stills were captured above water in each manhole chamber apart from Manhole #2. Data collected from the inspection was processed and compiled to give an accurate representation of the current state of the storm drain and manholes. ASI successfully and safely completed the storm drain inspection in accordance with the project scope. No observable damage or major deficiencies were noted at the time of inspection.

Cross-sectional profiles captured every 50 feet in the storm drain from STA 0+34 to STA 16+79 revealed sediment accumulation along the invert of the pipe. The average sediment depth across the entire pipe was measured at approximately 13.3 inches. The maximum sediment depth was observed at STA 8+27 and STA 16+28, both measuring at approximately 21.0 inches.

Video and sonar stills captured in the storm drain corroborated the presence of sediment as depicted in the profile data. Foreign debris, including trash, was observed on the invert and against the crown of the pipe. Ropes were observed hanging from the crown along the downstream end of the Manhole #4 chamber. Eels were noted in the storm drain, particularly downstream from Manhole #5 towards the outfall.

Above-water 360-degree videos and stills captured in the manhole chambers also showed the presence of sediment in the storm drain. A smaller-diameter pipe was seen inside the Manhole #1, #3 and #4 chambers. Three spalls between two layers of concrete were noted inside the Manhole #4 shaft. A spall alongside three vent pipe openings were observed in the shaft of Manhole #5. Sediment and debris were seen on pipe invert below Manhole #6.

# APPENDIX 1:

Site Information

"NEW BEDFORD"
"JOHN F. KENNEDY MEMORIAL HIGHWAY EXTENSION"

| PUB. RD DIV. NO. | STATE | FED AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 1 | MASS. | M-4431(002) | 1982 | 29 | 173 |

# FRONT ST. TO OUTFALL PLAN

13+31.70 POTOMSKA = 25+40.03 FRONT ST.

POTOMSKA ST.

FRONT ST.

HALL COMMUNICATIONS, INC.

N/F CITY OF NEW BEDFORD

ROY ENOKSEN

ROY ENOKSEN

NEW BEDFORD REDEVELOPMENT AUTHORITY

THE ANNEX REALTY TRUST
ELEANOR F. ARUJO
1 STORY
CONC. BLOCK BLDG.

350 SOUTH FRONT STREET

362 SOUTH FRONT STREET

54 WRIGHT STREET

4 WRIGHT STREET

18 WRIGHT STREET

WRIGHT ST.

R&R FENCE

C.L.F.

CONC. FOOTING

PT. 5+80.43

SPEC. M.H.+49

430'-72" R.C.P.

N 75°-39'-23" E
399.57'

MATCH LINE STA. 8+00

PROP. BIT. CONC. DRIVE

20'

30'

TEMPORARY EASEMENT

PERMANENT EASEMENT

359'-72" R.C.P.

N 54°-09'-23" E
352.27'

5 AUX. ℄ "J"

SPEC. M.H.+50

N 75°-39'-23" E
228.16'

30'-72" R.C.P.

SPEC. M.H.+82

PT. 2+28.16

CONC. FOUNDATION

R.C.P.

SPEC. M.H.+45

40'-72" R.C.P.

23+65.91 AUX. ℄ "C" =
0+00.00 AUX. ℄ "J"

CONT. ON SHEET # 23

AUX. ℄ "C"
R = 1618.00'
L = 423.59'

OUTER LIMIT OF BURIED COPPER RADIALS

BURIED COPPER RADIALS #10 AWG

GATE

6HH WIRE

CENTER OF RADIO TOWER

OTTAWAY NEWSPAPERS, INC.

10"VC SEWER

SDMH 66" RCP

12"CI WATER

PT. 12+27.21

R&R FLAG POLE

SHRUBS

414'-12" R.C.P.

SPEC. M.H.+27 PROP

N 70°-17'-58" E
414.40'

BIT. CONC. PARKING LOT

R&R CURB

CEM. CURB

GRASS

SPAVCON REALTY COMPANY
LEASE TO CAPEWAY SEAFOOD COMPANY

1-1/2 STORY METAL BLDG.

PT. 16+41.61

CELL #4

CELL #3

CELL #2

CELL #1

END 16+93.97

PROP. REINF. CONC. BOX CULVERT

N 33°-51" E
52.36'

48" BOX CULVERT

BIT. CONC.

PAVE.

SPEC. M.H.+42

30' PERMANENT EASEMENT

20' TEMPORARY EASEMENT

BERM

PLANTER

SMH

BIT. CONC. PARKING LOT

LOADING RAMP

CB

GRASS

ELEC.

247'-72" R.C.P. CLASS V

N 45°-39'-23" E
241.21'

LOADING DOCK

RICHARD A. & STEVEN L. & BARBARA K. SHUSTER d/b/a SOUTHEAST DEVELOPMENT CO.

1 STORY BRICK BLDG.

BIT. CONC. PARKING LOT

steel box w/ LI. phone

NEW BEDFORD REDEVELOPMENT AUTHORITY

MATCH LINE STA. 8+00

430'-72" R.C.P.

SPEC. M.H.+80

N 75°-39'-23" E
399.57'

PT. 9+80.00

HALL COMMUNICATIONS, INC.

U.S. COMBINED PIERHEAD & BULKHEAD LINE

ACUSHNET RIVER

FOR OUTFALL & CULVERT DETAILS SEE SHEETS No. 53 & 54

MANHOLE #1:
WATER DEPTH BELOW RIM = NONE
BOT. PIPE DEPTH BELOW RIM = 7'-4"
WATER LEVEL = 0
TIME = 11:02 A.M.
NOTE = NO WATER PRESENT IN PIPE AT TIME OF INVESTIGATION

MANHOLE #2:
MANHOLE NOT FOUND

MANHOLE #3:
WATER DEPTH BELOW RIM = 9'-0"
BOT. PIPE DEPTH BELOW RIM = 9'-10"
WATER LEVEL = 10"
TIME = 9:56 A.M.
NOTE = NO DEBRIS PRESENT, SLIGHTLY MURKY WATER.

MANHOLE #4:
WATER DEPTH BELOW RIM = 10'-1"
BOT. PIPE DEPTH BELOW RIM = 13'-0"
WATER LEVEL = 1'-11"
TIME = 10:17 A.M.
NOTE = SLIGHTLY MURKY WATER.

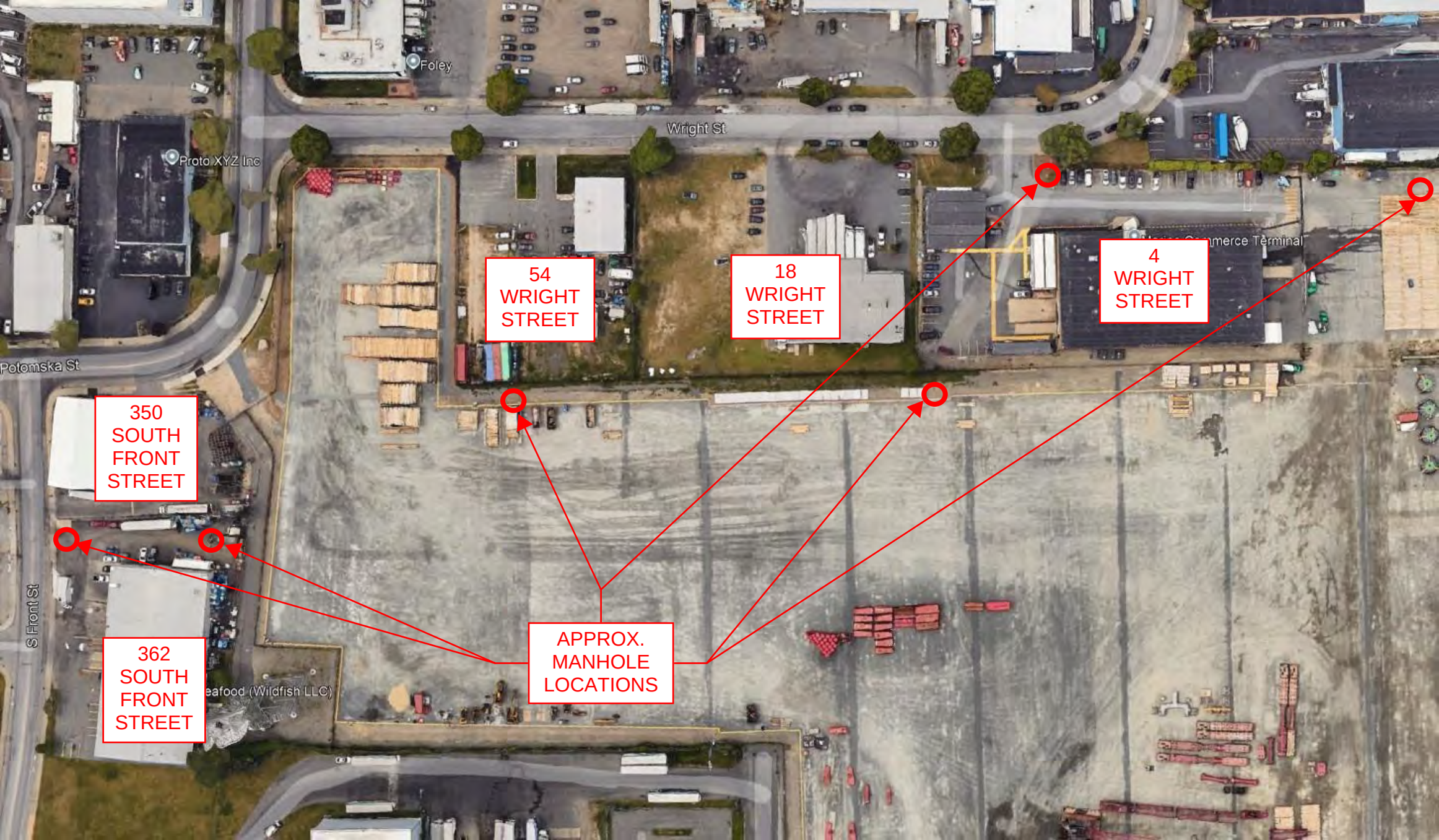
MANHOLE #5:
WATER DEPTH BELOW RIM = 11'-7"
BOT. PIPE DEPTH BELOW RIM = 14'-11"
WATER LEVEL = 3'-4"
TIME = 10:42 A.M.
NOTE = MURKY WATER

MANHOLE #6:
WATER DEPTH BELOW RIM = 9'-8"
BOT. PIPE DEPTH BELOW RIM = 12'-4"
WATER LEVEL = 2'-8"
TIME = 9:47 A.M.
NOTE = HEAVY SILT DEBRIS & ODOR, MURKY WATER.

GENERAL NOTES:
1.) INVESTIGATION PERFORMED BY FOTH ON 4/22/2025.
2.) DAILY TIDE: Station #8447636
HIGH TIDE = 3.3' @ 3:29 A.M. ; 3.2' @ 3:59 P.M.
LOW TIDE = 0.5' @ 10:14 A.M. ; 0.5' @ 10:08 P.M.

0 40 100 200 FT.

FOR PROFILE SEE SHEET NO. 30


Foley
Wright St
Proto XYZ Inc
54 WRIGHT STREET
18 WRIGHT STREET
4 WRIGHT STREET
Potomska St
350 SOUTH FRONT STREET
362 SOUTH FRONT STREET
S Front St
APPROX. MANHOLE LOCATIONS

# APPENDIX 2:

## Equipment Specifications




# ASI Marine | ASI vLBV300

The vLBV300 system is ASI's smallest vectored vehicle, making it an extremely versatile and highly portable inspection solution. The vehicle can be also retrofitted with tracks that allow it to crawl along any underwater surface, vertical or horizontal. The tracks also enable the vehicle to crawl from its launch location into the water, eliminating confined space entry by personnel.

## VEHICLE DIMENSIONS

| | | |
|---|---|---|
| Length | 0.6 m | 2.0 ft |
| Width | 0.4 m | 1.3 ft |
| Minimum Tunnel Diameter | 0.6 m | 1.9 ft |
| Depth Rating | 300 m | 1000 ft |
| Estimated Weight | 18 kg | 40 lb |

## UMBILICAL LENGTHS

| | | |
|---|---|---|
| Long | 2.5 km | 1.6 mi |
| Medium | 800 m | 2600 ft |
| Short | 150 m | 490 ft |

## POWER REQUIREMENTS

- Single phase power for hotel loads 120-140 VAC at 3kW 50/60 Hz
- Single phase power for for 2.5 km winch 208-240 VAC at 4kW 50/60 Hz

## OPTIONAL EQUIPMENT

Including but not limited to:

- Single function manipulator
- Profiling sonar
- Dye injection system
- Sampling scoop

## STANDARD EQUIPMENT

- 2 x 4300 lumen LED lighting
- 4 vectored and 2 vertical brushless DC thrusters
- Portable cable payout counter
- High resolution colour main camera
- 5 MP HD video and still images camera
- Real-time multi-beam navigation imaging sonar
- Video overlay for display of compass heading, depth, date, time, and cable payout

**SPECIALIZED TOOLING AVAILABLE ON A PROJECT-SPECIFIC BASIS**

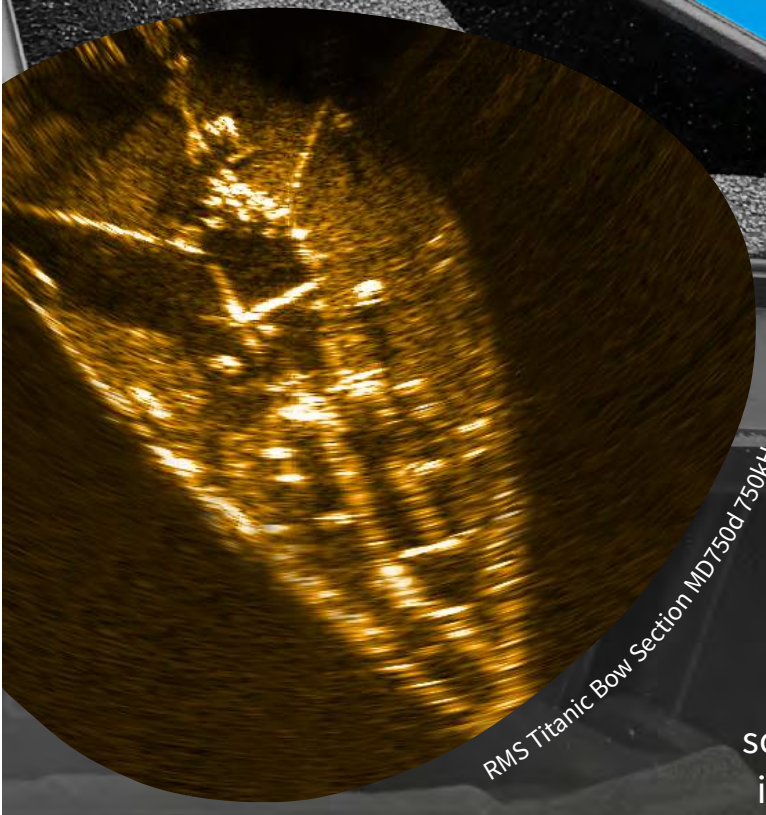
asi-group.com
info@asi-group.com

566 Arvin Avenue, Stoney Creek, ON, Canada L8E 5P1 | tel 905-643-3283
40 Centre Drive, Suite 3, Orchard Park, NY USA 14127 | tel 716-667-3507

blueprint subsea

# Oculus Multibeam Imaging Sonars

**Providing clear real-time imaging in poor visibility or over long range**



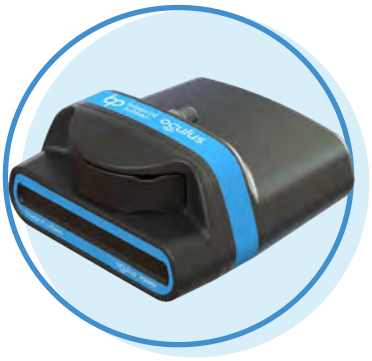
RMS Titanic Bow Section MD750d 750kHz

Redefining multibeam imaging sonars. Oculus, a range of single and dual-frequency sonar systems with unparalleled image quality in a compact, rugged form factor. Available in 500m, 1000m and 4000m depth ratings.

oculus

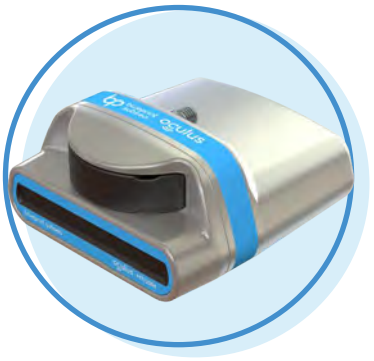
enquiries@blueprintsubsea.com
www.blueprintsubsea.com

# Systems



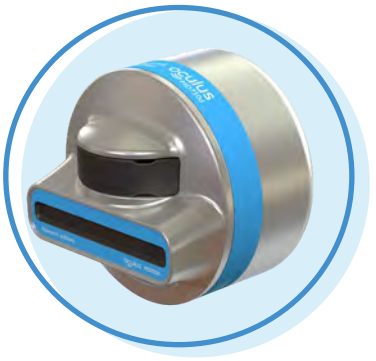
## M-Series

The benchmark in multibeam imaging sonars. Providing exceptional image quality and depth rated to 500m.



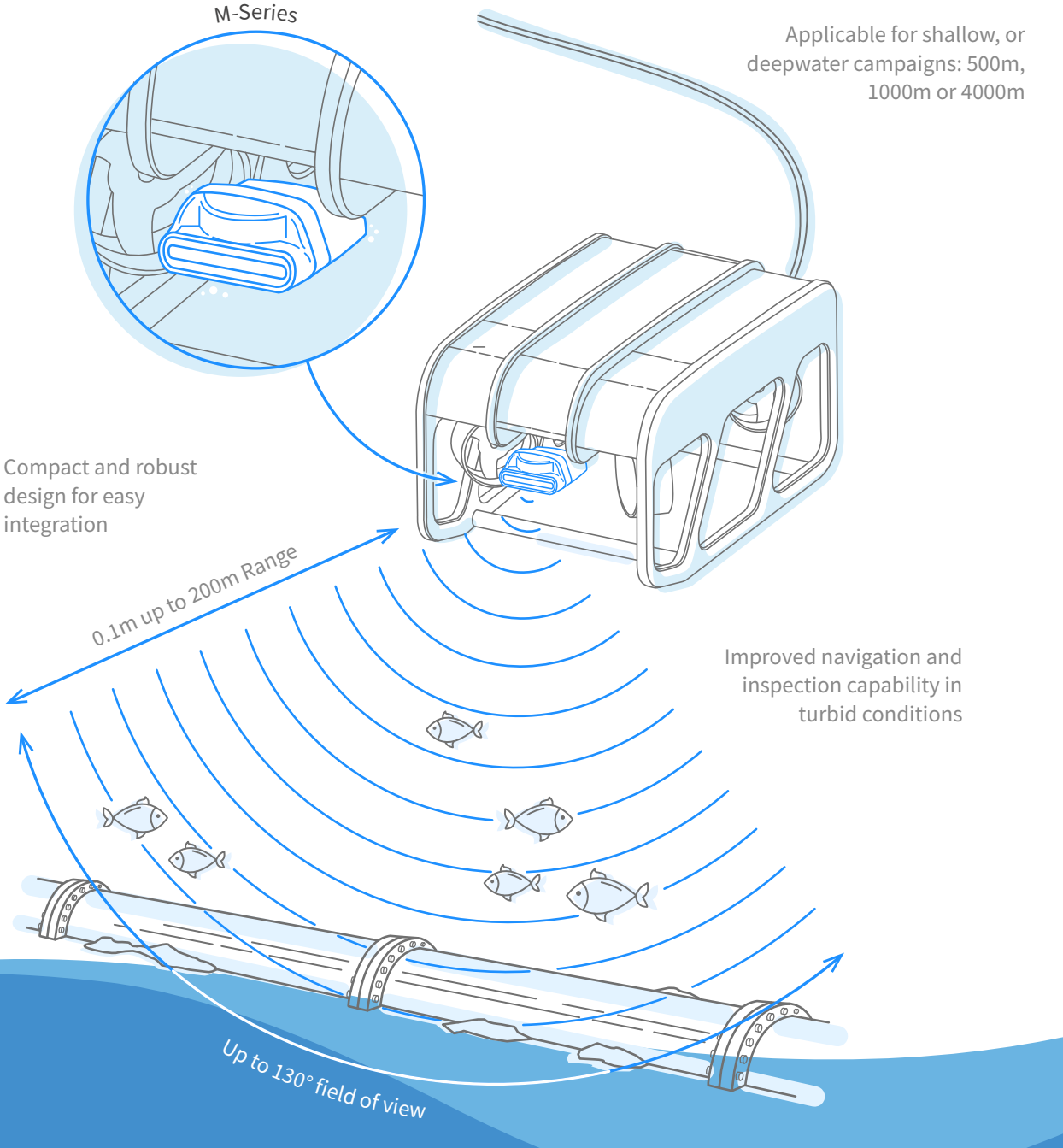
## MT-Series

All the benefits of the Oculus M-Series with the advantage of a titanium housing to give a depth rating of 1000m.



## MD-Series

The 4000m depth rated titanium housing allows the Oculus MD-Series to withstand the pressures of deep-sea working.

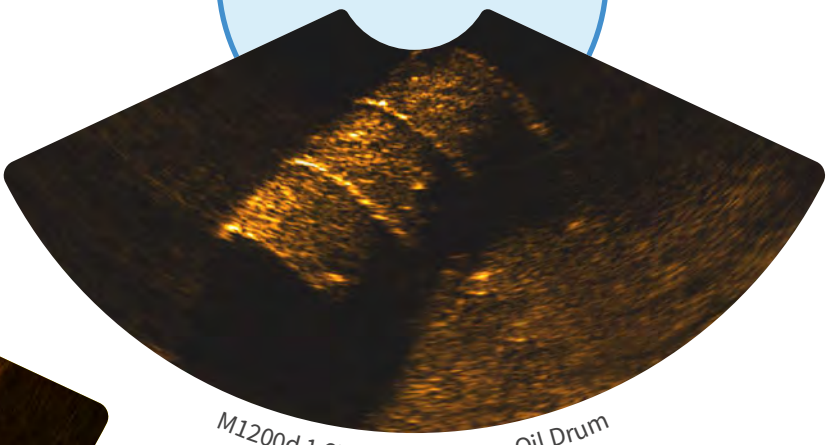


## Features

- 375kHz to 3.0MHz, single and dual frequency systems suitable for navigation, situational awareness and inspection work
- Superior wide-angle field of view, up to 130° horizontal / 20° vertical
- Extensive range capability, 0.1m to 200m
- Exceptional image quality, angular resolution down to 0.25°
- Outstanding image definition, range resolution down to 2mm
- Simple and intuitive operator software
- Real-time imaging with ultra-fast update rate of up to 40Hz

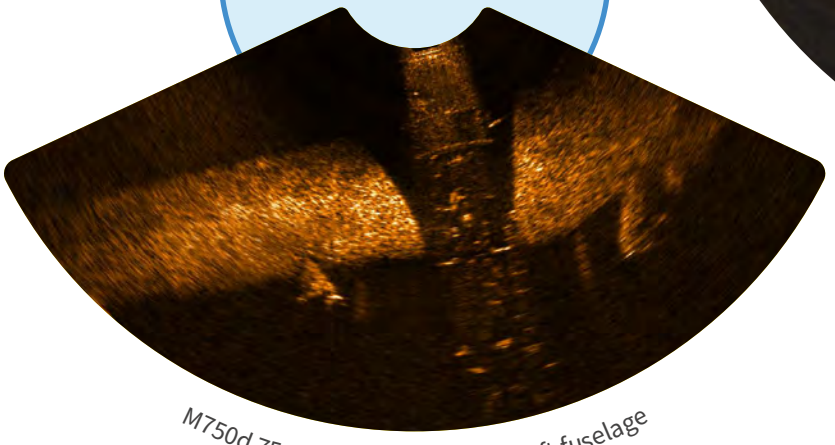
## Imagery

For target identification **1.2MHz**



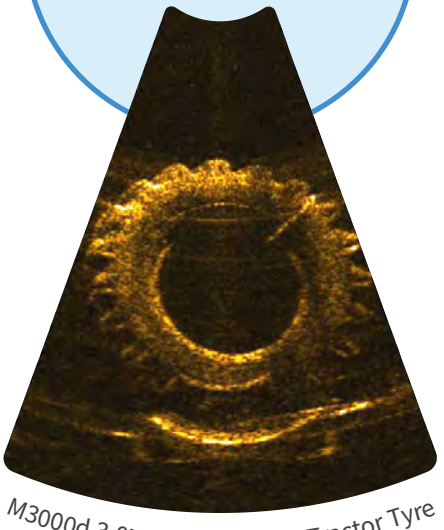
M1200d 1.2MHz 2m Range - Oil Drum

For longer range navigation **750kHz**



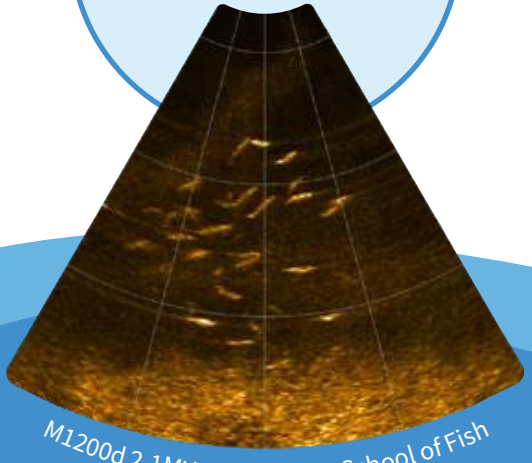
M750d 750kHz 20m Range - Aircraft fuselage

For ultra-high resolution **3.0MHz**



M3000d 3.0MHz 2m Range - Tractor Tyre

For high resolution target inspection **2.1MHz**



M1200d 2.1MHz 5m Range - School of Fish

# oculus

## Specification

### Mechanical

| | M-Series | MT-Series | MD-Series |
|---|---|---|---|
| Dimensions | 125mm (L) x 122mm (W) x 62mm (H) | 125mm (L) x 122mm (W) x 62mm (H) | 125mm (L) *excluding connector* x ø125mm |
| Construction | Anodised Aliminium | Titanium | Titanium |
| Weight | 980g (Air), 360g (Water) | 1350g (Air), 730g (Water) | 2.5kg (Air), 1.45kg (Water) |
| Depth Rating | 500m | 1000m | 4000m |
| Temp' Range (Operating) | -5°c to +35°c | -5°c to +35°c | -5°c to +35°c |
| Temp' Range (Storage) | -20°c to +50°c | -20°c o +50°c | -20°c to +50°c |

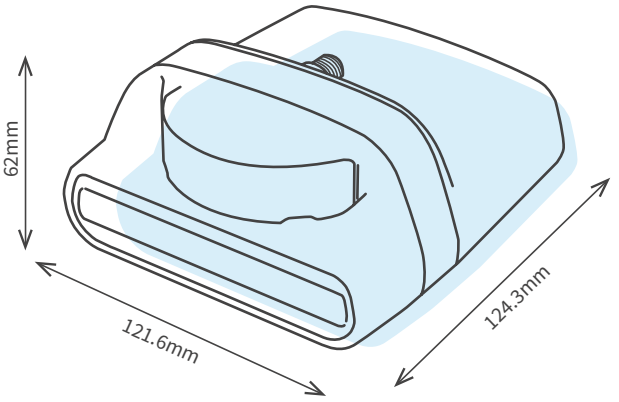
### Performance

| | M370s MT370s MD370s | M750d MT750d MD750d | M1200d MT1200d MD1200d | M3000d MT3000d MD3000d |
|---|---|---|---|---|
| Operating Frequency | 375kHz | 750kHz / 1.2MHz | 1.2MHz / 2.1MHz | 1.2MHz / 3.0MHz |
| Range (Max) | 200m | 120m / 40m | 40m / 10m | 30m / 5m |
| Range (Min) | 0.2m | 0.1m | 0.1m | 0.1m |
| Range Resolution* | 8mm | 4mm / 2.5mm | 2.5mm / 2.5mm | 2.5mm / 2mm |
| Update Rate (Max)* | 40Hz | 40Hz | 40Hz | 40Hz |
| Horizontal Aperture | 130° | 130°/ 130° | 130°/ 60° | 130°/ 40° |
| Vertical Aperture | 20° | 20°/ 20° | 20°/ 12° | 20°/ 20° |
| Number of Beams (Max) | 256 | 512 | 512 | 512 |
| Angular Resolution | 2° | 1°/ 0.6° | 0.6°/ 0.4° | 0.6°/ 0.4° |
| Beam Separation | 0.5° | 0.25°/ 0.25° | 0.25°/ 0.16° | 0.25°/ 0.1° |

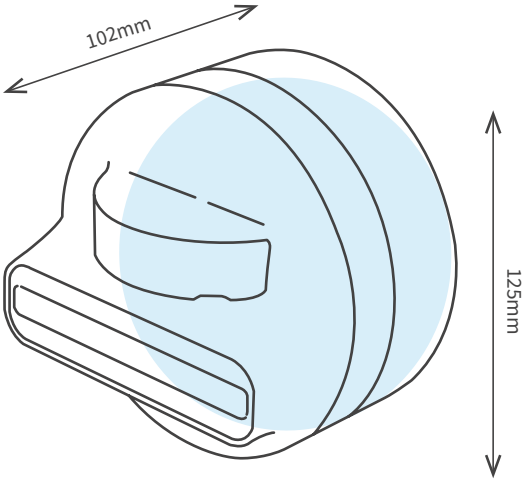
**Indicates parameter is dependent on range.*

*Please note that all functions & specifications may be subject to change in line with our policy of continual product development.*

## M and MT-Series




## MD-Series




### Electrical

| | M & MT-Series | MD-Series |
|---|---|---|
| Connector | Impulse IE55 Series, 6-way | Impulse MC Series, 6-way (Schilling SeaNet / Burton option) |
| Communications | 4-wire 100-BaseT Ethernet, 2-wire DSL extender module | 4-wire 100-BaseT Ethernet, 2-wire DSL extender module |
| Supply Voltage | 12V to 32V DC non-isolated | 18V to 32V DC isolated |
| Power Consumption | 10W to 35W (model and range dependent*) | 10W to 35W (model and range dependent*) |
| Integrated Sensors | Water pressure and temperature (for Velocity-of-Sound calculation) | Water pressure and temperature (for Velocity-of-Sound calculation) |

*DA-148-P01443-05*

Blueprint Subsea
The Clock Tower Business Centre
Low Wood, Ulverston
Cumbria, LA12 8LY

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enquiries@blueprintsubsea.com
www.blueprintsubsea.com

# IMAGENEX MODEL 831L
# DIGITAL PIPE PROFILING SONAR

## APPLICATIONS:

- Profiling
- Pipeline Inspection
- Scientific Research

## FEATURES:

- **Ethernet**
- Programmable
- High performance
- Scans 360° in 1.3 sec (up to 1 m range)
- Low power
- 0.125 m to 6 m operation (full scale)
- Compact size
- Communication format available to user
- Built in Pitch/Roll sensor

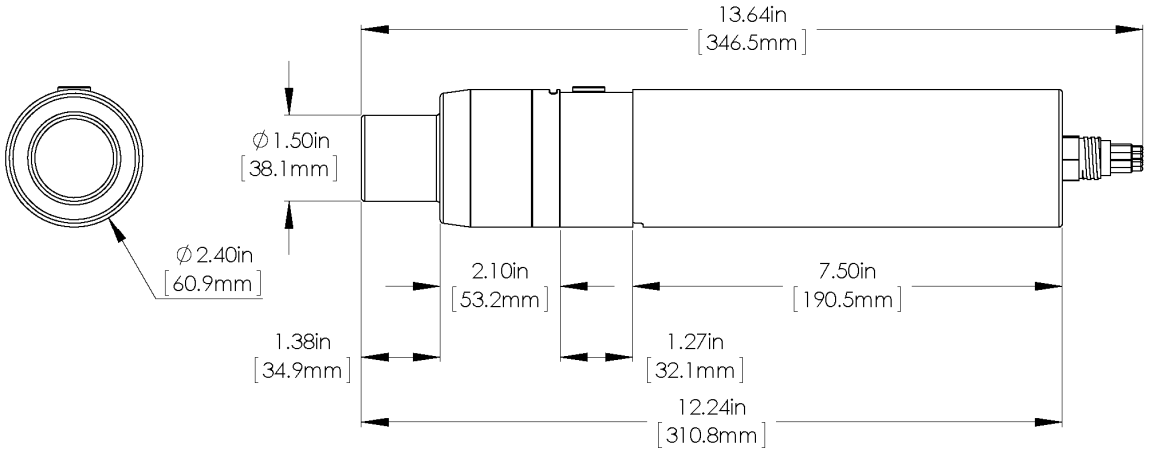



| HARDWARE SPECIFICATIONS: | |
|---|---|
| **FREQUENCY** | 2.25 MHz |
| **TRANSDUCER** | Profiling type, fluid compensated |
| **TRANSDUCER BEAM WIDTH** | 1.4° conical |
| **RANGE RESOLUTION** | 0.5 mm |
| **MIN. DETECTABLE RANGE** | 50 mm (~ 2”) |
| **MAX. OPERATING DEPTH** | 1000 m |
| **MAX. CABLE LENGTH** | Standard: 100 m on CAT5e<br>Cable length may be increased up to ~9000 m using an Ethernet extender. Please enquire for more information. |
| **INTERFACE** | Standard: 10 Mbps Ethernet (10 BASE-T) using TCP/IP<br>Bit rate may vary if an Ethernet extender is in use. |
| **CONNECTOR** | End mounted, eight conductor, wet mateable<br>(Subconn MCBH8M-AS) |
| **POWER SUPPLY** | 20 – 32 VDC at less than 5 Watts |
| **DIMENSIONS** | 61 mm (2.4”) diameter x 347 mm (13.64”) overall length |
| **WEIGHT: In Air**<br>**In Water** | 1.2 kg (2.6 lbs)<br>0.4 kg (0.8 lb) |
| **MATERIALS** | 6061-T6 Aluminum & Polyurethane |
| **FINISH** | Hard Anodize |



Copyright © 2009 - 2016
Imagenex Technology Corp.

| SOFTWARE SPECIFICATIONS: | PipeSonarL.exe |
|---|---|
| **WINDOWS™ OPERATING SYSTEM** | Windows™ 98, Me, NT, 2000, XP, Vista |
| **MODES** | Polar |
| **RANGE SCALES** | 0.125 m, 0.25 m, 0.50 m, 0.75 m,<br>1 m, 2 m, 3 m, 4 m, 5 m, 6 m |
| **TRAIN ANGLES** | Continuous rotation, 9° increments |
| **SECTOR SIZE** | 0° – 351°, 9° increments, or Continuous rotation |
| **STEP SIZE** | 0.9° |
| **GRID TYPES** | Polar and rectangular |
| **FILE FORMAT** | (filename).31L |
| **RECOMMENDED MINIMUM COMPUTER REQUIREMENTS:** | 2 GHz Pentium 4<br>256 MB RAM<br>20 GB Hard Disk<br>1024 x 768 screen resolution |




| ORDERING INFORMATION: | | |
|---|---|---|
| **1000 m UNIT** | Standard | 831L-000-200 |
| IP Address* | Option | -020 |

*Note: Standard IP Address is 192.168.0.5
A different IP Address may be specified upon ordering.

Product and company names listed are trademarks or trade names of their respective companies.

# APPENDIX 3:

## Daily Logs & Safety Documentation

# Field Report - ROV Division

| | | | |
|---|---|---|---|
| Date: June 24, 2025 | Facility: | Storm Drain & Manholes | ASI Marine |
| | Location: | New Bedford, MA | |
| Client: Foth Contractor Services | Client Reference (PO, Contract No.): | | ASI Job Number: RU25-054 |

| Name | | Position (Function) | Activity | Start Time (HH:MM) | End Time (HH:MM) | Total Hours |
|---|---|---|---|---|---|---|
| Andrew Longua | | 040 - Eng Tech | 200 - Mob | 8:30 | 16:30 | 8.00 |
| Wiley Brooks-Joiner | | 040 - Eng Tech | 200 - Mob | 8:00 | 17:30 | 9.50 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| ASI Equipment | Consumables | (QTY) | Other Equipment | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

**Record of Events**

| Time | Description |
|---|---|
| 8:00 | Wiley departs from Stoney Creek |
| 8:30 | Andrew departs from Orchard Park |
| 9:00 | Wiley and gear in US |
| 16:30 | Andrew arrives at hotel |
| 17:30 | Wiley arrives at hotel |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

# Field Report - ROV Division

| | | | |
|---|---|---|---|
| Date: June 25, 2025 | Facility: | Storm Drain & Manholes | ASI Marine |
| | Location: | New Bedford, MA | |
| Client: Foth Contractor Services | Client Reference (PO, Contract No.): | | ASI Job Number: RU25-054 |

| Name | | Position (Function) | Activity | Start Time (HH:MM) | End Time (HH:MM) | Total Hours |
|---|---|---|---|---|---|---|
| Andrew Longua | | 040 - Eng Tech | 205 - Insp | 5:30 | 14:30 | 9.00 |
| Wiley Brooks-Joiner | | 040 - Eng Tech | 205 - Insp | 5:30 | 14:30 | 9.00 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| ASI Equipment | Consumables | (QTY) | Other Equipment | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

**Record of Events**

| Time | Description |
|---|---|
| 5:30 | Crew departs from hotel |
| 6:00 | Crew arrives on site |
| 6:45 | Crew begins setup at manhole 5 |
| 7:45 | ROV deployed, communications issues noted |
| 9:10 | Comms issues resolved, ROV redeployed |
| 10:49 | Upstream portion of inspection completed |
| 11:30 | Downstream portion of inspection completed, ROV recovered to deck |
| 12:30 | Began dropcam inspections |
| 14:00 | Dropcam inspections completed, crew leaves site |
| 14:30 | Crew arrives at hotel |
| | |
| | |
| | |

# Field Report - ROV Division

| | | | |
|---|---|---|---|
| Date: June 26, 2025 | Facility: | Storm Drain & Manholes | ASI Marine |
| | Location: | New Bedford, MA | |
| Client: Foth Contractor Services | Client Reference (PO, Contract No.): | | ASI Job Number: RU25-054 |

| Name | | Position (Function) | Activity | Start Time (HH:MM) | End Time (HH:MM) | Total Hours |
|---|---|---|---|---|---|---|
| Andrew Longua | | 040 - Eng Tech | 266 - Demob | 8:15 | 16:15 | 8.00 |
| Wiley Brooks-Joiner | | 040 - Eng Tech | 266 - Demob | 7:00 | 16:45 | 9.75 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| ASI Equipment | Consumables | (QTY) | Other Equipment | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

**Record of Events**

| Time | Description |
|---|---|
| 7:00 | Wiley departs from hotel |
| 8:15 | Andrew departs from hotel |
| 16:15 | Andrew demob complete |
| 17:45 | Wiley demob complete |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

# Tailboard Safety Talk

*Form to be completed at start of each shift as regular Tailboard Safety Talk meeting.*
*Form to be uploaded to Project Field Data folder upon return to office.*

| | | |
|---|---|---|
| Project Number: RU25-054 | Client: Foth Contractor Services | |
| Project Location: New Bedford, MA | | |
| Scope of Work: Storm Drain & Manhole Inspections | | |
| Completed By: Andrew L. | Date: June 25, 2025 | Time: 0630 |

| **Hazards Identification:** | | | | | |
|---|---|---|---|---|---|
| Chemical Exposure | | Flammables/Combustibles | ✔ | Biological Contamination/Disease | |
| Energy: Electric/Hydraulic/Pressure | ✔ | Inadvertent Equipment Startup | ✔ | Slips/Trips/Falls | ✔ |
| Overhead Hazards/Material | | Cranes/Hoists | | Pinch/Crush/Shear Points | ✔ |
| Noise | | UV/Light Radiation | ✔ | Adequate Lighting | |
| Extreme Cold/Heat | ✔ | Dangerous Atmosphere/Air Quality | | Working Around Water/Drowning | ✔ |
| Water/Vessel *fill out Vessel Check Sheet | | Working Alone | | Weather Conditions | ✔ |
| Traffic/Public Roadways | ✔ | Working at Heights/Falling | ✔ | Confined Space | |
| Hot Work | | Distractions | ✔ | Manual Lifting | ✔ |
| Potable Water/Restrooms | | Other: | | Other: | |

| **Hazard Controls:** | | | | | |
|---|---|---|---|---|---|
| Traffic Control | | Fall Protection | ✔ | Barriers | ✔ |
| Confined Space *see ASI procedure | | Lift Plan/Inspect Rigging | | Lockout/Tagout | |
| Housekeeping | ✔ | Other: | | Other: | |

| **Personal Protective Equipment (PPE):** | | | | | |
|---|---|---|---|---|---|
| Head Protection | ✔ | Foot Protection | ✔ | Eye Protection | ✔ |
| Hearing Protection | | Respiratory Protection | | Skin Protection (Sun/Insects etc.) | ✔ |
| Gloves | ✔ | Clothing | ✔ | High Visibility Clothing | ✔ |
| PFDs/Floatation Suits | | Other: | | Other: | |

| **Emergency Equipment and Response:** | | | | | |
|---|---|---|---|---|---|
| Emergency Response Plan | ✔ | First-Aid Supplies/Equipment | ✔ | Fire Extinguisher | ✔ |
| Throw Rope/Life Ring | | Eye Wash Station | | Spill Containment/Spill Kit | ✔ |
| MSDS | | Other: | | Other: | |

| **Communication/Emergency Numbers:** | |
|---|---|
| 978 601 6411 | |
| | |
| | |

| **Personnel Present for Safety Talk:** | | | |
|---|---|---|---|
| *Print Name* | *Initial* | *Print Name* | *Initial* |
| Andrew Longua | AL | David Nieves | DN |
| Wiley Brooks-Joiner | WBJ | Jonathan Delgado | JD |
| Bruce Hebbel | BCH | Adam Hart | AMH |
| | | | |
| | | | |
| | | | |

# APPENDIX 4:

## Inspection Log

| POSITION | | TIME | DESCRIPTION | SENSOR FLAG |
|---|---|---|---|---|
| Payout Feet | Station | (hh:mm:ss) | | |
| - | - | 8:01:39 | All deck checks done, ready for deployment | GEN_NTE |
| - | - | 8:08:08 | Deploying | HDC_TLT |
| - | - | 8:18:38 | Counter zero'd at surface inside manhole 5 | GEN_NTE |
| - | - | 8:20:25 | On crown, facing upstream (towards problem end of pipe) | GEN_NTE |
| - | - | 8:50:49 | Comms issues ongoing | GEN_NTE |
| - | - | 9:07:00 | ROV on deck, vacuum check complete and good, swapped ports for accessories, fiber cleaned | GEN_NTE |
| - | - | 9:07:32 | Deploying ROV | GEN_NTE |
| - | - | 9:11:04 | In tunnel, everything functioning | HDC_TLT |
| 244.42 | 09+83 | 9:29:17 | Manhole 4 | HDC_TLT |
| 695.21 | 05+32 | 9:36:47 | Manhole 3 | HDC_TLT |
| 1058.07 | 01+69 | 9:43:02 | Manhole 2 | HDC_TLT |
| 1060.04 | 01+67 | 9:43:07 | " | HDC_TLT |
| 1184.38 | 00+43 | 9:45:22 | Manhole 1 | HDC_TLT |
| 1202.76 | 00+24 | 9:49:53 | Prof test settings, about to recover to payout 0.0 | PRO_AFT |
| 1193.57 | 00+34 | 9:51:07 | p1 | PRO_AFT |
| 1185.04 | 00+42 | 9:51:39 | Manhole 1 looking upstream | MBI_TLT |
| 1176.84 | 00+50 | 9:51:54 | bend | MBI_TLT |
| 1150.59 | 00+77 | 9:53:36 | p2 | PRO_AFT |
| 1100.39 | 01+27 | 9:55:50 | p3 | PRO_AFT |
| 1050.20 | 01+77 | 9:57:06 | Roll correction goofed orientation of profiler, must fix in post | GEN_NTE |
| 1049.21 | 01+78 | 9:59:48 | p4 | PRO_AFT |
| 1034.12 | 01+93 | 10:00:07 | Record check good | GEN_NTE |
| 1000.33 | 02+27 | 10:01:49 | p5 | PRO_AFT |
| 950.13 | 02+77 | 10:03:12 | p6 | PRO_AFT |
| 899.93 | 03+27 | 10:04:59 | p7 | PRO_AFT |
| 850.39 | 03+77 | 10:07:00 | p8 | PRO_AFT |
| 799.54 | 04+28 | 10:09:13 | p9 | PRO_AFT |
| 750.98 | 04+76 | 10:10:43 | p10 | PRO_AFT |
| 699.15 | 05+28 | 10:12:58 | p11 | PRO_AFT |
| 671.26 | 05+56 | 10:13:23 | Manhole 2 | MBI_TLT |
| 650.26 | 05+77 | 10:14:24 | p12 | PRO_AFT |
| 600.07 | 06+27 | 10:16:42 | p13 | PRO_AFT |
| 550.85 | 06+76 | 10:18:22 | Profiler not connecting (does not say no connection) | GEN_NTE |
| 550.85 | 06+76 | 10:19:10 | Power cycling ROV | GEN_NTE |
| 550.85 | 06+76 | 10:21:05 | Profiler working | GEN_NTE |
| 550.85 | 06+76 | 10:21:11 | p14 | PRO_AFT |
| 500.00 | 07+27 | 10:22:56 | p15 | PRO_AFT |
| 500.00 | 07+27 | 10:23:12 | Restarted recordings | GEN_NTE |
| 449.80 | 07+77 | 10:25:09 | p16 | PRO_AFT |
| 400.26 | 08+27 | 10:26:51 | p17 | PRO_AFT |
| 351.71 | 08+76 | 10:29:56 | p18 - changed from low to medium mix | PRO_AFT |
| 301.18 | 09+26 | 10:31:49 | p19 | PRO_AFT |
| 250.33 | 09+77 | 10:33:54 | p20 | PRO_AFT |
| 232.61 | 09+95 | 10:36:59 | Manhole 3 ahead | MBI_TLT |
| 201.44 | 10+26 | 10:38:33 | p21 | PRO_AFT |
| 151.25 | 10+76 | 10:40:29 | p22 | PRO_AFT |
| 151.25 | 10+76 | 10:40:39 | Video still example of crown | HDC_TLT |
| 100.72 | 11+26 | 10:43:00 | p23 | PRO_AFT |
| 51.18 | 11+76 | 10:45:33 | p24 | PRO_AFT |
| 4.59 | 12+23 | 10:49:22 | p25 | PRO_AFT |

| POSITION | | TIME | DESCRIPTION | SENSOR FLAG |
|---|---|---|---|---|
| Payout Feet | Station | (hh:mm:ss) | | |
| 4.59 | 12+23 | 10:49:28 | At manhole 5 (entry point) | GEN_NTE |
| 4.59 | 12+23 | 10:51:37 | Going opposite direction (towards manhole 6) - outfall at end without rack, will take one profile after manhole 6 and then pull back | GEN_NTE |
| 4.59 | 12+23 | 10:53:32 | Inside downstream side of pipe relative to manhole 5 | HDC_TLT |
| 204.40 | 14+32 | 10:56:11 | Wall | HDC_TLT |
| 440.29 | 16+67 | 10:58:43 | Square profile, light from outfall ahead | HDC_TLT |
| 459.97 | 16+87 | 10:59:27 | Trash | HDC_TLT |
| 451.44 | 16+79 | 11:01:59 | p26 | PRO_AFT |
| 413.39 | 16+41 | 11:03:17 | Manhole 6 | MBI_TLT |
| 412.40 | 16+40 | 11:03:18 | Manhole 6 | HDC_TLT |
| 400.59 | 16+28 | 11:04:08 | Hole on crown | HDC_TLT |
| 400.59 | 16+28 | 11:04:15 | Hole on crown | HDC_TLT |
| 400.59 | 16+28 | 11:04:59 | Hole on crown | HDC_TLT |
| 412.40 | 16+40 | 11:06:50 | Transition between circle to square profile approx 410ft payout from manhole 5 towards manhole 6 | HDC_TLT |
| 415.03 | 16+42 | 11:08:09 | Manhole 6 | HDC_TLT |
| 350.72 | 15+78 | 11:11:24 | p28, going back for p27 | PRO_AFT |
| 401.25 | 16+28 | 11:12:57 | p27 | PRO_AFT |
| 300.52 | 15+28 | 11:15:53 | p29 | PRO_AFT |
| 249.34 | 14+77 | 11:17:37 | p30 | PRO_AFT |
| 200.79 | 14+28 | 11:19:32 | p31 | PRO_AFT |
| 151.25 | 13+78 | 11:20:50 | p32 | PRO_AFT |
| 101.05 | 13+28 | 11:22:55 | p33 | PRO_AFT |
| 49.54 | 12+77 | 11:24:13 | Trash | HDC_TLT |
| 49.54 | 12+77 | 11:25:05 | p34 | PRO_AFT |
| - | - | 11:26:21 | At surface in manhole 5 | GEN_NTE |
| - | - | 11:26:33 | Beginning recovery | GEN_NTE |
| - | - | 11:31:25 | ROV on deck, vehicle checks complete | GEN_NTE |

# APPENDIX 5:

Profiles

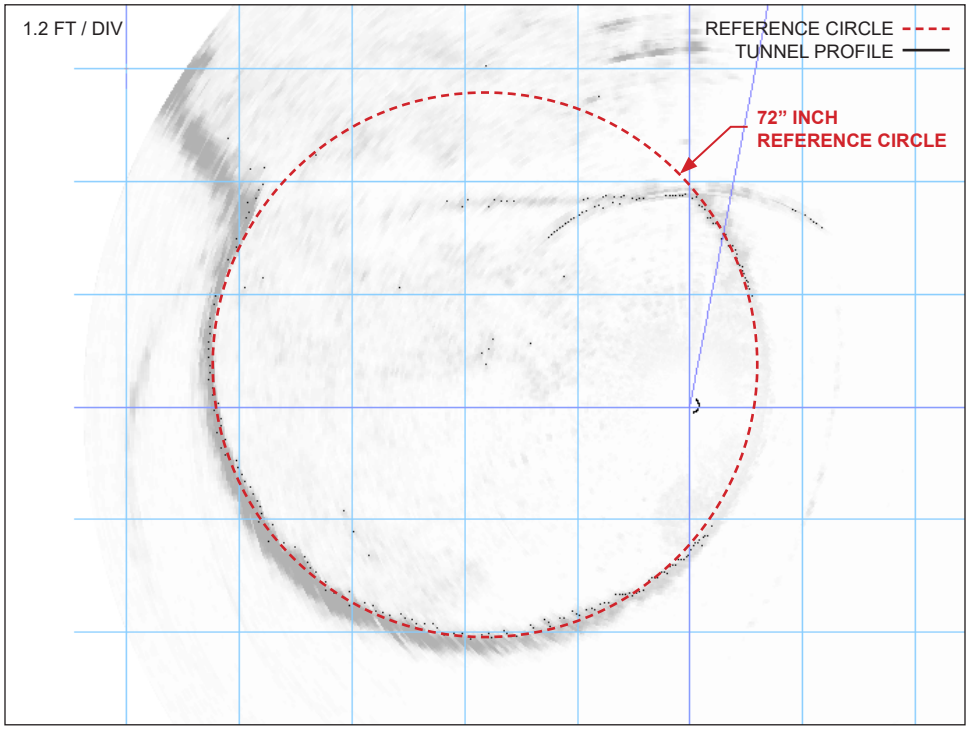



Image 5-1: Storm Drain, STA 0+34; cross-sectional profile, less than 1 inch of sediment on invert.

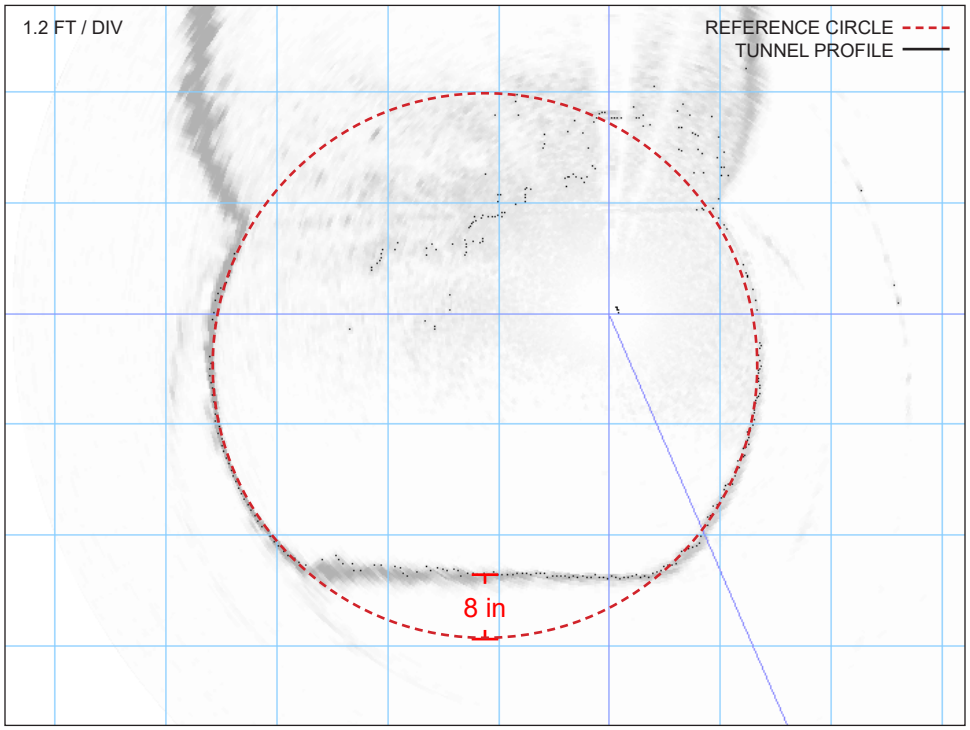



Image 5-2: Storm Drain, STA 0+77; cross-sectional profile, 8 inches of sediment on invert.

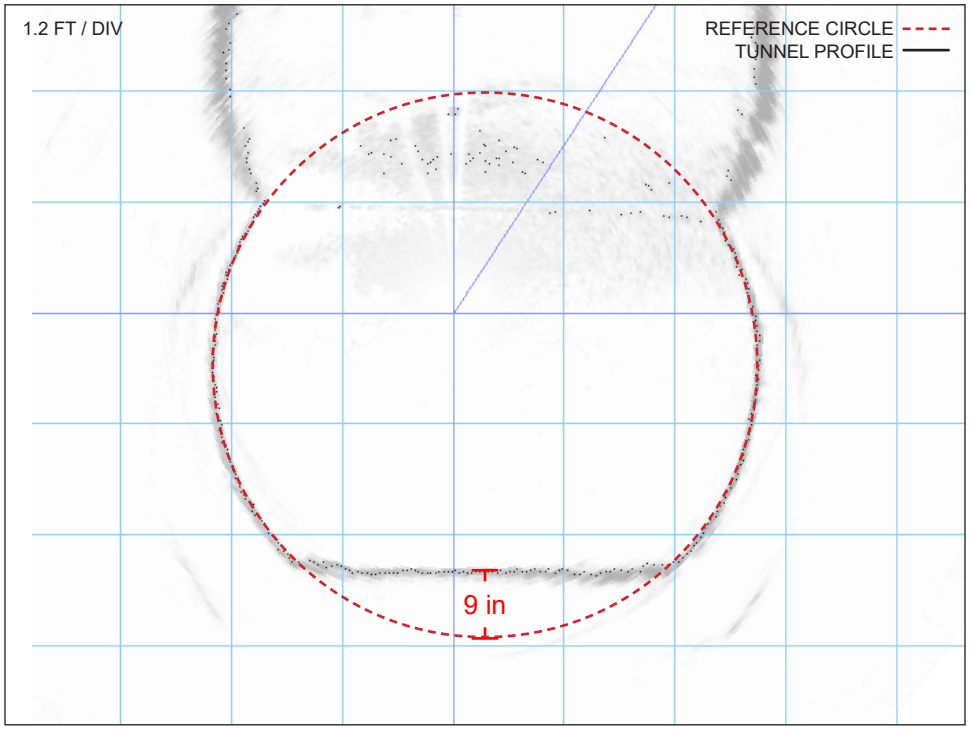



Image 5-3: Storm Drain, STA 1+27; cross-sectional profile, 9 inches of sediment on invert.

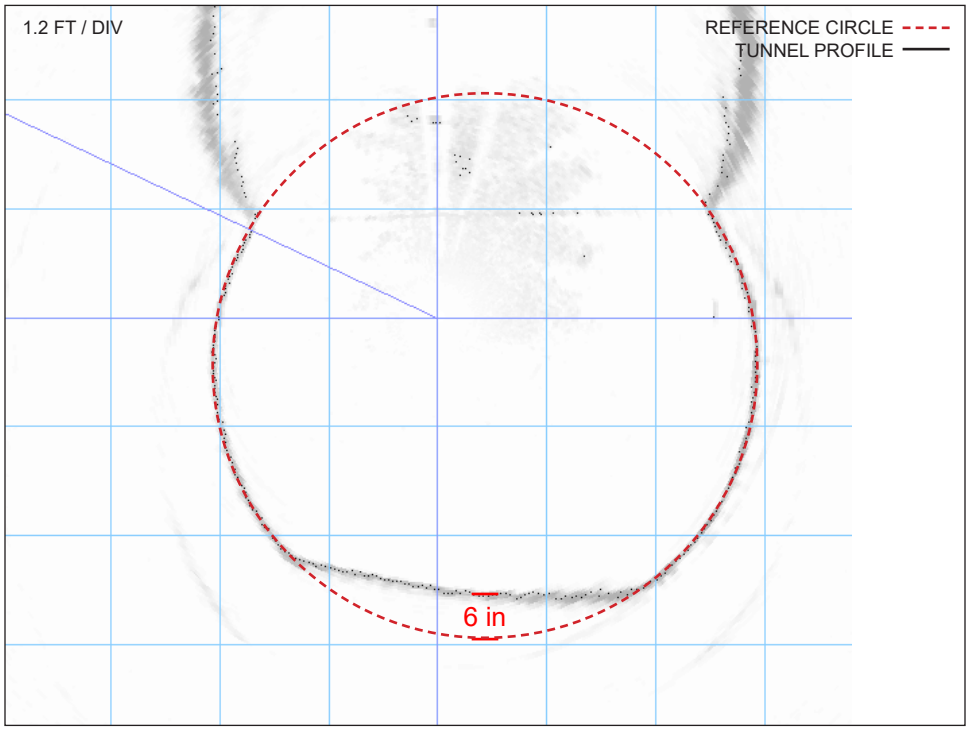



Image 5-4: Storm Drain, STA 1+78; cross-sectional profile, 6 inches of sediment on invert.

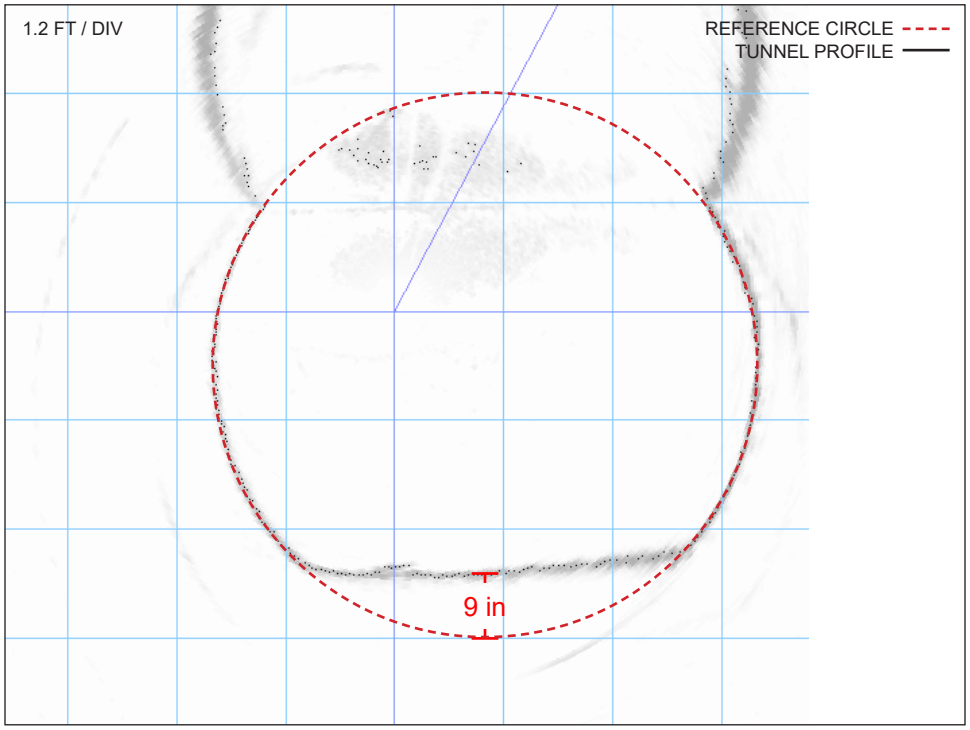



Image 5-5: Storm Drain, STA 2+27; cross-sectional profile, 8 inches of sediment on invert.

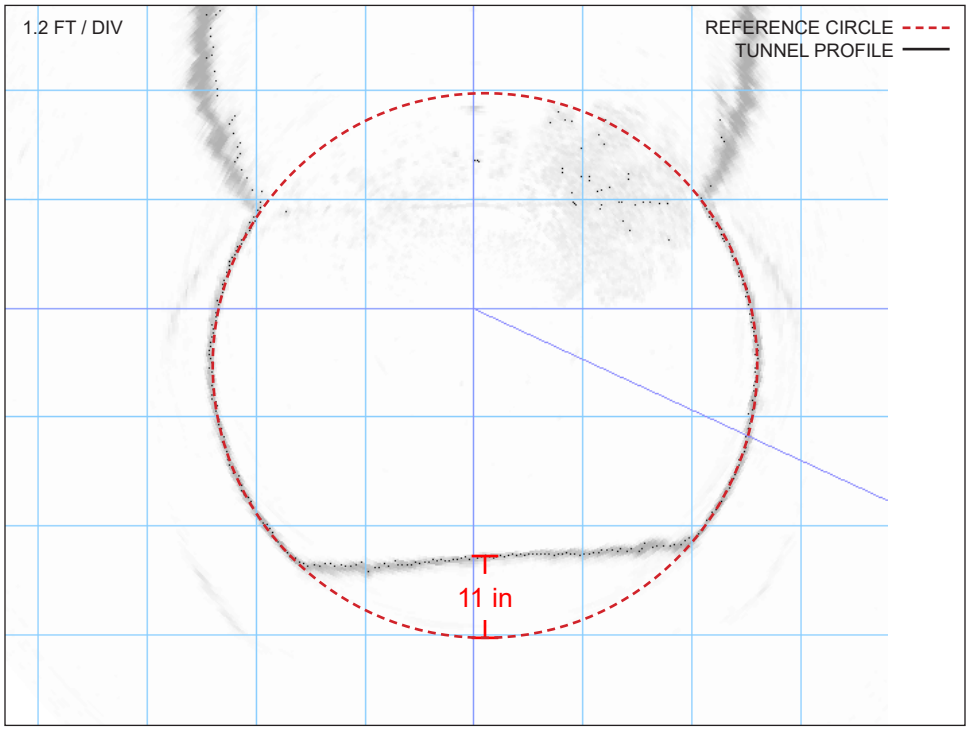



Image 5-6: Storm Drain, STA 2+77; cross-sectional profile, 11 inches of sediment on invert.

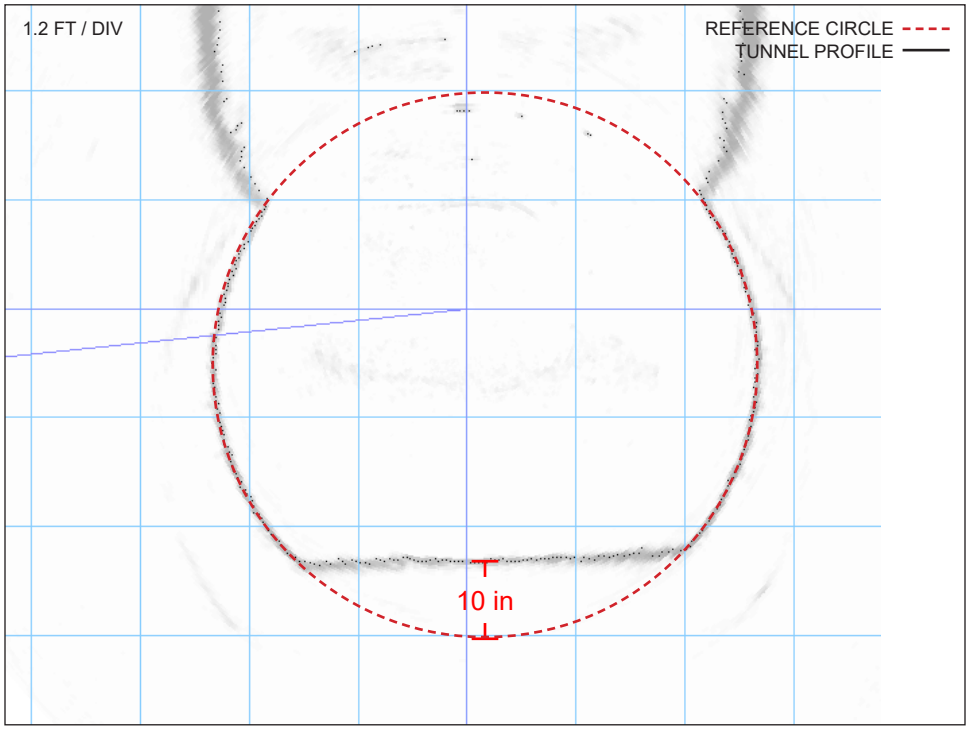



Image 5-7: Storm Drain, STA 3+27; cross-sectional profile, 10 inches of sediment on invert.

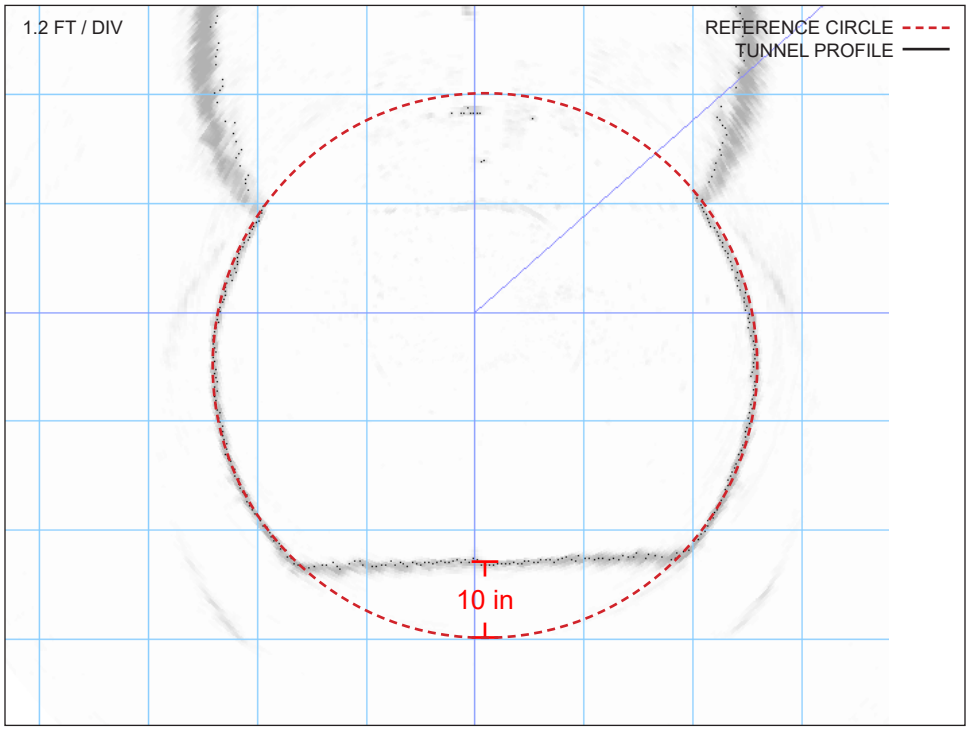



Image 5-8: Storm Drain, STA 3+77; cross-sectional profile, 10 inches of sediment on invert.

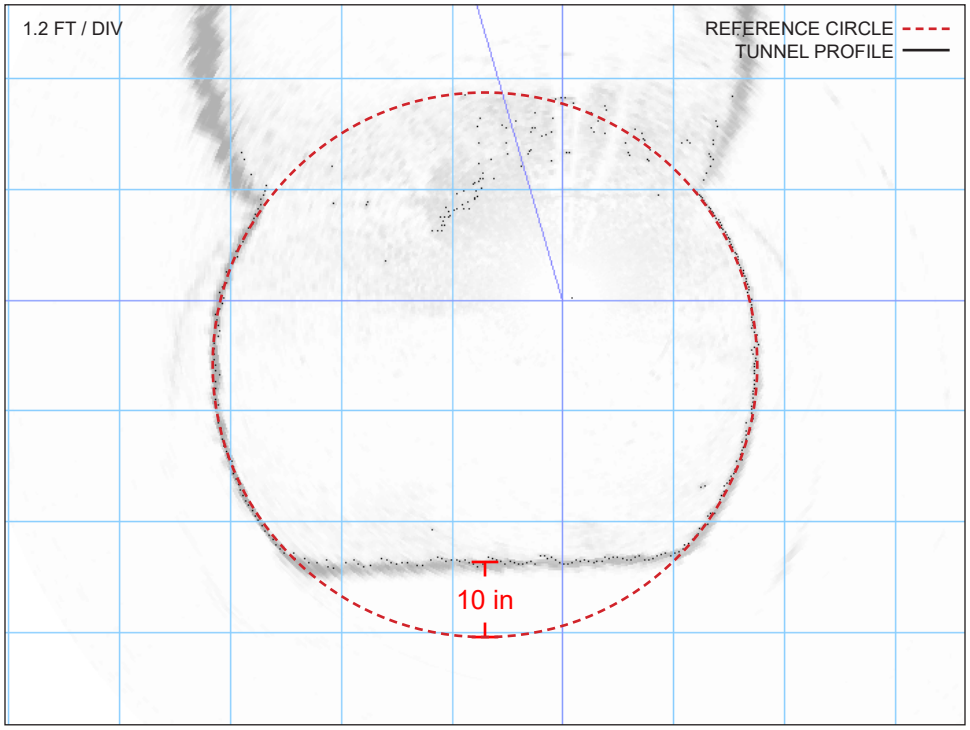



Image 5-9: Storm Drain, STA 4+28; cross-sectional profile, 10 inches of sediment on invert.

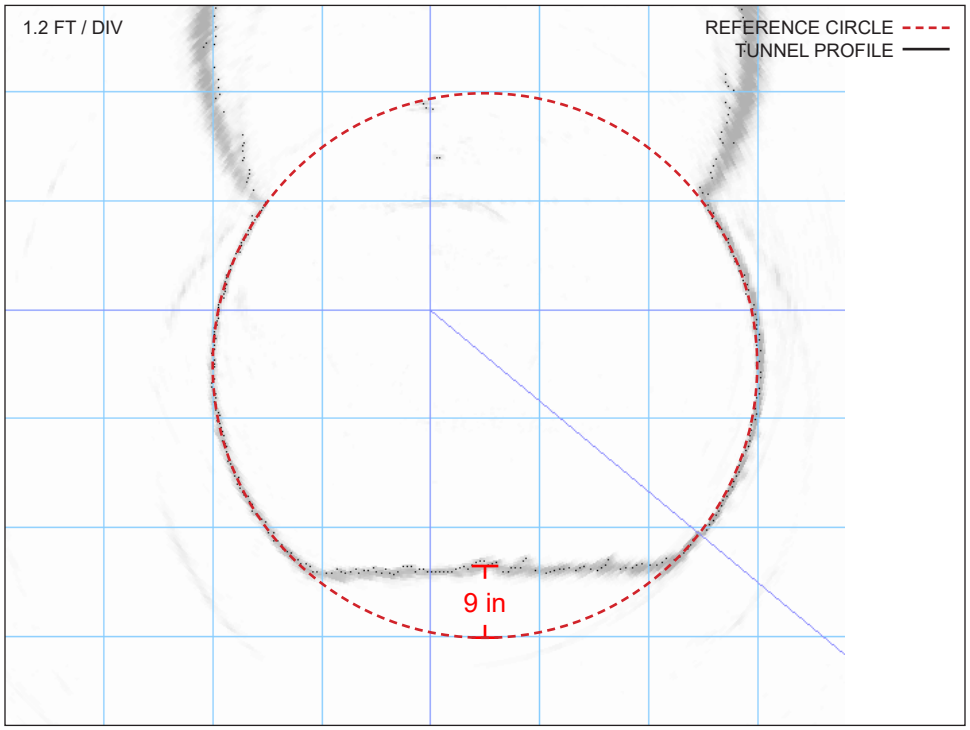



Image 5-10: Storm Drain, STA 4+76; cross-sectional profile, 9 inches of sediment on invert.

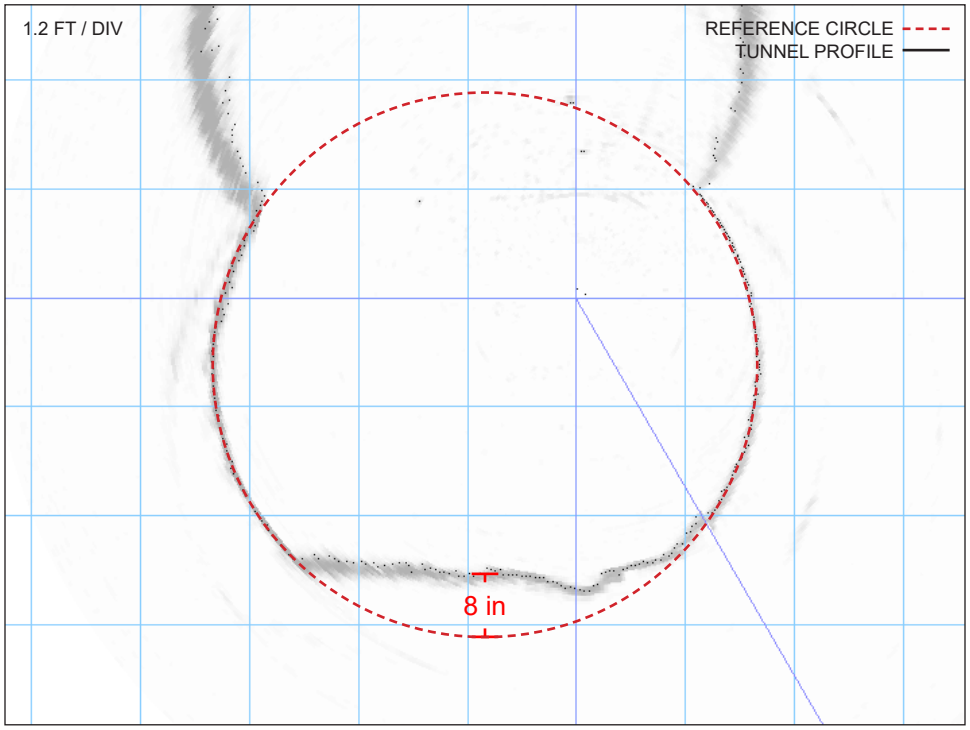



Image 5-11: Storm Drain, STA 5+28; cross-sectional profile, 8 inches of sediment on invert.

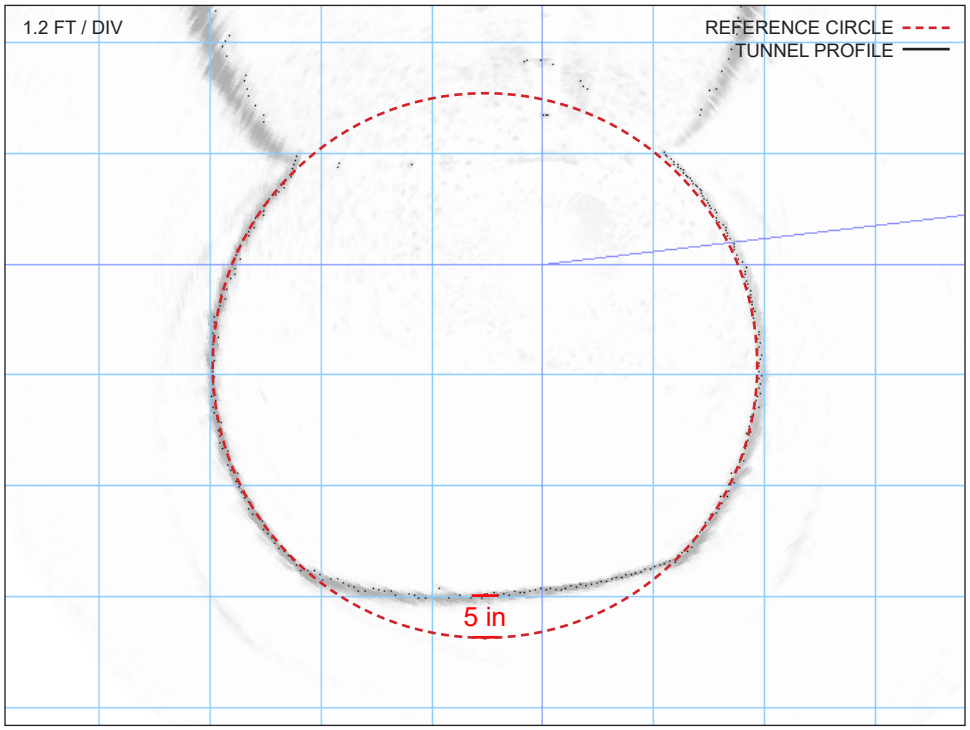



Image 5-12: Storm Drain, STA 5+77; cross-sectional profile, 6 inches of sediment on invert.

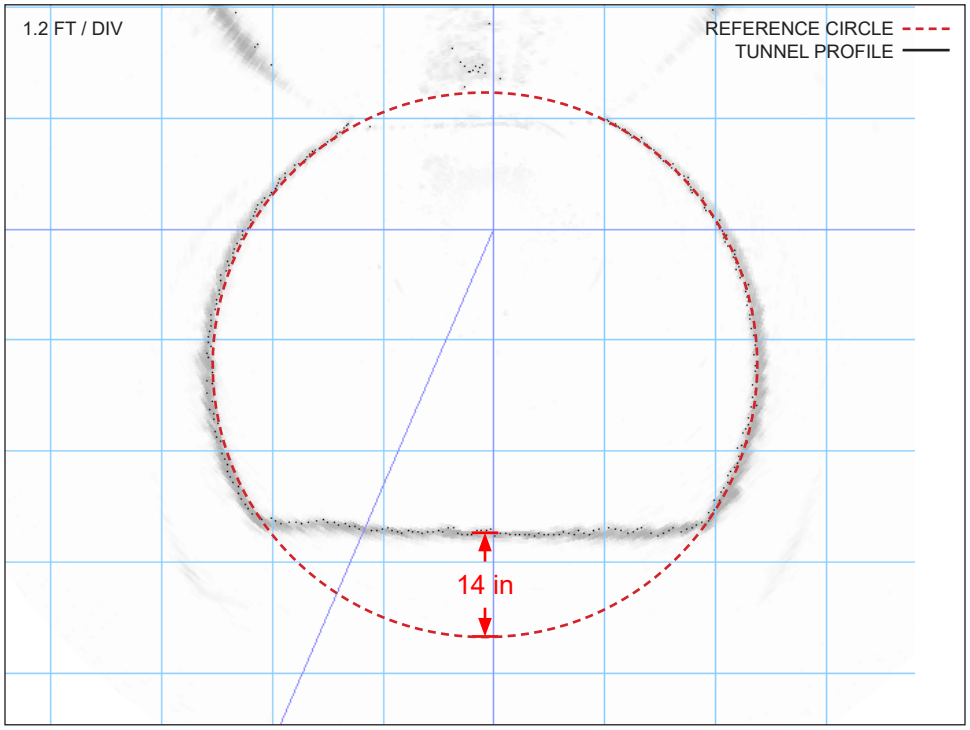



Image 5-13: Storm Drain, STA 6+27; cross-sectional profile, 14 inches of sediment on invert.

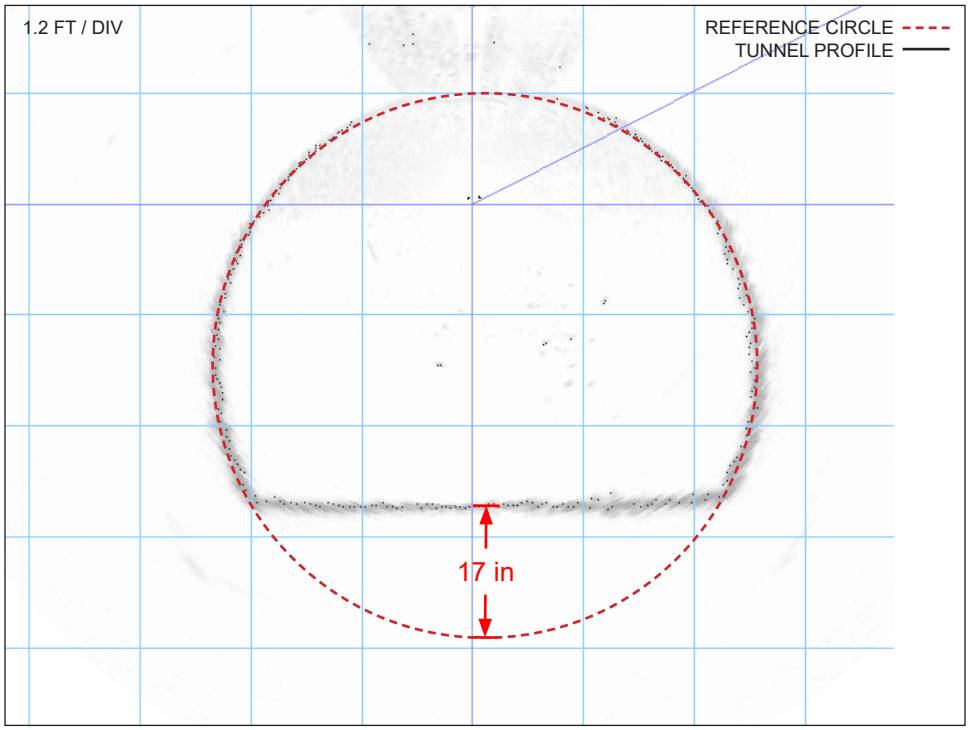



Image 5-14: Storm Drain, STA 6+76; cross-sectional profile, 17 inches of sediment on invert.

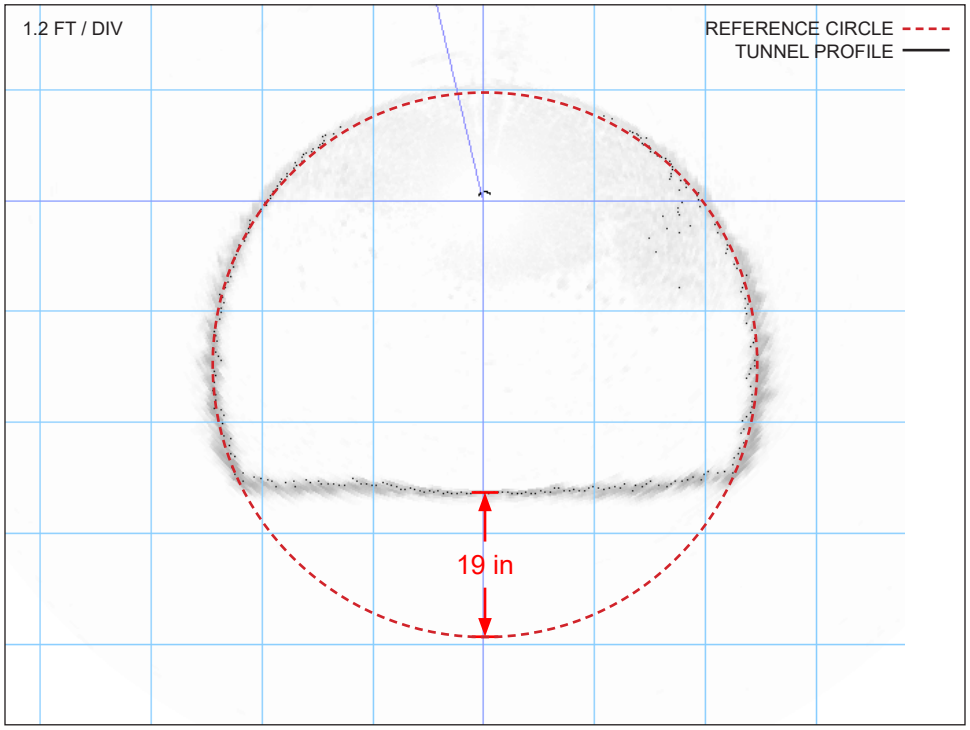



Image 5-15: Storm Drain, STA 7+27; cross-sectional profile, 19 inches of sediment on invert.

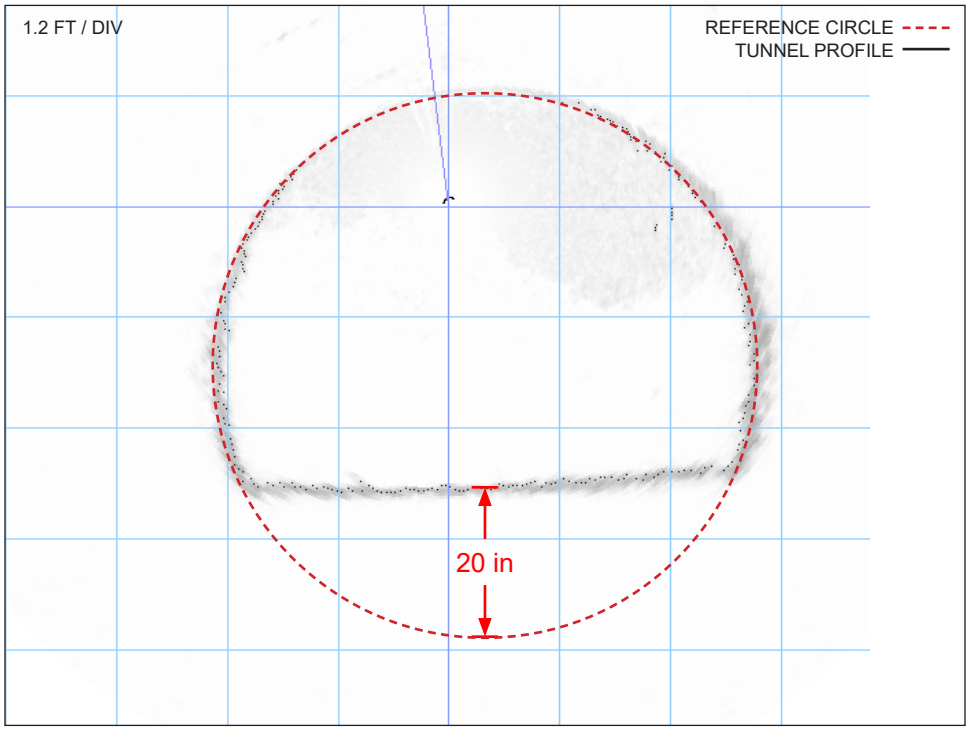



Image 5-16: Storm Drain, STA 7+77; cross-sectional profile, 20 inches of sediment on invert.

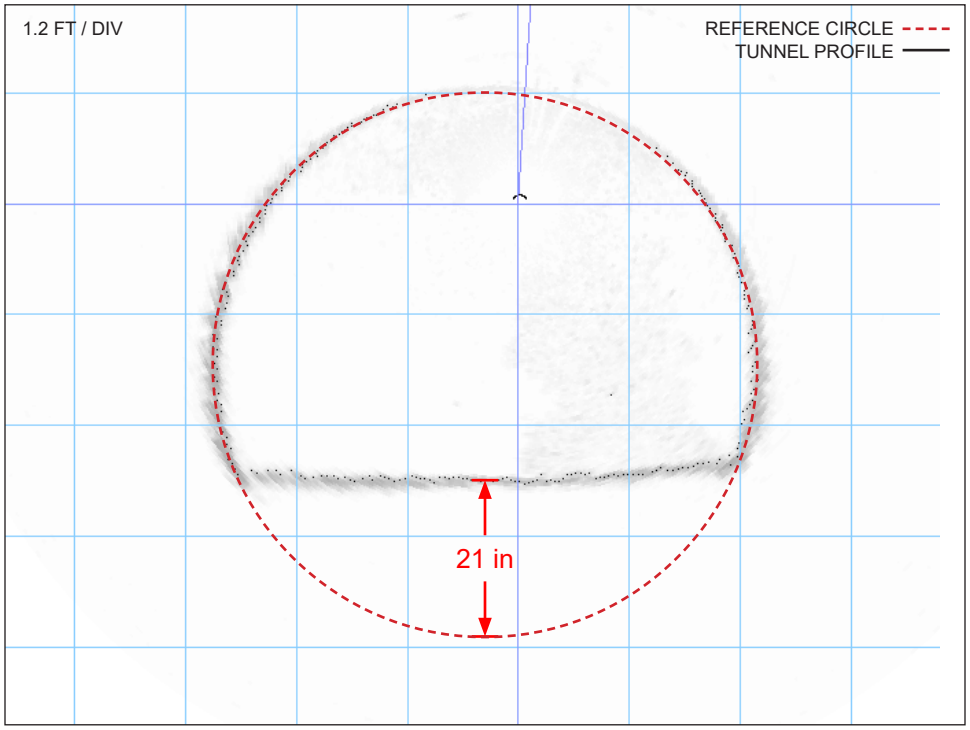



Image 5-17: Storm Drain, STA 8+27; cross-sectional profile, 21 inches of sediment on invert.

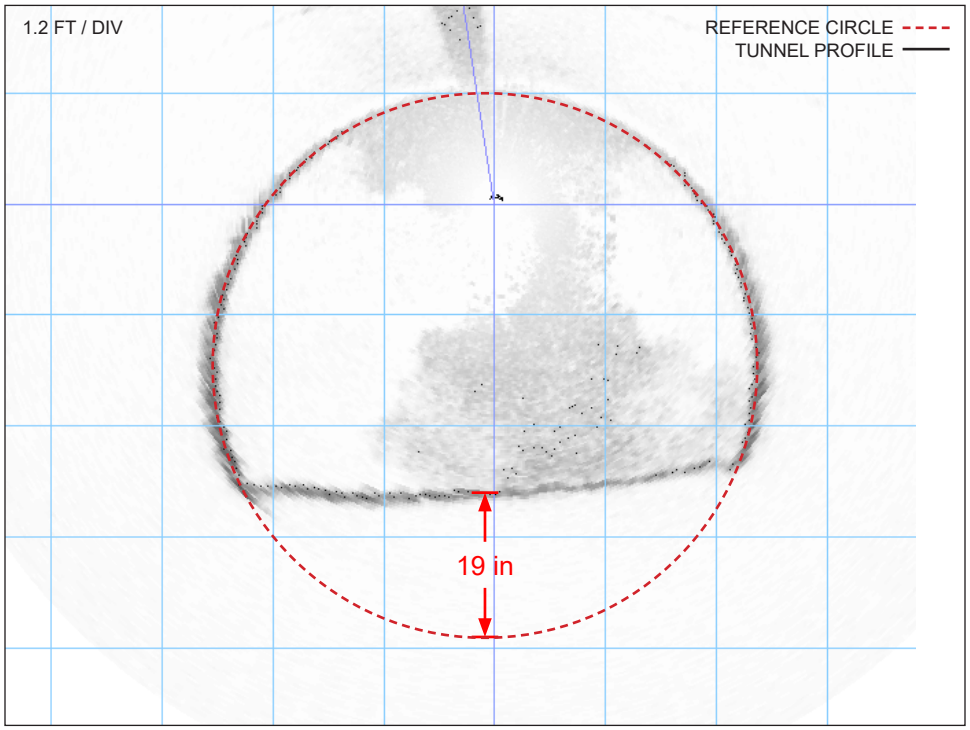



Image 5-18: Storm Drain, STA 8+76; cross-sectional profile, 19 inches of sediment on invert.

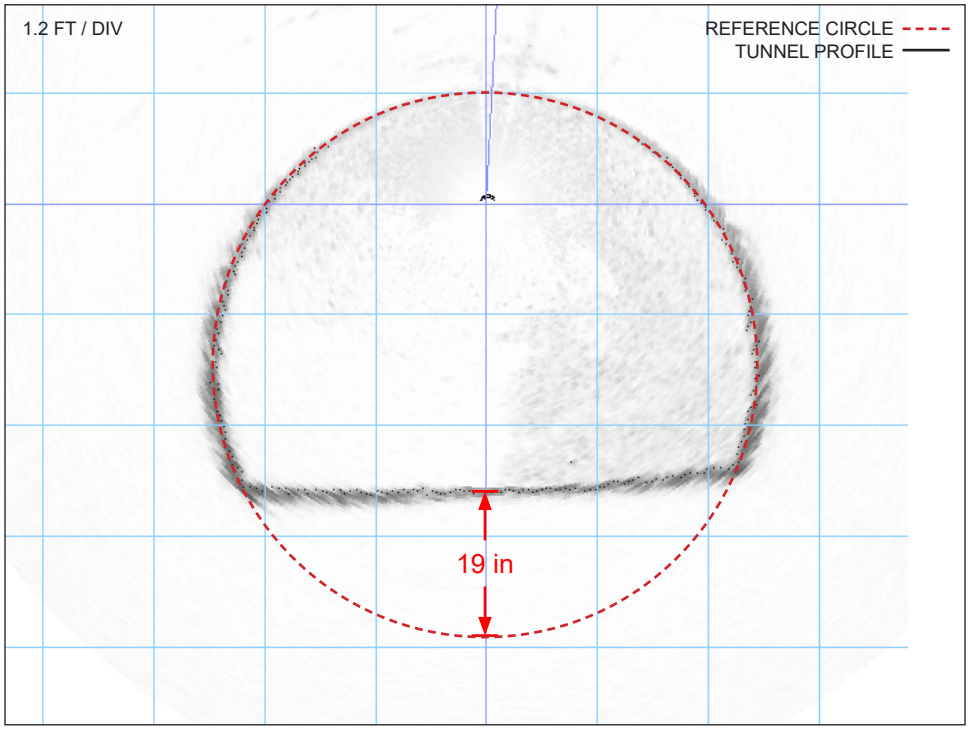



Image 5-19: Storm Drain, STA 9+26; cross-sectional profile, 19 inches of sediment on invert.

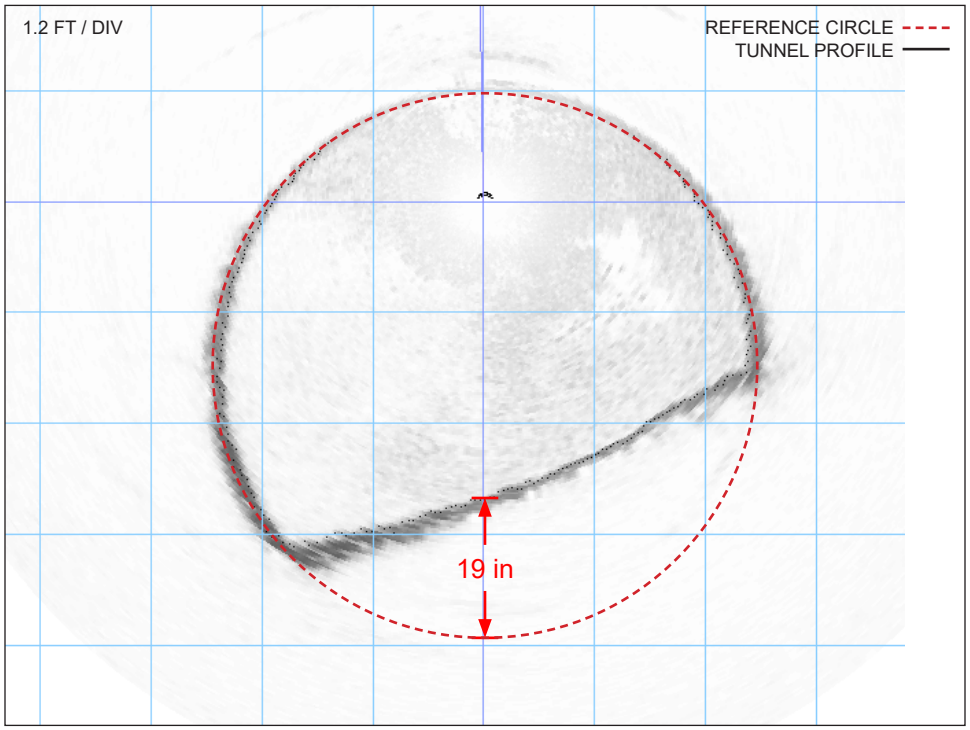



Image 5-20: Storm Drain, STA 9+77; cross-sectional profile, 19 inches of sediment on invert.

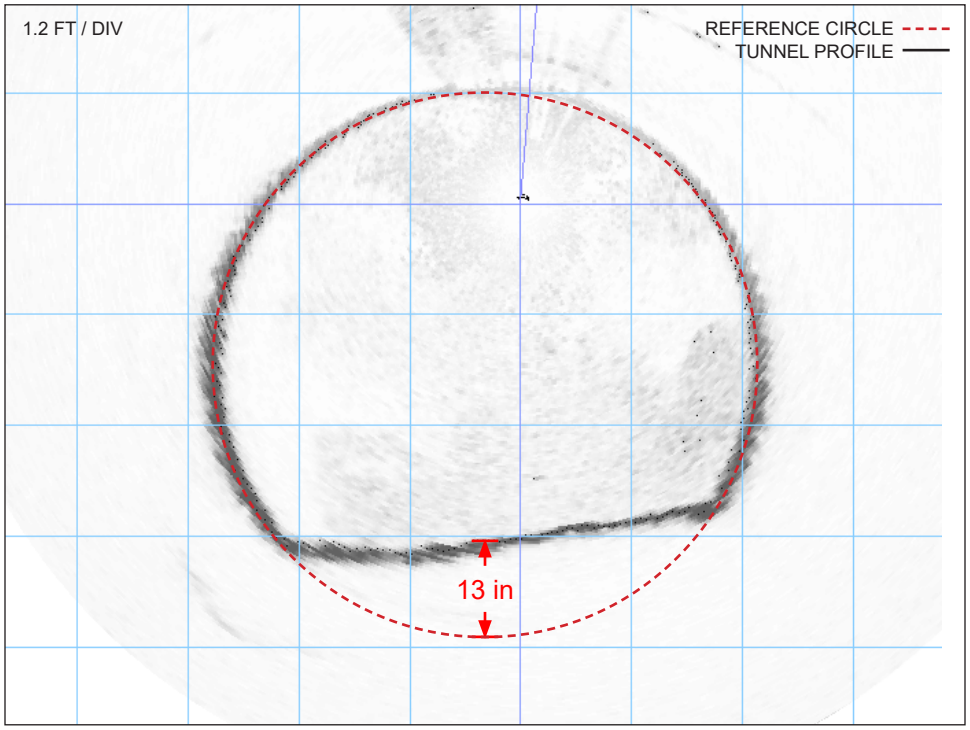



Image 5-21: Storm Drain, STA 10+26; cross-sectional profile, 13 inches of sediment on invert.

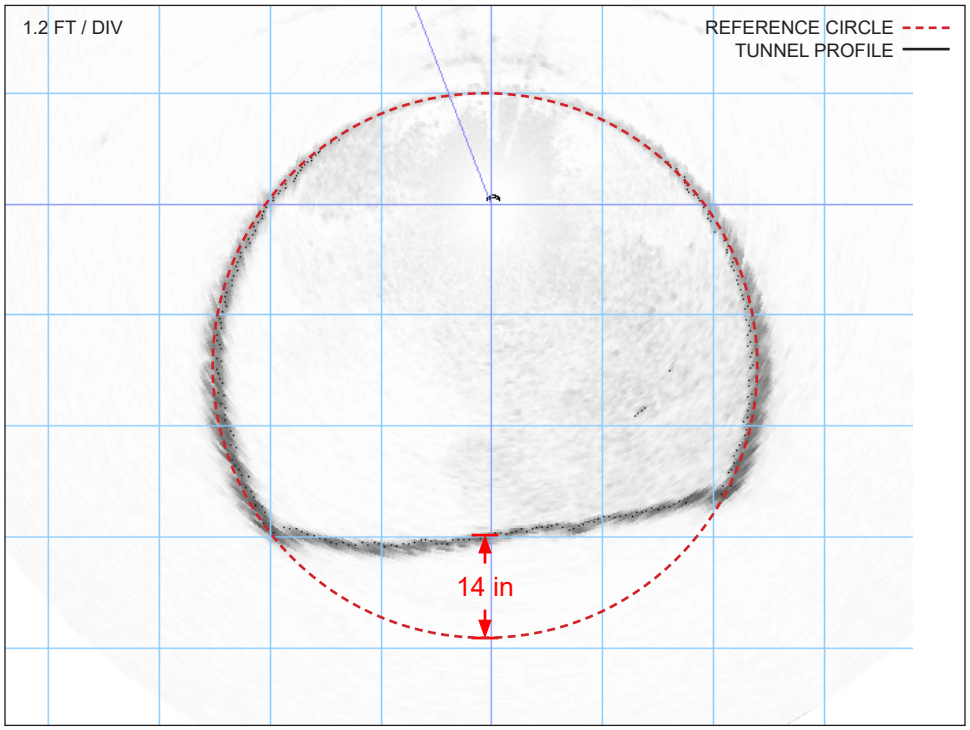



Image 5-22: Storm Drain, STA 10+76; cross-sectional profile, 14 inches of sediment on invert.

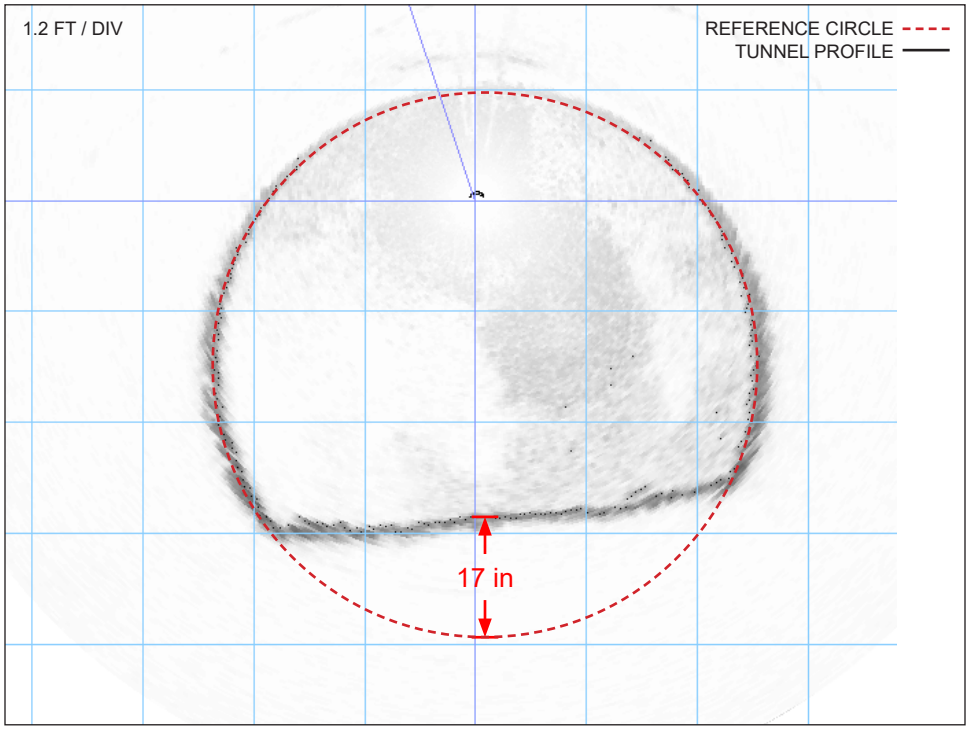



Image 5-23: Storm Drain, STA 11+26; cross-sectional profile, 17 inches of sediment on invert.

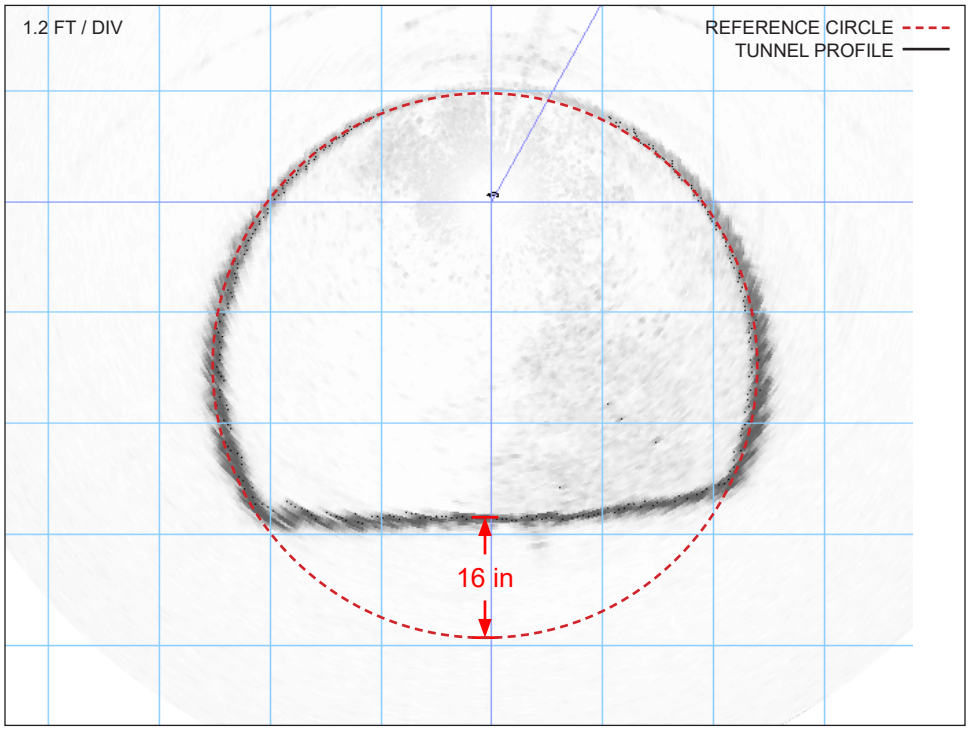



Image 5-24: Storm Drain, STA 11+76; cross-sectional profile, 16 inches of sediment on invert.

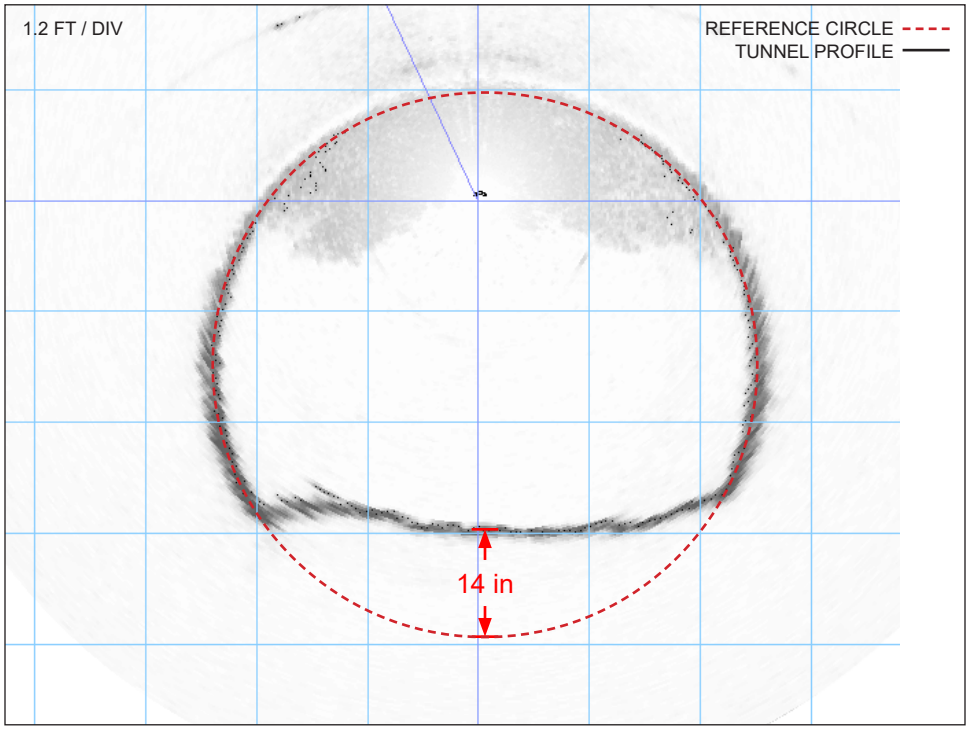



Image 5-25: Storm Drain, STA 12+23; cross-sectional profile, 14 inches of sediment on invert.

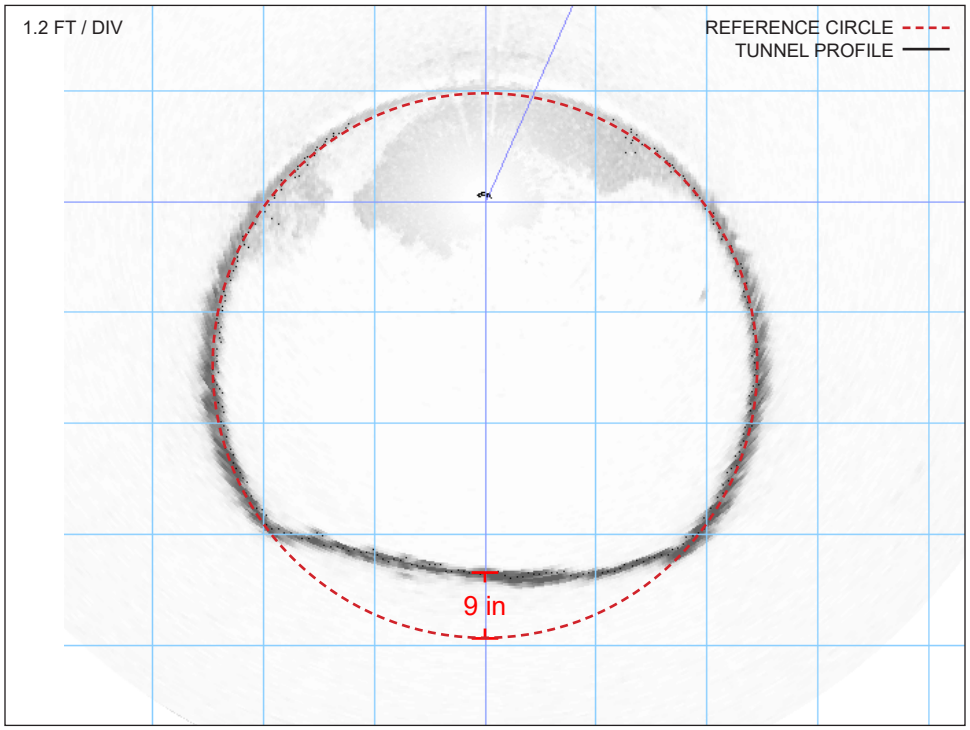



Image 5-26: Storm Drain, STA 12+77; cross-sectional profile, 9 inches of sediment on invert.

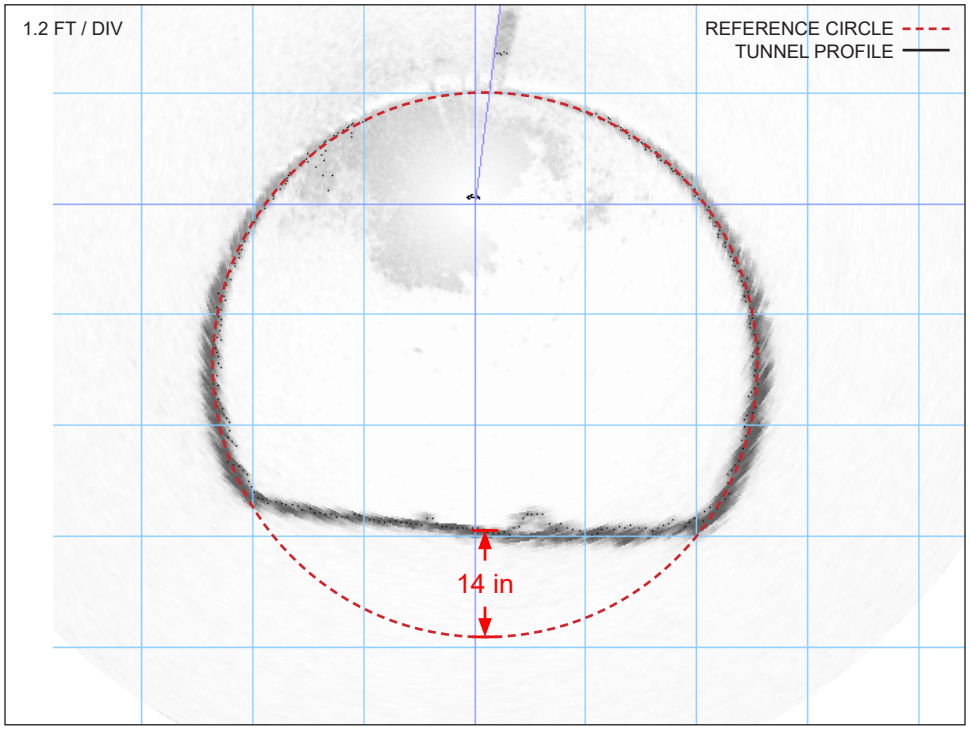



Image 5-27: Storm Drain, STA 13+28; cross-sectional profile, 14 inches of sediment on invert.

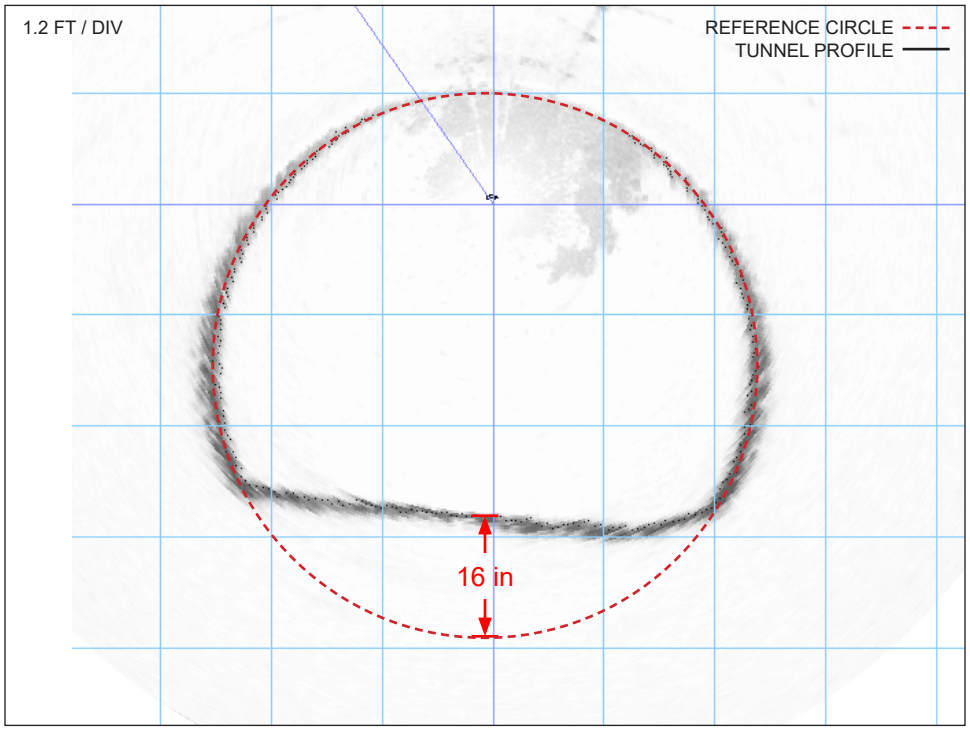



Image 5-28: Storm Drain, STA 13+78; cross-sectional profile, 16 inches of sediment on invert.

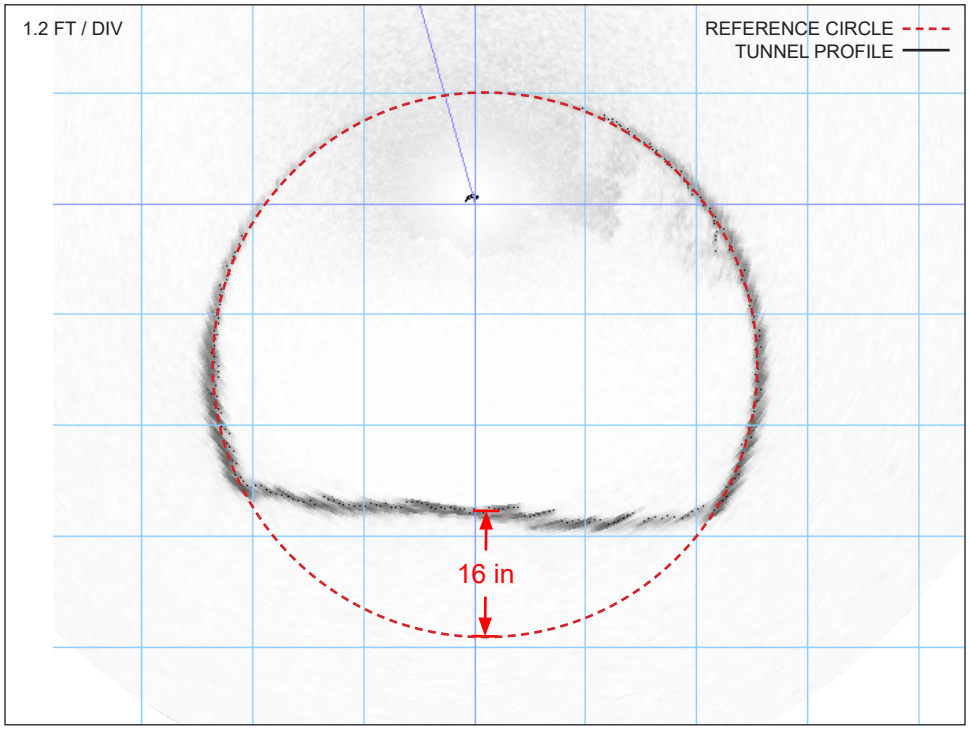



Image 5-29: Storm Drain, STA 14+28; cross-sectional profile, 16 inches of sediment on invert.

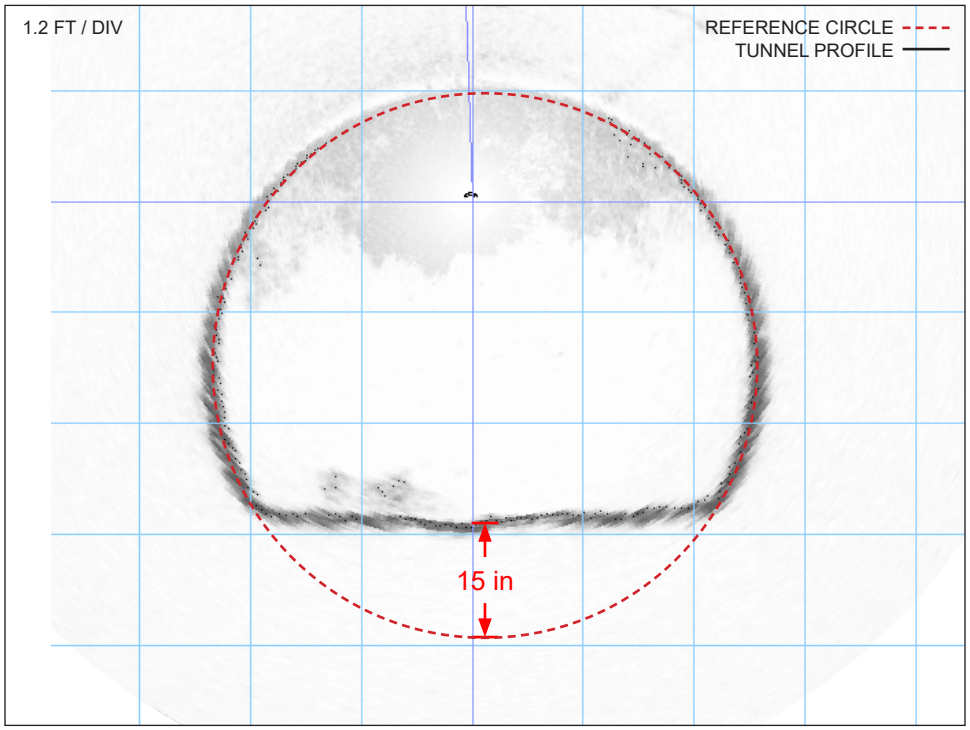



Image 5-30: Storm Drain, STA 14+77; cross-sectional profile, 15 inches of sediment on invert.

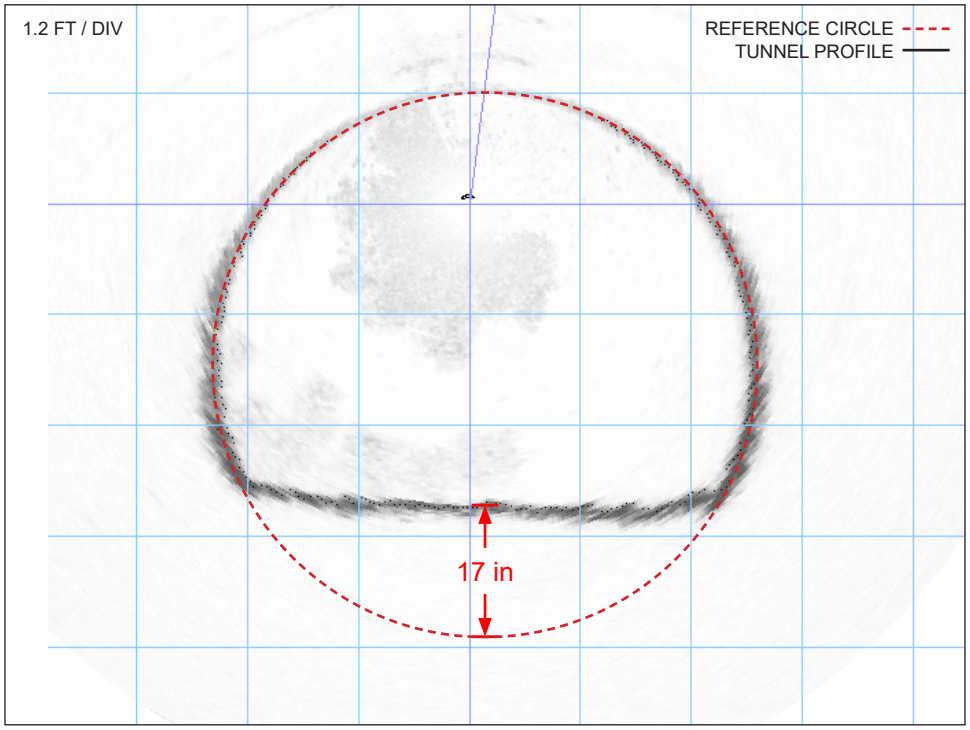



Image 5-31: Storm Drain, STA 15+28; cross-sectional profile, 17 inches of sediment on invert.

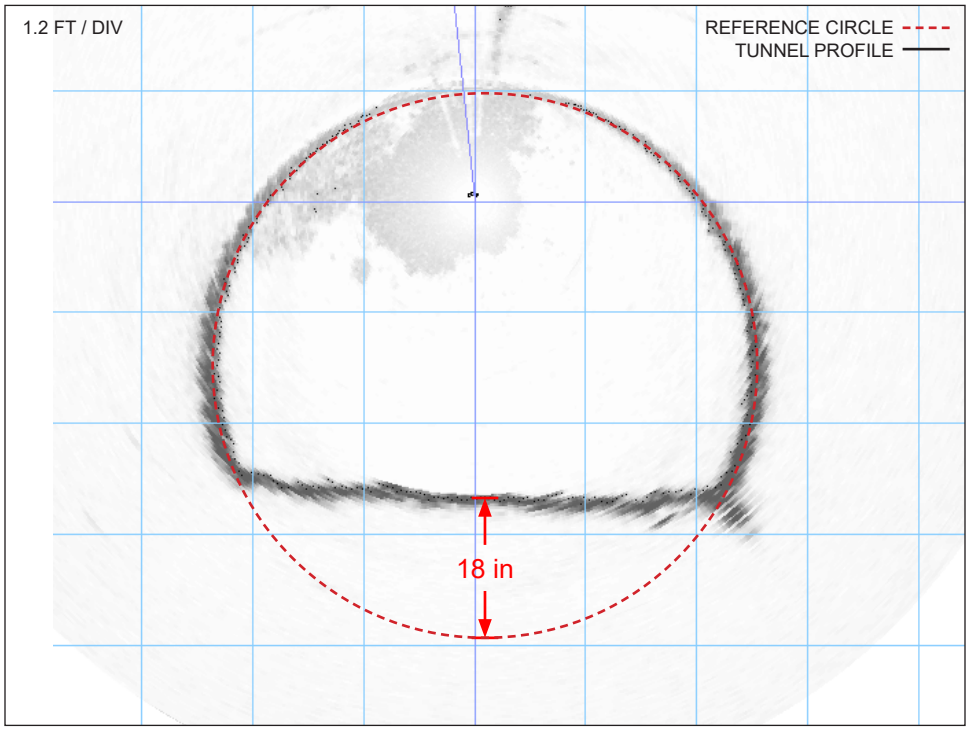



Image 5-32: Storm Drain, STA 15+78; cross-sectional profile, 18 inches of sediment on invert.

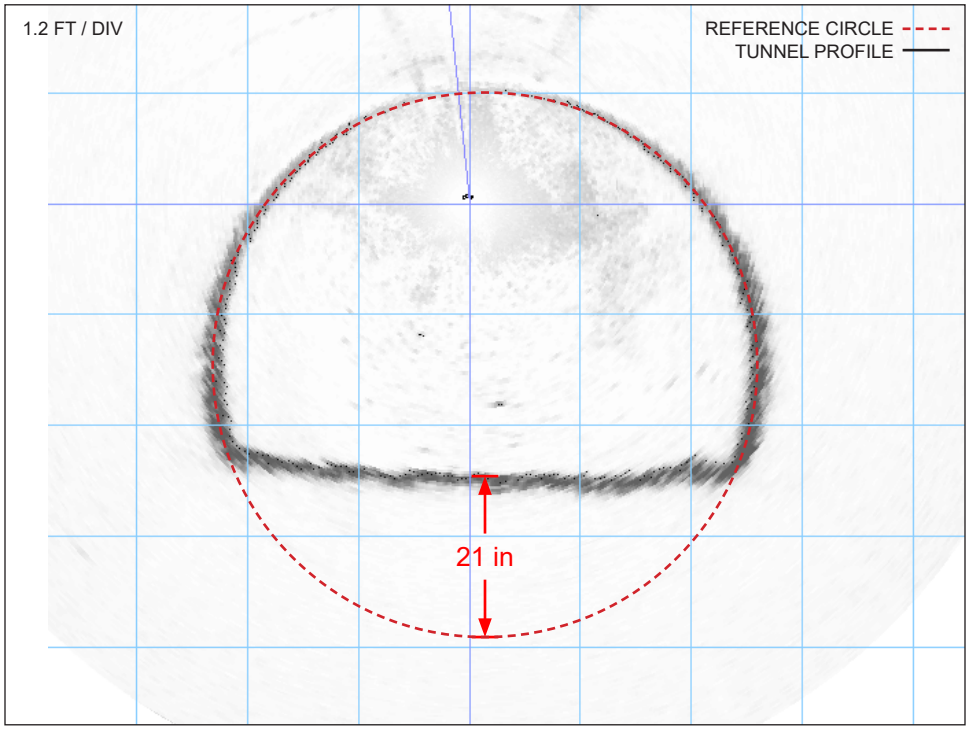



Image 5-33: Storm Drain, STA 16+28; cross-sectional profile, 21 inches of sediment on invert.

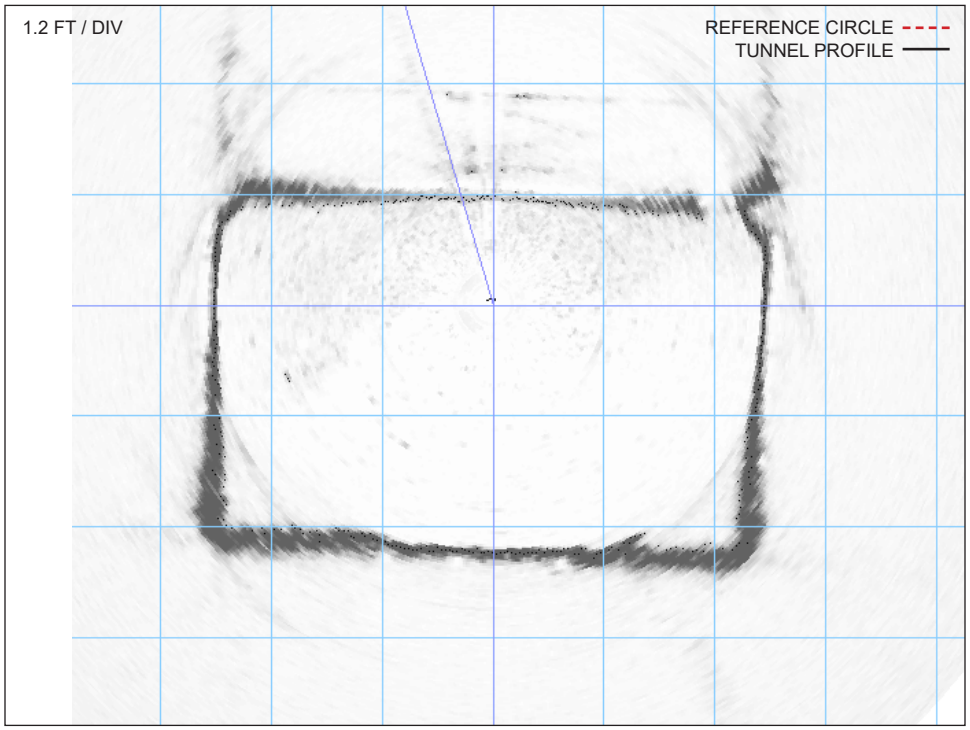



Image 5-34: Storm Drain, STA 16+79; cross-sectional profile, square profile section upstream from outfall.

# APPENDIX 6:

Video & 2D Sonar Stills

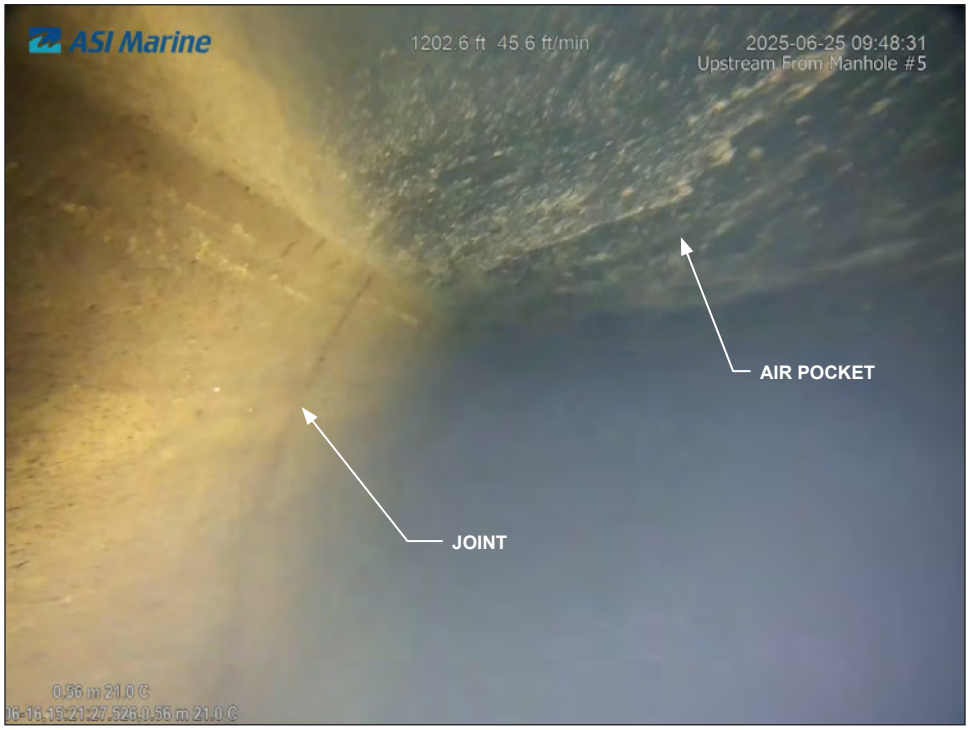



Image 6-1: Storm Drain, STA 0+25; air pocket on crown, looking upstream.

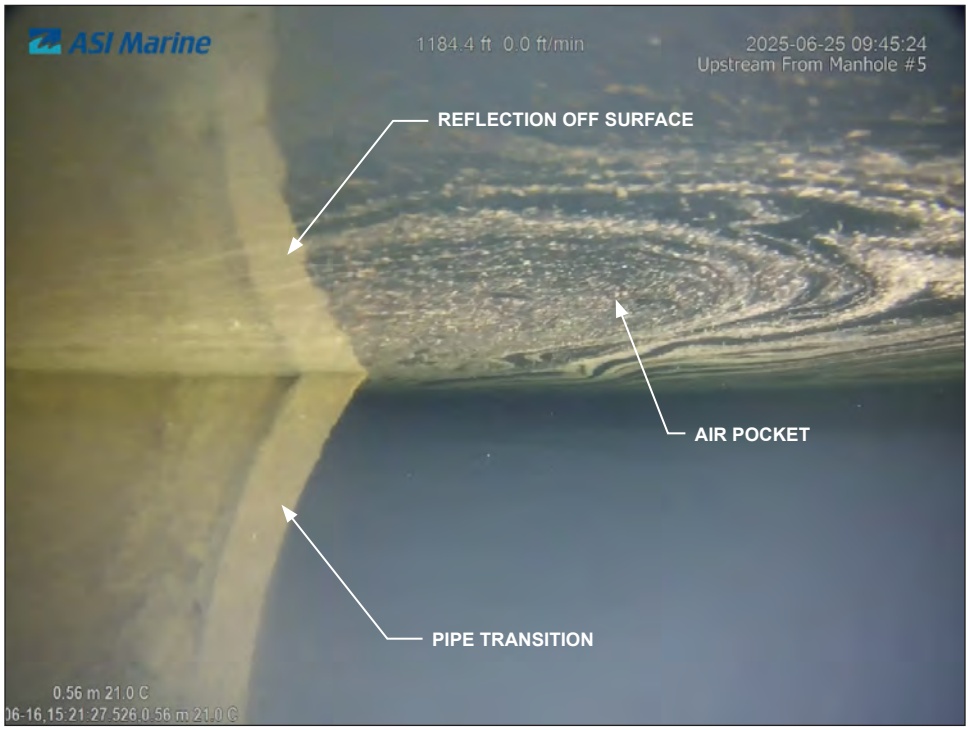



Image 6-2: Storm Drain, STA 0+43; transition from upstream pipe into Manhole #1 chamber, looking upstream.

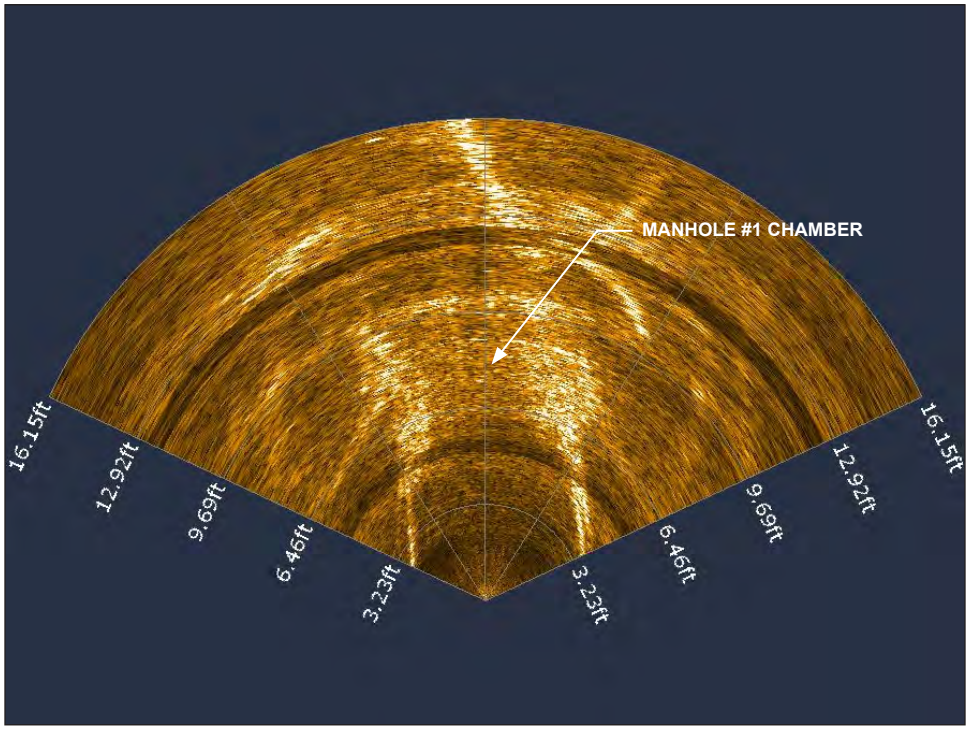



Image 6-3: Storm Drain, STA 0+50; sonar still of Manhole #1 chamber ahead with bend, looking upstream.

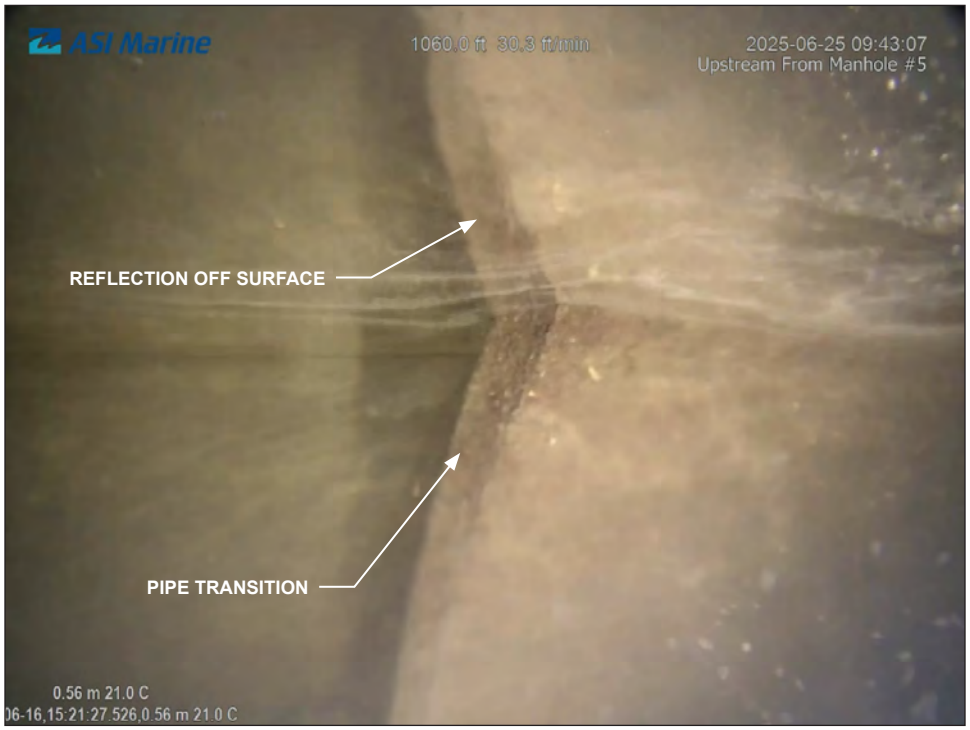



Image 6-4: Storm Drain, STA 1+67; transition from upstream pipe into Manhole #2 chamber, looking upstream.

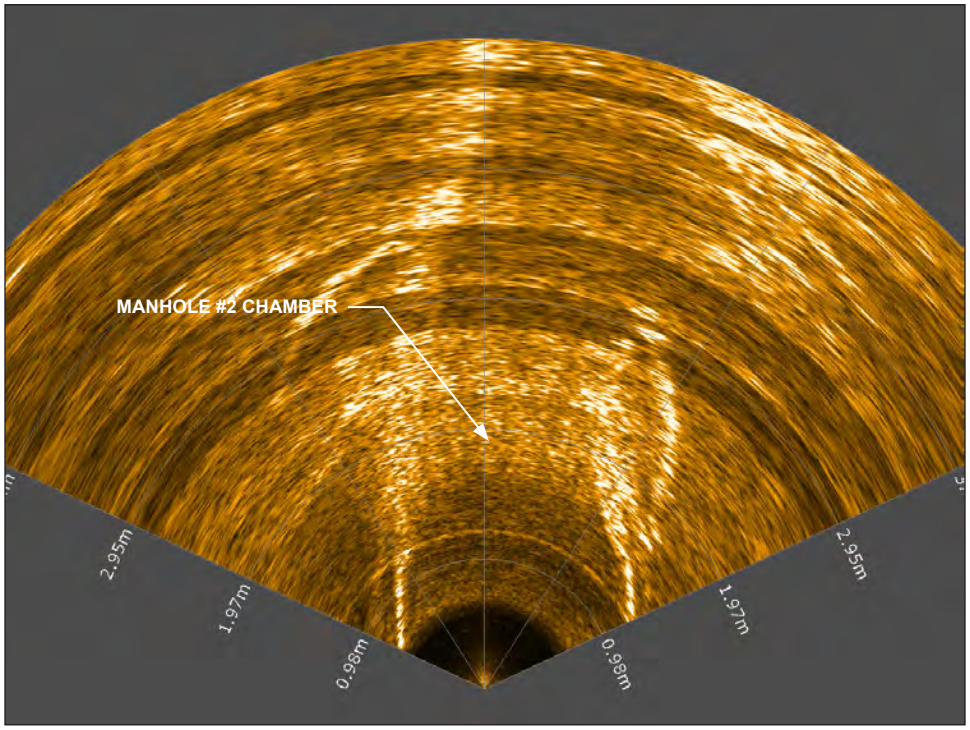



Image 6-5: Storm Drain, STA 1+81; sonar still of Manhole #2 chamber ahead with bend, looking upstream.




Image 6-6: Storm Drain, STA 5+26; transition from upstream pipe into Manhole #3 chamber, looking upstream.

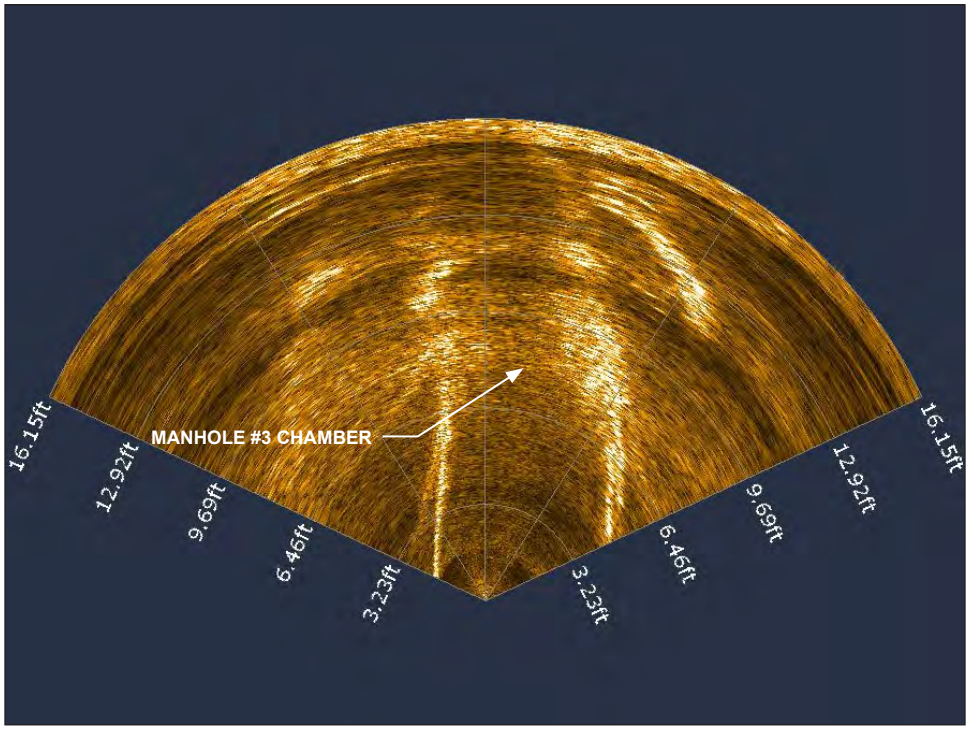



Image 6-7: Storm Drain, STA 5+56; sonar still of Manhole #3 ahead with bend, looking upstream.

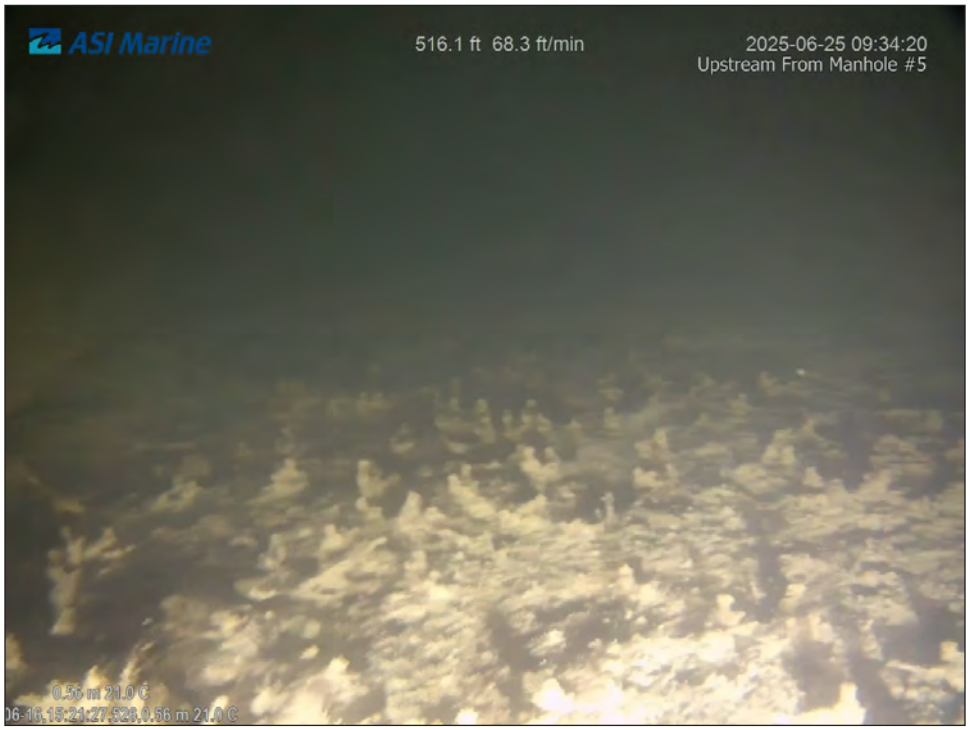



Image 6-8: Storm Drain, STA 7+11; sediment on invert, looking upstream.




Image 6-9: Storm Drain, STA 7+90; example of typical joint, mussel present, looking upstream.

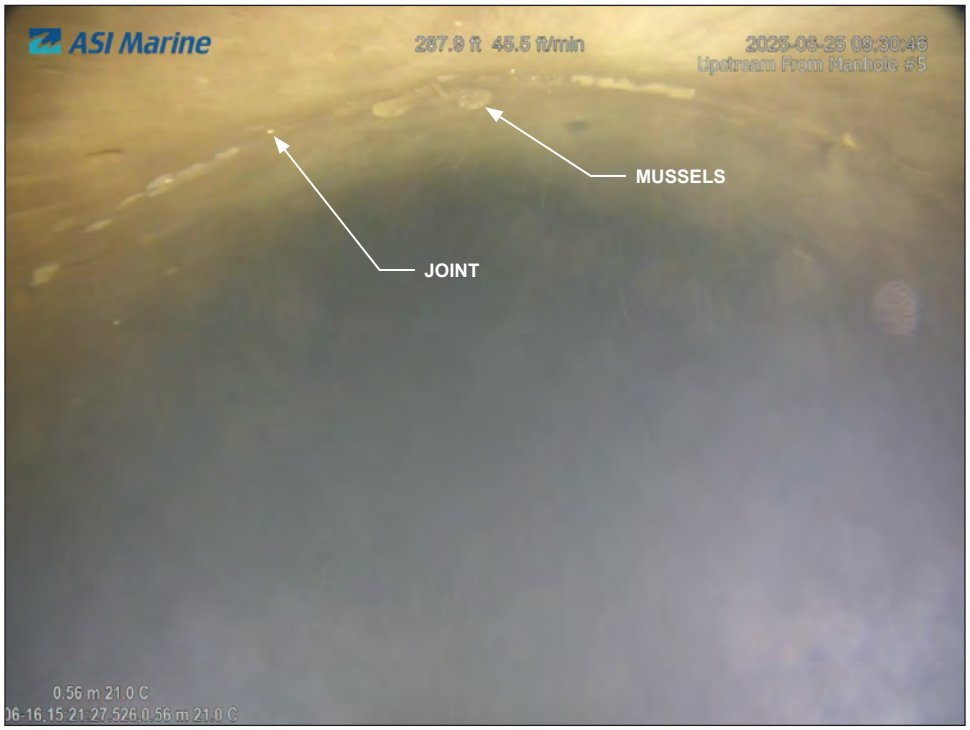



Image 6-10: Storm Drain, STA 9+39; example of typical joint, mussels present, looking upstream.




Image 6-11: Storm Drain, STA 9+57; wood debris, trash, and sediment on invert, looking upstream.

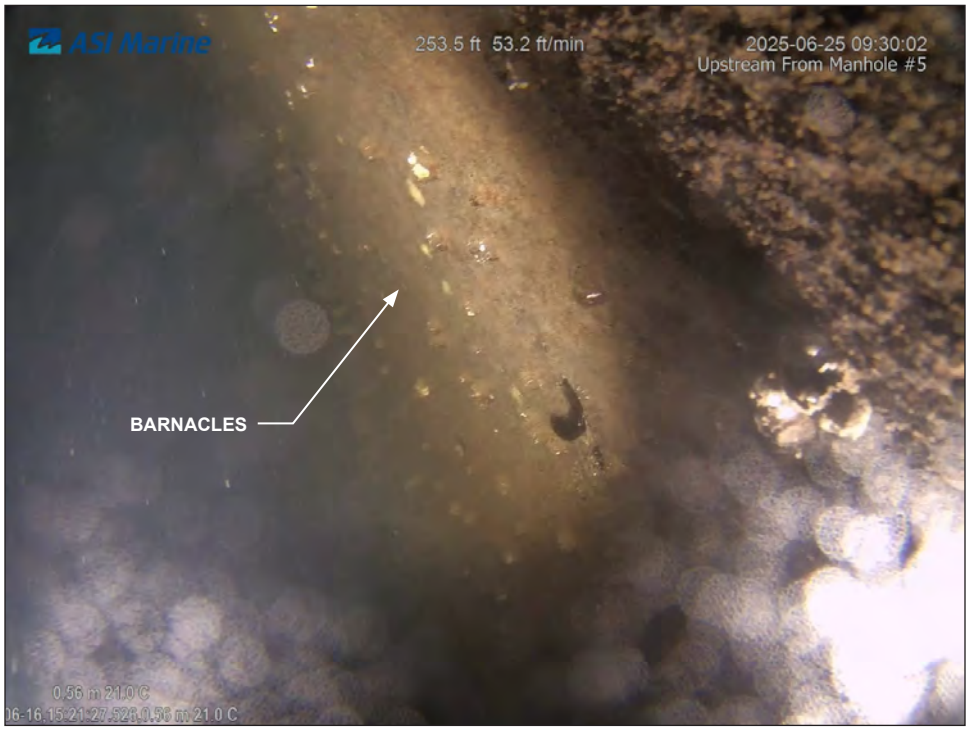



Image 6-12: Storm Drain, STA 9+74; example of barnacles at 10 o'clock position, looking upstream.

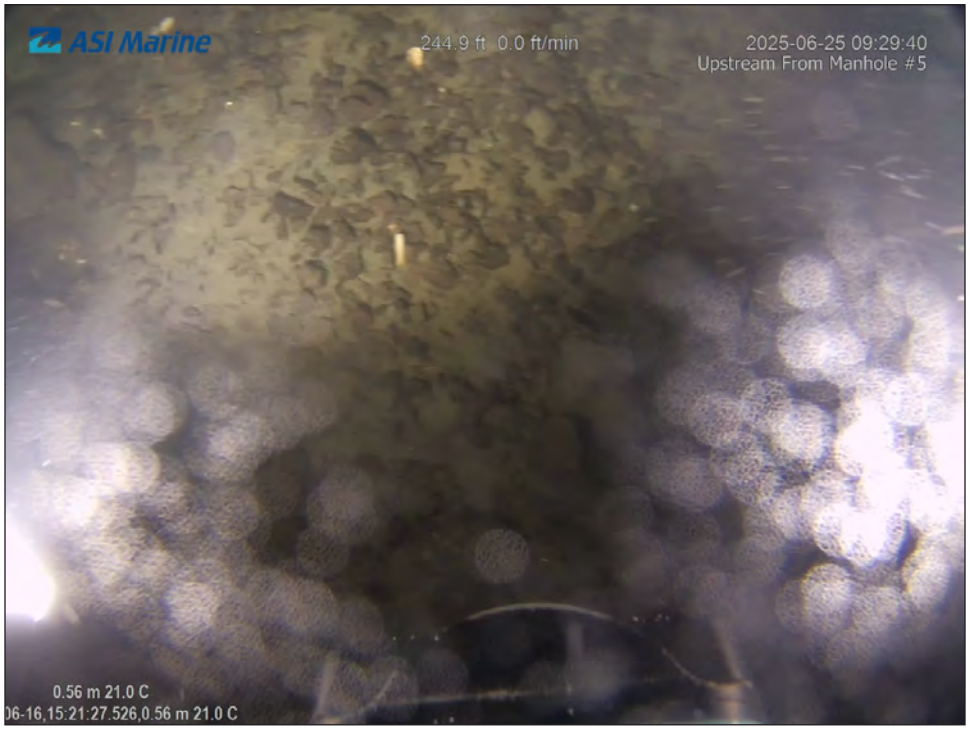



Image 6-13: Storm Drain, STA 9+82; debris on invert of Manhole #4 chamber.

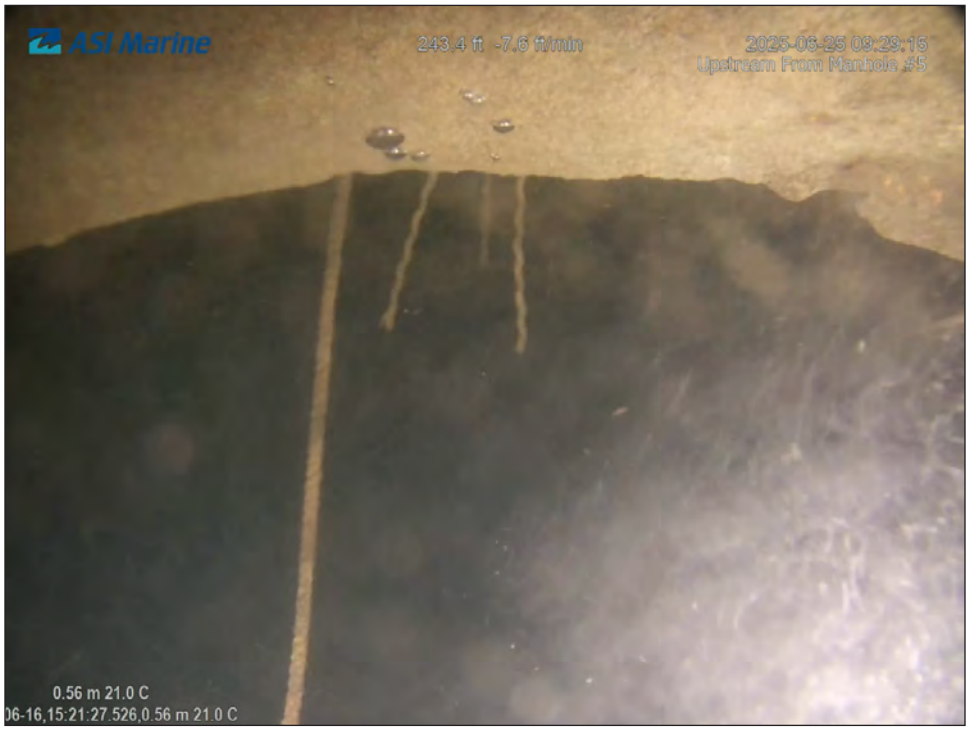



Image 6-14: Storm Drain, STA 9+84; rope hanging from crown of Manhole #4 chamber against transition into downstream pipe, looking upstream.

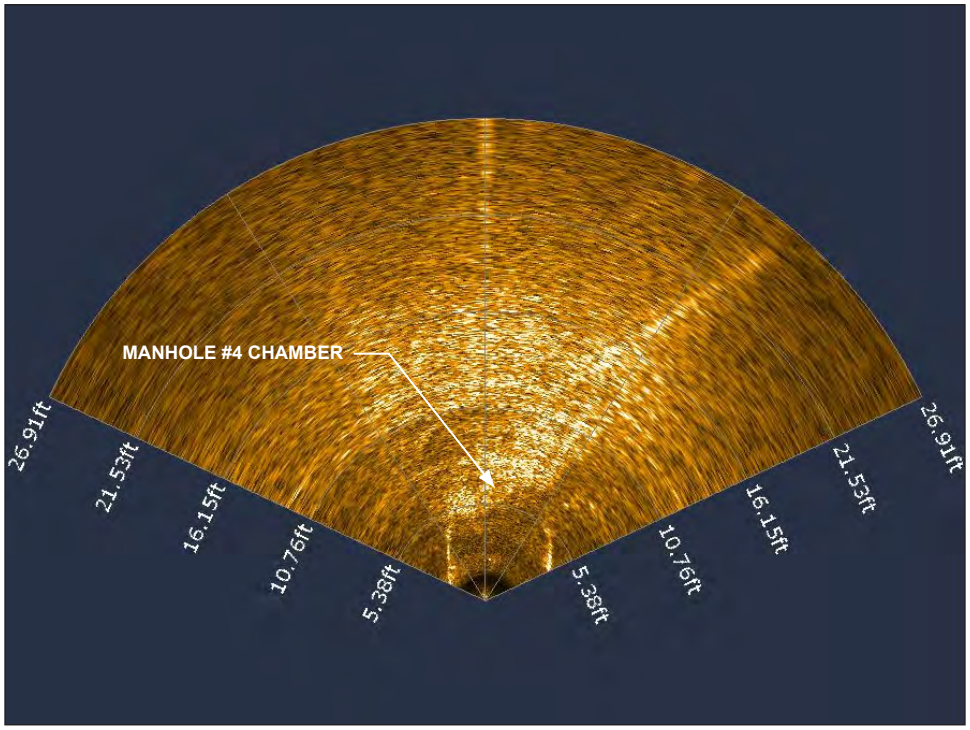



Image 6-15: Storm Drain, STA 9+86; sonar still of Manhole #4 ahead with bend, looking upstream.




Image 6-16: Storm Drain, STA 12+84; example of eel presence in pipe, looking downstream.

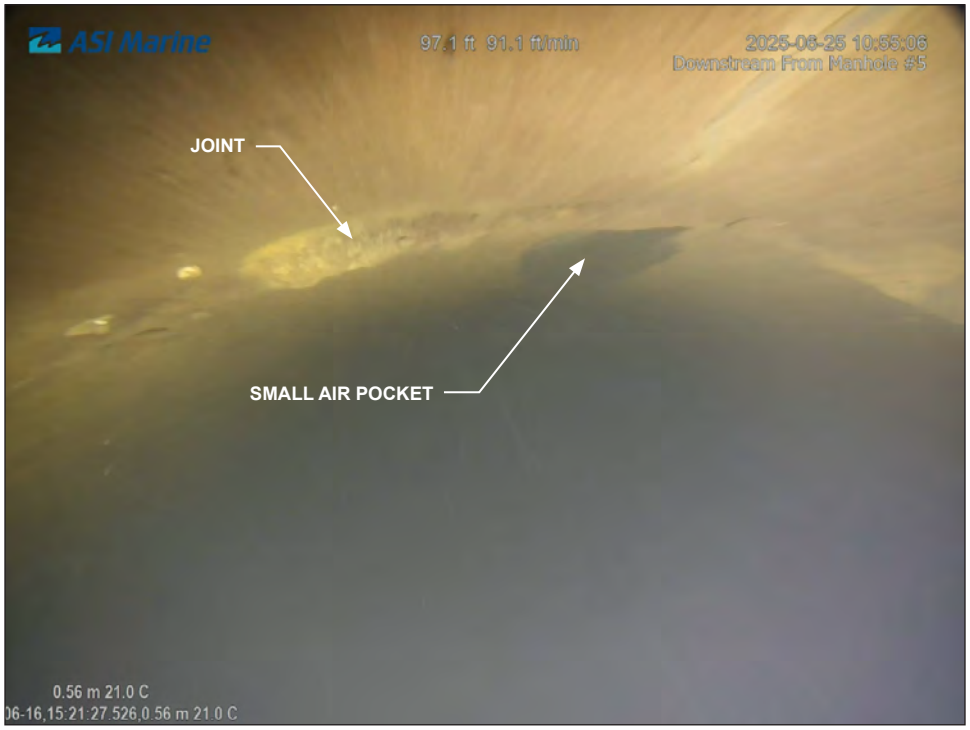



Image 6-17: Storm Drain, STA 13+24; example of typical joint, looking downstream.




Image 6-18: Storm Drain, STA 15+47; sediment on invert against tunnel-left, looking downstream.

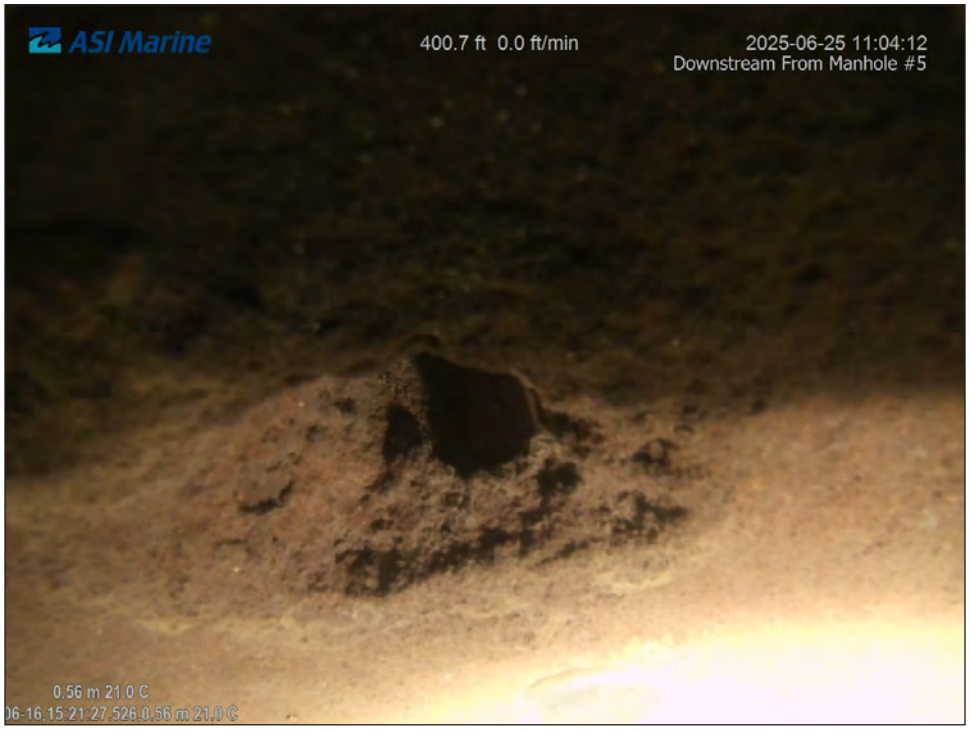



Image 6-19: Storm Drain, STA 16+28; man-made hole on crown.

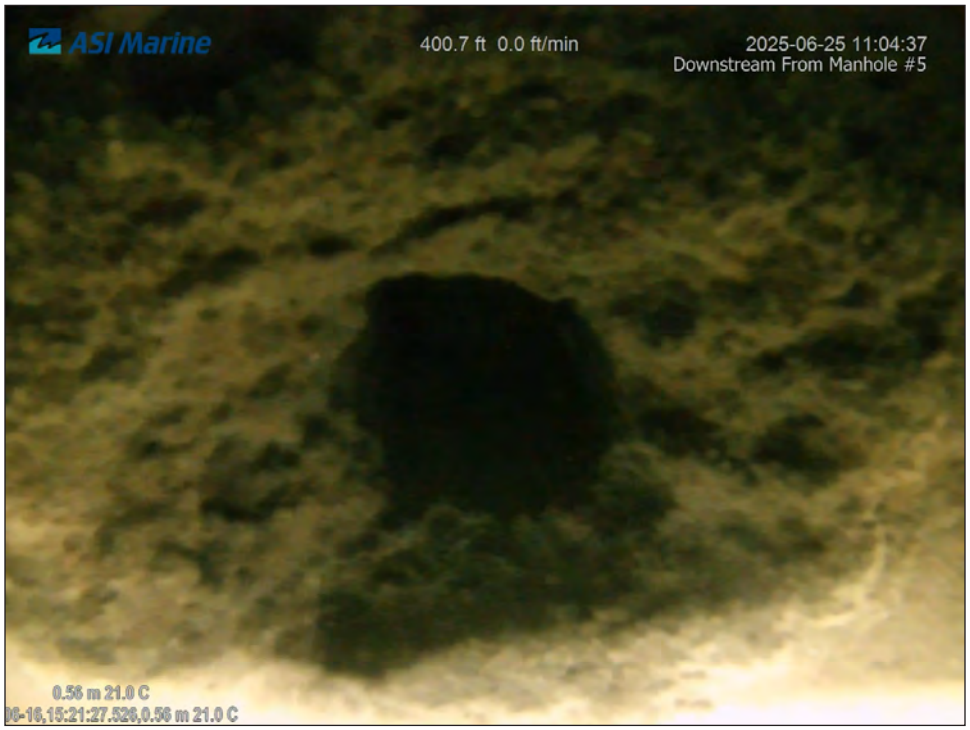



Image 6-20: Storm Drain, STA 16+28; man-made hole on crown (same feature as seen in Image 6-19).

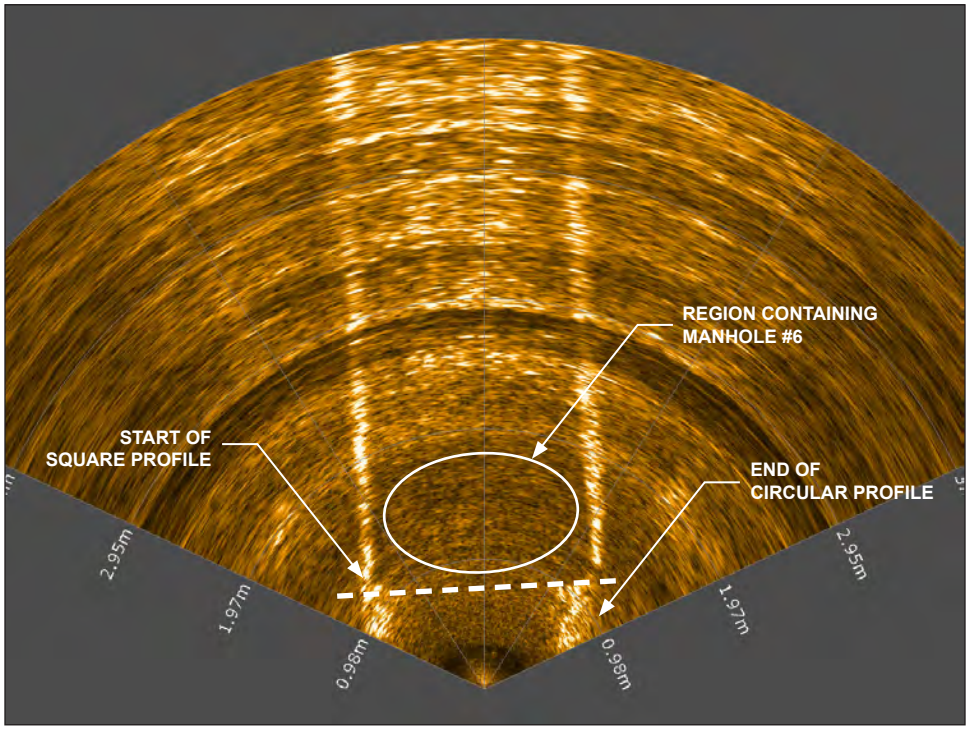



Image 6-21: Storm Drain, STA 16+38; sonar still of transition from round-profile section to square-profile section, looking downstream.




Image 6-22: Storm Drain, STA 16+42; Manhole #6 on crown of square-profile section of pipe, looking downstream.




Image 6-23: Storm Drain, STA 16+46; ledge on crown immediately downstream from Manhole #1, looking downstream.

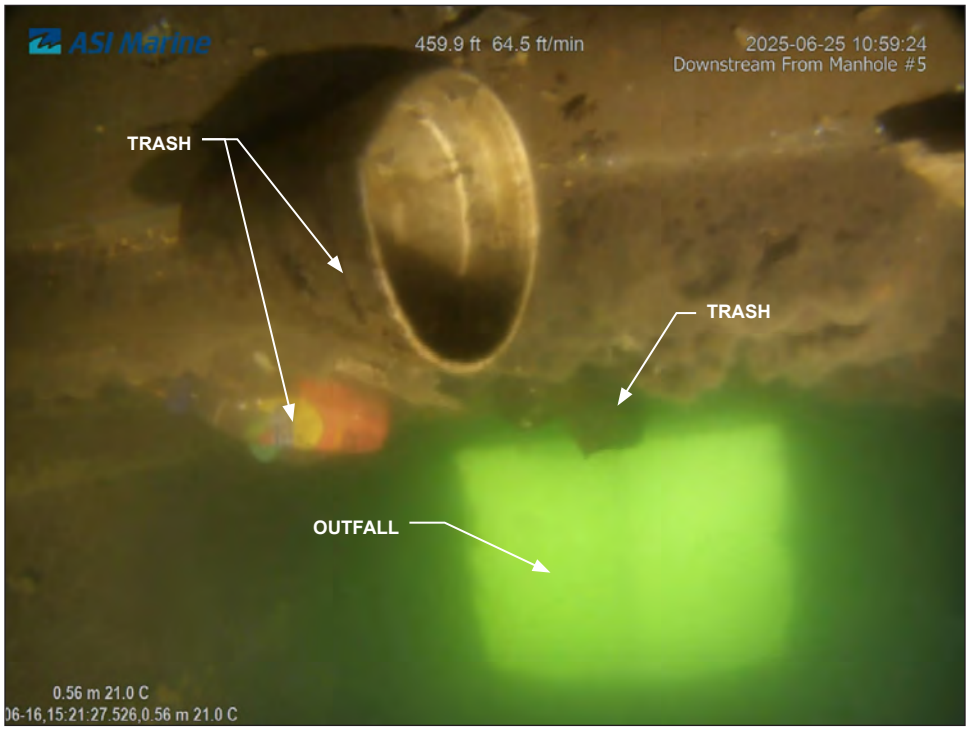



Image 6-24: Storm Drain, STA 16+87; trash on crown of square-profile section of pipe upstream of outfall, looking downstream.

# APPENDIX 7:

360-Degree Video Stills



Image 7-1: Manhole #1; 360-degree video still - manhole shaft.

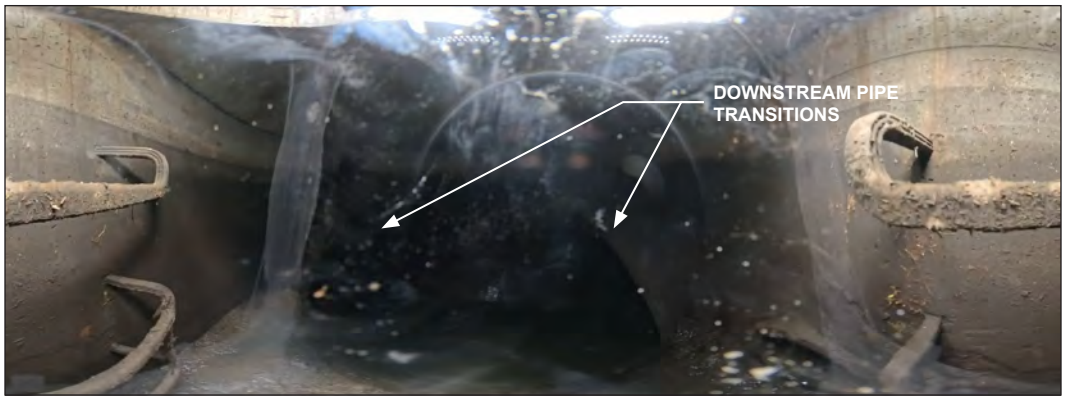



Image 7-2: Manhole #1; 360-degree video still - manhole chamber, upstream and downstream storm drain transitions.

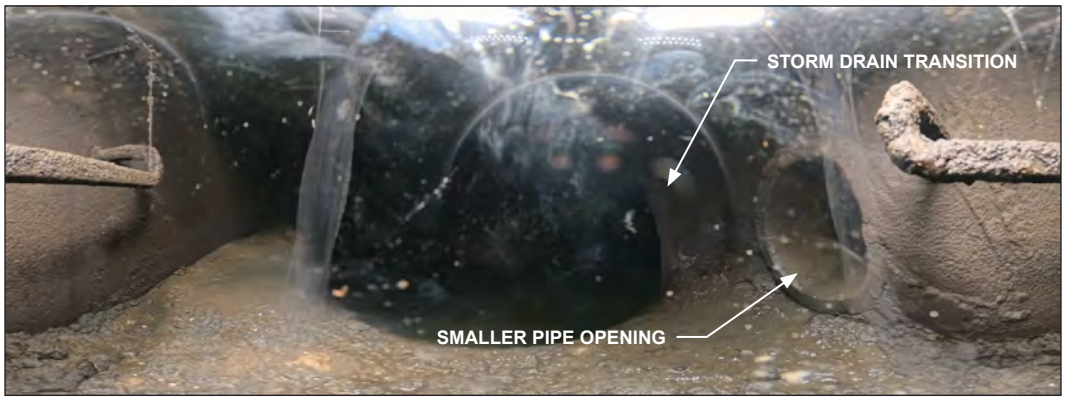



Image 7-3: Manhole #1; 360-degree video still - manhole chamber, storm drain transitions, smaller-diameter pipe opening.



Image 7-4: Manhole #3; 360-degree video still - manhole shaft.



Image 7-5: Manhole #3; 360-degree video still - manhole shaft.

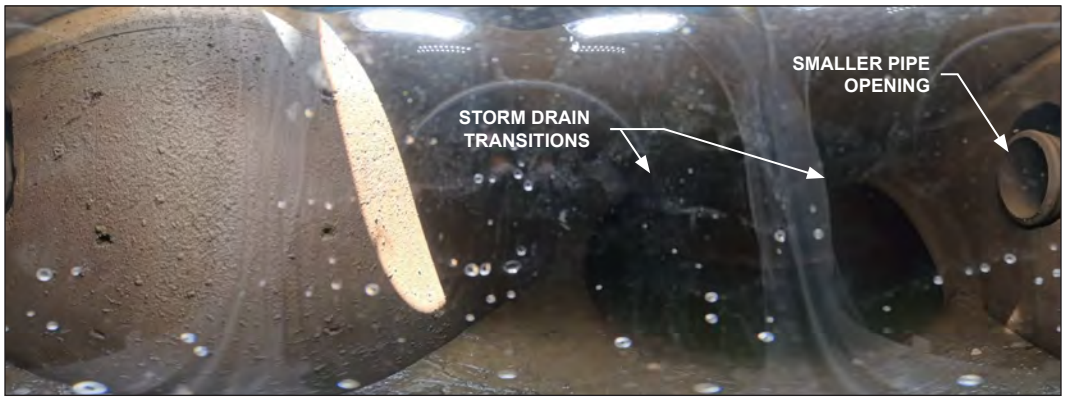



Image 7-6: Manhole #3; 360-degree video still - manhole chamber, storm drain transitions, smaller-diameter pipe opening.



Image 7-7: Manhole #4; 360-degree video still - manhole shaft.

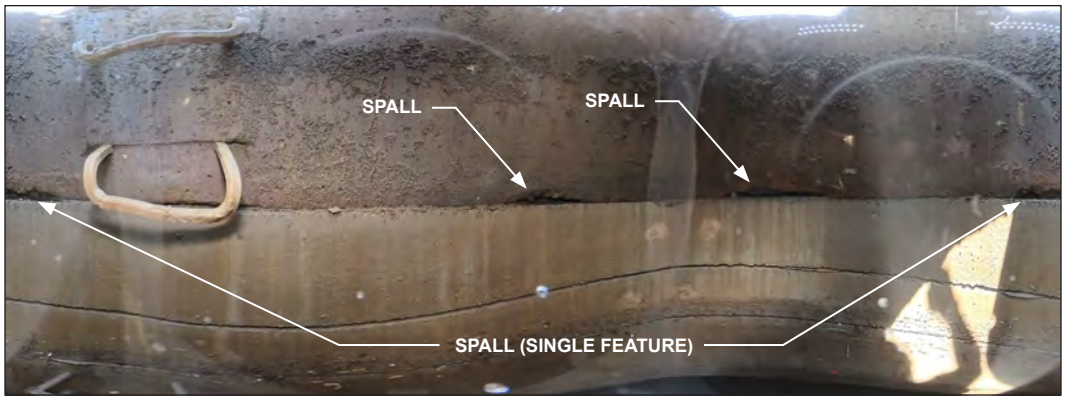



Image 7-8: Manhole #4; 360-degree video still - manhole shaft, small spalls.



Image 7-9: Manhole #4; 360-degree video still - manhole shaft.

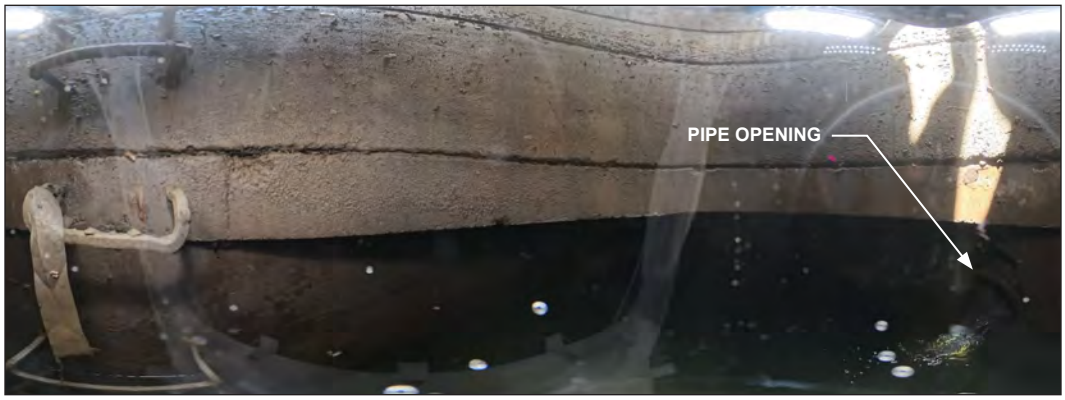



Image 7-10: Manhole #4; 360-degree video still - manhole shaft, smaller-diameter pipe opening.

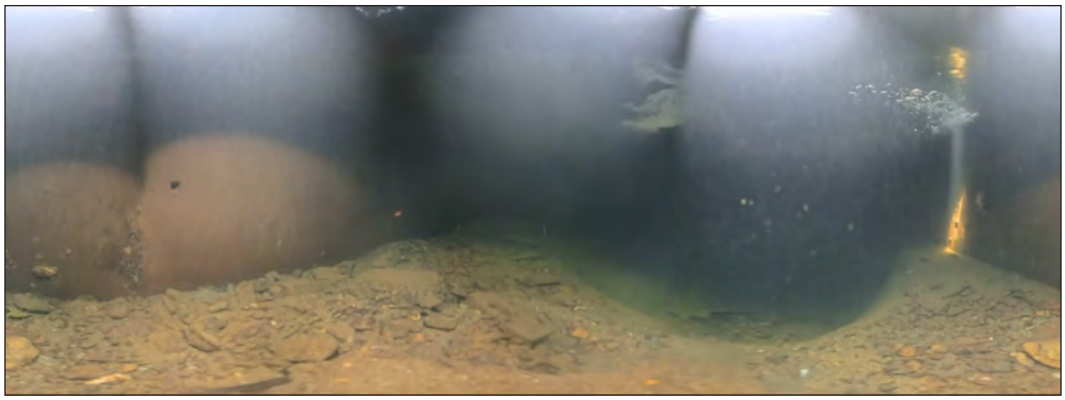


Image 7-11: Manhole #4; 360-degree video still - manhole chamber, sediment and debris on bottom.



Image 7-12: Manhole #5; 360-degree video still - manhole shaft.



Image 7-13: Manhole #5; 360-degree video still - manhole shaft.

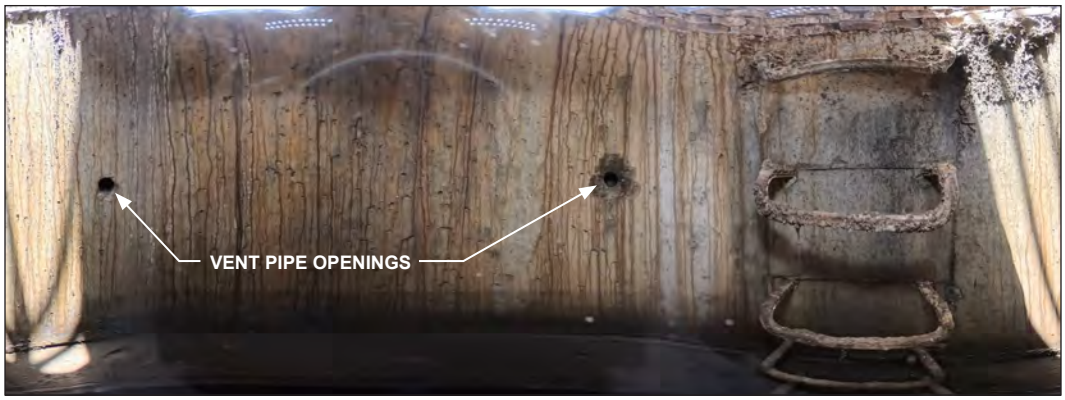



Image 7-14: Manhole #5; 360-degree video still - manhole shaft, vent pipe openings.

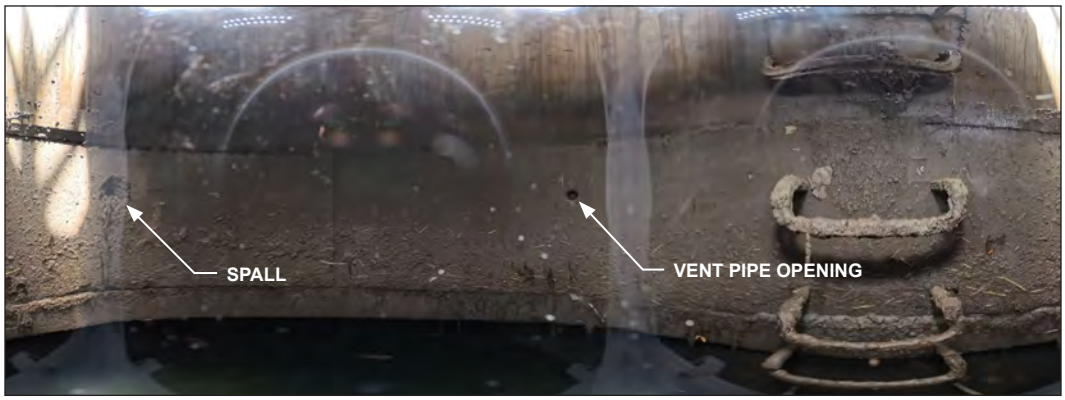



Image 7-15: Manhole #5; 360-degree video still - manhole shaft, spall, vent pipe opening.

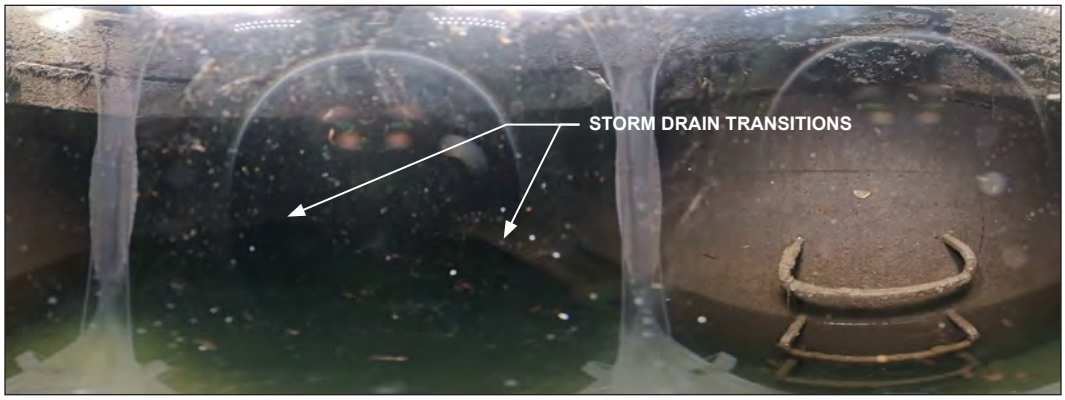



Image 7-16: Manhole #5; 360-degree video still - manhole chamber, storm drain transitions.



Image 7-17: Manhole #6; 360-degree video still - manhole shaft.



Image 7-18: Manhole #6; 360-degree video still - manhole shaft.




Image 7-19: Manhole #6; 360-degree video still - manhole shaft, ledge.

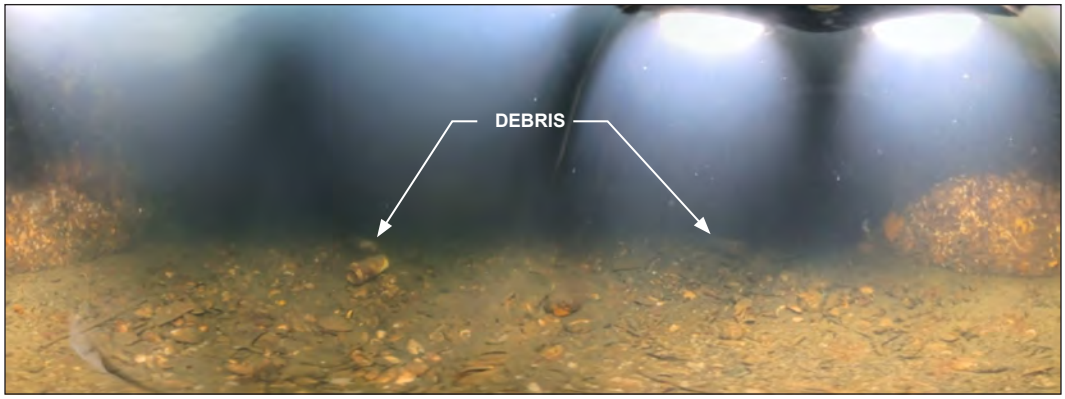



Image 7-20: Manhole #6; 360-degree video still - storm drain, sediment and debris on invert.

# APPENDIX 8:

## Media

(Provided separately for download via link)

**ATTACHMENT 10: LETTER – DRAINAGE MANHOLE BEARING CAPACITY FOR PROPOSED SHUSTER BULKHEAD (CIVIL & ENVIRONMENTAL CONSULTANTS, INC., OCTOBER 1, 2025)**

October 1, 2025

Mr. Doug Ernst, P.E.
Foth Infrastructure & Environment, LLC
8191 Birchwood Court, Suite L
Johnston, IA 50131

Subject: Drainage Manhole Bearing Capacity Letter
Proposed Shuster Bulkhead
4 Wright Street, New Bedford, Massachusetts 02740
CEC Project 332-344

Dear Mr. Ernst:

Civil & Environmental Consultants, Inc. (CEC) has prepared this letter to provide an allowable bearing capacity recommendation for a proposed drainage manhole structure supported on existing soil immediately adjacent to the proposed Shuster Bulkhead. This letter was prepared based on an email exchange on September 22, 2025 between Mr. Tony Sousa of CEC and Mr. Doug Ernst, Mr. Thomas Ciha and Mr. Christoper Pfrommer, all with Foth Infrastructure & Environment, LLC (Foth).

In the e mail exchange, the location of the proposed manhole was provided as well as drawings depicting the proposed manhole. Based on the correspondence and our review of the provided drawings, the following information was utilized to perform the bearing capacity analysis:

- Maximum allowable total settlement: 1 inch
- Elevation at the bottom of the structure: - 3 feet
- Total bearing area of the manhole is 9 feet by 11 feet.
- The area around the manhole will be subjected to HS-40 loading.

To perform the analysis and develop the bearing capacity recommendation, CEC utilized subsurface data provided in the report titled “Geotechnical Data Report” for the proposed Shuster Bulkhead, prepared by CEC dated November 13, 2024, revised April 4, 2025. Boring CEC-14A from the report was identified as the closest and most representative boring relative to the location of the proposed manhole structure. Subsurface conditions at this boring location consisted of loose to very dense sandy fill from the ground surface to El. -5 feet, underlain by about 4 feet of loose to medium dense silty glacial outwash, in turn underlain by dense glacial till soils and bedrock.

Mr. Doug Ernst, P.E. - Foth Infrastructure & Environment, LLC
CEC Project 332-344
October 1, 2025

Based on the information provided to us by Foth and the anticipated subsurface conditions, CEC recommends using a net allowable bearing capacity of 3,000 pounds per square foot (psf) for design of the manhole structure. CEC can provide more detailed recommendations for earthwork construction and subgrade preparation if requested by Foth. In addition, if design of the manhole is changed such that the information used to perform the bearing capacity analysis is no longer valid, CEC should be contacted to revise our recommendations accordingly.

CEC appreciates the opportunity to be of service to you on this project. Please call Tony Sousa at (774) 409 2640 if you have any questions or comments.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Amanda Bucco, EIT
Staff Consultant

Antonio E. Sousa, P.E.
Project Manager

**ATTACHMENT 11: PROJECT MEMORANDUM - PRELIMINARY SOIL INVESTIGATION FOR SHUSTER BULKHEAD (CIVIL & ENVIRONMENTAL CONSULTANTS, INC., MARCH 8, 2024)**

# PROJECT MEMORANDUM

To: Tim Griffin, Massachusetts Clean Energy Center

From: Jon Kitchen

Date: March 8, 2024

Subject: Preliminary Soil Investigation
Shuster Bulkhead – 4 Wright Street, New Bedford, Massachusetts
CEC Project 332-344

Dear Tim:

This memo documents the results of a Preliminary Soil Investigation conducted at the Shuster Bulkhead area of 4 Wright Street in New Bedford, Massachusetts in anticipation of future repair work. This memo was prepared by Civil & Environmental Consultants, Inc. (CEC) on behalf of the Massachusetts Clean Energy Center (MassCEC) through a subcontract with Foth infrastructure & Environment, LLC (Foth).

The purpose of this Preliminary Soil Investigation was to assess the environmental and geotechnical characteristics of the soils within three cofferdam sections at the Shuster Bulkhead. MassCEC plans to reconstruct the bulkhead at the site and requires soil characteristics for disposal and reuse purposes.

## Scope of Services

The specific activities that were conducted are outlined below:

- The advancement of soil borings with soil sample collection (to refusal or upon discovery of medium-dense material) at three locations across the site.
- The collection and field screening of soil samples to evaluate soil characteristics for environmental and geotechnical purposes, and to evaluate the implications of potential soil impacts for the reuse and/or disposal of the soils at the site.
- Environmental soil sample submission for the analysis of polychlorinated biphenyls (PCBs), Massachusetts Contingency Plan (MCP) metals, and semi-volatile organic compounds (SVOCs). The list of target analytes was based upon those contaminants that have impacted that ability to dispose of soil from the MassCEC property in the past or are expected to have a high potential to impact disposal options.

- Geotechnical soil sample submission for the analyses of moisture content, grain size, and organic material analyses to evaluate the geotechnical characteristics of the soils.

**Background**

The MassDEP – Bureau of Waste Site Cleanup Phase 1 Site Assessment Map (attached) indicates that the Subject Properties are located adjacent to a Federal Emergency Management Agency (FEMA) 100-year Floodplain. The nearby Acushnet River is classified by the Natural Heritage & Endangered Species Program (NHESP) as a Priority Habitat of Rare Species. There are no public drinking water supply wells or drinking water resource areas within a ¼ mile of the Subject Property. The surrounding area consist of industrial/commercial properties associated with the fishing industry.

**Regulatory Reporting Criteria**

Measured concentrations of any oil or hazardous material in soil were compared to the applicable Reportable Concentrations (RCs) at the current location of the soil.

The Reportable Concentration Categories are generally described as follows:

Reporting Category RCS-1 is applied to all soil samples collected:

- Within 500 feet of a residential dwelling, residentially zoned area, school, playground, recreational area; or
- Within the geographic boundaries of a groundwater resource area.

Reporting Category RCS-2 is applied to all soil samples:

- That are not obtained from category RCS-1 areas.

For the purposes of this investigation, CEC has determined that RCS-2 criteria apply at this location since it is not within 500 feet of a residential dwelling, residentially zoned area, school, playground, recreational area, or within the geographic boundaries of a groundwater resource area.

**Subsurface Soil Investigation**

Table 1 (attached) is a Summary of Soil Data showing only analytes that were detected in at least one sample. Complete laboratory analytical reports are also attached.

Between November 15 & 16, 2023, CEC collected soil samples from three boring locations at the site, to environmentally characterize soil that may need to be managed during construction, and to assess the geotechnical characteristics of the soils for reuse purposes.
CEC subcontracted Geosearch, Inc. to advance boring locations with drilling equipment. The boring locations are shown on Figure 2, attached. Soil borings CEC-1-A, CEC-2-A, and CEC-3-A were advanced to depths between 29.2 feet and 31 feet below grade.

**Environmental**

A total of four soil samples were submitted at each soil boring location. Soil samples selected for laboratory analysis at each boring location were selected based on field observations, PID readings, and/or anticipated need for displacement during construction. All samples were placed into appropriate glassware and submitted to ESS Laboratories (ESS) of Cranston, Rhode Island. Samples were analyzed for parameters including PCBs, MCP Metals, and SVOCs. All soil samples submitted for analysis were below the applicable MassDEP RCS-2 Reportable Concentrations.

**Geotechnical**

The following geotechnical laboratory tests were performed on select samples obtained during the drilling program:

- Moisture content in accordance with ASTM D2216 “Determination of Water Content of Soil and Rock by Mass”;
- Grain size analysis in accordance with ASTM D6913 “Particle-Size Distribution of Soils Using Sieve Analysis”; and
- Organic material analysis in accordance with ASTM D2974 “Determination of Water Content, Ash Content, and Organic Material of Peat and Other Organic Soils”.

The moisture content, percent fines (percent passing the #200 sieve), and organic content are shown on the boring logs attached and the full geotechnical laboratory test results, also attached.

**Conclusion**

Concentrations of PCBs, SVOCs, and metals in soil were all below the RCS-1 and RCS-2 reportable concentrations at the site, except for one sample (CEC-2-A 26-28). At CEC-2-A, the total PCB concentration was detected at a concentration of 1.1 mg/kg, which exceeds the applicable RCS-1 concentration of 1 mg/kg; however, soil at this location is not categorized as RCS-1. Therefore, concentrations triggering a 120-day Reportable Condition to Massachusetts

Department of Environmental Protection (MassDEP) per 310 CMR 40.0315 of the Massachusetts Contingency Plan (MCP) do not exist.

For disposal purposes, all soils may have the potential to be reused at a < RCS-1 soil reclamation facility, except soils from boring location CEC-2-A. Additionally, all soils may have the potential to be reused at a < RCS-2 soil reclamation facility, and a lined or unlined landfill; however, requirements vary at each facility based upon permits and future sampling and evaluation would be required. Further investigations, including additional soil sampling and analysis for additional analytical parameters, are necessary to accurately characterize and quantify the soils across the site that may require management during future construction.

For geotechnical purposes, it appears that most of the soil material has re-use potential due to the material being sandy without a high number of fines (generally less than 10 percent). However, the gravel content is relatively low, so the soils may be used for general purpose backfill but not as heavy lift fill or base course fill directly below pavements. In addition, most of the soil material is below groundwater which may lead to increased time for the soils to dry out properly if re-use as backfill is expected for future development of the site. Additional geotechnical sampling is required to fully characterize the soils prior to re-use.

## Limitations

This report presents CEC's field observations and results as they existed on the dates of the Limited Subsurface Investigation activities. Environmental evaluations and conclusions are inherently limited as environmental conditions change with time. Conclusions are drawn from information obtained during CEC's evaluation as they existed on the date of the site sampling. Conditions inferred to exist between sampling points may differ significantly from the conditions that actually exist there. The activities documented herein were intended to evaluate whether specific impacts were present at the site and did not necessarily meet regulatory guidelines, as may be required of the party responsible for the impact. Therefore, it should be recognized that alternate and/or more rigorous assessment methods may produce different results.

Chemical data presented herein are applicable to the location, time of sample collection, and the parameters analyzed. Chemical conditions may change with time. Reported conditions may not represent current or future conditions. Chemical concentrations between sampling points may differ.

The conclusions expressed herein have been developed as a result of site assessment, field observations, and research by Civil & Environmental Consultants, Inc. (CEC) personnel. CEC

makes no claims or representations (implicit or explicit) as to the completeness or accuracy of information or data developed and provided by others.

**Attachments**

1. Figure 1: Site Plan with Boring Locations
2. Table 1: Soil Analytical
3. MassDEP Phase I Site Assessment Map
4. Boring Logs
5. Environmental Laboratory Reports
6. Geotechnical Laboratory Reports

**FIGURE 1: SITE PLAN WITH BORING LOCATIONS**

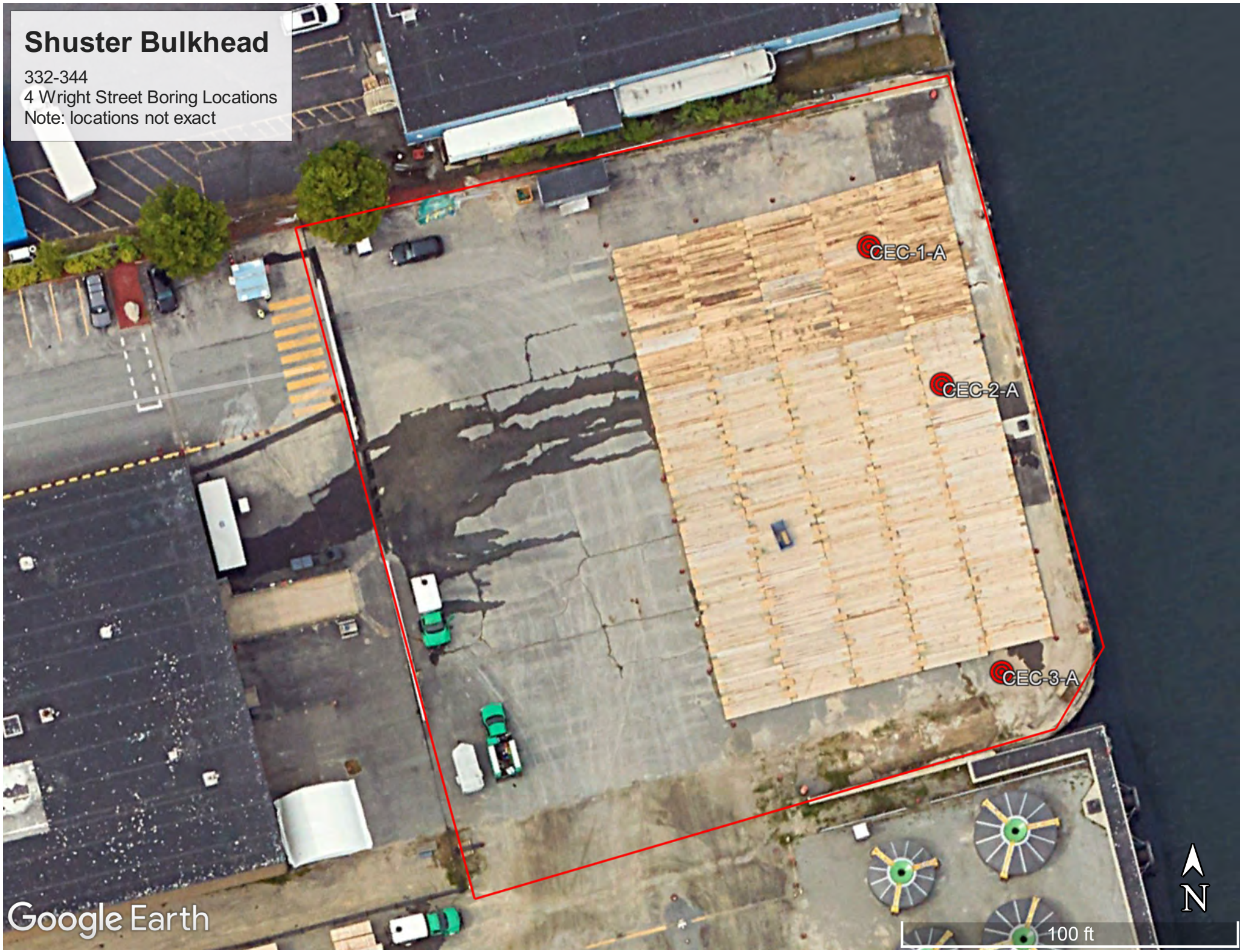

Shuster Bulkhead
332-344
4 Wright Street Boring Locations
Note: locations not exact
CEC-1-A
CEC-2-A
CEC-3-A
Google Earth
100 ft
N

**TABLE 1: SOIL ANALYTICAL DATA**

Table 1
Soil Analytical Data
MassCEC
New Bedford, MA

| Shuster Bulkhead - 4 Wright Street, New Bedford, Massachusetts | | | | | | | | | | | | | Reuse Levels | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | CEC-1-A 0-6 | CEC-1-A 10-12 | CEC-1-A 16-18 | CEC-1-A 22-24 | CEC-2-A 0-4 | CEC-2-A 12-14 | CEC-2-A 24-26 | CEC-2-A 26-28 | CEC-3-A 0-4 | CEC-3-A 6-8 | CEC-3A 18-20 | CEC-3-A 24-26 | | | | |
| Sample Depth (feet) | 0-6 | 10-12 | 16-18 | 22-24 | 0-4 | 12-14 | 24-26 | 26-28 | 0-4 | 6-8 | 18-20 | 24-26 | | | | |
| PID Reading (ppmv) | 0.0 | 0.4 | 0.1 | 0.1 | 0.2 | 0.2 | 0.1 | 0.1 | 0.3 | 0.1 | 0.2 | 0.1 | | | | |
| Sample Date | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | Unlined Landfills | Lined Landfills | RCS-1 | RCS-2 |
| Laboratory Sample ID | 23K0532-01 | 23K0532-02 | 23K0532-03 | 23K0532-04 | 23K0532-05 | 23K0532-06 | 23K0532-07 | 23K0532-08 | 23K0532-09 | 23K0532-10 | 23K0532-11 | 23K0532-12 | | | | |
| **SVOCSs (mg/kg)** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | 100 | varies | varies |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | | | |
| Barium | 7.50 | 5.77 | 5.86 | 5.72 | 6.81 | 6.60 | 12.90 | 7.19 | 11.60 | 6.57 | 7.87 | 3.38 | NS | NS | 1,000 | 3,000 |
| Beryllium | 0.16 | 0.14 | 0.15 | <0.11 | 0.15 | 0.15 | 0.23 | 0.21 | 0.15 | 0.17 | 0.15 | <0.1 | NS | NS | 90 | 200 |
| Chromium | 4.65 | 3.36 | 3.56 | 4.18 | 4.58 | 4.04 | 14.50 | 9.08 | 7.05 | 4.35 | 8.94 | 3.21 | 1000 | 1000 | 100 | 200 |
| Lead | 4.71 | <4.54 | <4.93 | <4.95 | 6.95 | <4.92 | 22.5 | 8.88 | 7.97 | <5.04 | <5.18 | 8.53 | 2000 | 1000 | 200 | 600 |
| Mercury | <0.031 | <0.038 | <0.037 | <0.033 | <0.034 | <0.035 | 0.138 | <0.037 | <0.031 | <0.036 | <0.038 | <0.037 | 10 | 10 | 20 | 30 |
| Nickel | 4.65 | 3.82 | 3.82 | 3.38 | 4.54 | 4.41 | <6.3 | 5.30 | 5.81 | 4.77 | 5.28 | <2.2 | NS | NS | 600 | 1,000 |
| Vanadium | 5.24 | 4.61 | 4.52 | 5.07 | 5.15 | 4.63 | 9.34 | 6.89 | 6.58 | 5.69 | 4.94 | 2.93 | NS | NS | 400 | 700 |
| Zinc | 15.1 | 11.4 | 12.6 | 12.0 | 14.5 | 12.8 | 46.0 | 25.4 | 16.2 | 16.6 | 14.1 | 18.0 | NS | NS | 1,000 | 3,000 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | | | |
| Aroclor 1248 | <0.05 | <0.06 | <0.06 | <0.05 | <0.05 | <0.06 | 0.6 | 0.3 | <0.05 | <0.06 | <0.06 | 0.3 | NS | NS | - | - |
| Aroclor 1254 | <0.05 | <0.06 | <0.06 | <0.05 | <0.05 | <0.06 | 0.5 | 0.2 | <0.05 | <0.06 | <0.06 | 0.2 | NS | NS | - | - |
| **Total PCBs** | <0.05 | <0.06 | <0.06 | <0.06 | <0.05 | <0.06 | 1.1 | 0.5 | <0.05 | <0.06 | <0.06 | 0.5 | <2 | <2 | 1 | 4 |

Notes:
Laboratory analytical results compared to RCS-2 Massachusetts Contingency Plan Reportable Concentrations
Table shows only detected analytes
PCBs = Polychlorinated Biphenyls;
PID = photo ionization detector; ppmv = parts per million volumetric;
All data reported in mg/kg = milligrams per kilogram.
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
**Bold** = exceeds applicable MassDEP MCP Standard RCS-2
PID calibrated with Isobutylene with a Response Factor of 1.0
Reuse levels based on Massachusetts Department of Environmental Protection's "Reuse and Disposal of Contaminated Soil at Massachusetts Landfills Department of Environmental Protection Policy # Comm-97-001"

**MASSDEP PHASE I SITE ASSESSMENT MAP**

# MassDEP - Bureau of Waste Site Cleanup

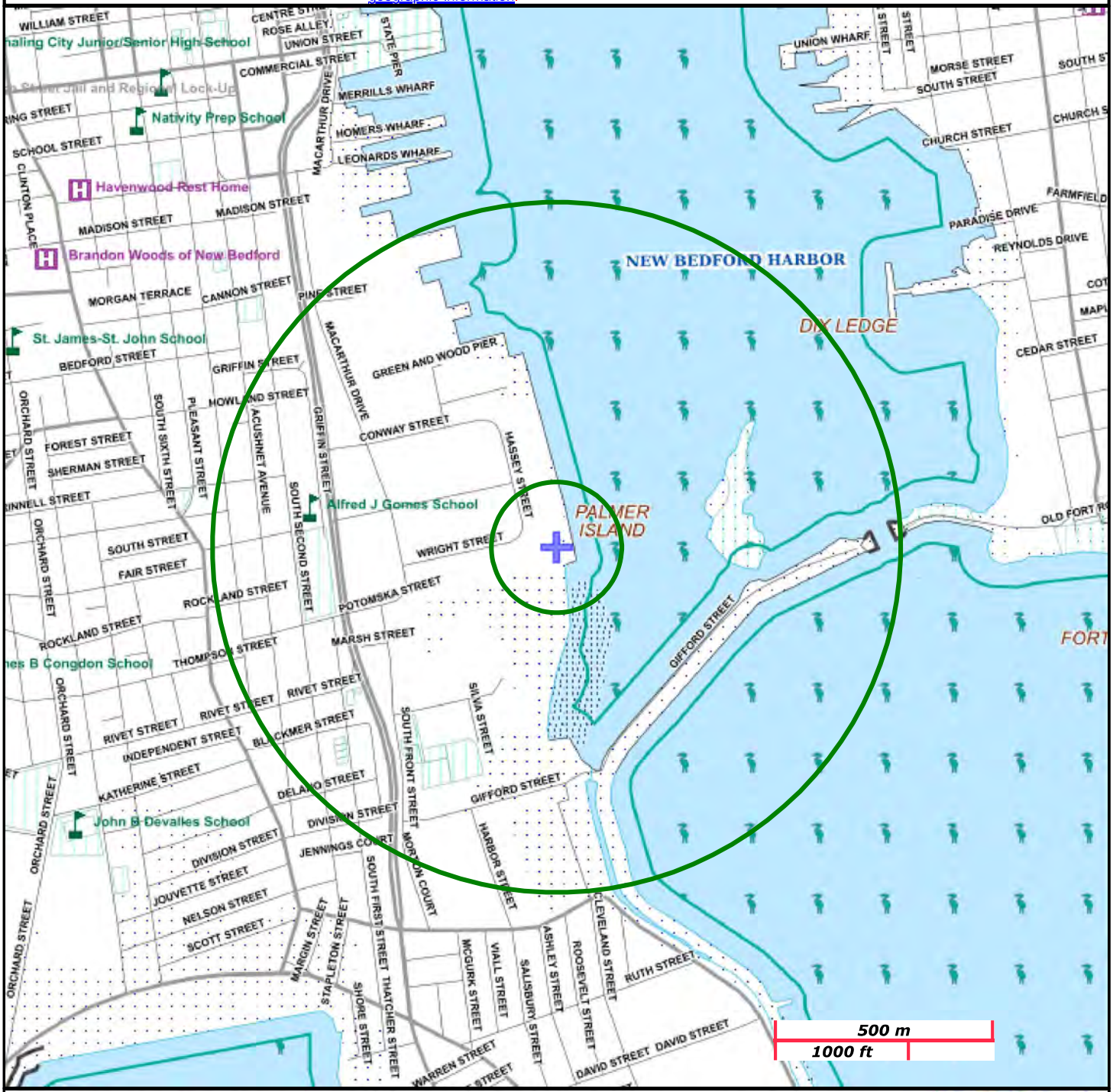
## Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

**Site Information:**
SHUSTER BULKHEAD - 4 WRIGHT STREET
4 WRIGHT STREET NEW BEDFORD, MA

NAD83 UTM Meters:
4609827mN , 340468mE (Zone: 19)
February 22, 2024

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: https://www.mass.gov/orgs/massgis-bureau-of-geographic-information.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection




Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source

Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A

Hydrography: Open Water, PWS Reservoir, Tidal Flat

Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100yr Floodplain; Protected Open Space; ACEC

NHESP Pri-Hab of Rare Species; Vernal Pool: Cert., Potential

Solid Waste Landfill; PWS: Com.GW,SW, Emerg., Non-Com.

**BORING LOGS**

# Rock Types

| Rock Name | Characteristics | Symbol |
|---|---|---|
| Claystone | Clay sized particles that are consolidated, lacking fissility. | |
| Coal | Black and shiny, can break into cubes or conchoidally. | |
| Conglomerate | Gravel sized grains and larger held together by finer material, called a breccia if clasts are angular. | |
| Limestone | Effervesses w/ diluted HCl, can be composed of clay up to gravel particles (fossils). | |
| Sandstone | Primarily sand sized particles modified w/ the descriptor fine, medium, or coarse. | |
| Shale | Clay sized particles, shale has fissility which is a horizontal sheet-like or laminated feature. | |
| Siltstone | Composed of silt, normally breaks as irregular chunks. | |

# Rock Quality Descriptions

## Weathering

**Completely Weathered:** All rock material is decomposed and/or disintegrated. The original rock structure may still be intact.

**Highly Weathered:** More than half of the rock material is decomposed. Fresh rock is present only as a discontinuous framework or as corestones.

**Moderately Weathered:** Less than half of the rock material is decomposed. Fresh rock is present at a discontinuous framework or as corestones.

**Slightly Weathered:** Discoloration or staining indicates weathering of rock material on discontinuity surfaces. Rock may be discolored and softened.

**Fresh:** No visible signs of rock material weathering.

## RQD

| Descriptor | % |
|---|---|
| Very Poor | <25 |
| Poor | 25-50 |
| Fair | 50-75 |
| Good | 75-90 |
| Excellent | >90 |

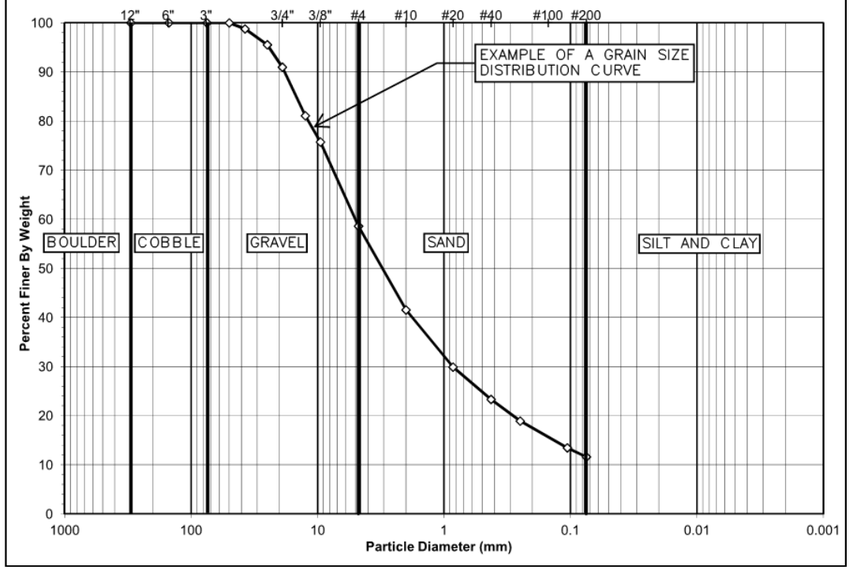
## Brokenness

| Descriptor | Fracture Spacing (in & ft) |
|---|---|
| Very Broken | <1 (<0.08) |
| Broken | 1-3 (0.08-0.25) |
| Moderately Broken | 3-6 (0.25-0.5) |
| Slightly Broken | >6 (>0.5) |

## Rock Hardness

| Descriptor | Field Criterion | Relative Unconfined Compressive Strength |
|---|---|---|
| Very Hard | Difficult to break w/ Hammer | > 30,000 psi |
| Hard | Hand-held sample breaks w/ Hammer | 8,000 to 30,000 psi |
| Medium Hard | Cannot scrape surface w/ knife | 2,000 to 8,000 psi |
| Soft | Cutting or scraping w/ knife difficult | 500 to 2,000 psi |
| Very Soft | Can be cut w/ knife | < 500 psi |

# Grain Size Distribution Curve




## UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS
(more than 50% of material is larger than No. 200 sieve size.)

| | | | |
|---|---|---|---|
| GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size | Clean Gravels (Less than 5% fines) | GW | Well-graded gravels, gravel-sand mixtures, little or no fines |
| | | GP | Poorly-graded gravels, gravel-sand mixtures, little or no fines |
| | Gravels with fines (More than 12% fines) | GM | Silty gravels, gravel-sand-silt mixtures |
| | | GC | Clayey gravels, gravel-sand-clay mixtures |
| SANDS 50% or more of coarse fraction smaller than No. 4 sieve size | Clean Sands (Less than 5% fines) | SW | Well-graded sands, gravelly sands, little or no fines |
| | | SP | Poorly graded sands, gravelly sands, little or no fines |
| | Sands with fines (More than 12% fines) | SM | Silty sands, sand-silt mixtures |
| | | SC | Clayey sands, sand-clay mixtures |

FINE-GRAINED SOILS
(50% or more of material is smaller than No. 200 sieve size.)

| | | | |
|---|---|---|---|
| SILTS AND CLAYS Liquid limit less than 50% | | ML | Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity |
| | | CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays |
| | | OL | Organic silts and organic silty clays of low plasticity |
| SILTS AND CLAYS Liquid limit 50% or greater | | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts |
| | | CH | Inorganic clays of high plasticity, fat clays |
| | | OH | Organic clays of medium to high plasticity, organic silts |
| HIGHLY ORGANIC SOILS | | PT | Peat and other highly organic soils |

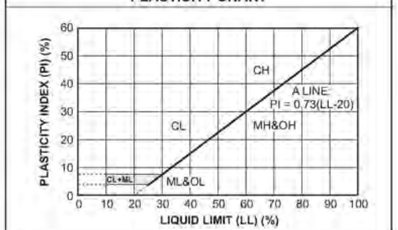
## LABORATORY CLASSIFICATION CRITERIA

| | | |
|---|---|---|
| GW | $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3 | |
| GP | Not meeting all gradation requirements for GW | |
| GM | Atterberg limits below "A" line or P.I. less than 4 | Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols |
| GC | Atterberg limits above "A" line with P.I. greater than 7 | |
| SW | $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3 | |
| SP | Not meeting all gradation requirements for GW | |
| SM | Atterberg limits below "A" line or P.I. less than 4 | Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols |
| SC | Atterberg limits above "A" line with P.I. greater than 7 | |

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

| | |
|---|---|
| Less than 5 percent | GW, GP, SW, SP |
| More than 12 percent | GM, GC, SM, SC |
| 5 to 12 percent | Borderline cases requiring dual symbols |

## PLASTICITY CHART




# Glossary

**Alluvial Soil or Alluvium:** Soil deposited by water in a river, stream, floodplain, or delta.

**Bedrock:** Materials underlying soil or other unconsolidated surficial materials in which refusal is consistently encountered on lithified, undisturbed, natural bedrock.

**Colluvial Soil or Colluvium:** Incoherent soil on or at the base of a slope deposited by gravity or slope movement.

**Fill:** Soil derived from natural soil, rock, or processed materials that was placed by artificial methods, such as construction, waste disposal, or dumping.

**Glacial Outwash:** Soil, typically sand and gravel, deposited by glacial streams or meltwater in a preexisting valley or over a plain.

**Glacial Till:** Soil deposited by and underneath a glacier, generally consisting of a heterogeneous, unstratified mixture of clay, sand, gravel, and boulders.

**N-Value:** The blow count representation of the penetration resistance of the soil determined by the Standard Penetration Test (SPT). It is the sum of the number of blows required to drive the sampler the second and third 6-inch increments (sample depth interval of 6 to 18 inches) and is recorded in blows per foot (bpf). The N-value is considered to be an indication of the relative density of coarse-grained soils (sand and gravel) or consistency of fine-grained soils (silt and clay).

**Pocket Pen (PP):** Field penetration test performed using a hand-held penetrometer that estimates unconfined compressive strength of cohesive soil in tons per square foot (tsf).

**Recovery %:** Total length of rock core or soil sample retrieved divided by the total length of the core run or sample interval, expressed as a percentage.

**Refusal:** The depth at which greater than 50 SPT hammer blows are required to drive the sampling spoon 6 inches or less.

**Residual Soil or Residuum:** Soil derived from the physical or chemical weathering of the underlying parent bedrock, generally with N-values less than 30 and 50 bpf in cohesive and cohesionless materials, respectively.

**Rock Quality Designation (RQD):** The sum of the length of intact rock core pieces longer than 4 inches (excluding mechanical breaks) divided by the total length of the core run, expressed as a percentage.

**Shelby Tube:** A 2" to 3" diameter, thin walled sampling tube that is pushed into the soil to obtain a relatively undisturbed soil sample for geotechnical laboratory tests.

**Split Spoon Sampler:** A soil sampling tube which is driven, retrieved, and split-open lengthwise for removal and visual inspection, and testing of the soil obtained.

**Standard Penetration Test (SPT) ASTM D1586 :** Field penetration test consisting of driving a 2-inch outside diameter split-spoon sampler 18 inches using a 140-pound hammer free falling a distance of 30 inches. The number of blows required to advance the spoon through successive 6-inch increments is recorded to determine the N-value.

**Weathered Rock:** Materials derived from lithified, undisturbed, natural bedrock which are able to be sampled with a split-spoon. Cohesive and cohesionless materials generally have N-values greater than 30 and 50 bpf, respectively.

# N-Value Rating

### Fine-Grained Soils (Silt and Clay)

| Consistency | Blows/ft | PP (tsf) |
|---|---|---|
| Very Soft | 0-2 | <0.25 |
| Soft | 3-4 | 0.25-0.5 |
| Medium Stiff | 5-8 | 0.5-1 |
| Stiff | 9-15 | 1-2 |
| Very Stiff | 16-32 | 2-4 |
| Hard | >32 | >4 |

### Coarse-Grained Soils (Sand and Gravel)

| Relative Density | Blows/ft |
|---|---|
| Very Loose | 0-4 |
| Loose | 5-10 |
| Medium Dense | 11-30 |
| Dense | 31-50 |
| Very Dense | >50 |

# Unconsolidated Material

| Term | Grain Size in mm (in) | Approximate Example Size |
|---|---|---|
| Clay and Silt | <.075 | can't see grains to barely visible |
| Fine Sand | 0.075-0.4 | table salt to sugar |
| Med. Sand | 0.4-2.0 (~<1/16) | openings in a window screen |
| Coarse Sand | 2.0-4.75 (~1/16-1/8) | sidewalk salt |
| Gravel | 4.75-75 (~1/8-3) | pea to tennis ball |
| Cobble | 75-300 (3-12) | tennis ball to basketball |
| Boulder | >300 (>12) | larger than a basketball |

**Other Features** – Used to describe other identifiable, pertinent features (e.g., angularity of coarse-grained soils, organics, construction debris, etc.)

| Term | % |
|---|---|
| Trace | < 5 |
| Few | 5-15 |
| Some | 15-45 |

**Moisture Content**
Dry: Sample is dusty or obviously dry.
Moist: Anything that does not fit the definition of dry or wet.
Wet: Sample contains free water.

Civil & Environmental Consultants, Inc.

Definitions of Standard Terms and Symbols

# BORING NUMBER CEC-1-A



Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/14/2023 **DATE COMPLETED** 11/14/2023
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624358 **LONGITUDE** -70.914750
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/14/2023 6.0 ft / Elev 2.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | | 0.3 ft 3" Asphalt | 7.7 | | | | | |
| | | Light Brown, POORLY-GRADED SAND WITH SILT, FEW GRAVEL, Dry, Medium Dense, SP-SM, **(FILL)** | | SS S-1 | 70 | 10-11-13-12 (24) | | 0.0 |
| | | 2.0 ft | 6.0 | | | | | |
| | | Light Brown, Silty Sand, Trace Gravel, Dry to Moist, Medium Dense To Dense, SM, **(FILL)** | | SS S-2 | 70 | 16-19-15-19 (34) | | 0.0 |
| 5 | | | | SS S-3 | 65 | 12-6-14-13 (20) | | 0.1 |
| | | | | SS S-4 | 85 | 11-8-9-7 (17) | | 0.1 |
| | | 8.0 ft | 0.0 | | | | | |
| | | Brown, Poorly-Graded Sand with Silt, Trace Gravel, Wet, Loose, SP-SM, **(FILL)** | | SS S-5 | 55 | 3-2-3-3 (5) | | 0.3 |
| 10 | | 10.0 ft | -2.0 | -2 | | | | |
| | | Brown, Poorly-Graded Sand with Silt, Few Gravel, Wet, Very Loose, SP-SM, **(FILL)** | | SS S-6 | 65 | 2-1-2-1 (3) | | 0.4 |
| | | 12.0 ft | -4.0 | | | | | |
| | | Brown, POORLY-GRADED SAND WITH SILT, FEW GRAVEL, Wet, Loose, SP-SM, **(FILL)** | | SS S-7 | 55 | 2-2-3-5 (5) | | 0.2 |
| | | 14.0 ft | -6.0 | | | | | |
| 15 | | Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Very Loose to Loose, SP-SM, **(FILL)** | | SS S-8 | 65 | 5-1-2-1 (3) | | 0.1 |
| | | 17.5 ft | -9.5 | | | | | |
| | | 18.0 ft Dark Brown, Slightly Organic Silty Sand, Trace Gravel, Trace Shells, Wet, Loose, SM, **(OUTWASH)** | -10.0 | SS S-9 | 80 | 3-3-1-9 (4) | | 0.5 |
| | | Brown, Silty Sand with Gravel, Wet, Very Dense, SM, **(TILL)** | | SS S-10 | 90 | 13-23-30-31 (53) | | 0.2 |
| 20 | | 20.0 ft | -12.0 | -12 | | | | |
| | | 21.0 ft Grayish Brown, Poorly-Graded Sand with Silt, Few Gravel, Wet, Dense, SP-SM, **(TILL)** | -13.0 | SS S-11 | 100 | 15-16-28-29 (44) | | 0.1 |
| | Split Spoon Refusal at 23.8' bgs. | Gray, Silty Sand, Trace Gravel, Wet, Very Dense, SM, **(TILL)** | | SS S-12 | 91 | 12-30-37-50 /0.3' (67) | | 0.5 |
| 25 | | | | SS S-13 | 90 | 14-32-44-32 (76) | | 0.2 |
| | | | | SS S-14 | 75 | 29-25-25-29 (50) | | 0.5 |
| | Split Spoon And Roller Bit Refusal at 29.8' bgs. | | | SS S-15 | 83 | 28-20-31-50 /0.3' (51) | | 0.1 |
| 30 | | 29.8 ft End of boring at 29.8 feet | -21.8 | -22 | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-2-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/14/2023 **DATE COMPLETED** 11/15/2023
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624247 **LONGITUDE** -70.914672
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/14/2023 8.0 ft / Elev 0.0 ft
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
AT END OF CORING N/A
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 0.2 ft 3" Asphalt | 7.8 | | | | | |
| | | | Tan, Poorly-Graded Sand with Silt, Dry to Moist, Medium Dense to Dense, SP-SM, **(FILL)** | | SS S-1 | 75 | 9-10-10-17 (20) | | 0.2 |
| | | | | | SS S-2 | 75 | 15-19-19-19 (38) | | 0.1 |
| | | | 4.0 ft | 4.0 | | | | | |
| 5 | | | | | SS S-3 | 70 | 10-7-7-8 (14) | | 0.1 |
| | | | 6.0 ft | 2.0 | | | | | |
| | | | Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Moist to Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-4 | 70 | 6-6-7-7 (13) | | 0.2 |
| | | | | | SS S-5 | 50 | 2-4-7-5 (11) | | 0.1 |
| 10 | | | 10.0 ft | -2.0 | -2 | | | | |
| | | | Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-6 | 70 | 5-5-7-9 (12) | | 0.3 |
| | | | 12.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | -4.0 | SS S-7 | 90 | 4-5-10-14 (15) | | 0.2 |
| 15 | | | | | SS S-8 | 55 | 7-12-16-24 (28) | | 0.1 |
| | | | | | SS S-9 | 55 | 7-5-9-14 (14) | | 0.3 |
| | | | 18.0 ft Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Loose, SP-SM, **(FILL)** | -10.0 | SS S-10 | 75 | 6-4-5-6 (9) | | 0.2 |
| 20 | | | 20.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | -12.0 -12 | SS S-11 | 90 | 5-7-10-12 (17) | | 0.2 |
| | | | | | SS S-12 | 70 | 5-6-7-7 (13) | | 0.1 |
| | | | 24.0 ft Brown, POORLY-GRADED SAND WITH SILT, FEW GRAVEL, Wet, Loose, SP-SM, **(FILL)** | -16.0 | SS S-13 | 75 | 4-5-3-4 (8) | | 0.1 |
| 25 | | | 26.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | -18.0 | SS S-14 | 95 | 5-9-15-36 (24) | | 0.2 |
| | | | | | SS S-15 | 75 | 15-11-13-22 (24) | | 0.1 |
| 30 | | Split spoon refusal at 31' bgs | 30.0 ft Gray, Silty Sand with Gravel, Wet, Very Dense, SM, **(TILL)** | -22.0 -22 | SS S-16 | 100 | 7-32-50/0' | | 0.4 |
| | | | 31.0 ft End of boring at 31.0 feet | -23.0 | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

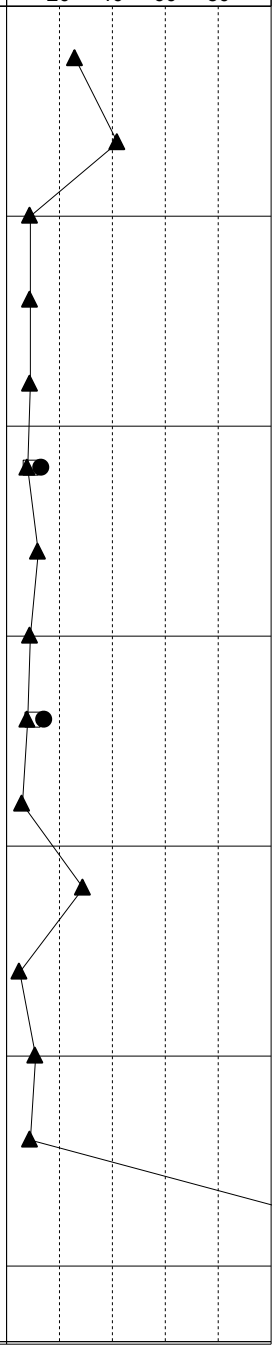
# BORING NUMBER CEC-3-A



Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/15/2023 **DATE COMPLETED** 11/15/2023
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624011 **LONGITUDE** -70.914611
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/15/2023 4.0 ft / Elev 4.0 ft
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
AT END OF CORING N/A
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | ELEVATION (ft) | MATERIAL DESCRIPTION | REMARKS | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8 | 0.2 ft / 7.8: 3" Asphalt | | | | | | |
| | | Tan, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)** | | SS S-1 | 60 | 7-9-17-16 (26) | | 0.1 |
| | | 2.0 ft / 6.0: Tan, Poorly-Graded Sand with Silt and Gravel, Dry, Dense, SP-SM, **(FILL)** | | SS S-2 | 65 | 15-27-15-13 (42) | | 0.3 |
| | | 4.2 ft / 3.8: Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Loose, SP-SM, **(FILL)** | | SS S-3 | 55 | 5-4-5-7 (9) | | 0.1 |
| 5 | | 7.0 ft / 1.0: Gray To Brown, Silty Sand with Gravel, Wet, | | SS S-4 | 75 | 7-5-4-7 (9) | | 0.1 |
| | | 8.0 ft / 0.0: Loose, SM, **(FILL)** Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Loose, SP-SM, **(FILL)** | | SS S-5 | 50 | 4-5-4-5 (9) | | 0.1 |
| 10 | -2 | 10.0 ft / -2.0: Brown, WELL-GRADED SAND WITH SILT AND GRAVEL, Wet, Loose, SW-SM, **(FILL)** | | SS S-6 | 55 | 2-2-6-5 (8) | | 0.1 |
| | | 12.0 ft / -4.0: Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Loose to Medium Dense, SP-SM, **(FILL)** | | SS S-7 | 70 | 4-5-7-9 (12) | | 0.1 |
| 15 | | | | SS S-8 | 50 | 6-4-5-6 (9) | | 0.1 |
| | | 16.0 ft / -8.0: Brown, WELL-GRADED SAND WITH SILT, FEW GRAVEL, Wet, Loose, SW-SM, **(FILL)** | | SS S-9 | 85 | 4-4-4-6 (8) | | 0.1 |
| | | 18.0 ft / -10.0: Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Loose to Medium Dense, SP-SM, **(FILL)** | | SS S-10 | 55 | 3-3-3-6 (6) | | 0.2 |
| 20 | -12 | | | SS S-11 | 60 | 9-13-16-24 (29) | | 0.0 |
| | | 22.0 ft / -14.0: Dark Gray, Silty Sand with Gravel, Trace Shells, Wet, Loose to Medium Dense, SM, **(FILL)** | | SS S-12 | 38 | 2-3-2-3 (5) | | 0.0 |
| 25 | | | | SS S-13 | 38 | 7-5-6-4 (11) | | 0.1 |
| | | 28.0 ft / -20.0: Gray, Silty Sand with Gravel, Trace Shells, Wet, Very Dense, SM, **(TILL)** | Split spoon refusal at 29.2' bgs. | SS S-14 | 56 | 2-5-4-9 (9) | | 0.0 |
| | | 29.2 ft / -21.2: End of boring at 29.2 feet | | SS S-15 | 64 | 25-50-55/0.2' (105) | | 0.0 |
| 30 | -22 | | | | | | | |



**ENVIRONMENTAL LABORATORY RESULTS**

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC - New Bedford (332-344)**
**ESS Laboratory Work Order Number: 23K0532**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

**REVIEWED**
**By ESS Laboratory at 3:05 pm, Nov 22, 2023**

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

## SAMPLE RECEIPT

The following samples were received on November 16, 2023 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 23K0532-01 | CEC-1-A 0-6 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-02 | CEC-1-A 10-12 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-03 | CEC-1-A 16-18 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-04 | CEC-1-A 22-24 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-05 | CEC-2-A 0-4 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-06 | CEC-2-A 12-14 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-07 | CEC-2-A 24-26 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-08 | CEC-2-A 26-28 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-09 | CEC-3-A 0-4 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-10 | CEC-3-A 6-8 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-11 | CEC-3A 18-20 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-12 | CEC-3-A 24-26 | Soil | 6010C, 7471B, 8082A, 8270D |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford ESS Laboratory Work Order: 23K0532

## PROJECT NARRATIVE

**8270D Semi-Volatile Organic Compounds**

D3K0381-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (128% @ 80-120%)

D3K0381-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4-Dinitrophenol (28% @ 20%), 2,6-Dinitrotoluene (21% @ 20%), 3,3′-Dichlorobenzidine (21% @ 20%)

D3K0394-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (125% @ 80-120%)

D3K0394-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4-Dinitrophenol (25% @ 20%), 3,3′-Dichlorobenzidine (21% @ 20%), Hexachlorobutadiene (22% @ 20%)

D3K0428-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (82% @ 80-120%)

D3K0428-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,6-Dinitrotoluene (21% @ 20%), 3,3′-Dichlorobenzidine (26% @ 20%), Benzo(g,h,i)perylene (22% @ 20%), bis(2-Ethylhexyl)phthalate (27% @ 20%), Butylbenzylphthalate (24% @ 20%), Di-n-octylphthalate (24% @ 20%), Indeno(1,2,3-cd)Pyrene (24% @ 20%)

**No other observations noted.**

**End of Project Narrative.**

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **23K0532-01 through 23K0532-12**

Matrices: ( ) Ground Water/Surface Water (x) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| ( ) 8260 VOC CAM II A | (x) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | (x) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (x) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | ( ) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (x) 6010 Metals CAM III A | ( ) 6020 Metals CAM III D | ( ) MassDEP EPH CAM IV B | ( ) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (x) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (x) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (x) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (x) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes ( ) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (x) No ( ) |

***Responses to Questions G, H and I below are required for '"Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? | Yes (x) No ( )* |
| | ***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.** | |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (x)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes (x) No ( )* |

****All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: November 22, 2023
Printed Name: Laur[illegible] Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.57) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Arsenic | ND (2.28) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Barium** | **7.50** (2.28) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Beryllium** | **0.16** (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Cadmium | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Chromium** | **4.65** (0.91) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Lead** | **4.71** (4.57) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Mercury | ND (0.031) | | 7471B | | 1 | AFV | 11/17/23 15:56 | 0.69 | 40 | DK31706 |
| **Nickel** | **4.65** (2.28) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Selenium | ND (4.57) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Silver | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Thallium | ND (4.57) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Vanadium** | **5.24** (0.91) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Zinc** | **15.1** (2.28) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1221 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1232 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1242 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1248 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1254 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1260 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1262 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1268 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *61 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *69 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.027) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4-Dichlorophenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4-Dimethylphenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4-Dinitrophenol | ND (1.08) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Chloronaphthalene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Chlorophenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Methylnaphthalene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Methylphenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Nitrophenol | ND (0.540) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 3+4-Methylphenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 4-Chloroaniline | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 4-Nitrophenol | ND (1.08) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Acenaphthene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Acenaphthylene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Acetophenone | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Aniline | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Anthracene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Azobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Benzo(a)anthracene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Benzo(a)pyrene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Benzo(b)fluoranthene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Butylbenzylphthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Chrysene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Dibenzofuran | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Diethylphthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Dimethylphthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Di-n-butylphthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Di-n-octylphthalate | ND (0.540) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Fluoranthene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Fluorene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Hexachlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Hexachlorobutadiene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Hexachloroethane | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Isophorone | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Naphthalene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Nitrobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| N-Nitrosodimethylamine | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Pentachlorophenol | ND (1.08) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Phenanthrene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Phenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Pyrene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *88 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *113 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *89 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *91 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *89 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *79 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *83 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *103 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.54) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Arsenic | ND (2.27) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Barium** | **5.77** (2.27) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Beryllium** | **0.14** (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Cadmium | ND (0.45) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Chromium** | **3.36** (0.91) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Lead | ND (4.54) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Mercury | ND (0.038) | | 7471B | | 1 | AFV | 11/17/23 15:58 | 0.61 | 40 | DK31706 |
| **Nickel** | **3.82** (2.27) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Selenium | ND (4.54) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Silver | ND (0.45) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Thallium | ND (4.54) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Vanadium** | **4.61** (0.91) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Zinc** | **11.4** (2.27) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85
Initial Volume: 20.3g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *64 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *67 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.030) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4-Dichlorophenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4-Dimethylphenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4-Dinitrophenol | ND (1.19) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Chloronaphthalene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Chlorophenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Methylnaphthalene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Methylphenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Nitrophenol | ND (0.593) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 3+4-Methylphenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 4-Chloroaniline | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 4-Nitrophenol | ND (1.19) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Acenaphthene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Acenaphthylene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Acetophenone | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Aniline | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Anthracene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Azobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Benzo(a)anthracene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Benzo(a)pyrene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Benzo(b)fluoranthene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Butylbenzylphthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Chrysene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Dibenzofuran | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Diethylphthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Dimethylphthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Di-n-butylphthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Di-n-octylphthalate | ND (0.593) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Fluoranthene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Fluorene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Hexachlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Hexachlorobutadiene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Hexachloroethane | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Isophorone | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Naphthalene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Nitrobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| N-Nitrosodimethylamine | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Pentachlorophenol | ND (1.19) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Phenanthrene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Phenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Pyrene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *90 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *122 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *95 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *97 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *94 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *83 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *88 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *112 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.93) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Arsenic | ND (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Barium** | **5.86** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Cadmium | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Chromium** | **3.56** (0.99) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Lead | ND (4.93) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Mercury | ND (0.037) | | 7471B | | 1 | AFV | 11/17/23 16:00 | 0.62 | 40 | DK31706 |
| **Nickel** | **3.82** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Selenium | ND (4.93) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Silver | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Thallium | ND (4.93) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Vanadium** | **4.52** (0.99) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Zinc** | **12.6** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *68 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *68 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.18) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.589) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.18) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Acetophenone | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Aniline | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Anthracene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Azobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Chrysene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.589) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Fluorene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Isophorone | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Naphthalene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.18) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Phenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Pyrene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *92 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *98 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *94 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *92 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *93 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *84 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *90 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *104 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.95) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Arsenic | ND (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| **Barium** | **5.72** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Beryllium | ND (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Cadmium | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| **Chromium** | **4.18** (0.99) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Lead | ND (4.95) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Mercury | ND (0.033) | | 7471B | | 1 | AFV | 11/17/23 16:02 | 0.66 | 40 | DK31706 |
| **Nickel** | **3.38** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Selenium | ND (4.95) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Silver | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Thallium | ND (4.95) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| **Vanadium** | **5.07** (0.99) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| **Zinc** | **12.0** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1221 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1232 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1242 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1248 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1254 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1260 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1262 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1268 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *68 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *68 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91
Initial Volume: 19.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.578) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Acetophenone | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Aniline | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Anthracene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Azobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91
Initial Volume: 19.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Chrysene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.578) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Fluorene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Isophorone | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Naphthalene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Phenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Pyrene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *94 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *106 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *98 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91
Initial Volume: 19.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *95 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *96 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *87 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *94 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *105 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.64) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Arsenic | ND (2.32) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Barium** | **6.81** (2.32) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Cadmium | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Chromium** | **4.58** (0.93) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Lead** | **6.95** (4.64) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Mercury | ND (0.034) | | 7471B | | 1 | AFV | 11/17/23 16:04 | 0.62 | 40 | DK31706 |
| **Nickel** | **4.54** (2.32) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Selenium | ND (4.64) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Silver | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Thallium | ND (4.64) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Vanadium** | **5.15** (0.93) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Zinc** | **14.5** (2.32) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94
Initial Volume: 19.7g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1221 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1232 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1242 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1248 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1254 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1260 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1262 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1268 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *69 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *70 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.10) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.550) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.10) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Acetophenone | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Aniline | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Anthracene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Azobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Chrysene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.550) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Fluorene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Isophorone | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Naphthalene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.10) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Phenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Pyrene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *85 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *94 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *88 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *87 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *87 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *78 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *85 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *95 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.92) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Arsenic | ND (2.46) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Barium** | **6.60** (2.46) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Cadmium | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Chromium** | **4.04** (0.98) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Lead | ND (4.92) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Mercury | ND (0.035) | | 7471B | | 1 | AFV | 11/17/23 16:06 | 0.64 | 40 | DK31706 |
| **Nickel** | **4.41** (2.46) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Selenium | ND (4.92) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Silver | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Thallium | ND (4.92) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Vanadium** | **4.63** (0.98) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Zinc** | **12.8** (2.46) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88
Initial Volume: 20.4g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *74 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *65 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.580) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Acetophenone | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Aniline | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Anthracene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Azobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Chrysene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.580) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Fluorene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Isophorone | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Naphthalene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Phenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Pyrene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *90 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *100 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *93 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *90 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *92 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *84 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *90 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *100 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (5.86) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Arsenic | ND (2.93) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Barium** | **12.9** (2.93) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Beryllium** | **0.23** (0.13) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Cadmium | ND (0.59) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Chromium** | **14.5** (1.17) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Lead** | **22.5** (5.86) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Mercury** | **0.138** (0.040) | | 7471B | | 1 | AFV | 11/17/23 16:08 | 0.64 | 40 | DK31706 |
| **Nickel** | **6.30** (2.93) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Selenium | ND (5.86) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Silver | ND (0.59) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Thallium | ND (5.86) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Vanadium** | **9.34** (1.17) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Zinc** | **46.0** (2.93) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78
Initial Volume: 19.9g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| **Aroclor 1248 [2C]** | **0.6** (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| **Aroclor 1254 [2C]** | **0.5** (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *41 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *39 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78
Initial Volume: 19.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.033) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.30) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.652) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.30) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Acetophenone | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Aniline | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Anthracene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Azobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78
Initial Volume: 19.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Chrysene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.652) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Fluorene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Isophorone | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Naphthalene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.30) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Phenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Pyrene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *95 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *106 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *100 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78
Initial Volume: 19.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *99 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *96 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *91 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *96 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *106 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (5.14) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Arsenic | ND (2.57) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Barium** | **7.19** (2.57) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Beryllium** | **0.21** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Cadmium | ND (0.51) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Chromium** | **9.08** (1.03) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Lead** | **8.88** (5.14) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Mercury | ND (0.037) | | 7471B | | 1 | AFV | 11/17/23 16:15 | 0.6 | 40 | DK31706 |
| **Nickel** | **5.30** (2.57) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Selenium | ND (5.14) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Silver | ND (0.51) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Thallium | ND (5.14) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Vanadium** | **6.89** (1.03) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Zinc** | **25.4** (2.57) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| **Aroclor 1248 [2C]** | **0.3** (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| **Aroclor 1254** | **0.2** (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *64 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *60 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.11) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.557) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.11) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Acetophenone | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Aniline | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Anthracene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Azobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Chrysene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.557) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Fluorene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Isophorone | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Naphthalene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.11) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Phenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Pyrene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *96 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *110 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *100 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *101 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *99 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *93 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *97 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *112 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.63) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Arsenic | ND (2.31) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Barium** | **11.6** (2.31) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Cadmium | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Chromium** | **7.05** (0.93) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Lead** | **7.97** (4.63) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Mercury | ND (0.031) | | 7471B | | 1 | AFV | 11/17/23 16:17 | 0.68 | 40 | DK31706 |
| **Nickel** | **5.81** (2.31) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Selenium | ND (4.63) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Silver | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Thallium | ND (4.63) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Vanadium** | **6.58** (0.93) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Zinc** | **16.2** (2.31) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94
Initial Volume: 20.5g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1221 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1232 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1242 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1248 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1254 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1260 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1262 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1268 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *67 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *66 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94
Initial Volume: 20g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.027) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.07) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.535) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.07) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Acetophenone | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Aniline | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Anthracene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Azobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94
Initial Volume: 20g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Chrysene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.535) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Fluorene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Isophorone | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Naphthalene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.07) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Phenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Pyrene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *98 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *106 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *105 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94
Initial Volume: 20g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *104 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *100 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *94 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *99 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *117 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (5.04) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Arsenic | ND (2.52) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Barium** | **6.57** (2.52) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Beryllium** | **0.17** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Cadmium | ND (0.50) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Chromium** | **4.35** (1.01) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Lead | ND (5.04) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Mercury | ND (0.036) | | 7471B | | 1 | AFV | 11/17/23 16:19 | 0.62 | 40 | DK31706 |
| **Nickel** | **4.77** (2.52) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Selenium | ND (5.04) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Silver | ND (0.50) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Thallium | ND (5.04) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Vanadium** | **5.69** (1.01) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Zinc** | **16.6** (2.52) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88
Initial Volume: 20.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *66 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *62 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.581) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Acetophenone | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Aniline | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Azobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Chrysene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.581) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Fluorene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Isophorone | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Naphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Phenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *87 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *99 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *91 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *91 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *87 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *82 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *86 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *102 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (5.18) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Arsenic | ND (2.59) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Barium** | **7.87** (2.59) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Cadmium | ND (0.52) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Chromium** | **8.94** (1.04) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Lead | ND (5.18) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Mercury | ND (0.038) | | 7471B | | 1 | AFV | 11/17/23 16:21 | 0.62 | 40 | DK31706 |
| **Nickel** | **5.28** (2.59) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Selenium | ND (5.18) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Silver | ND (0.52) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Thallium | ND (5.18) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Vanadium** | **4.94** (1.04) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Zinc** | **14.1** (2.59) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83
Initial Volume: 20.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *71 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *69 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.030) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.20) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.598) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.20) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Acetophenone | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Aniline | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Anthracene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Azobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Chrysene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.598) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Fluorene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Isophorone | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Naphthalene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.20) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Phenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Pyrene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *94 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *114 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *100 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *98 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *99 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *90 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *95 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *112 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.41) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Arsenic | ND (2.20) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Barium** | **3.38** (2.20) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Beryllium | ND (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Cadmium | ND (0.44) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Chromium** | **3.21** (0.88) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Lead** | **8.53** (4.41) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Mercury | ND (0.037) | | 7471B | | 1 | AFV | 11/17/23 16:23 | 0.62 | 40 | DK31706 |
| Nickel | ND (2.20) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Selenium | ND (4.41) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Silver | ND (0.44) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Thallium | ND (4.41) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Vanadium** | **2.93** (0.88) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Zinc** | **18.0** (2.20) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87
Initial Volume: 20.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| **Aroclor 1248 [2C]** | **0.3** (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| **Aroclor 1254** | **0.2** (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *66 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *59 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.581) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Acetophenone | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Aniline | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Azobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Chrysene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.581) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Fluorene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Isophorone | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Naphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Phenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *92 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *110 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *96 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *100 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *96 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *88 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *93 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *112 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DK31667 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Antimony | ND | 5.00 | mg/kg wet | | | | | | | |
| Arsenic | ND | 2.50 | mg/kg wet | | | | | | | |
| Barium | ND | 2.50 | mg/kg wet | | | | | | | |
| Beryllium | ND | 0.11 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Nickel | ND | 2.50 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| Thallium | ND | 5.00 | mg/kg wet | | | | | | | |
| Vanadium | ND | 1.00 | mg/kg wet | | | | | | | |
| Zinc | ND | 2.50 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Antimony | 41.4 | 14.3 | mg/kg wet | 54.20 | | 76 | 40-160 | | | |
| Arsenic | 239 | 7.14 | mg/kg wet | 258.0 | | 93 | 80-120 | | | |
| Barium | 732 | 7.14 | mg/kg wet | 809.0 | | 91 | 80-120 | | | |
| Beryllium | 46.4 | 0.31 | mg/kg wet | 48.50 | | 96 | 80-120 | | | |
| Cadmium | 295 | 1.43 | mg/kg wet | 321.0 | | 92 | 80-120 | | | |
| Chromium | 123 | 2.86 | mg/kg wet | 133.0 | | 93 | 80-120 | | | |
| Lead | 99.4 | 14.3 | mg/kg wet | 102.0 | | 97 | 80-120 | | | |
| Nickel | 136 | 7.14 | mg/kg wet | 137.0 | | 99 | 80-120 | | | |
| Selenium | 44.0 | 14.3 | mg/kg wet | 49.40 | | 89 | 80-120 | | | |
| Silver | 22.6 | 1.43 | mg/kg wet | 22.70 | | 100 | 80-120 | | | |
| Thallium | 80.7 | 14.3 | mg/kg wet | 81.40 | | 99 | 80-120 | | | |
| Vanadium | 92.3 | 2.86 | mg/kg wet | 108.0 | | 85 | 80-120 | | | |
| Zinc | 507 | 7.14 | mg/kg wet | 540.0 | | 94 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Antimony | 41.2 | 14.9 | mg/kg wet | 54.20 | | 76 | 40-160 | 0.5 | 30 | |
| Arsenic | 235 | 7.46 | mg/kg wet | 258.0 | | 91 | 80-120 | 2 | 30 | |
| Barium | 760 | 7.46 | mg/kg wet | 809.0 | | 94 | 80-120 | 4 | 30 | |
| Beryllium | 45.6 | 0.33 | mg/kg wet | 48.50 | | 94 | 80-120 | 2 | 20 | |
| Cadmium | 291 | 1.49 | mg/kg wet | 321.0 | | 91 | 80-120 | 2 | 30 | |
| Chromium | 122 | 2.99 | mg/kg wet | 133.0 | | 92 | 80-120 | 1 | 30 | |
| Lead | 97.8 | 14.9 | mg/kg wet | 102.0 | | 96 | 80-120 | 2 | 20 | |
| Nickel | 134 | 7.46 | mg/kg wet | 137.0 | | 98 | 80-120 | 2 | 30 | |
| Selenium | 44.3 | 14.9 | mg/kg wet | 49.40 | | 90 | 80-120 | 0.6 | 30 | |
| Silver | 22.3 | 1.49 | mg/kg wet | 22.70 | | 98 | 80-120 | 1 | 30 | |
| Thallium | 80.4 | 14.9 | mg/kg wet | 81.40 | | 99 | 80-120 | 0.4 | 30 | |
| Vanadium | 91.6 | 2.99 | mg/kg wet | 108.0 | | 85 | 80-120 | 0.8 | 30 | |
| Zinc | 501 | 7.46 | mg/kg wet | 540.0 | | 93 | 80-120 | 1 | 30 | |
| **Batch DK31706 - 7471B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DK31706 - 7471B** | | | | | | | | | | |
| Mercury | ND | 0.031 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 10.4 | 3.19 | mg/kg wet | 17.10 | | 61 | 33.1-86.55 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 10.3 | 3.19 | mg/kg wet | 17.10 | | 60 | 33.1-86.55 | 1 | 30 | |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DK31603 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0205* | | mg/kg wet | *0.02500* | | *82* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 77 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 76 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 78 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 79 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0186* | | mg/kg wet | *0.02500* | | *74* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0184* | | mg/kg wet | *0.02500* | | *74* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0190* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0192* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 78 | 40-140 | 2 | 30 | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 78 | 40-140 | 2 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DK31603 - 3540C** | | | | | | | | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 81 | 40-140 | 4 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 82 | 40-140 | 4 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0192* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0191* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0193* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0196* | | mg/kg wet | *0.02500* | | *78* | *30-150* | | | |
| **Batch DK31704 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0195* | | mg/kg wet | *0.02500* | | *78* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0225* | | mg/kg wet | *0.02500* | | *90* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0170* | | mg/kg wet | *0.02500* | | *68* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0203* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 75 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 79 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 79 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 87 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0202* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0230* | | mg/kg wet | *0.02500* | | *92* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0176* | | mg/kg wet | *0.02500* | | *70* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 77 | 40-140 | 2 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DK31704 - 3540C** | | | | | | | | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 81 | 40-140 | 3 | 30 | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 79 | 40-140 | 0.04 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 87 | 40-140 | 0.3 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0200* | | mg/kg wet | *0.02500* | | *80* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0228* | | mg/kg wet | *0.02500* | | *91* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0187* | | mg/kg wet | *0.02500* | | *75* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0202* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.57* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.67* | | mg/kg wet | *3.750* | | *125* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.98* | | mg/kg wet | *3.750* | | *106* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.67* | | mg/kg wet | *2.500* | | *107* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.11* | | mg/kg wet | *3.750* | | *110* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.39* | | mg/kg wet | *2.500* | | *95* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.77* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.97* | | mg/kg wet | *2.500* | | *119* | *30-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.22 | 0.025 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.04 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.14 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 30-130 | | | |
| 2,4-Dimethylphenol | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 30-130 | | | |
| 2,4-Dinitrophenol | 2.48 | 1.00 | mg/kg wet | 2.500 | | 99 | 30-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| 2,4-Dinitrotoluene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.57 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| 2-Chloronaphthalene | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| 2-Chlorophenol | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 30-130 | | | |
| 2-Methylnaphthalene | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |
| 2-Methylphenol | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 30-130 | | | |
| 2-Nitrophenol | 2.18 | 0.500 | mg/kg wet | 2.500 | | 87 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| 3+4-Methylphenol | 4.79 | 0.250 | mg/kg wet | 5.000 | | 96 | 30-130 | | | |
| 4-Bromophenyl-phenylether | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| 4-Chloroaniline | 1.75 | 0.250 | mg/kg wet | 2.500 | | 70 | 40-140 | | | |
| 4-Nitrophenol | 2.22 | 1.00 | mg/kg wet | 2.500 | | 89 | 30-130 | | | |
| Acenaphthene | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| Acenaphthylene | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| Acetophenone | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Aniline | 1.13 | 0.250 | mg/kg wet | 2.500 | | 45 | 40-140 | | | |
| Anthracene | 2.21 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Azobenzene | 1.78 | 0.250 | mg/kg wet | 2.500 | | 71 | 40-140 | | | |
| Benzo(a)anthracene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Benzo(a)pyrene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.11 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 1.83 | 0.250 | mg/kg wet | 2.500 | | 73 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 1.94 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 1.98 | 0.250 | mg/kg wet | 2.500 | | 79 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.57 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| Butylbenzylphthalate | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Chrysene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.23 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Dibenzofuran | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Diethylphthalate | 2.59 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| Dimethylphthalate | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Di-n-butylphthalate | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Di-n-octylphthalate | 2.45 | 0.500 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Fluoranthene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Fluorene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Hexachlorobenzene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Hexachlorobutadiene | 2.25 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Hexachloroethane | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Isophorone | 1.73 | 0.250 | mg/kg wet | 2.500 | | 69 | 40-140 | | | |
| Naphthalene | 1.95 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | | | |
| Nitrobenzene | 1.87 | 0.250 | mg/kg wet | 2.500 | | 75 | 40-140 | | | |
| N-Nitrosodimethylamine | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| Pentachlorophenol | 2.38 | 1.00 | mg/kg wet | 2.500 | | 95 | 30-130 | | | |
| Phenanthrene | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Phenol | 2.26 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | | | |
| Pyrene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.40* | | mg/kg wet | *2.500* | | *96* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.38* | | mg/kg wet | *3.750* | | *117* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.79* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.55* | | mg/kg wet | *2.500* | | *102* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.76* | | mg/kg wet | *3.750* | | *100* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.02* | | mg/kg wet | *2.500* | | *81* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.52* | | mg/kg wet | *3.750* | | *94* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.75* | | mg/kg wet | *2.500* | | *110* | *30-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.41 | 0.025 | mg/kg wet | 2.500 | | 97 | 40-140 | 8 | 30 | |
| 1,2,4-Trichlorobenzene | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | 8 | 30 | |
| 1,2-Dichlorobenzene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 9 | 30 | |
| 1,3-Dichlorobenzene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 9 | 30 | |
| 1,4-Dichlorobenzene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 9 | 30 | |
| 2,4,5-Trichlorophenol | 2.71 | 0.250 | mg/kg wet | 2.500 | | 109 | 30-130 | 8 | 30 | |
| 2,4,6-Trichlorophenol | 2.64 | 0.250 | mg/kg wet | 2.500 | | 106 | 30-130 | 7 | 30 | |
| 2,4-Dichlorophenol | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 30-130 | 8 | 30 | |
| 2,4-Dimethylphenol | 2.81 | 0.250 | mg/kg wet | 2.500 | | 113 | 30-130 | 8 | 30 | |
| 2,4-Dinitrophenol | 2.74 | 1.00 | mg/kg wet | 2.500 | | 110 | 30-130 | 10 | 30 | |
| 2,4-Dinitrotoluene | 2.64 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 7 | 30 | |
| 2,6-Dinitrotoluene | 2.81 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | 9 | 30 | |
| 2-Chloronaphthalene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 7 | 30 | |
| 2-Chlorophenol | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 30-130 | 10 | 30 | |
| 2-Methylnaphthalene | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | 6 | 30 | |
| 2-Methylphenol | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 30-130 | 9 | 30 | |
| 2-Nitrophenol | 2.31 | 0.500 | mg/kg wet | 2.500 | | 93 | 30-130 | 6 | 30 | |
| 3,3´-Dichlorobenzidine | 2.61 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | 9 | 30 | |
| 3+4-Methylphenol | 5.32 | 0.250 | mg/kg wet | 5.000 | | 106 | 30-130 | 11 | 30 | |
| 4-Bromophenyl-phenylether | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 6 | 30 | |
| 4-Chloroaniline | 1.84 | 0.250 | mg/kg wet | 2.500 | | 73 | 40-140 | 5 | 30 | |
| 4-Nitrophenol | 2.38 | 1.00 | mg/kg wet | 2.500 | | 95 | 30-130 | 7 | 30 | |
| Acenaphthene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 8 | 30 | |
| Acenaphthylene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 9 | 30 | |
| Acetophenone | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 9 | 30 | |
| Aniline | 1.22 | 0.250 | mg/kg wet | 2.500 | | 49 | 40-140 | 8 | 30 | |
| Anthracene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 6 | 30 | |
| Azobenzene | 1.90 | 0.250 | mg/kg wet | 2.500 | | 76 | 40-140 | 7 | 30 | |
| Benzo(a)anthracene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 8 | 30 | |
| Benzo(a)pyrene | 2.66 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Benzo(b)fluoranthene | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 7 | 30 | |
| Benzo(g,h,i)perylene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 8 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| Benzo(k)fluoranthene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 11 | 30 | |
| bis(2-Chloroethoxy)methane | 1.94 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | 6 | 30 | |
| bis(2-Chloroethyl)ether | 2.14 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | 10 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 15 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 8 | 30 | |
| Butylbenzylphthalate | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 8 | 30 | |
| Chrysene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 7 | 30 | |
| Dibenzo(a,h)Anthracene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 12 | 30 | |
| Dibenzofuran | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 7 | 30 | |
| Diethylphthalate | 2.79 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | 8 | 30 | |
| Dimethylphthalate | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Di-n-butylphthalate | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 7 | 30 | |
| Di-n-octylphthalate | 2.68 | 0.500 | mg/kg wet | 2.500 | | 107 | 40-140 | 9 | 30 | |
| Fluoranthene | 2.53 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 5 | 30 | |
| Fluorene | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Hexachlorobenzene | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Hexachlorobutadiene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 10 | 30 | |
| Hexachloroethane | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 12 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 8 | 30 | |
| Isophorone | 1.86 | 0.250 | mg/kg wet | 2.500 | | 74 | 40-140 | 7 | 30 | |
| Naphthalene | 2.11 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | 8 | 30 | |
| Nitrobenzene | 2.01 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | 7 | 30 | |
| N-Nitrosodimethylamine | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 9 | 30 | |
| Pentachlorophenol | 2.65 | 1.00 | mg/kg wet | 2.500 | | 106 | 30-130 | 11 | 30 | |
| Phenanthrene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 6 | 30 | |
| Phenol | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 30-130 | 9 | 30 | |
| Pyrene | 2.65 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 8 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.57* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.52* | | mg/kg wet | *3.750* | | *121* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.03* | | mg/kg wet | *3.750* | | *107* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.69* | | mg/kg wet | *2.500* | | *108* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.05* | | mg/kg wet | *3.750* | | *108* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.08* | | mg/kg wet | *2.500* | | *83* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.79* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.93* | | mg/kg wet | *2.500* | | *117* | *30-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford ESS Laboratory Work Order: 23K0532

**Notes and Definitions**

| | |
|---|---|
| U | Analyte included in the analysis, but not detected |
| Q | Calibration required quadratic regression (Q). |
| D | Diluted. |
| CD+ | Continuing Calibration %Diff/Drift is above control limit (CD+). |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 23K0532
Date Received: 11/16/2023
Project Due Date: 11/22/2023
Days for Project: 4 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.9 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: _____ Time: _____ By/Acid Lot#: _____
    b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? _____ Date: _____ Time: _____ By: _____

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 494131 | Yes | N/A | Yes | 8 oz jar | NP | |
| 1 | 494740 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 494132 | Yes | N/A | Yes | 8 oz jar | NP | |
| 3 | 494133 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 494134 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 494741 | Yes | N/A | Yes | 8 oz jar | NP | |
| 5 | 494135 | Yes | N/A | Yes | 8 oz jar | NP | |
| 5 | 494742 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 494136 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 494743 | Yes | N/A | Yes | 8 oz jar | NP | |
| 7 | 494137 | Yes | N/A | Yes | 8 oz jar | NP | |
| 8 | 494138 | Yes | N/A | Yes | 8 oz jar | NP | |
| 9 | 494139 | Yes | N/A | Yes | 8 oz jar | NP | |
| 9 | 494744 | Yes | N/A | Yes | 8 oz jar | NP | |
| 10 | 494140 | Yes | N/A | Yes | 8 oz jar | NP | |
| 11 | 494141 | Yes | N/A | Yes | 8 oz jar | NP | |
| 12 | 494142 | Yes | N/A | Yes | 8 oz jar | NP | |

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

ESS Project ID: 23K0532
Date Received: 11/16/2023

**2nd Review**
**Were all containers scanned into storage/lab?** Initials TJ
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: [signature] Date & Time: 11/16/23 1540
Reviewed By: [signature] Date & Time: 11/16/23 1549

ESS LABORATORY

185 Frances Avenue
Cranston, RI 02910
Phone: 401-461-7181
Fax: 401-461-4486
www.esslaboratory.com

# CHAIN OF CUSTODY

ESS Lab # 23150532 | Page 1 of 2

Turn Time (Days) ☐ > 5 ☐ 5 ☑ 4 ☐ 3 ☐ 2 ☐ 1 ☐ Same Day

Regulatory State: MA Criteria: MCP S-1

Is this project for any of the following?:
☐ CT RCP ☑ MA MCP ☐ RGP ☐ Permit ☐ 401 WQ

ELECTRONIC DELIVERABLES (Final Reports are PDF)
☑ Limit Checker ☐ State Forms ☐ EQuIS
☑ Excel ☐ State Upload ☐ Enviro Data
☐ CLP-Like Package ☐ Other (Specify) →

## CLIENT INFORMATION

Client: CEC Inc.
Address: 31 Bellows Road
Raynham, MA 02767
Phone: 339-226-1264
Email Distribution List: cdalbello@cecinc.com, jkitchen@cecinc.com, dbarboza@cecinc.com

## PROJECT INFORMATION

Project Name: MassCEC Expansion
Project Location: 54 Wright Street, New Bedford, MA
Project Number: 332-344
Project Manager: Cassia Dal Bello
Bill to: CEC Inc.
PO#:
Quote#:

Client acknowledges that sampling is compliant with all EPA / State regulatory programs

## REQUESTED ANALYSES

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | PCBs | MCP 14 Metals | SVOCs | Total Number of Bottles |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 11-15-23 | 0800 | Comp | Soil | CEC-1-A (0-6) | X | X | X | |
| 2 | | 0805 | Grab | | CEC-1-A (10-12) | X | X | X | |
| 3 | | 0810 | Grab | | CEC-1-A (16-18) | X | X | X | |
| 4 | | 0815 | Grab | | CEC-1-A (22-24) | X | X | X | |
| 5 | | 1200 | Comp | | CEC-2-A (0-4) | X | X | X | |
| 6 | | 1205 | Grab | | CEC-2-A (12-14) | X | X | X | |
| 7 | | 1210 | Grab | | CEC-2-A (24-26) | X | X | X | |
| 8 | | 1215 | Grab | | CEC-2-A (26-28) | X | X | X | |
| 9 | | 16:00 | Comp | | CEC-3-A (0-4) | X | X | X | |
| 10 | | 16:05 | Grab | | CEC-3-A (6-8) | X | X | X | |
| Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial | | | | | | J | J | J | |
| Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* | | | | | | 10 | 10 | 10 | |
| Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* | | | | | | 1 | 1 | 1 | |

Sampled by : Dave Barboza DB

**Chain needs to be filled out neatly and completely for on time delivery.**

**Laboratory Use Only**
Cooler Temperature (°C): 2.9 / 1 Ice

**Comments:** * Please specify "Other" preservative and containers types in this space
4 - day rush analysis approved by ESS.

All samples submitted are subject to ESS Laboratory's payment terms and conditions.

**Dissolved Filtration**
☐ Lab Filter

| Relinquished by (Signature) | Date | Time | Received by (Signature) | Relinquished by (Signature) | Date | Time | Received by (Signature) |
|---|---|---|---|---|---|---|---|
| [signature] | 11-16-23 | 06:30 | Secure Fridge | [signature] | 11/16/23 | 9:35 | [signature] 11/16/23 9:35 |
| [signature] | 11/16/23 | 15:16 | [signature] | | | | |

ESS LABORATORY
185 Frances Avenue
Cranston, RI 02910
Phone: 401-461-7181
Fax: 401-461-4486
www.esslaboratory.com

# CHAIN OF CUSTODY

ESS Lab # 23K0532 | Page 2 of 2

Turn Time (Days) ☐ >5 ☐ 5 ☑ 4 ☐ 3 ☐ 2 ☐ 1 ☐ Same Day

Regulatory State: MA Criteria: MCP S-1

Is this project for any of the following?:
☐ CT RCP ☑ MA MCP ☐ RGP ☐ Permit ☐ 401 WQ

ELECTRONIC DELIVERABLES (Final Reports are PDF)
☑ Limit Checker ☐ State Forms ☐ EQuIS
☑ Excel ☐ State Upload ☐ Enviro Data
☐ CLP-Like Package ☐ Other (Specify) →

## CLIENT INFORMATION

Client: CEC Inc.
Address: 31 Bellows Road
Raynham, MA 02767
Phone: 339-226-1264
Email Distribution List: cdalbello@cecinc.com, jkitchen@cecinc.com, dbarboza@cecinc.com

## PROJECT INFORMATION

Project Name: MassCEC Expansion
Project Location: 54 Wright Street, New Bedford, MA
Project Number: 332-344
Project Manager: Cassia Dal Bello
Bill to: CEC Inc.
PO#:
Quote#:

Client acknowledges that sampling is compliant with all EPA / State regulatory programs

## REQUESTED ANALYSES

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | PCBs | MCP 14 Metals | SVOCs | Total Number of Bottles |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 11-15-23 | 16:10 | Grab | Soil | CEC-3-A (18-20) | X | X | X | |
| 12 | 11-15-23 | 16:15 | Grab | Soil | CEC-3-A (24-26) | X | X | X | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

| | | | | |
|---|---|---|---|---|
| Container Type: | AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial | J | J | J |
| Container Volume: | 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* | 10 | 10 | 10 |
| Preservation Code: | 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* | 1 | 1 | 1 |

Sampled by : DAVE BARBOZA (DB)

**Chain needs to be filled out neatly and completely for on time delivery.**

**Laboratory Use Only**
Cooler Temperature (°C): 2.9 / 1C

**Comments:** * Please specify "Other" preservative and containers types in this space
4 - day rush analysis approved by ESS.

All samples submitted are subject to ESS Laboratory's payment terms and conditions.

**Dissolved Filtration**
☐ Lab Filter

| Relinquished by (Signature) | Date | Time | Received by (Signature) | Relinquished by (Signature) | Date | Time | Received by (Signature) |
|---|---|---|---|---|---|---|---|
| [signature] | 11-16-23 | 06:30 | Secure Fridge | [signature] | 11/16/23 | 9:35 | [signature] 11/16/23 9:37 |
| [signature] | 11/16/23 | 15:10 | [signature] | | | | |

## GEOTECHNICAL LABORATORY RESULTS

Thielsch
DIVISION OF THE RISE GROUP

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
cts.thielsch.com
*Let's Build a Solid Foundation*

| Client Information: | |
|---|---|
| Civil & Environmental Consultants | |
| Raynham, MA 02767 | |
| Project Manager: | Tony Sousa |
| Assigned By: | Tony Sousa |
| Collected By: | Client |

| Project Information: | |
|---|---|
| **MassCEC Expansion** | |
| **New Bedford, MA** | |
| Project Number: | 332-344 |
| Summary Page: | 1 of 1 |
| Report Date: | 12.05.23 |

## LABORATORY TESTING DATA SHEET, Report No.: 7423-L-215

| Boring No. | Sample No. | Depth (ft) | Laboratory No. | Identification Tests | | | | | | | | Proctor / CBR / Permeability Tests | | | | | | | | Laboratory Log and Soil Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | As Rcvd Moisture Content % | LL % | PL % | Gravel % | Sand % | Fines % | Org. % | pH | $g_d$ MAX (pcf) $W_{opt}$ (%) | $g_d$ MAX (pcf) $W_{opt}$ (%) (Corr.) | Dry unit wt. (pcf) | Test Moisture Content % | Target Test Setup as % of Proctor | CBR @ 0.1" | CBR @ 0.2" | Permeability cm/sec | |
| | | | | D2216 | D4318 | | D6913 | | | D2974 | D4792 | D1557 | | | | | | | | |
| CEC-6-4 | S-1 | 0-2 | 23-S-4766 | 9.0 | | | 33.6 | 54.2 | 12.2 | | | | | | | | | | | Brown silty sand with gravel |
| CEC-1A | S-1 | 0.3-2.3 | 23-S-4767 | 3.5 | | | 14.6 | 75.2 | 10.2 | | | | | | | | | | | Light Brown poorly graded sand with silt |
| CEC-1A | S-8 | 14-16 | 23-S-4768 | 12.4 | | | 22.5 | 72.0 | 5.5 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-1A | S-7 | 12-14 | 23-S-4769 | 17.8 | | | 7.3 | 87.0 | 5.7 | | | | | | | | | | | Brown poorly graded sand with silt |
| CEC-2A | S-6 | 10-12 | 23-S-4770 | 10.8 | | | 34.6 | 57.1 | 8.3 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-2A | S-10 | 18-20 | 23-S-4771 | 9.7 | | | 27.7 | 64.5 | 7.8 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-2A | S-13 | 24-26 | 23-S-4772 | 15.5 | | | 11.9 | 79.3 | 8.8 | | | | | | | | | | | Brown poorly graded sand with silt |
| CEC-3A | S-6 | 10-12 | 23-S-4773 | 13.3 | | | 21.0 | 69.7 | 9.3 | | | | | | | | | | | Brown well-graded sand with silt and gravel |
| CEC-3A | S-9 | 16-18 | 23-S-4774 | 14.4 | | | 13.5 | 76.5 | 10.0 | | | | | | | | | | | Brown well-graded sand with silt |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

Date Received: **11.27.23** Reviewed By: Date Reviewed: **12.05.23**

This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.
This report shall not be reproduced, except in full, without prior written approval from the Agency, as defined in ASTM E329.

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 14.6 | 5.7 | 27.1 | 42.4 | 10.2 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 94.1 | | |
| 3/8" | 90.0 | | |
| #4 | 85.4 | | |
| #10 | 79.7 | | |
| #20 | 70.2 | | |
| #40 | 52.6 | | |
| #60 | 33.4 | | |
| #100 | 18.6 | | |
| #200 | 10.2 | | |

* (no specification provided)

**Soil Description**

Light Brown poorly graded sand with silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 9.5317 $D_{85}$= 4.4289 $D_{60}$= 0.5479
$D_{50}$= 0.3928 $D_{30}$= 0.2253 $D_{15}$= 0.1196
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-3

**Remarks**

Source of Sample: Boring Depth: 0.3-2.3'
Sample Number: CEC-1A / S-1

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344 Fig. 23-S-4767

Tested By: RB Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 10.4 | 12.1 | 8.5 | 29.9 | 33.6 | 5.5 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 89.6 | | |
| 3/4" | 89.6 | | |
| 1/2" | 87.4 | | |
| 3/8" | 85.1 | | |
| #4 | 77.5 | | |
| #10 | 69.0 | | |
| #20 | 56.2 | | |
| #40 | 39.1 | | |
| #60 | 22.0 | | |
| #100 | 11.3 | | |
| #200 | 5.5 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 26.9954 $D_{85}$= 9.3936 $D_{60}$= 1.0467
$D_{50}$= 0.6406 $D_{30}$= 0.3220 $D_{15}$= 0.1856
$D_{10}$= 0.1356 $C_u$= 7.72 $C_c$= 0.73

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 14-16'
Sample Number: CEC-1A / S-8

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

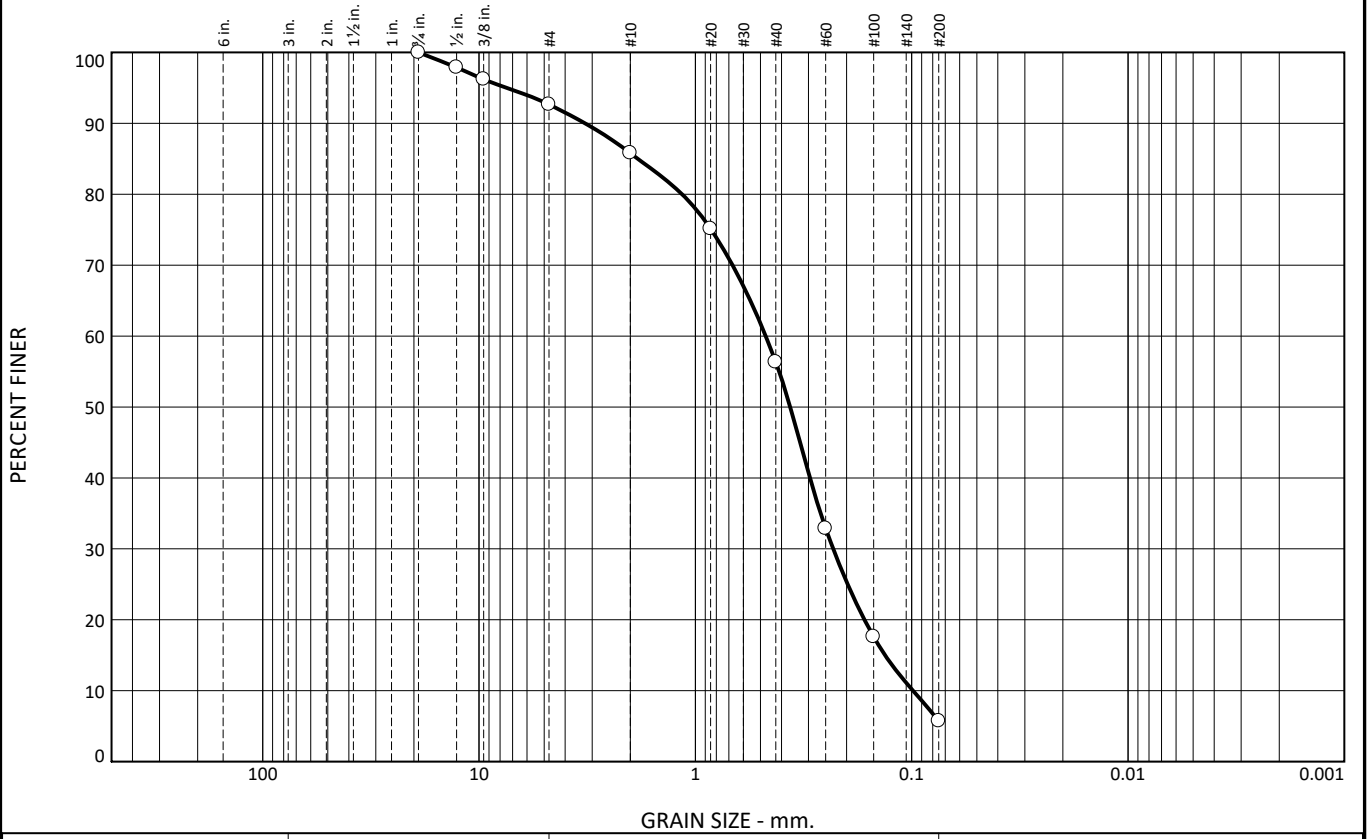
Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344

Fig. 23-S-4768

Tested By: RB Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 7.3 | 6.9 | 29.5 | 50.6 | 5.7 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 97.9 | | |
| 3/8" | 96.2 | | |
| #4 | 92.7 | | |
| #10 | 85.8 | | |
| #20 | 75.1 | | |
| #40 | 56.3 | | |
| #60 | 32.9 | | |
| #100 | 17.6 | | |
| #200 | 5.7 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 3.2327 $D_{85}$= 1.8453 $D_{60}$= 0.4730
$D_{50}$= 0.3646 $D_{30}$= 0.2307 $D_{15}$= 0.1329
$D_{10}$= 0.0987 $C_u$= 4.79 $C_c$= 1.14

**Classification**

USCS= SP-SM AASHTO= A-3

**Remarks**

Source of Sample: Boring Depth: 12-14'
Sample Number: CEC-1A / S-7

Date: 12.1.23

Thielsch Engineering Inc.

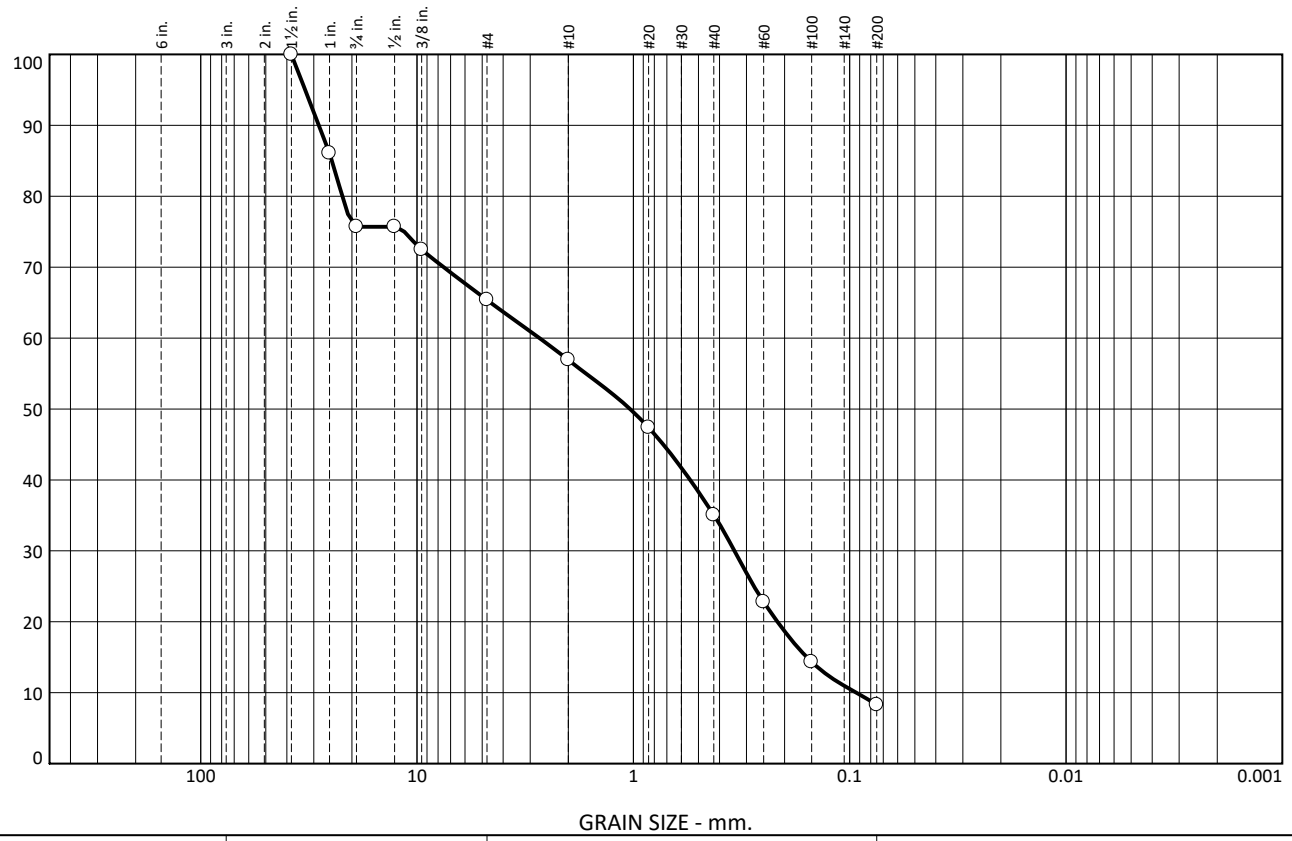
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344 Fig. 23-S-4769

Tested By: RB Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 24.3 | 10.3 | 8.5 | 21.8 | 26.8 | 8.3 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 86.1 | | |
| 3/4" | 75.7 | | |
| 1/2" | 75.7 | | |
| 3/8" | 72.5 | | |
| #4 | 65.4 | | |
| #10 | 56.9 | | |
| #20 | 47.4 | | |
| #40 | 35.1 | | |
| #60 | 22.8 | | |
| #100 | 14.3 | | |
| #200 | 8.3 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 28.4430 $D_{85}$= 24.7077 $D_{60}$= 2.7187
$D_{50}$= 1.0362 $D_{30}$= 0.3410 $D_{15}$= 0.1578
$D_{10}$= 0.0933 $C_u$= 29.14 $C_c$= 0.46

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 10-12'
Sample Number: CEC-2A / S-6

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

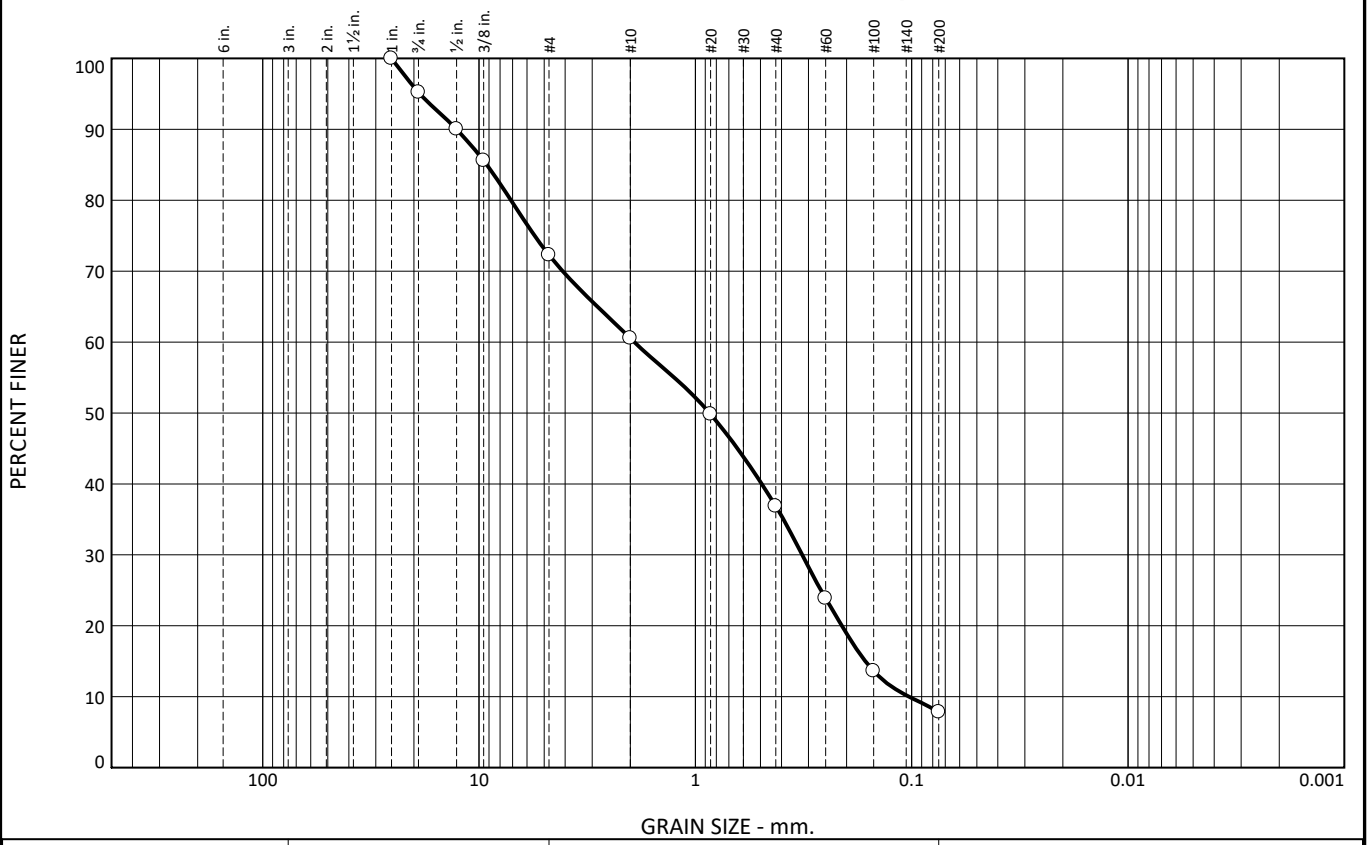
Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344

Fig. 23-S-4770

Tested By: RB Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 4.8 | 22.9 | 11.7 | 23.7 | 29.1 | 7.8 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 95.2 | | |
| 1/2" | 90.0 | | |
| 3/8" | 85.6 | | |
| #4 | 72.3 | | |
| #10 | 60.6 | | |
| #20 | 49.8 | | |
| #40 | 36.9 | | |
| #60 | 23.9 | | |
| #100 | 13.6 | | |
| #200 | 7.8 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 12.6898 $D_{85}$= 9.2105 $D_{60}$= 1.9159
$D_{50}$= 0.8595 $D_{30}$= 0.3209 $D_{15}$= 0.1639
$D_{10}$= 0.1030 $C_u$= 18.61 $C_c$= 0.52

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 18-20'
Sample Number: CEC-2A / S-10

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344

Fig. 23-S-4771

Tested By: RB Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 11.9 | 4.4 | 26.9 | 48.0 | 8.8 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 96.2 | | |
| 3/8" | 90.8 | | |
| #4 | 88.1 | | |
| #10 | 83.7 | | |
| #20 | 74.2 | | |
| #40 | 56.8 | | |
| #60 | 35.6 | | |
| #100 | 19.3 | | |
| #200 | 8.8 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 8.6787 $D_{85}$= 2.4025 $D_{60}$= 0.4700
$D_{50}$= 0.3543 $D_{30}$= 0.2134 $D_{15}$= 0.1194
$D_{10}$= 0.0815 $C_u$= 5.76 $C_c$= 1.19

**Classification**

USCS= SP-SM AASHTO= A-3

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-2A / S-13

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

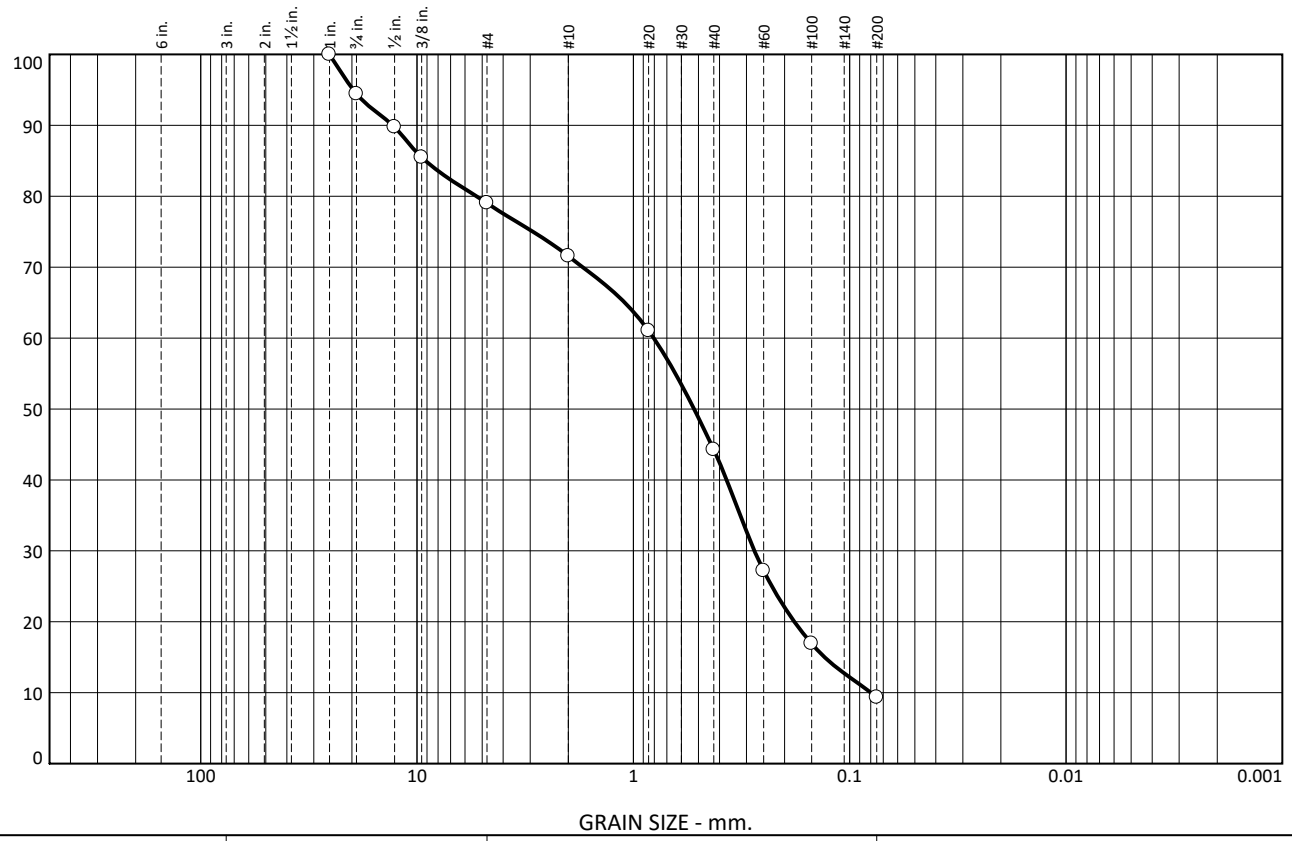
Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344

Fig. 23-S-4772

Tested By: RB Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 5.6 | 15.4 | 7.4 | 27.3 | 35.0 | 9.3 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 94.4 | | |
| 1/2" | 89.8 | | |
| 3/8" | 85.5 | | |
| #4 | 79.0 | | |
| #10 | 71.6 | | |
| #20 | 61.0 | | |
| #40 | 44.3 | | |
| #60 | 27.2 | | |
| #100 | 16.9 | | |
| #200 | 9.3 | | |

* (no specification provided)

**Soil Description**

Brown well-graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 12.9406 $D_{85}$= 9.1423 $D_{60}$= 0.8050
$D_{50}$= 0.5242 $D_{30}$= 0.2757 $D_{15}$= 0.1307
$D_{10}$= 0.0798 $C_u$= 10.08 $C_c$= 1.18

**Classification**

USCS= SW-SM AASHTO= A-1-b

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 10-12'
Sample Number: CEC-3A / S-6

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

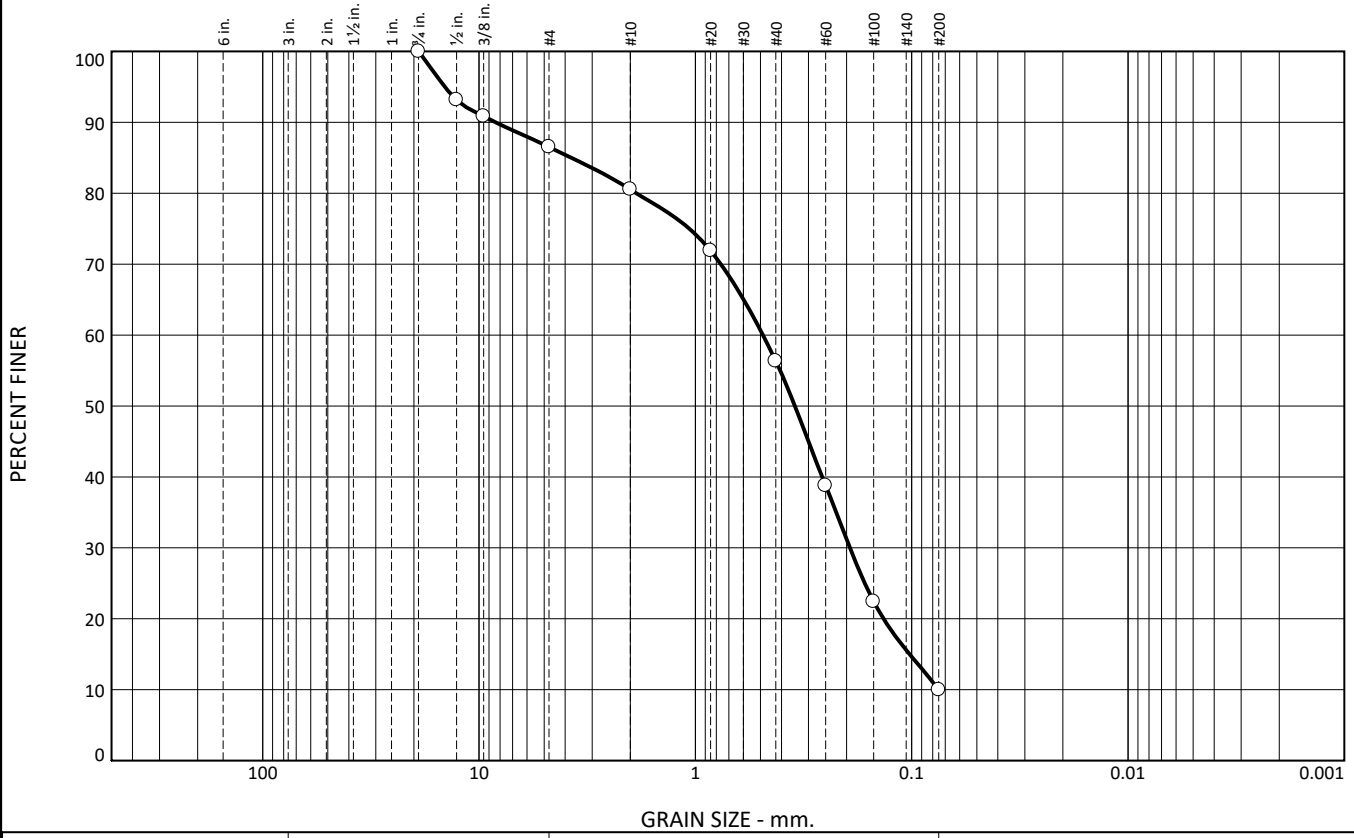
Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344

Fig. 23-S-4773

Tested By: RB Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 13.5 | 6.0 | 24.2 | 46.3 | 10.0 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 93.2 | | |
| 3/8" | 90.9 | | |
| #4 | 86.5 | | |
| #10 | 80.5 | | |
| #20 | 71.9 | | |
| #40 | 56.3 | | |
| #60 | 38.8 | | |
| #100 | 22.4 | | |
| #200 | 10.0 | | |

* (no specification provided)

**Soil Description**

Brown well-graded sand with silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 8.3764 $D_{85}$= 3.7433 $D_{60}$= 0.4870
$D_{50}$= 0.3468 $D_{30}$= 0.1930 $D_{15}$= 0.1023
$D_{10}$= 0.0752 $C_u$= 6.48 $C_c$= 1.02

**Classification**

USCS= SW-SM AASHTO= A-3

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 16-18'
Sample Number: CEC-3A / S-9

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344

Fig. 23-S-4774

Tested By: RB Checked By: Kris Roland

**ATTACHMENT 12: LETTER REPORT - SOIL CHARACTERIZATION FOR POTENTIAL DISPOSAL/REUSE FOR SHUSTER BULKHEAD (CIVIL & ENVIRONMENTAL CONSULTANTS, INC., AUGUST 14, 2024)**

August 14, 2024

Tim Griffin
Terminal Director
Massachusetts Clean Energy Center
4 Wright Street
New Bedford, MA 02740

Subject: Soil Characterization for Potential Disposal/Reuse
Shuster Bulkhead
4 Wright Street, New Bedford, MA 02740
CEC Project: 332-344

Dear Mr. Griffin,

Civil & Environmental Consultants, Inc. (CEC) is presenting this soil characterization summary letter for the soils to be removed from the Shuster Bulkhead. This work is scheduled to be conducted in 2025. This letter was prepared by Civil & Environmental Consultants, Inc. (CEC) on behalf of the Massachusetts Clean Energy Center (MassCEC) through a subcontract with Foth Infrastructure & Environment, LLC (Foth).

## Property/Project Information

The Shuster Bulkhead is a cofferdam constructed marine bulkhead that is connected to the MassCEC New Bedford Marine Commerce Terminal, which serves as a marine port for wind turbine parts. Due to structural concerns with the current bulkhead, MassCEC is evaluating the demolition and replacement of the existing bulkhead. The Shuster Bulkhead is approximately 0.5 acres in size, and the cofferdam structure contains approximately 9,750 cubic yards (cy) of infilled soils. To prepare for this future work, CEC was contracted to complete a soil waste characterization program to satisfy the requirements for soil disposal and/or reuse. As a contingency, CEC has collected samples at a frequency corresponding to a total disposal volume of up to 12,500 cy.

## Soil Sampling

In November 2023, CEC completed a preliminary subsurface investigation at the Shuster Bulkhead including the advancement of three soil borings (CEC-1A through CEC-3A) in the cofferdam sections of the bulkhead. The soil samples were field screened, and various samples were submitted to a laboratory for environmental analyses of polychlorinated biphenyls (PCBs)

(aroclors), Massachusetts Contingency Plan (MCP) metals, semi-volatile organic compounds (SVOCs), and grain size.

In May 2024, CEC advanced 10 additional borings (CEC-4A through CEC-13A) to characterize soils for disposal/reuse purposes. CEC performed the sampling using appropriate methods and techniques in accordance with the Environmental Sampling Plan prepared by CEC. CEC personnel collected samples from the 10 locations in the eastern section of the Shuster Bulkhead, as shown on Figure 1. In total, 24 waste characterization samples were submitted for analyses which corresponds with a minimum sampling density of roughly one sample per 500 cy. The samples were submitted for laboratory analysis for various parameters including total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), SVOCs (including pyridine), metals (including silver, arsenic, barium, cadmium, chromium (total), lead, selenium, and mercury), PCBs (aroclors), pesticides/herbicides (including toxaphene), sulfide and cyanide reactivity, flashpoint, conductivity, corrosivity (pH), grain size, and free liquid. Additionally, recognizing that PCB congeners (NOAA list) were required if the material was considered for Confined Aquatic Disposal (CAD) cell and offshore disposal, but at a lower sampling frequency, a separate composite sample representing each boring within the cofferdams was placed on hold in frozen storage for PCB congeners (one sample per boring location).

Laboratory results were compared to the Massachusetts Department of Environmental Protection (MassDEP) RCS-1 and RCS-2 reportable concentrations outlined within the MCP, as well as the reuse levels for soils outlined in COMM-97. The MassDEP RCS-2 reportable concentrations are the applicable standards for this site. Low concentrations of various heavy metals, TPH, VOCs, and PCBs were detected at multiple locations across the site, however, all results were below the RCS-2 reportable concentrations. It should be noted that one sample (CEC-2-A 24-26) exceeded the RCS-1 value of 1 mg/kg for PCBs, which is below the COMM-97 reuse criteria of 2 mg/kg total, however the RCS-1 reporting category is not applicable to the bulkhead location. No samples were submitted for Toxicity Characteristic Leaching Procedure (TCLP) analysis, due to all results for analyses being below the “rule of thumb” thresholds. Based on the laboratory results from the samples submitted and available historical information, the material is not considered a listed or characteristic RCRA Hazardous Waste. Sieve analyses were also performed on the soil samples. Sieve analysis results indicate the material consists of medium to fine sands, with varying amounts of silt and gravel. Results from the 2023 and 2024 sampling events are summarized in Tables 1 to 3. The laboratory reports and soil gradation reports are also enclosed for reference.

Site History/Possible Sources

The soils were placed within the cofferdam structure of the bulkhead during its construction. There is no known source of the contaminants, however, the concentrations of contaminants reported may be present due to historical industrial operations in the area, the somewhat ubiquitous presence of PCBs in the area of New Bedford Harbor, and unregulated infilling of the harbor throughout the years.

If you have any questions or need additional information, please feel free to contact either of the undersigned.

Sincerely,

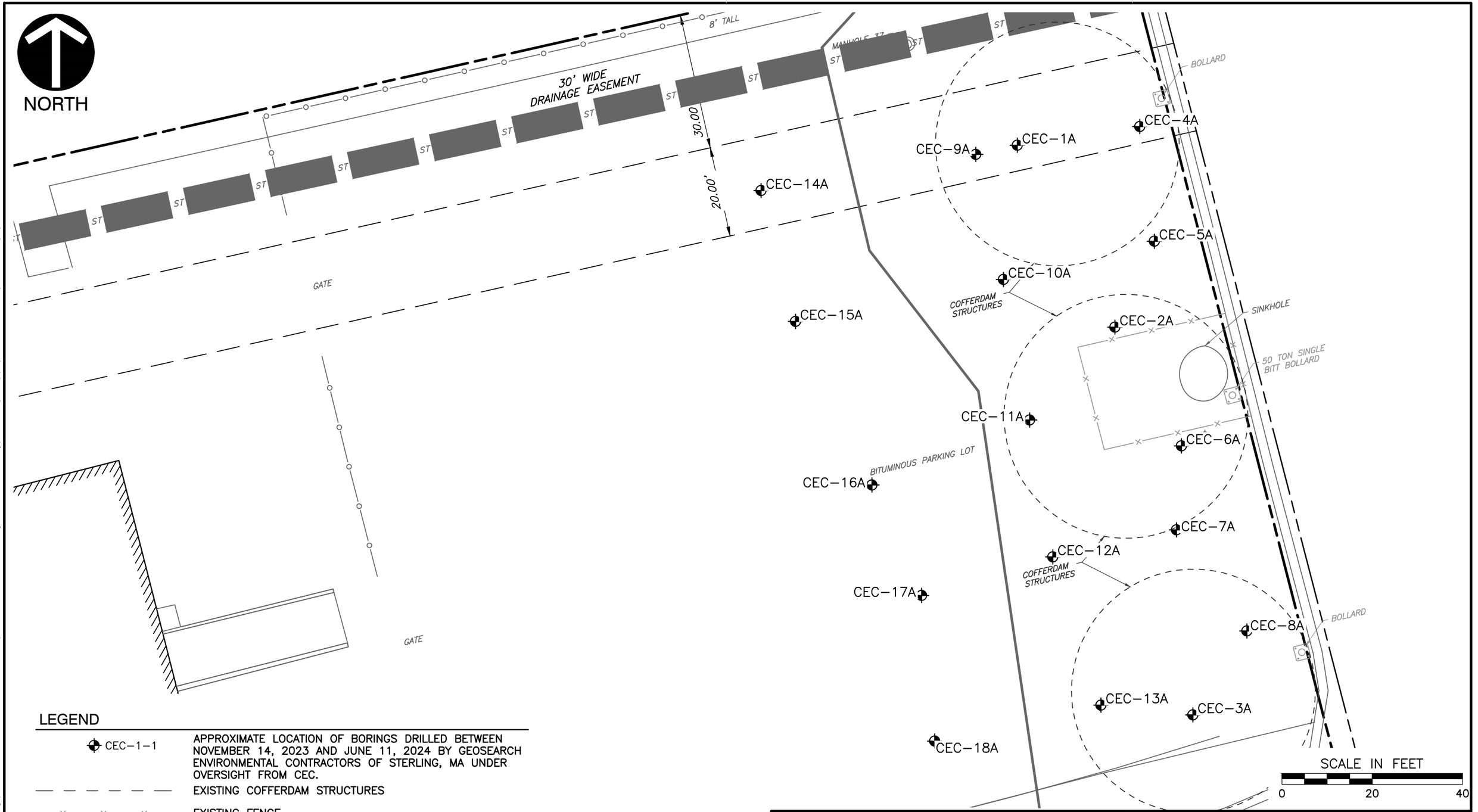
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Cassia P. Dal Bello
Assistant Project Manager

Jonathan D. Kitchen, PG, LSP
Principal

Attachments: Figure 1: Boring Location Plan
Boring Logs
Table 1: Soil Analytical Data (CEC-1A, CEC-2A, and CEC-3A) – Detections Only
Table 2: Soil Analytical Data (CEC 4A through CEC-13A) - Detections Only
Table 3: Soil Analytical Data (CEC 4A through CEC-13A) – All Data
Laboratory Analytical Reports
Soil Gradation Reports

**FIGURE 1: BORING LOCATION PLAN**




## LEGEND

| | |
|---|---|
| CEC-1-1 | APPROXIMATE LOCATION OF BORINGS DRILLED BETWEEN NOVEMBER 14, 2023 AND JUNE 11, 2024 BY GEOSEARCH ENVIRONMENTAL CONTRACTORS OF STERLING, MA UNDER OVERSIGHT FROM CEC. |
| — — — — — — | EXISTING COFFERDAM STRUCTURES |
| ——×——×——×—— | EXISTING FENCE |
| ——————— | EXISTING SINKHOLE |

## REFERENCE

1. EXISTING SITE INFORMATION WAS OBTAINED FROM PLANS ENTITLED "MASSCEC MAIN TERMINAL AS-BUILTS", DATED 5/10/2023, BY FOTH, AND PROVIDED ELECTRONICALLY TO CEC BY FOTH. CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.


Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767
Ph: 774.501.2176
www.cecinc.com


MASSACUSETTS CLEAN ENERGY CENTER
SITE 4 - SHUSTER BULKHEAD
4 WRIGHT STREET, NEW BEDFORD, MA

BORING LOCATION PLAN

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | FIGURE NO.: | 1 |
| DATE: | AUGUST 2024 | DWG SCALE: | 1"=20' | PROJECT NO: | 332-344 | | |

P:\330-000\332-344\-CADD\Dwg\ENO5 - Site 4 - Shuster Bulkhead\332344 - ENO5 - Boring Location Plan.dwg[FIGURE 1] LS:(8/5/2024 - abucco) - LP: 8/5/2024 10:09 AM

# BORING LOGS

# Rock Types

| Rock Name | Characteristics | Symbol |
|---|---|---|
| Claystone | Clay sized particles that are consolidated, lacking fissility. | |
| Coal | Black and shiny, can break into cubes or conchoidally. | |
| Conglomerate | Gravel sized grains and larger held together by finer material, called a breccia if clasts are angular. | |
| Limestone | Effervesses w/ diluted HCl, can be composed of clay up to gravel particles (fossils). | |
| Sandstone | Primarily sand sized particles modified w/ the descriptor fine, medium, or coarse. | |
| Shale | Clay sized particles, shale has fissility which is a horizontal sheet-like or laminated feature. | |
| Siltstone | Composed of silt, normally breaks as irregular chunks. | |

# Rock Quality Descriptions

## Weathering

**Completely Weathered:** All rock material is decomposed and/or disintegrated. The original rock structure may still be intact.

**Highly Weathered:** More than half of the rock material is decomposed. Fresh rock is present only as a discontinuous framework or as corestones.

**Moderately Weathered:** Less than half of the rock material is decomposed. Fresh rock is present at a discontinuous framework or as corestones.

**Slightly Weathered:** Discoloration or staining indicates weathering of rock material on discontinuity surfaces. Rock may be discolored and softened.

**Fresh:** No visible signs of rock material weathering.

## RQD

| Descriptor | % |
|---|---|
| Very Poor | <25 |
| Poor | 25-50 |
| Fair | 50-75 |
| Good | 75-90 |
| Excellent | >90 |

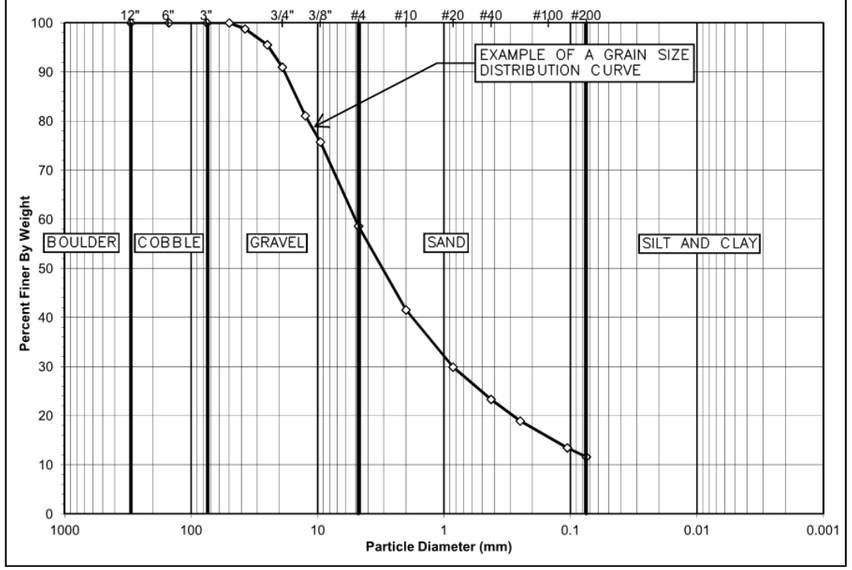
## Brokenness

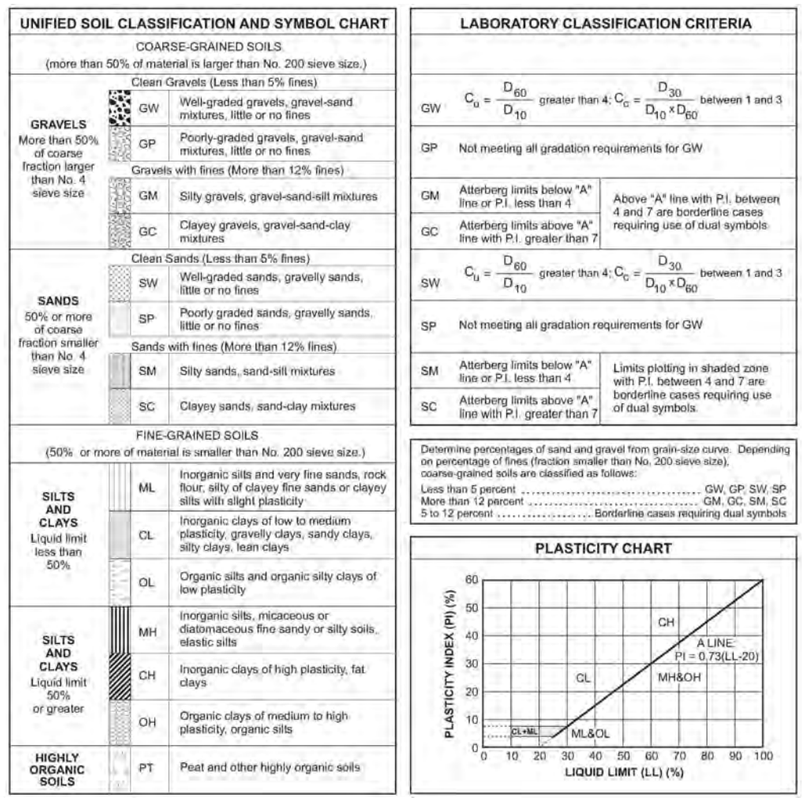
| Descriptor | Fracture Spacing (in & ft) |
|---|---|
| Very Broken | <1 (<0.08) |
| Broken | 1-3 (0.08-0.25) |
| Moderately Broken | 3-6 (0.25-0.5) |
| Slightly Broken | >6 (>0.5) |

## Rock Hardness

| Descriptor | Field Criterion | Relative Unconfined Compressive Strength |
|---|---|---|
| Very Hard | Difficult to break w/ Hammer | > 30,000 psi |
| Hard | Hand-held sample breaks w/ Hammer | 8,000 to 30,000 psi |
| Medium Hard | Cannot scrape surface w/ knife | 2,000 to 8,000 psi |
| Soft | Cutting or scraping w/ knife difficult | 500 to 2,000 psi |
| Very Soft | Can be cut w/ knife | < 500 psi |

# Grain Size Distribution Curve




# Glossary

**Alluvial Soil or Alluvium:** Soil deposited by water in a river, stream, floodplain, or delta.

**Bedrock:** Materials underlying soil or other unconsolidated surficial materials in which refusal is consistently encountered on lithified, undisturbed, natural bedrock.

**Colluvial Soil or Colluvium:** Incoherent soil on or at the base of a slope deposited by gravity or slope movement.

**Fill:** Soil derived from natural soil, rock, or processed materials that was placed by artificial methods, such as construction, waste disposal, or dumping.

**Glacial Outwash:** Soil, typically sand and gravel, deposited by glacial streams or meltwater in a preexisting valley or over a plain.

**Glacial Till:** Soil deposited by and underneath a glacier, generally consisting of a heterogeneous, unstratified mixture of clay, sand, gravel, and boulders.

**N-Value:** The blow count representation of the penetration resistance of the soil determined by the Standard Penetration Test (SPT). It is the sum of the number of blows required to drive the sampler the second and third 6-inch increments (sample depth interval of 6 to 18 inches) and is recorded in blows per foot (bpf). The N-value is considered to be an indication of the relative density of coarse-grained soils (sand and gravel) or consistency of fine-grained soils (silt and clay).

**Pocket Pen (PP):** Field penetration test performed using a hand-held penetrometer that estimates unconfined compressive strength of cohesive soil in tons per square foot (tsf).

**Recovery %:** Total length of rock core or soil sample retrieved divided by the total length of the core run or sample interval, expressed as a percentage.

**Refusal:** The depth at which greater than 50 SPT hammer blows are required to drive the sampling spoon 6 inches or less.

**Residual Soil or Residuum:** Soil derived from the physical or chemical weathering of the underlying parent bedrock, generally with N-values less than 30 and 50 bpf in cohesive and cohesionless materials, respectively.

**Rock Quality Designation (RQD):** The sum of the length of intact rock core pieces longer than 4 inches (excluding mechanical breaks) divided by the total length of the core run, expressed as a percentage.

**Shelby Tube:** A 2" to 3" diameter, thin walled sampling tube that is pushed into the soil to obtain a relatively undisturbed soil sample for geotechnical laboratory tests.

**Split Spoon Sampler:** A soil sampling tube which is driven, retrieved, and split-open lengthwise for removal and visual inspection, and testing of the soil obtained.

**Standard Penetration Test (SPT) ASTM D1586 :** Field penetration test consisting of driving a 2-inch outside diameter split-spoon sampler 18 inches using a 140-pound hammer free falling a distance of 30 inches. The number of blows required to advance the spoon through successive 6-inch increments is recorded to determine the N-value.

**Weathered Rock:** Materials derived from lithified, undisturbed, natural bedrock which are able to be sampled with a split-spoon. Cohesive and cohesionless materials generally have N-values greater than 30 and 50 bpf, respectively.

# N-Value Rating

**Fine-Grained Soils (Silt and Clay)**

| Consistency | Blows/ft | PP (tsf) |
|---|---|---|
| Very Soft | 0-2 | <0.25 |
| Soft | 3-4 | 0.25-0.5 |
| Medium Stiff | 5-8 | 0.5-1 |
| Stiff | 9-15 | 1-2 |
| Very Stiff | 16-32 | 2-4 |
| Hard | >32 | >4 |

**Coarse-Grained Soils (Sand and Gravel)**

| Relative Density | Blows/ft |
|---|---|
| Very Loose | 0-4 |
| Loose | 5-10 |
| Medium Dense | 11-30 |
| Dense | 31-50 |
| Very Dense | >50 |

# Unconsolidated Material

| Term | Grain Size in mm (in) | Approximate Example Size |
|---|---|---|
| Clay and Silt | <.075 | can't see grains to barely visible |
| Fine Sand | 0.075-0.4 | table salt to sugar |
| Med. Sand | 0.4-2.0 (~<1/16) | openings in a window screen |
| Coarse Sand | 2.0-4.75 (~1/16-1/8) | sidewalk salt |
| Gravel | 4.75-75 (~1/8-3) | pea to tennis ball |
| Cobble | 75-300 (3-12) | tennis ball to basketball |
| Boulder | >300 (>12) | larger than a basketball |

**Other Features** – Used to describe other identifiable, pertinent features (e.g., angularity of coarse-grained soils, organics, construction debris, etc.)

| Term | % |
|---|---|
| Trace | < 5 |
| Few | 5-15 |
| Some | 15-45 |

**Moisture Content**

Dry: Sample is dusty or obviously dry.
Moist: Anything that does not fit the definition of dry or wet.
Wet: Sample contains free water.

Civil & Environmental Consultants, Inc.

Definitions of Standard Terms and Symbols

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-1-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/14/2023 **DATE COMPLETED** 11/14/2023
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624358 **LONGITUDE** -70.914750
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 11/14/2023 6.0 ft / Elev 2.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | MATERIAL DESCRIPTION | REMARKS | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8 | 0.3 ft / 7.7: 3" Asphalt | | | | | | |
| | | Light Brown, POORLY-GRADED SAND WITH SILT, FEW GRAVEL, Dry, Medium Dense, SP-SM, **(FILL)** | | SS S-1 | 70 | 10-11-13-12 (24) | | 0.0 |
| | | 2.0 ft / 6.0: Light Brown, Silty Sand, Trace Gravel, Dry to Moist, Medium Dense To Dense, SM, **(FILL)** | | SS S-2 | 70 | 16-19-15-19 (34) | | 0.0 |
| 5 | | ▽ | | SS S-3 | 65 | 12-6-14-13 (20) | | 0.1 |
| | | | | SS S-4 | 85 | 11-8-9-7 (17) | | 0.1 |
| | | 8.0 ft / 0.0: Brown, Poorly-Graded Sand with Silt, Trace Gravel, Wet, Loose, SP-SM, **(FILL)** | | SS S-5 | 55 | 3-2-3-3 (5) | | 0.3 |
| 10 | -2 | 10.0 ft / -2.0: Brown, Poorly-Graded Sand with Silt, Few Gravel, Wet, Very Loose, SP-SM, **(FILL)** | | SS S-6 | 65 | 2-1-2-1 (3) | | 0.4 |
| | -4 | 12.0 ft / -4.0: Brown, POORLY-GRADED SAND WITH SILT, FEW GRAVEL, Wet, Loose, SP-SM, **(FILL)** | | SS S-7 | 55 | 2-2-3-5 (5) | | 0.2 |
| 15 | -6 | 14.0 ft / -6.0: Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Very Loose to Loose, SP-SM, **(FILL)** | | SS S-8 | 65 | 5-1-2-1 (3) | | 0.1 |
| | -9.5 | 17.5 ft / -9.5: Dark Brown, Slightly Organic Silty Sand, Trace Gravel, Trace Shells, Wet, Loose, SM, **(OUTWASH)** | | SS S-9 | 80 | 3-3-1-9 (4) | | 0.5 |
| | -10 | 18.0 ft / -10.0: Brown, Silty Sand with Gravel, Wet, Very Dense, SM, **(GLACIAL TILL)** | | SS S-10 | 90 | 13-23-30-31 (53) | | 0.2 |
| 20 | -12 | 20.0 ft / -12.0: Grayish Brown, Poorly-Graded Sand with Silt, Few Gravel, Wet, Dense, SP-SM, **(GLACIAL TILL)** | | SS S-11 | 100 | 15-16-28-29 (44) | | 0.1 |
| | -13 | 21.0 ft / -13.0: Gray, Silty Sand, Trace Gravel, Wet, Very Dense, SM, **(GLACIAL TILL)** | Split Spoon Refusal at 23.8' bgs. | SS S-12 | 91 | 12-30-37-50 /0.3' (67) | | 0.5 |
| 25 | | | | SS S-13 | 90 | 14-32-44-32 (76) | | 0.2 |
| | | | | SS S-14 | 75 | 29-25-25-29 (50) | | 0.5 |
| | | | Split Spoon And Roller Bit Refusal at 29.8' bgs. | SS S-15 | 83 | 28-20-31-50 /0.3' (51) | | 0.1 |
| 30 | -22 | 29.8 ft / -21.8: End of boring at 29.8 feet | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-2-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/14/2023 **DATE COMPLETED** 11/15/2023
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624247 **LONGITUDE** -70.914672
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 11/14/2023 8.0 ft / Elev 0.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | MATERIAL DESCRIPTION | REMARKS | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8 | 0.2 ft 3" Asphalt | | | | | | |
| | 7.8 | Tan, Poorly-Graded Sand with Silt, Dry to Moist, Medium Dense to Dense, SP-SM, **(FILL)** | | SS S-1 | 75 | 9-10-10-17 (20) | | 0.2 |
| | | | | SS S-2 | 75 | 15-19-19-19 (38) | | 0.1 |
| 5 | 4.0 | 4.0 ft | | SS S-3 | 70 | 10-7-7-8 (14) | | 0.1 |
| | 2.0 | 6.0 ft Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Moist to Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-4 | 70 | 6-6-7-7 (13) | | 0.2 |
| | | ▽ | | SS S-5 | 50 | 2-4-7-5 (11) | | 0.1 |
| 10 | -2 | 10.0 ft Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-6 | 70 | 5-5-7-9 (12) | | 0.3 |
| | -4.0 | 12.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-7 | 90 | 4-5-10-14 (15) | | 0.2 |
| 15 | | | | SS S-8 | 55 | 7-12-16-24 (28) | | 0.1 |
| | | | | SS S-9 | 55 | 7-5-9-14 (14) | | 0.3 |
| | -10.0 | 18.0 ft Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Loose, SP-SM, **(FILL)** | | SS S-10 | 75 | 6-4-5-6 (9) | | 0.2 |
| 20 | -12.0 -12 | 20.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-11 | 90 | 5-7-10-12 (17) | | 0.2 |
| | | | | SS S-12 | 70 | 5-6-7-7 (13) | | 0.1 |
| | -16.0 | 24.0 ft Brown, POORLY-GRADED SAND WITH SILT, FEW GRAVEL, Wet, Loose, SP-SM, **(FILL)** | | SS S-13 | 75 | 4-5-3-4 (8) | | 0.1 |
| 25 | -18.0 | 26.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-14 | 95 | 5-9-15-36 (24) | | 0.2 |
| | | | | SS S-15 | 75 | 15-11-13-22 (24) | | 0.1 |
| 30 | -22.0 -22 | 30.0 ft Gray, Silty Sand with Gravel, Wet, Very Dense, SM, **(GLACIAL TILL)** | Split spoon refusal at 31' bgs | SS S-16 | 100 | 7-32-50/0' | | 0.4 |
| | -23.0 | 31.0 ft End of boring at 31.0 feet | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

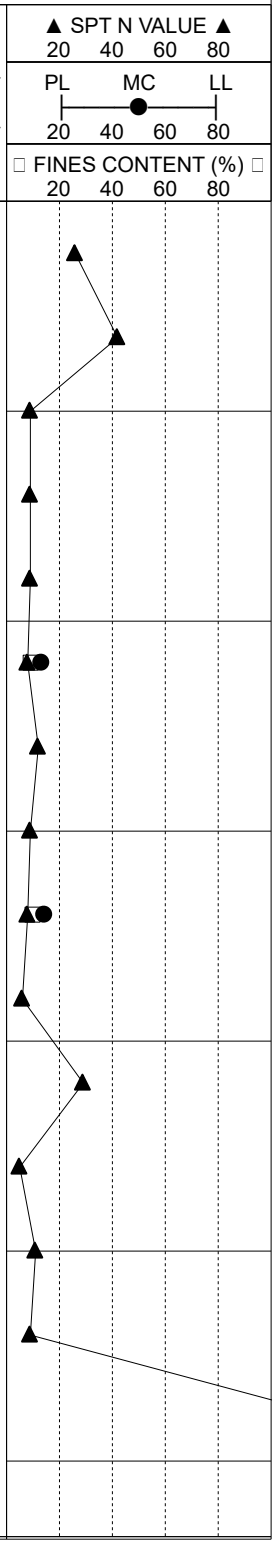
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31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-3-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/15/2023 **DATE COMPLETED** 11/15/2023
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624011 **LONGITUDE** -70.914611
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 11/15/2023 4.0 ft / Elev 4.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | MATERIAL DESCRIPTION | REMARKS | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8 | 0.2 ft / 7.8: 3" Asphalt | | | | | | |
| | | Tan, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)** | | SS S-1 | 60 | 7-9-17-16 (26) | | 0.1 |
| | | 2.0 ft / 6.0: Tan, Poorly-Graded Sand with Silt and Gravel, Dry, Dense, SP-SM, **(FILL)** | | SS S-2 | 65 | 15-27-15-13 (42) | | 0.3 |
| | | 4.2 ft / 3.8: Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Loose, SP-SM, **(FILL)** | | SS S-3 | 55 | 5-4-5-7 (9) | | 0.1 |
| 5 | | 7.0 ft / 1.0: Gray To Brown, Silty Sand with Gravel, Wet, Loose, SM, **(FILL)** | | SS S-4 | 75 | 7-5-4-7 (9) | | 0.1 |
| | | 8.0 ft / 0.0: Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Loose, SP-SM, **(FILL)** | | SS S-5 | 50 | 4-5-4-5 (9) | | 0.1 |
| 10 | -2 | 10.0 ft / -2.0: Brown, WELL-GRADED SAND WITH SILT AND GRAVEL, Wet, Loose, SW-SM, **(FILL)** | | SS S-6 | 55 | 2-2-6-5 (8) | | 0.1 |
| | | 12.0 ft / -4.0: Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Loose to Medium Dense, SP-SM, **(FILL)** | | SS S-7 | 70 | 4-5-7-9 (12) | | 0.1 |
| 15 | | 16.0 ft / -8.0: Brown, WELL-GRADED SAND WITH SILT, FEW GRAVEL, Wet, Loose, SW-SM, **(FILL)** | | SS S-8 | 50 | 6-4-5-6 (9) | | 0.1 |
| | | 18.0 ft / -10.0: Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Loose to Medium Dense, SP-SM, **(FILL)** | | SS S-9 | 85 | 4-4-4-6 (8) | | 0.1 |
| 20 | -12 | | | SS S-10 | 55 | 3-3-3-6 (6) | | 0.2 |
| | | 22.0 ft / -14.0: Dark Gray, Silty Sand with Gravel, Trace Shells, Wet, Loose to Medium Dense, SM, **(FILL)** | | SS S-11 | 60 | 9-13-16-24 (29) | | 0.0 |
| | | | | SS S-12 | 38 | 2-3-2-3 (5) | | 0.0 |
| 25 | | | | SS S-13 | 38 | 7-5-6-4 (11) | | 0.1 |
| | | 28.0 ft / -20.0: Gray, Silty Sand with Gravel, Trace Shells, Wet, Very Dense, SM, **(GLACIAL TILL)** | Split spoon refusal at 29.2' bgs. | SS S-14 | 56 | 2-5-4-9 (9) | | 0.0 |
| | | 29.2 ft / -21.2: End of boring at 29.2 feet | | SS S-15 | 64 | 25-50-55/0.2' (105) | | 0.0 |
| 30 | -22 | | | | | | | |



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# BORING NUMBER CEC-4-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/03/2024 **DATE COMPLETED** 06/05/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624410 **LONGITUDE** -70.914650
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: N/A; AT END OF CORING: 06/05/2024 6.0 ft / Elev 2.0 ft; 24 HRS AFTER DRILLING: N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft 5" Asphalt<br>Brown, Poorly-Graded Sand with Silt, Trace Gravel, Dry, Medium Dense, SP-SM, **(FILL)** | 7.6 | SS S-1 | 75 | 8-6-20-20 (26) | | |
| | | 4.0 ft<br>Brown, Poorly-Graded Sand with Silt, Moist, Medium Dense, SP-SM, **(FILL)** | 4.0 | SS S-2 | 40 | 16-5-6-6 (11) | | |
| 5 | | 9.0 ft<br>Brown, SILTY SAND, Wet, Very Loose, SM, **(FILL)** | -1.0 | SS S-3 | 45 | 2-2-1-4 (3) | | |
| 10 | Composite analytical sample obtained from 12-24 ft. | 14.0 ft<br>Brown, SILTY SAND, Wet, Medium Dense, SM, **(FILL)** | -6.0 | SS S-4 | 50 | 7-7-9-8 (16) | | |
| 15 | | 19.0 ft<br>Brownish Gray, Poorly-Graded Sand, Wet, Medium Dense, SP, **(FILL)** | -11.0 | SS S-5 | 100 | 5-7-6-7 (13) | | |
| 20 | Composite analytical sample obtained from 24-36 ft. | 24.0 ft<br>Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Loose, SP-SM, **(FILL)** | -16.0 | SS S-6 | 35 | 6-3-2-1 (5) | | |
| 25 | Split spoon refusal at 45' bgs. | 29.0 ft<br>Brownish Gray to Orange, Poorly-Graded Sand with Gravel, Wet, Very Dense, SM, **(GLACIAL TILL)** 30.3 ft | -21.0<br>-22.3 | SS S-7 | 100 | 24-22-100/0.3' (122) | | |
| 30 | | | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-4-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 35 | | 34.0 ft — Brownish Gray to Orange, Silty Sand with Gravel, Wet, Very Dense, SM, **(GLACIAL TILL)** | -26.0 | SS S-8 | 100 | 50-54-25-64 (79) | | |
| 40 | Split spoon refusal at 40.3' bgs. | 39.0 ft — Brown to Gray, Sandy Silt, Wet, Hard, ML, **(GLACIAL TILL)** 40.3 ft | -31.0 -32.3 -32 | SS S-9 | 100 | 14-13-65/0.3' (78) | | |
| 45 | Started coring at 45' bgs. 0.5'/ft 0.5'/ft 0.75'/ft 1'/ft 2'/ft | No Recovery | | RC C-1 | 0 (0) | | | |
| 50 | 1.75'/ft 1.5'/ft 3.25'/ft 3.25'/ft 3.5'/ft | 50.0 ft — Dark Gray, Fine to Coarse Grained Gabbro, Slightly Weathered, Broken, Hard 50.0 ft | -42.0 -42.0 -42 | RC C-2 | 66 (22) | | | |
| 55 | 2.25'/ft 1.25'/ft 1'/ft 1'/ft 1.5'/ft | 55.0 ft — Gray to White, Coarse Grained Granite, Slightly Weathered, Very Broken, Hard | -47.0 | RC C-3 | 35 (7) | | | |
| 60 | | 60.0 ft — End of boring at 60.0 feet | -52.0 -52 | | | | | |
| 65 | | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-5-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/05/2024 **DATE COMPLETED** 06/07/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624340 **LONGITUDE** -70.914639
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
AT END OF CORING 06/07/2024 4.0 ft / Elev 4.0 ft
24 HRS AFTER DRILLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft 5" Asphalt<br>Brown, Poorly-Graded Sand with Silt, Trace Gravel, Dry, Medium Dense, SP-SM, **(FILL)** | 7.6 | SS S-1 | 33 | 9-9-13-15 (22) | | |
| | | 4.0 ft<br>Brown, SILTY SAND, Moist, Medium Dense, SM, **(FILL)** | 4.0 | | | | | |
| 5 | | | | SS S-2 | 40 | 9-7-8-9 (15) | | |
| | | 9.0 ft<br>Brown, Poorly-Graded Sand with Silt, Trace Gravel, Wet, Dense, SP-SM, **(FILL)** | -1.0 | | | | | |
| 10 | | | -2 | SS S-3 | 50 | 17-15-18-9 (33) | | |
| | Composite analytical sample obtained from 12-24 ft. | 14.0 ft<br>Brown, WELL-GRADED SAND WITH SILT, Wet, Medium Dense, SW-SM, **(FILL)** | -6.0 | | | | | |
| 15 | | | | SS S-4 | 40 | 13-11-13-10 (24) | | |
| | | 19.0 ft<br>Brown, Poorly-Graded Sand, Wet, Dense, SP, **(FILL)** | -11.0 | | | | | |
| 20 | | | -12 | SS S-5 | 65 | 23-23-20-35 (43) | | |
| | Composite analytical sample obtained from 24-36 ft. | 24.0 ft<br>Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Dense, SP-SM, **(FILL)** | -16.0 | | | | | |
| 25 | | | | SS S-6 | 40 | 20-16-24-19 (40) | | |
| | | 29.0 ft<br>Dark Gray, Poorly-Graded Sand with Silt, Trace Shells, Wet, Dense, SM, **(OUTWASH)** | -21.0 | | | | | |
| 30 | | 31.0 ft | -22<br>-23.0 | SS S-7 | 40 | 7-15-22-17 (37) | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-5-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| | | 34.0 ft | -26.0 | | | | | |
| 35 | | Brownish Gray to Orange, Silty Sand with Gravel, Wet, Dense to Very Dense, SM, **(GLACIAL TILL)** | | SS S-8 | 60 | 34-18-27-23 (45) | | |
| 40 | | | -32 | SS S-9 | 50 | 17-12-18-30 (30) | | |
| | Split spoon refusal at 44' bgs. | 43.5 ft | -35.5 | | | | | |
| | 2.25'/ft | 44.0 ft No Recovery | -36.0 | SS S-10 | 0 | 60/0' (60) | | |
| 45 | 1.5'/ft | Gray, Granite, Highly Weathered, Very Broken, Medium Hard, **(Weathered Rock)** | | | | | | |
| | 1.5'/ft | | | RC C-1 | 12 (0) | | | |
| | 1.75'/ft | | | | | | | |
| | 1.25'/ft | | | | | | | |
| | 2.25'/ft | | | | | | | |
| 50 | 1'/ft | | -42 | | | | | |
| | 0.25'/ft | | | RC C-2 | 4 (0) | | | |
| | 1'/ft | | | | | | | |
| | 1'/ft | | | | | | | |
| | Sand infiltration noted at about 52' bgs. | 54.0 ft | -46.0 | | | | | |
| 55 | | End of boring at 54.0 feet | | | | | | |
| 60 | | | -52 | | | | | |
| 65 | | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-6-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/11/2024 **DATE COMPLETED** 06/11/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624221 **LONGITUDE** -70.914618
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING 06/11/2024 6.5 ft / Elev 1.5 ft
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft 5" Asphalt<br>Dark Brown, Poorly-Graded Sand with Silt and Gravel, Dry, Dense, SP-SM, **(FILL)** | 7.6 | SS S-1 | 90 | 17-14-22-20 (36) | | |
| 5 | | 4.0 ft<br>Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Moist, Medium Dense, SM, **(FILL)** | 4.0 | SS S-2 | 50 | 13-13-14-9 (27) | | |
| 10 | Composite analytical sample obtained from 12-24 ft. | 9.0 ft<br>Brownish Gray, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(FILL)** | -1.0 | SS S-3 | 50 | 11-6-10-7 (16) | | |
| 15 | | 14.0 ft<br>Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | -6.0 | SS S-4 | 25 | 6-5-6-5 (11) | | |
| 20 | | 19.0 ft<br>Brown, POORLY-GRADED SAND WITH SILT, Wet, Medium Dense, SP-SM, **(FILL)** | -11.0 | SS S-5 | 55 | 7-7-7-16 (14) | | |
| 25 | Composite analytical sample obtained from 24-36 ft. | 24.0 ft<br>Brown, POORLY GRADED SAND WITH GRAVEL, Wet, Loose, SP, **(FILL)** | -16.0 | SS S-6 | 25 | 5-4-5-4 (9) | | |
| 30 | | 29.0 ft<br>Brownish Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)**<br>31.0 ft | -21.0<br>-23.0 | SS S-7 | 15 | 5-4-6-18 (10) | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-6-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| | | | 34.0 ft<br>Brown, SILTY SAND WITH GRAVEL, Wet, Very Dense to Medium Dense, SM, **(GLACIAL TILL)** | -26.0 | | | | | |
| 35 | | | | | SS S-8 | 70 | 40-40-90-74 (130) | | |
| 40 | | | | -32 | SS S-9 | 40 | 15-12-11-8 (23) | | |
| | | Split spoon refusal at 44' bgs. | 43.9 ft<br>44.0 ft No Recovery<br>End of boring at 44.0 feet | -35.9<br>-36.0 | S-10 | 0 | 50/0' | | |
| 45 | | | | | | | | | |
| 50 | | | | -42 | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | -52 | | | | | |
| 65 | | | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-7-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/10/2024 **DATE COMPLETED** 06/11/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624202 **LONGITUDE** -70.914623
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: N/A; AT END OF CORING: N/A; 24 HRS AFTER DRILLING: 06/11/2024 5.0 ft / Elev 3.0 ft
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft 5" Asphalt<br>Brown, Poorly-Graded Sand with Silt, Dry, Loose, SP-SM, **(FILL)** | 8 | SS S-1 | 90 | 13-5-4-5 (9) | | |
| 5 | | 4.0 ft<br>Brown, SILTY SAND WITH GRAVEL, Moist, Medium Dense, SM, **(FILL)** | 4.0 | SS S-2 | 55 | 18-7-9-9 (16) | | |
| 10 | | 9.0 ft<br>Brown, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(FILL)** | -1.0 | SS S-3 | 75 | 11-7-8-8 (15) | | |
| 15 | Composite analytical sample obtained from 12-24 ft. | 14.0 ft<br>Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | -6.0 | SS S-4 | 40 | 4-8-12-6 (20) | | |
| 20 | | 19.0 ft<br>Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Dense to Medium Dense, SP-SM, **(FILL)** | -11.0 | SS S-5 | 50 | 14-15-17-12 (32) | | |
| 25 | Composite analytical sample obtained from 24-36 ft. | | | SS S-6 | 33 | 15-12-13-9 (25) | | |
| 30 | | 29.0 ft<br>Dark Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Medium Dense, SP-SM, **(OUTWASH)**<br>31.0 ft | -21.0<br>-23.0 | SS S-7 | 65 | 8-4-13-30 (17) | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-7-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| | | | 34.0 ft<br>Brownish Orange, Silty Sand with Gravel, Moist, Very Dense to Dense, SM, **(GLACIAL TILL)** | -26.0 | | | | | |
| 35 | | | | | SS S-8 | 55 | 21-37-83-74 (120) | | |
| 40 | | | | -32 | SS S-9 | 40 | 31-16-19-14 (35) | | |
| | | Split spoon refusal at 44.1' bgs. | 44.0 ft<br>44.1 ft No Recovery<br>End of boring at 44.1 feet | -36.0<br>-36.1 | SS S-10 | 0 | 120/0.1' (120) | | |
| 45 | | | | | | | | | |
| 50 | | | | -42 | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | -52 | | | | | |
| 65 | | | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-8-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/10/2024 **DATE COMPLETED** 06/10/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624103 **LONGITUDE** -70.914566
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 06/10/2024 5.5 ft / Elev 2.5 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft / 7.6: 5" Asphalt<br>Brown, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)** | SS S-1 | 40 | 10-6-9-6 (15) | | |
| 5 | | | 4.0 ft / 4.0: Brown, SILTY SAND, Moist, Loose, SM, **(FILL)** | SS S-2 | 90 | 5-4-5-3 (9) | | |
| 10 | -2 | Composite analytical sample obtained from 12-24 ft. | 9.0 ft / -1.0: Brown, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(FILL)** | SS S-3 | 25 | 8-7-11-9 (18) | | |
| 15 | | | 14.0 ft / -6.0: Brown, POORLY-GRADED SAND WITH GRAVEL, Wet, Medium Dense, SP, **(FILL)** | SS S-4 | 50 | 10-10-11-12 (21) | | |
| 20 | -12 | | 19.0 ft / -11.0: Brown, Poorly-Graded Sand with Silt, Wet, Dense, SP-SM, **(FILL)** | SS S-5 | 88 | 13-16-17-28 (33) | | |
| 25 | | Composite analytical sample obtained from 24-36 ft. | 24.0 ft / -16.0: Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | SS S-6 | 35 | 15-10-10-11 (20) | | |
| 30 | -22 | | 29.0 ft / -21.0: Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Medium Dense, SP-SM, **(OUTWASH)**<br>31.0 ft / -23.0 | SS S-7 | 40 | 6-7-10-6 (17) | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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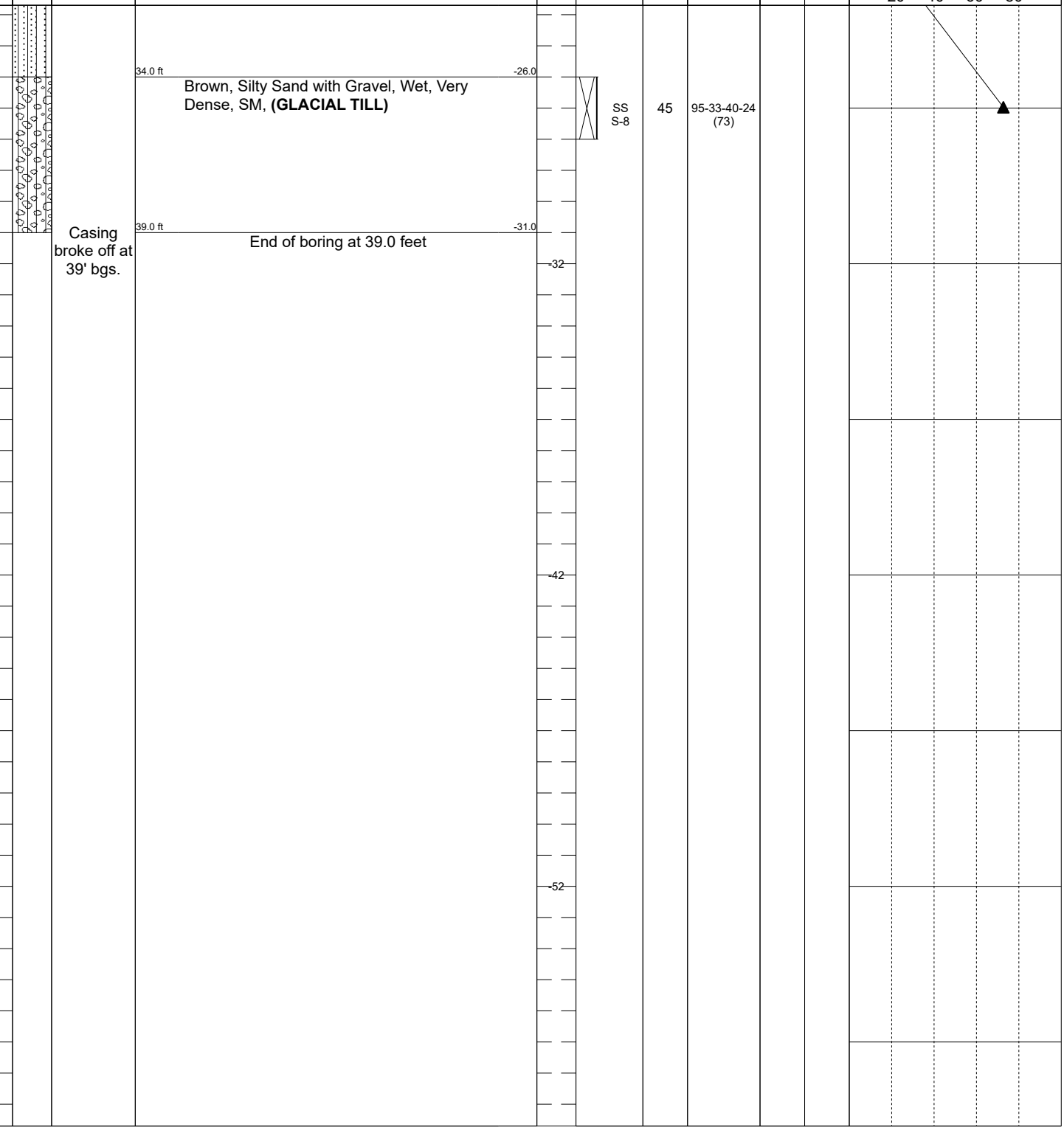
# BORING NUMBER CEC-8-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| 34.0 ft | | | Brown, Silty Sand with Gravel, Wet, Very Dense, SM, **(GLACIAL TILL)** | -26.0 | | | | | |
| 35 | | | | | SS S-8 | 45 | 95-33-40-24 (73) | | |
| 39.0 ft | | Casing broke off at 39' bgs. | End of boring at 39.0 feet | -31.0 | | | | | |
| 40 | | | | -32 | | | | | |
| 45 | | | | | | | | | |
| 50 | | | | -42 | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | -52 | | | | | |
| 65 | | | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80



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# BORING NUMBER CEC-9-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/31/2024 **DATE COMPLETED** 06/03/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624394 **LONGITUDE** -70.914783
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING 06/03/2024 6.5 ft / Elev 1.5 ft
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Composite analytical sample collected from 0-12' bgs | 0.4 ft 5" Asphalt<br>Brown, SILTY SAND WITH GRAVEL, Dry, Dense, SM, **(FILL)** 7.6 | 8 | SS S-1 | 50 | 15-20-15-8 (35) | | |
| 5 | | 4.0 ft Brown, Poorly-Graded Sand with Silt, Moist, Medium Dense, SP-SM, **(FILL)** 4.0 | | SS S-2 | 71 | 9-9-6-7 (15) | | |
| 10 | | 9.0 ft Brown, POORLY-GRADED SAND WITH GRAVEL, Wet, Medium Dense, SP, **(FILL)** -1.0 | 2 | SS S-3 | 50 | 11-7-11-8 (18) | | |
| 15 | Split spoon refusal at 15.3' bgs. Washed down to 19' bgs. | 14.0 ft Brown, Poorly-Graded Sand with Silt, Wet, Very Dense, SP-SM, **(FILL)** -6.0<br>15.3 ft -7.3 | | SS S-4 | 38 | 3-5-50/0.3' | | |
| 20 | 1.5'/ft<br>1.25'/ft<br>1.25'/ft<br>0.75'/ft<br>0.75'/ft<br>1.25'/ft<br>1.25'/ft | 19.0 ft Gray, Coarse Grained Granite, Slightly Weathered, Slightly Broken to Moderately Broken, Hard -11.0 | 12 | RC C-1 | 87 (64) | | | |
| 25 | 0.5'/ft<br>1'/ft<br>1.25'/ft<br>1'/ft | | | RC C-2 | 68 (33) | | | |
| 30 | 0.5'/ft<br>0.5'/ft | 29.0 ft Gray, Coarse Grained Granite, Moderately Weathered, Very Broken, Hard -21.0 | 22 | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-9-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1'/ft | Gray, Coarse Grained Granite, Moderately Weathered, Very Broken, Hard | | RC C-3 | 20 (0) | | | | |
| | | 1'/ft | | | | | | | | |
| | | Washed down to 36' bgs. | 34.0 ft | -26.0 | | | | | | |
| 35 | | 1'/ft | 36.0 ft | -28.0 | | | | | | |
| | | 0.75'/ft | Gray to White, Coarse Grained Granite, Slightly Weathered, Moderately Broken, Hard | | | | | | | |
| | | 0.75'/ft | | | RC C-4 | 83 (40) | | | | |
| | | 2.5'/ft | | | | | | | | |
| 40 | | 2.5'/ft | | -32 | | | | | | |
| | | | 41.0 ft | -33.0 | | | | | | |
| | | | End of boring at 41.0 feet | | | | | | | |
| 45 | | | | | | | | | | |
| 50 | | | | -42 | | | | | | |
| 55 | | | | | | | | | | |
| 60 | | | | -52 | | | | | | |
| 65 | | | | | | | | | | |

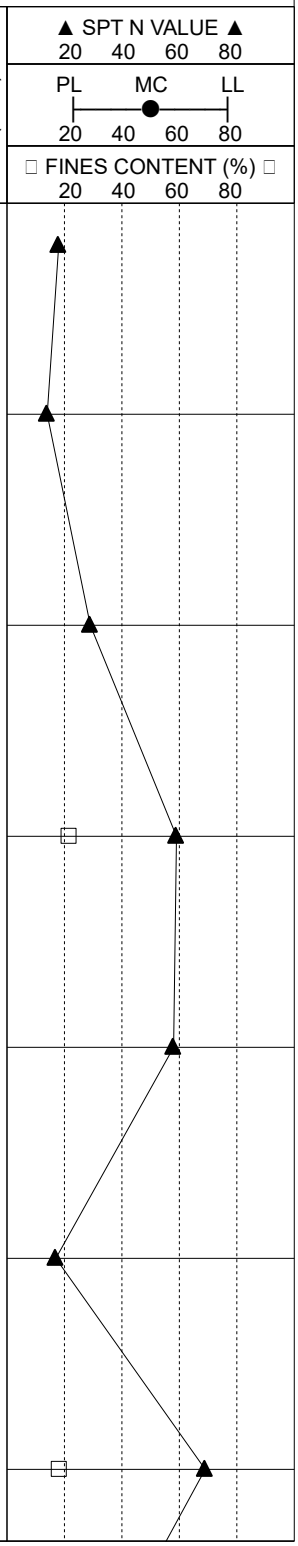
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# BORING NUMBER CEC-10-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/30/2024 **DATE COMPLETED** 05/31/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624318 **LONGITUDE** -70.914762
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: N/A; AT END OF CORING: 05/31/2024 6.0 ft / Elev 2.0 ft; 24 HRS AFTER DRILLING: N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft 5" Asphalt<br>Brown, Silty Sand, Dry, Medium Dense, SM, **(FILL)** | 7.6 | SS S-1 | 66 | 9-8-10-14 (18) | | |
| | | 4.0 ft<br>Brown to Gray, Poorly-Graded Sand with Silt, Moist to Wet, Medium Dense, SP-SM, **(FILL)** | 4.0 | SS S-2 | 71 | 11-7-7-6 (14) | | |
| 10 | | | -2 | SS S-3 | 50 | 13-14-15-12 (29) | | |
| | Composite analytical sample obtained from 12-24 ft. | 14.0 ft<br>Brown, SILTY SAND, Wet, Very Dense, SM, **(FILL)** | -6.0 | SS S-4 | 66 | 15-22-37-30 (59) | | |
| | | 19.0 ft<br>Gray, Poorly-Graded Sand with Silt, Wet, Very Dense, SP-SM, **(FILL)** | -11.0 | SS S-5 | 58 | 18-28-30-30 (58) | | |
| 25 | | 24.0 ft<br>Dark Gray, Poorly-Graded Gravel with Silt, Wet, Medium Dense, GP-GM, **(OUTWASH)** | -16.0 | SS S-6 | 4 | 7-8-9-18 (17) | | |
| | | 29.0 ft<br>Brown, SILTY SAND WITH GRAVEL, Wet, Very Dense, SM, **(GLACIAL TILL)** | -21.0 | SS S-7 | 38 | 21-24-45-34 (69) | | |
| 30 | | 31.0 ft | -23.0 | | | | | |




(Continued Next Page)

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# BORING NUMBER CEC-10-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| 34.0 ft | | | Brown to Orange, Silty Sand with Gravel/ Weathered Rock, Wet, Medium Dense, SM, **(GLACIAL TILL)** | -26.0 | | | | | |
| 35 | | | | | SS S-8 | 42 | 26-15-14-12 (29) | | |
| 36.0 ft | | | | -28.0 | | | | | |
| | | Split spoon refusal at 39' bgs. Began rock coring at 41' bgs. | | | | | | | |
| 39.0 ft | | | No Recovery | -31.0 | SS S-9 | 0 | 50/0' | | |
| 40 | | | | -32 | | | | | |
| 41.0 ft | | | | -33.0 | | | | | |
| | | 2'/ft | Gray, Coarse Grained Granite, Slightly Weathered, Moderately Broken to Slightly Broken, Hard | | | | | | |
| | | 2'/ft | | | | | | | |
| | | 1.25'/ft | | | RC C-1 | 100 (43) | | | |
| | | 1.25'/ft | | | | | | | |
| 45 | | 4.25'/0.5 ft 1.5'/ft | | | | | | | |
| | | 1.75'/ft | | | | | | | |
| | | 1.75'/ft | | | | | | | |
| | | 1.75'/ft | | | RC tC-2 | 97 (64) | | | |
| | | 1.25'/ft | | | | | | | |
| 50 | | 0.75'/0.5 ft | | -42 | | | | | |
| 51.0 ft | | | | -43.0 | | | | | |
| | | | End of boring at 51.0 feet | | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | -52 | | | | | |
| 65 | | | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-11-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/07/2024 **DATE COMPLETED** 06/07/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624232 **LONGITUDE** -70.914741
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING 06/07/2024 6.5 ft / Elev 1.5 ft
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft 5" Asphalt<br>Brown, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)** | 7.6 | SS S-1 | 65 | 8-13-14-13 (27) | | |
| 5 | | 4.0 ft<br>Brown, Silty Sand with Gravel, Moist, Dense, SM, **(FILL)** | 4.0 | SS S-2 | 50 | 14-17-13-11 (30) | | |
| 10 | Composite analytical sample obtained from 12-24 ft. | 9.0 ft<br>Brown, SILTY SAND WITH GRAVEL, Wet, Medium Dense, SM, **(FILL)** | -1.0 | SS S-3 | 50 | 5-7-18-20 (25) | | |
| 15 | | 14.0 ft<br>Brownish Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Dense, SP-SM, **(FILL)** | -6.0 | SS S-4 | 65 | 20-19-21-28 (40) | | |
| 20 | | 19.0 ft<br>Brownish Gray, Poorly-Graded Sand with Silt, Wet, Very Dense, SP-SM, **(FILL)** | -11.0 | SS S-5 | 65 | 22-36-38-42 (74) | | |
| 25 | Slight organic odor at 24' bgs. | 24.0 ft<br>Dark Brown, SILTY SAND, Wet, Medium Dense, SM, **(OUTWASH)** | -16.0 | SS S-6 | 38 | 10-13-11-14 (24) | | |
| 30 | | 29.0 ft<br>Gray, Silty Sand with Gravel, Wet, Very Dense, SM, **(GLACIAL TILL)**<br>31.0 ft | -21.0<br>-23.0 | SS S-7 | 65 | 31-41-55-65 (96) | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-11-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| 34.0 ft | | | Dark Orange, Silty Sand with Gravel, Wet, Very Dense, SM, **(GLACIAL TILL)** | -26.0 | | | | | |
| 35 | | | | | SS S-8 | 65 | 14-36-59-36 (95) | | |
| | | Split spoon refusal at 40.9' bgs. | | | | | | | |
| 40 | | | | -32 | SS S-9 | 84 | 24-24-28-120 /0.4' (52) | | |
| 40.9 ft | | | | -32.9 | | | | | |
| 44.0 ft | | | | -36.0 | | | | | |
| | | Split spoon refusal at 45' bgs. | Gray, Silty Sand with Gravel, Wet, Very Dense, **(WEATHERED ROCK)** | | | | | | |
| 45.0 ft | | | | -37.0 | SS S-10 | 100 | 35-110 (110) | | |
| 45 | | | End of boring at 45.0 feet | | | | | | |
| 50 | | | | -42 | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | -52 | | | | | |
| 65 | | | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-12-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/29/2024 **DATE COMPLETED** 05/30/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624149 **LONGITUDE** -70.914723
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: N/A; AT END OF CORING: 05/30/2024 6.5 ft / Elev 1.5 ft; 24 HRS AFTER DRILLING: N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft / 7.6: 5" Asphalt<br>Brown, SILTY SAND, Dry, Medium Dense, SM, **(FILL)** | SS S-1 | 88 | 7-5-7-5 (12) | | |
| | | | 4.0 ft / 4.0: Brown, Poorly-Graded Sand with Silt and Gravel, Moist, Medium Dense, SP-SM, **(FILL)** | SS S-2 | 62 | 10-9-12-9 (21) | | |
| | | | 9.0 ft / -1.0: Brown, Silty Sand, Wet, Medium Dense, SM, **(FILL)** | SS S-3 | 4 | 6-5-7-7 (12) | | |
| | | Composite analytical sample obtained from 12-24 ft. | 14.0 ft / -6.0: Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | SS S-4 | 58 | 14-13-16-17 (29) | | |
| | | | 19.0 ft / -11.0: Brownish Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Dense, SP-SM, **(FILL)** | | | | | |
| 20 | -12 | | 20.0 ft / -12.0: Gray, Silty Sand with Gravel, Wet, Dense, SM, **(OUTWASH)** | SS S-5 | 54 | 19-17-20-18 (37) | | |
| | | | 24.0 ft / -16.0: Dark Brown, SILTY SAND, Wet, Medium Dense, SM, **(OUTWASH)** | SS S-6 | 50 | 6-5-10-9 (15) | | |
| | | | 29.0 ft / -21.0: Brown to Orange, Silty Sand with Gravel, Wet, Very Dense, SM, **(GLACIAL TILL)** | SS S-7 | 66 | 35-38-40-42 (78) | | |
| 30 | -22 | | 31.0 ft / -23.0 | | | | | |

SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
FINES CONTENT (%) 20 40 60 80

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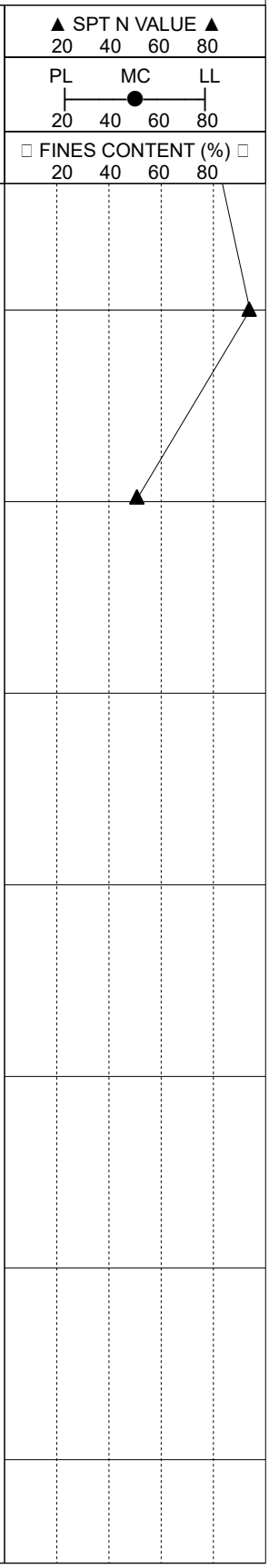
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# BORING NUMBER CEC-12-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| | | | 34.0 ft | -26.0 | | | | | |
| 35 | | | Brown to Orange, Silty Sand with Gravel/ Weathered Rock, Wet, Very Dense, SM, **(GLACIAL TILL)** 35.0 ft | -27.0 | SS S-8 | 66 | 13-25-69-54 (94) | | |
| | | | Black, Poorly-Graded Gravel with Silt, Wet, Very Dense, GP-GM, **(GLACIAL TILL)** | | | | | | |
| | | Split spoon refusal at 40.8' bgs. Started coring at 42' bgs. 1.75'/ft | 39.0 ft | -31.0 | | | | | |
| 40 | | | Brown to Orange, Silty Sand with Gravel/ Weathered Rock, Wet, Very Dense, SM, **(GLACIAL TILL)** 40.8 ft | -32.8 | SS S-9 | 65 | 27-16-35-26/ 0.3' (51) | | |
| | | | 42.0 ft | -34.0 | | | | | |
| | | 1.25'/ft | Black to Gray, Coarse Grained Gabbro, Slightly Weathered, Moderately Broken, Hard | | | | | | |
| | | 1.5'/ft | | | | | | | |
| 45 | | 1.25'/ft | | | RC C-1 | 100 (56) | | | |
| | | 2'/ft | | | | | | | |
| | | | 47.0 ft | -39.0 | | | | | |
| | | | End of boring at 47.0 feet | | | | | | |
| 50 | | | | -42 | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | -52 | | | | | |
| 65 | | | | | | | | | |



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# BORING NUMBER CEC-13-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/20/2024 **DATE COMPLETED** 05/21/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624058 **LONGITUDE** -70.914685
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 05/20/2024 6.0 ft / Elev 2.0 ft
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample obtained from 0-12 and 12-24 ft. | 0.4 ft 5" Asphalt<br>Light Brown, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)** | 7.6 / 8 | SS S-1 | 75 | 8-6-14-10 (20) | | |
| 5 | | | 4.0 ft<br>Brown, SANDY SILT, Moist, Medium Dense, ML, **(FILL)** | 4.0 | SS S-2 | 86 | 15-7-11-7 (18) | | |
| 10 | | | 9.0 ft<br>Brown, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(FILL)** | -1.0 / -2 | SS S-3 | 50 | 4-5-12-13 (17) | | |
| 15 | | | | | SS S-4 | 50 | 15-13-16-13 (29) | | |
| 20 | | Darker wash water observed at 21 feet. | 19.0 ft<br>Brownish Gray, Poorly-Graded Sand with Silt and Shells, Wet, Medium Dense, SP-SM, **(FILL)** | -11.0 / -12 | SS S-5 | 45 | 9-8-11-11 (19) | | |
| 25 | | | 24.0 ft<br>Dark Brown, SILTY SAND WITH GRAVEL, Wet, Medium Dense, SM, **(OUTWASH)**<br>25.0 ft<br>Light Brown, Poorly-Graded Sand with Gravel, Medium Dense, SP, **(GLACIAL TILL)** | -16.0<br>-17.0 | SS S-6 | 40 | 4-1-11-9 (12) | | |
| 30 | | | 29.0 ft<br>Gray, Silty Sand with Gravel, Wet, Medium Dense, SM, **(GLACIAL TILL)**<br>31.0 ft | -21.0 / -22<br>-23.0 | SS S-7 | 30 | 14-14-13-10 (27) | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-13-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| | | | 34.0 ft | -26.0 | | | | | |
| 35 | | | Orange to Brown, Silty Sand with Gravel, Dense to Loose, SM, **(GLACIAL TILL)** | | SS S-8 | 40 | 17-15-21-42 (36) | | |
| 40 | | Increased driving resistance at 42 ft. Began coring at 43 ft. 4.5'/ft 3.75'/ft 4'/ft 3.25'/ft 3'/ft | | -32 | SS S-9 | 30 | 12-7-2-6 (9) | | |
| | | | 43.0 ft | -35.0 | | | | | |
| 45 | | | Dark Gray to Black, Coarse Grained Gabbro, Slightly Weathered to Fresh, Moderately Broken, Hard | | RC C-1 | 100 (63) | | | |
| | | | 48.0 ft | -40.0 | | | | | |
| | | | End of boring at 48.0 feet | | | | | | |
| 50 | | | | -42 | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | -52 | | | | | |
| 65 | | | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-14-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/28/2024 **DATE COMPLETED** 05/29/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624373 **LONGITUDE** -70.914958
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING 05/29/2024 6.5 ft / Elev 1.5 ft
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | ELEVATION (ft) | MATERIAL DESCRIPTION | REMARKS | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8 | 0.4 ft / 7.6: 5" Asphalt<br>Light Brown, Silty Sand, Dry, Dense, SM, **(FILL)** | | SS S-1 | 25 | 13-11-25-27 (36) | | |
| | | 2.0 ft / 6.0: No Recovery | | SS S-2 | 0 | 30-31-26-22 (57) | | |
| | | 4.0 ft / 4.0: Brown, Silty Sand, Moist, Very Dense, SM, **(FILL)** | | SS S-3 | 79 | 19-20-33-36 (53) | | |
| 5 | | | | SS S-4 | 100 | 21-20-43-32 (63) | | |
| | | 8.0 ft / 0.0: Brown, Poorly-Graded Sand with Silt, Wet, Medium Dense to Loose, SP-SM, **(FILL)** | | SS S-5 | 12 | 7-5-7-5 (12) | | |
| 10 | -2 | | | SS S-6 | 75 | 4-5-4-5 (9) | | |
| | | | | SS S-7 | 38 | 3-3-4-3 (7) | | |
| | | 14.0 ft / -6.0: Dark Brown, SILTY SAND, Wet, Very Loose, SM, **(OUTWASH)** | | SS S-8 | 55 | WOH-1-2-1 (3) | | |
| 15 | | 16.0 ft / -8.0: Brownish Gray, Silty Sand, Trace Shells, Wet, Medium Dense, SM, **(OUTWASH)** | | SS S-9 | 50 | 4-5-7-4 (12) | | |
| | | 18.0 ft / -10.0: Brown to Gray, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(GLACIAL TILL)** | | SS S-10 | 46 | 10-12-15-14 (27) | | |
| 20 | -12 | | | SS S-11 | 100 | 32-35-49-42 (84) | | |
| | | | | SS S-12 | 75 | 25-25-60-58 (85) | | |
| 25 | | | | SS S-13 | 58 | 40-37-38-62 (75) | | |
| | | 26.0 ft / -18.0: Brownish Gray to Orange, Silty Sand with Gravel/Weathered Rock, Wet, Very Dense, SM, **(GLACIAL TILL)** | Split spoon refusal at 27.5' bgs. | SS S-14 | 100 | 47-52-72-50/0' (124) | | |
| 30 | -22 | 31.0 ft / -23.0 | Split spoon refusal at 31' bgs. Started coring at | SS S-15 | 46 | 27-18-36-38 (54) | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-14-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 34' bgs. | | | | | | | | |
| | | 2'/ft | 34.0 ft -26.0 | | | | | | | |
| 35 | | 1.5'/ft | Gray, Coarse Grained Granite, Fresh, Slightly Broken, Hard | | RC C-1 | 100 (100) | | | | |
| | | 1.5'/ft | | | | | | | | |
| | | 1.5'/ft | | | | | | | | |
| | | 1.5'/ft | 39.0 ft -31.0 | | | | | | | |
| | | | End of boring at 39.0 feet | | | | | | | |
| 40 | | | | -32 | | | | | | |
| 45 | | | | | | | | | | |
| 50 | | | | -42 | | | | | | |
| 55 | | | | | | | | | | |
| 60 | | | | -52 | | | | | | |
| 65 | | | | | | | | | | |

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# BORING NUMBER CEC-15-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/28/2024 **DATE COMPLETED** 05/28/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624293 **LONGITUDE** -70.914930
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 05/28/2024 5.5 ft / Elev 2.5 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0 | 0.4 ft 5" Asphalt | 8 | | | | | | |
| | 1.5 ft Brownish Tan, Poorly-Graded Sand with Silt and Gravel, Dry, Medium Dense, SP-SM, **(FILL)** | 7.6 | SS S-1 | 75 | 11-7-9-12 (16) | | | |
| | Light Brown, Poorly-Graded Sand with Silt, Dry, Dense, SP-SM, **(FILL)** | 6.5 | SS S-2 | 83 | 19-15-23-17 (38) | | | |
| 5 | 4.0 ft Light Brown, Silty Sand, Moist, Dense, SM, **(FILL)** | 4.0 | SS S-3 | 50 | 12-15-18-17 (33) | | | |
| | 6.0 ft Light Brown, Poorly-Graded Sand with Silt, Moist, Dense, SP-SM, **(FILL)** | 2.0 | SS S-4 | 100 | 20-24-16-13 (40) | | | |
| | 8.0 ft Brown, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(FILL)** | 0.0 | SS S-5 | 40 | 7-5-5-4 (10) | | | |
| 10 | 10.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Loose, SP-SM, **(FILL)** | -2.0 | SS S-6 | 71 | 3-3-4-3 (7) | | | |
| | 12.0 ft Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Loose, SP-SM, **(FILL)** | -4.0 | SS S-7 | 33 | 3-2-3-3 (5) | | | |
| | 14.0 ft Brown, Poorly-Graded Sand, Wet, Loose, SP, **(FILL)** | -6.0 | SS S-8 | 38 | 3-3-3-3 (6) | | | |
| 15 | | | SS S-9 | 71 | 2-2-3-4 (5) | | | |
| | 18.0 ft Brown, Poorly-Graded Sand with Silt, Wet, Loose, SP-SM, **(FILL)** | -10.0 | SS S-10 | 42 | 3-3-3-2 (6) | | | |
| 20 | 20.0 ft Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | -12.0 | SS S-11 | 42 | 2-5-15-37 (20) | | | |
| | 22.0 ft Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Dense, SP-SM, **(GLACIAL TILL)** | -14.0 | SS S-12 | 62 | 26-22-25-23 (47) | | | |
| | 24.0 ft Brown, WELL-GRADED SAND WITH SILT AND GRAVEL, Wet, Dense, SW-SM, **(GLACIAL TILL)** | -16.0 | SS S-13 | 50 | 19-15-16-12 (31) | | | |
| 25 | 26.0 ft Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Very Dense, SP-SM, **(GLACIAL TILL)** | -18.0 | SS S-14 | 100 | 25-30-51-50/ 0.3' (81) | | | Split spoon refusal at 27.8' bgs. Began coring at 29' bgs. |
| | 27.8 ft | -19.8 | | | | | | 3.75'/ft |
| | 29.0 ft Gray, Coarse Grained Granite, Slightly Weathered, Moderately Broken, Hard | -21.0 | | | | | | 3'/ft |
| 30 | | -22 | | | | | | 0.75'/ft |

SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
FINES CONTENT (%) 20 40 60 80

(Continued Next Page)

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Raynham, MA 02767

# BORING NUMBER CEC-15-A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.75'/ft<br>2.25'/ft | Gray, Coarse Grained Granite, Slightly Weathered, Moderately Broken, Hard | | RC C-1 | 60 (44) | | | | |
| 34.0 ft | | | -26.0 | | | | | | | |
| | | | End of boring at 34.0 feet | | | | | | | |
| 35 | | | | | | | | | | |
| 40 | | | | -32 | | | | | | |
| 45 | | | | | | | | | | |
| 50 | | | | -42 | | | | | | |
| 55 | | | | | | | | | | |
| 60 | | | | -52 | | | | | | |
| 65 | | | | | | | | | | |

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# BORING NUMBER CEC-16-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/24/2024 **DATE COMPLETED** 05/24/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624193 **LONGITUDE** -70.914869
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: N/A; AT END OF CORING: 05/28/2024 6.5 ft / Elev 1.5 ft; 24 HRS AFTER DRILLING: N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | MATERIAL DESCRIPTION | REMARKS | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8 | 0.4 ft 5" Asphalt<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, Dense, SP-SM, **(FILL)** (7.6) | | SS S-1 | 83 | 13-10-21-16 (31) | | |
| | | | | SS S-2 | 88 | 15-13-19-23 (32) | | |
| 5 | | | | SS S-3 | 83 | 22-18-25-19 (43) | | |
| | | 6.0 ft ▼ Brown, Poorly-Graded Sand with Silt and Gravel, Moist, Medium Dense, SP-SM, **(FILL)** (2.0) | | SS S-4 | 100 | 15-10-13-11 (23) | | |
| | | 8.0 ft Brown, SILTY SAND WITH GRAVEL, Wet, Medium Dense, SM, **(FILL)** (0.0) | | SS S-5 | 25 | 11-7-10-10 (17) | | |
| 10 | 2 | 10.0 ft Brownish Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Loose to Medium Dense, SP-SM, **(FILL)** (-2.0) | | SS S-6 | 83 | 9-6-5-5 (11) | | |
| | | | | SS S-7 | 25 | 4-2-4-3 (6) | | |
| | | 14.0 ft Brownish Gray, Well-Graded Sand with Silt and Gravel, Wet, Loose, SW-SM, **(FILL)** (-6.0) | | SS S-8 | 55 | 4-2-3-3 (5) | | |
| 15 | | | | SS S-9 | 16 | 4-2-3-3 (5) | | |
| | | 18.0 ft Gray, Poorly-Graded Sand with Silt, Wet, Loose, SP-SM, **(FILL)** (-10.0) | | SS S-10 | 25 | 3-2-2-2 (4) | | |
| 20 | -12 | | | SS S-11 | 100 | 2-2-2-2 (4) | | |
| | | 22.0 ft Dark Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Trace Shells, Wet, Loose, SP-SM, **(OUTWASH)** (-14.0) | | SS S-12 | 50 | 2-2-3-2 (5) | | |
| | | 24.0 ft Light Gray, Silty Sand with Gravel, Wet, Very Dense to Dense, SM, **(GLACIAL TILL)** (-16.0) | | SS S-13 | 75 | 5-19-37-38 (56) | | |
| 25 | | | | SS S-14 | 100 | 58-19-20-18 (39) | | |
| | | 28.0 ft Orange Brown to Gray, Silty Sand with Gravel, Wet, Very Dense, SM, **(GLACIAL TILL)** (-20.0) | | SS S-15 | 50 | 22-40-99-27 (139) | | |
| 30 | -22 | 30.0 ft Brown, Silty Gravel with Sand, Wet, Dense, SM, **(GLACIAL TILL)** (-22.0) | Split spoon refusal at 31.7' and | SS S-16 | 65 | 21-21-15-100 /0.2' | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-16-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| | | 34' bgs. | Brown, Silty Gravel with Sand, Wet, Dense, SM, **(GLACIAL TILL)** | | | | (36) | | |
| | | | 33.5 ft | -25.5 | | | | | |
| | | 1.25'/ft | 34.0 ft No Recovery | -26.0 | SS S-17 | 0 | 50/0' | | |
| 35 | | 2.5'/ft | Light Gray, Coarse Grained Granite, Slightly Weathered, Broken, Hard, **(BEDROCK)** | | | | | | |
| | | 2'/ft | | | tRC C-1 | 97 (43) | | | |
| | | 1'/ft | | | | | | | |
| | | 1.75'/ft | | | | | | | |
| | | | 39.0 ft | -31.0 | | | | | |
| | | | End of boring at 39.0 feet | | | | | | |
| 40 | | | | -32 | | | | | |
| 45 | | | | | | | | | |
| 50 | | | | -42 | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | -52 | | | | | |
| 65 | | | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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Raynham, MA 02767

# BORING NUMBER CEC-17-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/22/2024 **DATE COMPLETED** 05/24/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624126 **LONGITUDE** -70.914830
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 05/24/2024 5.0 ft / Elev 3.0 ft
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | MATERIAL DESCRIPTION | ELEV (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0 | 0.4 ft 5" Asphalt | 7.6 | | | | | | |
| | Light Brown to Tan, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)** | | SS S-1 | 65 | 12-10-18-14 (28) | | | |
| | 2.0 ft Brown to Tan, Poorly-Graded Sand with Silt and Gravel, Dry, Dense, SP-SM, **(FILL)** | 6.0 | SS S-2 | 75 | 17-16-26-21 (42) | | | |
| | 4.0 ft Brown, Poorly-Graded Sand with Silt, Moist, Dense, SP-SM, **(FILL)** | 4.0 | SS S-3 | 65 | 20-22-27-26 (49) | | | |
| 5 | | | SS S-4 | 100 | 11-13-17-12 (30) | | | |
| | 8.0 ft Brown, SILTY SAND, Wet, Medium Dense, SM, **(FILL)** | 0.0 | SS S-5 | 48 | 8-6-6-8 (12) | | | |
| 10 | 10.0 ft Brown, Poorly-Graded Sand, Wet, Loose, SP, **(FILL)** | -2.0 | SS S-6 | 75 | 3-4-4-4 (8) | | | |
| | | | SS S-7 | 30 | 3-2-3-4 (5) | | | |
| 15 | | | SS S-8 | 8 | 3-2-2-3 (4) | | | |
| | 16.0 ft Brown, SILTY SAND, Wet, Loose, SM, **(FILL)** | -8.0 | SS S-9 | 83 | 4-1-4-4 (5) | | | |
| | 18.0 ft Brownish Gray, Poorly-Graded Gravel with Sand, Wet, Loose, GP, **(FILL)** | -10.0 | SS S-10 | 5 | 4-2-2-1 (4) | | | |
| 20 | | | SS S-11 | 70 | 2-2-5-10 (7) | | | |
| | 22.0 ft Gray, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(GLACIAL TILL)** | -14.0 | SS S-12 | 50 | 24-20-28-17 (48) | | | |
| 25 | | | SS S-13 | 20 | 18-14-15-11 (29) | | | |
| | | | SS S-14 | 100 | 10-12-12-13 (24) | | | |
| | 28.8 ft Split spoon refusal at 28.8' bgs. | -20.8 | SS S-15 | 67 | 45-55/0.3' (55) | | | |
| 30 | 30.0 ft Brownish Gray, SILTY SAND WITH GRAVEL, Wet, Very Dense, SM, **(GLACIAL TILL)** | -22.0 | SS S-16 | 40 | 18-18-52-33 (70) | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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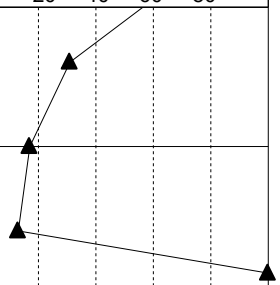
# BORING NUMBER CEC-17-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| | | Brownish Gray, SILTY SAND WITH GRAVEL, Wet, Very Dense, SM, **(GLACIAL TILL)** | | SS S-17 | 100 | 20-17-14-23 (31) | | |
| 34.0 ft | | | -26.0 | | | | | |
| 35 | | Brown to Tan, Silty Sand with Gravel, Wet, Medium Dense, SM, **(GLACIAL TILL)** | | SS S-18 | 25 | 15-8-9-9 (17) | | |
| 36.0 ft | | | -28.0 | | | | | |
| | Split spoon refusal at 38' bgs. Began coring at 39' bgs. 1.25'/ft | Brownish Orange, Silty Gravel with Sand, Wet, Medium Dense, GM, **(GLACIAL TILL)** | | SS S-19 | 25 | 10-7-6-31 (13) | | |
| 38.0 ft | | | -30.0 | | | | | |
| | | No Recovery | | SS S-20 | 0 | 50/0' | | |
| 39.0 ft | | | -31.0 | | | | | |
| 40 | 1.5'/ft | Gray, Coarse Grained Granite, Slightly Weathered, Broken, Hard | -32 | | | | | |
| | 0.75'/ft | | | RC C-1 | 22 (0) | | | |
| | 0.75'/ft | | | | | | | |
| | 1.25'/ft | | | | | | | |
| | 1.75'/ft | | | | | | | |
| 45 | 1.25'/ft | | | | | | | |
| | 1.5'/ft | | | RC C-2 | 10 (0) | | | |
| | 1.25'/ft | | | | | | | |
| | 1.25'/ft | | | | | | | |
| 49.0 ft | | | -41.0 | | | | | |
| | | End of boring at 49.0 feet | | | | | | |
| 50 | | | -42 | | | | | |
| 55 | | | | | | | | |
| 60 | | | -52 | | | | | |
| 65 | | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80



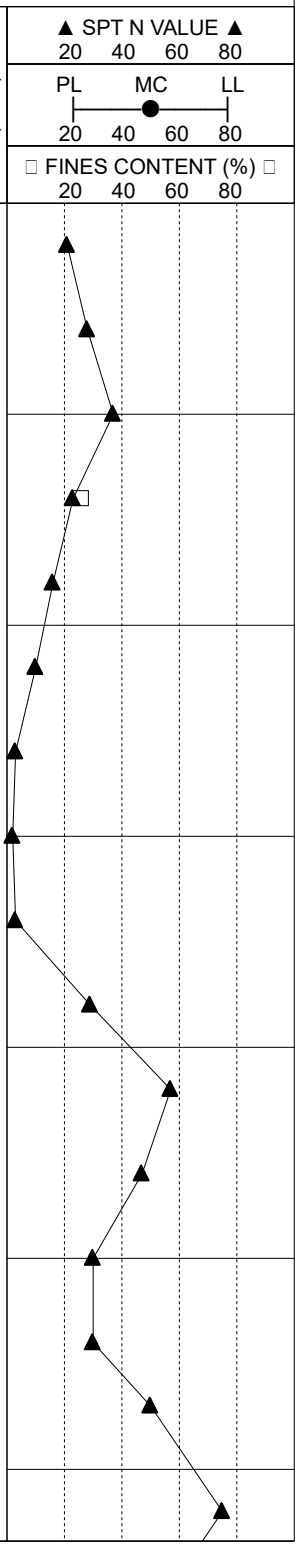
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-18-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/21/2024 **DATE COMPLETED** 05/22/2024
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624037 **LONGITUDE** -70.914820
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 05/22/2024 7.5 ft / Elev 0.5 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0 | 0.4 ft 5" Asphalt | 8 | | | | | | |
| | Light Brown, Poorly-Graded Sand with Silt, Dry, Medium Dense to Dense, SP-SM, **(FILL)** | | SS S-1 | 75 | 9-11-10-9 (21) | | | |
| | | | SS S-2 | 85 | 13-12-16-19 (28) | | | |
| 5 | | | SS S-3 | 85 | 20-19-18-16 (37) | | | |
| | 6.0 ft Brown, SILTY SAND, Wet, Medium Dense, SM, **(FILL)** | 2.0 | SS S-4 | 100 | 8-10-13-10 (23) | | | |
| | 8.0 ft Brown, Poorly-Graded Sand with Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | 0.0 | SS S-5 | 45 | 11-9-7-6 (16) | | | |
| 10 | 10.0 ft Brownish Gray, Silty Sand, Wet, Medium Dens, SM, **(FILL)** | -2.0 | SS S-6 | 100 | 6-5-5-5 (10) | | | |
| | 12.0 ft Gray, Poorly-Graded Sand with Gravel, Wet, Very Loose, SP-SM, **(FILL)** | -4.0 | SS S-7 | 30 | 3-2-1-1 (3) | | | |
| 15 | | | SS S-8 | 35 | 2-1-1-1 (2) | | | |
| | 17.5 ft | -9.5 | SS S-9 | 85 | 2-1-2-1 (3) | | | |
| | 18.0 ft Blackish Gray, Slightly Organic Silty Sand, Wet, Very Loose, SM, **(OUTWASH)** | -10.0 | SS S-10 | 50 | 6-10-19-15 (29) | | | |
| 20 | 20.0 ft Brownish Gray, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(OUTWASH)** | -12.0 | SS S-11 | 100 | 20-24-33-30 (57) | | | |
| | Brownish Gray, Silty Sand with Gravel, Wet, Dense to Very Dense, SM, **(GLACIAL TILL)** | | SS S-12 | 60 | 28-27-20-16 (47) | | | |
| 25 | | | SS S-13 | 45 | 21-17-13-13 (30) | | | |
| | 26.0 ft | -18.0 | SS S-14 | 85 | 13-16-14-18 (30) | | | |
| | Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Dense, SP-SM, **(GLACIAL TILL)** | | SS S-15 | 66 | 19-50 | | | Split spoon refusal at 29' bgs. |
| 30 | 30.0 ft | -22.0 | SS S-16 | 95 | 16-20-55-44 (75) | | | |
| | Brownish Gray to Orange, Poorly-Graded Sand with Silt and Gravel, Wet, Very Dense, SP-SM, **(GLACIAL TILL)** | | | | | | | |




(Continued Next Page)

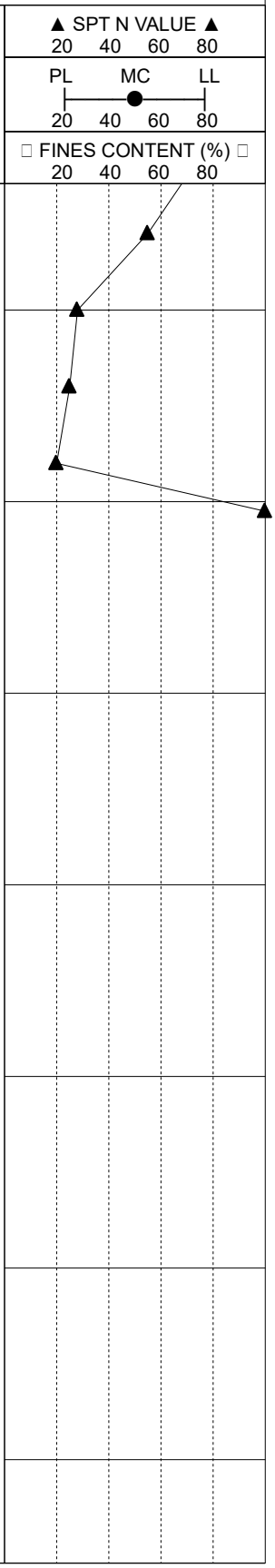
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-18-A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| | | Brownish Gray to Orange, Poorly-Graded Sand with Silt and Gravel, Wet, Very Dense, SP-SM, **(GLACIAL TILL)** | | SS S-17 | 70 | 16-30-25-39 (55) | | |
| | | 34.0 ft | -26.0 | | | | | |
| 35 | | Brownish Gray, Poorly-Graded Gravel with Sand, Wet, Medium Dense, GP, **(GLACIAL TILL)** | | SS S-18 | 12 | 15-17-11-9 (28) | | |
| | | 36.0 ft | -28.0 | | | | | |
| | | Orange to Brown, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(GLACIAL TILL)** | | SS S-19 | 100 | 8-13-12-18 (25) | | |
| | Split spoon refusal at 40.5' bgs. Began coring at 41' bgs. 1.75'/ft 1.75'/ft 1.5'/ft 1.75'/ft 2'/ft | | | SS S-20 | 55 | 19-10-10-28 (20) | | |
| 40 | | | -32 | SS S-21 | 50 | 50 | | |
| | | 40.5 ft | -32.5 | | | | | |
| | | 41.0 ft | -33.0 | | | | | |
| | | Dark Gray to Black, Coarse Grained Gabbro, Slightly Weathered, Moderately Broken, Hard | | RC C-1 | 100 (49) | | | |
| 45 | | | | | | | | |
| | | 46.0 ft | -38.0 | | | | | |
| | | End of boring at 46.0 feet | | | | | | |
| 50 | | | -42 | | | | | |
| 55 | | | | | | | | |
| 60 | | | -52 | | | | | |
| 65 | | | | | | | | |



# TABLE 1: SOIL ANALYTICAL DATA (CEC-1A, CEC-2A, AND CEC-3A) – DETECTIONS ONLY

Table 1
Soil Analytical Data (CEC-1-A, CEC-2-A, and CEC-3-A) – Detections Only
MassCEC - Shuster Bulkhead
New Bedford, MA

| | Reuse Levels | | MCP Concentrations | | Shuster Bulkhead - 4 Wright Street, New Bedford, Massachusetts | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | CEC-1-A 0-6 | CEC-1-A 10-12 | CEC-1-A 16-18 | CEC-1-A 22-24 | CEC-2-A 0-4 | CEC-2-A 12-14 | CEC-2-A 24-26 | CEC-2-A 26-28 | CEC-3-A 0-4 | CEC-3-A 6-8 | CEC-3-A 18-20 | CEC-3-A 24-26 |
| Sample Depth (feet) | | | | | 0-6 | 10-12 | 16-18 | 22-24 | 0-4 | 12-14 | 24-26 | 26-28 | 0-4 | 6-8 | 18-20 | 24-26 |
| PID Reading (ppmv) | | | | | 0.0 | 0.4 | 0.1 | 0.1 | 0.2 | 0.2 | 0.1 | 0.1 | 0.3 | 0.1 | 0.2 | 0.1 |
| Sample Date | | | | | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 | 11/15/2023 |
| Laboratory Sample ID | Unlined Landfills | Lined Landfills | RCS-1 | RCS-2 | 23K0532-01 | 23K0532-02 | 23K0532-03 | 23K0532-04 | 23K0532-05 | 23K0532-06 | 23K0532-07 | 23K0532-08 | 23K0532-09 | 23K0532-10 | 23K0532-11 | 23K0532-12 |
| **SVOCSs (mg/kg)** | 100 | 100 | varies | varies | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | | | |
| Barium | NS | NS | 1,000 | 3,000 | 7.50 | 5.77 | 5.86 | 5.72 | 6.81 | 6.60 | 12.90 | 7.19 | 11.60 | 6.57 | 7.87 | 3.38 |
| Beryllium | NS | NS | 90 | 200 | 0.16 | 0.14 | 0.15 | <0.11 | 0.15 | 0.15 | 0.23 | 0.21 | 0.15 | 0.17 | 0.15 | <0.1 |
| Chromium | 1000 | 1000 | 100 | 200 | 4.65 | 3.36 | 3.56 | 4.18 | 4.58 | 4.04 | 14.50 | 9.08 | 7.05 | 4.35 | 8.94 | 3.21 |
| Lead | 2000 | 1000 | 200 | 600 | 4.71 | <4.54 | <4.93 | <4.95 | 6.95 | <4.92 | 22.5 | 8.88 | 7.97 | <5.04 | <5.18 | 8.53 |
| Mercury | 10 | 10 | 20 | 30 | <0.031 | <0.038 | <0.037 | <0.033 | <0.034 | <0.035 | 0.138 | <0.037 | <0.031 | <0.036 | <0.038 | <0.037 |
| Nickel | NS | NS | 600 | 1,000 | 4.65 | 3.82 | 3.82 | 3.38 | 4.54 | 4.41 | <6.3 | 5.30 | 5.81 | 4.77 | 5.28 | <2.2 |
| Vanadium | NS | NS | 400 | 700 | 5.24 | 4.61 | 4.52 | 5.07 | 5.15 | 4.63 | 9.34 | 6.89 | 6.58 | 5.69 | 4.94 | 2.93 |
| Zinc | NS | NS | 1,000 | 3,000 | 15.1 | 11.4 | 12.6 | 12.0 | 14.5 | 12.8 | 46.0 | 25.4 | 16.2 | 16.6 | 14.1 | 18.0 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | | | |
| Aroclor 1248 | NS | NS | - | - | <0.05 | <0.06 | <0.06 | <0.05 | <0.05 | <0.06 | 0.6 | 0.3 | <0.05 | <0.06 | <0.06 | 0.3 |
| Aroclor 1254 | NS | NS | - | - | <0.05 | <0.06 | <0.06 | <0.05 | <0.05 | <0.06 | 0.5 | 0.2 | <0.05 | <0.06 | <0.06 | 0.2 |
| **Total PCBs** | <2 | <2 | 1 | 4 | <0.05 | <0.06 | <0.06 | <0.06 | <0.05 | <0.06 | 1.1 | 0.5 | <0.05 | <0.06 | <0.06 | 0.5 |

Notes:
Laboratory analytical results compared to RCS-2 Massachusetts Contingency Plan Reportable Concentrations
Table shows only detected analytes
PCBs = Polychlorinated Biphenyls;
PID = photo ionization detector; ppmv = parts per million volumetric;
All data reported in mg/kg = milligrams per kilogram.
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
**Bold** = exceeds applicable MassDEP MCP Standard RCS-2
PID calibrated with Isobutylene with a Response Factor of 1.0
Reuse levels based on Massachusetts Department of Environmental Protection's "Reuse and Disposal of Contaminated Soil at Massachusetts Landfills Department of Environmental Protection Policy # Comm-97-001"

# TABLE 2: SOIL ANALYTICAL DATA (CEC 4A THROUGH CEC-13A) - DETECTIONS ONLY

Table 2
Soil Analytical Data (CEC-4A through CEC-13A) - Detections Only
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels | | MCP Concentrations | | Sample Information | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lined Landfill[1] | Unlined Landfill[2] | RCS-1[3] | RCS-2[4] | CEC-10A 5/30/2024 0-12 ft | CEC-10A 5/30/2024 12-24 ft | CEC-11A 6/7/2024 0-12 ft | CEC-11A 6/7/2024 12-24 ft | CEC-12A 5/29/2024 0-12 ft | CEC-12A 5/30/2024 12-24 ft | CEC-13A 5/20/2024 0-12 ft | CEC-13A 5/20/2024 12-24 ft | CEC-4A 6/3/2024 0-12 ft | CEC-4A 6/3/2024 12-24 ft | CEC-4A 6/3/2024 24-36 ft | CEC-5A 6/5/2024 0-12 ft |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | | | | | | | | | | |
| Acetone | EPA8260 | mg/kg | -- | -- | 6 | 50 | < 0.0386 | < 0.0421 | 0.392 | < 0.0495 | 0.272 | < 0.0475 | < 0.0463 | < 0.0466 | < 0.0412 | 0.113 | < 0.0467 | 0.202 |
| Naphthalene | EPA8260 | mg/kg | -- | -- | 4 | 20 | < 0.0039 | < 0.0042 | < 0.0045 | < 0.0049 | < 0.0041 | < 0.0048 | < 0.0046 | < 0.0047 | < 0.0041 | < 0.0044 | < 0.0047 | < 0.0044 |
| Toluene | EPA8260 | mg/kg | -- | -- | 30 | 1000 | < 0.0039 | < 0.0042 | < 0.0045 | 0.0056 | < 0.0041 | < 0.0048 | < 0.0046 | < 0.0047 | < 0.0041 | < 0.0044 | < 0.0047 | < 0.0044 |
| Total VOCs | EPA8260 | mg/kg | 10 | 4 | -- | -- | < 0.0771 | < 0.0421 | 0.392 | 0.0056 | 0.272 | < 0.019 | < 0.0925 | < 0.0931 | < 0.0823 | 0.113 | < 0.0467 | 0.202 |
| **Semi-volatile Organic Compounds (SVOCs)** | | | | | | | | | | | | | | | | | | |
| Total SVOCs | EPA8270 | mg/kg | 100 | 100 | -- | -- | < 1.12 | < 1.13 | < 1.12 | < 1.1 | < 1.06 | < 1.16 | < 1.11 | < 1.11 | < 1.07 | < 1.18 | < 1.09 | < 1.14 |
| **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | EPA8015 | mg/kg | 5000 | 2500 | -- | -- | 21.7 | 13.7 | 23.1 | 20.8 | 11.5 | 71.9 | 50.5 | < 11.1 | 33.8 | 105 | 53.8 | 39.8 |
| **Pesticides/Herbicides** | | | | | | | | | | | | | | | | | | |
| No Detections | EPA8081 | mg/kg | -- | -- | -- | -- | | | | | | | | | | | | |
| **Polychlorinated Biphenyls (PCBs)** | | | | | | | | | | | | | | | | | | |
| PCB Aroclor 1248 | SW-8082A | mg/kg | -- | -- | -- | -- | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 |
| PCB Aroclor 1254 | SW-8082A | mg/kg | -- | -- | -- | -- | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | 0.06 | < 0.06 | < 0.05 | < 0.06 |
| Total PCBs | SW-8082A | mg/kg | 2 | 2 | 1 | 4 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | 0.06 | < 0.06 | < 0.05 | < 0.06 |
| **Inorganics and Metals** | | | | | | | | | | | | | | | | | | |
| Arsenic | SW-6010D | mg/kg | 40 | 40 | 20 | 20 | 3.85 | < 2.22 | < 2.1 | 2.25 | 1.49 | 2 | 3.77 | 4.29 | < 1.89 | 2.69 | < 2.06 | 2.97 |
| Barium | SW-6010D | mg/kg | -- | -- | 1000 | 3000 | 41 | 13.9 | 12.1 | 16.3 | 10.9 | 10.1 | 12.1 | 10.3 | 16.4 | 11.9 | 24.7 | 23.2 |
| Chromium | SW-6010D | mg/kg | 1000 | 1000 | 100 | 200 | 22.7 | 9.86 | 8.75 | 11.7 | 6.22 | 6.78 | 7.85 | 7.44 | 17 | 9.63 | 9.8 | 13.2 |
| Lead | SW-6010D | mg/kg | 2000 | 1000 | 200 | 600 | 22.9 | 7.4 | 16.8 | 11.4 | 9.48 | 5.99 | 8.85 | 7.38 | 11.2 | 10.8 | 5.67 | 14 |
| Mercury | EPA7471 | mg/kg | 10 | 10 | 20 | 40 | < 0.033 | < 0.033 | 0.072 | < 0.034 | < 0.031 | < 0.033 | < 0.036 | < 0.034 | < 0.035 | < 0.037 | < 0.035 | < 0.034 |
| **Anions and General Chemistry** | | | | | | | | | | | | | | | | | | |
| Corrosivity | EPA9040 | SU | -- | -- | -- | -- | 7.04 | 7.65 | 7.77 | 7.57 | 8.6 | 8.23 | 6.89 | 8.55 | 7.4 | 7.82 | 7.93 | 7.3 |
| **Physical Conditions** | | | | | | | | | | | | | | | | | | |
| Specific Conductance @ 25C | EPA9050 | umhos/cm | 8000 | 4000 | -- | -- | 180 | 345 | 98 | 225 | 116 | 498 | 299 | 1090 | 607 | 973 | 1570 | 191 |

Notes:

1. COMM-97-001 Table 1 (8/15/1997) Lined Landfills
2. COMM-97-001 Table 1 (8/15/1997) Unlined Landfills
3. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-1
4. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-2

-- In a standards value column denotes that no standard is available.
Table only shows detected constituents

Table 2
Soil Analytical Data (CEC-4A through CEC-13A) - Detections Only
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels | | MCP Concentrations | | Sample Information | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lined Landfill[1] | Unlined Landfill[2] | RCS-1[3] | RCS-2[4] | CEC-5A 6/5/2024 12-24 ft | CEC-5A 6/6/2024 24-36 ft | CEC-6A 6/11/2024 0-12 ft | CEC-6A 6/11/2024 12-24 ft | CEC-6A 6/11/2024 24-36 ft | CEC-7A 6/10/2024 0-12 ft | CEC-7A 6/10/2024 12-24 ft | CEC-7A 6/11/2024 24-36 ft | CEC-8A 6/10/2024 0-12 ft | CEC-8A 6/10/2024 12-24 ft | CEC-8A 6/10/2024 24-36 ft | CEC-9A 5/31/2024 0-12 ft |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | | | | | | | | | | |
| Acetone | EPA8260 | mg/kg | -- | -- | 6 | 50 | 0.137 | < 0.0396 | 0.246 | 0.124 | 0.259 | 0.195 | < 0.0464 | 0.327 | 0.27 | < 0.0452 | < 0.0482 | < 0.0444 |
| Naphthalene | EPA8260 | mg/kg | -- | -- | 4 | 20 | < 0.0043 | < 0.004 | < 0.004 | < 0.0045 | < 0.0045 | 0.0054 | < 0.0046 | < 0.0048 | < 0.0041 | < 0.0045 | < 0.0048 | < 0.0044 |
| Toluene | EPA8260 | mg/kg | -- | -- | 30 | 1000 | < 0.0043 | < 0.004 | < 0.004 | < 0.0045 | < 0.0045 | < 0.0041 | < 0.0046 | < 0.0048 | < 0.0041 | < 0.0045 | < 0.0048 | < 0.0044 |
| Total VOCs | EPA8260 | mg/kg | 10 | 4 | -- | -- | 0.137 | < 0.0792 | 0.246 | 0.124 | 0.259 | 0.2004 | < 0.0929 | 0.327 | 0.27 | < 0.0904 | < 0.0964 | < 0.0888 |
| **Semi-volatile Organic Compounds (SVOCs)** | | | | | | | | | | | | | | | | | | |
| Total SVOCs | EPA8270 | mg/kg | 100 | 100 | -- | -- | < 1.17 | < 1.14 | < 1.16 | < 1.18 | < 1.14 | < 1.13 | < 1.16 | < 1.21 | < 1.11 | < 1.17 | < 1.18 | < 1.11 |
| **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | EPA8015 | mg/kg | 5000 | 2500 | -- | -- | 22.9 | 20.8 | 19.4 | < 11.3 | 27.7 | 15.7 | 43.3 | 17.7 | 12.2 | 26.6 | 25.1 | 48.5 |
| **Pesticides/Herbicides** | | | | | | | | | | | | | | | | | | |
| No Detections | EPA8081 | mg/kg | -- | -- | -- | -- | | | | | | | | | | | | |
| **Polychlorinated Biphenyls (PCBs)** | | | | | | | | | | | | | | | | | | |
| PCB Aroclor 1248 | SW-8082A | mg/kg | -- | -- | -- | -- | < 0.06 | 0.09 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | 0.3 | < 0.05 | < 0.05 | 0.06 | < 0.06 |
| PCB Aroclor 1254 | SW-8082A | mg/kg | -- | -- | -- | -- | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | 0.3 | < 0.05 | < 0.05 | 0.06 | < 0.06 |
| Total PCBs | SW-8082A | mg/kg | 2 | 2 | 1 | 4 | < 0.06 | 0.09 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | 0.6 | < 0.05 | < 0.05 | 0.12 | < 0.06 |
| **Inorganics and Metals** | | | | | | | | | | | | | | | | | | |
| Arsenic | SW-6010D | mg/kg | 40 | 40 | 20 | 20 | 2.91 | < 6.09 | 11.5 | < 2.04 | < 1.96 | 4.5 | < 2.32 | < 2.01 | 2.56 | 2.05 | 2.44 | 2.87 |
| Barium | SW-6010D | mg/kg | -- | -- | 1000 | 3000 | 27.2 | 74.6 | 10.7 | 8 | 52.4 | 30.6 | 13.3 | 53.6 | 13.7 | 11.5 | 10.7 | 13.8 |
| Chromium | SW-6010D | mg/kg | 1000 | 1000 | 100 | 200 | 17.2 | 13 | 10.1 | 7.49 | 9.69 | 23.2 | 12.4 | 21.2 | 7.61 | 7.25 | 6.53 | 9.14 |
| Lead | SW-6010D | mg/kg | 2000 | 1000 | 200 | 600 | 13.2 | < 12.2 | 13.3 | 9.55 | 8.59 | 26.5 | 10.1 | 35.3 | 8.52 | 7.43 | 6.69 | 10.4 |
| Mercury | EPA7471 | mg/kg | 10 | 10 | 20 | 40 | < 0.034 | < 0.035 | < 0.037 | < 0.035 | < 0.036 | < 0.03 | < 0.035 | 0.131 | < 0.028 | < 0.028 | 0.038 | < 0.036 |
| **Anions and General Chemistry** | | | | | | | | | | | | | | | | | | |
| Corrosivity | EPA9040 | SU | -- | -- | -- | -- | 7.24 | 8.1 | 8.55 | 8.94 | 8.98 | 9.04 | 8.03 | 8.29 | 7.79 | 7.42 | 7.94 | 7.69 |
| **Physical Conditions** | | | | | | | | | | | | | | | | | | |
| Specific Conductance @ 25C | EPA9050 | umhos/cm | 8000 | 4000 | -- | -- | 1580 | 2470 | 214 | 1550 | 848 | 234 | 714 | 2900 | 231 | 1700 | 2990 | 465 |

Notes:

1. COMM-97-001 Table 1 (8/15/1997) Lined Landfills
2. COMM-97-001 Table 1 (8/15/1997) Unlined Landfills
3. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-1
4. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-2

-- In a standards value column denotes that no standard is available.
Table only shows detected constituents

# TABLE 3: SOIL ANALYTICAL DATA (CEC 4A THROUGH CEC-13A) – ALL DATA

Table 3
Soil Analytical Data (CEC- 4A through CEC-13A) – All Data
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels | | MCP Concentrations | | Sample Information | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lined Landfill[1] | Unlined Landfill[2] | RC S-1[3] | RC S-2[4] | CEC-10A 5/30/2024 9-11 ft | CEC-10A 5/30/2024 0-12 ft | CEC-10A 5/30/2024 19-21 ft | CEC-10A 5/30/2024 12-24 ft | CEC-11A 6/7/2024 9-11 ft | CEC-11A 6/7/2024 0-12 ft | CEC-11A 6/7/2024 19-21 ft | CEC-11A 6/7/2024 12-24 ft | CEC-12A 5/29/2024 4-6 ft | CEC-12A 5/29/2024 0-12 ft | CEC-12A 5/30/2024 19-21 ft | CEC-12A 5/30/2024 12-24 ft | CEC-13A 5/20/2024 0-12 ft | CEC-13A 5/20/2024 4-6 ft | CEC-13A 5/20/2024 12-24 ft | CEC-13A 5/20/2024 14-16 ft |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,1,1-Trichloroethane | EPA8260 | mg/kg | -- | -- | 30 | 600 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,1,2,2-Tetrachloroethane | EPA8260 | mg/kg | -- | -- | 0.005 | 0.02 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,1,2-Trichloroethane | EPA8260 | mg/kg | -- | -- | 0.1 | 2 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,1-Dichloroethane | EPA8260 | mg/kg | -- | -- | 0.4 | 9 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,1-Dichloroethylene | EPA8260 | mg/kg | -- | -- | 3 | 40 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,1-Dichloropropene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,2,3-Trichlorobenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,2,3-Trichloropropane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,2,4-Trichlorobenzene | EPA8260 | mg/kg | -- | -- | 2 | 6 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,2-Dibromo-3-chloropropane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,2-Dibromoethane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,2-Dichlorobenzene | EPA8260 | mg/kg | -- | -- | 9 | 100 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,2-Dichloroethane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,2-Dichloropropane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,3,4-Trimethylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,3,5-Trimethylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,3-Dichlorobenzene | EPA8260 | mg/kg | -- | -- | 3 | 200 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,3-Dichloropropane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 1,4-Dioxane | EPA8260 | mg/kg | -- | -- | 0.2 | 5 | < 0.0771 | -- | < 0.0841 | -- | < 0.0898 | -- | < 0.099 | -- | < 0.0823 | -- | < 0.0951 | -- | -- | < 0.0925 | -- | < 0.0931 |
| 2,2-Dichloropropane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| 4-Isopropyltoluene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Acetone | EPA8260 | mg/kg | -- | -- | 6 | 50 | < 0.0386 | -- | < 0.0421 | -- | 0.392 | -- | < 0.0495 | -- | 0.272 | -- | < 0.0475 | -- | -- | < 0.0463 | -- | < 0.0466 |
| Benzene | EPA8260 | mg/kg | -- | -- | 2 | 200 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Bromobenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Bromochloromethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Bromodichloromethane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Bromoform | EPA8260 | mg/kg | -- | -- | 0.1 | 1 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Bromomethane | EPA8260 | mg/kg | -- | -- | 0.5 | 0.5 | < 0.0077 | -- | < 0.0084 | -- | < 0.009 | -- | < 0.0099 | -- | < 0.0082 | -- | < 0.0095 | -- | -- | < 0.0093 | -- | < 0.0093 |
| Carbon Disulfide | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Carbon Tetrachloride | EPA8260 | mg/kg | -- | -- | 5 | 5 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Chlorobenzene | EPA8260 | mg/kg | -- | -- | 1 | 3 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Chlorodibromomethane | EPA8260 | mg/kg | -- | -- | 0.005 | 0.03 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Chloroethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0077 | -- | < 0.0084 | -- | < 0.009 | -- | < 0.0099 | -- | < 0.0082 | -- | < 0.0095 | -- | -- | < 0.0093 | -- | < 0.0093 |
| Chloroform | EPA8260 | mg/kg | -- | -- | 0.2 | 0.2 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Cis-1,2-dichloroethylene | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| cis-1,3-Dichloropropene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Dibromomethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Dichlorodifluoromethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0077 | -- | < 0.0084 | -- | < 0.009 | -- | < 0.0099 | -- | < 0.0082 | -- | < 0.0095 | -- | -- | < 0.0093 | -- | < 0.0093 |
| Dichloromethane | EPA8260 | mg/kg | -- | -- | 0.1 | 3 | < 0.0193 | -- | < 0.021 | -- | < 0.0224 | -- | < 0.0247 | -- | < 0.0206 | -- | < 0.0238 | -- | -- | < 0.0231 | -- | < 0.0233 |
| Diisopropyl Ether | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Ethyl benzene | EPA8260 | mg/kg | -- | -- | 40 | 1000 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Ethyl ether | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Ethyl tert-butyl ether | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Fluorotrichloromethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Hexachlorobutadiene | EPA8260 | mg/kg | -- | -- | 30 | 100 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Isopropyl benzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| m,p-Xylenes | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0077 | -- | < 0.0084 | -- | < 0.009 | -- | < 0.0099 | -- | < 0.0082 | -- | < 0.0095 | -- | -- | < 0.0093 | -- | < 0.0093 |
| Methyl Chloride | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0077 | -- | < 0.0084 | -- | < 0.009 | -- | < 0.0099 | -- | < 0.0082 | -- | < 0.0095 | -- | -- | < 0.0093 | -- | < 0.0093 |
| Methyl ethyl ketone | EPA8260 | mg/kg | -- | -- | 4 | 50 | < 0.0386 | -- | < 0.0421 | -- | < 0.0449 | -- | < 0.0495 | -- | < 0.0412 | -- | < 0.0475 | -- | -- | < 0.0463 | -- | < 0.0466 |
| Methyl isobutyl ketone | EPA8260 | mg/kg | -- | -- | 0.4 | 50 | < 0.0386 | -- | < 0.0421 | -- | < 0.0449 | -- | < 0.0495 | -- | < 0.0412 | -- | < 0.0475 | -- | -- | < 0.0463 | -- | < 0.0466 |
| Methyl n-butyl ketone | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0386 | -- | < 0.0421 | -- | < 0.0449 | -- | < 0.0495 | -- | < 0.0412 | -- | < 0.0475 | -- | -- | < 0.0463 | -- | < 0.0466 |
| Methyl-tert-butyl ether | EPA8260 | mg/kg | -- | -- | 0.1 | 100 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| n-Butylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| n-Propylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Naphthalene | EPA8260 | mg/kg | -- | -- | 4 | 20 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| O-chlorotoluene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| o-Xylenes | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| p-Chlorotoluene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| P-dichlorobenzene | EPA8260 | mg/kg | -- | -- | 0.7 | 1 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| sec-Butylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Styrene | EPA8260 | mg/kg | -- | -- | 3 | 4 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Tert-amyl-methyl ether | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| tert-Butylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Tetrachloroethylene | EPA8260 | mg/kg | -- | -- | 1 | 4 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Tetrahydrofuran | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0154 | -- | < 0.0168 | -- | < 0.018 | -- | < 0.0198 | -- | < 0.0165 | -- | < 0.019 | -- | -- | < 0.0185 | -- | < 0.0186 |
| Toluene | EPA8260 | mg/kg | -- | -- | 30 | 1000 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | 0.0056 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Trans-1,2-dichloroethylene | EPA8260 | mg/kg | -- | -- | 1 | 1 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| trans-1,3-Dichloropropene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Trichloroethylene | EPA8260 | mg/kg | -- | -- | 0.3 | 0.3 | < 0.0039 | -- | < 0.0042 | -- | < 0.0045 | -- | < 0.0049 | -- | < 0.0041 | -- | < 0.0048 | -- | -- | < 0.0046 | -- | < 0.0047 |
| Vinyl Chloride | EPA8260 | mg/kg | -- | -- | 0.3 | 0.7 | < 0.0077 | -- | < 0.0084 | -- | < 0.009 | -- | < 0.0099 | -- | < 0.0082 | -- | < 0.0095 | -- | -- | < 0.0093 | -- | < 0.0093 |
| Xylene | EPA8260 | mg/kg | -- | -- | 100 | 100 | < 0.0077 | -- | < 0.0084 | -- | < 0.009 | -- | < 0.0099 | -- | < 0.0082 | -- | < 0.0095 | -- | -- | < 0.0093 | -- | < 0.0093 |
| Total VOCs | EPA8260 | mg/kg | 10 | 4 | -- | -- | < 0.0771 | -- | < 0.0421 | -- | 0.392 | -- | 0.0056 | -- | 0.272 | -- | < 0.019 | -- | -- | < 0.0925 | -- | < 0.0931 |

Table 3
Soil Analytical Data (CEC- 4A through CEC-13A) – All Data
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels | | MCP Concentrations | | Sample Information | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lined Landfill[1] | Unlined Landfill[2] | RC S-1[3] | RC S-2[4] | CEC-10A 5/30/2024 9-11 ft | CEC-10A 5/30/2024 0-12 ft | CEC-10A 5/30/2024 19-21 ft | CEC-10A 5/30/2024 12-24 ft | CEC-11A 6/7/2024 9-11 ft | CEC-11A 6/7/2024 0-12 ft | CEC-11A 6/7/2024 19-21 ft | CEC-11A 6/7/2024 12-24 ft | CEC-12A 5/29/2024 4-6 ft | CEC-12A 5/29/2024 0-12 ft | CEC-12A 5/30/2024 19-21 ft | CEC-12A 5/30/2024 12-24 ft | CEC-13A 5/20/2024 0-12 ft | CEC-13A 5/20/2024 4-6 ft | CEC-13A 5/20/2024 12-24 ft | CEC-13A 5/20/2024 14-16 ft |
| **Semi-volatile Organic Compounds (SVOCs)** | | | | | | | | | | | | | | | | | | | | | | |
| 1,1-Biphenyl | EPA8270 | mg/kg | -- | -- | 0.05 | 6 | -- | < 0.028 | -- | < 0.028 | -- | < 0.028 | -- | < 0.028 | -- | < 0.026 | -- | < 0.029 | < 0.028 | -- | < 0.028 | -- |
| 1,2,4-Trichlorobenzene | EPA8270 | mg/kg | -- | -- | 2 | 6 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 1,2-Dichlorobenzene | EPA8270 | mg/kg | -- | -- | 9 | 100 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 1,3-Dichlorobenzene | EPA8270 | mg/kg | -- | -- | 3 | 200 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 2,4,5-Trichlorophenol | EPA8270 | mg/kg | -- | -- | 4 | 600 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 2,4,6-Trichlorophenol | EPA8270 | mg/kg | -- | -- | 0.7 | 20 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 2,4-Dichlorophenol | EPA8270 | mg/kg | -- | -- | 0.7 | 40 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 2,4-Dimethylphenol | EPA8270 | mg/kg | -- | -- | 0.7 | 100 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 2,4-Dinitrophenol | EPA8270 | mg/kg | -- | -- | 3 | 50 | -- | < 1.12 | -- | < 1.13 | -- | < 1.12 | -- | < 1.1 | -- | < 1.06 | -- | < 1.16 | < 1.11 | -- | < 1.11 | -- |
| 2,4-Dinitrotoluene | EPA8270 | mg/kg | -- | -- | 0.7 | 10 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 2,6-Dinitrotoluene | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 2-Chloronaphthalene | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 2-Chlorophenol | EPA8270 | mg/kg | -- | -- | 0.7 | 100 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 2-Methylnaphthalene | EPA8270 | mg/kg | -- | -- | 0.7 | 80 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 2-Methylphenol | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 2-Nitrophenol | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.562 | -- | < 0.564 | -- | < 0.559 | -- | < 0.55 | -- | < 0.53 | -- | < 0.579 | < 0.556 | -- | < 0.554 | -- |
| 3 & 4 Methylphenol | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 3,3'-Dichlorobenzidine | EPA8270 | mg/kg | -- | -- | 3 | 20 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 4-Bromophenyl phenyl ether | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| 4-Nitrophenol | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 1.12 | -- | < 1.13 | -- | < 1.12 | -- | < 1.1 | -- | < 1.06 | -- | < 1.16 | < 1.11 | -- | < 1.11 | -- |
| Acenaphthene | EPA8270 | mg/kg | -- | -- | 4 | 3000 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Acenaphthylene | EPA8270 | mg/kg | -- | -- | 2 | 10 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Acetophenone | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Aniline | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Anthracene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Azobenzene | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Benzo(A)anthracene | EPA8270 | mg/kg | -- | -- | 20 | 300 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Benzo(A)pyrene | EPA8270 | mg/kg | -- | -- | 2 | 30 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Benzo(B)fluoranthene | EPA8270 | mg/kg | -- | -- | 20 | 300 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Benzo(g,h,i)Perylene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Benzo(K)fluoranthene | EPA8270 | mg/kg | -- | -- | 200 | 3000 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| bis (2-chloroethoxy) Methane | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| bis (2-chloroethyl) Ether | EPA8270 | mg/kg | -- | -- | 0.7 | 0.7 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| bis (2-chloroisopropyl) Ether | EPA8270 | mg/kg | -- | -- | 0.7 | 0.7 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Bis (2-ethylhexyl) phthalate | EPA8270 | mg/kg | -- | -- | 100 | 700 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Butylbenzylphthalate | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Chrysene | EPA8270 | mg/kg | -- | -- | 200 | 3000 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Di-n-octyl phthalate | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.562 | -- | < 0.564 | -- | < 0.559 | -- | < 0.55 | -- | < 0.53 | -- | < 0.579 | < 0.556 | -- | < 0.554 | -- |
| Dibenzo(A,H)anthracene | EPA8270 | mg/kg | -- | -- | 2 | 30 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Dibenzofuran | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Diethyl phthalate | EPA8270 | mg/kg | -- | -- | 10 | 200 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Dimethyl phthalate | EPA8270 | mg/kg | -- | -- | 0.7 | 50 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Fluoranthene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Fluorene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Hexachlorobenzene | EPA8270 | mg/kg | -- | -- | 0.7 | 0.9 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Hexachlorobutadiene | EPA8270 | mg/kg | -- | -- | 30 | 100 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Hexachloroethane | EPA8270 | mg/kg | -- | -- | 0.7 | 3 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Indeno (1,2,3-cd) pyrene | EPA8270 | mg/kg | -- | -- | 20 | 300 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Isophorone | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| N-dibutyl phthalate | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| n-Nitrosodimethylamine | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Naphthalene | EPA8270 | mg/kg | -- | -- | 4 | 20 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Nitrobenzene | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| P-chloroaniline | EPA8270 | mg/kg | -- | -- | 1 | 3 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| P-dichlorobenzene | EPA8270 | mg/kg | -- | -- | 0.7 | 1 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Pentachlorophenol | EPA8270 | mg/kg | -- | -- | 3 | 10 | -- | < 1.12 | -- | < 1.13 | -- | < 1.12 | -- | < 1.1 | -- | < 1.06 | -- | < 1.16 | < 1.11 | -- | < 1.11 | -- |
| Phenanthrene | EPA8270 | mg/kg | -- | -- | 10 | 1000 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Phenols | EPA8270 | mg/kg | -- | -- | 0.9 | 20 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Pyrene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Pyridine | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.281 | -- | < 0.282 | -- | < 0.28 | -- | < 0.275 | -- | < 0.265 | -- | < 0.29 | < 0.278 | -- | < 0.277 | -- |
| Total SVOCs | EPA8270 | mg/kg | 100 | 100 | -- | -- | | < 1.12 | | < 1.13 | | < 1.12 | | < 1.1 | | < 1.06 | | < 1.16 | < 1.11 | | < 1.11 | |

Table 3
Soil Analytical Data (CEC- 4A through CEC-13A) – All Data
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels: Lined Landfill[1] | Reuse Levels: Unlined Landfill[2] | MCP Concentrations: RC S-1[3] | MCP Concentrations: RC S-2[4] | Sample Information: CEC-10A 5/30/2024 9-11 ft | CEC-10A 5/30/2024 0-12 ft | CEC-10A 5/30/2024 19-21 ft | CEC-10A 5/30/2024 12-24 ft | CEC-11A 6/7/2024 9-11 ft | CEC-11A 6/7/2024 0-12 ft | CEC-11A 6/7/2024 19-21 ft | CEC-11A 6/7/2024 12-24 ft | CEC-12A 5/29/2024 4-6 ft | CEC-12A 5/29/2024 0-12 ft | CEC-12A 5/30/2024 19-21 ft | CEC-12A 5/30/2024 12-24 ft | CEC-13A 5/20/2024 0-12 ft | CEC-13A 5/20/2024 4-6 ft | CEC-13A 5/20/2024 12-24 ft | CEC-13A 5/20/2024 14-16 ft |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | EPA8015 | mg/kg | 5000 | 2500 | -- | -- | -- | 21.7 | -- | 13.7 | -- | 23.1 | -- | 20.8 | -- | 11.5 | -- | 71.9 | 50.5 | -- | < 11.1 | -- |
| **Pesticides/Herbicides** | | | | | | | | | | | | | | | | | | | | | | |
| 2,2-Dichloropropionic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.051 | -- | < 0.05 | -- | < 0.05 | -- | < 0.049 | -- | < 0.048 | -- | < 0.05 | < 0.051 | -- | < 0.051 | -- |
| 2,4,5-Trichlorophenoxyacetic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.011 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.011 | < 0.011 | -- | < 0.011 | -- |
| 2,4,5-Trichlorophenoxypropionic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.011 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.011 | < 0.011 | -- | < 0.011 | -- |
| 2,4-Dichlorophenoxyacetic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.053 | -- | < 0.052 | -- | < 0.052 | -- | < 0.051 | -- | < 0.049 | -- | < 0.052 | < 0.053 | -- | < 0.052 | -- |
| 2-(2-Methyl-1,4-chlorophenoxy) propionic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 2.66 | -- | < 2.58 | -- | < 2.59 | -- | < 2.53 | -- | < 2.47 | -- | < 2.6 | < 2.63 | -- | < 2.62 | -- |
| 4,4'-DDD | EPA8081 | mg/kg | -- | -- | 10 | 40 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| 4,4'-DDE | EPA8081 | mg/kg | -- | -- | 7 | 30 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| 4,4'-DDT | EPA8081 | mg/kg | -- | -- | 7 | 30 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| 4-(2,4-dichlorophenoxy)-Butanoic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.054 | -- | < 0.052 | -- | < 0.052 | -- | < 0.051 | -- | < 0.05 | -- | < 0.053 | < 0.053 | -- | < 0.053 | -- |
| Aldrin | EPA8081 | mg/kg | -- | -- | 0.09 | 0.5 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| beta-BHC | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| BHC-alpha | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| BHC-delta | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| BHC-gamma | EPA8081 | mg/kg | -- | -- | 0.003 | 0.5 | -- | < 0.0017 | -- | < 0.0016 | -- | < 0.0017 | -- | < 0.0017 | -- | < 0.0016 | -- | < 0.0017 | < 0.0017 | -- | < 0.0017 | -- |
| Chlordane (mixture of isomers) | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0227 | -- | < 0.0218 | -- | < 0.0223 | -- | < 0.0226 | -- | < 0.0213 | -- | < 0.023 | < 0.0228 | -- | < 0.0225 | -- |
| Chlordane, alpha | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| Dicamba | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.011 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | < 0.011 | -- | < 0.01 | -- |
| Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid) | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.053 | -- | < 0.052 | -- | < 0.052 | -- | < 0.051 | -- | < 0.049 | -- | < 0.052 | < 0.053 | -- | < 0.052 | -- |
| Dieldrin | EPA8081 | mg/kg | -- | -- | 0.09 | 0.6 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| Dinoseb | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.054 | -- | < 0.052 | -- | < 0.052 | -- | < 0.051 | -- | < 0.05 | -- | < 0.053 | < 0.053 | -- | < 0.053 | -- |
| Endosulfan sulfate | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| Endosulfan, alpha | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| Endosulfan, beta | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| Endrin | EPA8081 | mg/kg | -- | -- | 20 | 30 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| Endrin ketone | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| Heptachlor | EPA8081 | mg/kg | -- | -- | 0.3 | 2 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| Heptachlor Epoxide | EPA8081 | mg/kg | -- | -- | 0.2 | 1 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| Hexachlorobenzene | EPA8081 | mg/kg | -- | -- | 0.7 | 0.9 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| Methoxychlor | EPA8081 | mg/kg | -- | -- | 300 | 400 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| Methylchlorophenoxyacetic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 2.63 | -- | < 2.56 | -- | < 2.56 | -- | < 2.5 | -- | < 2.44 | -- | < 2.58 | < 2.6 | -- | < 2.59 | -- |
| Toxaphene | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.142 | -- | < 0.136 | -- | < 0.139 | -- | < 0.141 | -- | < 0.133 | -- | < 0.144 | < 0.143 | -- | < 0.141 | -- |
| trans-Chlordane | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0027 | -- | < 0.0029 | < 0.0029 | -- | < 0.0028 | -- |
| **Polychlorinated Biphenyls (PCBs)** | | | | | | | | | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | < 0.06 | -- | < 0.06 | -- |
| PCB Aroclor 1221 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | < 0.06 | -- | < 0.06 | -- |
| PCB Aroclor 1232 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | < 0.06 | -- | < 0.06 | -- |
| PCB Aroclor 1242 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | < 0.06 | -- | < 0.06 | -- |
| PCB Aroclor 1248 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | < 0.06 | -- | < 0.06 | -- |
| PCB Aroclor 1254 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | < 0.06 | -- | < 0.06 | -- |
| PCB Aroclor 1260 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | < 0.06 | -- | < 0.06 | -- |
| PCB Aroclor 1262 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | < 0.06 | -- | < 0.06 | -- |
| PCB Aroclor 1268 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | < 0.06 | -- | < 0.06 | -- |
| Total PCBs | SW-8082A | mg/kg | 2 | 2 | 1 | 4 | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | < 0.06 | -- | < 0.06 | -- |
| **Inorganics and Metals** | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | SW-6010D | mg/kg | 40 | 40 | 20 | 20 | -- | 3.85 | -- | < 2.22 | -- | < 2.1 | -- | 2.25 | -- | 1.49 | -- | 2 | 3.77 | -- | 4.29 | -- |
| Barium | SW-6010D | mg/kg | -- | -- | 1000 | 3000 | -- | 41 | -- | 13.9 | -- | 12.1 | -- | 16.3 | -- | 10.9 | -- | 10.1 | 12.1 | -- | 10.3 | -- |
| Cadmium | SW-6010D | mg/kg | 80 | 30 | 80 | 80 | -- | < 0.44 | -- | < 0.44 | -- | < 0.42 | -- | < 0.41 | -- | < 0.37 | -- | < 0.44 | < 0.42 | -- | < 0.45 | -- |
| Chromium | SW-6010D | mg/kg | 1000 | 1000 | 100 | 200 | -- | 22.7 | -- | 9.86 | -- | 8.75 | -- | 11.7 | -- | 6.22 | -- | 6.78 | 7.85 | -- | 7.44 | -- |
| Lead | SW-6010D | mg/kg | 2000 | 1000 | 200 | 600 | -- | 22.9 | -- | 7.4 | -- | 16.8 | -- | 11.4 | -- | 9.48 | -- | 5.99 | 8.85 | -- | 7.38 | -- |
| Mercury | EPA7471 | mg/kg | 10 | 10 | 20 | 40 | -- | < 0.033 | -- | < 0.033 | -- | 0.072 | -- | < 0.034 | -- | < 0.031 | -- | < 0.033 | < 0.036 | -- | < 0.034 | -- |
| Selenium | EPA6020 | mg/kg | -- | -- | 400 | 800 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | SW-6010D | mg/kg | -- | -- | 400 | 800 | -- | < 4.39 | -- | < 4.44 | -- | < 4.2 | -- | < 4.09 | -- | < 3.73 | -- | < 4.39 | < 4.24 | -- | < 4.55 | -- |
| Silver | SW-6010D | mg/kg | -- | -- | 100 | 200 | -- | < 0.44 | -- | < 0.44 | -- | < 0.42 | -- | < 0.41 | -- | < 0.37 | -- | < 0.44 | < 0.42 | -- | < 0.45 | -- |
| **Anions and General Chemistry** | | | | | | | | | | | | | | | | | | | | | | |
| Corrosivity | EPA9040 | SU | -- | -- | -- | -- | -- | 7.04 | -- | 7.65 | -- | 7.77 | -- | 7.57 | -- | 8.6 | -- | 8.23 | 6.89 | -- | 8.55 | -- |
| **Physical Conditions** | | | | | | | | | | | | | | | | | | | | | | |
| Flashpoint | EPA1010 | deg F | -- | -- | -- | -- | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 | > 200 | -- | > 200 | -- |
| Reactivity - Cyanide | EPA7.3 | mg/kg | 250 | 250 | -- | -- | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | < 2 | -- | < 2 | -- |
| Reactivity - Sulfide | EPA7.3 | mg/kg | 500 | 500 | -- | -- | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | < 2 | -- | < 2 | -- |
| Specific Conductance @ 25C | EPA9050 | umhos/cm | 8000 | 4000 | -- | -- | -- | 180 | -- | 345 | -- | 98 | -- | 225 | -- | 116 | -- | 498 | 299 | -- | 1090 | -- |

Notes:
1. COMM-97-001 Table 1 (8/15/1997) Lined Landfills
2. COMM-97-001 Table 1 (8/15/1997) Unlined Landfills
3. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-1
4. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-2

-- In a standards value column denotes that no standard is available.
-- In a parameter value column indicates that no analysis for the parameter was performed

Qualifier Definitions
D identified in an analysis that has been diluted

Table 3
Soil Analytical Data (CEC- 4A through CEC-13A) – All Data
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels | | MCP Concentrations | | Sample Information | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lined Landfill[1] | Unlined Landfill[2] | RC S-1[3] | RC S-2[4] | CEC-4A 6/3/2024 9-11 ft | CEC-4A 6/3/2024 0-12 ft | CEC-4A 6/3/2024 19-21 ft | CEC-4A 6/3/2024 12-24 ft | CEC-4A 6/3/2024 29-31 ft | CEC-4A 6/3/2024 24-36 ft | CEC-5A 6/5/2024 9-11 ft | CEC-5A 6/5/2024 0-12 ft | CEC-5A 6/5/2024 19-21 ft | CEC-5A 6/5/2024 12-24 ft | CEC-5A 6/5/2024 29-31 ft | CEC-5A 6/6/2024 24-36 ft | CEC-6A 6/11/2024 9-11 ft | CEC-6A 6/11/2024 0-12 ft | CEC-6A 6/11/2024 19-21 ft | CEC-6A 6/11/2024 12-24 ft |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,1,1-Trichloroethane | EPA8260 | mg/kg | -- | -- | 30 | 600 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,1,2,2-Tetrachloroethane | EPA8260 | mg/kg | -- | -- | 0.005 | 0.02 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,1,2-Trichloroethane | EPA8260 | mg/kg | -- | -- | 0.1 | 2 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,1-Dichloroethane | EPA8260 | mg/kg | -- | -- | 0.4 | 9 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,1-Dichloroethylene | EPA8260 | mg/kg | -- | -- | 3 | 40 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,1-Dichloropropene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,2,3-Trichlorobenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,2,3-Trichloropropane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,2,4-Trichlorobenzene | EPA8260 | mg/kg | -- | -- | 2 | 6 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,2-Dibromo-3-chloropropane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,2-Dibromoethane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,2-Dichlorobenzene | EPA8260 | mg/kg | -- | -- | 9 | 100 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,2-Dichloroethane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,2-Dichloropropane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,3,4-Trimethylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,3,5-Trimethylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,3-Dichlorobenzene | EPA8260 | mg/kg | -- | -- | 3 | 200 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,3-Dichloropropane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 1,4-Dioxane | EPA8260 | mg/kg | -- | -- | 0.2 | 5 | < 0.0823 | -- | < 0.0874 | -- | < 0.0933 | -- | < 0.0888 | -- | < 0.0852 | -- | < 0.0792 | -- | < 0.0805 | -- | < 0.0908 | -- |
| 2,2-Dichloropropane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| 4-Isopropyltoluene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Acetone | EPA8260 | mg/kg | -- | -- | 6 | 50 | < 0.0412 | -- | 0.113 | -- | < 0.0467 | -- | 0.202 | -- | 0.137 | -- | < 0.0396 | -- | 0.246 | -- | 0.124 | -- |
| Benzene | EPA8260 | mg/kg | -- | -- | 2 | 200 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Bromobenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Bromochloromethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Bromodichloromethane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Bromoform | EPA8260 | mg/kg | -- | -- | 0.1 | 1 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Bromomethane | EPA8260 | mg/kg | -- | -- | 0.5 | 0.5 | < 0.0082 | -- | < 0.0087 | -- | < 0.0093 | -- | < 0.0089 | -- | < 0.0085 | -- | < 0.0079 | -- | < 0.008 | -- | < 0.0091 | -- |
| Carbon Disulfide | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Carbon Tetrachloride | EPA8260 | mg/kg | -- | -- | 5 | 5 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Chlorobenzene | EPA8260 | mg/kg | -- | -- | 1 | 3 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Chlorodibromomethane | EPA8260 | mg/kg | -- | -- | 0.005 | 0.03 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Chloroethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0082 | -- | < 0.0087 | -- | < 0.0093 | -- | < 0.0089 | -- | < 0.0085 | -- | < 0.0079 | -- | < 0.008 | -- | < 0.0091 | -- |
| Chloroform | EPA8260 | mg/kg | -- | -- | 0.2 | 0.2 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Cis-1,2-dichloroethylene | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| cis-1,3-Dichloropropene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Dibromomethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Dichlorodifluoromethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0082 | -- | < 0.0087 | -- | < 0.0093 | -- | < 0.0089 | -- | < 0.0085 | -- | < 0.0079 | -- | < 0.008 | -- | < 0.0091 | -- |
| Dichloromethane | EPA8260 | mg/kg | -- | -- | 0.1 | 3 | < 0.0206 | -- | < 0.0218 | -- | < 0.0233 | -- | < 0.0222 | -- | < 0.0213 | -- | < 0.0198 | -- | < 0.0201 | -- | < 0.0227 | -- |
| Diisopropyl Ether | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Ethyl benzene | EPA8260 | mg/kg | -- | -- | 40 | 1000 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Ethyl ether | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Ethyl tert-butyl ether | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Fluorotrichloromethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Hexachlorobutadiene | EPA8260 | mg/kg | -- | -- | 30 | 100 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Isopropyl benzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| m,p-Xylenes | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0082 | -- | < 0.0087 | -- | < 0.0093 | -- | < 0.0089 | -- | < 0.0085 | -- | < 0.0079 | -- | < 0.008 | -- | < 0.0091 | -- |
| Methyl Chloride | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0082 | -- | < 0.0087 | -- | < 0.0093 | -- | < 0.0089 | -- | < 0.0085 | -- | < 0.0079 | -- | < 0.008 | -- | < 0.0091 | -- |
| Methyl ethyl ketone | EPA8260 | mg/kg | -- | -- | 4 | 50 | < 0.0412 | -- | < 0.0437 | -- | < 0.0467 | -- | < 0.0444 | -- | < 0.0426 | -- | < 0.0396 | -- | < 0.0402 | -- | < 0.0454 | -- |
| Methyl isobutyl ketone | EPA8260 | mg/kg | -- | -- | 0.4 | 50 | < 0.0412 | -- | < 0.0437 | -- | < 0.0467 | -- | < 0.0444 | -- | < 0.0426 | -- | < 0.0396 | -- | < 0.0402 | -- | < 0.0454 | -- |
| Methyl n-butyl ketone | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0412 | -- | < 0.0437 | -- | < 0.0467 | -- | < 0.0444 | -- | < 0.0426 | -- | < 0.0396 | -- | < 0.0402 | -- | < 0.0454 | -- |
| Methyl-tert-butyl ether | EPA8260 | mg/kg | -- | -- | 0.1 | 100 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| n-Butylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| n-Propylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Naphthalene | EPA8260 | mg/kg | -- | -- | 4 | 20 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| O-chlorotoluene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| o-Xylenes | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| p-Chlorotoluene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| P-dichlorobenzene | EPA8260 | mg/kg | -- | -- | 0.7 | 1 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| sec-Butylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Styrene | EPA8260 | mg/kg | -- | -- | 3 | 4 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Tert-amyl-methyl ether | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| tert-Butylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Tetrachloroethylene | EPA8260 | mg/kg | -- | -- | 1 | 4 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Tetrahydrofuran | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0165 | -- | < 0.0175 | -- | < 0.0187 | -- | < 0.0178 | -- | < 0.017 | -- | < 0.0158 | -- | < 0.0161 | -- | < 0.0182 | -- |
| Toluene | EPA8260 | mg/kg | -- | -- | 30 | 1000 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Trans-1,2-dichloroethylene | EPA8260 | mg/kg | -- | -- | 1 | 1 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| trans-1,3-Dichloropropene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Trichloroethylene | EPA8260 | mg/kg | -- | -- | 0.3 | 0.3 | < 0.0041 | -- | < 0.0044 | -- | < 0.0047 | -- | < 0.0044 | -- | < 0.0043 | -- | < 0.004 | -- | < 0.004 | -- | < 0.0045 | -- |
| Vinyl Chloride | EPA8260 | mg/kg | -- | -- | 0.3 | 0.7 | < 0.0082 | -- | < 0.0087 | -- | < 0.0093 | -- | < 0.0089 | -- | < 0.0085 | -- | < 0.0079 | -- | < 0.008 | -- | < 0.0091 | -- |
| Xylene | EPA8260 | mg/kg | -- | -- | 100 | 100 | < 0.0082 | -- | < 0.0087 | -- | < 0.0093 | -- | < 0.0089 | -- | < 0.0085 | -- | < 0.0079 | -- | < 0.008 | -- | < 0.0091 | -- |
| Total VOCs | EPA8260 | mg/kg | 10 | 4 | -- | -- | < 0.0823 | | 0.113 | | < 0.0467 | | 0.202 | | 0.137 | | < 0.0792 | | 0.246 | | 0.124 | |

Table 3
Soil Analytical Data (CEC- 4A through CEC-13A) – All Data
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels | | MCP Concentrations | | Sample Information | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lined Landfill[1] | Unlined Landfill[2] | RC S-1[3] | RC S-2[4] | CEC-4A 6/3/2024 9-11 ft | CEC-4A 6/3/2024 0-12 ft | CEC-4A 6/3/2024 19-21 ft | CEC-4A 6/3/2024 12-24 ft | CEC-4A 6/3/2024 29-31 ft | CEC-4A 6/3/2024 24-36 ft | CEC-5A 6/5/2024 9-11 ft | CEC-5A 6/5/2024 0-12 ft | CEC-5A 6/5/2024 19-21 ft | CEC-5A 6/5/2024 12-24 ft | CEC-5A 6/5/2024 29-31 ft | CEC-5A 6/6/2024 24-36 ft | CEC-6A 6/11/2024 9-11 ft | CEC-6A 6/11/2024 0-12 ft | CEC-6A 6/11/2024 19-21 ft | CEC-6A 6/11/2024 12-24 ft |
| **Semi-volatile Organic Compounds (SVOCs)** | | | | | | | | | | | | | | | | | | | | | | |
| 1,1-Biphenyl | EPA8270 | mg/kg | -- | -- | 0.05 | 6 | -- | < 0.027 | -- | < 0.029 | -- | < 0.027 | -- | < 0.029 | -- | < 0.029 | -- | < 0.028 | -- | < 0.029 | -- | < 0.029 |
| 1,2,4-Trichlorobenzene | EPA8270 | mg/kg | -- | -- | 2 | 6 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 1,2-Dichlorobenzene | EPA8270 | mg/kg | -- | -- | 9 | 100 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 1,3-Dichlorobenzene | EPA8270 | mg/kg | -- | -- | 3 | 200 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 2,4,5-Trichlorophenol | EPA8270 | mg/kg | -- | -- | 4 | 600 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 2,4,6-Trichlorophenol | EPA8270 | mg/kg | -- | -- | 0.7 | 20 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 2,4-Dichlorophenol | EPA8270 | mg/kg | -- | -- | 0.7 | 40 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 2,4-Dimethylphenol | EPA8270 | mg/kg | -- | -- | 0.7 | 100 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 2,4-Dinitrophenol | EPA8270 | mg/kg | -- | -- | 3 | 50 | -- | < 1.07 | -- | < 1.18 | -- | < 1.09 | -- | < 1.14 | -- | < 1.17 | -- | < 1.14 | -- | < 1.16 | -- | < 1.18 |
| 2,4-Dinitrotoluene | EPA8270 | mg/kg | -- | -- | 0.7 | 10 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 2,6-Dinitrotoluene | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 2-Chloronaphthalene | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 2-Chlorophenol | EPA8270 | mg/kg | -- | -- | 0.7 | 100 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 2-Methylnaphthalene | EPA8270 | mg/kg | -- | -- | 0.7 | 80 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 2-Methylphenol | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 2-Nitrophenol | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.533 | -- | < 0.588 | -- | < 0.547 | -- | < 0.571 | -- | < 0.585 | -- | < 0.568 | -- | < 0.581 | -- | < 0.59 |
| 3 & 4 Methylphenol | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 3,3'-Dichlorobenzidine | EPA8270 | mg/kg | -- | -- | 3 | 20 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 4-Bromophenyl phenyl ether | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| 4-Nitrophenol | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 1.07 | -- | < 1.18 | -- | < 1.09 | -- | < 1.14 | -- | < 1.17 | -- | < 1.14 | -- | < 1.16 | -- | < 1.18 |
| Acenaphthene | EPA8270 | mg/kg | -- | -- | 4 | 3000 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Acenaphthylene | EPA8270 | mg/kg | -- | -- | 2 | 10 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Acetophenone | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Aniline | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Anthracene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Azobenzene | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Benzo(A)anthracene | EPA8270 | mg/kg | -- | -- | 20 | 300 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Benzo(A)pyrene | EPA8270 | mg/kg | -- | -- | 2 | 30 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Benzo(B)fluoranthene | EPA8270 | mg/kg | -- | -- | 20 | 300 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Benzo(g,h,i)Perylene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Benzo(K)fluoranthene | EPA8270 | mg/kg | -- | -- | 200 | 3000 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| bis (2-chloroethoxy) Methane | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| bis (2-chloroethyl) Ether | EPA8270 | mg/kg | -- | -- | 0.7 | 0.7 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| bis (2-chloroisopropyl) Ether | EPA8270 | mg/kg | -- | -- | 0.7 | 0.7 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Bis (2-ethylhexyl) phthalate | EPA8270 | mg/kg | -- | -- | 100 | 700 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Butylbenzylphthalate | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Chrysene | EPA8270 | mg/kg | -- | -- | 200 | 3000 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Di-n-octyl phthalate | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.533 | -- | < 0.588 | -- | < 0.547 | -- | < 0.571 | -- | < 0.585 | -- | < 0.568 | -- | < 0.581 | -- | < 0.59 |
| Dibenzo(A,H)anthracene | EPA8270 | mg/kg | -- | -- | 2 | 30 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Dibenzofuran | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Diethyl phthalate | EPA8270 | mg/kg | -- | -- | 10 | 200 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Dimethyl phthalate | EPA8270 | mg/kg | -- | -- | 0.7 | 50 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Fluoranthene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Fluorene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Hexachlorobenzene | EPA8270 | mg/kg | -- | -- | 0.7 | 0.9 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Hexachlorobutadiene | EPA8270 | mg/kg | -- | -- | 30 | 100 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Hexachloroethane | EPA8270 | mg/kg | -- | -- | 0.7 | 3 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Indeno (1,2,3-cd) pyrene | EPA8270 | mg/kg | -- | -- | 20 | 300 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Isophorone | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| N-dibutyl phthalate | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| n-Nitrosodimethylamine | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Naphthalene | EPA8270 | mg/kg | -- | -- | 4 | 20 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Nitrobenzene | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| P-chloroaniline | EPA8270 | mg/kg | -- | -- | 1 | 3 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| P-dichlorobenzene | EPA8270 | mg/kg | -- | -- | 0.7 | 1 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Pentachlorophenol | EPA8270 | mg/kg | -- | -- | 3 | 10 | -- | < 1.07 | -- | < 1.18 | -- | < 1.09 | -- | < 1.14 | -- | < 1.17 | -- | < 1.14 | -- | < 1.16 | -- | < 1.18 |
| Phenanthrene | EPA8270 | mg/kg | -- | -- | 10 | 1000 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Phenols | EPA8270 | mg/kg | -- | -- | 0.9 | 20 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Pyrene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Pyridine | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.266 | -- | < 0.294 | -- | < 0.273 | -- | < 0.286 | -- | < 0.293 | -- | < 0.284 | -- | < 0.29 | -- | < 0.295 |
| Total SVOCs | EPA8270 | mg/kg | 100 | 100 | -- | -- | | < 1.07 | | < 1.18 | | < 1.09 | | < 1.14 | | < 1.17 | | < 1.14 | | < 1.16 | | < 1.18 |

Table 3
Soil Analytical Data (CEC- 4A through CEC-13A) – All Data
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels: Lined Landfill[1] | Reuse Levels: Unlined Landfill[2] | MCP Concentrations: RC S-1[3] | MCP Concentrations: RC S-2[4] | Sample Information: CEC-4A 6/3/2024 9-11 ft | CEC-4A 6/3/2024 0-12 ft | CEC-4A 6/3/2024 19-21 ft | CEC-4A 6/3/2024 12-24 ft | CEC-4A 6/3/2024 29-31 ft | CEC-4A 6/3/2024 24-36 ft | CEC-5A 6/5/2024 9-11 ft | CEC-5A 6/5/2024 0-12 ft | CEC-5A 6/5/2024 19-21 ft | CEC-5A 6/5/2024 12-24 ft | CEC-5A 6/5/2024 29-31 ft | CEC-5A 6/6/2024 24-36 ft | CEC-6A 6/11/2024 9-11 ft | CEC-6A 6/11/2024 0-12 ft | CEC-6A 6/11/2024 19-21 ft | CEC-6A 6/11/2024 12-24 ft |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | EPA8015 | mg/kg | 5000 | 2500 | -- | -- | -- | 33.8 | -- | 105 | -- | 53.8 | -- | 39.8 | -- | 22.9 | -- | 20.8 | -- | 19.4 | -- | < 11.3 |
| **Pesticides/Herbicides** | | | | | | | | | | | | | | | | | | | | | | |
| 2,2-Dichloropropionic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.049 | -- | < 0.05 | -- | < 0.047 | -- | < 0.05 | -- | < 0.052 | -- | < 0.05 | -- | < 0.05 | -- | < 0.05 |
| 2,4,5-Trichlorophenoxyacetic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.011 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 |
| 2,4,5-Trichlorophenoxypropionic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.011 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 |
| 2,4-Dichlorophenoxyacetic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.051 | -- | < 0.052 | -- | < 0.048 | -- | < 0.051 | -- | < 0.054 | -- | < 0.051 | -- | < 0.052 | -- | < 0.051 |
| 2-(2-Methyl-1,4-chlorophenoxy) propionic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 2.53 | -- | < 2.59 | -- | < 2.42 | -- | < 2.57 | -- | < 2.7 | -- | < 2.57 | -- | < 2.6 | -- | < 2.56 |
| 4,4'-DDD | EPA8081 | mg/kg | -- | -- | 10 | 40 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| 4,4'-DDE | EPA8081 | mg/kg | -- | -- | 7 | 30 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| 4,4'-DDT | EPA8081 | mg/kg | -- | -- | 7 | 30 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| 4-(2,4-dichlorophenoxy)-Butanoic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.051 | -- | < 0.052 | -- | < 0.049 | -- | < 0.052 | -- | < 0.054 | -- | < 0.052 | -- | < 0.052 | -- | < 0.052 |
| Aldrin | EPA8081 | mg/kg | -- | -- | 0.09 | 0.5 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| beta-BHC | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| BHC-alpha | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| BHC-delta | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| BHC-gamma | EPA8081 | mg/kg | -- | -- | 0.003 | 0.5 | -- | < 0.0017 | -- | < 0.0017 | -- | < 0.0016 | -- | < 0.0018 | -- | < 0.0018 | -- | < 0.0017 | -- | < 0.0018 | -- | < 0.0018 |
| Chlordane (mixture of isomers) | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0221 | -- | < 0.0231 | -- | < 0.0211 | -- | < 0.0234 | -- | < 0.0243 | -- | < 0.0227 | -- | < 0.0235 | -- | < 0.0236 |
| Chlordane, alpha | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| Dicamba | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.011 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 |
| Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid) | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.051 | -- | < 0.052 | -- | < 0.048 | -- | < 0.051 | -- | < 0.054 | -- | < 0.051 | -- | < 0.052 | -- | < 0.051 |
| Dieldrin | EPA8081 | mg/kg | -- | -- | 0.09 | 0.6 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| Dinoseb | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.051 | -- | < 0.052 | -- | < 0.049 | -- | < 0.052 | -- | < 0.054 | -- | < 0.052 | -- | < 0.052 | -- | < 0.052 |
| Endosulfan sulfate | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| Endosulfan, alpha | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| Endosulfan, beta | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| Endrin | EPA8081 | mg/kg | -- | -- | 20 | 30 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| Endrin ketone | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| Heptachlor | EPA8081 | mg/kg | -- | -- | 0.3 | 2 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| Heptachlor Epoxide | EPA8081 | mg/kg | -- | -- | 0.2 | 1 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| Hexachlorobenzene | EPA8081 | mg/kg | -- | -- | 0.7 | 0.9 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| Methoxychlor | EPA8081 | mg/kg | -- | -- | 300 | 400 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| Methylchlorophenoxyacetic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 2.5 | -- | < 2.56 | -- | < 2.4 | -- | < 2.54 | -- | < 2.67 | -- | < 2.54 | -- | < 2.57 | -- | < 2.53 |
| Toxaphene | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.138 | -- | < 0.144 | -- | < 0.132 | -- | < 0.146 | -- | < 0.152 | -- | < 0.142 | -- | < 0.147 | -- | < 0.147 |
| trans-Chlordane | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0026 | -- | < 0.0029 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 |
| **Polychlorinated Biphenyls (PCBs)** | | | | | | | | | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1221 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1232 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1242 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1248 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 | -- | 0.09 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1254 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1260 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1262 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1268 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| Total PCBs | SW-8082A | mg/kg | 2 | 2 | 1 | 4 | -- | 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 | -- | 0.09 | -- | < 0.06 | -- | < 0.06 |
| **Inorganics and Metals** | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | SW-6010D | mg/kg | 40 | 40 | 20 | 20 | -- | < 1.89 | -- | 2.69 | -- | < 2.06 | -- | 2.97 | -- | 2.91 | -- | < 6.09 | -- | 11.5 | -- | < 2.04 |
| Barium | SW-6010D | mg/kg | -- | -- | 1000 | 3000 | -- | 16.4 | -- | 11.9 | -- | 24.7 | -- | 23.2 | -- | 27.2 | -- | 74.6 D | -- | 10.7 | -- | 8 |
| Cadmium | SW-6010D | mg/kg | 80 | 30 | 80 | 80 | -- | < 0.38 | -- | < 0.41 | -- | < 0.41 | -- | < 0.42 | -- | < 0.44 | -- | < 1.22 | -- | < 0.45 | -- | < 0.41 |
| Chromium | SW-6010D | mg/kg | 1000 | 1000 | 100 | 200 | -- | 17 | -- | 9.63 | -- | 9.8 | -- | 13.2 | -- | 17.2 | -- | 13 D | -- | 10.1 | -- | 7.49 |
| Lead | SW-6010D | mg/kg | 2000 | 1000 | 200 | 600 | -- | 11.2 | -- | 10.8 | -- | 5.67 | -- | 14 | -- | 13.2 | -- | < 12.2 | -- | 13.3 | -- | 9.55 |
| Mercury | EPA7471 | mg/kg | 10 | 10 | 20 | 40 | -- | < 0.035 | -- | < 0.037 | -- | < 0.035 | -- | < 0.034 | -- | < 0.034 | -- | < 0.035 | -- | < 0.037 | -- | < 0.035 |
| Selenium | EPA6020 | mg/kg | -- | -- | 400 | 800 | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 1.74 | -- | < 1.62 | -- | < 0.9 | -- | -- |
| Selenium | SW-6010D | mg/kg | -- | -- | 400 | 800 | -- | < 3.77 | -- | < 4.1 | -- | < 4.12 | -- | < 4.21 | -- | -- | -- | -- | -- | -- | -- | < 4.09 |
| Silver | SW-6010D | mg/kg | -- | -- | 100 | 200 | -- | < 0.38 | -- | < 0.41 | -- | < 0.41 | -- | < 0.42 | -- | < 0.44 | -- | < 1.22 | -- | < 0.9 | -- | < 0.41 |
| **Anions and General Chemistry** | | | | | | | | | | | | | | | | | | | | | | |
| Corrosivity | EPA9040 | SU | -- | -- | -- | -- | -- | 7.4 | -- | 7.82 | -- | 7.93 | -- | 7.3 | -- | 7.24 | -- | 8.1 | -- | 8.55 | -- | 8.94 |
| **Physical Conditions** | | | | | | | | | | | | | | | | | | | | | | |
| Flashpoint | EPA1010 | deg F | -- | -- | -- | -- | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 |
| Reactivity - Cyanide | EPA7.3 | mg/kg | 250 | 250 | -- | -- | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 |
| Reactivity - Sulfide | EPA7.3 | mg/kg | 500 | 500 | -- | -- | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 |
| Specific Conductance @ 25C | EPA9050 | umhos/cm | 8000 | 4000 | -- | -- | -- | 607 | -- | 973 | -- | 1570 | -- | 191 | -- | 1580 | -- | 2470 | -- | 214 | -- | 1550 |

Notes:
1. COMM-97-001 Table 1 (8/15/1997) Lined Landfills
2. COMM-97-001 Table 1 (8/15/1997) Unlined Landfills
3. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-1
4. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-2

-- In a standards value column denotes that no standard is available.
-- In a parameter value column indicates that no analysis for the parameter was performed

Qualifier Definitions
D identified in an analysis that has been diluted

Table 3
Soil Analytical Data (CEC- 4A through CEC-13A) – All Data
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels: Lined Landfill[1] | Reuse Levels: Unlined Landfill[2] | MCP Concentrations: RC S-1[3] | MCP Concentrations: RC S-2[4] | Sample Information: CEC-6A 6/11/2024 29-31 ft | CEC-6A 6/11/2024 24-36 ft | CEC-7A 6/10/2024 9-11 ft | CEC-7A 6/10/2024 0-12 ft | CEC-7A 6/10/2024 19-21 ft | CEC-7A 6/10/2024 12-24 ft | CEC-7A 6/10/2024 29-31 ft | CEC-7A 6/11/2024 24-36 ft | CEC-8A 6/10/2024 9-11 ft | CEC-8A 6/10/2024 0-12 ft | CEC-8A 6/10/2024 19-21 ft | CEC-8A 6/10/2024 12-24 ft | CEC-8A 6/10/2024 29-31 ft | CEC-8A 6/10/2024 24-36 ft | CEC-9A 5/31/2024 9-11 ft | CEC-9A 5/31/2024 0-12 ft |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,1,1-Trichloroethane | EPA8260 | mg/kg | -- | -- | 30 | 600 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,1,2,2-Tetrachloroethane | EPA8260 | mg/kg | -- | -- | 0.005 | 0.02 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,1,2-Trichloroethane | EPA8260 | mg/kg | -- | -- | 0.1 | 2 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,1-Dichloroethane | EPA8260 | mg/kg | -- | -- | 0.4 | 9 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,1-Dichloroethylene | EPA8260 | mg/kg | -- | -- | 3 | 40 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,1-Dichloropropene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,2,3-Trichlorobenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,2,3-Trichloropropane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,2,4-Trichlorobenzene | EPA8260 | mg/kg | -- | -- | 2 | 6 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,2-Dibromo-3-chloropropane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,2-Dibromoethane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,2-Dichlorobenzene | EPA8260 | mg/kg | -- | -- | 9 | 100 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,2-Dichloroethane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,2-Dichloropropane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,3,4-Trimethylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,3,5-Trimethylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,3-Dichlorobenzene | EPA8260 | mg/kg | -- | -- | 3 | 200 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,3-Dichloropropane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 1,4-Dioxane | EPA8260 | mg/kg | -- | -- | 0.2 | 5 | < 0.0891 | -- | < 0.0819 | -- | < 0.0929 | -- | < 0.0964 | -- | < 0.0826 | -- | < 0.0904 | -- | < 0.0964 | -- | < 0.0888 | -- |
| 2,2-Dichloropropane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| 4-Isopropyltoluene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Acetone | EPA8260 | mg/kg | -- | -- | 6 | 50 | 0.259 | -- | 0.195 | -- | < 0.0464 | -- | 0.327 | -- | 0.27 | -- | < 0.0452 | -- | < 0.0482 | -- | < 0.0444 | -- |
| Benzene | EPA8260 | mg/kg | -- | -- | 2 | 200 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Bromobenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Bromochloromethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Bromodichloromethane | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Bromoform | EPA8260 | mg/kg | -- | -- | 0.1 | 1 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Bromomethane | EPA8260 | mg/kg | -- | -- | 0.5 | 0.5 | < 0.0089 | -- | < 0.0082 | -- | < 0.0093 | -- | < 0.0096 | -- | < 0.0083 | -- | < 0.009 | -- | < 0.0096 | -- | < 0.0089 | -- |
| Carbon Disulfide | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Carbon Tetrachloride | EPA8260 | mg/kg | -- | -- | 5 | 5 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Chlorobenzene | EPA8260 | mg/kg | -- | -- | 1 | 3 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Chlorodibromomethane | EPA8260 | mg/kg | -- | -- | 0.005 | 0.03 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Chloroethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0089 | -- | < 0.0082 | -- | < 0.0093 | -- | < 0.0096 | -- | < 0.0083 | -- | < 0.009 | -- | < 0.0096 | -- | < 0.0089 | -- |
| Chloroform | EPA8260 | mg/kg | -- | -- | 0.2 | 0.2 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Cis-1,2-dichloroethylene | EPA8260 | mg/kg | -- | -- | 0.1 | 0.1 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| cis-1,3-Dichloropropene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Dibromomethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Dichlorodifluoromethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0089 | -- | < 0.0082 | -- | < 0.0093 | -- | < 0.0096 | -- | < 0.0083 | -- | < 0.009 | -- | < 0.0096 | -- | < 0.0089 | -- |
| Dichloromethane | EPA8260 | mg/kg | -- | -- | 0.1 | 3 | < 0.0223 | -- | < 0.0205 | -- | < 0.0232 | -- | < 0.0241 | -- | < 0.0206 | -- | < 0.0226 | -- | < 0.0241 | -- | < 0.0222 | -- |
| Diisopropyl Ether | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Ethyl benzene | EPA8260 | mg/kg | -- | -- | 40 | 1000 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Ethyl ether | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Ethyl tert-butyl ether | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Fluorotrichloromethane | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Hexachlorobutadiene | EPA8260 | mg/kg | -- | -- | 30 | 100 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Isopropyl benzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| m,p-Xylenes | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0089 | -- | < 0.0082 | -- | < 0.0093 | -- | < 0.0096 | -- | < 0.0083 | -- | < 0.009 | -- | < 0.0096 | -- | < 0.0089 | -- |
| Methyl Chloride | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0089 | -- | < 0.0082 | -- | < 0.0093 | -- | < 0.0096 | -- | < 0.0083 | -- | < 0.009 | -- | < 0.0096 | -- | < 0.0089 | -- |
| Methyl ethyl ketone | EPA8260 | mg/kg | -- | -- | 4 | 50 | < 0.0445 | -- | < 0.0409 | -- | < 0.0464 | -- | < 0.0482 | -- | < 0.0413 | -- | < 0.0452 | -- | < 0.0482 | -- | < 0.0444 | -- |
| Methyl isobutyl ketone | EPA8260 | mg/kg | -- | -- | 0.4 | 50 | < 0.0445 | -- | < 0.0409 | -- | < 0.0464 | -- | < 0.0482 | -- | < 0.0413 | -- | < 0.0452 | -- | < 0.0482 | -- | < 0.0444 | -- |
| Methyl n-butyl ketone | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0445 | -- | < 0.0409 | -- | < 0.0464 | -- | < 0.0482 | -- | < 0.0413 | -- | < 0.0452 | -- | < 0.0482 | -- | < 0.0444 | -- |
| Methyl-tert-butyl ether | EPA8260 | mg/kg | -- | -- | 0.1 | 100 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| n-Butylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| n-Propylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Naphthalene | EPA8260 | mg/kg | -- | -- | 4 | 20 | < 0.0045 | -- | 0.0054 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| O-chlorotoluene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| o-Xylenes | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| p-Chlorotoluene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| P-dichlorobenzene | EPA8260 | mg/kg | -- | -- | 0.7 | 1 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| sec-Butylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Styrene | EPA8260 | mg/kg | -- | -- | 3 | 4 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Tert-amyl-methyl ether | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| tert-Butylbenzene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Tetrachloroethylene | EPA8260 | mg/kg | -- | -- | 1 | 4 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Tetrahydrofuran | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0178 | -- | < 0.0164 | -- | < 0.0186 | -- | < 0.0193 | -- | < 0.0165 | -- | < 0.0181 | -- | < 0.0193 | -- | < 0.0178 | -- |
| Toluene | EPA8260 | mg/kg | -- | -- | 30 | 1000 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Trans-1,2-dichloroethylene | EPA8260 | mg/kg | -- | -- | 1 | 1 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| trans-1,3-Dichloropropene | EPA8260 | mg/kg | -- | -- | -- | -- | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Trichloroethylene | EPA8260 | mg/kg | -- | -- | 0.3 | 0.3 | < 0.0045 | -- | < 0.0041 | -- | < 0.0046 | -- | < 0.0048 | -- | < 0.0041 | -- | < 0.0045 | -- | < 0.0048 | -- | < 0.0044 | -- |
| Vinyl Chloride | EPA8260 | mg/kg | -- | -- | 0.3 | 0.7 | < 0.0089 | -- | < 0.0082 | -- | < 0.0093 | -- | < 0.0096 | -- | < 0.0083 | -- | < 0.009 | -- | < 0.0096 | -- | < 0.0089 | -- |
| Xylene | EPA8260 | mg/kg | -- | -- | 100 | 100 | < 0.0089 | -- | < 0.0082 | -- | < 0.0093 | -- | < 0.0096 | -- | < 0.0083 | -- | < 0.009 | -- | < 0.0096 | -- | < 0.0089 | -- |
| Total VOCs | EPA8260 | mg/kg | 10 | 4 | -- | -- | 0.259 | | 0.2004 | | < 0.0929 | | 0.327 | | 0.27 | | < 0.0904 | | < 0.0964 | | < 0.0888 | |

Table 3
Soil Analytical Data (CEC- 4A through CEC-13A) – All Data
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels: Lined Landfill[1] | Reuse Levels: Unlined Landfill[2] | MCP Concentrations: RC S-1[3] | MCP Concentrations: RC S-2[4] | Sample Information: CEC-6A 6/11/2024 29-31 ft | CEC-6A 6/11/2024 24-36 ft | CEC-7A 6/10/2024 9-11 ft | CEC-7A 6/10/2024 0-12 ft | CEC-7A 6/10/2024 19-21 ft | CEC-7A 6/10/2024 12-24 ft | CEC-7A 6/10/2024 29-31 ft | CEC-7A 6/11/2024 24-36 ft | CEC-8A 6/10/2024 9-11 ft | CEC-8A 6/10/2024 0-12 ft | CEC-8A 6/10/2024 19-21 ft | CEC-8A 6/10/2024 12-24 ft | CEC-8A 6/10/2024 29-31 ft | CEC-8A 6/10/2024 24-36 ft | CEC-9A 5/31/2024 9-11 ft | CEC-9A 5/31/2024 0-12 ft |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-volatile Organic Compounds (SVOCs)** | | | | | | | | | | | | | | | | | | | | | | |
| 1,1-Biphenyl | EPA8270 | mg/kg | -- | -- | 0.05 | 6 | -- | < 0.028 | -- | < 0.028 | -- | < 0.029 | -- | < 0.03 | -- | < 0.028 | -- | < 0.029 | -- | < 0.03 | -- | < 0.028 |
| 1,2,4-Trichlorobenzene | EPA8270 | mg/kg | -- | -- | 2 | 6 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 1,2-Dichlorobenzene | EPA8270 | mg/kg | -- | -- | 9 | 100 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 1,3-Dichlorobenzene | EPA8270 | mg/kg | -- | -- | 3 | 200 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 2,4,5-Trichlorophenol | EPA8270 | mg/kg | -- | -- | 4 | 600 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 2,4,6-Trichlorophenol | EPA8270 | mg/kg | -- | -- | 0.7 | 20 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 2,4-Dichlorophenol | EPA8270 | mg/kg | -- | -- | 0.7 | 40 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 2,4-Dimethylphenol | EPA8270 | mg/kg | -- | -- | 0.7 | 100 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 2,4-Dinitrophenol | EPA8270 | mg/kg | -- | -- | 3 | 50 | -- | < 1.14 | -- | < 1.13 | -- | < 1.16 | -- | < 1.21 | -- | < 1.11 | -- | < 1.17 | -- | < 1.18 | -- | < 1.11 |
| 2,4-Dinitrotoluene | EPA8270 | mg/kg | -- | -- | 0.7 | 10 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 2,6-Dinitrotoluene | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 2-Chloronaphthalene | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 2-Chlorophenol | EPA8270 | mg/kg | -- | -- | 0.7 | 100 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 2-Methylnaphthalene | EPA8270 | mg/kg | -- | -- | 0.7 | 80 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 2-Methylphenol | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 2-Nitrophenol | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.569 | -- | < 0.565 | -- | < 0.581 | -- | < 0.604 | -- | < 0.553 | -- | < 0.584 | -- | < 0.592 | -- | < 0.556 |
| 3 & 4 Methylphenol | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 3,3'-Dichlorobenzidine | EPA8270 | mg/kg | -- | -- | 3 | 20 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 4-Bromophenyl phenyl ether | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| 4-Nitrophenol | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 1.14 | -- | < 1.13 | -- | < 1.16 | -- | < 1.21 | -- | < 1.11 | -- | < 1.17 | -- | < 1.18 | -- | < 1.11 |
| Acenaphthene | EPA8270 | mg/kg | -- | -- | 4 | 3000 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Acenaphthylene | EPA8270 | mg/kg | -- | -- | 2 | 10 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Acetophenone | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Aniline | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Anthracene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Azobenzene | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Benzo(A)anthracene | EPA8270 | mg/kg | -- | -- | 20 | 300 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Benzo(A)pyrene | EPA8270 | mg/kg | -- | -- | 2 | 30 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Benzo(B)fluoranthene | EPA8270 | mg/kg | -- | -- | 20 | 300 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Benzo(g,h,i)Perylene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Benzo(K)fluoranthene | EPA8270 | mg/kg | -- | -- | 200 | 3000 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| bis (2-chloroethoxy) Methane | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| bis (2-chloroethyl) Ether | EPA8270 | mg/kg | -- | -- | 0.7 | 0.7 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| bis (2-chloroisopropyl) Ether | EPA8270 | mg/kg | -- | -- | 0.7 | 0.7 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Bis (2-ethylhexyl) phthalate | EPA8270 | mg/kg | -- | -- | 100 | 700 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Butylbenzylphthalate | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Chrysene | EPA8270 | mg/kg | -- | -- | 200 | 3000 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Di-n-octyl phthalate | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.569 | -- | < 0.565 | -- | < 0.581 | -- | < 0.604 | -- | < 0.553 | -- | < 0.584 | -- | < 0.592 | -- | < 0.556 |
| Dibenzo(A,H)anthracene | EPA8270 | mg/kg | -- | -- | 2 | 30 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Dibenzofuran | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Diethyl phthalate | EPA8270 | mg/kg | -- | -- | 10 | 200 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Dimethyl phthalate | EPA8270 | mg/kg | -- | -- | 0.7 | 50 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Fluoranthene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Fluorene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Hexachlorobenzene | EPA8270 | mg/kg | -- | -- | 0.7 | 0.9 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Hexachlorobutadiene | EPA8270 | mg/kg | -- | -- | 30 | 100 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Hexachloroethane | EPA8270 | mg/kg | -- | -- | 0.7 | 3 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Indeno (1,2,3-cd) pyrene | EPA8270 | mg/kg | -- | -- | 20 | 300 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Isophorone | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| N-dibutyl phthalate | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| n-Nitrosodimethylamine | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Naphthalene | EPA8270 | mg/kg | -- | -- | 4 | 20 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Nitrobenzene | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| P-chloroaniline | EPA8270 | mg/kg | -- | -- | 1 | 3 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| P-dichlorobenzene | EPA8270 | mg/kg | -- | -- | 0.7 | 1 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Pentachlorophenol | EPA8270 | mg/kg | -- | -- | 3 | 10 | -- | < 1.14 | -- | < 1.13 | -- | < 1.16 | -- | < 1.21 | -- | < 1.11 | -- | < 1.17 | -- | < 1.18 | -- | < 1.11 |
| Phenanthrene | EPA8270 | mg/kg | -- | -- | 10 | 1000 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Phenols | EPA8270 | mg/kg | -- | -- | 0.9 | 20 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Pyrene | EPA8270 | mg/kg | -- | -- | 1000 | 3000 | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Pyridine | EPA8270 | mg/kg | -- | -- | -- | -- | -- | < 0.285 | -- | < 0.283 | -- | < 0.29 | -- | < 0.302 | -- | < 0.277 | -- | < 0.292 | -- | < 0.296 | -- | < 0.278 |
| Total SVOCs | EPA8270 | mg/kg | 100 | 100 | -- | -- | | < 1.14 | | < 1.13 | | < 1.16 | | < 1.21 | | < 1.11 | | < 1.17 | | < 1.18 | | < 1.11 |

Table 3
Soil Analytical Data (CEC- 4A through CEC-13A) – All Data
MassCEC - Shuster Bulkhead
New Bedford, MA

| Constituent | Analytical Method | Units | Reuse Levels | | MCP Concentrations | | Sample Information | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lined Landfill[1] | Unlined Landfill[2] | RC S-1[3] | RC S-2[4] | CEC-6A 6/11/2024 29-31 ft | CEC-6A 6/11/2024 24-36 ft | CEC-7A 6/10/2024 9-11 ft | CEC-7A 6/10/2024 0-12 ft | CEC-7A 6/10/2024 19-21 ft | CEC-7A 6/10/2024 12-24 ft | CEC-7A 6/10/2024 29-31 ft | CEC-7A 6/11/2024 24-36 ft | CEC-8A 6/10/2024 9-11 ft | CEC-8A 6/10/2024 0-12 ft | CEC-8A 6/10/2024 19-21 ft | CEC-8A 6/10/2024 12-24 ft | CEC-8A 6/10/2024 29-31 ft | CEC-8A 6/10/2024 24-36 ft | CEC-9A 5/31/2024 9-11 ft | CEC-9A 5/31/2024 0-12 ft |
| **Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | EPA8015 | mg/kg | 5000 | 2500 | -- | -- | -- | 27.7 | -- | 15.7 | -- | 43.3 | -- | 17.7 | -- | 12.2 | -- | 26.6 | -- | 25.1 | -- | 48.5 |
| **Pesticides/Herbicides** | | | | | | | | | | | | | | | | | | | | | | |
| 2,2-Dichloropropionic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.048 | -- | < 0.048 | -- | < 0.05 | -- | < 0.054 | -- | < 0.05 | -- | < 0.049 | -- | < 0.05 | -- | < 0.051 |
| 2,4,5-Trichlorophenoxyacetic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.011 | -- | < 0.011 | -- | < 0.01 | -- | < 0.01 | -- | < 0.011 |
| 2,4,5-Trichlorophenoxypropionic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.011 | -- | < 0.011 | -- | < 0.01 | -- | < 0.01 | -- | < 0.011 |
| 2,4-Dichlorophenoxyacetic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.05 | -- | < 0.05 | -- | < 0.051 | -- | < 0.056 | -- | < 0.052 | -- | < 0.051 | -- | < 0.052 | -- | < 0.053 |
| 2-(2-Methyl-1,4-chlorophenoxy) propionic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 2.48 | -- | < 2.49 | -- | < 2.56 | -- | < 2.81 | -- | < 2.6 | -- | < 2.53 | -- | < 2.59 | -- | < 2.63 |
| 4,4'-DDD | EPA8081 | mg/kg | -- | -- | 10 | 40 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| 4,4'-DDE | EPA8081 | mg/kg | -- | -- | 7 | 30 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| 4,4'-DDT | EPA8081 | mg/kg | -- | -- | 7 | 30 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| 4-(2,4-dichlorophenoxy)-Butanoic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.05 | -- | < 0.05 | -- | < 0.052 | -- | < 0.057 | -- | < 0.053 | -- | < 0.051 | -- | < 0.052 | -- | < 0.053 |
| Aldrin | EPA8081 | mg/kg | -- | -- | 0.09 | 0.5 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| beta-BHC | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| BHC-alpha | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| BHC-delta | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| BHC-gamma | EPA8081 | mg/kg | -- | -- | 0.003 | 0.5 | -- | < 0.0017 | -- | < 0.0017 | -- | < 0.0017 | -- | < 0.0018 | -- | < 0.0017 | -- | < 0.0018 | -- | < 0.0018 | -- | < 0.0017 |
| Chlordane (mixture of isomers) | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0223 | -- | < 0.0222 | -- | < 0.0228 | -- | < 0.0237 | -- | < 0.0226 | -- | < 0.0235 | -- | < 0.0236 | -- | < 0.0229 |
| Chlordane, alpha | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| Dicamba | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.011 | -- | < 0.01 | -- | < 0.01 | -- | < 0.01 | -- | < 0.011 |
| Dichloroprop (2-(2,4-dichlorophenoxy) propanoic acid) | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.05 | -- | < 0.05 | -- | < 0.051 | -- | < 0.056 | -- | < 0.052 | -- | < 0.051 | -- | < 0.052 | -- | < 0.053 |
| Dieldrin | EPA8081 | mg/kg | -- | -- | 0.09 | 0.6 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| Dinoseb | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 0.05 | -- | < 0.05 | -- | < 0.052 | -- | < 0.057 | -- | < 0.053 | -- | < 0.051 | -- | < 0.052 | -- | < 0.053 |
| Endosulfan sulfate | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| Endosulfan, alpha | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| Endosulfan, beta | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| Endrin | EPA8081 | mg/kg | -- | -- | 20 | 30 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| Endrin ketone | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| Heptachlor | EPA8081 | mg/kg | -- | -- | 0.3 | 2 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| Heptachlor Epoxide | EPA8081 | mg/kg | -- | -- | 0.2 | 1 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| Hexachlorobenzene | EPA8081 | mg/kg | -- | -- | 0.7 | 0.9 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| Methoxychlor | EPA8081 | mg/kg | -- | -- | 300 | 400 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| Methylchlorophenoxyacetic acid | EPA8151 | mg/kg | -- | -- | -- | -- | -- | < 2.45 | -- | < 2.47 | -- | < 2.53 | -- | < 2.78 | -- | < 2.57 | -- | < 2.51 | -- | < 2.57 | -- | < 2.6 |
| Toxaphene | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.139 | -- | < 0.139 | -- | < 0.142 | -- | < 0.148 | -- | < 0.141 | -- | < 0.147 | -- | < 0.147 | -- | < 0.143 |
| trans-Chlordane | EPA8081 | mg/kg | -- | -- | -- | -- | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.0028 | -- | < 0.003 | -- | < 0.0028 | -- | < 0.0029 | -- | < 0.0029 | -- | < 0.0029 |
| **Polychlorinated Biphenyls (PCBs)** | | | | | | | | | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1221 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1232 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1242 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1248 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | 0.3 | -- | < 0.05 | -- | < 0.05 | -- | 0.06 | -- | < 0.06 |
| PCB Aroclor 1254 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | 0.3 | -- | < 0.05 | -- | < 0.05 | -- | 0.06 | -- | < 0.06 |
| PCB Aroclor 1260 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1262 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| PCB Aroclor 1268 | SW-8082A | mg/kg | -- | -- | -- | -- | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | < 0.05 | -- | < 0.05 | -- | < 0.06 | -- | < 0.06 |
| Total PCBs | SW-8082A | mg/kg | 2 | 2 | 1 | 4 | -- | < 0.06 | -- | < 0.06 | -- | < 0.06 | -- | 0.6 | -- | < 0.05 | -- | < 0.05 | -- | 0.12 | -- | < 0.06 |
| **Inorganics and Metals** | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | SW-6010D | mg/kg | 40 | 40 | 20 | 20 | -- | < 1.96 | -- | 4.5 | -- | < 2.32 | -- | < 2.01 | -- | 2.56 | -- | 2.05 | -- | 2.44 | -- | 2.87 |
| Barium | SW-6010D | mg/kg | -- | -- | 1000 | 3000 | -- | 52.4 | -- | 30.6 | -- | 13.3 | -- | 53.6 | -- | 13.7 | -- | 11.5 | -- | 10.7 | -- | 13.8 |
| Cadmium | SW-6010D | mg/kg | 80 | 30 | 80 | 80 | -- | < 0.39 | -- | < 0.44 | -- | < 0.46 | -- | < 0.4 | -- | < 0.44 | -- | < 0.39 | -- | < 0.44 | -- | < 0.4 |
| Chromium | SW-6010D | mg/kg | 1000 | 1000 | 100 | 200 | -- | 9.69 | -- | 23.2 | -- | 12.4 | -- | 21.2 | -- | 7.61 | -- | 7.25 | -- | 6.53 | -- | 9.14 |
| Lead | SW-6010D | mg/kg | 2000 | 1000 | 200 | 600 | -- | 8.59 | -- | 26.5 | -- | 10.1 | -- | 35.3 | -- | 8.52 | -- | 7.43 | -- | 6.69 | -- | 10.4 |
| Mercury | EPA7471 | mg/kg | 10 | 10 | 20 | 40 | -- | < 0.036 | -- | < 0.03 | -- | < 0.035 | -- | 0.131 | -- | < 0.028 | -- | < 0.028 | -- | 0.038 | -- | < 0.036 |
| Selenium | EPA6020 | mg/kg | -- | -- | 400 | 800 | -- | -- | -- | < 1.78 | -- | -- | -- | < 1.61 | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | SW-6010D | mg/kg | -- | -- | 400 | 800 | -- | < 3.92 | -- | -- | -- | < 4.64 | -- | -- | -- | < 4.43 | -- | < 3.91 | -- | < 4.37 | -- | < 4.02 |
| Silver | SW-6010D | mg/kg | -- | -- | 100 | 200 | -- | < 0.39 | -- | < 1.78 | -- | < 0.46 | -- | < 0.8 | -- | < 0.44 | -- | < 0.39 | -- | < 0.44 | -- | < 0.4 |
| **Anions and General Chemistry** | | | | | | | | | | | | | | | | | | | | | | |
| Corrosivity | EPA9040 | SU | -- | -- | -- | -- | -- | 8.98 | -- | 9.04 | -- | 8.03 | -- | 8.29 | -- | 7.79 | -- | 7.42 | -- | 7.94 | -- | 7.69 |
| **Physical Conditions** | | | | | | | | | | | | | | | | | | | | | | |
| Flashpoint | EPA1010 | deg F | -- | -- | -- | -- | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 | -- | > 200 |
| Reactivity - Cyanide | EPA7.3 | mg/kg | 250 | 250 | -- | -- | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 |
| Reactivity - Sulfide | EPA7.3 | mg/kg | 500 | 500 | -- | -- | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 | -- | < 2 |
| Specific Conductance @ 25C | EPA9050 | umhos/cm | 8000 | 4000 | -- | -- | -- | 848 | -- | 234 | -- | 714 | -- | 2900 | -- | 231 | -- | 1700 | -- | 2990 | -- | 465 |

Notes:

1. COMM-97-001 Table 1 (8/15/1997) Lined Landfills
2. COMM-97-001 Table 1 (8/15/1997) Unlined Landfills
3. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-1
4. 310 CMR 40.0000 Subpart P (3/1/2024) Reportable Concentrations RCS-2

-- In a standards value column denotes that no standard is available.
-- In a parameter value column indicates that no analysis for the parameter was performed

Qualifier Definitions

D identified in an analysis that has been diluted

# LABORATORY ANALYTICAL REPORTS

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC - New Bedford (332-344)**
**ESS Laboratory Work Order Number: 23K0532**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

**REVIEWED**
**By ESS Laboratory at 3:05 pm, Nov 22, 2023**

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC - New Bedford (332-344)**
**ESS Laboratory Work Order Number: 23K0532**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



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*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

## SAMPLE RECEIPT

The following samples were received on November 16, 2023 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 23K0532-01 | CEC-1-A 0-6 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-02 | CEC-1-A 10-12 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-03 | CEC-1-A 16-18 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-04 | CEC-1-A 22-24 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-05 | CEC-2-A 0-4 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-06 | CEC-2-A 12-14 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-07 | CEC-2-A 24-26 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-08 | CEC-2-A 26-28 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-09 | CEC-3-A 0-4 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-10 | CEC-3-A 6-8 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-11 | CEC-3A 18-20 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-12 | CEC-3-A 24-26 | Soil | 6010C, 7471B, 8082A, 8270D |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford ESS Laboratory Work Order: 23K0532

## PROJECT NARRATIVE

**8270D Semi-Volatile Organic Compounds**

D3K0381-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (128% @ 80-120%)

D3K0381-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4-Dinitrophenol (28% @ 20%), 2,6-Dinitrotoluene (21% @ 20%), 3,3′-Dichlorobenzidine (21% @ 20%)

D3K0394-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (125% @ 80-120%)

D3K0394-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4-Dinitrophenol (25% @ 20%), 3,3′-Dichlorobenzidine (21% @ 20%), Hexachlorobutadiene (22% @ 20%)

D3K0428-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (82% @ 80-120%)

D3K0428-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,6-Dinitrotoluene (21% @ 20%), 3,3′-Dichlorobenzidine (26% @ 20%), Benzo(g,h,i)perylene (22% @ 20%), bis(2-Ethylhexyl)phthalate (27% @ 20%), Butylbenzylphthalate (24% @ 20%), Di-n-octylphthalate (24% @ 20%), Indeno(1,2,3-cd)Pyrene (24% @ 20%)

**No other observations noted.**

**End of Project Narrative.**

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **23K0532-01 through 23K0532-12**

Matrices: ( ) Ground Water/Surface Water (x) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| ( ) 8260 VOC CAM II A | (x) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | (x) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (x) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | ( ) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (x) 6010 Metals CAM III A | ( ) 6020 Metals CAM III D | ( ) MassDEP EPH CAM IV B | ( ) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (x) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (x) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (x) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (x) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes ( ) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (x) No ( ) |

***Responses to Questions G, H and I below are required for "'Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? | Yes (x) No ( )* |
| | ***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.** | |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (x)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes (x) No ( )* |

***All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: November 22, 2023

Printed Name: Laur[illegible] Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.57) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Arsenic | ND (2.28) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Barium** | **7.50** (2.28) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Beryllium** | **0.16** (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Cadmium | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Chromium** | **4.65** (0.91) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Lead** | **4.71** (4.57) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Mercury | ND (0.031) | | 7471B | | 1 | AFV | 11/17/23 15:56 | 0.69 | 40 | DK31706 |
| **Nickel** | **4.65** (2.28) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Selenium | ND (4.57) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Silver | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Thallium | ND (4.57) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Vanadium** | **5.24** (0.91) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Zinc** | **15.1** (2.28) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1221 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1232 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1242 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1248 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1254 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1260 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1262 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1268 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *61 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *69 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.027) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4-Dichlorophenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4-Dimethylphenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4-Dinitrophenol | ND (1.08) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Chloronaphthalene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Chlorophenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Methylnaphthalene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Methylphenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Nitrophenol | ND (0.540) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 3+4-Methylphenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 4-Chloroaniline | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 4-Nitrophenol | ND (1.08) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Acenaphthene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Acenaphthylene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Acetophenone | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Aniline | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Anthracene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Azobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Benzo(a)anthracene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Benzo(a)pyrene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Benzo(b)fluoranthene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Butylbenzylphthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Chrysene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Dibenzofuran | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Diethylphthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Dimethylphthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Di-n-butylphthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Di-n-octylphthalate | ND (0.540) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Fluoranthene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Fluorene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Hexachlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Hexachlorobutadiene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Hexachloroethane | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Isophorone | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Naphthalene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Nitrobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| N-Nitrosodimethylamine | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Pentachlorophenol | ND (1.08) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Phenanthrene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Phenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Pyrene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *88 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *113 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *89 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *91 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *89 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *79 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *83 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *103 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.54) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Arsenic | ND (2.27) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Barium** | **5.77** (2.27) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Beryllium** | **0.14** (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Cadmium | ND (0.45) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Chromium** | **3.36** (0.91) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Lead | ND (4.54) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Mercury | ND (0.038) | | 7471B | | 1 | AFV | 11/17/23 15:58 | 0.61 | 40 | DK31706 |
| **Nickel** | **3.82** (2.27) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Selenium | ND (4.54) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Silver | ND (0.45) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Thallium | ND (4.54) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Vanadium** | **4.61** (0.91) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Zinc** | **11.4** (2.27) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85
Initial Volume: 20.3g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *64 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *67 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.030) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4-Dichlorophenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4-Dimethylphenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4-Dinitrophenol | ND (1.19) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Chloronaphthalene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Chlorophenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Methylnaphthalene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Methylphenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Nitrophenol | ND (0.593) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 3+4-Methylphenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 4-Chloroaniline | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 4-Nitrophenol | ND (1.19) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Acenaphthene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Acenaphthylene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Acetophenone | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Aniline | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Anthracene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Azobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Benzo(a)anthracene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Benzo(a)pyrene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Benzo(b)fluoranthene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Butylbenzylphthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Chrysene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Dibenzofuran | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Diethylphthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Dimethylphthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Di-n-butylphthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Di-n-octylphthalate | ND (0.593) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Fluoranthene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Fluorene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Hexachlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Hexachlorobutadiene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Hexachloroethane | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Isophorone | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Naphthalene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Nitrobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| N-Nitrosodimethylamine | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Pentachlorophenol | ND (1.19) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Phenanthrene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Phenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Pyrene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *90 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *122 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *95 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *97 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *94 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *83 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *88 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *112 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.93) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Arsenic | ND (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Barium** | **5.86** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Cadmium | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Chromium** | **3.56** (0.99) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Lead | ND (4.93) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Mercury | ND (0.037) | | 7471B | | 1 | AFV | 11/17/23 16:00 | 0.62 | 40 | DK31706 |
| **Nickel** | **3.82** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Selenium | ND (4.93) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Silver | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Thallium | ND (4.93) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Vanadium** | **4.52** (0.99) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Zinc** | **12.6** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *68 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *68 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.18) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.589) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.18) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Acetophenone | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Aniline | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Anthracene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Azobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Chrysene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.589) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Fluorene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Isophorone | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Naphthalene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.18) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Phenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Pyrene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *92 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *98 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *94 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *92 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *93 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *84 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *90 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *104 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.95) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Arsenic | ND (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| **Barium** | **5.72** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Beryllium | ND (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Cadmium | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| **Chromium** | **4.18** (0.99) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Lead | ND (4.95) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Mercury | ND (0.033) | | 7471B | | 1 | AFV | 11/17/23 16:02 | 0.66 | 40 | DK31706 |
| **Nickel** | **3.38** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Selenium | ND (4.95) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Silver | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Thallium | ND (4.95) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| **Vanadium** | **5.07** (0.99) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| **Zinc** | **12.0** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1221 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1232 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1242 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1248 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1254 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1260 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1262 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1268 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *68 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *68 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91
Initial Volume: 19.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.578) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Acetophenone | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Aniline | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Anthracene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Azobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91
Initial Volume: 19.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Chrysene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.578) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Fluorene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Isophorone | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Naphthalene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Phenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Pyrene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *94 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *106 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *98 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91
Initial Volume: 19.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *95 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *96 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *87 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *94 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *105 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.64) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Arsenic | ND (2.32) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Barium** | **6.81** (2.32) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Cadmium | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Chromium** | **4.58** (0.93) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Lead** | **6.95** (4.64) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Mercury | ND (0.034) | | 7471B | | 1 | AFV | 11/17/23 16:04 | 0.62 | 40 | DK31706 |
| **Nickel** | **4.54** (2.32) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Selenium | ND (4.64) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Silver | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Thallium | ND (4.64) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Vanadium** | **5.15** (0.93) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Zinc** | **14.5** (2.32) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94
Initial Volume: 19.7g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1221 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1232 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1242 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1248 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1254 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1260 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1262 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1268 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *69 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *70 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.10) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.550) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.10) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Acetophenone | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Aniline | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Anthracene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Azobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Chrysene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.550) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Fluorene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Isophorone | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Naphthalene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.10) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Phenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Pyrene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *85 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *94 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *88 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *87 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *87 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *78 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *85 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *95 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.92) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Arsenic | ND (2.46) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Barium** | **6.60** (2.46) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Cadmium | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Chromium** | **4.04** (0.98) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Lead | ND (4.92) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Mercury | ND (0.035) | | 7471B | | 1 | AFV | 11/17/23 16:06 | 0.64 | 40 | DK31706 |
| **Nickel** | **4.41** (2.46) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Selenium | ND (4.92) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Silver | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Thallium | ND (4.92) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Vanadium** | **4.63** (0.98) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Zinc** | **12.8** (2.46) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88
Initial Volume: 20.4g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *74 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *65 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.580) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Acetophenone | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Aniline | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Anthracene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Azobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Chrysene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.580) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Fluorene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Isophorone | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Naphthalene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Phenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Pyrene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *90 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *100 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *93 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *90 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *92 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *84 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *90 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *100 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (5.86) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Arsenic | ND (2.93) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Barium** | **12.9** (2.93) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Beryllium** | **0.23** (0.13) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Cadmium | ND (0.59) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Chromium** | **14.5** (1.17) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Lead** | **22.5** (5.86) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Mercury** | **0.138** (0.040) | | 7471B | | 1 | AFV | 11/17/23 16:08 | 0.64 | 40 | DK31706 |
| **Nickel** | **6.30** (2.93) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Selenium | ND (5.86) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Silver | ND (0.59) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Thallium | ND (5.86) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Vanadium** | **9.34** (1.17) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Zinc** | **46.0** (2.93) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78
Initial Volume: 19.9g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| **Aroclor 1248 [2C]** | **0.6** (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| **Aroclor 1254 [2C]** | **0.5** (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *41 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *39 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78
Initial Volume: 19.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.033) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.30) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.652) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.30) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Acetophenone | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Aniline | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Anthracene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Azobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78
Initial Volume: 19.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Chrysene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.652) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Fluorene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Isophorone | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Naphthalene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.30) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Phenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Pyrene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *95 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *106 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *100 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78
Initial Volume: 19.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *99 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *96 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *91 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *96 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *106 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (5.14) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Arsenic | ND (2.57) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Barium** | **7.19** (2.57) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Beryllium** | **0.21** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Cadmium | ND (0.51) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Chromium** | **9.08** (1.03) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Lead** | **8.88** (5.14) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Mercury | ND (0.037) | | 7471B | | 1 | AFV | 11/17/23 16:15 | 0.6 | 40 | DK31706 |
| **Nickel** | **5.30** (2.57) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Selenium | ND (5.14) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Silver | ND (0.51) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Thallium | ND (5.14) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Vanadium** | **6.89** (1.03) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Zinc** | **25.4** (2.57) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| **Aroclor 1248 [2C]** | **0.3** (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| **Aroclor 1254** | **0.2** (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *64 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *60 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.11) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.557) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.11) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Acetophenone | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Aniline | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Anthracene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Azobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Chrysene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.557) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Fluorene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Isophorone | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Naphthalene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.11) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Phenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Pyrene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *96 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *110 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *100 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *101 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *99 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *93 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *97 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *112 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.63) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Arsenic | ND (2.31) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Barium** | **11.6** (2.31) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Cadmium | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Chromium** | **7.05** (0.93) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Lead** | **7.97** (4.63) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Mercury | ND (0.031) | | 7471B | | 1 | AFV | 11/17/23 16:17 | 0.68 | 40 | DK31706 |
| **Nickel** | **5.81** (2.31) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Selenium | ND (4.63) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Silver | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Thallium | ND (4.63) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Vanadium** | **6.58** (0.93) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Zinc** | **16.2** (2.31) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94
Initial Volume: 20.5g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1221 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1232 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1242 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1248 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1254 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1260 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1262 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1268 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *67 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *66 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94
Initial Volume: 20g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.027) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.07) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.535) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.07) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Acetophenone | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Aniline | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Anthracene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Azobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94
Initial Volume: 20g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Chrysene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.535) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Fluorene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Isophorone | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Naphthalene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.07) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Phenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Pyrene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *98 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *106 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *105 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94
Initial Volume: 20g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *104 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *100 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *94 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *99 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *117 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (5.04) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Arsenic | ND (2.52) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Barium** | **6.57** (2.52) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Beryllium** | **0.17** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Cadmium | ND (0.50) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Chromium** | **4.35** (1.01) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Lead | ND (5.04) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Mercury | ND (0.036) | | 7471B | | 1 | AFV | 11/17/23 16:19 | 0.62 | 40 | DK31706 |
| **Nickel** | **4.77** (2.52) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Selenium | ND (5.04) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Silver | ND (0.50) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Thallium | ND (5.04) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Vanadium** | **5.69** (1.01) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Zinc** | **16.6** (2.52) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88
Initial Volume: 20.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *66 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *62 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.581) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Acetophenone | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Aniline | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Azobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Chrysene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.581) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Fluorene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Isophorone | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Naphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Phenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *87 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *99 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *91 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *91 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *87 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *82 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *86 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *102 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (5.18) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Arsenic | ND (2.59) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Barium** | **7.87** (2.59) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Cadmium | ND (0.52) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Chromium** | **8.94** (1.04) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Lead | ND (5.18) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Mercury | ND (0.038) | | 7471B | | 1 | AFV | 11/17/23 16:21 | 0.62 | 40 | DK31706 |
| **Nickel** | **5.28** (2.59) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Selenium | ND (5.18) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Silver | ND (0.52) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Thallium | ND (5.18) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Vanadium** | **4.94** (1.04) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Zinc** | **14.1** (2.59) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83
Initial Volume: 20.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *71 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *69 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.030) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.20) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.598) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.20) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Acetophenone | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Aniline | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Anthracene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Azobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Chrysene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.598) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Fluorene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Isophorone | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Naphthalene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.20) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Phenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Pyrene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *94 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *114 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *100 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *98 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *99 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *90 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *95 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *112 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.41) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Arsenic | ND (2.20) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Barium** | **3.38** (2.20) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Beryllium | ND (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Cadmium | ND (0.44) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Chromium** | **3.21** (0.88) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Lead** | **8.53** (4.41) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Mercury | ND (0.037) | | 7471B | | 1 | AFV | 11/17/23 16:23 | 0.62 | 40 | DK31706 |
| Nickel | ND (2.20) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Selenium | ND (4.41) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Silver | ND (0.44) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Thallium | ND (4.41) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Vanadium** | **2.93** (0.88) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Zinc** | **18.0** (2.20) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87
Initial Volume: 20.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| **Aroclor 1248 [2C]** | **0.3** (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| **Aroclor 1254** | **0.2** (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *66 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *59 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.581) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Acetophenone | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Aniline | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Azobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Chrysene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.581) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Fluorene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Isophorone | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Naphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Phenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *92 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *110 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *96 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *100 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *96 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *88 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *93 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *112 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DK31667 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Antimony | ND | 5.00 | mg/kg wet | | | | | | | |
| Arsenic | ND | 2.50 | mg/kg wet | | | | | | | |
| Barium | ND | 2.50 | mg/kg wet | | | | | | | |
| Beryllium | ND | 0.11 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Nickel | ND | 2.50 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| Thallium | ND | 5.00 | mg/kg wet | | | | | | | |
| Vanadium | ND | 1.00 | mg/kg wet | | | | | | | |
| Zinc | ND | 2.50 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Antimony | 41.4 | 14.3 | mg/kg wet | 54.20 | | 76 | 40-160 | | | |
| Arsenic | 239 | 7.14 | mg/kg wet | 258.0 | | 93 | 80-120 | | | |
| Barium | 732 | 7.14 | mg/kg wet | 809.0 | | 91 | 80-120 | | | |
| Beryllium | 46.4 | 0.31 | mg/kg wet | 48.50 | | 96 | 80-120 | | | |
| Cadmium | 295 | 1.43 | mg/kg wet | 321.0 | | 92 | 80-120 | | | |
| Chromium | 123 | 2.86 | mg/kg wet | 133.0 | | 93 | 80-120 | | | |
| Lead | 99.4 | 14.3 | mg/kg wet | 102.0 | | 97 | 80-120 | | | |
| Nickel | 136 | 7.14 | mg/kg wet | 137.0 | | 99 | 80-120 | | | |
| Selenium | 44.0 | 14.3 | mg/kg wet | 49.40 | | 89 | 80-120 | | | |
| Silver | 22.6 | 1.43 | mg/kg wet | 22.70 | | 100 | 80-120 | | | |
| Thallium | 80.7 | 14.3 | mg/kg wet | 81.40 | | 99 | 80-120 | | | |
| Vanadium | 92.3 | 2.86 | mg/kg wet | 108.0 | | 85 | 80-120 | | | |
| Zinc | 507 | 7.14 | mg/kg wet | 540.0 | | 94 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Antimony | 41.2 | 14.9 | mg/kg wet | 54.20 | | 76 | 40-160 | 0.5 | 30 | |
| Arsenic | 235 | 7.46 | mg/kg wet | 258.0 | | 91 | 80-120 | 2 | 30 | |
| Barium | 760 | 7.46 | mg/kg wet | 809.0 | | 94 | 80-120 | 4 | 30 | |
| Beryllium | 45.6 | 0.33 | mg/kg wet | 48.50 | | 94 | 80-120 | 2 | 20 | |
| Cadmium | 291 | 1.49 | mg/kg wet | 321.0 | | 91 | 80-120 | 2 | 30 | |
| Chromium | 122 | 2.99 | mg/kg wet | 133.0 | | 92 | 80-120 | 1 | 30 | |
| Lead | 97.8 | 14.9 | mg/kg wet | 102.0 | | 96 | 80-120 | 2 | 20 | |
| Nickel | 134 | 7.46 | mg/kg wet | 137.0 | | 98 | 80-120 | 2 | 30 | |
| Selenium | 44.3 | 14.9 | mg/kg wet | 49.40 | | 90 | 80-120 | 0.6 | 30 | |
| Silver | 22.3 | 1.49 | mg/kg wet | 22.70 | | 98 | 80-120 | 1 | 30 | |
| Thallium | 80.4 | 14.9 | mg/kg wet | 81.40 | | 99 | 80-120 | 0.4 | 30 | |
| Vanadium | 91.6 | 2.99 | mg/kg wet | 108.0 | | 85 | 80-120 | 0.8 | 30 | |
| Zinc | 501 | 7.46 | mg/kg wet | 540.0 | | 93 | 80-120 | 1 | 30 | |
| **Batch DK31706 - 7471B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DK31706 - 7471B** | | | | | | | | | | |
| Mercury | ND | 0.031 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 10.4 | 3.19 | mg/kg wet | 17.10 | | 61 | 33.1-86.55 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 10.3 | 3.19 | mg/kg wet | 17.10 | | 60 | 33.1-86.55 | 1 | 30 | |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DK31603 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0205* | | mg/kg wet | *0.02500* | | *82* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 77 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 76 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 78 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 79 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0186* | | mg/kg wet | *0.02500* | | *74* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0184* | | mg/kg wet | *0.02500* | | *74* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0190* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0192* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 78 | 40-140 | 2 | 30 | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 78 | 40-140 | 2 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DK31603 - 3540C** | | | | | | | | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 81 | 40-140 | 4 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 82 | 40-140 | 4 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0192* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0191* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0193* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0196* | | mg/kg wet | *0.02500* | | *78* | *30-150* | | | |
| **Batch DK31704 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0195* | | mg/kg wet | *0.02500* | | *78* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0225* | | mg/kg wet | *0.02500* | | *90* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0170* | | mg/kg wet | *0.02500* | | *68* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0203* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 75 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 79 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 79 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 87 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0202* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0230* | | mg/kg wet | *0.02500* | | *92* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0176* | | mg/kg wet | *0.02500* | | *70* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 77 | 40-140 | 2 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DK31704 - 3540C** | | | | | | | | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 81 | 40-140 | 3 | 30 | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 79 | 40-140 | 0.04 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 87 | 40-140 | 0.3 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0200* | | mg/kg wet | *0.02500* | | *80* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0228* | | mg/kg wet | *0.02500* | | *91* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0187* | | mg/kg wet | *0.02500* | | *75* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0202* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.57* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.67* | | mg/kg wet | *3.750* | | *125* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.98* | | mg/kg wet | *3.750* | | *106* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.67* | | mg/kg wet | *2.500* | | *107* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.11* | | mg/kg wet | *3.750* | | *110* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.39* | | mg/kg wet | *2.500* | | *95* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.77* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.97* | | mg/kg wet | *2.500* | | *119* | *30-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.22 | 0.025 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.04 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.14 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 30-130 | | | |
| 2,4-Dimethylphenol | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 30-130 | | | |
| 2,4-Dinitrophenol | 2.48 | 1.00 | mg/kg wet | 2.500 | | 99 | 30-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| 2,4-Dinitrotoluene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.57 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| 2-Chloronaphthalene | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| 2-Chlorophenol | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 30-130 | | | |
| 2-Methylnaphthalene | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |
| 2-Methylphenol | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 30-130 | | | |
| 2-Nitrophenol | 2.18 | 0.500 | mg/kg wet | 2.500 | | 87 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| 3+4-Methylphenol | 4.79 | 0.250 | mg/kg wet | 5.000 | | 96 | 30-130 | | | |
| 4-Bromophenyl-phenylether | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| 4-Chloroaniline | 1.75 | 0.250 | mg/kg wet | 2.500 | | 70 | 40-140 | | | |
| 4-Nitrophenol | 2.22 | 1.00 | mg/kg wet | 2.500 | | 89 | 30-130 | | | |
| Acenaphthene | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| Acenaphthylene | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| Acetophenone | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Aniline | 1.13 | 0.250 | mg/kg wet | 2.500 | | 45 | 40-140 | | | |
| Anthracene | 2.21 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Azobenzene | 1.78 | 0.250 | mg/kg wet | 2.500 | | 71 | 40-140 | | | |
| Benzo(a)anthracene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Benzo(a)pyrene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.11 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 1.83 | 0.250 | mg/kg wet | 2.500 | | 73 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 1.94 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 1.98 | 0.250 | mg/kg wet | 2.500 | | 79 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.57 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| Butylbenzylphthalate | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Chrysene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.23 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Dibenzofuran | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Diethylphthalate | 2.59 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| Dimethylphthalate | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Di-n-butylphthalate | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Di-n-octylphthalate | 2.45 | 0.500 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Fluoranthene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Fluorene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Hexachlorobenzene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Hexachlorobutadiene | 2.25 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Hexachloroethane | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Isophorone | 1.73 | 0.250 | mg/kg wet | 2.500 | | 69 | 40-140 | | | |
| Naphthalene | 1.95 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | | | |
| Nitrobenzene | 1.87 | 0.250 | mg/kg wet | 2.500 | | 75 | 40-140 | | | |
| N-Nitrosodimethylamine | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| Pentachlorophenol | 2.38 | 1.00 | mg/kg wet | 2.500 | | 95 | 30-130 | | | |
| Phenanthrene | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Phenol | 2.26 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | | | |
| Pyrene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.40* | | mg/kg wet | *2.500* | | *96* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.38* | | mg/kg wet | *3.750* | | *117* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.79* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.55* | | mg/kg wet | *2.500* | | *102* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.76* | | mg/kg wet | *3.750* | | *100* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.02* | | mg/kg wet | *2.500* | | *81* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.52* | | mg/kg wet | *3.750* | | *94* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.75* | | mg/kg wet | *2.500* | | *110* | *30-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.41 | 0.025 | mg/kg wet | 2.500 | | 97 | 40-140 | 8 | 30 | |
| 1,2,4-Trichlorobenzene | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | 8 | 30 | |
| 1,2-Dichlorobenzene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 9 | 30 | |
| 1,3-Dichlorobenzene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 9 | 30 | |
| 1,4-Dichlorobenzene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 9 | 30 | |
| 2,4,5-Trichlorophenol | 2.71 | 0.250 | mg/kg wet | 2.500 | | 109 | 30-130 | 8 | 30 | |
| 2,4,6-Trichlorophenol | 2.64 | 0.250 | mg/kg wet | 2.500 | | 106 | 30-130 | 7 | 30 | |
| 2,4-Dichlorophenol | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 30-130 | 8 | 30 | |
| 2,4-Dimethylphenol | 2.81 | 0.250 | mg/kg wet | 2.500 | | 113 | 30-130 | 8 | 30 | |
| 2,4-Dinitrophenol | 2.74 | 1.00 | mg/kg wet | 2.500 | | 110 | 30-130 | 10 | 30 | |
| 2,4-Dinitrotoluene | 2.64 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 7 | 30 | |
| 2,6-Dinitrotoluene | 2.81 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | 9 | 30 | |
| 2-Chloronaphthalene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 7 | 30 | |
| 2-Chlorophenol | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 30-130 | 10 | 30 | |
| 2-Methylnaphthalene | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | 6 | 30 | |
| 2-Methylphenol | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 30-130 | 9 | 30 | |
| 2-Nitrophenol | 2.31 | 0.500 | mg/kg wet | 2.500 | | 93 | 30-130 | 6 | 30 | |
| 3,3´-Dichlorobenzidine | 2.61 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | 9 | 30 | |
| 3+4-Methylphenol | 5.32 | 0.250 | mg/kg wet | 5.000 | | 106 | 30-130 | 11 | 30 | |
| 4-Bromophenyl-phenylether | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 6 | 30 | |
| 4-Chloroaniline | 1.84 | 0.250 | mg/kg wet | 2.500 | | 73 | 40-140 | 5 | 30 | |
| 4-Nitrophenol | 2.38 | 1.00 | mg/kg wet | 2.500 | | 95 | 30-130 | 7 | 30 | |
| Acenaphthene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 8 | 30 | |
| Acenaphthylene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 9 | 30 | |
| Acetophenone | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 9 | 30 | |
| Aniline | 1.22 | 0.250 | mg/kg wet | 2.500 | | 49 | 40-140 | 8 | 30 | |
| Anthracene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 6 | 30 | |
| Azobenzene | 1.90 | 0.250 | mg/kg wet | 2.500 | | 76 | 40-140 | 7 | 30 | |
| Benzo(a)anthracene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 8 | 30 | |
| Benzo(a)pyrene | 2.66 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Benzo(b)fluoranthene | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 7 | 30 | |
| Benzo(g,h,i)perylene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 8 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| Benzo(k)fluoranthene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 11 | 30 | |
| bis(2-Chloroethoxy)methane | 1.94 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | 6 | 30 | |
| bis(2-Chloroethyl)ether | 2.14 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | 10 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 15 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 8 | 30 | |
| Butylbenzylphthalate | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 8 | 30 | |
| Chrysene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 7 | 30 | |
| Dibenzo(a,h)Anthracene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 12 | 30 | |
| Dibenzofuran | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 7 | 30 | |
| Diethylphthalate | 2.79 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | 8 | 30 | |
| Dimethylphthalate | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Di-n-butylphthalate | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 7 | 30 | |
| Di-n-octylphthalate | 2.68 | 0.500 | mg/kg wet | 2.500 | | 107 | 40-140 | 9 | 30 | |
| Fluoranthene | 2.53 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 5 | 30 | |
| Fluorene | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Hexachlorobenzene | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Hexachlorobutadiene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 10 | 30 | |
| Hexachloroethane | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 12 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 8 | 30 | |
| Isophorone | 1.86 | 0.250 | mg/kg wet | 2.500 | | 74 | 40-140 | 7 | 30 | |
| Naphthalene | 2.11 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | 8 | 30 | |
| Nitrobenzene | 2.01 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | 7 | 30 | |
| N-Nitrosodimethylamine | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 9 | 30 | |
| Pentachlorophenol | 2.65 | 1.00 | mg/kg wet | 2.500 | | 106 | 30-130 | 11 | 30 | |
| Phenanthrene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 6 | 30 | |
| Phenol | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 30-130 | 9 | 30 | |
| Pyrene | 2.65 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 8 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.57* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.52* | | mg/kg wet | *3.750* | | *121* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.03* | | mg/kg wet | *3.750* | | *107* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.69* | | mg/kg wet | *2.500* | | *108* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.05* | | mg/kg wet | *3.750* | | *108* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.08* | | mg/kg wet | *2.500* | | *83* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.79* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.93* | | mg/kg wet | *2.500* | | *117* | *30-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford ESS Laboratory Work Order: 23K0532

**Notes and Definitions**

| | |
|---|---|
| U | Analyte included in the analysis, but not detected |
| Q | Calibration required quadratic regression (Q). |
| D | Diluted. |
| CD+ | Continuing Calibration %Diff/Drift is above control limit (CD+). |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 23K0532
Date Received: 11/16/2023
Project Due Date: 11/22/2023
Days for Project: 4 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.9 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: _____ Time: _____ By/Acid Lot#: _____
    b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? _____ Date: _____ Time: _____ By: _____

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 494131 | Yes | N/A | Yes | 8 oz jar | NP | |
| 1 | 494740 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 494132 | Yes | N/A | Yes | 8 oz jar | NP | |
| 3 | 494133 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 494134 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 494741 | Yes | N/A | Yes | 8 oz jar | NP | |
| 5 | 494135 | Yes | N/A | Yes | 8 oz jar | NP | |
| 5 | 494742 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 494136 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 494743 | Yes | N/A | Yes | 8 oz jar | NP | |
| 7 | 494137 | Yes | N/A | Yes | 8 oz jar | NP | |
| 8 | 494138 | Yes | N/A | Yes | 8 oz jar | NP | |
| 9 | 494139 | Yes | N/A | Yes | 8 oz jar | NP | |
| 9 | 494744 | Yes | N/A | Yes | 8 oz jar | NP | |
| 10 | 494140 | Yes | N/A | Yes | 8 oz jar | NP | |
| 11 | 494141 | Yes | N/A | Yes | 8 oz jar | NP | |
| 12 | 494142 | Yes | N/A | Yes | 8 oz jar | NP | |

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

ESS Project ID: 23K0532
Date Received: 11/16/2023

**2nd Review**
**Were all containers scanned into storage/lab?** Initials TJ
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: [signature] Date & Time: 11/16/23 1540
Reviewed By: [signature] Date & Time: 11/16/23 1549

# CHAIN OF CUSTODY

ESS Lab # 23150532 | Page 1 of 2

ESS LABORATORY
185 Frances Avenue
Cranston, RI 02910
Phone: 401-461-7181
Fax: 401-461-4486
www.esslaboratory.com

Turn Time (Days): ☐ > 5 ☐ 5 ☑ 4 ☐ 3 ☐ 2 ☐ 1 ☐ Same Day

Regulatory State: MA Criteria: MCP S-1

Is this project for any of the following?: ☐ CT RCP ☑ MA MCP ☐ RGP ☐ Permit ☐ 401 WQ

ELECTRONIC DELIVERABLES (Final Reports are PDF)
☑ Limit Checker ☐ State Forms ☐ EQuIS
☑ Excel ☐ State Upload ☐ Enviro Data
☐ CLP-Like Package ☐ Other (Specify) →

## CLIENT INFORMATION

Client: CEC Inc.
Address: 31 Bellows Road, Raynham, MA 02767
Phone: 339-226-1264
Email Distribution List: cdalbello@cecinc.com, jkitchen@cecinc.com, dbarboza@cecinc.com

## PROJECT INFORMATION

Project Name: MassCEC Expansion
Project Location: 54 Wright Street, New Bedford, MA
Project Number: 332-344
Project Manager: Cassia Dal Bello
Bill to: CEC Inc.
PO#:
Quote#:

Client acknowledges that sampling is compliant with all EPA / State regulatory programs

## REQUESTED ANALYSES

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | PCBs | MCP 14 Metals | SVOCs | Total Number of Bottles |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 11-15-23 | 0800 | Comp | Soil | CEC-1-A (0-6) | X | X | X | |
| 2 | | 0805 | Grab | | CEC-1-A (10-12) | X | X | X | |
| 3 | | 0810 | Grab | | CEC-1-A (16-18) | X | X | X | |
| 4 | | 0815 | Grab | | CEC-1-A (22-24) | X | X | X | |
| 5 | | 1200 | Comp | | CEC-2-A (0-4) | X | X | X | |
| 6 | | 1205 | Grab | | CEC-2-A (12-14) | X | X | X | |
| 7 | | 1210 | Grab | | CEC-2-A (24-26) | X | X | X | |
| 8 | | 1215 | Grab | | CEC-2-A (26-28) | X | X | X | |
| 9 | | 16:00 | Comp | | CEC-3-A (0-4) | X | X | X | |
| 10 | | 16:05 | Grab | | CEC-3-A (6-8) | X | X | X | |
| Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial | | | | | | J | J | J | |
| Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* | | | | | | 10 | 10 | 10 | |
| Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* | | | | | | 1 | 1 | 1 | |

Sampled by: Dave Barboza DB

**Chain needs to be filled out neatly and completely for on time delivery.**

**Laboratory Use Only**
Cooler Temperature (°C): 2.9 / 1 Ice

**Comments:** * Please specify "Other" preservative and containers types in this space
4 - day rush analysis approved by ESS.

All samples submitted are subject to ESS Laboratory's payment terms and conditions.

**Dissolved Filtration**
☐ Lab Filter

| Relinquished by (Signature) | Date | Time | Received by (Signature) | Relinquished by (Signature) | Date | Time | Received by (Signature) |
|---|---|---|---|---|---|---|---|
| [signature] | 11-16-23 | 06:30 | Secure Fridge | [signature] | 11/16/23 | 9:35 | [signature] 11/16/23 9:35 |
| [signature] | 11/16/23 | 15:16 | [signature] | | | | |

ESS LABORATORY

185 Frances Avenue
Cranston, RI 02910
Phone: 401-461-7181
Fax: 401-461-4486
www.esslaboratory.com

# CHAIN OF CUSTODY

ESS Lab # 23K0532 | Page 2 of 2

Turn Time (Days) ☐ >5 ☐ 5 ☑ 4 ☐ 3 ☐ 2 ☐ 1 ☐ Same Day

Regulatory State: MA Criteria: MCP S-1

Is this project for any of the following?:
☐ CT RCP ☑ MA MCP ☐ RGP ☐ Permit ☐ 401 WQ

ELECTRONIC DELIVERABLES (Final Reports are PDF)
☑ Limit Checker ☐ State Forms ☐ EQuIS
☑ Excel ☐ State Upload ☐ Enviro Data
☐ CLP-Like Package ☐ Other (Specify) →

## CLIENT INFORMATION

Client: CEC Inc.
Address: 31 Bellows Road
Raynham, MA 02767
Phone: 339-226-1264
Email Distribution List: cdalbello@cecinc.com, jkitchen@cecinc.com, dbarboza@cecinc.com

## PROJECT INFORMATION

Project Name: MassCEC Expansion
Project Location: 54 Wright Street, New Bedford, MA
Project Number: 332-344
Project Manager: Cassia Dal Bello
Bill to: CEC Inc.
PO#:
Quote#:

Client acknowledges that sampling is compliant with all EPA / State regulatory programs

## REQUESTED ANALYSES

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | PCBs | MCP 14 Metals | SVOCs | Total Number of Bottles |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 11-15-23 | 16:10 | Grab | Soil | CEC-3-A (18-20) | X | X | X | |
| 12 | 11-15-23 | 16:15 | Grab | Soil | CEC-3-A (24-26) | X | X | X | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

| | | | |
|---|---|---|---|
| Container Type: | AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial | J | J | J | |
| Container Volume: | 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* | 10 | 10 | 10 | |
| Preservation Code: | 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* | 1 | 1 | 1 | |

Sampled by : DAVE BARBOZA (DB)

**Chain needs to be filled out neatly and completely for on time delivery.**

**Laboratory Use Only**
Cooler Temperature (°C): 2.9 / 1C

**Comments:** * Please specify "Other" preservative and containers types in this space
4 - day rush analysis approved by ESS.

All samples submitted are subject to ESS Laboratory's payment terms and conditions.

**Dissolved Filtration**
☐ Lab Filter

| Relinquished by (Signature) | Date | Time | Received by (Signature) | Relinquished by (Signature) | Date | Time | Received by (Signature) |
|---|---|---|---|---|---|---|---|
| [signature] | 11-16-23 | 06:30 | Secure Fridge | [signature] | 11/16/23 | 9:35 | [signature] 11/16/23 9:37 |
| [signature] | 11/16/23 | 15:10 | [signature] | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

## SAMPLE RECEIPT

The following samples were received on November 16, 2023 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 23K0532-01 | CEC-1-A 0-6 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-02 | CEC-1-A 10-12 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-03 | CEC-1-A 16-18 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-04 | CEC-1-A 22-24 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-05 | CEC-2-A 0-4 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-06 | CEC-2-A 12-14 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-07 | CEC-2-A 24-26 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-08 | CEC-2-A 26-28 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-09 | CEC-3-A 0-4 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-10 | CEC-3-A 6-8 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-11 | CEC-3A 18-20 | Soil | 6010C, 7471B, 8082A, 8270D |
| 23K0532-12 | CEC-3-A 24-26 | Soil | 6010C, 7471B, 8082A, 8270D |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford ESS Laboratory Work Order: 23K0532

## PROJECT NARRATIVE

**8270D Semi-Volatile Organic Compounds**

D3K0381-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (128% @ 80-120%)

D3K0381-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4-Dinitrophenol (28% @ 20%), 2,6-Dinitrotoluene (21% @ 20%), 3,3′-Dichlorobenzidine (21% @ 20%)

D3K0394-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (125% @ 80-120%)

D3K0394-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4-Dinitrophenol (25% @ 20%), 3,3′-Dichlorobenzidine (21% @ 20%), Hexachlorobutadiene (22% @ 20%)

D3K0428-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (82% @ 80-120%)

D3K0428-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,6-Dinitrotoluene (21% @ 20%), 3,3′-Dichlorobenzidine (26% @ 20%), Benzo(g,h,i)perylene (22% @ 20%), bis(2-Ethylhexyl)phthalate (27% @ 20%), Butylbenzylphthalate (24% @ 20%), Di-n-octylphthalate (24% @ 20%), Indeno(1,2,3-cd)Pyrene (24% @ 20%)

**No other observations noted.**

**End of Project Narrative.**

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **23K0532-01 through 23K0532-12**

Matrices: ( ) Ground Water/Surface Water (x) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| ( ) 8260 VOC CAM II A | (x) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | (x) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (x) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | ( ) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (x) 6010 Metals CAM III A | ( ) 6020 Metals CAM III D | ( ) MassDEP EPH CAM IV B | ( ) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (x) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (x) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (x) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (x) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes ( ) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (x) No ( ) |

***Responses to Questions G, H and I below are required for "'Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? | Yes (x) No ( )* |
| | ***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.** | |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (x)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes (x) No ( )* |

***All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: November 22, 2023

Printed Name: Laur[illegible] Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.57) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Arsenic | ND (2.28) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Barium** | **7.50** (2.28) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Beryllium** | **0.16** (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Cadmium | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Chromium** | **4.65** (0.91) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Lead** | **4.71** (4.57) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Mercury | ND (0.031) | | 7471B | | 1 | AFV | 11/17/23 15:56 | 0.69 | 40 | DK31706 |
| **Nickel** | **4.65** (2.28) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Selenium | ND (4.57) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Silver | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| Thallium | ND (4.57) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Vanadium** | **5.24** (0.91) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |
| **Zinc** | **15.1** (2.28) | | 6010C | | 1 | CEV | 11/17/23 16:22 | 2.33 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1221 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1232 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1242 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1248 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1254 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1260 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1262 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |
| Aroclor 1268 | ND (0.05) | | 8082A | | 1 | 11/20/23 15:30 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *61 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *69 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.027) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4-Dichlorophenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4-Dimethylphenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4-Dinitrophenol | ND (1.08) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Chloronaphthalene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Chlorophenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Methylnaphthalene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Methylphenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 2-Nitrophenol | ND (0.540) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 3+4-Methylphenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 4-Chloroaniline | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| 4-Nitrophenol | ND (1.08) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Acenaphthene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Acenaphthylene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Acetophenone | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Aniline | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Anthracene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Azobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Benzo(a)anthracene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Benzo(a)pyrene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Benzo(b)fluoranthene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Butylbenzylphthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Chrysene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Dibenzofuran | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Diethylphthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Dimethylphthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Di-n-butylphthalate | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Di-n-octylphthalate | ND (0.540) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Fluoranthene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Fluorene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Hexachlorobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Hexachlorobutadiene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Hexachloroethane | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Isophorone | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Naphthalene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Nitrobenzene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| N-Nitrosodimethylamine | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Pentachlorophenol | ND (1.08) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Phenanthrene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Phenol | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |
| Pyrene | ND (0.270) | | 8270D | | 1 | 11/18/23 5:55 | D3K0394 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *88 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *113 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *89 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 0-6
Date Sampled: 11/15/23 08:00
Percent Solids: 94
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *91 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *89 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *79 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *83 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *103 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.54) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Arsenic | ND (2.27) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Barium** | **5.77** (2.27) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Beryllium** | **0.14** (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Cadmium | ND (0.45) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Chromium** | **3.36** (0.91) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Lead | ND (4.54) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Mercury | ND (0.038) | | 7471B | | 1 | AFV | 11/17/23 15:58 | 0.61 | 40 | DK31706 |
| **Nickel** | **3.82** (2.27) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Selenium | ND (4.54) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Silver | ND (0.45) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| Thallium | ND (4.54) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Vanadium** | **4.61** (0.91) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |
| **Zinc** | **11.4** (2.27) | | 6010C | | 1 | CEV | 11/17/23 16:31 | 2.6 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85
Initial Volume: 20.3g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 15:50 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *64 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *67 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.030) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4-Dichlorophenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4-Dimethylphenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4-Dinitrophenol | ND (1.19) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Chloronaphthalene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Chlorophenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Methylnaphthalene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Methylphenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 2-Nitrophenol | ND (0.593) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 3+4-Methylphenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 4-Chloroaniline | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| 4-Nitrophenol | ND (1.19) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Acenaphthene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Acenaphthylene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Acetophenone | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Aniline | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Anthracene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Azobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Benzo(a)anthracene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Benzo(a)pyrene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Benzo(b)fluoranthene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Butylbenzylphthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Chrysene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Dibenzofuran | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Diethylphthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Dimethylphthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Di-n-butylphthalate | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Di-n-octylphthalate | ND (0.593) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Fluoranthene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Fluorene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Hexachlorobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Hexachlorobutadiene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Hexachloroethane | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Isophorone | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Naphthalene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Nitrobenzene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| N-Nitrosodimethylamine | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Pentachlorophenol | ND (1.19) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Phenanthrene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Phenol | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |
| Pyrene | ND (0.296) | | 8270D | | 1 | 11/18/23 6:25 | D3K0394 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *90 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *122 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *95 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 10-12
Date Sampled: 11/15/23 08:05
Percent Solids: 85
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *97 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *94 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *83 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *88 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *112 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.93) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Arsenic | ND (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Barium** | **5.86** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Cadmium | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Chromium** | **3.56** (0.99) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Lead | ND (4.93) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Mercury | ND (0.037) | | 7471B | | 1 | AFV | 11/17/23 16:00 | 0.62 | 40 | DK31706 |
| **Nickel** | **3.82** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Selenium | ND (4.93) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Silver | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| Thallium | ND (4.93) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Vanadium** | **4.52** (0.99) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |
| **Zinc** | **12.6** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:33 | 2.33 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 16:10 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *68 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *68 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.18) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.589) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.18) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Acetophenone | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Aniline | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Anthracene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Azobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Chrysene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.589) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Fluorene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Isophorone | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Naphthalene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.18) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Phenol | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |
| Pyrene | ND (0.295) | | 8270D | | 1 | 11/21/23 0:43 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *92 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *98 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *94 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 16-18
Date Sampled: 11/15/23 08:10
Percent Solids: 87
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *92 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *93 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *84 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *90 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *104 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.95) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Arsenic | ND (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| **Barium** | **5.72** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Beryllium | ND (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Cadmium | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| **Chromium** | **4.18** (0.99) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Lead | ND (4.95) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Mercury | ND (0.033) | | 7471B | | 1 | AFV | 11/17/23 16:02 | 0.66 | 40 | DK31706 |
| **Nickel** | **3.38** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Selenium | ND (4.95) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Silver | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| Thallium | ND (4.95) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| **Vanadium** | **5.07** (0.99) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |
| **Zinc** | **12.0** (2.47) | | 6010C | | 1 | CEV | 11/17/23 16:35 | 2.23 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1221 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1232 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1242 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1248 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1254 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1260 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1262 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |
| Aroclor 1268 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:29 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *68 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *68 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91
Initial Volume: 19.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.578) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Acetophenone | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Aniline | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Anthracene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Azobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91
Initial Volume: 19.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Chrysene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.578) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Fluorene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Isophorone | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Naphthalene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Phenol | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |
| Pyrene | ND (0.289) | | 8270D | | 1 | 11/21/23 1:14 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *94 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *106 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *98 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-1-A 22-24
Date Sampled: 11/15/23 08:15
Percent Solids: 91
Initial Volume: 19.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *95 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *96 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *87 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *94 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *105 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.64) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Arsenic | ND (2.32) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Barium** | **6.81** (2.32) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Cadmium | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Chromium** | **4.58** (0.93) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Lead** | **6.95** (4.64) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Mercury | ND (0.034) | | 7471B | | 1 | AFV | 11/17/23 16:04 | 0.62 | 40 | DK31706 |
| **Nickel** | **4.54** (2.32) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Selenium | ND (4.64) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Silver | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| Thallium | ND (4.64) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Vanadium** | **5.15** (0.93) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |
| **Zinc** | **14.5** (2.32) | | 6010C | | 1 | CEV | 11/17/23 16:37 | 2.29 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94
Initial Volume: 19.7g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 12:20

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1221 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1232 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1242 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1248 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1254 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1260 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1262 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |
| Aroclor 1268 | ND (0.05) | | 8082A | | 1 | 11/20/23 16:49 | | DK31603 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *69 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *70 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.10) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.550) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.10) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Acetophenone | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Aniline | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Anthracene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Azobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Chrysene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.550) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Fluorene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Isophorone | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Naphthalene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.10) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Phenol | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |
| Pyrene | ND (0.275) | | 8270D | | 1 | 11/21/23 1:44 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *85 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *94 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *88 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 0-4
Date Sampled: 11/15/23 12:00
Percent Solids: 94
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *87 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *87 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *78 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *85 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *95 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.92) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Arsenic | ND (2.46) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Barium** | **6.60** (2.46) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Cadmium | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Chromium** | **4.04** (0.98) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Lead | ND (4.92) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Mercury | ND (0.035) | | 7471B | | 1 | AFV | 11/17/23 16:06 | 0.64 | 40 | DK31706 |
| **Nickel** | **4.41** (2.46) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Selenium | ND (4.92) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Silver | ND (0.49) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| Thallium | ND (4.92) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Vanadium** | **4.63** (0.98) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |
| **Zinc** | **12.8** (2.46) | | 6010C | | 1 | CEV | 11/17/23 16:39 | 2.32 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88
Initial Volume: 20.4g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/21/23 11:36 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *74 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *65 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.580) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Acetophenone | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Aniline | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Anthracene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Azobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Chrysene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.580) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Fluorene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Isophorone | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Naphthalene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Phenol | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |
| Pyrene | ND (0.290) | | 8270D | | 1 | 11/21/23 2:15 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *90 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *100 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *93 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 12-14
Date Sampled: 11/15/23 12:05
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *90 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *92 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *84 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *90 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *100 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (5.86) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Arsenic | ND (2.93) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Barium** | **12.9** (2.93) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Beryllium** | **0.23** (0.13) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Cadmium | ND (0.59) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Chromium** | **14.5** (1.17) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Lead** | **22.5** (5.86) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Mercury** | **0.138** (0.040) | | 7471B | | 1 | AFV | 11/17/23 16:08 | 0.64 | 40 | DK31706 |
| **Nickel** | **6.30** (2.93) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Selenium | ND (5.86) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Silver | ND (0.59) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| Thallium | ND (5.86) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Vanadium** | **9.34** (1.17) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |
| **Zinc** | **46.0** (2.93) | | 6010C | | 1 | CEV | 11/17/23 16:41 | 2.18 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78
Initial Volume: 19.9g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| **Aroclor 1248 [2C]** | **0.6** (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| **Aroclor 1254 [2C]** | **0.5** (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 18:41 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *41 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *39 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78
Initial Volume: 19.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.033) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.30) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.652) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.30) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Acetophenone | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Aniline | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Anthracene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Azobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78
Initial Volume: 19.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Chrysene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.652) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Fluorene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Isophorone | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Naphthalene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.30) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Phenol | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |
| Pyrene | ND (0.326) | | 8270D | | 1 | 11/21/23 2:46 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *95 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *106 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *100 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 24-26
Date Sampled: 11/15/23 12:10
Percent Solids: 78
Initial Volume: 19.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *99 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *96 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *91 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *96 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *106 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (5.14) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Arsenic | ND (2.57) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Barium** | **7.19** (2.57) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Beryllium** | **0.21** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Cadmium | ND (0.51) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Chromium** | **9.08** (1.03) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Lead** | **8.88** (5.14) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Mercury | ND (0.037) | | 7471B | | 1 | AFV | 11/17/23 16:15 | 0.6 | 40 | DK31706 |
| **Nickel** | **5.30** (2.57) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Selenium | ND (5.14) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Silver | ND (0.51) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| Thallium | ND (5.14) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Vanadium** | **6.89** (1.03) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |
| **Zinc** | **25.4** (2.57) | | 6010C | | 1 | CEV | 11/17/23 16:43 | 2.2 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| **Aroclor 1248 [2C]** | **0.3** (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| **Aroclor 1254** | **0.2** (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:00 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *64 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *60 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.11) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.557) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.11) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Acetophenone | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Aniline | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Anthracene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Azobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Chrysene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.557) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Fluorene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Isophorone | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Naphthalene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.11) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Phenol | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |
| Pyrene | ND (0.278) | | 8270D | | 1 | 11/21/23 3:17 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *96 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *110 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *100 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-2-A 26-28
Date Sampled: 11/15/23 12:15
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *101 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *99 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *93 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *97 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *112 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.63) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Arsenic | ND (2.31) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Barium** | **11.6** (2.31) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Cadmium | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Chromium** | **7.05** (0.93) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Lead** | **7.97** (4.63) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Mercury | ND (0.031) | | 7471B | | 1 | AFV | 11/17/23 16:17 | 0.68 | 40 | DK31706 |
| **Nickel** | **5.81** (2.31) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Selenium | ND (4.63) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Silver | ND (0.46) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| Thallium | ND (4.63) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Vanadium** | **6.58** (0.93) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |
| **Zinc** | **16.2** (2.31) | | 6010C | | 1 | CEV | 11/17/23 16:45 | 2.31 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94
Initial Volume: 20.5g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1221 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1232 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1242 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1248 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1254 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1260 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1262 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |
| Aroclor 1268 | ND (0.05) | | 8082A | | 1 | 11/20/23 19:19 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *67 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *66 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94
Initial Volume: 20g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.027) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.07) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.535) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.07) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Acetophenone | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Aniline | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Anthracene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Azobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94
Initial Volume: 20g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Chrysene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.535) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Fluorene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Isophorone | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Naphthalene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.07) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Phenol | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |
| Pyrene | ND (0.267) | | 8270D | | 1 | 11/21/23 3:48 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *98 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *106 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *105 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 0-4
Date Sampled: 11/15/23 16:00
Percent Solids: 94
Initial Volume: 20g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *104 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *100 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *94 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *99 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *117 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (5.04) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Arsenic | ND (2.52) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Barium** | **6.57** (2.52) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Beryllium** | **0.17** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Cadmium | ND (0.50) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Chromium** | **4.35** (1.01) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Lead | ND (5.04) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Mercury | ND (0.036) | | 7471B | | 1 | AFV | 11/17/23 16:19 | 0.62 | 40 | DK31706 |
| **Nickel** | **4.77** (2.52) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Selenium | ND (5.04) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Silver | ND (0.50) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| Thallium | ND (5.04) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Vanadium** | **5.69** (1.01) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |
| **Zinc** | **16.6** (2.52) | | 6010C | | 1 | CEV | 11/17/23 16:47 | 2.25 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88
Initial Volume: 20.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:39 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *66 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *62 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.581) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Acetophenone | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Aniline | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Azobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Chrysene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.581) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Fluorene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Isophorone | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Naphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Phenol | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |
| Pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 4:19 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *87 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *99 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *91 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 6-8
Date Sampled: 11/15/23 16:05
Percent Solids: 88
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *91 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *87 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *82 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *86 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *102 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (5.18) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Arsenic | ND (2.59) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Barium** | **7.87** (2.59) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Beryllium** | **0.15** (0.11) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Cadmium | ND (0.52) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Chromium** | **8.94** (1.04) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Lead | ND (5.18) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Mercury | ND (0.038) | | 7471B | | 1 | AFV | 11/17/23 16:21 | 0.62 | 40 | DK31706 |
| **Nickel** | **5.28** (2.59) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Selenium | ND (5.18) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Silver | ND (0.52) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| Thallium | ND (5.18) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Vanadium** | **4.94** (1.04) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |
| **Zinc** | **14.1** (2.59) | | 6010C | | 1 | CEV | 11/17/23 16:49 | 2.32 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83
Initial Volume: 20.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1248 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1254 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 19:58 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *71 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *69 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.030) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.20) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.598) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.20) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Acetophenone | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Aniline | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Anthracene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Azobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Chrysene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.598) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Fluorene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Isophorone | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Naphthalene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.20) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Phenol | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |
| Pyrene | ND (0.299) | | 8270D | | 1 | 11/21/23 4:49 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *94 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *114 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *100 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3A 18-20
Date Sampled: 11/15/23 16:10
Percent Solids: 83
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *98 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *99 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *90 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *95 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *112 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | I/V | F/V | Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND (4.41) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Arsenic | ND (2.20) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Barium** | **3.38** (2.20) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Beryllium | ND (0.10) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Cadmium | ND (0.44) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Chromium** | **3.21** (0.88) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Lead** | **8.53** (4.41) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Mercury | ND (0.037) | | 7471B | | 1 | AFV | 11/17/23 16:23 | 0.62 | 40 | DK31706 |
| Nickel | ND (2.20) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Selenium | ND (4.41) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Silver | ND (0.44) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| Thallium | ND (4.41) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Vanadium** | **2.93** (0.88) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |
| **Zinc** | **18.0** (2.20) | | 6010C | | 1 | CEV | 11/17/23 16:58 | 2.61 | 100 | DK31667 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87
Initial Volume: 20.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 11/17/23 13:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1221 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1232 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1242 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| **Aroclor 1248 [2C]** | **0.3** (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| **Aroclor 1254** | **0.2** (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1260 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1262 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |
| Aroclor 1268 | ND (0.06) | | 8082A | | 1 | 11/20/23 20:17 | | DK31704 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *66 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *59 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 1,2,4-Trichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 1,2-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 1,3-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 1,4-Dichlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4,5-Trichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4,6-Trichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4-Dichlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4-Dimethylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4-Dinitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,4-Dinitrotoluene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2,6-Dinitrotoluene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Chloronaphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Chlorophenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Methylnaphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Methylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 2-Nitrophenol | ND (0.581) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 3,3´-Dichlorobenzidine | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 3+4-Methylphenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 4-Bromophenyl-phenylether | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 4-Chloroaniline | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| 4-Nitrophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Acenaphthene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Acenaphthylene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Acetophenone | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Aniline | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Azobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Benzo(a)anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Benzo(a)pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Benzo(b)fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Benzo(g,h,i)perylene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| bis(2-Chloroethoxy)methane | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| bis(2-Chloroethyl)ether | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| bis(2-chloroisopropyl)Ether | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| bis(2-Ethylhexyl)phthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Butylbenzylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Chrysene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Dibenzo(a,h)Anthracene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Dibenzofuran | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Diethylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Dimethylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Di-n-butylphthalate | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Di-n-octylphthalate | ND (0.581) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Fluoranthene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Fluorene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Hexachlorobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Hexachlorobutadiene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Hexachloroethane | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Indeno(1,2,3-cd)Pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Isophorone | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Naphthalene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Nitrobenzene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| N-Nitrosodimethylamine | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Pentachlorophenol | ND (1.16) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Phenanthrene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Phenol | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |
| Pyrene | ND (0.291) | | 8270D | | 1 | 11/21/23 5:21 | D3K0428 | DK31664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *92 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *110 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *96 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford
Client Sample ID: CEC-3-A 24-26
Date Sampled: 11/15/23 16:15
Percent Solids: 87
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0532
ESS Laboratory Sample ID: 23K0532-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/16/23 20:18

## 8270D Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| *Surrogate: 2-Fluorobiphenyl* | | *100 %* | | *30-130* | | | | |
| *Surrogate: 2-Fluorophenol* | | *96 %* | | *30-130* | | | | |
| *Surrogate: Nitrobenzene-d5* | | *88 %* | | *30-130* | | | | |
| *Surrogate: Phenol-d6* | | *93 %* | | *30-130* | | | | |
| *Surrogate: p-Terphenyl-d14* | | *112 %* | | *30-130* | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DK31667 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Antimony | ND | 5.00 | mg/kg wet | | | | | | | |
| Arsenic | ND | 2.50 | mg/kg wet | | | | | | | |
| Barium | ND | 2.50 | mg/kg wet | | | | | | | |
| Beryllium | ND | 0.11 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Nickel | ND | 2.50 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| Thallium | ND | 5.00 | mg/kg wet | | | | | | | |
| Vanadium | ND | 1.00 | mg/kg wet | | | | | | | |
| Zinc | ND | 2.50 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Antimony | 41.4 | 14.3 | mg/kg wet | 54.20 | | 76 | 40-160 | | | |
| Arsenic | 239 | 7.14 | mg/kg wet | 258.0 | | 93 | 80-120 | | | |
| Barium | 732 | 7.14 | mg/kg wet | 809.0 | | 91 | 80-120 | | | |
| Beryllium | 46.4 | 0.31 | mg/kg wet | 48.50 | | 96 | 80-120 | | | |
| Cadmium | 295 | 1.43 | mg/kg wet | 321.0 | | 92 | 80-120 | | | |
| Chromium | 123 | 2.86 | mg/kg wet | 133.0 | | 93 | 80-120 | | | |
| Lead | 99.4 | 14.3 | mg/kg wet | 102.0 | | 97 | 80-120 | | | |
| Nickel | 136 | 7.14 | mg/kg wet | 137.0 | | 99 | 80-120 | | | |
| Selenium | 44.0 | 14.3 | mg/kg wet | 49.40 | | 89 | 80-120 | | | |
| Silver | 22.6 | 1.43 | mg/kg wet | 22.70 | | 100 | 80-120 | | | |
| Thallium | 80.7 | 14.3 | mg/kg wet | 81.40 | | 99 | 80-120 | | | |
| Vanadium | 92.3 | 2.86 | mg/kg wet | 108.0 | | 85 | 80-120 | | | |
| Zinc | 507 | 7.14 | mg/kg wet | 540.0 | | 94 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Antimony | 41.2 | 14.9 | mg/kg wet | 54.20 | | 76 | 40-160 | 0.5 | 30 | |
| Arsenic | 235 | 7.46 | mg/kg wet | 258.0 | | 91 | 80-120 | 2 | 30 | |
| Barium | 760 | 7.46 | mg/kg wet | 809.0 | | 94 | 80-120 | 4 | 30 | |
| Beryllium | 45.6 | 0.33 | mg/kg wet | 48.50 | | 94 | 80-120 | 2 | 20 | |
| Cadmium | 291 | 1.49 | mg/kg wet | 321.0 | | 91 | 80-120 | 2 | 30 | |
| Chromium | 122 | 2.99 | mg/kg wet | 133.0 | | 92 | 80-120 | 1 | 30 | |
| Lead | 97.8 | 14.9 | mg/kg wet | 102.0 | | 96 | 80-120 | 2 | 20 | |
| Nickel | 134 | 7.46 | mg/kg wet | 137.0 | | 98 | 80-120 | 2 | 30 | |
| Selenium | 44.3 | 14.9 | mg/kg wet | 49.40 | | 90 | 80-120 | 0.6 | 30 | |
| Silver | 22.3 | 1.49 | mg/kg wet | 22.70 | | 98 | 80-120 | 1 | 30 | |
| Thallium | 80.4 | 14.9 | mg/kg wet | 81.40 | | 99 | 80-120 | 0.4 | 30 | |
| Vanadium | 91.6 | 2.99 | mg/kg wet | 108.0 | | 85 | 80-120 | 0.8 | 30 | |
| Zinc | 501 | 7.46 | mg/kg wet | 540.0 | | 93 | 80-120 | 1 | 30 | |
| **Batch DK31706 - 7471B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DK31706 - 7471B** | | | | | | | | | | |
| Mercury | ND | 0.031 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 10.4 | 3.19 | mg/kg wet | 17.10 | | 61 | 33.1-86.55 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 10.3 | 3.19 | mg/kg wet | 17.10 | | 60 | 33.1-86.55 | 1 | 30 | |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DK31603 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0205* | | mg/kg wet | *0.02500* | | *82* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 77 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 76 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 78 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 79 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0186* | | mg/kg wet | *0.02500* | | *74* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0184* | | mg/kg wet | *0.02500* | | *74* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0190* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0192* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 78 | 40-140 | 2 | 30 | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 78 | 40-140 | 2 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DK31603 - 3540C** | | | | | | | | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 81 | 40-140 | 4 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 82 | 40-140 | 4 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0192* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0191* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0193* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0196* | | mg/kg wet | *0.02500* | | *78* | *30-150* | | | |
| **Batch DK31704 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0195* | | mg/kg wet | *0.02500* | | *78* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0225* | | mg/kg wet | *0.02500* | | *90* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0170* | | mg/kg wet | *0.02500* | | *68* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0203* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 75 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 79 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 79 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 87 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0202* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0230* | | mg/kg wet | *0.02500* | | *92* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0176* | | mg/kg wet | *0.02500* | | *70* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 77 | 40-140 | 2 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DK31704 - 3540C** | | | | | | | | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 81 | 40-140 | 3 | 30 | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 79 | 40-140 | 0.04 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 87 | 40-140 | 0.3 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0200* | | mg/kg wet | *0.02500* | | *80* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0228* | | mg/kg wet | *0.02500* | | *91* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0187* | | mg/kg wet | *0.02500* | | *75* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0202* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.57* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.67* | | mg/kg wet | *3.750* | | *125* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.98* | | mg/kg wet | *3.750* | | *106* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.67* | | mg/kg wet | *2.500* | | *107* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.11* | | mg/kg wet | *3.750* | | *110* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.39* | | mg/kg wet | *2.500* | | *95* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.77* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.97* | | mg/kg wet | *2.500* | | *119* | *30-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.22 | 0.025 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.04 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.14 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 30-130 | | | |
| 2,4-Dimethylphenol | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 30-130 | | | |
| 2,4-Dinitrophenol | 2.48 | 1.00 | mg/kg wet | 2.500 | | 99 | 30-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| 2,4-Dinitrotoluene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.57 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| 2-Chloronaphthalene | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| 2-Chlorophenol | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 30-130 | | | |
| 2-Methylnaphthalene | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |
| 2-Methylphenol | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 30-130 | | | |
| 2-Nitrophenol | 2.18 | 0.500 | mg/kg wet | 2.500 | | 87 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| 3+4-Methylphenol | 4.79 | 0.250 | mg/kg wet | 5.000 | | 96 | 30-130 | | | |
| 4-Bromophenyl-phenylether | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| 4-Chloroaniline | 1.75 | 0.250 | mg/kg wet | 2.500 | | 70 | 40-140 | | | |
| 4-Nitrophenol | 2.22 | 1.00 | mg/kg wet | 2.500 | | 89 | 30-130 | | | |
| Acenaphthene | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| Acenaphthylene | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| Acetophenone | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Aniline | 1.13 | 0.250 | mg/kg wet | 2.500 | | 45 | 40-140 | | | |
| Anthracene | 2.21 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Azobenzene | 1.78 | 0.250 | mg/kg wet | 2.500 | | 71 | 40-140 | | | |
| Benzo(a)anthracene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Benzo(a)pyrene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.11 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 1.83 | 0.250 | mg/kg wet | 2.500 | | 73 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 1.94 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 1.98 | 0.250 | mg/kg wet | 2.500 | | 79 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.57 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| Butylbenzylphthalate | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Chrysene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.23 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Dibenzofuran | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Diethylphthalate | 2.59 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| Dimethylphthalate | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Di-n-butylphthalate | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Di-n-octylphthalate | 2.45 | 0.500 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Fluoranthene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Fluorene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Hexachlorobenzene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Hexachlorobutadiene | 2.25 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Hexachloroethane | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Isophorone | 1.73 | 0.250 | mg/kg wet | 2.500 | | 69 | 40-140 | | | |
| Naphthalene | 1.95 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | | | |
| Nitrobenzene | 1.87 | 0.250 | mg/kg wet | 2.500 | | 75 | 40-140 | | | |
| N-Nitrosodimethylamine | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| Pentachlorophenol | 2.38 | 1.00 | mg/kg wet | 2.500 | | 95 | 30-130 | | | |
| Phenanthrene | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Phenol | 2.26 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | | | |
| Pyrene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.40* | | mg/kg wet | *2.500* | | *96* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.38* | | mg/kg wet | *3.750* | | *117* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.79* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.55* | | mg/kg wet | *2.500* | | *102* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.76* | | mg/kg wet | *3.750* | | *100* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.02* | | mg/kg wet | *2.500* | | *81* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.52* | | mg/kg wet | *3.750* | | *94* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.75* | | mg/kg wet | *2.500* | | *110* | *30-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.41 | 0.025 | mg/kg wet | 2.500 | | 97 | 40-140 | 8 | 30 | |
| 1,2,4-Trichlorobenzene | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | 8 | 30 | |
| 1,2-Dichlorobenzene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 9 | 30 | |
| 1,3-Dichlorobenzene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 9 | 30 | |
| 1,4-Dichlorobenzene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 9 | 30 | |
| 2,4,5-Trichlorophenol | 2.71 | 0.250 | mg/kg wet | 2.500 | | 109 | 30-130 | 8 | 30 | |
| 2,4,6-Trichlorophenol | 2.64 | 0.250 | mg/kg wet | 2.500 | | 106 | 30-130 | 7 | 30 | |
| 2,4-Dichlorophenol | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 30-130 | 8 | 30 | |
| 2,4-Dimethylphenol | 2.81 | 0.250 | mg/kg wet | 2.500 | | 113 | 30-130 | 8 | 30 | |
| 2,4-Dinitrophenol | 2.74 | 1.00 | mg/kg wet | 2.500 | | 110 | 30-130 | 10 | 30 | |
| 2,4-Dinitrotoluene | 2.64 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 7 | 30 | |
| 2,6-Dinitrotoluene | 2.81 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | 9 | 30 | |
| 2-Chloronaphthalene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 7 | 30 | |
| 2-Chlorophenol | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 30-130 | 10 | 30 | |
| 2-Methylnaphthalene | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | 6 | 30 | |
| 2-Methylphenol | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 30-130 | 9 | 30 | |
| 2-Nitrophenol | 2.31 | 0.500 | mg/kg wet | 2.500 | | 93 | 30-130 | 6 | 30 | |
| 3,3´-Dichlorobenzidine | 2.61 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | 9 | 30 | |
| 3+4-Methylphenol | 5.32 | 0.250 | mg/kg wet | 5.000 | | 106 | 30-130 | 11 | 30 | |
| 4-Bromophenyl-phenylether | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 6 | 30 | |
| 4-Chloroaniline | 1.84 | 0.250 | mg/kg wet | 2.500 | | 73 | 40-140 | 5 | 30 | |
| 4-Nitrophenol | 2.38 | 1.00 | mg/kg wet | 2.500 | | 95 | 30-130 | 7 | 30 | |
| Acenaphthene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 8 | 30 | |
| Acenaphthylene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 9 | 30 | |
| Acetophenone | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 9 | 30 | |
| Aniline | 1.22 | 0.250 | mg/kg wet | 2.500 | | 49 | 40-140 | 8 | 30 | |
| Anthracene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 6 | 30 | |
| Azobenzene | 1.90 | 0.250 | mg/kg wet | 2.500 | | 76 | 40-140 | 7 | 30 | |
| Benzo(a)anthracene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 8 | 30 | |
| Benzo(a)pyrene | 2.66 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Benzo(b)fluoranthene | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 7 | 30 | |
| Benzo(g,h,i)perylene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 8 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8270D Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DK31664 - 3546** | | | | | | | | | | |
| Benzo(k)fluoranthene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 11 | 30 | |
| bis(2-Chloroethoxy)methane | 1.94 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | 6 | 30 | |
| bis(2-Chloroethyl)ether | 2.14 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | 10 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 15 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 8 | 30 | |
| Butylbenzylphthalate | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 8 | 30 | |
| Chrysene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 7 | 30 | |
| Dibenzo(a,h)Anthracene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 12 | 30 | |
| Dibenzofuran | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 7 | 30 | |
| Diethylphthalate | 2.79 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | 8 | 30 | |
| Dimethylphthalate | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Di-n-butylphthalate | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 7 | 30 | |
| Di-n-octylphthalate | 2.68 | 0.500 | mg/kg wet | 2.500 | | 107 | 40-140 | 9 | 30 | |
| Fluoranthene | 2.53 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 5 | 30 | |
| Fluorene | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Hexachlorobenzene | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Hexachlorobutadiene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 10 | 30 | |
| Hexachloroethane | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 12 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 8 | 30 | |
| Isophorone | 1.86 | 0.250 | mg/kg wet | 2.500 | | 74 | 40-140 | 7 | 30 | |
| Naphthalene | 2.11 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | 8 | 30 | |
| Nitrobenzene | 2.01 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | 7 | 30 | |
| N-Nitrosodimethylamine | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 9 | 30 | |
| Pentachlorophenol | 2.65 | 1.00 | mg/kg wet | 2.500 | | 106 | 30-130 | 11 | 30 | |
| Phenanthrene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 6 | 30 | |
| Phenol | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 30-130 | 9 | 30 | |
| Pyrene | 2.65 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 8 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.57* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.52* | | mg/kg wet | *3.750* | | *121* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.03* | | mg/kg wet | *3.750* | | *107* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.69* | | mg/kg wet | *2.500* | | *108* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.05* | | mg/kg wet | *3.750* | | *108* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.08* | | mg/kg wet | *2.500* | | *83* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.79* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.93* | | mg/kg wet | *2.500* | | *117* | *30-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford ESS Laboratory Work Order: 23K0532

**Notes and Definitions**

| | |
|---|---|
| U | Analyte included in the analysis, but not detected |
| Q | Calibration required quadratic regression (Q). |
| D | Diluted. |
| CD+ | Continuing Calibration %Diff/Drift is above control limit (CD+). |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC - New Bedford

ESS Laboratory Work Order: 23K0532

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 23K0532
Date Received: 11/16/2023
Project Due Date: 11/22/2023
Days for Project: 4 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.9 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: _____ Time: _____ By/Acid Lot#: _____
    b. Low Level VOA vials frozen: Date: _____ Time: _____ By: _____

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? _____ Date: _____ Time: _____ By: _____

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 494131 | Yes | N/A | Yes | 8 oz jar | NP | |
| 1 | 494740 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 494132 | Yes | N/A | Yes | 8 oz jar | NP | |
| 3 | 494133 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 494134 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 494741 | Yes | N/A | Yes | 8 oz jar | NP | |
| 5 | 494135 | Yes | N/A | Yes | 8 oz jar | NP | |
| 5 | 494742 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 494136 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 494743 | Yes | N/A | Yes | 8 oz jar | NP | |
| 7 | 494137 | Yes | N/A | Yes | 8 oz jar | NP | |
| 8 | 494138 | Yes | N/A | Yes | 8 oz jar | NP | |
| 9 | 494139 | Yes | N/A | Yes | 8 oz jar | NP | |
| 9 | 494744 | Yes | N/A | Yes | 8 oz jar | NP | |
| 10 | 494140 | Yes | N/A | Yes | 8 oz jar | NP | |
| 11 | 494141 | Yes | N/A | Yes | 8 oz jar | NP | |
| 12 | 494142 | Yes | N/A | Yes | 8 oz jar | NP | |

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

ESS Project ID: 23K0532
Date Received: 11/16/2023

**2nd Review**
**Were all containers scanned into storage/lab?** Initials TJ
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: [signature] Date & Time: 11/16/23 1540
Reviewed By: [signature] Date & Time: 11/16/23 1549

# CHAIN OF CUSTODY

ESS Lab # 23150532 | Page 1 of 2

ESS LABORATORY
185 Frances Avenue
Cranston, RI 02910
Phone: 401-461-7181
Fax: 401-461-4486
www.esslaboratory.com

Turn Time (Days): ☐ > 5 ☐ 5 ☑ 4 ☐ 3 ☐ 2 ☐ 1 ☐ Same Day

Regulatory State: MA Criteria: MCP S-1

Is this project for any of the following?: ☐ CT RCP ☑ MA MCP ☐ RGP ☐ Permit ☐ 401 WQ

ELECTRONIC DELIVERABLES (Final Reports are PDF)
☑ Limit Checker ☐ State Forms ☐ EQuIS
☑ Excel ☐ State Upload ☐ Enviro Data
☐ CLP-Like Package ☐ Other (Specify) →

## CLIENT INFORMATION

Client: CEC Inc.
Address: 31 Bellows Road, Raynham, MA 02767
Phone: 339-226-1264
Email Distribution List: cdalbello@cecinc.com, jkitchen@cecinc.com, dbarboza@cecinc.com

## PROJECT INFORMATION

Project Name: MassCEC Expansion
Project Location: 54 Wright Street, New Bedford, MA
Project Number: 332-344
Project Manager: Cassia Dal Bello
Bill to: CEC Inc.
PO#:
Quote#:

Client acknowledges that sampling is compliant with all EPA / State regulatory programs

## REQUESTED ANALYSES

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | PCBs | MCP 14 Metals | SVOCs | Total Number of Bottles |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 11-15-23 | 0800 | Comp | Soil | CEC-1-A (0-6) | X | X | X | |
| 2 | | 0805 | Grab | | CEC-1-A (10-12) | X | X | X | |
| 3 | | 0810 | Grab | | CEC-1-A (16-18) | X | X | X | |
| 4 | | 0815 | Grab | | CEC-1-A (22-24) | X | X | X | |
| 5 | | 1200 | Comp | | CEC-2-A (0-4) | X | X | X | |
| 6 | | 1205 | Grab | | CEC-2-A (12-14) | X | X | X | |
| 7 | | 1210 | Grab | | CEC-2-A (24-26) | X | X | X | |
| 8 | | 1215 | Grab | | CEC-2-A (26-28) | X | X | X | |
| 9 | | 16:00 | Comp | | CEC-3-A (0-4) | X | X | X | |
| 10 | | 16:05 | Grab | | CEC-3-A (6-8) | X | X | X | |
| Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial | | | | | | J | J | J | |
| Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* | | | | | | 10 | 10 | 10 | |
| Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* | | | | | | 1 | 1 | 1 | |

Sampled by: Dave Barboza DB

**Chain needs to be filled out neatly and completely for on time delivery.**

**Laboratory Use Only**
Cooler Temperature (°C): 2.9 / 1 Ice

**Comments:** * Please specify "Other" preservative and containers types in this space
4 - day rush analysis approved by ESS.

All samples submitted are subject to ESS Laboratory's payment terms and conditions.

**Dissolved Filtration**
☐ Lab Filter

| Relinquished by (Signature) | Date | Time | Received by (Signature) | Relinquished by (Signature) | Date | Time | Received by (Signature) |
|---|---|---|---|---|---|---|---|
| [signature] | 11-16-23 | 06:30 | Secure Fridge | [signature] | 11/16/23 | 9:35 | [signature] 11/16/23 9:35 |
| [signature] | 11/16/23 | 15:16 | [signature] | | | | |

ESS LABORATORY

185 Frances Avenue
Cranston, RI 02910
Phone: 401-461-7181
Fax: 401-461-4486
www.esslaboratory.com

# CHAIN OF CUSTODY

ESS Lab # 23K0532 | Page 2 of 2

Turn Time (Days) ☐ >5 ☐ 5 ☑ 4 ☐ 3 ☐ 2 ☐ 1 ☐ Same Day

Regulatory State: MA Criteria: MCP S-1

Is this project for any of the following?:
☐ CT RCP ☑ MA MCP ☐ RGP ☐ Permit ☐ 401 WQ

ELECTRONIC DELIVERABLES (Final Reports are PDF)
☑ Limit Checker ☐ State Forms ☐ EQuIS
☑ Excel ☐ State Upload ☐ Enviro Data
☐ CLP-Like Package ☐ Other (Specify) →

## CLIENT INFORMATION

Client: CEC Inc.
Address: 31 Bellows Road
Raynham, MA 02767
Phone: 339-226-1264
Email Distribution List: cdalbello@cecinc.com, jkitchen@cecinc.com, dbarboza@cecinc.com

## PROJECT INFORMATION

Project Name: MassCEC Expansion
Project Location: 54 Wright Street, New Bedford, MA
Project Number: 332-344
Project Manager: Cassia Dal Bello
Bill to: CEC Inc.
PO#:
Quote#:

Client acknowledges that sampling is compliant with all EPA / State regulatory programs

## REQUESTED ANALYSES

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | PCBs | MCP 14 Metals | SVOCs | Total Number of Bottles |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 11-15-23 | 16:10 | Grab | Soil | CEC-3-A (18-20) | X | X | X | |
| 12 | 11-15-23 | 16:15 | Grab | Soil | CEC-3-A (24-26) | X | X | X | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |

| | | | |
|---|---|---|---|
| Container Type: | AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial | J | J | J | |
| Container Volume: | 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* | 10 | 10 | 10 | |
| Preservation Code: | 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* | 1 | 1 | 1 | |

Sampled by : DAVE BARBOZA (DB)

**Chain needs to be filled out neatly and completely for on time delivery.**

**Laboratory Use Only**
Cooler Temperature (°C): 2.9 / 1C

**Comments:** * Please specify "Other" preservative and containers types in this space
4 - day rush analysis approved by ESS.

All samples submitted are subject to ESS Laboratory's payment terms and conditions.

**Dissolved Filtration**
☐ Lab Filter

| Relinquished by (Signature) | Date | Time | Received by (Signature) | Relinquished by (Signature) | Date | Time | Received by (Signature) |
|---|---|---|---|---|---|---|---|
| [signature] | 11-16-23 | 06:30 | Secure Fridge | [signature] | 11/16/23 | 9:35 | [signature] 11/16/23 9:37 |
| [signature] | 11/16/23 | 15:10 | [signature] | | | | |

ESS Laboratory
DIVISION OF THE RISE GROUP
BAL Laboratory Analytical Balance

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC Phase III - Site 4 (332-344)**
**ESS Laboratory Work Order Number: 24F0351**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

**REVIEWED**
**By ESS Laboratory at 4:08 pm, Jun 18, 2024**

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

## SAMPLE RECEIPT

The following samples were received on June 10, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

**Low Level VOA vials were frozen by the client on June 7, 2024 at 17:00.**
**Tetrahydrofuran is reported above the MA CAM reporting limit of 0.010 mg/kg.**

**Question I: All samples for metals and EPH were analyzed for a subset of the required MCP list per the client's request.**

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 24F0351-01 | CEC-11A 9ft-11ft | Soil | 8260D Low |
| 24F0351-02 | CEC-11A 0ft-12ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24F0351-03 | CEC-11A 19ft-21ft | Soil | 8260D Low |
| 24F0351-04 | CEC-11A 12ft-24ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

## PROJECT NARRATIVE

**Semi-Volatile Organic Compounds**

| | |
|---|---|
| D4F0210-CCV1 | **Calibration required quadratic regression (Q).** |
| | 2,4-Dinitrophenol (108% @ 40-160%) |
| D4F0210-CCV1 | **Continuing Calibration %Diff/Drift is above control limit (CD+).** |
| | N-Nitrosodimethylamine (34% @ 20%), Pyridine (34% @ 20%) |
| D4F0273-CCV1 | **Calibration required quadratic regression (Q).** |
| | 2,4-Dinitrophenol (129% @ 40-160%) |
| D4F0273-CCV1 | **Continuing Calibration %Diff/Drift is above control limit (CD+).** |
| | N-Nitrosodimethylamine (29% @ 20%), Pyridine (26% @ 20%) |
| DF41149-BS1 | **Blank Spike recovery is above upper control limit (B+).** |
| | N-Nitrosodimethylamine (140% @ 40-140%) |
| DF41149-BSD1 | **Blank Spike recovery is above upper control limit (B+).** |
| | N-Nitrosodimethylamine (148% @ 40-140%) |

**Total Metals**

| | |
|---|---|
| 24F0351-02 | **Elevated Method Reporting Limits due to sample matrix (EL).** |
| | Arsenic |

**Volatile Organics Low Level**

| | |
|---|---|
| D4F0193-CCV1 | **Calibration required quadratic regression (Q).** |
| | Naphthalene (101% @ 40-160%) |
| D4F0193-CCV1 | **Continuing Calibration %Diff/Drift is above control limit (CD+).** |
| | Vinyl Chloride (25% @ 20%), Xylene P,M (21% @ 20%) |
| DF41110-BS1 | **Blank Spike recovery is above upper control limit (B+).** |
| | Acetone (163% @ 40-160%), Isopropylbenzene (133% @ 70-130%) |
| DF41110-BSD1 | **Relative percent difference for duplicate is outside of criteria (D+).** |
| | 2-Butanone (21% @ 20%), Acetone (54% @ 20%) |

**No other observations noted.**

**End of Project Narrative.**

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24F0351-01 through 24F0351-04**

Matrices: ( ) Ground Water/Surface Water (x) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| (x) 8260 VOC CAM II A | (x) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | (x) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (x) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | (x) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (x) 6010 Metals CAM III A | ( ) 6020 Metals CAM III D | (x) MassDEP EPH CAM IV B | (x) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (x) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (x) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (x) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (x) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes (x) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (x) No ( ) |

***Responses to Questions G, H and I below are required for '"Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? ***Data User Note:*** ***Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*** | Yes ( ) No (x)* |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (x)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes ( ) No (x)* |

****All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: June 18, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 9ft-11ft
Date Sampled: 06/07/24 11:40
Percent Solids: 90
Initial Volume: 6.2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/11/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,1,1-Trichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,1,2,2-Tetrachloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,1,2-Trichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,1-Dichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,1-Dichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,1-Dichloropropene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,2,3-Trichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,2,3-Trichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,2,4-Trichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,2,4-Trimethylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,2-Dibromoethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,2-Dichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,2-Dichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,2-Dichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,3,5-Trimethylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,3-Dichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,3-Dichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,4-Dichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 1,4-Dioxane | ND (0.0898) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 2,2-Dichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 2-Butanone | ND (0.0449) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 2-Chlorotoluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 2-Hexanone | ND (0.0449) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 4-Chlorotoluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| 4-Isopropyltoluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 9ft-11ft
Date Sampled: 06/07/24 11:40
Percent Solids: 90
Initial Volume: 6.2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/11/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0449) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| **Acetone** | **0.392** (0.0449) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Benzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Bromobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Bromochloromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Bromodichloromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Bromoform | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Bromomethane | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Carbon Disulfide | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Carbon Tetrachloride | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Chlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Chloroethane | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Chloroform | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Chloromethane | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| cis-1,2-Dichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| cis-1,3-Dichloropropene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Dibromochloromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Dibromomethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Dichlorodifluoromethane | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Diethyl Ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Di-isopropyl ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Ethyl tertiary-butyl ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Ethylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Hexachlorobutadiene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Isopropylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Methyl tert-Butyl Ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Methylene Chloride | ND (0.0224) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 9ft-11ft
Date Sampled: 06/07/24 11:40
Percent Solids: 90
Initial Volume: 6.2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/11/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| n-Butylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| n-Propylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| sec-Butylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Styrene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| tert-Butylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Tertiary-amyl methyl ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Tetrachloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Tetrahydrofuran | ND (0.0180) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Toluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| trans-1,2-Dichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| trans-1,3-Dichloropropene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Trichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Trichlorofluoromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Vinyl Chloride | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Xylene O | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Xylene P,M | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |
| Xylenes (Total) | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 17:56 | D4F0193 | DF41110 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *120 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *98 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *115 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *104 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 0ft-12ft
Date Sampled: 06/07/24 11:50
Percent Solids: 90

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | **EL** ND (2.10) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:38 | 2.65 100 | DF41107 |
| **Barium** | **12.1** (0.84) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:38 | 2.65 100 | DF41107 |
| Cadmium | ND (0.42) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:38 | 2.65 100 | DF41107 |
| **Chromium** | **8.75** (0.84) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:38 | 2.65 100 | DF41107 |
| **Lead** | **16.8** (4.20) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:38 | 2.65 100 | DF41107 |
| **Mercury** | **0.072** (0.036) | --- | 7471B | --- | 1 | AFV | 06/11/24 15:52 | 0.61 40 | DF41112 |
| Selenium | ND (4.20) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:38 | 2.65 100 | DF41107 |
| Silver | ND (0.42) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:38 | 2.65 100 | DF41107 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 0ft-12ft
Date Sampled: 06/07/24 11:50
Percent Solids: 90
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 6/11/24 16:10

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 1,2,4-Trichlorobenzene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 1,2-Dichlorobenzene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 1,3-Dichlorobenzene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 1,4-Dichlorobenzene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 2,4,5-Trichlorophenol | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 2,4,6-Trichlorophenol | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 2,4-Dichlorophenol | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 2,4-Dimethylphenol | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 2,4-Dinitrophenol | ND (1.12) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 2,4-Dinitrotoluene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 2,6-Dinitrotoluene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 2-Chloronaphthalene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 2-Chlorophenol | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 2-Methylnaphthalene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 2-Methylphenol | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 2-Nitrophenol | ND (0.559) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 3,3´-Dichlorobenzidine | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 3+4-Methylphenol | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 4-Bromophenyl-phenylether | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 4-Chloroaniline | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| 4-Nitrophenol | ND (1.12) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Acenaphthene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Acenaphthylene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Acetophenone | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Aniline | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Anthracene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 0ft-12ft
Date Sampled: 06/07/24 11:50
Percent Solids: 90
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 6/11/24 16:10

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Benzo(a)anthracene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Benzo(a)pyrene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Benzo(b)fluoranthene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Benzo(g,h,i)perylene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Benzo(k)fluoranthene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| bis(2-Chloroethoxy)methane | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| bis(2-Chloroethyl)ether | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| bis(2-chloroisopropyl)Ether | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| bis(2-Ethylhexyl)phthalate | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Butylbenzylphthalate | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Chrysene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Dibenzo(a,h)Anthracene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Dibenzofuran | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Diethylphthalate | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Dimethylphthalate | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Di-n-butylphthalate | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Di-n-octylphthalate | ND (0.559) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Fluoranthene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Fluorene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Hexachlorobenzene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Hexachlorobutadiene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Hexachloroethane | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Indeno(1,2,3-cd)Pyrene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Isophorone | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Naphthalene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Nitrobenzene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 0ft-12ft
Date Sampled: 06/07/24 11:50
Percent Solids: 90
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 6/11/24 16:10

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Pentachlorophenol | ND (1.12) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Phenanthrene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Phenol | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Pyrene | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |
| Pyridine | ND (0.280) | --- | 8270E | --- | 1 | IBM | 06/14/24 1:19 | D4F0273 | DF41149 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *96 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *96 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *99 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *92 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *100 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *96 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *108 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *100 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 0ft-12ft
Date Sampled: 06/07/24 11:50
Percent Solids: 90
Initial Volume: 20.3g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 6/11/24 10:45

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | --- | 8082A | --- | 1 | 06/12/24 13:40 | --- | DF41117 |
| Aroclor 1221 | ND (0.05) | --- | 8082A | --- | 1 | 06/12/24 13:40 | --- | DF41117 |
| Aroclor 1232 | ND (0.05) | --- | 8082A | --- | 1 | 06/12/24 13:40 | --- | DF41117 |
| Aroclor 1242 | ND (0.05) | --- | 8082A | --- | 1 | 06/12/24 13:40 | --- | DF41117 |
| Aroclor 1248 | ND (0.05) | --- | 8082A | --- | 1 | 06/12/24 13:40 | --- | DF41117 |
| Aroclor 1254 | ND (0.05) | --- | 8082A | --- | 1 | 06/12/24 13:40 | --- | DF41117 |
| Aroclor 1260 | ND (0.05) | --- | 8082A | --- | 1 | 06/12/24 13:40 | --- | DF41117 |
| Aroclor 1262 | ND (0.05) | --- | 8082A | --- | 1 | 06/12/24 13:40 | --- | DF41117 |
| Aroclor 1268 | ND (0.05) | --- | 8082A | --- | 1 | 06/12/24 13:40 | --- | DF41117 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *68 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *79 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 0ft-12ft
Date Sampled: 06/07/24 11:50
Percent Solids: 90
Initial Volume: 20g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/11/24 12:00

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| 4,4´-DDE | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| 4,4´-DDT | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Aldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| alpha-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| alpha-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| beta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Chlordane (Total) | ND (0.0223) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| delta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Dieldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Endosulfan I | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Endosulfan II | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Endosulfan Sulfate | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Endrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Endrin Ketone | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| gamma-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Heptachlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Heptachlor Epoxide | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Hexachlorobenzene | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Methoxychlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |
| Toxaphene | ND (0.139) | --- | 8081B | --- | 1 | 06/13/24 2:58 | D4F0226 | DF41106 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl [2C]* | *75 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *76 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 0ft-12ft
Date Sampled: 06/07/24 11:50
Percent Solids: 90
Initial Volume: 10.1g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 16:05

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 12:48 | D4F0286 | DF41259 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 12:48 | D4F0286 | DF41259 |
| 2,4-D | ND (0.052) | --- | 8151A | --- | 1 | 06/14/24 12:48 | D4F0286 | DF41259 |
| 2,4-DB | ND (0.052) | --- | 8151A | --- | 1 | 06/14/24 12:48 | D4F0286 | DF41259 |
| Dalapon | ND (0.050) | --- | 8151A | --- | 1 | 06/14/24 12:48 | D4F0286 | DF41259 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 12:48 | D4F0286 | DF41259 |
| Dichlorprop | ND (0.052) | --- | 8151A | --- | 1 | 06/14/24 12:48 | D4F0286 | DF41259 |
| Dinoseb | ND (0.052) | --- | 8151A | --- | 1 | 06/14/24 12:48 | D4F0286 | DF41259 |
| MCPA | ND (2.56) | --- | 8151A | --- | 1 | 06/14/24 12:48 | D4F0286 | DF41259 |
| MCPP | ND (2.59) | --- | 8151A | --- | 1 | 06/14/24 12:48 | D4F0286 | DF41259 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: DCAA* | *85 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 0ft-12ft
Date Sampled: 06/07/24 11:50
Percent Solids: 90
Initial Volume: 19.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/10/24 19:09

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **23.1** (11.4) | --- | 8100M | --- | 1 | 06/13/24 0:57 | --- | DF41071 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 67 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 0ft-12ft
Date Sampled: 06/07/24 11:50
Percent Solids: 90

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-02
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 98** (5) | --- | 9050A | --- | 1 | JLK | 06/10/24 19:54 | umhos/cm | DF41063 |
| **Corrosivity (pH)** | **7.77** (N/A) | --- | 9045 | --- | 1 | CCP | 06/10/24 18:55 | S.U. | DF41053 |
| **Corrosivity (pH) Sample Temp** | **20.3** | --- | 2550B | --- | 1 | CCP | 06/10/24 18:55 | °C | DF41053 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | CCP | 06/11/24 17:00 | °F | DF41136 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/10/24 17:48 | ml/5 min | DF41047 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | JLK | 06/11/24 16:26 | mg/kg | DF41144 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | JLK | 06/11/24 16:26 | mg/kg | DF41144 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 19ft-21ft
Date Sampled: 06/07/24 12:40
Percent Solids: 89
Initial Volume: 5.7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/11/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,1,1-Trichloroethane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,1,2,2-Tetrachloroethane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,1,2-Trichloroethane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,1-Dichloroethane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,1-Dichloroethene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,1-Dichloropropene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,2,3-Trichlorobenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,2,3-Trichloropropane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,2,4-Trichlorobenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,2,4-Trimethylbenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,2-Dibromoethane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,2-Dichlorobenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,2-Dichloroethane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,2-Dichloropropane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,3,5-Trimethylbenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,3-Dichlorobenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,3-Dichloropropane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,4-Dichlorobenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 1,4-Dioxane | ND (0.0990) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 2,2-Dichloropropane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 2-Butanone | ND (0.0495) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 2-Chlorotoluene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 2-Hexanone | ND (0.0495) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 4-Chlorotoluene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| 4-Isopropyltoluene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 19ft-21ft
Date Sampled: 06/07/24 12:40
Percent Solids: 89
Initial Volume: 5.7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/11/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0495) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Acetone | ND (0.0495) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Benzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Bromobenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Bromochloromethane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Bromodichloromethane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Bromoform | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Bromomethane | ND (0.0099) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Carbon Disulfide | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Carbon Tetrachloride | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Chlorobenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Chloroethane | ND (0.0099) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Chloroform | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Chloromethane | ND (0.0099) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| cis-1,2-Dichloroethene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| cis-1,3-Dichloropropene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Dibromochloromethane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Dibromomethane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Dichlorodifluoromethane | ND (0.0099) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Diethyl Ether | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Di-isopropyl ether | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Ethyl tertiary-butyl ether | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Ethylbenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Hexachlorobutadiene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Isopropylbenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Methyl tert-Butyl Ether | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Methylene Chloride | ND (0.0247) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 19ft-21ft
Date Sampled: 06/07/24 12:40
Percent Solids: 89
Initial Volume: 5.7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/11/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| n-Butylbenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| n-Propylbenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| sec-Butylbenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Styrene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| tert-Butylbenzene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Tertiary-amyl methyl ether | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Tetrachloroethene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Tetrahydrofuran | ND (0.0198) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| **Toluene** | **0.0056** (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| trans-1,2-Dichloroethene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| trans-1,3-Dichloropropene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Trichloroethene | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Trichlorofluoromethane | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Vinyl Chloride | ND (0.0099) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Xylene O | ND (0.0049) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Xylene P,M | ND (0.0099) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |
| Xylenes (Total) | ND (0.0099) | --- | 8260D Low | --- | 1 | MEK | 06/11/24 18:21 | D4F0193 | DF41110 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *119 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *96 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *114 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *105 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 12ft-24ft
Date Sampled: 06/07/24 12:50
Percent Solids: 89

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **2.25** (2.04) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:40 | 2.76 100 | DF41107 |
| **Barium** | **16.3** (0.82) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:40 | 2.76 100 | DF41107 |
| Cadmium | ND (0.41) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:40 | 2.76 100 | DF41107 |
| **Chromium** | **11.7** (0.82) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:40 | 2.76 100 | DF41107 |
| **Lead** | **11.4** (4.09) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:40 | 2.76 100 | DF41107 |
| Mercury | ND (0.034) | --- | 7471B | --- | 1 | AFV | 06/11/24 15:58 | 0.65 40 | DF41112 |
| Selenium | ND (4.09) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:40 | 2.76 100 | DF41107 |
| Silver | ND (0.41) | --- | 6010D | --- | 1 | KJB | 06/11/24 16:40 | 2.76 100 | DF41107 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 12ft-24ft
Date Sampled: 06/07/24 12:50
Percent Solids: 89
Initial Volume: 20.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 6/11/24 16:10

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 1,2,4-Trichlorobenzene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 1,2-Dichlorobenzene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 1,3-Dichlorobenzene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 1,4-Dichlorobenzene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 2,4,5-Trichlorophenol | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 2,4,6-Trichlorophenol | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 2,4-Dichlorophenol | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 2,4-Dimethylphenol | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 2,4-Dinitrophenol | ND (1.10) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 2,4-Dinitrotoluene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 2,6-Dinitrotoluene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 2-Chloronaphthalene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 2-Chlorophenol | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 2-Methylnaphthalene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 2-Methylphenol | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 2-Nitrophenol | ND (0.550) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 3,3´-Dichlorobenzidine | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 3+4-Methylphenol | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 4-Bromophenyl-phenylether | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 4-Chloroaniline | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| 4-Nitrophenol | ND (1.10) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Acenaphthene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Acenaphthylene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Acetophenone | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Aniline | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Anthracene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 12ft-24ft
Date Sampled: 06/07/24 12:50
Percent Solids: 89
Initial Volume: 20.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 6/11/24 16:10

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Benzo(a)anthracene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Benzo(a)pyrene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Benzo(b)fluoranthene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Benzo(g,h,i)perylene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Benzo(k)fluoranthene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| bis(2-Chloroethoxy)methane | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| bis(2-Chloroethyl)ether | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| bis(2-chloroisopropyl)Ether | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| bis(2-Ethylhexyl)phthalate | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Butylbenzylphthalate | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Chrysene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Dibenzo(a,h)Anthracene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Dibenzofuran | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Diethylphthalate | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Dimethylphthalate | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Di-n-butylphthalate | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Di-n-octylphthalate | ND (0.550) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Fluoranthene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Fluorene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Hexachlorobenzene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Hexachlorobutadiene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Hexachloroethane | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Indeno(1,2,3-cd)Pyrene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Isophorone | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Naphthalene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Nitrobenzene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 12ft-24ft
Date Sampled: 06/07/24 12:50
Percent Solids: 89
Initial Volume: 20.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 6/11/24 16:10

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Pentachlorophenol | ND (1.10) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Phenanthrene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Phenol | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Pyrene | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |
| Pyridine | ND (0.275) | --- | 8270E | --- | 1 | IBM | 06/14/24 0:49 | D4F0273 | DF41149 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *96 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *99 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *97 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *91 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *96 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *95 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *104 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *97 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 12ft-24ft
Date Sampled: 06/07/24 12:50
Percent Solids: 89
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 6/11/24 10:45

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/12/24 14:00 | --- | DF41117 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/12/24 14:00 | --- | DF41117 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/12/24 14:00 | --- | DF41117 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/12/24 14:00 | --- | DF41117 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/12/24 14:00 | --- | DF41117 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 06/12/24 14:00 | --- | DF41117 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/12/24 14:00 | --- | DF41117 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/12/24 14:00 | --- | DF41117 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/12/24 14:00 | --- | DF41117 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *67 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *76 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 12ft-24ft
Date Sampled: 06/07/24 12:50
Percent Solids: 89
Initial Volume: 20g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/11/24 12:00

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| 4,4´-DDE | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| 4,4´-DDT | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Aldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| alpha-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| alpha-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| beta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Chlordane (Total) | ND (0.0226) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| delta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Dieldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Endosulfan I | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Endosulfan II | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Endosulfan Sulfate | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Endrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Endrin Ketone | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| gamma-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Heptachlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Heptachlor Epoxide | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Hexachlorobenzene | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Methoxychlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |
| Toxaphene | ND (0.141) | --- | 8081B | --- | 1 | 06/13/24 3:26 | D4F0226 | DF41106 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl [2C]* | *72 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *99 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 12ft-24ft
Date Sampled: 06/07/24 12:50
Percent Solids: 89
Initial Volume: 10.5g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 16:05

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 13:19 | D4F0286 | DF41259 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 13:19 | D4F0286 | DF41259 |
| 2,4-D | ND (0.051) | --- | 8151A | --- | 1 | 06/14/24 13:19 | D4F0286 | DF41259 |
| 2,4-DB | ND (0.051) | --- | 8151A | --- | 1 | 06/14/24 13:19 | D4F0286 | DF41259 |
| Dalapon | ND (0.049) | --- | 8151A | --- | 1 | 06/14/24 13:19 | D4F0286 | DF41259 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 13:19 | D4F0286 | DF41259 |
| Dichlorprop | ND (0.051) | --- | 8151A | --- | 1 | 06/14/24 13:19 | D4F0286 | DF41259 |
| Dinoseb | ND (0.051) | --- | 8151A | --- | 1 | 06/14/24 13:19 | D4F0286 | DF41259 |
| MCPA | ND (2.50) | --- | 8151A | --- | 1 | 06/14/24 13:19 | D4F0286 | DF41259 |
| MCPP | ND (2.53) | --- | 8151A | --- | 1 | 06/14/24 13:19 | D4F0286 | DF41259 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *98 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 12ft-24ft
Date Sampled: 06/07/24 12:50
Percent Solids: 89
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/10/24 19:09

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **20.8** (11.4) | --- | 8100M | --- | 1 | 06/12/24 17:31 | --- | DF41071 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 71 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-11A 12ft-24ft
Date Sampled: 06/07/24 12:50
Percent Solids: 89

ESS Laboratory Work Order: 24F0351
ESS Laboratory Sample ID: 24F0351-04
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 225** (5) | --- | 9050A | --- | 1 | JLK | 06/10/24 19:54 | umhos/cm | DF41063 |
| **Corrosivity (pH)** | **7.57** (N/A) | --- | 9045 | --- | 1 | CCP | 06/10/24 18:55 | S.U. | DF41053 |
| **Corrosivity (pH) Sample Temp** | **20.2** | --- | 2550B | --- | 1 | CCP | 06/10/24 18:55 | °C | DF41053 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | CCP | 06/11/24 17:00 | °F | DF41136 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/10/24 17:48 | ml/5 min | DF41047 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | JLK | 06/11/24 16:26 | mg/kg | DF41144 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | JLK | 06/11/24 16:26 | mg/kg | DF41144 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DF41107 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Arsenic | ND | 2.50 | mg/kg wet | | | | | | | |
| Barium | ND | 1.00 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Arsenic | 75.5 | 8.33 | mg/kg wet | 75.60 | | 100 | 80-120 | | | |
| Barium | 697 | 3.33 | mg/kg wet | 372.0 | | 187 | 40-297 | | | |
| Cadmium | 255 | 1.67 | mg/kg wet | 259.0 | | 98 | 80-120 | | | |
| Chromium | 157 | 3.33 | mg/kg wet | 156.0 | | 101 | 80-120 | | | |
| Lead | 219 | 16.7 | mg/kg wet | 225.0 | | 97 | 80-120 | | | |
| Selenium | 79.7 | 16.7 | mg/kg wet | 82.70 | | 96 | 80-120 | | | |
| Silver | 51.7 | 1.67 | mg/kg wet | 51.00 | | 101 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Arsenic | 64.6 | 8.33 | mg/kg wet | 75.60 | | 85 | 80-120 | 16 | 30 | |
| Barium | 668 | 3.33 | mg/kg wet | 372.0 | | 180 | 40-297 | 4 | 30 | |
| Cadmium | 219 | 1.67 | mg/kg wet | 259.0 | | 85 | 80-120 | 15 | 30 | |
| Chromium | 135 | 3.33 | mg/kg wet | 156.0 | | 87 | 80-120 | 15 | 30 | |
| Lead | 192 | 16.7 | mg/kg wet | 225.0 | | 85 | 80-120 | 13 | 30 | |
| Selenium | 67.9 | 16.7 | mg/kg wet | 82.70 | | 82 | 80-120 | 16 | 30 | |
| Silver | 44.6 | 1.67 | mg/kg wet | 51.00 | | 87 | 80-120 | 15 | 30 | |
| **Reference** | | | | | | | | | | |
| Lead | 3430 | 87.7 | mg/kg wet | 4490 | | 76 | 81-120 | | | |
| **Batch DF41112 - 245.1/7470A** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Mercury | ND | 0.030 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 21.9 | 3.05 | mg/kg wet | 25.50 | | 86 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 24.9 | 3.30 | mg/kg wet | 25.50 | | 98 | 80-120 | 13 | 30 | |
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41110 - 5035** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,1-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41110 - 5035** | | | | | | | | | | |
| 1,1-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromoethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dioxane | ND | 0.100 | mg/kg wet | | | | | | | |
| 2,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Butanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 2-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Hexanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 4-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Isopropyltoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Methyl-2-Pentanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Acetone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Benzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromodichloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromoform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromomethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Carbon Disulfide | ND | 0.0050 | mg/kg wet | | | | | | | |
| Carbon Tetrachloride | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloroethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Chloroform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| cis-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| cis-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromomethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dichlorodifluoromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Diethyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Di-isopropyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethyl tertiary-butyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41110 - 5035** | | | | | | | | | | |
| Isopropylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methyl tert-Butyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methylene Chloride | ND | 0.0250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Propylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| sec-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Styrene | ND | 0.0050 | mg/kg wet | | | | | | | |
| tert-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tertiary-amyl methyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrachloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrahydrofuran | ND | 0.0200 | mg/kg wet | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichlorofluoromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Vinyl Chloride | ND | 0.0100 | mg/kg wet | | | | | | | |
| Xylene O | ND | 0.0050 | mg/kg wet | | | | | | | |
| Xylene P,M | ND | 0.0100 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0576* | | mg/kg wet | *0.05000* | | *115* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0488* | | mg/kg wet | *0.05000* | | *98* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0558* | | mg/kg wet | *0.05000* | | *112* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0529* | | mg/kg wet | *0.05000* | | *106* | *70-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0550 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| 1,1,1-Trichloroethane | 0.0567 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | | | |
| 1,1,2,2-Tetrachloroethane | 0.0548 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 40-160 | | | |
| 1,1,2-Trichloroethane | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 1,1-Dichloroethane | 0.0550 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| 1,1-Dichloroethene | 0.0605 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | | | |
| 1,1-Dichloropropene | 0.0563 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | | | |
| 1,2,3-Trichlorobenzene | 0.0585 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | | | |
| 1,2,3-Trichloropropane | 0.0499 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 1,2,4-Trichlorobenzene | 0.0605 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | | | |
| 1,2,4-Trimethylbenzene | 0.0619 | 0.0050 | mg/kg wet | 0.05000 | | 124 | 70-130 | | | |
| 1,2-Dibromo-3-Chloropropane | 0.0451 | 0.0050 | mg/kg wet | 0.05000 | | 90 | 70-130 | | | |
| 1,2-Dibromoethane | 0.0535 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 1,2-Dichlorobenzene | 0.0572 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | | | |
| 1,2-Dichloroethane | 0.0552 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| 1,2-Dichloropropane | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| 1,3,5-Trimethylbenzene | 0.0611 | 0.0050 | mg/kg wet | 0.05000 | | 122 | 70-130 | | | |
| 1,3-Dichlorobenzene | 0.0585 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | | | |
| 1,3-Dichloropropane | 0.0561 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | | | |
| 1,4-Dichlorobenzene | 0.0577 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41110 - 5035** | | | | | | | | | | |
| 1,4-Dioxane | 0.873 | 0.100 | mg/kg wet | 1.000 | | 87 | 70-130 | | | |
| 2,2-Dichloropropane | 0.0580 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | | | |
| 2-Butanone | 0.312 | 0.0500 | mg/kg wet | 0.2500 | | 125 | 40-160 | | | |
| 2-Chlorotoluene | 0.0598 | 0.0050 | mg/kg wet | 0.05000 | | 120 | 70-130 | | | |
| 2-Hexanone | 0.248 | 0.0500 | mg/kg wet | 0.2500 | | 99 | 40-160 | | | |
| 4-Chlorotoluene | 0.0597 | 0.0050 | mg/kg wet | 0.05000 | | 119 | 70-130 | | | |
| 4-Isopropyltoluene | 0.0586 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | | | |
| 4-Methyl-2-Pentanone | 0.221 | 0.0500 | mg/kg wet | 0.2500 | | 89 | 40-160 | | | |
| Acetone | 0.407 | 0.0500 | mg/kg wet | 0.2500 | | 163 | 40-160 | | | B+ |
| Benzene | 0.0568 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | | | |
| Bromobenzene | 0.0589 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 70-130 | | | |
| Bromochloromethane | 0.0549 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Bromodichloromethane | 0.0612 | 0.0050 | mg/kg wet | 0.05000 | | 122 | 70-130 | | | |
| Bromoform | 0.0483 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 40-160 | | | |
| Bromomethane | 0.0569 | 0.0100 | mg/kg wet | 0.05000 | | 114 | 40-160 | | | |
| Carbon Disulfide | 0.0603 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | | | |
| Carbon Tetrachloride | 0.0561 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | | | |
| Chlorobenzene | 0.0553 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | | | |
| Chloroethane | 0.0681 | 0.0100 | mg/kg wet | 0.05000 | | 136 | 40-160 | | | |
| Chloroform | 0.0554 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | | | |
| Chloromethane | 0.0591 | 0.0100 | mg/kg wet | 0.05000 | | 118 | 40-160 | | | |
| cis-1,2-Dichloroethene | 0.0575 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | | | |
| cis-1,3-Dichloropropene | 0.0591 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 40-160 | | | |
| Dibromochloromethane | 0.0591 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 40-160 | | | |
| Dibromomethane | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Dichlorodifluoromethane | 0.0461 | 0.0100 | mg/kg wet | 0.05000 | | 92 | 40-160 | | | |
| Diethyl Ether | 0.0639 | 0.0050 | mg/kg wet | 0.05000 | | 128 | 70-130 | | | |
| Di-isopropyl ether | 0.0591 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 70-130 | | | |
| Ethyl tertiary-butyl ether | 0.0599 | 0.0050 | mg/kg wet | 0.05000 | | 120 | 70-130 | | | |
| Ethylbenzene | 0.0568 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | | | |
| Hexachlorobutadiene | 0.0567 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 40-160 | | | |
| Isopropylbenzene | 0.0664 | 0.0050 | mg/kg wet | 0.05000 | | 133 | 70-130 | | | B+ |
| Methyl tert-Butyl Ether | 0.0575 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | | | |
| Methylene Chloride | 0.0586 | 0.0250 | mg/kg wet | 0.05000 | | 117 | 70-130 | | | |
| Naphthalene | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 40-160 | | | |
| n-Butylbenzene | 0.0616 | 0.0050 | mg/kg wet | 0.05000 | | 123 | 70-130 | | | |
| n-Propylbenzene | 0.0618 | 0.0050 | mg/kg wet | 0.05000 | | 124 | 70-130 | | | |
| sec-Butylbenzene | 0.0619 | 0.0050 | mg/kg wet | 0.05000 | | 124 | 70-130 | | | |
| Styrene | 0.0573 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 40-160 | | | |
| tert-Butylbenzene | 0.0607 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | | | |
| Tertiary-amyl methyl ether | 0.0592 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 70-130 | | | |
| Tetrachloroethene | 0.0562 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | | | |
| Tetrahydrofuran | 0.0462 | 0.0200 | mg/kg wet | 0.05000 | | 92 | 70-130 | | | |
| Toluene | 0.0569 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | | | |
| trans-1,2-Dichloroethene | 0.0568 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41110 - 5035** | | | | | | | | | | |
| trans-1,3-Dichloropropene | 0.0556 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | | | |
| Trichloroethene | 0.0559 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | | | |
| Trichlorofluoromethane | 0.0596 | 0.0050 | mg/kg wet | 0.05000 | | 119 | 40-160 | | | |
| Vinyl Chloride | 0.0613 | 0.0100 | mg/kg wet | 0.05000 | | 123 | 70-130 | | | |
| Xylene O | 0.0603 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | | | |
| Xylene P,M | 0.121 | 0.0100 | mg/kg wet | 0.1000 | | 121 | 70-130 | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0539* | | mg/kg wet | *0.05000* | | *108* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0503* | | mg/kg wet | *0.05000* | | *101* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0547* | | mg/kg wet | *0.05000* | | *109* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0524* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0554 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 0.8 | 20 | |
| 1,1,1-Trichloroethane | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 3 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 40-160 | 6 | 20 | |
| 1,1,2-Trichloroethane | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 4 | 20 | |
| 1,1-Dichloroethane | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 3 | 20 | |
| 1,1-Dichloroethene | 0.0583 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | 4 | 20 | |
| 1,1-Dichloropropene | 0.0543 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 4 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0556 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 5 | 20 | |
| 1,2,3-Trichloropropane | 0.0460 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | 8 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0571 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | 6 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0578 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 7 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0418 | 0.0050 | mg/kg wet | 0.05000 | | 84 | 70-130 | 7 | 20 | |
| 1,2-Dibromoethane | 0.0542 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 1 | 20 | |
| 1,2-Dichlorobenzene | 0.0540 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 6 | 20 | |
| 1,2-Dichloroethane | 0.0528 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 4 | 20 | |
| 1,2-Dichloropropane | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 3 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0577 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 6 | 20 | |
| 1,3-Dichlorobenzene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 7 | 20 | |
| 1,3-Dichloropropane | 0.0560 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | 0.2 | 20 | |
| 1,4-Dichlorobenzene | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 4 | 20 | |
| 1,4-Dioxane | 0.787 | 0.100 | mg/kg wet | 1.000 | | 79 | 70-130 | 10 | 20 | |
| 2,2-Dichloropropane | 0.0557 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 4 | 20 | |
| 2-Butanone | 0.252 | 0.0500 | mg/kg wet | 0.2500 | | 101 | 40-160 | 21 | 20 | D+ |
| 2-Chlorotoluene | 0.0568 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | 5 | 20 | |
| 2-Hexanone | 0.207 | 0.0500 | mg/kg wet | 0.2500 | | 83 | 40-160 | 18 | 20 | |
| 4-Chlorotoluene | 0.0562 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | 6 | 20 | |
| 4-Isopropyltoluene | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 6 | 20 | |
| 4-Methyl-2-Pentanone | 0.204 | 0.0500 | mg/kg wet | 0.2500 | | 82 | 40-160 | 8 | 20 | |
| Acetone | 0.234 | 0.0500 | mg/kg wet | 0.2500 | | 93 | 40-160 | 54 | 20 | D+ |
| Benzene | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 3 | 20 | |
| Bromobenzene | 0.0548 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 7 | 20 | |
| Bromochloromethane | 0.0524 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 5 | 20 | |
| Bromodichloromethane | 0.0589 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 70-130 | 4 | 20 | |
| Bromoform | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 40-160 | 0.3 | 20 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41110 - 5035** | | | | | | | | | | |
| Bromomethane | 0.0558 | 0.0100 | mg/kg wet | 0.05000 | | 112 | 40-160 | 2 | 20 | |
| Carbon Disulfide | 0.0572 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | 5 | 20 | |
| Carbon Tetrachloride | 0.0543 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 3 | 20 | |
| Chlorobenzene | 0.0561 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | 2 | 20 | |
| Chloroethane | 0.0669 | 0.0100 | mg/kg wet | 0.05000 | | 134 | 40-160 | 2 | 20 | |
| Chloroform | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 3 | 20 | |
| Chloromethane | 0.0564 | 0.0100 | mg/kg wet | 0.05000 | | 113 | 40-160 | 5 | 20 | |
| cis-1,2-Dichloroethene | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 4 | 20 | |
| cis-1,3-Dichloropropene | 0.0568 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 40-160 | 4 | 20 | |
| Dibromochloromethane | 0.0588 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 40-160 | 0.5 | 20 | |
| Dibromomethane | 0.0523 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 5 | 20 | |
| Dichlorodifluoromethane | 0.0439 | 0.0100 | mg/kg wet | 0.05000 | | 88 | 40-160 | 5 | 20 | |
| Diethyl Ether | 0.0608 | 0.0050 | mg/kg wet | 0.05000 | | 122 | 70-130 | 5 | 20 | |
| Di-isopropyl ether | 0.0569 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | 4 | 20 | |
| Ethyl tertiary-butyl ether | 0.0577 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 4 | 20 | |
| Ethylbenzene | 0.0581 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 2 | 20 | |
| Hexachlorobutadiene | 0.0542 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 40-160 | 5 | 20 | |
| Isopropylbenzene | 0.0626 | 0.0050 | mg/kg wet | 0.05000 | | 125 | 70-130 | 6 | 20 | |
| Methyl tert-Butyl Ether | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 4 | 20 | |
| Methylene Chloride | 0.0560 | 0.0250 | mg/kg wet | 0.05000 | | 112 | 70-130 | 5 | 20 | |
| Naphthalene | 0.0508 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 40-160 | 5 | 20 | |
| n-Butylbenzene | 0.0576 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 7 | 20 | |
| n-Propylbenzene | 0.0581 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 6 | 20 | |
| sec-Butylbenzene | 0.0578 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 7 | 20 | |
| Styrene | 0.0580 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 40-160 | 1 | 20 | |
| tert-Butylbenzene | 0.0566 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | 7 | 20 | |
| Tertiary-amyl methyl ether | 0.0567 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | 4 | 20 | |
| Tetrachloroethene | 0.0552 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 2 | 20 | |
| Tetrahydrofuran | 0.0430 | 0.0200 | mg/kg wet | 0.05000 | | 86 | 70-130 | 7 | 20 | |
| Toluene | 0.0549 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 4 | 20 | |
| trans-1,2-Dichloroethene | 0.0559 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | 2 | 20 | |
| trans-1,3-Dichloropropene | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 4 | 20 | |
| Trichloroethene | 0.0543 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 3 | 20 | |
| Trichlorofluoromethane | 0.0579 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 40-160 | 3 | 20 | |
| Vinyl Chloride | 0.0584 | 0.0100 | mg/kg wet | 0.05000 | | 117 | 70-130 | 5 | 20 | |
| Xylene O | 0.0605 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | 0.4 | 20 | |
| Xylene P,M | 0.122 | 0.0100 | mg/kg wet | 0.1000 | | 122 | 70-130 | 0.5 | 20 | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0516* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0522* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0528* | | mg/kg wet | *0.05000* | | *106* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0533* | | mg/kg wet | *0.05000* | | *107* | *70-130* | | | |
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41149 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41149 - 3546** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41149 - 3546** | | | | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyridine | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.65* | | mg/kg wet | *2.500* | | *106* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.14* | | mg/kg wet | *3.750* | | *110* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.97* | | mg/kg wet | *3.750* | | *106* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.47* | | mg/kg wet | *2.500* | | *99* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.37* | | mg/kg wet | *3.750* | | *116* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.50* | | mg/kg wet | *2.500* | | *100* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.06* | | mg/kg wet | *3.750* | | *108* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.49* | | mg/kg wet | *2.500* | | *100* | *30-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.51 | 0.025 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.54 | 0.250 | mg/kg wet | 2.500 | | 101 | 30-130 | | | |
| 2,4-Dimethylphenol | 1.89 | 0.250 | mg/kg wet | 2.500 | | 76 | 30-130 | | | |
| 2,4-Dinitrophenol | 2.09 | 1.00 | mg/kg wet | 2.500 | | 84 | 15-140 | | | |
| 2,4-Dinitrotoluene | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| 2-Chloronaphthalene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| 2-Chlorophenol | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 30-130 | | | |
| 2-Methylnaphthalene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| 2-Methylphenol | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | | | |
| 2-Nitrophenol | 2.63 | 0.500 | mg/kg wet | 2.500 | | 105 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| 3+4-Methylphenol | 2.59 | 0.250 | mg/kg wet | 5.000 | | 52 | 15-140 | | | |
| 4-Bromophenyl-phenylether | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| 4-Chloroaniline | 2.23 | 0.250 | mg/kg wet | 2.500 | | 89 | 15-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41149 - 3546** | | | | | | | | | | |
| 4-Nitrophenol | 2.79 | 1.00 | mg/kg wet | 2.500 | | 112 | 15-140 | | | |
| Acenaphthene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Acenaphthylene | 2.23 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Acetophenone | 2.53 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | | | |
| Aniline | 1.93 | 0.250 | mg/kg wet | 2.500 | | 77 | 40-140 | | | |
| Anthracene | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Azobenzene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Benzo(a)anthracene | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Benzo(a)pyrene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.59 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Butylbenzylphthalate | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Chrysene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Dibenzofuran | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Diethylphthalate | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Dimethylphthalate | 2.23 | 0.250 | mg/kg wet | 2.500 | | 89 | 15-140 | | | |
| Di-n-butylphthalate | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Di-n-octylphthalate | 2.50 | 0.500 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Fluoranthene | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Fluorene | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Hexachlorobenzene | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Hexachlorobutadiene | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| Hexachloroethane | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| Isophorone | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Naphthalene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| Nitrobenzene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| N-Nitrosodimethylamine | 3.51 | 0.250 | mg/kg wet | 2.500 | | 140 | 40-140 | | | B+ |
| Pentachlorophenol | 2.36 | 1.00 | mg/kg wet | 2.500 | | 95 | 15-140 | | | |
| Phenanthrene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Phenol | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 15-140 | | | |
| Pyrene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Pyridine | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.62* | | mg/kg wet | *2.500* | | *105* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.94* | | mg/kg wet | *3.750* | | *105* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.05* | | mg/kg wet | *3.750* | | *108* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.53* | | mg/kg wet | *2.500* | | *101* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.60* | | mg/kg wet | *3.750* | | *123* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.59* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41149 - 3546** | | | | | | | | | | |
| *Surrogate: Phenol-d6* | *4.17* | | mg/kg wet | *3.750* | | *111* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.57* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.59 | 0.025 | mg/kg wet | 2.500 | | 103 | 40-140 | 3 | 30 | |
| 1,2,4-Trichlorobenzene | 2.53 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 3 | 30 | |
| 1,2-Dichlorobenzene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 2 | 30 | |
| 1,3-Dichlorobenzene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 4 | 30 | |
| 1,4-Dichlorobenzene | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 3 | 30 | |
| 2,4,5-Trichlorophenol | 2.64 | 0.250 | mg/kg wet | 2.500 | | 106 | 30-130 | 6 | 30 | |
| 2,4,6-Trichlorophenol | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 30-130 | 6 | 30 | |
| 2,4-Dichlorophenol | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 30-130 | 0.5 | 30 | |
| 2,4-Dimethylphenol | 1.85 | 0.250 | mg/kg wet | 2.500 | | 74 | 30-130 | 2 | 30 | |
| 2,4-Dinitrophenol | 2.82 | 1.00 | mg/kg wet | 2.500 | | 113 | 15-140 | 30 | 30 | |
| 2,4-Dinitrotoluene | 2.66 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 2 | 30 | |
| 2,6-Dinitrotoluene | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 4 | 30 | |
| 2-Chloronaphthalene | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 6 | 30 | |
| 2-Chlorophenol | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 30-130 | 5 | 30 | |
| 2-Methylnaphthalene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 1 | 30 | |
| 2-Methylphenol | 2.53 | 0.250 | mg/kg wet | 2.500 | | 101 | 15-140 | 2 | 30 | |
| 2-Nitrophenol | 2.66 | 0.500 | mg/kg wet | 2.500 | | 106 | 30-130 | 1 | 30 | |
| 3,3´-Dichlorobenzidine | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | 6 | 30 | |
| 3+4-Methylphenol | 2.64 | 0.250 | mg/kg wet | 5.000 | | 53 | 15-140 | 2 | 30 | |
| 4-Bromophenyl-phenylether | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 3 | 30 | |
| 4-Chloroaniline | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 15-140 | 5 | 30 | |
| 4-Nitrophenol | 2.87 | 1.00 | mg/kg wet | 2.500 | | 115 | 15-140 | 3 | 30 | |
| Acenaphthene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 2 | 30 | |
| Acenaphthylene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 5 | 30 | |
| Acetophenone | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 0.9 | 30 | |
| Aniline | 1.99 | 0.250 | mg/kg wet | 2.500 | | 80 | 40-140 | 3 | 30 | |
| Anthracene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 3 | 30 | |
| Azobenzene | 2.54 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 3 | 30 | |
| Benzo(a)anthracene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 3 | 30 | |
| Benzo(a)pyrene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 4 | 30 | |
| Benzo(b)fluoranthene | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 6 | 30 | |
| Benzo(g,h,i)perylene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 7 | 30 | |
| Benzo(k)fluoranthene | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 4 | 30 | |
| bis(2-Chloroethoxy)methane | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 1 | 30 | |
| bis(2-Chloroethyl)ether | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 3 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 1 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 2 | 30 | |
| Butylbenzylphthalate | 2.65 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 6 | 30 | |
| Chrysene | 2.53 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 2 | 30 | |
| Dibenzo(a,h)Anthracene | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 6 | 30 | |
| Dibenzofuran | 2.56 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | 4 | 30 | |
| Diethylphthalate | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 3 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41149 - 3546** | | | | | | | | | | |
| Dimethylphthalate | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 15-140 | 4 | 30 | |
| Di-n-butylphthalate | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 3 | 30 | |
| Di-n-octylphthalate | 2.56 | 0.500 | mg/kg wet | 2.500 | | 102 | 40-140 | 2 | 30 | |
| Fluoranthene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 4 | 30 | |
| Fluorene | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 3 | 30 | |
| Hexachlorobenzene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 3 | 30 | |
| Hexachlorobutadiene | 2.29 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | 0.2 | 30 | |
| Hexachloroethane | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 4 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.76 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | 5 | 30 | |
| Isophorone | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 3 | 30 | |
| Naphthalene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 4 | 30 | |
| Nitrobenzene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 0.7 | 30 | |
| N-Nitrosodimethylamine | 3.70 | 0.250 | mg/kg wet | 2.500 | | 148 | 40-140 | 6 | 30 | B+ |
| Pentachlorophenol | 2.55 | 1.00 | mg/kg wet | 2.500 | | 102 | 15-140 | 8 | 30 | |
| Phenanthrene | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 1 | 30 | |
| Phenol | 2.58 | 0.250 | mg/kg wet | 2.500 | | 103 | 15-140 | 0.8 | 30 | |
| Pyrene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 0.7 | 30 | |
| Pyridine | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 12 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.69* | | mg/kg wet | *2.500* | | *107* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.90* | | mg/kg wet | *3.750* | | *104* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.03* | | mg/kg wet | *3.750* | | *108* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.53* | | mg/kg wet | *2.500* | | *101* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.61* | | mg/kg wet | *3.750* | | *123* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.50* | | mg/kg wet | *2.500* | | *100* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.00* | | mg/kg wet | *3.750* | | *107* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.49* | | mg/kg wet | *2.500* | | *100* | *30-130* | | | |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF41117 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1262 | ND | 0.02 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF41117 - 3540C** | | | | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0193* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0188* | | mg/kg wet | *0.02500* | | *75* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0194* | | mg/kg wet | *0.02500* | | *78* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0199* | | mg/kg wet | *0.02500* | | *80* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 85 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 83 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 88 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 90 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0201* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0197* | | mg/kg wet | *0.02500* | | *79* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0207* | | mg/kg wet | *0.02500* | | *83* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0202* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 84 | 40-140 | 1 | 30 | |
| Aroclor 1016 [2C] | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 83 | 40-140 | 0.7 | 30 | |
| Aroclor 1260 | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 87 | 40-140 | 1 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 89 | 40-140 | 1 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0196* | | mg/kg wet | *0.02500* | | *79* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0191* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0204* | | mg/kg wet | *0.02500* | | *82* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0201* | | mg/kg wet | *0.02500* | | *80* | *30-150* | | | |
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41106 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 4,4´-DDD | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDD [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Chlordane (Total) | ND | 0.0200 | mg/kg wet | | | | | | | |
| Chlordane (Total) [2C] | ND | 0.0200 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41106 - 3546** | | | | | | | | | | |
| delta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| delta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) [2C] | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Toxaphene | ND | 0.125 | mg/kg wet | | | | | | | |
| Toxaphene [2C] | ND | 0.125 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0116* | | mg/kg wet | *0.01250* | | *93* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0125* | | mg/kg wet | *0.01250* | | *100* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0118* | | mg/kg wet | *0.01250* | | *94* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0130* | | mg/kg wet | *0.01250* | | *104* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 4,4´-DDD | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| 4,4´-DDD [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | | | |
| 4,4´-DDE | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| 4,4´-DDE [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| 4,4´-DDT | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| 4,4´-DDT [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Aldrin | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| Aldrin [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | | | |
| alpha-BHC | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| alpha-BHC [2C] | 0.0142 | 0.0025 | mg/kg wet | 0.01250 | | 114 | 40-140 | | | |
| alpha-Chlordane | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| alpha-Chlordane [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41106 - 3546** | | | | | | | | | | |
| beta-BHC | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| beta-BHC [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | | | |
| delta-BHC | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| delta-BHC [2C] | 0.0122 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| Dieldrin | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| Dieldrin [2C] | 0.0138 | 0.0025 | mg/kg wet | 0.01250 | | 111 | 40-140 | | | |
| Endosulfan I | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Endosulfan I [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | | | |
| Endosulfan II | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | | | |
| Endosulfan II [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| Endosulfan Sulfate | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Endosulfan Sulfate [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | | | |
| Endrin | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Endrin [2C] | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| Endrin Ketone | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Endrin Ketone [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| gamma-BHC (Lindane) | 0.0127 | 0.0015 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| gamma-BHC (Lindane) [2C] | 0.0138 | 0.0015 | mg/kg wet | 0.01250 | | 110 | 40-140 | | | |
| gamma-Chlordane | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | | | |
| gamma-Chlordane [2C] | 0.0148 | 0.0025 | mg/kg wet | 0.01250 | | 118 | 40-140 | | | |
| Heptachlor | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Heptachlor [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| Heptachlor Epoxide | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Heptachlor Epoxide [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| Hexachlorobenzene | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | | | |
| Hexachlorobenzene [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| Methoxychlor | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | | | |
| Methoxychlor [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0130* | | mg/kg wet | *0.01250* | | *104* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0140* | | mg/kg wet | *0.01250* | | *112* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0124* | | mg/kg wet | *0.01250* | | *99* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0140* | | mg/kg wet | *0.01250* | | *112* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 4,4´-DDD | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 7 | 30 | |
| 4,4´-DDD [2C] | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | 8 | 30 | |
| 4,4´-DDE | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 6 | 30 | |
| 4,4´-DDE [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 5 | 30 | |
| 4,4´-DDT | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | 11 | 30 | |
| 4,4´-DDT [2C] | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | 11 | 30 | |
| Aldrin | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 1 | 30 | |
| Aldrin [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 0.7 | 30 | |
| alpha-BHC | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 2 | 30 | |
| alpha-BHC [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | 2 | 30 | |
| alpha-Chlordane | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 2 | 30 | |
| alpha-Chlordane [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 2 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41106 - 3546** | | | | | | | | | | |
| beta-BHC | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 3 | 30 | |
| beta-BHC [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 0.4 | 30 | |
| delta-BHC | 0.0101 | 0.0025 | mg/kg wet | 0.01250 | | 81 | 40-140 | 7 | 30 | |
| delta-BHC [2C] | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 5 | 30 | |
| Dieldrin | 0.0129 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | 2 | 30 | |
| Dieldrin [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | 2 | 30 | |
| Endosulfan I | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 2 | 30 | |
| Endosulfan I [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 2 | 30 | |
| Endosulfan II | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 5 | 30 | |
| Endosulfan II [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 6 | 30 | |
| Endosulfan Sulfate | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 8 | 30 | |
| Endosulfan Sulfate [2C] | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 8 | 30 | |
| Endrin | 0.0122 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | 4 | 30 | |
| Endrin [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 4 | 30 | |
| Endrin Ketone | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 9 | 30 | |
| Endrin Ketone [2C] | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 9 | 30 | |
| gamma-BHC (Lindane) | 0.0124 | 0.0015 | mg/kg wet | 0.01250 | | 99 | 40-140 | 3 | 30 | |
| gamma-BHC (Lindane) [2C] | 0.0136 | 0.0015 | mg/kg wet | 0.01250 | | 109 | 40-140 | 2 | 30 | |
| gamma-Chlordane | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 110 | 40-140 | 2 | 30 | |
| gamma-Chlordane [2C] | 0.0145 | 0.0025 | mg/kg wet | 0.01250 | | 116 | 40-140 | 2 | 30 | |
| Heptachlor | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 2 | 30 | |
| Heptachlor [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 1 | 30 | |
| Heptachlor Epoxide | 0.0124 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 2 | 30 | |
| Heptachlor Epoxide [2C] | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | 2 | 30 | |
| Hexachlorobenzene | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 2 | 30 | |
| Hexachlorobenzene [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 2 | 30 | |
| Methoxychlor | 0.0107 | 0.0025 | mg/kg wet | 0.01250 | | 85 | 40-140 | 9 | 30 | |
| Methoxychlor [2C] | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | 11 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0115* | | mg/kg wet | *0.01250* | | *92* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0124* | | mg/kg wet | *0.01250* | | *99* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0118* | | mg/kg wet | *0.01250* | | *94* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0134* | | mg/kg wet | *0.01250* | | *107* | *30-150* | | | |
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41259 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 2,4,5-T | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-T [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4-D | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-D [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-DB | ND | 0.048 | mg/kg wet | | | | | | | |
| 2,4-DB [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| Dalapon | ND | 0.046 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41259 - 3546** | | | | | | | | | | |
| Dalapon [2C] | ND | 0.046 | mg/kg wet | | | | | | | |
| Dicamba | ND | 0.009 | mg/kg wet | | | | | | | |
| Dicamba [2C] | ND | 0.009 | mg/kg wet | | | | | | | |
| Dichlorprop | ND | 0.047 | mg/kg wet | | | | | | | |
| Dichlorprop [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| Dinoseb | ND | 0.048 | mg/kg wet | | | | | | | |
| Dinoseb [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| MCPA | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPA [2C] | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPP | ND | 2.35 | mg/kg wet | | | | | | | |
| MCPP [2C] | ND | 2.35 | mg/kg wet | | | | | | | |
| *Surrogate: DCAA* | *0.186* | | mg/kg wet | *0.2000* | | *93* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.166* | | mg/kg wet | *0.2000* | | *83* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 2,4,5-T | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 70 | 40-140 | | | |
| 2,4,5-T [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 66 | 40-140 | | | |
| 2,4,5-TP (Silvex) | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 70 | 40-140 | | | |
| 2,4,5-TP (Silvex) [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | | | |
| 2,4-D | 0.133 | 0.047 | mg/kg wet | 0.1880 | | 71 | 40-140 | | | |
| 2,4-D [2C] | 0.124 | 0.047 | mg/kg wet | 0.1880 | | 66 | 40-140 | | | |
| 2,4-DB | 0.136 | 0.048 | mg/kg wet | 0.1900 | | 71 | 40-140 | | | |
| 2,4-DB [2C] | 0.138 | 0.048 | mg/kg wet | 0.1900 | | 73 | 40-140 | | | |
| Dalapon | 0.306 | 0.046 | mg/kg wet | 0.4550 | | 67 | 40-140 | | | |
| Dalapon [2C] | 0.316 | 0.046 | mg/kg wet | 0.4550 | | 69 | 40-140 | | | |
| Dicamba | 0.013 | 0.009 | mg/kg wet | 0.01880 | | 70 | 40-140 | | | |
| Dicamba [2C] | 0.014 | 0.009 | mg/kg wet | 0.01880 | | 76 | 40-140 | | | |
| Dichlorprop | 0.170 | 0.047 | mg/kg wet | 0.1880 | | 90 | 40-140 | | | |
| Dichlorprop [2C] | 0.146 | 0.047 | mg/kg wet | 0.1880 | | 77 | 40-140 | | | |
| Dinoseb | 0.016 | 0.048 | mg/kg wet | 0.09500 | | 17 | 10-100 | | | |
| Dinoseb [2C] | 0.017 | 0.048 | mg/kg wet | 0.09500 | | 18 | 10-100 | | | |
| MCPA | 15.3 | 2.32 | mg/kg wet | 18.60 | | 82 | 40-140 | | | |
| MCPA [2C] | 15.2 | 2.32 | mg/kg wet | 18.60 | | 82 | 40-140 | | | |
| MCPP | 14.4 | 2.35 | mg/kg wet | 18.80 | | 77 | 40-140 | | | |
| MCPP [2C] | 15.1 | 2.35 | mg/kg wet | 18.80 | | 80 | 40-140 | | | |
| *Surrogate: DCAA* | *0.208* | | mg/kg wet | *0.2000* | | *104* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.187* | | mg/kg wet | *0.2000* | | *93* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 2,4,5-T | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 72 | 40-140 | 3 | 30 | |
| 2,4,5-T [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | 3 | 30 | |
| 2,4,5-TP (Silvex) | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 72 | 40-140 | 3 | 30 | |
| 2,4,5-TP (Silvex) [2C] | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 72 | 40-140 | 6 | 30 | |
| 2,4-D | 0.137 | 0.047 | mg/kg wet | 0.1880 | | 73 | 40-140 | 3 | 30 | |
| 2,4-D [2C] | 0.128 | 0.047 | mg/kg wet | 0.1880 | | 68 | 40-140 | 4 | 30 | |
| 2,4-DB | 0.149 | 0.048 | mg/kg wet | 0.1900 | | 78 | 40-140 | 9 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41259 - 3546** | | | | | | | | | | |
| 2,4-DB [2C] | 0.144 | 0.048 | mg/kg wet | 0.1900 | | 76 | 40-140 | 4 | 30 | |
| Dalapon | 0.322 | 0.046 | mg/kg wet | 0.4550 | | 71 | 40-140 | 5 | 30 | |
| Dalapon [2C] | 0.331 | 0.046 | mg/kg wet | 0.4550 | | 73 | 40-140 | 5 | 30 | |
| Dicamba | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 64 | 40-140 | 9 | 30 | |
| Dicamba [2C] | 0.015 | 0.009 | mg/kg wet | 0.01880 | | 80 | 40-140 | 5 | 30 | |
| Dichlorprop | 0.179 | 0.047 | mg/kg wet | 0.1880 | | 95 | 40-140 | 6 | 30 | |
| Dichlorprop [2C] | 0.153 | 0.047 | mg/kg wet | 0.1880 | | 82 | 40-140 | 5 | 30 | |
| Dinoseb | 0.017 | 0.048 | mg/kg wet | 0.09500 | | 18 | 10-100 | 5 | 30 | |
| Dinoseb [2C] | 0.017 | 0.048 | mg/kg wet | 0.09500 | | 18 | 10-100 | 0 | 30 | |
| MCPA | 15.3 | 2.32 | mg/kg wet | 18.60 | | 82 | 40-140 | 0.2 | 30 | |
| MCPA [2C] | 15.7 | 2.32 | mg/kg wet | 18.60 | | 85 | 40-140 | 3 | 30 | |
| MCPP | 15.1 | 2.35 | mg/kg wet | 18.80 | | 80 | 40-140 | 4 | 30 | |
| MCPP [2C] | 15.8 | 2.35 | mg/kg wet | 18.80 | | 84 | 40-140 | 5 | 30 | |
| *Surrogate: DCAA* | *0.198* | | mg/kg wet | *0.2000* | | *99* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.175* | | mg/kg wet | *0.2000* | | *88* | *30-150* | | | |
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF41071 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Decane (C10) | ND | 0.2 | mg/kg wet | | | | | | | |
| Docosane (C22) | ND | 0.2 | mg/kg wet | | | | | | | |
| Dodecane (C12) | ND | 0.2 | mg/kg wet | | | | | | | |
| Eicosane (C20) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexacosane (C26) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexadecane (C16) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexatriacontane (C36) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonadecane (C19) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonane (C9) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octacosane (C28) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octadecane (C18) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetracosane (C24) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetradecane (C14) | ND | 0.2 | mg/kg wet | | | | | | | |
| Total Petroleum Hydrocarbons (C9-C36) | ND | 10.0 | mg/kg wet | | | | | | | |
| Triacontane (C30) | ND | 0.2 | mg/kg wet | | | | | | | |
| *Surrogate: O-Terphenyl* | *3.78* | | mg/kg wet | *5.000* | | *76* | *40-140* | | | |
| **LCS** | | | | | | | | | | |
| Decane (C10) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 74 | 40-140 | | | |
| Docosane (C22) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |
| Dodecane (C12) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 77 | 40-140 | | | |
| Eicosane (C20) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Hexacosane (C26) | 2.5 | 0.2 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Hexadecane (C16) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 79 | 40-140 | | | |
| Hexatriacontane (C36) | 1.4 | 0.2 | mg/kg wet | 2.500 | | 58 | 40-140 | | | |
| Nonadecane (C19) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Nonane (C9) | 1.6 | 0.2 | mg/kg wet | 2.500 | | 66 | 30-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF41071 - 3546** | | | | | | | | | | |
| Octacosane (C28) | 2.6 | 0.2 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| Octadecane (C18) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 78 | 40-140 | | | |
| Tetracosane (C24) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |
| Tetradecane (C14) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 79 | 40-140 | | | |
| Total Petroleum Hydrocarbons (C9-C36) | 29.0 | 10.0 | mg/kg wet | 35.00 | | 83 | 40-140 | | | |
| Triacontane (C30) | 2.6 | 0.2 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| *Surrogate: O-Terphenyl* | *3.91* | | mg/kg wet | *5.000* | | *78* | *40-140* | | | |
| **LCS Dup** | | | | | | | | | | |
| Decane (C10) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 69 | 40-140 | 6 | 25 | |
| Docosane (C22) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 78 | 40-140 | 9 | 25 | |
| Dodecane (C12) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 73 | 40-140 | 6 | 25 | |
| Eicosane (C20) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 7 | 25 | |
| Hexacosane (C26) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 89 | 40-140 | 11 | 25 | |
| Hexadecane (C16) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 6 | 25 | |
| Hexatriacontane (C36) | 1.3 | 0.2 | mg/kg wet | 2.500 | | 52 | 40-140 | 11 | 25 | |
| Nonadecane (C19) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 9 | 25 | |
| Nonane (C9) | 1.6 | 0.2 | mg/kg wet | 2.500 | | 62 | 30-140 | 6 | 25 | |
| Octacosane (C28) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 91 | 40-140 | 12 | 25 | |
| Octadecane (C18) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 73 | 40-140 | 7 | 25 | |
| Tetracosane (C24) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 77 | 40-140 | 10 | 25 | |
| Tetradecane (C14) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 74 | 40-140 | 6 | 25 | |
| Total Petroleum Hydrocarbons (C9-C36) | 26.6 | 10.0 | mg/kg wet | 35.00 | | 76 | 40-140 | 9 | 25 | |
| Triacontane (C30) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 91 | 40-140 | 12 | 25 | |
| *Surrogate: O-Terphenyl* | *3.66* | | mg/kg wet | *5.000* | | *73* | *40-140* | | | |
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DF41063 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Conductivity | ND | 5 | umhos/cm | | | | | | | |
| **LCS** | | | | | | | | | | |
| Conductivity | 1390 | | umhos/cm | 1410 | | 98 | 90-110 | | | |
| **Batch DF41136 - General Preparation** | | | | | | | | | | |
| **Reference** | | | | | | | | | | |
| Flashpoint | 81 | | °F | 81.00 | | 100 | 97.9-102.1 | | | |
| **Batch DF41144 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Reactive Cyanide | ND | 2.0 | mg/kg | | | | | | | |
| Reactive Sulfide | ND | 2.0 | mg/kg | | | | | | | |
| **LCS** | | | | | | | | | | |
| Reactive Cyanide | 4.1 | 2.0 | mg/kg | 100.3 | | 4 | 0.68-5.41 | | | |
| Reactive Sulfide | 2.1 | 2.0 | mg/kg | 10.00 | | 21 | 0-44 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

**Notes and Definitions**

| | |
|---|---|
| WL | Results obtained from a deionized water leach of the sample. |
| U | Analyte included in the analysis, but not detected |
| Q | Calibration required quadratic regression (Q). |
| EL | Elevated Method Reporting Limits due to sample matrix (EL). |
| D+ | Relative percent difference for duplicate is outside of criteria (D+). |
| D | Diluted. |
| CD+ | Continuing Calibration %Diff/Drift is above control limit (CD+). |
| B+ | Blank Spike recovery is above upper control limit (B+). |
| > | Greater than. |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0351

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24F0351
Date Received: 6/10/2024
Project Due Date: 6/17/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 4.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: 6/7/2024 Time: 17:00 -JA 6/18/2024 By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: N/A Time: N/A By: Client

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted: Cam Indeck Date: 6/18/2024 Time: 09:30 By: JA

Resolution:

Client Confirmed date/time VOC vials were frozen

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 558800 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 558801 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 558804 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 2 | 558880 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 2 | 558882 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 558883 | Yes | N/A | Yes | 8 oz jar | NP | |
| 3 | 558802 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 558803 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 558805 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 4 | 558881 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 4 | 558884 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 558885 | Yes | N/A | Yes | 8 oz jar | NP | |

**2nd Review**
**Were all containers scanned into storage/lab?** Initials TD Yes / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

## ESS Laboratory Sample and Cooler Receipt Checklist

| | | | |
|---|---|---|---|
| Client: | CEC - Civil & Envtal Consultants - TB | ESS Project ID: | 24F0351 |
| | | Date Received: | 6/10/2024 |
| Completed By: | [signature] | Date & Time: | 6/10/24 1022 |
| Reviewed By: | [signature] | Date & Time: | 6/10/24 1700 |

# ESS Laboratory

*Division of Thielsch Engineering, Inc.*
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

## CHAIN OF CUSTODY

ESS Lab # 24F0351

| | |
|---|---|
| Turn Time | 5 Days |
| Regulatory State | Massachusetts |
| Is this project for any of the following?: | ○ CT RCP ◉ MA MCP ○ RGP |
| Reporting Limits | compare results to RCS-1, RCS-2, Lined and unlined landfills, TCLP, and 20X if needed. |
| Electonic Deliverables | ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) EDD |

| Company Name | Project # | Project Name |
|---|---|---|
| Civil and Environmental Consultants | 332-344 | MassCEC Phase III - Site #4 |

| Contact Person | Address |
|---|---|
| Cassia Dal Bello | 31 Bellows Road |

| City | State | Zip Code | PO # |
|---|---|---|---|
| Raynham | MA | 02767 | |

| Telephone Number | FAX Number | Email Address |
|---|---|---|
| 774-501-2176 | | cdalbello; jkitchen, dbarboza@cecinc.com |

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | RCRA8 Metals | PCBs via 3540C | TPH | SVOC - incl pyr | Pest - incl Tox | Herbicides | Reactivity | Conductivity | pH | Free Liquid | Flashpoint | VOC - high | VOC - low | ~~Grain Size Analysis (Sieve Only)~~ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6/7/24 | 11:40 | Solid | Soil | CEC-11A 9'-11' | | | | | | | | | | | X | X | X | | | |
| 2 | | 11:50 | | | CEC-11A 0'-12' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 3 | | 12:40 | | | CEC-11A 19'-21' | | | | | | | | | | | | X | X | | | |
| 4 | | 12:50 | | | CEC-11A 12'-24' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Container Type:** | AC-Air Cassette | AG-Amber Glass | B-BOD Bottle | C-Cubitainer | J-Jar | O-Other | P-Poly | S-Sterile | V-Vial | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | V | V | J | J |
| **Container Volume:** | 1-100 mL | 2-2.5 gal | 3-250 mL | 4-300 mL | 5-500 mL | 6-1L | 7-VOA | 8-2 oz | 9-4 oz | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7 | 7 | 10 | 9 |
| **Preservation Code:** | 1-Non Preserved | 2-HCl | 3-H2SO4 | 4-HNO3 | 5-NaOH | 6-Methanol | 7-Na2S2O3 | 8-ZnAce, NaOH | 9-NH4Cl | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 10 | 1 | 1 |
| **Number of Containers per Sample:** | | | | | | | | | | 1 | | | | | 1 | | | | | 1 | 1 | 2 | 1 | 1 |

**Laboratory Use Only**

Cooler Present: Yes ○ Drop Off
Seals Intact: ○ Pickup
Cooler Temperature: 4.8 °C / Q

**Sampled by :** CI

**Comments:** Please specify "Other" preservative and containers types in this space

Run TCLP if fails 20x !! VOAs in Freezer !!

| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
|---|---|---|---|
| 6/7/24 17:00 | Secured Fridge | 6/10/24 14:10 | 6/10/24 14:20 |
| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
| 6/10/24 18:25 | 6/10/24 1825 | | |

ESS Laboratory
DIVISION OF THE RISE GROUP
BAL Laboratory Analytical Balance

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC Phase III - Site 4 (332-344)**
**ESS Laboratory Work Order Number: 24F0378**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

**REVIEWED**
**By ESS Laboratory at 6:23 pm, Jun 19, 2024**

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

## SAMPLE RECEIPT

The following samples were received on June 11, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

**Low Level VOA vials were frozen by ESS Laboratory on June 11, 2024 at 17:55.**
**Tetrahydrofuran is reported above the MA CAM reporting limit of 0.010 mg/kg.**

**Question I: All samples for EPH and metals were analyzed for a subset of the required MCP list per the client's request.**

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 24F0378-01 | CEC-7A 9ft-11ft | Soil | 8260D Low |
| 24F0378-02 | CEC-7A 0ft-12ft | Soil | 1010A, 2550B, 6010D, 6020B, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24F0378-03 | CEC-7A 19ft-21ft | Soil | 8260D Low |
| 24F0378-04 | CEC-7A 12ft-24ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24F0378-05 | CEC-7A 29ft-31ft | Soil | 8260D Low |
| 24F0378-06 | CEC-7A 24ft-36ft | Soil | 1010A, 2550B, 6010D, 6020B, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

## PROJECT NARRATIVE

**Semi-Volatile Organic Compounds**

D4F0245-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (134% @ 40-160%)

D4F0245-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
N-Nitrosodimethylamine (26% @ 20%), Pyridine (25% @ 20%)

D4F0305-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (112% @ 40-160%)

D4F0305-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
N-Nitrosodimethylamine (24% @ 20%)

**Total Metals**

24F0378-02 **Elevated Method Reporting Limits due to sample matrix (EL).**
Silver

24F0378-04 **Elevated Method Reporting Limits due to sample matrix (EL).**
Arsenic

24F0378-06 **Elevated Method Reporting Limits due to sample matrix (EL).**
Arsenic , Silver

**Volatile Organics Low Level**

D4F0279-CCV1 **Calibration required quadratic regression (Q).**
Naphthalene (94% @ 40-160%)

**No other observations noted.**

**End of Project Narrative.**

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24F0378-01 through 24F0378-06**

Matrices: ( ) Ground Water/Surface Water (x) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| (x) 8260 VOC CAM II A | ( x) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | (x) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (x) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | (x) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (x) 6010 Metals CAM III A | (x) 6020 Metals CAM III D | (x) MassDEP EPH CAM IV B | (x) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (x) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (x) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (x) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (x) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes (x) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (x) No ( ) |

***Responses to Questions G, H and I below are required for '"Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? ***Data User Note:** Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.* | Yes ( ) No (x)* |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (x)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes ( ) No (x)* |

***All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: June 19, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 9ft-11ft
Date Sampled: 06/10/24 15:30
Percent Solids: 90
Initial Volume: 6.8g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,1,1-Trichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,1,2,2-Tetrachloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,1,2-Trichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,1-Dichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,1-Dichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,1-Dichloropropene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,2,3-Trichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,2,3-Trichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,2,4-Trichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,2,4-Trimethylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,2-Dibromoethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,2-Dichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,2-Dichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,2-Dichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,3,5-Trimethylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,3-Dichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,3-Dichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,4-Dichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 1,4-Dioxane | ND (0.0819) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 2,2-Dichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 2-Butanone | ND (0.0409) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 2-Chlorotoluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 2-Hexanone | ND (0.0409) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 4-Chlorotoluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| 4-Isopropyltoluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 9ft-11ft
Date Sampled: 06/10/24 15:30
Percent Solids: 90
Initial Volume: 6.8g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0409) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| **Acetone** | **0.195** (0.0409) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Benzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Bromobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Bromochloromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Bromodichloromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Bromoform | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Bromomethane | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Carbon Disulfide | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Carbon Tetrachloride | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Chlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Chloroethane | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Chloroform | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Chloromethane | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| cis-1,2-Dichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| cis-1,3-Dichloropropene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Dibromochloromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Dibromomethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Dichlorodifluoromethane | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Diethyl Ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Di-isopropyl ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Ethyl tertiary-butyl ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Ethylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Hexachlorobutadiene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Isopropylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Methyl tert-Butyl Ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Methylene Chloride | ND (0.0205) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 9ft-11ft
Date Sampled: 06/10/24 15:30
Percent Solids: 90
Initial Volume: 6.8g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Naphthalene** | **0.0054** (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| n-Butylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| n-Propylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| sec-Butylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Styrene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| tert-Butylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Tertiary-amyl methyl ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Tetrachloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Tetrahydrofuran | ND (0.0164) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Toluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| trans-1,2-Dichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| trans-1,3-Dichloropropene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Trichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Trichlorofluoromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Vinyl Chloride | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Xylene O | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Xylene P,M | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |
| Xylenes (Total) | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:11 | D4F0279 | DF41335 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *118 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *98 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *114 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *104 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 0ft-12ft
Date Sampled: 06/10/24 15:40
Percent Solids: 90

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **4.50** (2.22) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:45 | 2.51 100 | DF41240 |
| **Barium** | **30.6** (0.89) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:45 | 2.51 100 | DF41240 |
| Cadmium | ND (0.44) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:45 | 2.51 100 | DF41240 |
| **Chromium** | **23.2** (0.89) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:45 | 2.51 100 | DF41240 |
| **Lead** | **26.5** (4.44) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:45 | 2.51 100 | DF41240 |
| Mercury | ND (0.030) | --- | 7471B | --- | 1 | BJV | 06/18/24 11:19 | 0.74 40 | DF41437 |
| Selenium | ND (1.78) | --- | 6020B | --- | 20 | BJV | 06/14/24 14:54 | 2.51 100 | DF41240 |
| Silver | **EL** ND (1.78) | --- | 6010D | --- | 4 | KJB | 06/18/24 12:30 | 2.51 100 | DF41240 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 0ft-12ft
Date Sampled: 06/10/24 15:40
Percent Solids: 90
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 1,2,4-Trichlorobenzene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 1,2-Dichlorobenzene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 1,3-Dichlorobenzene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 1,4-Dichlorobenzene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 2,4,5-Trichlorophenol | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 2,4,6-Trichlorophenol | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 2,4-Dichlorophenol | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 2,4-Dimethylphenol | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 2,4-Dinitrophenol | ND (1.13) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 2,4-Dinitrotoluene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 2,6-Dinitrotoluene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 2-Chloronaphthalene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 2-Chlorophenol | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 2-Methylnaphthalene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 2-Methylphenol | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 2-Nitrophenol | ND (0.565) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 3,3´-Dichlorobenzidine | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 3+4-Methylphenol | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 4-Bromophenyl-phenylether | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 4-Chloroaniline | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| 4-Nitrophenol | ND (1.13) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Acenaphthene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Acenaphthylene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Acetophenone | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Aniline | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Anthracene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 0ft-12ft
Date Sampled: 06/10/24 15:40
Percent Solids: 90
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Benzo(a)anthracene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Benzo(a)pyrene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Benzo(b)fluoranthene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Benzo(g,h,i)perylene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Benzo(k)fluoranthene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| bis(2-Chloroethoxy)methane | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| bis(2-Chloroethyl)ether | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| bis(2-chloroisopropyl)Ether | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| bis(2-Ethylhexyl)phthalate | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Butylbenzylphthalate | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Chrysene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Dibenzo(a,h)Anthracene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Dibenzofuran | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Diethylphthalate | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Dimethylphthalate | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Di-n-butylphthalate | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Di-n-octylphthalate | ND (0.565) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Fluoranthene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Fluorene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Hexachlorobenzene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Hexachlorobutadiene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Hexachloroethane | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Indeno(1,2,3-cd)Pyrene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Isophorone | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Naphthalene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Nitrobenzene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 0ft-12ft
Date Sampled: 06/10/24 15:40
Percent Solids: 90
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Pentachlorophenol | ND (1.13) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Phenanthrene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Phenol | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Pyrene | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |
| Pyridine | ND (0.283) | --- | 8270E | --- | 1 | TJ | 06/15/24 0:39 | D4F0305 | DF41154 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *97 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *87 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *99 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *95 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *98 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *95 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *106 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *111 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 0ft-12ft
Date Sampled: 06/10/24 15:40
Percent Solids: 90
Initial Volume: 19.9g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 12:30

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:34 | --- | DF41206 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:34 | --- | DF41206 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:34 | --- | DF41206 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:34 | --- | DF41206 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:34 | --- | DF41206 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:34 | --- | DF41206 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:34 | --- | DF41206 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:34 | --- | DF41206 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:34 | --- | DF41206 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *72 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *74 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 0ft-12ft
Date Sampled: 06/10/24 15:40
Percent Solids: 90
Initial Volume: 20.1g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/11/24 19:45

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| 4,4´-DDE | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| 4,4´-DDT | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Aldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| alpha-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| alpha-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| beta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Chlordane (Total) | ND (0.0222) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| delta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Dieldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Endosulfan I | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Endosulfan II | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Endosulfan Sulfate | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Endrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Endrin Ketone | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| gamma-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Heptachlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Heptachlor Epoxide | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Hexachlorobenzene | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Methoxychlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |
| Toxaphene | ND (0.139) | --- | 8081B | --- | 1 | 06/14/24 13:15 | D4F0295 | DF41106 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *86 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *74 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 0ft-12ft
Date Sampled: 06/10/24 15:40
Percent Solids: 90
Initial Volume: 10.5g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 16:05

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 13:48 | D4F0286 | DF41259 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 13:48 | D4F0286 | DF41259 |
| 2,4-D | ND (0.050) | --- | 8151A | --- | 1 | 06/14/24 13:48 | D4F0286 | DF41259 |
| 2,4-DB | ND (0.050) | --- | 8151A | --- | 1 | 06/14/24 13:48 | D4F0286 | DF41259 |
| Dalapon | ND (0.048) | --- | 8151A | --- | 1 | 06/14/24 13:48 | D4F0286 | DF41259 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 13:48 | D4F0286 | DF41259 |
| Dichlorprop | ND (0.050) | --- | 8151A | --- | 1 | 06/14/24 13:48 | D4F0286 | DF41259 |
| Dinoseb | ND (0.050) | --- | 8151A | --- | 1 | 06/14/24 13:48 | D4F0286 | DF41259 |
| MCPA | ND (2.47) | --- | 8151A | --- | 1 | 06/14/24 13:48 | D4F0286 | DF41259 |
| MCPP | ND (2.49) | --- | 8151A | --- | 1 | 06/14/24 13:48 | D4F0286 | DF41259 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: DCAA* | *102 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 0ft-12ft
Date Sampled: 06/10/24 15:40
Percent Solids: 90
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/11/24 19:45

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **15.7** (11.5) | --- | 8100M | --- | 1 | 06/14/24 1:49 | --- | DF41150 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | *74 %* | | *40-140* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 0ft-12ft
Date Sampled: 06/10/24 15:40
Percent Solids: 90

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-02
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 234** (5) | --- | 9050A | --- | 1 | CCP | 06/12/24 15:45 | umhos/cm | DF41247 |
| **Corrosivity (pH)** | **9.04** (N/A) | --- | 9045 | --- | 1 | JLK | 06/11/24 20:14 | S.U. | DF41147 |
| **Corrosivity (pH) Sample Temp** | **20.6** | --- | 2550B | --- | 1 | JLK | 06/11/24 20:14 | °C | DF41147 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/12/24 18:21 | °F | DF41243 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/11/24 22:04 | ml/5 min | DF41164 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | JLK | 06/11/24 19:23 | mg/kg | DF41144 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | JLK | 06/11/24 19:23 | mg/kg | DF41144 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 19ft-21ft
Date Sampled: 06/10/24 16:20
Percent Solids: 88
Initial Volume: 6.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,1,1-Trichloroethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,1,2,2-Tetrachloroethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,1,2-Trichloroethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,1-Dichloroethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,1-Dichloroethene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,1-Dichloropropene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,2,3-Trichlorobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,2,3-Trichloropropane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,2,4-Trichlorobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,2,4-Trimethylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,2-Dibromoethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,2-Dichlorobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,2-Dichloroethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,2-Dichloropropane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,3,5-Trimethylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,3-Dichlorobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,3-Dichloropropane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,4-Dichlorobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 1,4-Dioxane | ND (0.0929) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 2,2-Dichloropropane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 2-Butanone | ND (0.0464) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 2-Chlorotoluene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 2-Hexanone | ND (0.0464) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 4-Chlorotoluene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| 4-Isopropyltoluene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 19ft-21ft
Date Sampled: 06/10/24 16:20
Percent Solids: 88
Initial Volume: 6.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0464) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Acetone | ND (0.0464) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Benzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Bromobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Bromochloromethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Bromodichloromethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Bromoform | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Bromomethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Carbon Disulfide | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Carbon Tetrachloride | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Chlorobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Chloroethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Chloroform | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Chloromethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| cis-1,2-Dichloroethene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| cis-1,3-Dichloropropene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Dibromochloromethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Dibromomethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Dichlorodifluoromethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Diethyl Ether | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Di-isopropyl ether | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Ethyl tertiary-butyl ether | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Ethylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Hexachlorobutadiene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Isopropylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Methyl tert-Butyl Ether | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Methylene Chloride | ND (0.0232) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 19ft-21ft
Date Sampled: 06/10/24 16:20
Percent Solids: 88
Initial Volume: 6.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| n-Butylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| n-Propylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| sec-Butylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Styrene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| tert-Butylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Tertiary-amyl methyl ether | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Tetrachloroethene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Tetrahydrofuran | ND (0.0186) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Toluene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| trans-1,2-Dichloroethene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| trans-1,3-Dichloropropene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Trichloroethene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Trichlorofluoromethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Vinyl Chloride | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Xylene O | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Xylene P,M | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |
| Xylenes (Total) | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 14:37 | D4F0279 | DF41335 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *115 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *103 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *110 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *101 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 12ft-24ft
Date Sampled: 06/10/24 16:30
Percent Solids: 88

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | **EL** ND (2.32) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:47 | 2.44 100 | DF41240 |
| **Barium** | **13.3** (0.93) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:47 | 2.44 100 | DF41240 |
| Cadmium | ND (0.46) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:47 | 2.44 100 | DF41240 |
| **Chromium** | **12.4** (0.93) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:47 | 2.44 100 | DF41240 |
| **Lead** | **10.1** (4.64) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:47 | 2.44 100 | DF41240 |
| Mercury | ND (0.035) | --- | 7471B | --- | 1 | BJV | 06/18/24 11:21 | 0.64 40 | DF41437 |
| Selenium | ND (4.64) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:47 | 2.44 100 | DF41240 |
| Silver | ND (0.46) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:47 | 2.44 100 | DF41240 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 12ft-24ft
Date Sampled: 06/10/24 16:30
Percent Solids: 88
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 1,2,4-Trichlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 1,2-Dichlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 1,3-Dichlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 1,4-Dichlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 2,4,5-Trichlorophenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 2,4,6-Trichlorophenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 2,4-Dichlorophenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 2,4-Dimethylphenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 2,4-Dinitrophenol | ND (1.16) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 2,4-Dinitrotoluene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 2,6-Dinitrotoluene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 2-Chloronaphthalene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 2-Chlorophenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 2-Methylnaphthalene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 2-Methylphenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 2-Nitrophenol | ND (0.581) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 3,3´-Dichlorobenzidine | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 3+4-Methylphenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 4-Bromophenyl-phenylether | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 4-Chloroaniline | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| 4-Nitrophenol | ND (1.16) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Acenaphthene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Acenaphthylene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Acetophenone | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Aniline | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Anthracene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 12ft-24ft
Date Sampled: 06/10/24 16:30
Percent Solids: 88
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Benzo(a)anthracene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Benzo(a)pyrene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Benzo(b)fluoranthene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Benzo(g,h,i)perylene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Benzo(k)fluoranthene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| bis(2-Chloroethoxy)methane | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| bis(2-Chloroethyl)ether | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| bis(2-chloroisopropyl)Ether | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| bis(2-Ethylhexyl)phthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Butylbenzylphthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Chrysene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Dibenzo(a,h)Anthracene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Dibenzofuran | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Diethylphthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Dimethylphthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Di-n-butylphthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Di-n-octylphthalate | ND (0.581) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Fluoranthene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Fluorene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Hexachlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Hexachlorobutadiene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Hexachloroethane | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Indeno(1,2,3-cd)Pyrene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Isophorone | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Naphthalene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Nitrobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 12ft-24ft
Date Sampled: 06/10/24 16:30
Percent Solids: 88
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Pentachlorophenol | ND (1.16) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Phenanthrene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Phenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Pyrene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |
| Pyridine | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:09 | D4F0305 | DF41154 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *96 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *94 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *98 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *97 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *99 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *94 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *106 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *111 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 12ft-24ft
Date Sampled: 06/10/24 16:30
Percent Solids: 88
Initial Volume: 20.5g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 12:30

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:53 | --- | DF41206 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:53 | --- | DF41206 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:53 | --- | DF41206 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:53 | --- | DF41206 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:53 | --- | DF41206 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:53 | --- | DF41206 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:53 | --- | DF41206 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:53 | --- | DF41206 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 10:53 | --- | DF41206 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *72 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *71 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 12ft-24ft
Date Sampled: 06/10/24 16:30
Percent Solids: 88
Initial Volume: 19.9g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/11/24 19:45

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| 4,4´-DDE | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| 4,4´-DDT | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Aldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| alpha-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| alpha-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| beta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Chlordane (Total) | ND (0.0228) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| delta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Dieldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Endosulfan I | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Endosulfan II | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Endosulfan Sulfate | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Endrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Endrin Ketone | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| gamma-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Heptachlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Heptachlor Epoxide | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Hexachlorobenzene | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Methoxychlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |
| Toxaphene | ND (0.142) | --- | 8081B | --- | 1 | 06/14/24 13:43 | D4F0295 | DF41106 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *70 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *68 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 12ft-24ft
Date Sampled: 06/10/24 16:30
Percent Solids: 88
Initial Volume: 10.4g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 16:05

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 14:18 | D4F0286 | DF41259 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 14:18 | D4F0286 | DF41259 |
| 2,4-D | ND (0.051) | --- | 8151A | --- | 1 | 06/14/24 14:18 | D4F0286 | DF41259 |
| 2,4-DB | ND (0.052) | --- | 8151A | --- | 1 | 06/14/24 14:18 | D4F0286 | DF41259 |
| Dalapon | ND (0.050) | --- | 8151A | --- | 1 | 06/14/24 14:18 | D4F0286 | DF41259 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 14:18 | D4F0286 | DF41259 |
| Dichlorprop | ND (0.051) | --- | 8151A | --- | 1 | 06/14/24 14:18 | D4F0286 | DF41259 |
| Dinoseb | ND (0.052) | --- | 8151A | --- | 1 | 06/14/24 14:18 | D4F0286 | DF41259 |
| MCPA | ND (2.53) | --- | 8151A | --- | 1 | 06/14/24 14:18 | D4F0286 | DF41259 |
| MCPP | ND (2.56) | --- | 8151A | --- | 1 | 06/14/24 14:18 | D4F0286 | DF41259 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *102 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 12ft-24ft
Date Sampled: 06/10/24 16:30
Percent Solids: 88
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/11/24 19:45

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **43.3** (11.4) | --- | 8100M | --- | 1 | 06/14/24 2:38 | --- | DF41150 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 66 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 12ft-24ft
Date Sampled: 06/10/24 16:30
Percent Solids: 88

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-04
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 714** (5) | --- | 9050A | --- | 1 | CCP | 06/12/24 15:45 | umhos/cm | DF41247 |
| **Corrosivity (pH)** | **8.03** (N/A) | --- | 9045 | --- | 1 | JLK | 06/11/24 20:14 | S.U. | DF41147 |
| **Corrosivity (pH) Sample Temp** | **20.6** | --- | 2550B | --- | 1 | JLK | 06/11/24 20:14 | °C | DF41147 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/12/24 18:21 | °F | DF41243 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/11/24 22:04 | ml/5 min | DF41164 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | JLK | 06/11/24 19:23 | mg/kg | DF41144 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | JLK | 06/11/24 19:23 | mg/kg | DF41144 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 29ft-31ft
Date Sampled: 06/10/24 17:00
Percent Solids: 84
Initial Volume: 6.2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,1,1-Trichloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,1,2,2-Tetrachloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,1,2-Trichloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,1-Dichloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,1-Dichloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,1-Dichloropropene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,2,3-Trichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,2,3-Trichloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,2,4-Trichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,2,4-Trimethylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,2-Dibromoethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,2-Dichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,2-Dichloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,2-Dichloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,3,5-Trimethylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,3-Dichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,3-Dichloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,4-Dichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 1,4-Dioxane | ND (0.0964) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 2,2-Dichloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 2-Butanone | ND (0.0482) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 2-Chlorotoluene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 2-Hexanone | ND (0.0482) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 4-Chlorotoluene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| 4-Isopropyltoluene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 29ft-31ft
Date Sampled: 06/10/24 17:00
Percent Solids: 84
Initial Volume: 6.2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0482) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| **Acetone** | **0.327** (0.0482) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Benzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Bromobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Bromochloromethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Bromodichloromethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Bromoform | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Bromomethane | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Carbon Disulfide | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Carbon Tetrachloride | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Chlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Chloroethane | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Chloroform | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Chloromethane | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| cis-1,2-Dichloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| cis-1,3-Dichloropropene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Dibromochloromethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Dibromomethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Dichlorodifluoromethane | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Diethyl Ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Di-isopropyl ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Ethyl tertiary-butyl ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Ethylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Hexachlorobutadiene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Isopropylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Methyl tert-Butyl Ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Methylene Chloride | ND (0.0241) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 29ft-31ft
Date Sampled: 06/10/24 17:00
Percent Solids: 84
Initial Volume: 6.2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| n-Butylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| n-Propylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| sec-Butylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Styrene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| tert-Butylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Tertiary-amyl methyl ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Tetrachloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Tetrahydrofuran | ND (0.0193) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Toluene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| trans-1,2-Dichloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| trans-1,3-Dichloropropene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Trichloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Trichlorofluoromethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Vinyl Chloride | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Xylene O | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Xylene P,M | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |
| Xylenes (Total) | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:02 | D4F0279 | DF41335 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *119 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *100 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *112 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *102 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 24ft-36ft
Date Sampled: 06/11/24 08:30
Percent Solids: 84

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-06
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | **EL** ND (2.01) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:49 | 2.98 100 | DF41240 |
| **Barium** | **53.6** (0.80) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:49 | 2.98 100 | DF41240 |
| Cadmium | ND (0.40) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:49 | 2.98 100 | DF41240 |
| **Chromium** | **21.2** (0.80) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:49 | 2.98 100 | DF41240 |
| **Lead** | **35.3** (4.01) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:49 | 2.98 100 | DF41240 |
| **Mercury** | **0.131** (0.036) | --- | 7471B | --- | 1 | BJV | 06/18/24 11:23 | 0.66 40 | DF41437 |
| Selenium | ND (1.61) | --- | 6020B | --- | 20 | BJV | 06/14/24 15:00 | 2.98 100 | DF41240 |
| Silver | **EL** ND (0.80) | --- | 6010D | --- | 2 | KJB | 06/17/24 17:37 | 2.98 100 | DF41240 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 24ft-36ft
Date Sampled: 06/11/24 08:30
Percent Solids: 84
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.030) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 1,2,4-Trichlorobenzene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 1,2-Dichlorobenzene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 1,3-Dichlorobenzene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 1,4-Dichlorobenzene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 2,4,5-Trichlorophenol | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 2,4,6-Trichlorophenol | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 2,4-Dichlorophenol | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 2,4-Dimethylphenol | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 2,4-Dinitrophenol | ND (1.21) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 2,4-Dinitrotoluene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 2,6-Dinitrotoluene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 2-Chloronaphthalene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 2-Chlorophenol | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 2-Methylnaphthalene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 2-Methylphenol | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 2-Nitrophenol | ND (0.604) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 3,3´-Dichlorobenzidine | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 3+4-Methylphenol | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 4-Bromophenyl-phenylether | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 4-Chloroaniline | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| 4-Nitrophenol | ND (1.21) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Acenaphthene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Acenaphthylene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Acetophenone | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Aniline | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Anthracene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 24ft-36ft
Date Sampled: 06/11/24 08:30
Percent Solids: 84
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Benzo(a)anthracene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Benzo(a)pyrene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Benzo(b)fluoranthene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Benzo(g,h,i)perylene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Benzo(k)fluoranthene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| bis(2-Chloroethoxy)methane | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| bis(2-Chloroethyl)ether | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| bis(2-chloroisopropyl)Ether | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| bis(2-Ethylhexyl)phthalate | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Butylbenzylphthalate | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Chrysene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Dibenzo(a,h)Anthracene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Dibenzofuran | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Diethylphthalate | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Dimethylphthalate | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Di-n-butylphthalate | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Di-n-octylphthalate | ND (0.604) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Fluoranthene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Fluorene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Hexachlorobenzene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Hexachlorobutadiene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Hexachloroethane | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Indeno(1,2,3-cd)Pyrene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Isophorone | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Naphthalene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Nitrobenzene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 24ft-36ft
Date Sampled: 06/11/24 08:30
Percent Solids: 84
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Pentachlorophenol | ND (1.21) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Phenanthrene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Phenol | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Pyrene | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |
| Pyridine | ND (0.302) | --- | 8270E | --- | 1 | TJ | 06/15/24 1:39 | D4F0305 | DF41154 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *96 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *81 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *97 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *87 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *95 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *93 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *102 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *93 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 24ft-36ft
Date Sampled: 06/11/24 08:30
Percent Solids: 84
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 12:30

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 11:13 | --- | DF41206 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 11:13 | --- | DF41206 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 11:13 | --- | DF41206 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 11:13 | --- | DF41206 |
| **Aroclor 1248** | **0.3** (0.06) | --- | 8082A | --- | 1 | 06/13/24 11:13 | --- | DF41206 |
| **Aroclor 1254** | **0.3** (0.06) | --- | 8082A | --- | 1 | 06/13/24 11:13 | --- | DF41206 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 11:13 | --- | DF41206 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 11:13 | --- | DF41206 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 11:13 | --- | DF41206 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *65 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *70 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 24ft-36ft
Date Sampled: 06/11/24 08:30
Percent Solids: 84
Initial Volume: 20.2g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/11/24 19:45

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| 4,4´-DDE | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| 4,4´-DDT | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Aldrin | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| alpha-BHC | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| alpha-Chlordane | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| beta-BHC | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Chlordane (Total) | ND (0.0237) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| delta-BHC | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Dieldrin [2C] | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Endosulfan I [2C] | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Endosulfan II | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Endosulfan Sulfate | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Endrin | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Endrin Ketone | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| gamma-BHC (Lindane) | ND (0.0018) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| gamma-Chlordane | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Heptachlor | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Heptachlor Epoxide | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Hexachlorobenzene | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Methoxychlor | ND (0.0030) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |
| Toxaphene | ND (0.148) | --- | 8081B | --- | 1 | 06/14/24 14:10 | D4F0295 | DF41106 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *77 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *65 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 24ft-36ft
Date Sampled: 06/11/24 08:30
Percent Solids: 84
Initial Volume: 10g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 16:05

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.011) | --- | 8151A | --- | 1 | 06/14/24 14:48 | D4F0286 | DF41259 |
| 2,4,5-TP (Silvex) | ND (0.011) | --- | 8151A | --- | 1 | 06/14/24 14:48 | D4F0286 | DF41259 |
| 2,4-D | ND (0.056) | --- | 8151A | --- | 1 | 06/14/24 14:48 | D4F0286 | DF41259 |
| 2,4-DB | ND (0.057) | --- | 8151A | --- | 1 | 06/14/24 14:48 | D4F0286 | DF41259 |
| Dalapon | ND (0.054) | --- | 8151A | --- | 1 | 06/14/24 14:48 | D4F0286 | DF41259 |
| Dicamba | ND (0.011) | --- | 8151A | --- | 1 | 06/14/24 14:48 | D4F0286 | DF41259 |
| Dichlorprop | ND (0.056) | --- | 8151A | --- | 1 | 06/14/24 14:48 | D4F0286 | DF41259 |
| Dinoseb | ND (0.057) | --- | 8151A | --- | 1 | 06/14/24 14:48 | D4F0286 | DF41259 |
| MCPA | ND (2.78) | --- | 8151A | --- | 1 | 06/14/24 14:48 | D4F0286 | DF41259 |
| MCPP | ND (2.81) | --- | 8151A | --- | 1 | 06/14/24 14:48 | D4F0286 | DF41259 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: DCAA* | *94 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 24ft-36ft
Date Sampled: 06/11/24 08:30
Percent Solids: 84
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/11/24 19:45

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **17.7** (12.1) | --- | 8100M | --- | 1 | 06/14/24 22:30 | --- | DF41150 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 61 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-7A 24ft-36ft
Date Sampled: 06/11/24 08:30
Percent Solids: 84

ESS Laboratory Work Order: 24F0378
ESS Laboratory Sample ID: 24F0378-06
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 2900** (5) | --- | 9050A | --- | 1 | CCP | 06/12/24 15:45 | umhos/cm | DF41247 |
| **Corrosivity (pH)** | **8.29** (N/A) | --- | 9045 | --- | 1 | JLK | 06/11/24 20:14 | S.U. | DF41147 |
| **Corrosivity (pH) Sample Temp** | **20.7** | --- | 2550B | --- | 1 | JLK | 06/11/24 20:14 | °C | DF41147 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/12/24 18:21 | °F | DF41243 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/11/24 22:04 | ml/5 min | DF41164 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | JLK | 06/11/24 19:23 | mg/kg | DF41144 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | JLK | 06/11/24 19:23 | mg/kg | DF41144 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DF41240 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Arsenic | ND | 2.50 | mg/kg wet | | | | | | | |
| Barium | ND | 1.00 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| **Blank** | | | | | | | | | | |
| Selenium | ND | 2.00 | mg/kg wet | | | | | | | , |
| **LCS** | | | | | | | | | | |
| Arsenic | 173 | 7.46 | mg/kg wet | 223.0 | | 78 | 70-102 | | | |
| Barium | 404 | 2.99 | mg/kg wet | 445.0 | | 91 | 78-111 | | | |
| Cadmium | 185 | 1.49 | mg/kg wet | 226.0 | | 82 | 74-105 | | | |
| Chromium | 200 | 2.99 | mg/kg wet | 230.0 | | 87 | 73-107 | | | |
| Lead | 243 | 14.9 | mg/kg wet | 275.0 | | 88 | 74-108 | | | |
| Selenium | 109 | 14.9 | mg/kg wet | 137.0 | | 80 | 71-109 | | | |
| Silver | 64.8 | 1.49 | mg/kg wet | 75.30 | | 86 | 72-110 | | | |
| **LCS** | | | | | | | | | | |
| Selenium | 87.4 | 33.3 | mg/kg wet | 82.70 | | 106 | 70-130 | | | |
| **LCS Dup** | | | | | | | | | | |
| Arsenic | 173 | 7.58 | mg/kg wet | 223.0 | | 78 | 70-102 | 0.2 | 30 | |
| Barium | 378 | 3.03 | mg/kg wet | 445.0 | | 85 | 78-111 | 7 | 30 | |
| Cadmium | 182 | 1.52 | mg/kg wet | 226.0 | | 81 | 74-105 | 1 | 30 | |
| Chromium | 199 | 3.03 | mg/kg wet | 230.0 | | 87 | 73-107 | 0.5 | 30 | |
| Lead | 236 | 15.2 | mg/kg wet | 275.0 | | 86 | 74-108 | 3 | 30 | |
| Selenium | 110 | 15.2 | mg/kg wet | 137.0 | | 81 | 71-109 | 1 | 30 | |
| Silver | 65.0 | 1.52 | mg/kg wet | 75.30 | | 86 | 72-110 | 0.3 | 30 | |
| **LCS Dup** | | | | | | | | | | |
| Selenium | 64.7 | 30.8 | mg/kg wet | 82.70 | | 78 | 70-130 | 30 | 30 | |
| **Batch DF41437 - 245.1/7470A** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Mercury | ND | 0.033 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 20.6 | 3.30 | mg/kg wet | 25.50 | | 81 | 71-125 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 20.3 | 3.19 | mg/kg wet | 25.50 | | 79 | 71-125 | 2 | 30 | |
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,1-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromoethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dioxane | ND | 0.100 | mg/kg wet | | | | | | | |
| 2,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Butanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 2-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Hexanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 4-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Isopropyltoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Methyl-2-Pentanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Acetone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Benzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromodichloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromoform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromomethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Carbon Disulfide | ND | 0.0050 | mg/kg wet | | | | | | | |
| Carbon Tetrachloride | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloroethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Chloroform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| cis-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| cis-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromomethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dichlorodifluoromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Diethyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| Di-isopropyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethyl tertiary-butyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Isopropylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methyl tert-Butyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methylene Chloride | ND | 0.0250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Propylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| sec-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Styrene | ND | 0.0050 | mg/kg wet | | | | | | | |
| tert-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tertiary-amyl methyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrachloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrahydrofuran | ND | 0.0200 | mg/kg wet | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichlorofluoromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Vinyl Chloride | ND | 0.0100 | mg/kg wet | | | | | | | |
| Xylene O | ND | 0.0050 | mg/kg wet | | | | | | | |
| Xylene P,M | ND | 0.0100 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0563* | | mg/kg wet | *0.05000* | | *113* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0495* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0544* | | mg/kg wet | *0.05000* | | *109* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0524* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 1,1,1-Trichloroethane | 0.0542 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| 1,1,2,2-Tetrachloroethane | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 40-160 | | | |
| 1,1,2-Trichloroethane | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,1-Dichloroethane | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,1-Dichloroethene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,1-Dichloropropene | 0.0538 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| 1,2,3-Trichlorobenzene | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| 1,2,3-Trichloropropane | 0.0455 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | | | |
| 1,2,4-Trichlorobenzene | 0.0540 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| 1,2,4-Trimethylbenzene | 0.0546 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| 1,2-Dibromo-3-Chloropropane | 0.0421 | 0.0050 | mg/kg wet | 0.05000 | | 84 | 70-130 | | | |
| 1,2-Dibromoethane | 0.0528 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| 1,2-Dichlorobenzene | 0.0503 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| 1,2-Dichloroethane | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| 1,2-Dichloropropane | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| 1,3,5-Trimethylbenzene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| 1,3-Dichlorobenzene | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,3-Dichloropropane | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| 1,4-Dichlorobenzene | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,4-Dioxane | 0.845 | 0.100 | mg/kg wet | 1.000 | | 85 | 70-130 | | | |
| 2,2-Dichloropropane | 0.0548 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| 2-Butanone | 0.259 | 0.0500 | mg/kg wet | 0.2500 | | 103 | 40-160 | | | |
| 2-Chlorotoluene | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 2-Hexanone | 0.219 | 0.0500 | mg/kg wet | 0.2500 | | 88 | 40-160 | | | |
| 4-Chlorotoluene | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 4-Isopropyltoluene | 0.0518 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 4-Methyl-2-Pentanone | 0.217 | 0.0500 | mg/kg wet | 0.2500 | | 87 | 40-160 | | | |
| Acetone | 0.228 | 0.0500 | mg/kg wet | 0.2500 | | 91 | 40-160 | | | |
| Benzene | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Bromobenzene | 0.0514 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| Bromochloromethane | 0.0524 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Bromodichloromethane | 0.0579 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | | | |
| Bromoform | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 40-160 | | | |
| Bromomethane | 0.0475 | 0.0100 | mg/kg wet | 0.05000 | | 95 | 40-160 | | | |
| Carbon Disulfide | 0.0578 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | | | |
| Carbon Tetrachloride | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Chlorobenzene | 0.0540 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Chloroethane | 0.0557 | 0.0100 | mg/kg wet | 0.05000 | | 111 | 40-160 | | | |
| Chloroform | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| Chloromethane | 0.0576 | 0.0100 | mg/kg wet | 0.05000 | | 115 | 40-160 | | | |
| cis-1,2-Dichloroethene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| cis-1,3-Dichloropropene | 0.0556 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 40-160 | | | |
| Dibromochloromethane | 0.0579 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 40-160 | | | |
| Dibromomethane | 0.0522 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| Dichlorodifluoromethane | 0.0442 | 0.0100 | mg/kg wet | 0.05000 | | 88 | 40-160 | | | |
| Diethyl Ether | 0.0473 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| Di-isopropyl ether | 0.0552 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Ethyl tertiary-butyl ether | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | | | |
| Ethylbenzene | 0.0561 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | | | |
| Hexachlorobutadiene | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 40-160 | | | |
| Isopropylbenzene | 0.0587 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | | | |
| Methyl tert-Butyl Ether | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Methylene Chloride | 0.0524 | 0.0250 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Naphthalene | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | | | |
| n-Butylbenzene | 0.0552 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| n-Propylbenzene | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| sec-Butylbenzene | 0.0546 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| Styrene | 0.0562 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 40-160 | | | |
| tert-Butylbenzene | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Tertiary-amyl methyl ether | 0.0548 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| Tetrachloroethene | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Tetrahydrofuran | 0.0452 | 0.0200 | mg/kg wet | 0.05000 | | 90 | 70-130 | | | |
| Toluene | 0.0538 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| trans-1,2-Dichloroethene | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| trans-1,3-Dichloropropene | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Trichloroethene | 0.0537 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Trichlorofluoromethane | 0.0456 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 40-160 | | | |
| Vinyl Chloride | 0.0520 | 0.0100 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| Xylene O | 0.0583 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | | | |
| Xylene P,M | 0.118 | 0.0100 | mg/kg wet | 0.1000 | | 118 | 70-130 | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0523* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0524* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0522* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0527* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0530 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 1 | 20 | |
| 1,1,1-Trichloroethane | 0.0525 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 3 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0526 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 40-160 | 5 | 20 | |
| 1,1,2-Trichloroethane | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 1 | 20 | |
| 1,1-Dichloroethane | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 2 | 20 | |
| 1,1-Dichloroethene | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 3 | 20 | |
| 1,1-Dichloropropene | 0.0518 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 4 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 3 | 20 | |
| 1,2,3-Trichloropropane | 0.0474 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 4 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0566 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | 5 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0584 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | 7 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0418 | 0.0050 | mg/kg wet | 0.05000 | | 84 | 70-130 | 0.7 | 20 | |
| 1,2-Dibromoethane | 0.0524 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 0.7 | 20 | |
| 1,2-Dichlorobenzene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 8 | 20 | |
| 1,2-Dichloroethane | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 1 | 20 | |
| 1,2-Dichloropropane | 0.0510 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 2 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0580 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 6 | 20 | |
| 1,3-Dichlorobenzene | 0.0549 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 7 | 20 | |
| 1,3-Dichloropropane | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 0.3 | 20 | |
| 1,4-Dichlorobenzene | 0.0557 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 7 | 20 | |
| 1,4-Dioxane | 0.818 | 0.100 | mg/kg wet | 1.000 | | 82 | 70-130 | 3 | 20 | |
| 2,2-Dichloropropane | 0.0526 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 4 | 20 | |
| 2-Butanone | 0.271 | 0.0500 | mg/kg wet | 0.2500 | | 108 | 40-160 | 5 | 20 | |
| 2-Chlorotoluene | 0.0572 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | 7 | 20 | |
| 2-Hexanone | 0.224 | 0.0500 | mg/kg wet | 0.2500 | | 90 | 40-160 | 2 | 20 | |
| 4-Chlorotoluene | 0.0566 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | 6 | 20 | |
| 4-Isopropyltoluene | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 6 | 20 | |
| 4-Methyl-2-Pentanone | 0.206 | 0.0500 | mg/kg wet | 0.2500 | | 82 | 40-160 | 5 | 20 | |
| Acetone | 0.227 | 0.0500 | mg/kg wet | 0.2500 | | 91 | 40-160 | 0.7 | 20 | |
| Benzene | 0.0525 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 2 | 20 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

## Volatile Organics Low Level

**Batch DF41335 - 5035**

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| Bromobenzene | 0.0560 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | 8 | 20 | |
| Bromochloromethane | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 2 | 20 | |
| Bromodichloromethane | 0.0573 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 0.9 | 20 | |
| Bromoform | 0.0472 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 40-160 | 1 | 20 | |
| Bromomethane | 0.0467 | 0.0100 | mg/kg wet | 0.05000 | | 93 | 40-160 | 2 | 20 | |
| Carbon Disulfide | 0.0550 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 5 | 20 | |
| Carbon Tetrachloride | 0.0523 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 3 | 20 | |
| Chlorobenzene | 0.0537 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 0.6 | 20 | |
| Chloroethane | 0.0511 | 0.0100 | mg/kg wet | 0.05000 | | 102 | 40-160 | 9 | 20 | |
| Chloroform | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 2 | 20 | |
| Chloromethane | 0.0566 | 0.0100 | mg/kg wet | 0.05000 | | 113 | 40-160 | 2 | 20 | |
| cis-1,2-Dichloroethene | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 2 | 20 | |
| cis-1,3-Dichloropropene | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 40-160 | 0.2 | 20 | |
| Dibromochloromethane | 0.0575 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 40-160 | 0.7 | 20 | |
| Dibromomethane | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 0.6 | 20 | |
| Dichlorodifluoromethane | 0.0422 | 0.0100 | mg/kg wet | 0.05000 | | 84 | 40-160 | 4 | 20 | |
| Diethyl Ether | 0.0465 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 2 | 20 | |
| Di-isopropyl ether | 0.0549 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 0.6 | 20 | |
| Ethyl tertiary-butyl ether | 0.0553 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 0.3 | 20 | |
| Ethylbenzene | 0.0553 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 1 | 20 | |
| Hexachlorobutadiene | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 40-160 | 5 | 20 | |
| Isopropylbenzene | 0.0629 | 0.0050 | mg/kg wet | 0.05000 | | 126 | 70-130 | 7 | 20 | |
| Methyl tert-Butyl Ether | 0.0542 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 0.2 | 20 | |
| Methylene Chloride | 0.0487 | 0.0250 | mg/kg wet | 0.05000 | | 97 | 70-130 | 7 | 20 | |
| Naphthalene | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 40-160 | 2 | 20 | |
| n-Butylbenzene | 0.0576 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 4 | 20 | |
| n-Propylbenzene | 0.0582 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 7 | 20 | |
| sec-Butylbenzene | 0.0584 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | 7 | 20 | |
| Styrene | 0.0559 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 40-160 | 0.6 | 20 | |
| tert-Butylbenzene | 0.0573 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 7 | 20 | |
| Tertiary-amyl methyl ether | 0.0546 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 0.3 | 20 | |
| Tetrachloroethene | 0.0520 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 3 | 20 | |
| Tetrahydrofuran | 0.0433 | 0.0200 | mg/kg wet | 0.05000 | | 87 | 70-130 | 4 | 20 | |
| Toluene | 0.0525 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 2 | 20 | |
| trans-1,2-Dichloroethene | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 2 | 20 | |
| trans-1,3-Dichloropropene | 0.0522 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 0.9 | 20 | |
| Trichloroethene | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 3 | 20 | |
| Trichlorofluoromethane | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | 7 | 20 | |
| Vinyl Chloride | 0.0509 | 0.0100 | mg/kg wet | 0.05000 | | 102 | 70-130 | 2 | 20 | |
| Xylene O | 0.0581 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 0.3 | 20 | |
| Xylene P,M | 0.117 | 0.0100 | mg/kg wet | 0.1000 | | 117 | 70-130 | 0.4 | 20 | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0522* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0510* | | mg/kg wet | *0.05000* | | *102* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0524* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0530* | | mg/kg wet | *0.05000* | | *106* | *70-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41154 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41154 - 3546** | | | | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyridine | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.50* | | mg/kg wet | *2.500* | | *100* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.54* | | mg/kg wet | *3.750* | | *94* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.83* | | mg/kg wet | *3.750* | | *102* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.32* | | mg/kg wet | *2.500* | | *93* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.81* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.50* | | mg/kg wet | *2.500* | | *100* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.11* | | mg/kg wet | *3.750* | | *110* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.55* | | mg/kg wet | *2.500* | | *102* | *30-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.42 | 0.025 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.07 | 0.250 | mg/kg wet | 2.500 | | 83 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.19 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.26 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 30-130 | | | |
| 2,4-Dimethylphenol | 2.26 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | | | |
| 2,4-Dinitrophenol | 2.83 | 1.00 | mg/kg wet | 2.500 | | 113 | 15-140 | | | |
| 2,4-Dinitrotoluene | 2.54 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| 2-Chloronaphthalene | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| 2-Chlorophenol | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 30-130 | | | |
| 2-Methylnaphthalene | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| 2-Methylphenol | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 15-140 | | | |
| 2-Nitrophenol | 2.15 | 0.500 | mg/kg wet | 2.500 | | 86 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.11 | 0.250 | mg/kg wet | 2.500 | | 84 | 40-140 | | | |
| 3+4-Methylphenol | 4.98 | 0.250 | mg/kg wet | 5.000 | | 100 | 15-140 | | | |
| 4-Bromophenyl-phenylether | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41154 - 3546** | | | | | | | | | | |
| 4-Chloroaniline | 2.01 | 0.250 | mg/kg wet | 2.500 | | 81 | 15-140 | | | |
| 4-Nitrophenol | 2.77 | 1.00 | mg/kg wet | 2.500 | | 111 | 15-140 | | | |
| Acenaphthene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Acenaphthylene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Acetophenone | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Aniline | 2.01 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Anthracene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Azobenzene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Benzo(a)anthracene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Benzo(a)pyrene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.22 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 2.01 | 0.250 | mg/kg wet | 2.500 | | 80 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 2.08 | 0.250 | mg/kg wet | 2.500 | | 83 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.22 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Butylbenzylphthalate | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Chrysene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Dibenzofuran | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| Diethylphthalate | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Dimethylphthalate | 2.29 | 0.250 | mg/kg wet | 2.500 | | 91 | 15-140 | | | |
| Di-n-butylphthalate | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Di-n-octylphthalate | 2.30 | 0.500 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| Fluoranthene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Fluorene | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Hexachlorobenzene | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Hexachlorobutadiene | 1.95 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | | | |
| Hexachloroethane | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Isophorone | 1.99 | 0.250 | mg/kg wet | 2.500 | | 79 | 40-140 | | | |
| Naphthalene | 2.03 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Nitrobenzene | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| N-Nitrosodimethylamine | 2.89 | 0.250 | mg/kg wet | 2.500 | | 115 | 40-140 | | | |
| Pentachlorophenol | 2.23 | 1.00 | mg/kg wet | 2.500 | | 89 | 15-140 | | | |
| Phenanthrene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Phenol | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 15-140 | | | |
| Pyrene | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Pyridine | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.44* | | mg/kg wet | *2.500* | | *97* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.39* | | mg/kg wet | *3.750* | | *90* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.80* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.41* | | mg/kg wet | *2.500* | | *97* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.81* | | mg/kg wet | *3.750* | | *102* | *30-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41154 - 3546** | | | | | | | | | | |
| *Surrogate: Nitrobenzene-d5* | *2.30* | | mg/kg wet | *2.500* | | *92* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.00* | | mg/kg wet | *3.750* | | *107* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.44* | | mg/kg wet | *2.500* | | *97* | *30-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.43 | 0.025 | mg/kg wet | 2.500 | | 97 | 40-140 | 0.2 | 30 | |
| 1,2,4-Trichlorobenzene | 2.01 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | 3 | 30 | |
| 1,2-Dichlorobenzene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 4 | 30 | |
| 1,3-Dichlorobenzene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 6 | 30 | |
| 1,4-Dichlorobenzene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 6 | 30 | |
| 2,4,5-Trichlorophenol | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 30-130 | 4 | 30 | |
| 2,4,6-Trichlorophenol | 2.19 | 0.250 | mg/kg wet | 2.500 | | 88 | 30-130 | 1 | 30 | |
| 2,4-Dichlorophenol | 2.06 | 0.250 | mg/kg wet | 2.500 | | 83 | 30-130 | 1 | 30 | |
| 2,4-Dimethylphenol | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | 0.2 | 30 | |
| 2,4-Dinitrophenol | 2.92 | 1.00 | mg/kg wet | 2.500 | | 117 | 15-140 | 3 | 30 | |
| 2,4-Dinitrotoluene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 1 | 30 | |
| 2,6-Dinitrotoluene | 2.39 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 0.5 | 30 | |
| 2-Chloronaphthalene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 0.8 | 30 | |
| 2-Chlorophenol | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 30-130 | 7 | 30 | |
| 2-Methylnaphthalene | 2.06 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | 0.6 | 30 | |
| 2-Methylphenol | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 15-140 | 4 | 30 | |
| 2-Nitrophenol | 2.18 | 0.500 | mg/kg wet | 2.500 | | 87 | 30-130 | 1 | 30 | |
| 3,3´-Dichlorobenzidine | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | 5 | 30 | |
| 3+4-Methylphenol | 5.28 | 0.250 | mg/kg wet | 5.000 | | 106 | 15-140 | 6 | 30 | |
| 4-Bromophenyl-phenylether | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | 2 | 30 | |
| 4-Chloroaniline | 2.01 | 0.250 | mg/kg wet | 2.500 | | 80 | 15-140 | 0.1 | 30 | |
| 4-Nitrophenol | 2.86 | 1.00 | mg/kg wet | 2.500 | | 114 | 15-140 | 3 | 30 | |
| Acenaphthene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 0.006 | 30 | |
| Acenaphthylene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 2 | 30 | |
| Acetophenone | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 5 | 30 | |
| Aniline | 2.12 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | 5 | 30 | |
| Anthracene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 0.4 | 30 | |
| Azobenzene | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 0.8 | 30 | |
| Benzo(a)anthracene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 0.7 | 30 | |
| Benzo(a)pyrene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 2 | 30 | |
| Benzo(b)fluoranthene | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 0.4 | 30 | |
| Benzo(g,h,i)perylene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 1 | 30 | |
| Benzo(k)fluoranthene | 2.22 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | 0.2 | 30 | |
| bis(2-Chloroethoxy)methane | 1.96 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | 3 | 30 | |
| bis(2-Chloroethyl)ether | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 4 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | 2 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 3 | 30 | |
| Butylbenzylphthalate | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 2 | 30 | |
| Chrysene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 2 | 30 | |
| Dibenzo(a,h)Anthracene | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 2 | 30 | |
| Dibenzofuran | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 1 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41154 - 3546** | | | | | | | | | | |
| Diethylphthalate | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 1 | 30 | |
| Dimethylphthalate | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 15-140 | 2 | 30 | |
| Di-n-butylphthalate | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 0.1 | 30 | |
| Di-n-octylphthalate | 2.34 | 0.500 | mg/kg wet | 2.500 | | 94 | 40-140 | 2 | 30 | |
| Fluoranthene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 0.2 | 30 | |
| Fluorene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 0.5 | 30 | |
| Hexachlorobenzene | 2.14 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | 0.8 | 30 | |
| Hexachlorobutadiene | 1.89 | 0.250 | mg/kg wet | 2.500 | | 76 | 40-140 | 3 | 30 | |
| Hexachloroethane | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 6 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 0.2 | 30 | |
| Isophorone | 1.98 | 0.250 | mg/kg wet | 2.500 | | 79 | 40-140 | 0.1 | 30 | |
| Naphthalene | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | 0.4 | 30 | |
| Nitrobenzene | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | 0.1 | 30 | |
| N-Nitrosodimethylamine | 3.03 | 0.250 | mg/kg wet | 2.500 | | 121 | 40-140 | 5 | 30 | |
| Pentachlorophenol | 2.25 | 1.00 | mg/kg wet | 2.500 | | 90 | 15-140 | 0.7 | 30 | |
| Phenanthrene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 0.1 | 30 | |
| Phenol | 2.58 | 0.250 | mg/kg wet | 2.500 | | 103 | 15-140 | 3 | 30 | |
| Pyrene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 3 | 30 | |
| Pyridine | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 6 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.53* | | mg/kg wet | *2.500* | | *101* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.40* | | mg/kg wet | *3.750* | | *91* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.01* | | mg/kg wet | *3.750* | | *107* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.37* | | mg/kg wet | *2.500* | | *95* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.89* | | mg/kg wet | *3.750* | | *104* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.25* | | mg/kg wet | *2.500* | | *90* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.13* | | mg/kg wet | *3.750* | | *110* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.44* | | mg/kg wet | *2.500* | | *98* | *30-130* | | | |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF41206 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF41206 - 3540C** | | | | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0186* | | mg/kg wet | *0.02500* | | *75* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0211* | | mg/kg wet | *0.02500* | | *84* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0168* | | mg/kg wet | *0.02500* | | *67* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0162* | | mg/kg wet | *0.02500* | | *65* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 76 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.3 | 0.05 | mg/kg wet | 0.5000 | | 69 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 76 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 73 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0183* | | mg/kg wet | *0.02500* | | *73* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0194* | | mg/kg wet | *0.02500* | | *78* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0185* | | mg/kg wet | *0.02500* | | *74* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0168* | | mg/kg wet | *0.02500* | | *67* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 84 | 40-140 | 11 | 30 | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 78 | 40-140 | 12 | 30 | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 89 | 40-140 | 15 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 86 | 40-140 | 17 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0207* | | mg/kg wet | *0.02500* | | *83* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0228* | | mg/kg wet | *0.02500* | | *91* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0199* | | mg/kg wet | *0.02500* | | *80* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0179* | | mg/kg wet | *0.02500* | | *72* | *30-150* | | | |
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41106 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 4,4´-DDD | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDD [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Chlordane (Total) | ND | 0.0200 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| 8081B Organochlorine Pesticides | | | | | | | | | | |
| **Batch DF41106 - 3546** | | | | | | | | | | |
| Chlordane (Total) [2C] | ND | 0.0200 | mg/kg wet | | | | | | | |
| delta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| delta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) [2C] | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Toxaphene | ND | 0.125 | mg/kg wet | | | | | | | |
| Toxaphene [2C] | ND | 0.125 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0116* | | mg/kg wet | *0.01250* | | *93* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0125* | | mg/kg wet | *0.01250* | | *100* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0118* | | mg/kg wet | *0.01250* | | *94* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0130* | | mg/kg wet | *0.01250* | | *104* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 4,4´-DDD | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| 4,4´-DDD [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | | | |
| 4,4´-DDE | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| 4,4´-DDE [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| 4,4´-DDT | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| 4,4´-DDT [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Aldrin | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| Aldrin [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | | | |
| alpha-BHC | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| alpha-BHC [2C] | 0.0142 | 0.0025 | mg/kg wet | 0.01250 | | 114 | 40-140 | | | |
| alpha-Chlordane | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41106 - 3546** | | | | | | | | | | |
| alpha-Chlordane [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| beta-BHC | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| beta-BHC [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | | | |
| delta-BHC | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| delta-BHC [2C] | 0.0122 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| Dieldrin | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| Dieldrin [2C] | 0.0138 | 0.0025 | mg/kg wet | 0.01250 | | 111 | 40-140 | | | |
| Endosulfan I | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Endosulfan I [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | | | |
| Endosulfan II | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | | | |
| Endosulfan II [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| Endosulfan Sulfate | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Endosulfan Sulfate [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | | | |
| Endrin | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Endrin [2C] | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| Endrin Ketone | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Endrin Ketone [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| gamma-BHC (Lindane) | 0.0127 | 0.0015 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| gamma-BHC (Lindane) [2C] | 0.0138 | 0.0015 | mg/kg wet | 0.01250 | | 110 | 40-140 | | | |
| gamma-Chlordane | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | | | |
| gamma-Chlordane [2C] | 0.0148 | 0.0025 | mg/kg wet | 0.01250 | | 118 | 40-140 | | | |
| Heptachlor | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Heptachlor [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| Heptachlor Epoxide | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Heptachlor Epoxide [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| Hexachlorobenzene | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | | | |
| Hexachlorobenzene [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| Methoxychlor | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | | | |
| Methoxychlor [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0130* | | mg/kg wet | *0.01250* | | *104* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0140* | | mg/kg wet | *0.01250* | | *112* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0124* | | mg/kg wet | *0.01250* | | *99* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0140* | | mg/kg wet | *0.01250* | | *112* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 4,4´-DDD | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 7 | 30 | |
| 4,4´-DDD [2C] | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | 8 | 30 | |
| 4,4´-DDE | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 6 | 30 | |
| 4,4´-DDE [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 5 | 30 | |
| 4,4´-DDT | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | 11 | 30 | |
| 4,4´-DDT [2C] | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | 11 | 30 | |
| Aldrin | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 1 | 30 | |
| Aldrin [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 0.7 | 30 | |
| alpha-BHC | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 2 | 30 | |
| alpha-BHC [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | 2 | 30 | |
| alpha-Chlordane | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 2 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41106 - 3546** | | | | | | | | | | |
| alpha-Chlordane [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 2 | 30 | |
| beta-BHC | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 3 | 30 | |
| beta-BHC [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 0.4 | 30 | |
| delta-BHC | 0.0101 | 0.0025 | mg/kg wet | 0.01250 | | 81 | 40-140 | 7 | 30 | |
| delta-BHC [2C] | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 5 | 30 | |
| Dieldrin | 0.0129 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | 2 | 30 | |
| Dieldrin [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | 2 | 30 | |
| Endosulfan I | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 2 | 30 | |
| Endosulfan I [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 2 | 30 | |
| Endosulfan II | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 5 | 30 | |
| Endosulfan II [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 6 | 30 | |
| Endosulfan Sulfate | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 8 | 30 | |
| Endosulfan Sulfate [2C] | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 8 | 30 | |
| Endrin | 0.0122 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | 4 | 30 | |
| Endrin [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 4 | 30 | |
| Endrin Ketone | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 9 | 30 | |
| Endrin Ketone [2C] | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 9 | 30 | |
| gamma-BHC (Lindane) | 0.0124 | 0.0015 | mg/kg wet | 0.01250 | | 99 | 40-140 | 3 | 30 | |
| gamma-BHC (Lindane) [2C] | 0.0136 | 0.0015 | mg/kg wet | 0.01250 | | 109 | 40-140 | 2 | 30 | |
| gamma-Chlordane | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 110 | 40-140 | 2 | 30 | |
| gamma-Chlordane [2C] | 0.0145 | 0.0025 | mg/kg wet | 0.01250 | | 116 | 40-140 | 2 | 30 | |
| Heptachlor | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 2 | 30 | |
| Heptachlor [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 1 | 30 | |
| Heptachlor Epoxide | 0.0124 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 2 | 30 | |
| Heptachlor Epoxide [2C] | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | 2 | 30 | |
| Hexachlorobenzene | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 2 | 30 | |
| Hexachlorobenzene [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 2 | 30 | |
| Methoxychlor | 0.0107 | 0.0025 | mg/kg wet | 0.01250 | | 85 | 40-140 | 9 | 30 | |
| Methoxychlor [2C] | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | 11 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0115* | | mg/kg wet | *0.01250* | | *92* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0124* | | mg/kg wet | *0.01250* | | *99* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0118* | | mg/kg wet | *0.01250* | | *94* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0134* | | mg/kg wet | *0.01250* | | *107* | *30-150* | | | |
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41259 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 2,4,5-T | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-T [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4-D | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-D [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-DB | ND | 0.048 | mg/kg wet | | | | | | | |
| 2,4-DB [2C] | ND | 0.048 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41259 - 3546** | | | | | | | | | | |
| Dalapon | ND | 0.046 | mg/kg wet | | | | | | | |
| Dalapon [2C] | ND | 0.046 | mg/kg wet | | | | | | | |
| Dicamba | ND | 0.009 | mg/kg wet | | | | | | | |
| Dicamba [2C] | ND | 0.009 | mg/kg wet | | | | | | | |
| Dichlorprop | ND | 0.047 | mg/kg wet | | | | | | | |
| Dichlorprop [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| Dinoseb | ND | 0.048 | mg/kg wet | | | | | | | |
| Dinoseb [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| MCPA | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPA [2C] | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPP | ND | 2.35 | mg/kg wet | | | | | | | |
| MCPP [2C] | ND | 2.35 | mg/kg wet | | | | | | | |
| *Surrogate: DCAA* | *0.186* | | mg/kg wet | *0.2000* | | *93* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.166* | | mg/kg wet | *0.2000* | | *83* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 2,4,5-T | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 70 | 40-140 | | | |
| 2,4,5-T [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 66 | 40-140 | | | |
| 2,4,5-TP (Silvex) | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 70 | 40-140 | | | |
| 2,4,5-TP (Silvex) [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | | | |
| 2,4-D | 0.133 | 0.047 | mg/kg wet | 0.1880 | | 71 | 40-140 | | | |
| 2,4-D [2C] | 0.124 | 0.047 | mg/kg wet | 0.1880 | | 66 | 40-140 | | | |
| 2,4-DB | 0.136 | 0.048 | mg/kg wet | 0.1900 | | 71 | 40-140 | | | |
| 2,4-DB [2C] | 0.138 | 0.048 | mg/kg wet | 0.1900 | | 73 | 40-140 | | | |
| Dalapon | 0.306 | 0.046 | mg/kg wet | 0.4550 | | 67 | 40-140 | | | |
| Dalapon [2C] | 0.316 | 0.046 | mg/kg wet | 0.4550 | | 69 | 40-140 | | | |
| Dicamba | 0.013 | 0.009 | mg/kg wet | 0.01880 | | 70 | 40-140 | | | |
| Dicamba [2C] | 0.014 | 0.009 | mg/kg wet | 0.01880 | | 76 | 40-140 | | | |
| Dichlorprop | 0.170 | 0.047 | mg/kg wet | 0.1880 | | 90 | 40-140 | | | |
| Dichlorprop [2C] | 0.146 | 0.047 | mg/kg wet | 0.1880 | | 77 | 40-140 | | | |
| Dinoseb | 0.016 | 0.048 | mg/kg wet | 0.09500 | | 17 | 10-100 | | | |
| Dinoseb [2C] | 0.017 | 0.048 | mg/kg wet | 0.09500 | | 18 | 10-100 | | | |
| MCPA | 15.3 | 2.32 | mg/kg wet | 18.60 | | 82 | 40-140 | | | |
| MCPA [2C] | 15.2 | 2.32 | mg/kg wet | 18.60 | | 82 | 40-140 | | | |
| MCPP | 14.4 | 2.35 | mg/kg wet | 18.80 | | 77 | 40-140 | | | |
| MCPP [2C] | 15.1 | 2.35 | mg/kg wet | 18.80 | | 80 | 40-140 | | | |
| *Surrogate: DCAA* | *0.208* | | mg/kg wet | *0.2000* | | *104* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.187* | | mg/kg wet | *0.2000* | | *93* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 2,4,5-T | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 72 | 40-140 | 3 | 30 | |
| 2,4,5-T [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | 3 | 30 | |
| 2,4,5-TP (Silvex) | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 72 | 40-140 | 3 | 30 | |
| 2,4,5-TP (Silvex) [2C] | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 72 | 40-140 | 6 | 30 | |
| 2,4-D | 0.137 | 0.047 | mg/kg wet | 0.1880 | | 73 | 40-140 | 3 | 30 | |
| 2,4-D [2C] | 0.128 | 0.047 | mg/kg wet | 0.1880 | | 68 | 40-140 | 4 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41259 - 3546** | | | | | | | | | | |
| 2,4-DB | 0.149 | 0.048 | mg/kg wet | 0.1900 | | 78 | 40-140 | 9 | 30 | |
| 2,4-DB [2C] | 0.144 | 0.048 | mg/kg wet | 0.1900 | | 76 | 40-140 | 4 | 30 | |
| Dalapon | 0.322 | 0.046 | mg/kg wet | 0.4550 | | 71 | 40-140 | 5 | 30 | |
| Dalapon [2C] | 0.331 | 0.046 | mg/kg wet | 0.4550 | | 73 | 40-140 | 5 | 30 | |
| Dicamba | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 64 | 40-140 | 9 | 30 | |
| Dicamba [2C] | 0.015 | 0.009 | mg/kg wet | 0.01880 | | 80 | 40-140 | 5 | 30 | |
| Dichlorprop | 0.179 | 0.047 | mg/kg wet | 0.1880 | | 95 | 40-140 | 6 | 30 | |
| Dichlorprop [2C] | 0.153 | 0.047 | mg/kg wet | 0.1880 | | 82 | 40-140 | 5 | 30 | |
| Dinoseb | 0.017 | 0.048 | mg/kg wet | 0.09500 | | 18 | 10-100 | 5 | 30 | |
| Dinoseb [2C] | 0.017 | 0.048 | mg/kg wet | 0.09500 | | 18 | 10-100 | 0 | 30 | |
| MCPA | 15.3 | 2.32 | mg/kg wet | 18.60 | | 82 | 40-140 | 0.2 | 30 | |
| MCPA [2C] | 15.7 | 2.32 | mg/kg wet | 18.60 | | 85 | 40-140 | 3 | 30 | |
| MCPP | 15.1 | 2.35 | mg/kg wet | 18.80 | | 80 | 40-140 | 4 | 30 | |
| MCPP [2C] | 15.8 | 2.35 | mg/kg wet | 18.80 | | 84 | 40-140 | 5 | 30 | |
| *Surrogate: DCAA* | *0.198* | | mg/kg wet | *0.2000* | | *99* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.175* | | mg/kg wet | *0.2000* | | *88* | *30-150* | | | |
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF41150 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Decane (C10) | ND | 0.2 | mg/kg wet | | | | | | | |
| Docosane (C22) | ND | 0.2 | mg/kg wet | | | | | | | |
| Dodecane (C12) | ND | 0.2 | mg/kg wet | | | | | | | |
| Eicosane (C20) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexacosane (C26) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexadecane (C16) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexatriacontane (C36) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonadecane (C19) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonane (C9) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octacosane (C28) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octadecane (C18) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetracosane (C24) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetradecane (C14) | ND | 0.2 | mg/kg wet | | | | | | | |
| Total Petroleum Hydrocarbons (C9-C36) | ND | 10.0 | mg/kg wet | | | | | | | |
| Triacontane (C30) | ND | 0.2 | mg/kg wet | | | | | | | |
| *Surrogate: O-Terphenyl* | *4.15* | | mg/kg wet | *5.000* | | *83* | *40-140* | | | |
| **LCS** | | | | | | | | | | |
| Decane (C10) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 70 | 40-140 | | | |
| Docosane (C22) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 83 | 40-140 | | | |
| Dodecane (C12) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 76 | 40-140 | | | |
| Eicosane (C20) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | | | |
| Hexacosane (C26) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Hexadecane (C16) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Hexatriacontane (C36) | 1.6 | 0.2 | mg/kg wet | 2.500 | | 62 | 40-140 | | | |
| Nonadecane (C19) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF41150 - 3546** | | | | | | | | | | |
| Nonane (C9) | 1.5 | 0.2 | mg/kg wet | 2.500 | | 61 | 30-140 | | | |
| Octacosane (C28) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Octadecane (C18) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | | | |
| Tetracosane (C24) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Tetradecane (C14) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 79 | 40-140 | | | |
| Total Petroleum Hydrocarbons (C9-C36) | 28.7 | 10.0 | mg/kg wet | 35.00 | | 82 | 40-140 | | | |
| Triacontane (C30) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| *Surrogate: O-Terphenyl* | *3.97* | | mg/kg wet | *5.000* | | *79* | *40-140* | | | |
| **LCS Dup** | | | | | | | | | | |
| Decane (C10) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 70 | 40-140 | 0.2 | 25 | |
| Docosane (C22) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 83 | 40-140 | 0.4 | 25 | |
| Dodecane (C12) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 76 | 40-140 | 0.6 | 25 | |
| Eicosane (C20) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | 0.5 | 25 | |
| Hexacosane (C26) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | 0.4 | 25 | |
| Hexadecane (C16) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | 0.7 | 25 | |
| Hexatriacontane (C36) | 1.5 | 0.2 | mg/kg wet | 2.500 | | 60 | 40-140 | 3 | 25 | |
| Nonadecane (C19) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 86 | 40-140 | 4 | 25 | |
| Nonane (C9) | 1.5 | 0.2 | mg/kg wet | 2.500 | | 62 | 30-140 | 0.8 | 25 | |
| Octacosane (C28) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | 0.2 | 25 | |
| Octadecane (C18) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | 1 | 25 | |
| Tetracosane (C24) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | 0.5 | 25 | |
| Tetradecane (C14) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 79 | 40-140 | 0.6 | 25 | |
| Total Petroleum Hydrocarbons (C9-C36) | 28.4 | 10.0 | mg/kg wet | 35.00 | | 81 | 40-140 | 1 | 25 | |
| Triacontane (C30) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 87 | 40-140 | 0.3 | 25 | |
| *Surrogate: O-Terphenyl* | *3.86* | | mg/kg wet | *5.000* | | *77* | *40-140* | | | |
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DF41144 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Reactive Cyanide | ND | 2.0 | mg/kg | | | | | | | |
| Reactive Sulfide | ND | 2.0 | mg/kg | | | | | | | |
| **LCS** | | | | | | | | | | |
| Reactive Cyanide | 4.1 | 2.0 | mg/kg | 100.3 | | 4 | 0.68-5.41 | | | |
| Reactive Sulfide | 2.1 | 2.0 | mg/kg | 10.00 | | 21 | 0-44 | | | |
| **Batch DF41243 - General Preparation** | | | | | | | | | | |
| **Reference** | | | | | | | | | | |
| Flashpoint | 80 | | °F | 81.00 | | 99 | 97.9-102.1 | | | |
| **Batch DF41247 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Conductivity | ND | 5 | umhos/cm | | | | | | | |
| **LCS** | | | | | | | | | | |
| Conductivity | 1380 | | umhos/cm | 1410 | | 98 | 90-110 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

**Notes and Definitions**

| | |
|---|---|
| WL | Results obtained from a deionized water leach of the sample. |
| U | Analyte included in the analysis, but not detected |
| Q | Calibration required quadratic regression (Q). |
| EL | Elevated Method Reporting Limits due to sample matrix (EL). |
| D | Diluted. |
| CD+ | Continuing Calibration %Diff/Drift is above control limit (CD+). |
| > | Greater than. |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0378

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24F0378
Date Received: 6/11/2024
Project Due Date: 6/18/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 4.4 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: 6/11/24 Time: 17:55 By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 559026 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 559027 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 559032 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 2 | 559035 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 559036 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 559813 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 3 | 559028 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 559029 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 559033 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 4 | 559037 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 559038 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 559814 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 5 | 559030 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 5 | 559031 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 5 | 559034 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 6 | 559039 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 559040 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 559815 | Yes | N/A | Yes | 4 oz. Jar | NP | |

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

ESS Project ID: 24F0378

Date Received: 6/11/2024

**2nd Review**

**Were all containers scanned into storage/lab?** Initials TB

Are barcode labels on correct containers? Yes / No

Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA

Are all Hex Chrome stickers attached? Yes / No / NA

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: [signature] Date & Time: 6/11/24 1719

Reviewed By: [signature] Date & Time: 6/11/24 17:55

# ESS Laboratory

*Division of Thielsch Engineering, Inc.*
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

## CHAIN OF CUSTODY

ESS Lab # 24F0378

| | | |
|---|---|---|
| **Turn Time** | 5 | Days |
| **Regulatory State** | Massachusetts | |

**Reporting Limits:** compare results to RCS-1, RCS-2, Lined and unlined landfills, TCLP, and 20X if needed.

**Is this project for any of the following?:** ○ CT RCP ◉ MA MCP ○ RGP

**Electonic Deliverables:** ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) EDD

| Company Name | Project # | Project Name |
|---|---|---|
| Civil and Environmental Consultants | 332-344 | MassCEC Phase III - Site #4 |

| Contact Person | Address |
|---|---|
| Cassia Dal Bello | 31 Bellows Road |

| City | State | Zip Code | PO # |
|---|---|---|---|
| Raynham | MA | 02767 | |

| Telephone Number | FAX Number | Email Address |
|---|---|---|
| 774-501-2176 | | cdalbello; jkitchen, dbarboza@cecinc.com |

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | RCRA8 Metals | PCBs via 3540C | TPH | SVOC - incl pyr | Pest - incl Tox | Herbicides | Reactivity | Conductivity | pH | Free Liquid | Flashpoint | VOC - high | VOC - low | ~~Grain Size Analysis (Sieve Only)~~ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6/10/24 | 15:30 | Solid | Soil | CEC-7A 9'-11' | | | | | | | | | | | | X | X | | | |
| 2 | | 15:40 | | | CEC-7A 0'-12' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 3 | | 16:20 | | | CEC-7A 19'-21' | | | | | | | | | | | | X | X | | | |
| 4 | | 16:30 | | | CEC-7A 12'-24' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 5 | ↓ | 17:00 | | | CEC-7A 29'-31' | | | | | | | | | | | | X | X | | | |
| 6 | 6/11/24 | 08:30 | ↓ | ↓ | CEC-7A 24'-36' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Container Type:** AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | V | V | J | J |
| **Container Volume:** 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7 | 7 | 10 | 9 |
| **Preservation Code:** 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 10 | 1 | 1 |
| **Number of Containers per Sample:** | 1 | | | | | 1 | | | | | 1 | 1 | 2 | 1 | 1 |

**Laboratory Use Only**
Cooler Present: yes ○ Drop Off
Seals Intact: ○ Pickup
Cooler Temperature: 4.4 °C / C

**Sampled by :** CI

**Comments:** Please specify "Other" preservative and containers types in this space
Run TCLP if fails 20x

| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
|---|---|---|---|
| Carmen D. Dalbello 6/11/24 | 6/11/24 12:34 | 6/11/24 16:57 | 11057 6/11/24 |
| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
| | | | |

ESS Laboratory
DIVISION OF THE RISE GROUP
BAL Laboratory Analytical Balance

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC Phase III - Site 4 (332-344)**
**ESS Laboratory Work Order Number: 24F0379**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

***REVIEWED***
***By ESS Laboratory at 4:52 pm, Jun 18, 2024***

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

## SAMPLE RECEIPT

The following samples were received on June 11, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

**Low Level VOA vials were frozen by ESS Laboratory on June 11, 2024 at 17:50.**
**Tetrahydrofuran is reported above the MA CAM reporting limit of 0.010 mg/kg.**

**Question I: All samples for EPH and metals were analyzed for a subset of the required MCP list per the client's request.**

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 24F0379-01 | CEC-8A 9ft-11ft | Soil | 8260D Low |
| 24F0379-02 | CEC-8A 0ft-12ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24F0379-03 | CEC-8A 19ft-21ft | Soil | 8260D Low |
| 24F0379-04 | CEC-8A 12ft-24ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24F0379-05 | CEC-8A 29ft-31ft | Soil | 8260D Low |
| 24F0379-06 | CEC-8A 24ft-36ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

## PROJECT NARRATIVE

**Semi-Volatile Organic Compounds**

D4F0245-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (134% @ 40-160%)

D4F0245-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
N-Nitrosodimethylamine (26% @ 20%), Pyridine (25% @ 20%)

D4F0305-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (112% @ 40-160%)

D4F0305-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
N-Nitrosodimethylamine (24% @ 20%)

**Volatile Organics Low Level**

D4F0279-CCV1 **Calibration required quadratic regression (Q).**
Naphthalene (94% @ 40-160%)

**No other observations noted.**

**End of Project Narrative.**

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24F0379-01 through 24F0379-06**

Matrices: ( ) Ground Water/Surface Water (x) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| (x) 8260 VOC CAM II A | ( x) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | (x ) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (x) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | ( x) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (x) 6010 Metals CAM III A | ( ) 6020 Metals CAM III D | (x) MassDEP EPH CAM IV B | ( x) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (x) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (x) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (x) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (x) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes (x) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (x) No ( ) |

***Responses to Questions G, H and I below are required for '"Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? | Yes ( ) No (x)* |
| | ***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.** | |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (x)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes ( ) No (x)* |

***All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: June 18, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 9ft-11ft
Date Sampled: 06/10/24 10:10
Percent Solids: 90
Initial Volume: 6.7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,1,1-Trichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,1,2,2-Tetrachloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,1,2-Trichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,1-Dichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,1-Dichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,1-Dichloropropene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,2,3-Trichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,2,3-Trichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,2,4-Trichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,2,4-Trimethylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,2-Dibromoethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,2-Dichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,2-Dichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,2-Dichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,3,5-Trimethylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,3-Dichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,3-Dichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,4-Dichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 1,4-Dioxane | ND (0.0826) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 2,2-Dichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 2-Butanone | ND (0.0413) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 2-Chlorotoluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 2-Hexanone | ND (0.0413) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 4-Chlorotoluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| 4-Isopropyltoluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 9ft-11ft
Date Sampled: 06/10/24 10:10
Percent Solids: 90
Initial Volume: 6.7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0413) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| **Acetone** | **0.270** (0.0413) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Benzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Bromobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Bromochloromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Bromodichloromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Bromoform | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Bromomethane | ND (0.0083) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Carbon Disulfide | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Carbon Tetrachloride | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Chlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Chloroethane | ND (0.0083) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Chloroform | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Chloromethane | ND (0.0083) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| cis-1,2-Dichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| cis-1,3-Dichloropropene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Dibromochloromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Dibromomethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Dichlorodifluoromethane | ND (0.0083) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Diethyl Ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Di-isopropyl ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Ethyl tertiary-butyl ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Ethylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Hexachlorobutadiene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Isopropylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Methyl tert-Butyl Ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Methylene Chloride | ND (0.0206) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 9ft-11ft
Date Sampled: 06/10/24 10:10
Percent Solids: 90
Initial Volume: 6.7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| n-Butylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| n-Propylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| sec-Butylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Styrene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| tert-Butylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Tertiary-amyl methyl ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Tetrachloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Tetrahydrofuran | ND (0.0165) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Toluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| trans-1,2-Dichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| trans-1,3-Dichloropropene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Trichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Trichlorofluoromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Vinyl Chloride | ND (0.0083) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Xylene O | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Xylene P,M | ND (0.0083) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |
| Xylenes (Total) | ND (0.0083) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 15:53 | D4F0279 | DF41335 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *119 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *103 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *112 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *104 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 0ft-12ft
Date Sampled: 06/10/24 10:15
Percent Solids: 90

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **2.56** (2.21) | --- | 6010D | --- | 1 | CEV | 06/14/24 21:04 | 2.5 100 | DF41240 |
| **Barium** | **13.7** (0.89) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:39 | 2.5 100 | DF41240 |
| Cadmium | ND (0.44) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:39 | 2.5 100 | DF41240 |
| **Chromium** | **7.61** (0.89) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:39 | 2.5 100 | DF41240 |
| **Lead** | **8.52** (4.43) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:39 | 2.5 100 | DF41240 |
| Mercury | ND (0.028) | --- | 7471B | --- | 1 | BJV | 06/18/24 11:25 | 0.78 40 | DF41437 |
| Selenium | ND (4.43) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:39 | 2.5 100 | DF41240 |
| Silver | ND (0.44) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:39 | 2.5 100 | DF41240 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 0ft-12ft
Date Sampled: 06/10/24 10:15
Percent Solids: 90
Initial Volume: 20g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 1,2,4-Trichlorobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 1,2-Dichlorobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 1,3-Dichlorobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 1,4-Dichlorobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 2,4,5-Trichlorophenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 2,4,6-Trichlorophenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 2,4-Dichlorophenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 2,4-Dimethylphenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 2,4-Dinitrophenol | ND (1.11) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 2,4-Dinitrotoluene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 2,6-Dinitrotoluene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 2-Chloronaphthalene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 2-Chlorophenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 2-Methylnaphthalene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 2-Methylphenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 2-Nitrophenol | ND (0.553) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 3,3´-Dichlorobenzidine | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 3+4-Methylphenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 4-Bromophenyl-phenylether | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 4-Chloroaniline | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| 4-Nitrophenol | ND (1.11) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Acenaphthene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Acenaphthylene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Acetophenone | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Aniline | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Anthracene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 0ft-12ft
Date Sampled: 06/10/24 10:15
Percent Solids: 90
Initial Volume: 20g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Benzo(a)anthracene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Benzo(a)pyrene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Benzo(b)fluoranthene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Benzo(g,h,i)perylene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Benzo(k)fluoranthene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| bis(2-Chloroethoxy)methane | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| bis(2-Chloroethyl)ether | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| bis(2-chloroisopropyl)Ether | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| bis(2-Ethylhexyl)phthalate | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Butylbenzylphthalate | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Chrysene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Dibenzo(a,h)Anthracene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Dibenzofuran | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Diethylphthalate | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Dimethylphthalate | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Di-n-butylphthalate | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Di-n-octylphthalate | ND (0.553) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Fluoranthene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Fluorene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Hexachlorobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Hexachlorobutadiene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Hexachloroethane | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Indeno(1,2,3-cd)Pyrene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Isophorone | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Naphthalene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Nitrobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 0ft-12ft
Date Sampled: 06/10/24 10:15
Percent Solids: 90
Initial Volume: 20g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Pentachlorophenol | ND (1.11) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Phenanthrene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Phenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Pyrene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |
| Pyridine | ND (0.277) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:10 | D4F0305 | DF41154 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *94 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *82 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *93 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *89 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *93 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *90 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *100 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *103 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 0ft-12ft
Date Sampled: 06/10/24 10:15
Percent Solids: 90
Initial Volume: 20.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 12:30

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:11 | --- | DF41206 |
| Aroclor 1221 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:11 | --- | DF41206 |
| Aroclor 1232 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:11 | --- | DF41206 |
| Aroclor 1242 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:11 | --- | DF41206 |
| Aroclor 1248 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:11 | --- | DF41206 |
| Aroclor 1254 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:11 | --- | DF41206 |
| Aroclor 1260 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:11 | --- | DF41206 |
| Aroclor 1262 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:11 | --- | DF41206 |
| Aroclor 1268 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:11 | --- | DF41206 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *73 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *77 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 0ft-12ft
Date Sampled: 06/10/24 10:15
Percent Solids: 90
Initial Volume: 19.6g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/11/24 19:45

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| 4,4´-DDE | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| 4,4´-DDT | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Aldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| alpha-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| alpha-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| beta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Chlordane (Total) | ND (0.0226) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| delta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Dieldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Endosulfan I | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Endosulfan II | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Endosulfan Sulfate | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Endrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Endrin Ketone | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| gamma-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Heptachlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Heptachlor Epoxide | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Hexachlorobenzene | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Methoxychlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |
| Toxaphene | ND (0.141) | --- | 8081B | --- | 1 | 06/14/24 14:38 | D4F0295 | DF41106 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *80 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *78 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 0ft-12ft
Date Sampled: 06/10/24 10:15
Percent Solids: 90
Initial Volume: 10g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 16:05

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.011) | --- | 8151A | --- | 1 | 06/14/24 15:19 | D4F0286 | DF41259 |
| 2,4,5-TP (Silvex) | ND (0.011) | --- | 8151A | --- | 1 | 06/14/24 15:19 | D4F0286 | DF41259 |
| 2,4-D | ND (0.052) | --- | 8151A | --- | 1 | 06/14/24 15:19 | D4F0286 | DF41259 |
| 2,4-DB | ND (0.053) | --- | 8151A | --- | 1 | 06/14/24 15:19 | D4F0286 | DF41259 |
| Dalapon | ND (0.050) | --- | 8151A | --- | 1 | 06/14/24 15:19 | D4F0286 | DF41259 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 15:19 | D4F0286 | DF41259 |
| Dichlorprop | ND (0.052) | --- | 8151A | --- | 1 | 06/14/24 15:19 | D4F0286 | DF41259 |
| Dinoseb | ND (0.053) | --- | 8151A | --- | 1 | 06/14/24 15:19 | D4F0286 | DF41259 |
| MCPA | ND (2.57) | --- | 8151A | --- | 1 | 06/14/24 15:19 | D4F0286 | DF41259 |
| MCPP | ND (2.60) | --- | 8151A | --- | 1 | 06/14/24 15:19 | D4F0286 | DF41259 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *89 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 0ft-12ft
Date Sampled: 06/10/24 10:15
Percent Solids: 90
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/12/24 15:51

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **12.2** (11.0) | --- | 8100M | --- | 1 | 06/14/24 17:43 | --- | DF41257 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 60 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 0ft-12ft
Date Sampled: 06/10/24 10:15
Percent Solids: 90

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-02
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 231** (5) | --- | 9050A | --- | 1 | CCP | 06/12/24 15:45 | umhos/cm | DF41247 |
| **Corrosivity (pH)** | **7.79** (N/A) | --- | 9045 | --- | 1 | JLK | 06/11/24 20:14 | S.U. | DF41147 |
| **Corrosivity (pH) Sample Temp** | **20.7** | --- | 2550B | --- | 1 | JLK | 06/11/24 20:14 | °C | DF41147 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/12/24 18:21 | °F | DF41243 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/11/24 22:10 | ml/5 min | DF41164 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/13/24 15:08 | mg/kg | DF41272 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/13/24 15:08 | mg/kg | DF41272 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 19ft-21ft
Date Sampled: 06/10/24 10:45
Percent Solids: 89
Initial Volume: 6.2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,1,1-Trichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,1,2,2-Tetrachloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,1,2-Trichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,1-Dichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,1-Dichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,1-Dichloropropene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,2,3-Trichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,2,3-Trichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,2,4-Trichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,2,4-Trimethylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,2-Dibromoethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,2-Dichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,2-Dichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,2-Dichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,3,5-Trimethylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,3-Dichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,3-Dichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,4-Dichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 1,4-Dioxane | ND (0.0904) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 2,2-Dichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 2-Butanone | ND (0.0452) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 2-Chlorotoluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 2-Hexanone | ND (0.0452) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 4-Chlorotoluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| 4-Isopropyltoluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 19ft-21ft
Date Sampled: 06/10/24 10:45
Percent Solids: 89
Initial Volume: 6.2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0452) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Acetone | ND (0.0452) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Benzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Bromobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Bromochloromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Bromodichloromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Bromoform | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Bromomethane | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Carbon Disulfide | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Carbon Tetrachloride | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Chlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Chloroethane | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Chloroform | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Chloromethane | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| cis-1,2-Dichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| cis-1,3-Dichloropropene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Dibromochloromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Dibromomethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Dichlorodifluoromethane | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Diethyl Ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Di-isopropyl ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Ethyl tertiary-butyl ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Ethylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Hexachlorobutadiene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Isopropylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Methyl tert-Butyl Ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Methylene Chloride | ND (0.0226) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 19ft-21ft
Date Sampled: 06/10/24 10:45
Percent Solids: 89
Initial Volume: 6.2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| n-Butylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| n-Propylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| sec-Butylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Styrene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| tert-Butylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Tertiary-amyl methyl ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Tetrachloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Tetrahydrofuran | ND (0.0181) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Toluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| trans-1,2-Dichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| trans-1,3-Dichloropropene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Trichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Trichlorofluoromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Vinyl Chloride | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Xylene O | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Xylene P,M | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |
| Xylenes (Total) | ND (0.0090) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:19 | D4F0279 | DF41335 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *119 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *104 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *112 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *102 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 12ft-24ft
Date Sampled: 06/10/24 10:55
Percent Solids: 89

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **2.05** (1.95) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:41 | 2.87 100 | DF41240 |
| **Barium** | **11.5** (0.78) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:41 | 2.87 100 | DF41240 |
| Cadmium | ND (0.39) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:41 | 2.87 100 | DF41240 |
| **Chromium** | **7.25** (0.78) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:41 | 2.87 100 | DF41240 |
| **Lead** | **7.43** (3.91) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:41 | 2.87 100 | DF41240 |
| Mercury | ND (0.028) | --- | 7471B | --- | 1 | BJV | 06/18/24 11:27 | 0.79 40 | DF41437 |
| Selenium | ND (3.91) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:41 | 2.87 100 | DF41240 |
| Silver | ND (0.39) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:41 | 2.87 100 | DF41240 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 12ft-24ft
Date Sampled: 06/10/24 10:55
Percent Solids: 89
Initial Volume: 19.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 1,2,4-Trichlorobenzene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 1,2-Dichlorobenzene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 1,3-Dichlorobenzene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 1,4-Dichlorobenzene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 2,4,5-Trichlorophenol | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 2,4,6-Trichlorophenol | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 2,4-Dichlorophenol | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 2,4-Dimethylphenol | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 2,4-Dinitrophenol | ND (1.17) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 2,4-Dinitrotoluene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 2,6-Dinitrotoluene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 2-Chloronaphthalene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 2-Chlorophenol | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 2-Methylnaphthalene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 2-Methylphenol | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 2-Nitrophenol | ND (0.584) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 3,3´-Dichlorobenzidine | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 3+4-Methylphenol | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 4-Bromophenyl-phenylether | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 4-Chloroaniline | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| 4-Nitrophenol | ND (1.17) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Acenaphthene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Acenaphthylene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Acetophenone | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Aniline | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Anthracene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 12ft-24ft
Date Sampled: 06/10/24 10:55
Percent Solids: 89
Initial Volume: 19.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Benzo(a)anthracene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Benzo(a)pyrene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Benzo(b)fluoranthene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Benzo(g,h,i)perylene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Benzo(k)fluoranthene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| bis(2-Chloroethoxy)methane | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| bis(2-Chloroethyl)ether | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| bis(2-chloroisopropyl)Ether | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| bis(2-Ethylhexyl)phthalate | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Butylbenzylphthalate | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Chrysene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Dibenzo(a,h)Anthracene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Dibenzofuran | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Diethylphthalate | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Dimethylphthalate | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Di-n-butylphthalate | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Di-n-octylphthalate | ND (0.584) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Fluoranthene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Fluorene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Hexachlorobenzene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Hexachlorobutadiene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Hexachloroethane | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Indeno(1,2,3-cd)Pyrene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Isophorone | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Naphthalene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Nitrobenzene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 12ft-24ft
Date Sampled: 06/10/24 10:55
Percent Solids: 89
Initial Volume: 19.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Pentachlorophenol | ND (1.17) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Phenanthrene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Phenol | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Pyrene | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |
| Pyridine | ND (0.292) | --- | 8270E | --- | 1 | TJ | 06/15/24 2:40 | D4F0305 | DF41154 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *95 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *88 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *96 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *91 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *95 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *92 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *103 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *107 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 12ft-24ft
Date Sampled: 06/10/24 10:55
Percent Solids: 89
Initial Volume: 20.5g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 12:30

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:31 | --- | DF41206 |
| Aroclor 1221 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:31 | --- | DF41206 |
| Aroclor 1232 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:31 | --- | DF41206 |
| Aroclor 1242 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:31 | --- | DF41206 |
| Aroclor 1248 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:31 | --- | DF41206 |
| Aroclor 1254 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:31 | --- | DF41206 |
| Aroclor 1260 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:31 | --- | DF41206 |
| Aroclor 1262 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:31 | --- | DF41206 |
| Aroclor 1268 | ND (0.05) | --- | 8082A | --- | 1 | 06/13/24 12:31 | --- | DF41206 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *76 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *76 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 12ft-24ft
Date Sampled: 06/10/24 10:55
Percent Solids: 89
Initial Volume: 19.1g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/11/24 19:45

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| 4,4´-DDE | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| 4,4´-DDT | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Aldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| alpha-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| alpha-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| beta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Chlordane (Total) | ND (0.0235) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| delta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Dieldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Endosulfan I | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Endosulfan II | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Endosulfan Sulfate | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Endrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Endrin Ketone | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| gamma-BHC (Lindane) | ND (0.0018) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| gamma-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Heptachlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Heptachlor Epoxide | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Hexachlorobenzene | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Methoxychlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |
| Toxaphene | ND (0.147) | --- | 8081B | --- | 1 | 06/14/24 15:06 | D4F0295 | DF41106 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *79 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *77 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 12ft-24ft
Date Sampled: 06/10/24 10:55
Percent Solids: 89
Initial Volume: 10.4g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 16:05

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 15:50 | D4F0286 | DF41259 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 15:50 | D4F0286 | DF41259 |
| 2,4-D | ND (0.051) | --- | 8151A | --- | 1 | 06/14/24 15:50 | D4F0286 | DF41259 |
| 2,4-DB | ND (0.051) | --- | 8151A | --- | 1 | 06/14/24 15:50 | D4F0286 | DF41259 |
| Dalapon | ND (0.049) | --- | 8151A | --- | 1 | 06/14/24 15:50 | D4F0286 | DF41259 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 15:50 | D4F0286 | DF41259 |
| Dichlorprop | ND (0.051) | --- | 8151A | --- | 1 | 06/14/24 15:50 | D4F0286 | DF41259 |
| Dinoseb | ND (0.051) | --- | 8151A | --- | 1 | 06/14/24 15:50 | D4F0286 | DF41259 |
| MCPA | ND (2.51) | --- | 8151A | --- | 1 | 06/14/24 15:50 | D4F0286 | DF41259 |
| MCPP | ND (2.53) | --- | 8151A | --- | 1 | 06/14/24 15:50 | D4F0286 | DF41259 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *93 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 12ft-24ft
Date Sampled: 06/10/24 10:55
Percent Solids: 89
Initial Volume: 20.4g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/12/24 15:51

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **26.6** (11.0) | --- | 8100M | --- | 1 | 06/14/24 15:32 | --- | DF41257 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 63 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 12ft-24ft
Date Sampled: 06/10/24 10:55
Percent Solids: 89

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-04
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 1700** (5) | --- | 9050A | --- | 1 | CCP | 06/12/24 15:45 | umhos/cm | DF41247 |
| **Corrosivity (pH)** | **7.42** (N/A) | --- | 9045 | --- | 1 | JLK | 06/11/24 20:14 | S.U. | DF41147 |
| **Corrosivity (pH) Sample Temp** | **20.6** | --- | 2550B | --- | 1 | JLK | 06/11/24 20:14 | °C | DF41147 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/12/24 18:21 | °F | DF41243 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/11/24 22:10 | ml/5 min | DF41164 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/13/24 15:08 | mg/kg | DF41272 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/13/24 15:08 | mg/kg | DF41272 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 29ft-31ft
Date Sampled: 06/10/24 11:50
Percent Solids: 88
Initial Volume: 5.9g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,1,1-Trichloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,1,2,2-Tetrachloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,1,2-Trichloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,1-Dichloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,1-Dichloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,1-Dichloropropene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,2,3-Trichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,2,3-Trichloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,2,4-Trichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,2,4-Trimethylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,2-Dibromoethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,2-Dichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,2-Dichloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,2-Dichloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,3,5-Trimethylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,3-Dichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,3-Dichloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,4-Dichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 1,4-Dioxane | ND (0.0964) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 2,2-Dichloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 2-Butanone | ND (0.0482) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 2-Chlorotoluene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 2-Hexanone | ND (0.0482) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 4-Chlorotoluene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| 4-Isopropyltoluene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 29ft-31ft
Date Sampled: 06/10/24 11:50
Percent Solids: 88
Initial Volume: 5.9g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0482) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Acetone | ND (0.0482) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Benzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Bromobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Bromochloromethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Bromodichloromethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Bromoform | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Bromomethane | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Carbon Disulfide | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Carbon Tetrachloride | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Chlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Chloroethane | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Chloroform | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Chloromethane | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| cis-1,2-Dichloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| cis-1,3-Dichloropropene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Dibromochloromethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Dibromomethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Dichlorodifluoromethane | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Diethyl Ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Di-isopropyl ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Ethyl tertiary-butyl ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Ethylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Hexachlorobutadiene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Isopropylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Methyl tert-Butyl Ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Methylene Chloride | ND (0.0241) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 29ft-31ft
Date Sampled: 06/10/24 11:50
Percent Solids: 88
Initial Volume: 5.9g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| n-Butylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| n-Propylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| sec-Butylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Styrene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| tert-Butylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Tertiary-amyl methyl ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Tetrachloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Tetrahydrofuran | ND (0.0193) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Toluene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| trans-1,2-Dichloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| trans-1,3-Dichloropropene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Trichloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Trichlorofluoromethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Vinyl Chloride | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Xylene O | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Xylene P,M | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |
| Xylenes (Total) | ND (0.0096) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 16:44 | D4F0279 | DF41335 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *119 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *102 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *111 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *104 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 24ft-36ft
Date Sampled: 06/10/24 12:25
Percent Solids: 88

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-06
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **2.44** (2.19) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:43 | 2.6 100 | DF41240 |
| **Barium** | **10.7** (0.87) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:43 | 2.6 100 | DF41240 |
| Cadmium | ND (0.44) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:43 | 2.6 100 | DF41240 |
| **Chromium** | **6.53** (0.87) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:43 | 2.6 100 | DF41240 |
| **Lead** | **6.69** (4.37) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:43 | 2.6 100 | DF41240 |
| **Mercury** | **0.038** (0.034) | --- | 7471B | --- | 1 | BJV | 06/18/24 11:29 | 0.66 40 | DF41437 |
| Selenium | ND (4.37) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:43 | 2.6 100 | DF41240 |
| Silver | ND (0.44) | --- | 6010D | --- | 1 | KJB | 06/13/24 14:43 | 2.6 100 | DF41240 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 24ft-36ft
Date Sampled: 06/10/24 12:25
Percent Solids: 88
Initial Volume: 19.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.030) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 1,2,4-Trichlorobenzene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 1,2-Dichlorobenzene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 1,3-Dichlorobenzene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 1,4-Dichlorobenzene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 2,4,5-Trichlorophenol | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 2,4,6-Trichlorophenol | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 2,4-Dichlorophenol | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 2,4-Dimethylphenol | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 2,4-Dinitrophenol | ND (1.18) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 2,4-Dinitrotoluene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 2,6-Dinitrotoluene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 2-Chloronaphthalene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 2-Chlorophenol | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 2-Methylnaphthalene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 2-Methylphenol | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 2-Nitrophenol | ND (0.592) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 3,3´-Dichlorobenzidine | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 3+4-Methylphenol | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 4-Bromophenyl-phenylether | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 4-Chloroaniline | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| 4-Nitrophenol | ND (1.18) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Acenaphthene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Acenaphthylene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Acetophenone | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Aniline | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Anthracene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 24ft-36ft
Date Sampled: 06/10/24 12:25
Percent Solids: 88
Initial Volume: 19.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Benzo(a)anthracene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Benzo(a)pyrene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Benzo(b)fluoranthene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Benzo(g,h,i)perylene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Benzo(k)fluoranthene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| bis(2-Chloroethoxy)methane | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| bis(2-Chloroethyl)ether | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| bis(2-chloroisopropyl)Ether | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| bis(2-Ethylhexyl)phthalate | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Butylbenzylphthalate | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Chrysene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Dibenzo(a,h)Anthracene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Dibenzofuran | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Diethylphthalate | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Dimethylphthalate | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Di-n-butylphthalate | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Di-n-octylphthalate | ND (0.592) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Fluoranthene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Fluorene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Hexachlorobenzene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Hexachlorobutadiene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Hexachloroethane | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Indeno(1,2,3-cd)Pyrene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Isophorone | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Naphthalene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Nitrobenzene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 24ft-36ft
Date Sampled: 06/10/24 12:25
Percent Solids: 88
Initial Volume: 19.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/11/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Pentachlorophenol | ND (1.18) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Phenanthrene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Phenol | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Pyrene | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |
| Pyridine | ND (0.296) | --- | 8270E | --- | 1 | TJ | 06/15/24 3:10 | D4F0305 | DF41154 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *97 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *89 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *99 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *95 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *98 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *99 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *106 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *107 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 24ft-36ft
Date Sampled: 06/10/24 12:25
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 12:30

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 12:50 | --- | DF41206 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 12:50 | --- | DF41206 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 12:50 | --- | DF41206 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 12:50 | --- | DF41206 |
| **Aroclor 1248 [2C]** | **0.06** (0.06) | --- | 8082A | --- | 1 | 06/13/24 12:50 | --- | DF41206 |
| **Aroclor 1254 [2C]** | **0.06** (0.06) | --- | 8082A | --- | 1 | 06/13/24 12:50 | --- | DF41206 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 12:50 | --- | DF41206 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 12:50 | --- | DF41206 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 12:50 | --- | DF41206 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *66 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *71 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 24ft-36ft
Date Sampled: 06/10/24 12:25
Percent Solids: 88
Initial Volume: 19.3g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/11/24 19:45

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| 4,4´-DDE | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| 4,4´-DDT | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Aldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| alpha-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| alpha-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| beta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Chlordane (Total) | ND (0.0236) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| delta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Dieldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Endosulfan I | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Endosulfan II | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Endosulfan Sulfate | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Endrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Endrin Ketone | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| gamma-BHC (Lindane) | ND (0.0018) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| gamma-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Heptachlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Heptachlor Epoxide | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Hexachlorobenzene | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Methoxychlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |
| Toxaphene | ND (0.147) | --- | 8081B | --- | 1 | 06/14/24 15:33 | D4F0295 | DF41106 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *78 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *66 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 24ft-36ft
Date Sampled: 06/10/24 12:25
Percent Solids: 88
Initial Volume: 10.3g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 16:05

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 16:21 | D4F0286 | DF41259 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 16:21 | D4F0286 | DF41259 |
| 2,4-D | ND (0.052) | --- | 8151A | --- | 1 | 06/14/24 16:21 | D4F0286 | DF41259 |
| 2,4-DB | ND (0.052) | --- | 8151A | --- | 1 | 06/14/24 16:21 | D4F0286 | DF41259 |
| Dalapon | ND (0.050) | --- | 8151A | --- | 1 | 06/14/24 16:21 | D4F0286 | DF41259 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/14/24 16:21 | D4F0286 | DF41259 |
| Dichlorprop | ND (0.052) | --- | 8151A | --- | 1 | 06/14/24 16:21 | D4F0286 | DF41259 |
| Dinoseb | ND (0.052) | --- | 8151A | --- | 1 | 06/14/24 16:21 | D4F0286 | DF41259 |
| MCPA | ND (2.57) | --- | 8151A | --- | 1 | 06/14/24 16:21 | D4F0286 | DF41259 |
| MCPP [2C] | ND (2.59) | --- | 8151A | --- | 1 | 06/14/24 16:21 | D4F0286 | DF41259 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *95 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 24ft-36ft
Date Sampled: 06/10/24 12:25
Percent Solids: 88
Initial Volume: 20.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/12/24 15:51

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **25.1** (11.1) | --- | 8100M | --- | 1 | 06/14/24 16:15 | --- | DF41257 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 61 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-8A 24ft-36ft
Date Sampled: 06/10/24 12:25
Percent Solids: 88

ESS Laboratory Work Order: 24F0379
ESS Laboratory Sample ID: 24F0379-06
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 2990** (5) | --- | 9050A | --- | 1 | CCP | 06/12/24 15:45 | umhos/cm | DF41247 |
| **Corrosivity (pH)** | **7.94** (N/A) | --- | 9045 | --- | 1 | JLK | 06/11/24 20:14 | S.U. | DF41147 |
| **Corrosivity (pH) Sample Temp** | **20.6** | --- | 2550B | --- | 1 | JLK | 06/11/24 20:14 | °C | DF41147 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/12/24 18:21 | °F | DF41243 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/11/24 22:10 | ml/5 min | DF41164 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/13/24 15:08 | mg/kg | DF41272 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/13/24 15:08 | mg/kg | DF41272 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DF41240 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Arsenic | ND | 2.50 | mg/kg wet | | | | | | | |
| Barium | ND | 1.00 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Arsenic | 173 | 7.46 | mg/kg wet | 223.0 | | 78 | 70-102 | | | |
| Barium | 404 | 2.99 | mg/kg wet | 445.0 | | 91 | 78-111 | | | |
| Cadmium | 185 | 1.49 | mg/kg wet | 226.0 | | 82 | 74-105 | | | |
| Chromium | 200 | 2.99 | mg/kg wet | 230.0 | | 87 | 73-107 | | | |
| Lead | 243 | 14.9 | mg/kg wet | 275.0 | | 88 | 74-108 | | | |
| Selenium | 109 | 14.9 | mg/kg wet | 137.0 | | 80 | 71-109 | | | |
| Silver | 64.8 | 1.49 | mg/kg wet | 75.30 | | 86 | 72-110 | | | |
| **LCS Dup** | | | | | | | | | | |
| Arsenic | 173 | 7.58 | mg/kg wet | 223.0 | | 78 | 70-102 | 0.2 | 30 | |
| Barium | 378 | 3.03 | mg/kg wet | 445.0 | | 85 | 78-111 | 7 | 30 | |
| Cadmium | 182 | 1.52 | mg/kg wet | 226.0 | | 81 | 74-105 | 1 | 30 | |
| Chromium | 199 | 3.03 | mg/kg wet | 230.0 | | 87 | 73-107 | 0.5 | 30 | |
| Lead | 236 | 15.2 | mg/kg wet | 275.0 | | 86 | 74-108 | 3 | 30 | |
| Selenium | 110 | 15.2 | mg/kg wet | 137.0 | | 81 | 71-109 | 1 | 30 | |
| Silver | 65.0 | 1.52 | mg/kg wet | 75.30 | | 86 | 72-110 | 0.3 | 30 | |
| **Batch DF41437 - 245.1/7470A** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Mercury | ND | 0.033 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 20.6 | 3.30 | mg/kg wet | 25.50 | | 81 | 71-125 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 20.3 | 3.19 | mg/kg wet | 25.50 | | 79 | 71-125 | 2 | 30 | |
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,1-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| 1,2,3-Trichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromoethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dioxane | ND | 0.100 | mg/kg wet | | | | | | | |
| 2,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Butanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 2-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Hexanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 4-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Isopropyltoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Methyl-2-Pentanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Acetone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Benzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromodichloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromoform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromomethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Carbon Disulfide | ND | 0.0050 | mg/kg wet | | | | | | | |
| Carbon Tetrachloride | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloroethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Chloroform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| cis-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| cis-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromomethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dichlorodifluoromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Diethyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Di-isopropyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethyl tertiary-butyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Isopropylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methyl tert-Butyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| Methylene Chloride | ND | 0.0250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Propylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| sec-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Styrene | ND | 0.0050 | mg/kg wet | | | | | | | |
| tert-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tertiary-amyl methyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrachloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrahydrofuran | ND | 0.0200 | mg/kg wet | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichlorofluoromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Vinyl Chloride | ND | 0.0100 | mg/kg wet | | | | | | | |
| Xylene O | ND | 0.0050 | mg/kg wet | | | | | | | |
| Xylene P,M | ND | 0.0100 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0563* | | mg/kg wet | *0.05000* | | *113* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0495* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0544* | | mg/kg wet | *0.05000* | | *109* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0524* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 1,1,1-Trichloroethane | 0.0542 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| 1,1,2,2-Tetrachloroethane | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 40-160 | | | |
| 1,1,2-Trichloroethane | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,1-Dichloroethane | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,1-Dichloroethene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,1-Dichloropropene | 0.0538 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| 1,2,3-Trichlorobenzene | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| 1,2,3-Trichloropropane | 0.0455 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | | | |
| 1,2,4-Trichlorobenzene | 0.0540 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| 1,2,4-Trimethylbenzene | 0.0546 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| 1,2-Dibromo-3-Chloropropane | 0.0421 | 0.0050 | mg/kg wet | 0.05000 | | 84 | 70-130 | | | |
| 1,2-Dibromoethane | 0.0528 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| 1,2-Dichlorobenzene | 0.0503 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| 1,2-Dichloroethane | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| 1,2-Dichloropropane | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,3,5-Trimethylbenzene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| 1,3-Dichlorobenzene | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,3-Dichloropropane | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| 1,4-Dichlorobenzene | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,4-Dioxane | 0.845 | 0.100 | mg/kg wet | 1.000 | | 85 | 70-130 | | | |
| 2,2-Dichloropropane | 0.0548 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| 2-Butanone | 0.259 | 0.0500 | mg/kg wet | 0.2500 | | 103 | 40-160 | | | |
| 2-Chlorotoluene | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 2-Hexanone | 0.219 | 0.0500 | mg/kg wet | 0.2500 | | 88 | 40-160 | | | |
| 4-Chlorotoluene | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 4-Isopropyltoluene | 0.0518 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 4-Methyl-2-Pentanone | 0.217 | 0.0500 | mg/kg wet | 0.2500 | | 87 | 40-160 | | | |
| Acetone | 0.228 | 0.0500 | mg/kg wet | 0.2500 | | 91 | 40-160 | | | |
| Benzene | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Bromobenzene | 0.0514 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| Bromochloromethane | 0.0524 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Bromodichloromethane | 0.0579 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | | | |
| Bromoform | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 40-160 | | | |
| Bromomethane | 0.0475 | 0.0100 | mg/kg wet | 0.05000 | | 95 | 40-160 | | | |
| Carbon Disulfide | 0.0578 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | | | |
| Carbon Tetrachloride | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Chlorobenzene | 0.0540 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Chloroethane | 0.0557 | 0.0100 | mg/kg wet | 0.05000 | | 111 | 40-160 | | | |
| Chloroform | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| Chloromethane | 0.0576 | 0.0100 | mg/kg wet | 0.05000 | | 115 | 40-160 | | | |
| cis-1,2-Dichloroethene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| cis-1,3-Dichloropropene | 0.0556 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 40-160 | | | |
| Dibromochloromethane | 0.0579 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 40-160 | | | |
| Dibromomethane | 0.0522 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| Dichlorodifluoromethane | 0.0442 | 0.0100 | mg/kg wet | 0.05000 | | 88 | 40-160 | | | |
| Diethyl Ether | 0.0473 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| Di-isopropyl ether | 0.0552 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Ethyl tertiary-butyl ether | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | | | |
| Ethylbenzene | 0.0561 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | | | |
| Hexachlorobutadiene | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 40-160 | | | |
| Isopropylbenzene | 0.0587 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | | | |
| Methyl tert-Butyl Ether | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Methylene Chloride | 0.0524 | 0.0250 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Naphthalene | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | | | |
| n-Butylbenzene | 0.0552 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| n-Propylbenzene | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| sec-Butylbenzene | 0.0546 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| Styrene | 0.0562 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 40-160 | | | |
| tert-Butylbenzene | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Tertiary-amyl methyl ether | 0.0548 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Tetrachloroethene | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Tetrahydrofuran | 0.0452 | 0.0200 | mg/kg wet | 0.05000 | | 90 | 70-130 | | | |
| Toluene | 0.0538 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| trans-1,2-Dichloroethene | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| trans-1,3-Dichloropropene | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Trichloroethene | 0.0537 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| Trichlorofluoromethane | 0.0456 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 40-160 | | | |
| Vinyl Chloride | 0.0520 | 0.0100 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| Xylene O | 0.0583 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | | | |
| Xylene P,M | 0.118 | 0.0100 | mg/kg wet | 0.1000 | | 118 | 70-130 | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0523* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0524* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0522* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0527* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0530 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 1 | 20 | |
| 1,1,1-Trichloroethane | 0.0525 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 3 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0526 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 40-160 | 5 | 20 | |
| 1,1,2-Trichloroethane | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 1 | 20 | |
| 1,1-Dichloroethane | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 2 | 20 | |
| 1,1-Dichloroethene | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 3 | 20 | |
| 1,1-Dichloropropene | 0.0518 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 4 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 3 | 20 | |
| 1,2,3-Trichloropropane | 0.0474 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 4 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0566 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | 5 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0584 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | 7 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0418 | 0.0050 | mg/kg wet | 0.05000 | | 84 | 70-130 | 0.7 | 20 | |
| 1,2-Dibromoethane | 0.0524 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 0.7 | 20 | |
| 1,2-Dichlorobenzene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 8 | 20 | |
| 1,2-Dichloroethane | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 1 | 20 | |
| 1,2-Dichloropropane | 0.0510 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 2 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0580 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 6 | 20 | |
| 1,3-Dichlorobenzene | 0.0549 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 7 | 20 | |
| 1,3-Dichloropropane | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 0.3 | 20 | |
| 1,4-Dichlorobenzene | 0.0557 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 7 | 20 | |
| 1,4-Dioxane | 0.818 | 0.100 | mg/kg wet | 1.000 | | 82 | 70-130 | 3 | 20 | |
| 2,2-Dichloropropane | 0.0526 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 4 | 20 | |
| 2-Butanone | 0.271 | 0.0500 | mg/kg wet | 0.2500 | | 108 | 40-160 | 5 | 20 | |
| 2-Chlorotoluene | 0.0572 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | 7 | 20 | |
| 2-Hexanone | 0.224 | 0.0500 | mg/kg wet | 0.2500 | | 90 | 40-160 | 2 | 20 | |
| 4-Chlorotoluene | 0.0566 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | 6 | 20 | |
| 4-Isopropyltoluene | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 6 | 20 | |
| 4-Methyl-2-Pentanone | 0.206 | 0.0500 | mg/kg wet | 0.2500 | | 82 | 40-160 | 5 | 20 | |
| Acetone | 0.227 | 0.0500 | mg/kg wet | 0.2500 | | 91 | 40-160 | 0.7 | 20 | |
| Benzene | 0.0525 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 2 | 20 | |
| Bromobenzene | 0.0560 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | 8 | 20 | |
| Bromochloromethane | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 2 | 20 | |
| Bromodichloromethane | 0.0573 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 0.9 | 20 | |
| Bromoform | 0.0472 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 40-160 | 1 | 20 | |
| Bromomethane | 0.0467 | 0.0100 | mg/kg wet | 0.05000 | | 93 | 40-160 | 2 | 20 | |
| Carbon Disulfide | 0.0550 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 5 | 20 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| Carbon Tetrachloride | 0.0523 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 3 | 20 | |
| Chlorobenzene | 0.0537 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 0.6 | 20 | |
| Chloroethane | 0.0511 | 0.0100 | mg/kg wet | 0.05000 | | 102 | 40-160 | 9 | 20 | |
| Chloroform | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 2 | 20 | |
| Chloromethane | 0.0566 | 0.0100 | mg/kg wet | 0.05000 | | 113 | 40-160 | 2 | 20 | |
| cis-1,2-Dichloroethene | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 2 | 20 | |
| cis-1,3-Dichloropropene | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 40-160 | 0.2 | 20 | |
| Dibromochloromethane | 0.0575 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 40-160 | 0.7 | 20 | |
| Dibromomethane | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 0.6 | 20 | |
| Dichlorodifluoromethane | 0.0422 | 0.0100 | mg/kg wet | 0.05000 | | 84 | 40-160 | 4 | 20 | |
| Diethyl Ether | 0.0465 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 2 | 20 | |
| Di-isopropyl ether | 0.0549 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 0.6 | 20 | |
| Ethyl tertiary-butyl ether | 0.0553 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 0.3 | 20 | |
| Ethylbenzene | 0.0553 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 1 | 20 | |
| Hexachlorobutadiene | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 40-160 | 5 | 20 | |
| Isopropylbenzene | 0.0629 | 0.0050 | mg/kg wet | 0.05000 | | 126 | 70-130 | 7 | 20 | |
| Methyl tert-Butyl Ether | 0.0542 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 0.2 | 20 | |
| Methylene Chloride | 0.0487 | 0.0250 | mg/kg wet | 0.05000 | | 97 | 70-130 | 7 | 20 | |
| Naphthalene | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 40-160 | 2 | 20 | |
| n-Butylbenzene | 0.0576 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 4 | 20 | |
| n-Propylbenzene | 0.0582 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 7 | 20 | |
| sec-Butylbenzene | 0.0584 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | 7 | 20 | |
| Styrene | 0.0559 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 40-160 | 0.6 | 20 | |
| tert-Butylbenzene | 0.0573 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 7 | 20 | |
| Tertiary-amyl methyl ether | 0.0546 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 0.3 | 20 | |
| Tetrachloroethene | 0.0520 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 3 | 20 | |
| Tetrahydrofuran | 0.0433 | 0.0200 | mg/kg wet | 0.05000 | | 87 | 70-130 | 4 | 20 | |
| Toluene | 0.0525 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 2 | 20 | |
| trans-1,2-Dichloroethene | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 2 | 20 | |
| trans-1,3-Dichloropropene | 0.0522 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 0.9 | 20 | |
| Trichloroethene | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 3 | 20 | |
| Trichlorofluoromethane | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | 7 | 20 | |
| Vinyl Chloride | 0.0509 | 0.0100 | mg/kg wet | 0.05000 | | 102 | 70-130 | 2 | 20 | |
| Xylene O | 0.0581 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 0.3 | 20 | |
| Xylene P,M | 0.117 | 0.0100 | mg/kg wet | 0.1000 | | 117 | 70-130 | 0.4 | 20 | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0522* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0510* | | mg/kg wet | *0.05000* | | *102* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0524* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0530* | | mg/kg wet | *0.05000* | | *106* | *70-130* | | | |
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41154 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41154 - 3546** | | | | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41154 - 3546** | | | | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyridine | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.50* | | mg/kg wet | *2.500* | | *100* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.54* | | mg/kg wet | *3.750* | | *94* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.83* | | mg/kg wet | *3.750* | | *102* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.32* | | mg/kg wet | *2.500* | | *93* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.81* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.50* | | mg/kg wet | *2.500* | | *100* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.11* | | mg/kg wet | *3.750* | | *110* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.55* | | mg/kg wet | *2.500* | | *102* | *30-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.42 | 0.025 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.07 | 0.250 | mg/kg wet | 2.500 | | 83 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.19 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.26 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 30-130 | | | |
| 2,4-Dimethylphenol | 2.26 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | | | |
| 2,4-Dinitrophenol | 2.83 | 1.00 | mg/kg wet | 2.500 | | 113 | 15-140 | | | |
| 2,4-Dinitrotoluene | 2.54 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| 2-Chloronaphthalene | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| 2-Chlorophenol | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 30-130 | | | |
| 2-Methylnaphthalene | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| 2-Methylphenol | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 15-140 | | | |
| 2-Nitrophenol | 2.15 | 0.500 | mg/kg wet | 2.500 | | 86 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.11 | 0.250 | mg/kg wet | 2.500 | | 84 | 40-140 | | | |
| 3+4-Methylphenol | 4.98 | 0.250 | mg/kg wet | 5.000 | | 100 | 15-140 | | | |
| 4-Bromophenyl-phenylether | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |
| 4-Chloroaniline | 2.01 | 0.250 | mg/kg wet | 2.500 | | 81 | 15-140 | | | |
| 4-Nitrophenol | 2.77 | 1.00 | mg/kg wet | 2.500 | | 111 | 15-140 | | | |
| Acenaphthene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41154 - 3546** | | | | | | | | | | |
| Acenaphthylene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Acetophenone | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Aniline | 2.01 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Anthracene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Azobenzene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Benzo(a)anthracene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Benzo(a)pyrene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.22 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 2.01 | 0.250 | mg/kg wet | 2.500 | | 80 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 2.08 | 0.250 | mg/kg wet | 2.500 | | 83 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.22 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Butylbenzylphthalate | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Chrysene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Dibenzofuran | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| Diethylphthalate | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Dimethylphthalate | 2.29 | 0.250 | mg/kg wet | 2.500 | | 91 | 15-140 | | | |
| Di-n-butylphthalate | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Di-n-octylphthalate | 2.30 | 0.500 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| Fluoranthene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Fluorene | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Hexachlorobenzene | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Hexachlorobutadiene | 1.95 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | | | |
| Hexachloroethane | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Isophorone | 1.99 | 0.250 | mg/kg wet | 2.500 | | 79 | 40-140 | | | |
| Naphthalene | 2.03 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Nitrobenzene | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| N-Nitrosodimethylamine | 2.89 | 0.250 | mg/kg wet | 2.500 | | 115 | 40-140 | | | |
| Pentachlorophenol | 2.23 | 1.00 | mg/kg wet | 2.500 | | 89 | 15-140 | | | |
| Phenanthrene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Phenol | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 15-140 | | | |
| Pyrene | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Pyridine | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.44* | | mg/kg wet | *2.500* | | *97* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.39* | | mg/kg wet | *3.750* | | *90* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.80* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.41* | | mg/kg wet | *2.500* | | *97* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.81* | | mg/kg wet | *3.750* | | *102* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.30* | | mg/kg wet | *2.500* | | *92* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.00* | | mg/kg wet | *3.750* | | *107* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.44* | | mg/kg wet | *2.500* | | *97* | *30-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41154 - 3546** | | | | | | | | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.43 | 0.025 | mg/kg wet | 2.500 | | 97 | 40-140 | 0.2 | 30 | |
| 1,2,4-Trichlorobenzene | 2.01 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | 3 | 30 | |
| 1,2-Dichlorobenzene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 4 | 30 | |
| 1,3-Dichlorobenzene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 6 | 30 | |
| 1,4-Dichlorobenzene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 6 | 30 | |
| 2,4,5-Trichlorophenol | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 30-130 | 4 | 30 | |
| 2,4,6-Trichlorophenol | 2.19 | 0.250 | mg/kg wet | 2.500 | | 88 | 30-130 | 1 | 30 | |
| 2,4-Dichlorophenol | 2.06 | 0.250 | mg/kg wet | 2.500 | | 83 | 30-130 | 1 | 30 | |
| 2,4-Dimethylphenol | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | 0.2 | 30 | |
| 2,4-Dinitrophenol | 2.92 | 1.00 | mg/kg wet | 2.500 | | 117 | 15-140 | 3 | 30 | |
| 2,4-Dinitrotoluene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 1 | 30 | |
| 2,6-Dinitrotoluene | 2.39 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 0.5 | 30 | |
| 2-Chloronaphthalene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 0.8 | 30 | |
| 2-Chlorophenol | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 30-130 | 7 | 30 | |
| 2-Methylnaphthalene | 2.06 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | 0.6 | 30 | |
| 2-Methylphenol | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 15-140 | 4 | 30 | |
| 2-Nitrophenol | 2.18 | 0.500 | mg/kg wet | 2.500 | | 87 | 30-130 | 1 | 30 | |
| 3,3´-Dichlorobenzidine | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | 5 | 30 | |
| 3+4-Methylphenol | 5.28 | 0.250 | mg/kg wet | 5.000 | | 106 | 15-140 | 6 | 30 | |
| 4-Bromophenyl-phenylether | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | 2 | 30 | |
| 4-Chloroaniline | 2.01 | 0.250 | mg/kg wet | 2.500 | | 80 | 15-140 | 0.1 | 30 | |
| 4-Nitrophenol | 2.86 | 1.00 | mg/kg wet | 2.500 | | 114 | 15-140 | 3 | 30 | |
| Acenaphthene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 0.006 | 30 | |
| Acenaphthylene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 2 | 30 | |
| Acetophenone | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 5 | 30 | |
| Aniline | 2.12 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | 5 | 30 | |
| Anthracene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 0.4 | 30 | |
| Azobenzene | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 0.8 | 30 | |
| Benzo(a)anthracene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 0.7 | 30 | |
| Benzo(a)pyrene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 2 | 30 | |
| Benzo(b)fluoranthene | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 0.4 | 30 | |
| Benzo(g,h,i)perylene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 1 | 30 | |
| Benzo(k)fluoranthene | 2.22 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | 0.2 | 30 | |
| bis(2-Chloroethoxy)methane | 1.96 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | 3 | 30 | |
| bis(2-Chloroethyl)ether | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 4 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | 2 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 3 | 30 | |
| Butylbenzylphthalate | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 2 | 30 | |
| Chrysene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 2 | 30 | |
| Dibenzo(a,h)Anthracene | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 2 | 30 | |
| Dibenzofuran | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 1 | 30 | |
| Diethylphthalate | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 1 | 30 | |
| Dimethylphthalate | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 15-140 | 2 | 30 | |
| Di-n-butylphthalate | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 0.1 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41154 - 3546** | | | | | | | | | | |
| Di-n-octylphthalate | 2.34 | 0.500 | mg/kg wet | 2.500 | | 94 | 40-140 | 2 | 30 | |
| Fluoranthene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 0.2 | 30 | |
| Fluorene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 0.5 | 30 | |
| Hexachlorobenzene | 2.14 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | 0.8 | 30 | |
| Hexachlorobutadiene | 1.89 | 0.250 | mg/kg wet | 2.500 | | 76 | 40-140 | 3 | 30 | |
| Hexachloroethane | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 6 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 0.2 | 30 | |
| Isophorone | 1.98 | 0.250 | mg/kg wet | 2.500 | | 79 | 40-140 | 0.1 | 30 | |
| Naphthalene | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | 0.4 | 30 | |
| Nitrobenzene | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | 0.1 | 30 | |
| N-Nitrosodimethylamine | 3.03 | 0.250 | mg/kg wet | 2.500 | | 121 | 40-140 | 5 | 30 | |
| Pentachlorophenol | 2.25 | 1.00 | mg/kg wet | 2.500 | | 90 | 15-140 | 0.7 | 30 | |
| Phenanthrene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 0.1 | 30 | |
| Phenol | 2.58 | 0.250 | mg/kg wet | 2.500 | | 103 | 15-140 | 3 | 30 | |
| Pyrene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 3 | 30 | |
| Pyridine | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 6 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.53* | | mg/kg wet | *2.500* | | *101* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.40* | | mg/kg wet | *3.750* | | *91* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.01* | | mg/kg wet | *3.750* | | *107* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.37* | | mg/kg wet | *2.500* | | *95* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.89* | | mg/kg wet | *3.750* | | *104* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.25* | | mg/kg wet | *2.500* | | *90* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.13* | | mg/kg wet | *3.750* | | *110* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.44* | | mg/kg wet | *2.500* | | *98* | *30-130* | | | |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF41206 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF41206 - 3540C** | | | | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0186* | | mg/kg wet | *0.02500* | | *75* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0211* | | mg/kg wet | *0.02500* | | *84* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0168* | | mg/kg wet | *0.02500* | | *67* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0162* | | mg/kg wet | *0.02500* | | *65* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 76 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.3 | 0.05 | mg/kg wet | 0.5000 | | 69 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 76 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 73 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0183* | | mg/kg wet | *0.02500* | | *73* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0194* | | mg/kg wet | *0.02500* | | *78* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0185* | | mg/kg wet | *0.02500* | | *74* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0168* | | mg/kg wet | *0.02500* | | *67* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 84 | 40-140 | 11 | 30 | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 78 | 40-140 | 12 | 30 | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 89 | 40-140 | 15 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 86 | 40-140 | 17 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0207* | | mg/kg wet | *0.02500* | | *83* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0228* | | mg/kg wet | *0.02500* | | *91* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0199* | | mg/kg wet | *0.02500* | | *80* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0179* | | mg/kg wet | *0.02500* | | *72* | *30-150* | | | |
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41106 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 4,4´-DDD | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDD [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Chlordane (Total) | ND | 0.0200 | mg/kg wet | | | | | | | |
| Chlordane (Total) [2C] | ND | 0.0200 | mg/kg wet | | | | | | | |
| delta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| delta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| 8081B Organochlorine Pesticides | | | | | | | | | | |
| **Batch DF41106 - 3546** | | | | | | | | | | |
| Dieldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) [2C] | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Toxaphene | ND | 0.125 | mg/kg wet | | | | | | | |
| Toxaphene [2C] | ND | 0.125 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0116* | | mg/kg wet | *0.01250* | | *93* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0125* | | mg/kg wet | *0.01250* | | *100* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0118* | | mg/kg wet | *0.01250* | | *94* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0130* | | mg/kg wet | *0.01250* | | *104* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 4,4´-DDD | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| 4,4´-DDD [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | | | |
| 4,4´-DDE | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| 4,4´-DDE [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| 4,4´-DDT | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| 4,4´-DDT [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Aldrin | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| Aldrin [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | | | |
| alpha-BHC | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| alpha-BHC [2C] | 0.0142 | 0.0025 | mg/kg wet | 0.01250 | | 114 | 40-140 | | | |
| alpha-Chlordane | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| alpha-Chlordane [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| beta-BHC | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| beta-BHC [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41106 - 3546** | | | | | | | | | | |
| delta-BHC | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| delta-BHC [2C] | 0.0122 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| Dieldrin | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| Dieldrin [2C] | 0.0138 | 0.0025 | mg/kg wet | 0.01250 | | 111 | 40-140 | | | |
| Endosulfan I | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Endosulfan I [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | | | |
| Endosulfan II | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | | | |
| Endosulfan II [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| Endosulfan Sulfate | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Endosulfan Sulfate [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | | | |
| Endrin | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Endrin [2C] | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| Endrin Ketone | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Endrin Ketone [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| gamma-BHC (Lindane) | 0.0127 | 0.0015 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| gamma-BHC (Lindane) [2C] | 0.0138 | 0.0015 | mg/kg wet | 0.01250 | | 110 | 40-140 | | | |
| gamma-Chlordane | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | | | |
| gamma-Chlordane [2C] | 0.0148 | 0.0025 | mg/kg wet | 0.01250 | | 118 | 40-140 | | | |
| Heptachlor | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Heptachlor [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| Heptachlor Epoxide | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Heptachlor Epoxide [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| Hexachlorobenzene | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | | | |
| Hexachlorobenzene [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| Methoxychlor | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | | | |
| Methoxychlor [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0130* | | mg/kg wet | *0.01250* | | *104* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0140* | | mg/kg wet | *0.01250* | | *112* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0124* | | mg/kg wet | *0.01250* | | *99* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0140* | | mg/kg wet | *0.01250* | | *112* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 4,4´-DDD | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 7 | 30 | |
| 4,4´-DDD [2C] | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | 8 | 30 | |
| 4,4´-DDE | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 6 | 30 | |
| 4,4´-DDE [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 5 | 30 | |
| 4,4´-DDT | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | 11 | 30 | |
| 4,4´-DDT [2C] | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | 11 | 30 | |
| Aldrin | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 1 | 30 | |
| Aldrin [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 0.7 | 30 | |
| alpha-BHC | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 2 | 30 | |
| alpha-BHC [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | 2 | 30 | |
| alpha-Chlordane | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 2 | 30 | |
| alpha-Chlordane [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 2 | 30 | |
| beta-BHC | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 3 | 30 | |
| beta-BHC [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 0.4 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41106 - 3546** | | | | | | | | | | |
| delta-BHC | 0.0101 | 0.0025 | mg/kg wet | 0.01250 | | 81 | 40-140 | 7 | 30 | |
| delta-BHC [2C] | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 5 | 30 | |
| Dieldrin | 0.0129 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | 2 | 30 | |
| Dieldrin [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | 2 | 30 | |
| Endosulfan I | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 2 | 30 | |
| Endosulfan I [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 2 | 30 | |
| Endosulfan II | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 5 | 30 | |
| Endosulfan II [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 6 | 30 | |
| Endosulfan Sulfate | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 8 | 30 | |
| Endosulfan Sulfate [2C] | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 8 | 30 | |
| Endrin | 0.0122 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | 4 | 30 | |
| Endrin [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 4 | 30 | |
| Endrin Ketone | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 9 | 30 | |
| Endrin Ketone [2C] | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 9 | 30 | |
| gamma-BHC (Lindane) | 0.0124 | 0.0015 | mg/kg wet | 0.01250 | | 99 | 40-140 | 3 | 30 | |
| gamma-BHC (Lindane) [2C] | 0.0136 | 0.0015 | mg/kg wet | 0.01250 | | 109 | 40-140 | 2 | 30 | |
| gamma-Chlordane | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 110 | 40-140 | 2 | 30 | |
| gamma-Chlordane [2C] | 0.0145 | 0.0025 | mg/kg wet | 0.01250 | | 116 | 40-140 | 2 | 30 | |
| Heptachlor | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 2 | 30 | |
| Heptachlor [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 1 | 30 | |
| Heptachlor Epoxide | 0.0124 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 2 | 30 | |
| Heptachlor Epoxide [2C] | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | 2 | 30 | |
| Hexachlorobenzene | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 2 | 30 | |
| Hexachlorobenzene [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 2 | 30 | |
| Methoxychlor | 0.0107 | 0.0025 | mg/kg wet | 0.01250 | | 85 | 40-140 | 9 | 30 | |
| Methoxychlor [2C] | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | 11 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0115* | | mg/kg wet | *0.01250* | | *92* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0124* | | mg/kg wet | *0.01250* | | *99* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0118* | | mg/kg wet | *0.01250* | | *94* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0134* | | mg/kg wet | *0.01250* | | *107* | *30-150* | | | |
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41259 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 2,4,5-T | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-T [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4-D | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-D [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-DB | ND | 0.048 | mg/kg wet | | | | | | | |
| 2,4-DB [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| Dalapon | ND | 0.046 | mg/kg wet | | | | | | | |
| Dalapon [2C] | ND | 0.046 | mg/kg wet | | | | | | | |
| Dicamba | ND | 0.009 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41259 - 3546** | | | | | | | | | | |
| Dicamba [2C] | ND | 0.009 | mg/kg wet | | | | | | | |
| Dichlorprop | ND | 0.047 | mg/kg wet | | | | | | | |
| Dichlorprop [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| Dinoseb | ND | 0.048 | mg/kg wet | | | | | | | |
| Dinoseb [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| MCPA | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPA [2C] | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPP | ND | 2.35 | mg/kg wet | | | | | | | |
| MCPP [2C] | ND | 2.35 | mg/kg wet | | | | | | | |
| *Surrogate: DCAA* | *0.186* | | mg/kg wet | *0.2000* | | *93* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.166* | | mg/kg wet | *0.2000* | | *83* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 2,4,5-T | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 70 | 40-140 | | | |
| 2,4,5-T [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 66 | 40-140 | | | |
| 2,4,5-TP (Silvex) | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 70 | 40-140 | | | |
| 2,4,5-TP (Silvex) [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | | | |
| 2,4-D | 0.133 | 0.047 | mg/kg wet | 0.1880 | | 71 | 40-140 | | | |
| 2,4-D [2C] | 0.124 | 0.047 | mg/kg wet | 0.1880 | | 66 | 40-140 | | | |
| 2,4-DB | 0.136 | 0.048 | mg/kg wet | 0.1900 | | 71 | 40-140 | | | |
| 2,4-DB [2C] | 0.138 | 0.048 | mg/kg wet | 0.1900 | | 73 | 40-140 | | | |
| Dalapon | 0.306 | 0.046 | mg/kg wet | 0.4550 | | 67 | 40-140 | | | |
| Dalapon [2C] | 0.316 | 0.046 | mg/kg wet | 0.4550 | | 69 | 40-140 | | | |
| Dicamba | 0.013 | 0.009 | mg/kg wet | 0.01880 | | 70 | 40-140 | | | |
| Dicamba [2C] | 0.014 | 0.009 | mg/kg wet | 0.01880 | | 76 | 40-140 | | | |
| Dichlorprop | 0.170 | 0.047 | mg/kg wet | 0.1880 | | 90 | 40-140 | | | |
| Dichlorprop [2C] | 0.146 | 0.047 | mg/kg wet | 0.1880 | | 77 | 40-140 | | | |
| Dinoseb | 0.016 | 0.048 | mg/kg wet | 0.09500 | | 17 | 10-100 | | | |
| Dinoseb [2C] | 0.017 | 0.048 | mg/kg wet | 0.09500 | | 18 | 10-100 | | | |
| MCPA | 15.3 | 2.32 | mg/kg wet | 18.60 | | 82 | 40-140 | | | |
| MCPA [2C] | 15.2 | 2.32 | mg/kg wet | 18.60 | | 82 | 40-140 | | | |
| MCPP | 14.4 | 2.35 | mg/kg wet | 18.80 | | 77 | 40-140 | | | |
| MCPP [2C] | 15.1 | 2.35 | mg/kg wet | 18.80 | | 80 | 40-140 | | | |
| *Surrogate: DCAA* | *0.208* | | mg/kg wet | *0.2000* | | *104* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.187* | | mg/kg wet | *0.2000* | | *93* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 2,4,5-T | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 72 | 40-140 | 3 | 30 | |
| 2,4,5-T [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | 3 | 30 | |
| 2,4,5-TP (Silvex) | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 72 | 40-140 | 3 | 30 | |
| 2,4,5-TP (Silvex) [2C] | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 72 | 40-140 | 6 | 30 | |
| 2,4-D | 0.137 | 0.047 | mg/kg wet | 0.1880 | | 73 | 40-140 | 3 | 30 | |
| 2,4-D [2C] | 0.128 | 0.047 | mg/kg wet | 0.1880 | | 68 | 40-140 | 4 | 30 | |
| 2,4-DB | 0.149 | 0.048 | mg/kg wet | 0.1900 | | 78 | 40-140 | 9 | 30 | |
| 2,4-DB [2C] | 0.144 | 0.048 | mg/kg wet | 0.1900 | | 76 | 40-140 | 4 | 30 | |
| Dalapon | 0.322 | 0.046 | mg/kg wet | 0.4550 | | 71 | 40-140 | 5 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41259 - 3546** | | | | | | | | | | |
| Dalapon [2C] | 0.331 | 0.046 | mg/kg wet | 0.4550 | | 73 | 40-140 | 5 | 30 | |
| Dicamba | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 64 | 40-140 | 9 | 30 | |
| Dicamba [2C] | 0.015 | 0.009 | mg/kg wet | 0.01880 | | 80 | 40-140 | 5 | 30 | |
| Dichlorprop | 0.179 | 0.047 | mg/kg wet | 0.1880 | | 95 | 40-140 | 6 | 30 | |
| Dichlorprop [2C] | 0.153 | 0.047 | mg/kg wet | 0.1880 | | 82 | 40-140 | 5 | 30 | |
| Dinoseb | 0.017 | 0.048 | mg/kg wet | 0.09500 | | 18 | 10-100 | 5 | 30 | |
| Dinoseb [2C] | 0.017 | 0.048 | mg/kg wet | 0.09500 | | 18 | 10-100 | 0 | 30 | |
| MCPA | 15.3 | 2.32 | mg/kg wet | 18.60 | | 82 | 40-140 | 0.2 | 30 | |
| MCPA [2C] | 15.7 | 2.32 | mg/kg wet | 18.60 | | 85 | 40-140 | 3 | 30 | |
| MCPP | 15.1 | 2.35 | mg/kg wet | 18.80 | | 80 | 40-140 | 4 | 30 | |
| MCPP [2C] | 15.8 | 2.35 | mg/kg wet | 18.80 | | 84 | 40-140 | 5 | 30 | |
| *Surrogate: DCAA* | *0.198* | | mg/kg wet | *0.2000* | | *99* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.175* | | mg/kg wet | *0.2000* | | *88* | *30-150* | | | |
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF41257 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Decane (C10) | ND | 0.2 | mg/kg wet | | | | | | | |
| Docosane (C22) | ND | 0.2 | mg/kg wet | | | | | | | |
| Dodecane (C12) | ND | 0.2 | mg/kg wet | | | | | | | |
| Eicosane (C20) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexacosane (C26) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexadecane (C16) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexatriacontane (C36) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonadecane (C19) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonane (C9) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octacosane (C28) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octadecane (C18) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetracosane (C24) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetradecane (C14) | ND | 0.2 | mg/kg wet | | | | | | | |
| Total Petroleum Hydrocarbons (C9-C36) | ND | 10.0 | mg/kg wet | | | | | | | |
| Triacontane (C30) | ND | 0.2 | mg/kg wet | | | | | | | |
| *Surrogate: O-Terphenyl* | *3.96* | | mg/kg wet | *5.000* | | *79* | *40-140* | | | |
| **LCS** | | | | | | | | | | |
| Decane (C10) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 74 | 40-140 | | | |
| Docosane (C22) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Dodecane (C12) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 79 | 40-140 | | | |
| Eicosane (C20) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Hexacosane (C26) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Hexadecane (C16) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Hexatriacontane (C36) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 69 | 40-140 | | | |
| Nonadecane (C19) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| Nonane (C9) | 1.6 | 0.2 | mg/kg wet | 2.500 | | 65 | 30-140 | | | |
| Octacosane (C28) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Octadecane (C18) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF41257 - 3546** | | | | | | | | | | |
| Tetracosane (C24) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | | | |
| Tetradecane (C14) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Total Petroleum Hydrocarbons (C9-C36) | 28.9 | 10.0 | mg/kg wet | 35.00 | | 83 | 40-140 | | | |
| Triacontane (C30) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| *Surrogate: O-Terphenyl* | *3.91* | | mg/kg wet | *5.000* | | *78* | *40-140* | | | |
| **LCS Dup** | | | | | | | | | | |
| Decane (C10) | 1.6 | 0.2 | mg/kg wet | 2.500 | | 63 | 40-140 | 15 | 25 | |
| Docosane (C22) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 69 | 40-140 | 17 | 25 | |
| Dodecane (C12) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 67 | 40-140 | 17 | 25 | |
| Eicosane (C20) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 68 | 40-140 | 17 | 25 | |
| Hexacosane (C26) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 17 | 25 | |
| Hexadecane (C16) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 69 | 40-140 | 17 | 25 | |
| Hexatriacontane (C36) | 1.4 | 0.2 | mg/kg wet | 2.500 | | 55 | 40-140 | 22 | 25 | |
| Nonadecane (C19) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 76 | 40-140 | 20 | 25 | |
| Nonane (C9) | 1.4 | 0.2 | mg/kg wet | 2.500 | | 57 | 30-140 | 13 | 25 | |
| Octacosane (C28) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 17 | 25 | |
| Octadecane (C18) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 68 | 40-140 | 18 | 25 | |
| Tetracosane (C24) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 67 | 40-140 | 17 | 25 | |
| Tetradecane (C14) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 69 | 40-140 | 17 | 25 | |
| Total Petroleum Hydrocarbons (C9-C36) | 24.2 | 10.0 | mg/kg wet | 35.00 | | 69 | 40-140 | 18 | 25 | |
| Triacontane (C30) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 19 | 25 | |
| *Surrogate: O-Terphenyl* | *3.36* | | mg/kg wet | *5.000* | | *67* | *40-140* | | | |
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DF41243 - General Preparation** | | | | | | | | | | |
| **Reference** | | | | | | | | | | |
| Flashpoint | 80 | | °F | 81.00 | | 99 | 97.9-102.1 | | | |
| **Batch DF41247 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Conductivity | ND | 5 | umhos/cm | | | | | | | |
| **LCS** | | | | | | | | | | |
| Conductivity | 1380 | | umhos/cm | 1410 | | 98 | 90-110 | | | |
| **Batch DF41272 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Reactive Cyanide | ND | 2.0 | mg/kg | | | | | | | |
| Reactive Sulfide | ND | 2.0 | mg/kg | | | | | | | |
| **LCS** | | | | | | | | | | |
| Reactive Cyanide | 4.2 | 2.0 | mg/kg | 100.3 | | 4 | 0.68-5.41 | | | |
| Reactive Sulfide | 2.1 | 2.0 | mg/kg | 10.00 | | 21 | 0-44 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

**Notes and Definitions**

| | |
|---|---|
| WL | Results obtained from a deionized water leach of the sample. |
| U | Analyte included in the analysis, but not detected |
| Q | Calibration required quadratic regression (Q). |
| D | Diluted. |
| CD+ | Continuing Calibration %Diff/Drift is above control limit (CD+). |
| > | Greater than. |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0379

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24F0379
Date Received: 6/11/2024
Project Due Date: 6/18/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 4.4 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? (Yes) / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: 10/11/24 Time: 17:50 By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 559041 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 559042 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 559043 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 2 | 559044 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 559045 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 559816 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 3 | 559046 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 559047 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 559048 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 4 | 559049 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 559050 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 559817 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 5 | 559051 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 5 | 559052 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 5 | 559053 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 6 | 559054 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 559055 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 559818 | Yes | N/A | Yes | 4 oz. Jar | NP | |

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

ESS Project ID: 24F0379
Date Received: 6/11/2024

**2nd Review**
**Were all containers scanned into storage/lab?** Initials TS

| | |
|---|---|
| Are barcode labels on correct containers? | Yes / No |
| Are all Flashpoint stickers attached/container ID # circled? | Yes / No / NA |
| Are all Hex Chrome stickers attached? | Yes / No / NA |
| Are all QC stickers attached? | Yes / No / NA |
| Are VOA stickers attached if bubbles noted? | Yes / No / NA |

Completed By: [signature] Date & Time: 6/11/24 1721

Reviewed By: [signature] Date & Time: 6/11/24 17:50

# ESS Laboratory

*Division of Thielsch Engineering, Inc.*
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

## CHAIN OF CUSTODY

ESS Lab # 24F0379

| | | |
|---|---|---|
| **Turn Time** | 5 | Days |
| **Regulatory State** | Massachusetts | |
| **Is this project for any of the following?:** | ○ CT RCP ◉ MA MCP ○ RGP | |

**Reporting Limits:** compare results to RCS-1, RCS-2, Lined and unlined landfills, TCLP, and 20X if needed.

**Electonic Deliverables:** ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) EDD

| | | |
|---|---|---|
| **Company Name** Civil and Environmental Consultants | **Project #** 332-344 | **Project Name** MassCEC Phase III - Site 4 |
| **Contact Person** Cassia Dal Bello | **Address** 31 Bellows Road | |
| **City** Raynham | **State** MA | **Zip Code** 02767 / **PO #** |
| **Telephone Number** 774-501-2176 | **FAX Number** | **Email Address** cdalbello; jkitchen, dbarboza@cecinc.com |

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | RCRA8 Metals | PCBs via 3540C | TPH | SVOC - incl pyr | Pest - incl Tox | Herbicides | Reactivity | Conductivity | pH | Free Liquid | Flashpoint | VOC - high | VOC - low | ~~Grain Size Analysis (Steve Only)~~ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6/10/24 | 10:10 | Solid | Soil | CEC-8A 9'-11' | | | | | | | | | | | | X | X | | | |
| 2 | | 10:15 | | | CEC-8A 0'-12' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 3 | | 10:45 | | | CEC-8A 19'-21' | | | | | | | | | | | | X | X | | | |
| 4 | | 10:55 | | | CEC-8A 12'-24' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 5 | | 11:50 | | | CEC-8A 29'-31' | | | | | | | | | | | | X | X | | | |
| 6 | | 12:25 | | | CEC-8A 24'-36' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Container Type:** AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | V | V | J | J | |
| **Container Volume:** 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7 | 7 | 10 | 9 | |
| **Preservation Code:** 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 10 | 1 | 1 | |
| **Number of Containers per Sample:** | 1 | | | | | 1 | | | | | 1 | 1 | 2 | 1 | 1 | |

**Laboratory Use Only**

Cooler Present: Yes ○ Drop Off
Seals Intact: ○ Pickup
Cooler Temperature: 4.9 °C IR

**Sampled by :** CI

**Comments:** Please specify "Other" preservative and containers types in this space

Run TCLP if fails 20x

| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
|---|---|---|---|
| Cassia N Dal Bello 6/11/24 | 6/11/24 11:37 | 6/11/24 16:58 | 6/11/24 11:58 |
| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
| | | | |

ESS Laboratory
DIVISION OF THE RISE GROUP
BAL Laboratory Analytical Balance

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC Phase III - Site 4 (332-344)**
**ESS Laboratory Work Order Number: 24F0472**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

**REVIEWED**
**By ESS Laboratory at 2:37 pm, Jun 24, 2024**

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

## SAMPLE RECEIPT

The following samples were received on June 12, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

**Low Level VOA vials were frozen by ESS Laboratory on 6/12/24 at 18:00**
**Tetrahydrofuran is reported above the MA CAM reporting limit of 0.010 mg/kg.**

**Question I: All samples for metals and EPH were analyzed for a subset of the required MCP list per the client's request.**

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 24F0472-01 | CEC-6A 9ft-11ft | Soil | 8260D Low |
| 24F0472-02 | CEC-6A 0ft-12ft | Soil | 1010A, 2550B, 6010D, 6020B, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24F0472-03 | CEC-6A 19ft-21ft | Soil | 8260D Low |
| 24F0472-04 | CEC-6A 12ft-24ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24F0472-05 | CEC-6A 29ft-31ft | Soil | 8260D Low |
| 24F0472-06 | CEC-6A 24ft-36ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

## PROJECT NARRATIVE

**Semi-Volatile Organic Compounds**

| | |
|---|---|
| D4F0245-CCV1 | **Calibration required quadratic regression (Q).** |
| | 2,4-Dinitrophenol (134% @ 40-160%) |
| D4F0245-CCV1 | **Continuing Calibration %Diff/Drift is above control limit (CD+).** |
| | N-Nitrosodimethylamine (26% @ 20%), Pyridine (25% @ 20%) |
| D4F0304-CCV1 | **Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration** |
| | 2,4-Dinitrophenol (107% @ 40-160%) |
| D4F0304-CCV1 | **Calibration required quadratic regression (Q).** |
| | 2,4-Dinitrophenol (107% @ 40-160%), Pentachlorophenol (110% @ 40-160%) |
| D4F0304-CCV1 | **Continuing Calibration %Diff/Drift is above control limit (CD+).** |
| | 2,4,6-Tribromophenol (25% @ 20%) |
| DF41253-BS1 | **Blank Spike recovery is above upper control limit (B+).** |
| | N-Nitrosodimethylamine (142% @ 40-140%) |
| DF41253-BSD1 | **Blank Spike recovery is above upper control limit (B+).** |
| | 2,4-Dinitrophenol (141% @ 15-140%) |

**Total Metals**

| | |
|---|---|
| 24F0472-04 | **Elevated Method Reporting Limits due to sample matrix (EL).** |
| | Arsenic |
| 24F0472-06 | **Elevated Method Reporting Limits due to sample matrix (EL).** |
| | Arsenic |

**Volatile Organics Low Level**

| | |
|---|---|
| D4F0279-CCV1 | **Calibration required quadratic regression (Q).** |
| | Naphthalene (94% @ 40-160%) |

**No other observations noted.**

**End of Project Narrative.**

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24F0472-01 through 24F0472-06**

Matrices: ( ) Ground Water/Surface Water (x) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| (x) 8260 VOC CAM II A | (x) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | ( ) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (x) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | (x) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (x) 6010 Metals CAM III A | (x) 6020 Metals CAM III D | (x) MassDEP EPH CAM IV B | (x) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (x) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (x) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (x) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (x) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes (x) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (x) No ( ) |

***Responses to Questions G, H and I below are required for '"Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? ***<u>Data User Note:</u> Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*** | Yes ( ) No (x)* |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (x)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes ( ) No (x)* |

****All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: June 24, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 9ft-11ft
Date Sampled: 06/11/24 12:35
Percent Solids: 89
Initial Volume: 7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,1,1-Trichloroethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,1,2,2-Tetrachloroethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,1,2-Trichloroethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,1-Dichloroethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,1-Dichloroethene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,1-Dichloropropene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,2,3-Trichlorobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,2,3-Trichloropropane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,2,4-Trichlorobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,2,4-Trimethylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,2-Dibromoethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,2-Dichlorobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,2-Dichloroethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,2-Dichloropropane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,3,5-Trimethylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,3-Dichlorobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,3-Dichloropropane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,4-Dichlorobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 1,4-Dioxane | ND (0.0805) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 2,2-Dichloropropane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 2-Butanone | ND (0.0402) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 2-Chlorotoluene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 2-Hexanone | ND (0.0402) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 4-Chlorotoluene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| 4-Isopropyltoluene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 9ft-11ft
Date Sampled: 06/11/24 12:35
Percent Solids: 89
Initial Volume: 7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0402) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| **Acetone** | **0.246** (0.0402) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Benzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Bromobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Bromochloromethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Bromodichloromethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Bromoform | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Bromomethane | ND (0.0080) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Carbon Disulfide | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Carbon Tetrachloride | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Chlorobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Chloroethane | ND (0.0080) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Chloroform | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Chloromethane | ND (0.0080) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| cis-1,2-Dichloroethene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| cis-1,3-Dichloropropene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Dibromochloromethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Dibromomethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Dichlorodifluoromethane | ND (0.0080) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Diethyl Ether | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Di-isopropyl ether | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Ethyl tertiary-butyl ether | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Ethylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Hexachlorobutadiene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Isopropylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Methyl tert-Butyl Ether | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Methylene Chloride | ND (0.0201) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 9ft-11ft
Date Sampled: 06/11/24 12:35
Percent Solids: 89
Initial Volume: 7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| n-Butylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| n-Propylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| sec-Butylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Styrene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| tert-Butylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Tertiary-amyl methyl ether | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Tetrachloroethene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Tetrahydrofuran | ND (0.0161) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Toluene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| trans-1,2-Dichloroethene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| trans-1,3-Dichloropropene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Trichloroethene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Trichlorofluoromethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Vinyl Chloride | ND (0.0080) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Xylene O | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Xylene P,M | ND (0.0080) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |
| Xylenes (Total) | ND (0.0080) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:11 | D4F0279 | DF41335 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *119 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *94 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *112 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *105 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 0ft-12ft
Date Sampled: 06/11/24 12:45
Percent Solids: 89

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **11.5** (1.13) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:30 | 5 100 | DF41307 |
| **Barium** | **10.7** (0.45) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:30 | 5 100 | DF41307 |
| Cadmium | ND (0.45) | --- | 6010D | --- | 2 | CEV | 06/14/24 22:11 | 5 100 | DF41307 |
| **Chromium** | **10.1** (0.45) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:30 | 5 100 | DF41307 |
| **Lead** | **13.3** (2.25) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:30 | 5 100 | DF41307 |
| Mercury | ND (0.037) | --- | 7471B | --- | 1 | AFV | 06/14/24 18:21 | 0.61 40 | DF41406 |
| Selenium | ND (0.90) | --- | 6020B | --- | 20 | BJV | 06/14/24 15:51 | 5 100 | DF41307 |
| Silver | ND (0.90) | --- | 6010D | --- | 4 | KJB | 06/18/24 12:39 | 5 100 | DF41307 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 0ft-12ft
Date Sampled: 06/11/24 12:45
Percent Solids: 89
Initial Volume: 19.4g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/12/24 17:20

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 1,2,4-Trichlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 1,2-Dichlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 1,3-Dichlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 1,4-Dichlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 2,4,5-Trichlorophenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 2,4,6-Trichlorophenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 2,4-Dichlorophenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 2,4-Dimethylphenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 2,4-Dinitrophenol | ND (1.16) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 2,4-Dinitrotoluene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 2,6-Dinitrotoluene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 2-Chloronaphthalene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 2-Chlorophenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 2-Methylnaphthalene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 2-Methylphenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 2-Nitrophenol | ND (0.581) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 3,3´-Dichlorobenzidine | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 3+4-Methylphenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 4-Bromophenyl-phenylether | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 4-Chloroaniline | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| 4-Nitrophenol | ND (1.16) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Acenaphthene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Acenaphthylene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Acetophenone | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Aniline | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Anthracene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 0ft-12ft
Date Sampled: 06/11/24 12:45
Percent Solids: 89
Initial Volume: 19.4g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/12/24 17:20

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Benzo(a)anthracene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Benzo(a)pyrene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Benzo(b)fluoranthene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Benzo(g,h,i)perylene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Benzo(k)fluoranthene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| bis(2-Chloroethoxy)methane | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| bis(2-Chloroethyl)ether | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| bis(2-chloroisopropyl)Ether | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| bis(2-Ethylhexyl)phthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Butylbenzylphthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Chrysene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Dibenzo(a,h)Anthracene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Dibenzofuran | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Diethylphthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Dimethylphthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Di-n-butylphthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Di-n-octylphthalate | ND (0.581) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Fluoranthene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Fluorene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Hexachlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Hexachlorobutadiene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Hexachloroethane | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Indeno(1,2,3-cd)Pyrene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Isophorone | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Naphthalene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Nitrobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 0ft-12ft
Date Sampled: 06/11/24 12:45
Percent Solids: 89
Initial Volume: 19.4g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/12/24 17:20

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Pentachlorophenol | ND (1.16) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Phenanthrene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Phenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Pyrene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |
| Pyridine | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/14/24 20:59 | D4F0304 | DF41253 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *67 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *89 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *71 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *76 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *69 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *74 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *69 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *94 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 0ft-12ft
Date Sampled: 06/11/24 12:45
Percent Solids: 89
Initial Volume: 19.4g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 17:25

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 15:55 | --- | DF41207 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 15:55 | --- | DF41207 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 15:55 | --- | DF41207 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 15:55 | --- | DF41207 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 15:55 | --- | DF41207 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 15:55 | --- | DF41207 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 15:55 | --- | DF41207 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 15:55 | --- | DF41207 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 15:55 | --- | DF41207 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *76 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *90 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 0ft-12ft
Date Sampled: 06/11/24 12:45
Percent Solids: 89
Initial Volume: 19.2g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 17:20

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| 4,4´-DDE | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| 4,4´-DDT | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Aldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| alpha-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| alpha-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| beta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Chlordane (Total) | ND (0.0235) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| delta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Dieldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Endosulfan I | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Endosulfan II | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Endosulfan Sulfate | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Endrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Endrin Ketone | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| gamma-BHC (Lindane) | ND (0.0018) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| gamma-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Heptachlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Heptachlor Epoxide | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Hexachlorobenzene | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Methoxychlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |
| Toxaphene | ND (0.147) | --- | 8081B | --- | 1 | 06/19/24 11:43 | D4F0373 | DF41208 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *89 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *100 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 0ft-12ft
Date Sampled: 06/11/24 12:45
Percent Solids: 89
Initial Volume: 10.2g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/19/24 16:00

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/21/24 16:14 | D4F0427 | DF41937 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/21/24 16:14 | D4F0427 | DF41937 |
| 2,4-D | ND (0.052) | --- | 8151A | --- | 1 | 06/21/24 16:14 | D4F0427 | DF41937 |
| 2,4-DB | ND (0.052) | --- | 8151A | --- | 1 | 06/21/24 16:14 | D4F0427 | DF41937 |
| Dalapon | ND (0.050) | --- | 8151A | --- | 1 | 06/21/24 16:14 | D4F0427 | DF41937 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/21/24 16:14 | D4F0427 | DF41937 |
| Dichlorprop | ND (0.052) | --- | 8151A | --- | 1 | 06/21/24 16:14 | D4F0427 | DF41937 |
| Dinoseb | ND (0.052) | --- | 8151A | --- | 1 | 06/21/24 16:14 | D4F0427 | DF41937 |
| MCPA | ND (2.57) | --- | 8151A | --- | 1 | 06/21/24 16:14 | D4F0427 | DF41937 |
| MCPP | ND (2.60) | --- | 8151A | --- | 1 | 06/21/24 16:14 | D4F0427 | DF41937 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *100 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 0ft-12ft
Date Sampled: 06/11/24 12:45
Percent Solids: 89
Initial Volume: 19g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/12/24 17:20

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **19.4** (11.9) | --- | 8100M | --- | 1 | 06/17/24 16:35 | --- | DF41257 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 69 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 0ft-12ft
Date Sampled: 06/11/24 12:45
Percent Solids: 89

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-02
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 214** (5) | --- | 9050A | --- | 1 | EEM | 06/13/24 17:00 | umhos/cm | DF41363 |
| **Corrosivity (pH)** | **8.55** (N/A) | --- | 9045 | --- | 1 | EAM | 06/12/24 19:52 | S.U. | DF41263 |
| **Corrosivity (pH) Sample Temp** | **20.5** | --- | 2550B | --- | 1 | EAM | 06/12/24 19:52 | °C | DF41263 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/12/24 20:45 | °F | DF41269 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/12/24 21:25 | ml/5 min | DF41164 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/13/24 15:08 | mg/kg | DF41272 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/13/24 15:08 | mg/kg | DF41272 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 19ft-21ft
Date Sampled: 06/11/24 13:10
Percent Solids: 87
Initial Volume: 6.3g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,1,1-Trichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,1,2,2-Tetrachloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,1,2-Trichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,1-Dichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,1-Dichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,1-Dichloropropene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,2,3-Trichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,2,3-Trichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,2,4-Trichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,2,4-Trimethylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,2-Dibromoethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,2-Dichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,2-Dichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,2-Dichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,3,5-Trimethylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,3-Dichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,3-Dichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,4-Dichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 1,4-Dioxane | ND (0.0908) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 2,2-Dichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 2-Butanone | ND (0.0454) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 2-Chlorotoluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 2-Hexanone | ND (0.0454) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 4-Chlorotoluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| 4-Isopropyltoluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 19ft-21ft
Date Sampled: 06/11/24 13:10
Percent Solids: 87
Initial Volume: 6.3g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0454) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| **Acetone** | **0.124** (0.0454) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Benzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Bromobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Bromochloromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Bromodichloromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Bromoform | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Bromomethane | ND (0.0091) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Carbon Disulfide | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Carbon Tetrachloride | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Chlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Chloroethane | ND (0.0091) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Chloroform | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Chloromethane | ND (0.0091) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| cis-1,2-Dichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| cis-1,3-Dichloropropene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Dibromochloromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Dibromomethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Dichlorodifluoromethane | ND (0.0091) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Diethyl Ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Di-isopropyl ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Ethyl tertiary-butyl ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Ethylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Hexachlorobutadiene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Isopropylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Methyl tert-Butyl Ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Methylene Chloride | ND (0.0227) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 19ft-21ft
Date Sampled: 06/11/24 13:10
Percent Solids: 87
Initial Volume: 6.3g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| n-Butylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| n-Propylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| sec-Butylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Styrene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| tert-Butylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Tertiary-amyl methyl ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Tetrachloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Tetrahydrofuran | ND (0.0182) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Toluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| trans-1,2-Dichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| trans-1,3-Dichloropropene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Trichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Trichlorofluoromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Vinyl Chloride | ND (0.0091) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Xylene O | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Xylene P,M | ND (0.0091) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |
| Xylenes (Total) | ND (0.0091) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 20:36 | D4F0279 | DF41335 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *118 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *97 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *112 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *104 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 12ft-24ft
Date Sampled: 06/11/24 13:15
Percent Solids: 87

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | **EL** ND (2.04) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:32 | 2.8 100 | DF41307 |
| **Barium** | **8.00** (0.82) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:32 | 2.8 100 | DF41307 |
| Cadmium | ND (0.41) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:32 | 2.8 100 | DF41307 |
| **Chromium** | **7.49** (0.82) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:32 | 2.8 100 | DF41307 |
| **Lead** | **9.55** (4.09) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:32 | 2.8 100 | DF41307 |
| Mercury | ND (0.035) | --- | 7471B | --- | 1 | AFV | 06/14/24 18:23 | 0.64 40 | DF41406 |
| Selenium | ND (4.09) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:32 | 2.8 100 | DF41307 |
| Silver | ND (0.41) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:32 | 2.8 100 | DF41307 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 12ft-24ft
Date Sampled: 06/11/24 13:15
Percent Solids: 87
Initial Volume: 19.4g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/12/24 17:20

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 1,2,4-Trichlorobenzene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 1,2-Dichlorobenzene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 1,3-Dichlorobenzene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 1,4-Dichlorobenzene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 2,4,5-Trichlorophenol | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 2,4,6-Trichlorophenol | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 2,4-Dichlorophenol | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 2,4-Dimethylphenol | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 2,4-Dinitrophenol | ND (1.18) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 2,4-Dinitrotoluene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 2,6-Dinitrotoluene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 2-Chloronaphthalene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 2-Chlorophenol | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 2-Methylnaphthalene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 2-Methylphenol | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 2-Nitrophenol | ND (0.590) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 3,3´-Dichlorobenzidine | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 3+4-Methylphenol | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 4-Bromophenyl-phenylether | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 4-Chloroaniline | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| 4-Nitrophenol | ND (1.18) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Acenaphthene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Acenaphthylene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Acetophenone | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Aniline | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Anthracene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 12ft-24ft
Date Sampled: 06/11/24 13:15
Percent Solids: 87
Initial Volume: 19.4g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/12/24 17:20

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Benzo(a)anthracene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Benzo(a)pyrene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Benzo(b)fluoranthene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Benzo(g,h,i)perylene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Benzo(k)fluoranthene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| bis(2-Chloroethoxy)methane | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| bis(2-Chloroethyl)ether | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| bis(2-chloroisopropyl)Ether | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| bis(2-Ethylhexyl)phthalate | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Butylbenzylphthalate | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Chrysene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Dibenzo(a,h)Anthracene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Dibenzofuran | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Diethylphthalate | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Dimethylphthalate | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Di-n-butylphthalate | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Di-n-octylphthalate | ND (0.590) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Fluoranthene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Fluorene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Hexachlorobenzene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Hexachlorobutadiene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Hexachloroethane | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Indeno(1,2,3-cd)Pyrene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Isophorone | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Naphthalene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Nitrobenzene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 12ft-24ft
Date Sampled: 06/11/24 13:15
Percent Solids: 87
Initial Volume: 19.4g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/12/24 17:20

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Pentachlorophenol | ND (1.18) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Phenanthrene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Phenol | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Pyrene | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |
| Pyridine | ND (0.295) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:29 | D4F0304 | DF41253 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *66 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *83 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *67 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *70 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *65 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *69 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *67 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *87 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 12ft-24ft
Date Sampled: 06/11/24 13:15
Percent Solids: 87
Initial Volume: 19.9g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 17:25

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:18 | --- | DF41207 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:18 | --- | DF41207 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:18 | --- | DF41207 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:18 | --- | DF41207 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:18 | --- | DF41207 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:18 | --- | DF41207 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:18 | --- | DF41207 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:18 | --- | DF41207 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:18 | --- | DF41207 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *80 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *85 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 12ft-24ft
Date Sampled: 06/11/24 13:15
Percent Solids: 87
Initial Volume: 19.4g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 17:20

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| 4,4´-DDE | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| 4,4´-DDT | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Aldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| alpha-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| alpha-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| beta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Chlordane (Total) | ND (0.0236) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| delta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Dieldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Endosulfan I | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Endosulfan II | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Endosulfan Sulfate | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Endrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Endrin Ketone | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| gamma-BHC (Lindane) | ND (0.0018) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| gamma-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Heptachlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Heptachlor Epoxide | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Hexachlorobenzene | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Methoxychlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |
| Toxaphene | ND (0.147) | --- | 8081B | --- | 1 | 06/19/24 12:11 | D4F0373 | DF41208 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *85 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *83 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 12ft-24ft
Date Sampled: 06/11/24 13:15
Percent Solids: 87
Initial Volume: 10.5g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/19/24 16:00

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/21/24 16:44 | D4F0427 | DF41937 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/21/24 16:44 | D4F0427 | DF41937 |
| 2,4-D | ND (0.051) | --- | 8151A | --- | 1 | 06/21/24 16:44 | D4F0427 | DF41937 |
| 2,4-DB | ND (0.052) | --- | 8151A | --- | 1 | 06/21/24 16:44 | D4F0427 | DF41937 |
| Dalapon | ND (0.050) | --- | 8151A | --- | 1 | 06/21/24 16:44 | D4F0427 | DF41937 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/21/24 16:44 | D4F0427 | DF41937 |
| Dichlorprop | ND (0.051) | --- | 8151A | --- | 1 | 06/21/24 16:44 | D4F0427 | DF41937 |
| Dinoseb | ND (0.052) | --- | 8151A | --- | 1 | 06/21/24 16:44 | D4F0427 | DF41937 |
| MCPA | ND (2.53) | --- | 8151A | --- | 1 | 06/21/24 16:44 | D4F0427 | DF41937 |
| MCPP | ND (2.56) | --- | 8151A | --- | 1 | 06/21/24 16:44 | D4F0427 | DF41937 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *100 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 12ft-24ft
Date Sampled: 06/11/24 13:15
Percent Solids: 87
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/12/24 17:20

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Total Petroleum Hydrocarbons (C9-C36) | ND (11.3) | --- | 8100M | --- | 1 | 06/17/24 17:22 | --- | DF41257 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | *54 %* | | *40-140* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 12ft-24ft
Date Sampled: 06/11/24 13:15
Percent Solids: 87

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-04
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 1550** (5) | --- | 9050A | --- | 1 | EEM | 06/13/24 17:00 | umhos/cm | DF41363 |
| **Corrosivity (pH)** | **8.94** (N/A) | --- | 9045 | --- | 1 | EAM | 06/12/24 19:52 | S.U. | DF41263 |
| **Corrosivity (pH) Sample Temp** | **20.5** | --- | 2550B | --- | 1 | EAM | 06/12/24 19:52 | °C | DF41263 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/12/24 20:45 | °F | DF41269 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/12/24 21:25 | ml/5 min | DF41164 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/13/24 15:08 | mg/kg | DF41272 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/13/24 15:08 | mg/kg | DF41272 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 29ft-31ft
Date Sampled: 06/11/24 13:55
Percent Solids: 92
Initial Volume: 6.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,1,1-Trichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,1,2,2-Tetrachloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,1,2-Trichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,1-Dichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,1-Dichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,1-Dichloropropene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,2,3-Trichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,2,3-Trichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,2,4-Trichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,2,4-Trimethylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,2-Dibromoethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,2-Dichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,2-Dichloroethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,2-Dichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,3,5-Trimethylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,3-Dichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,3-Dichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,4-Dichlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 1,4-Dioxane | ND (0.0891) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 2,2-Dichloropropane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 2-Butanone | ND (0.0445) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 2-Chlorotoluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 2-Hexanone | ND (0.0445) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 4-Chlorotoluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| 4-Isopropyltoluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 29ft-31ft
Date Sampled: 06/11/24 13:55
Percent Solids: 92
Initial Volume: 6.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0445) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| **Acetone** | **0.259** (0.0445) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Benzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Bromobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Bromochloromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Bromodichloromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Bromoform | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Bromomethane | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Carbon Disulfide | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Carbon Tetrachloride | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Chlorobenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Chloroethane | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Chloroform | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Chloromethane | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| cis-1,2-Dichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| cis-1,3-Dichloropropene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Dibromochloromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Dibromomethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Dichlorodifluoromethane | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Diethyl Ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Di-isopropyl ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Ethyl tertiary-butyl ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Ethylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Hexachlorobutadiene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Isopropylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Methyl tert-Butyl Ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Methylene Chloride | ND (0.0223) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 29ft-31ft
Date Sampled: 06/11/24 13:55
Percent Solids: 92
Initial Volume: 6.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/13/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| n-Butylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| n-Propylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| sec-Butylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Styrene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| tert-Butylbenzene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Tertiary-amyl methyl ether | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Tetrachloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Tetrahydrofuran | ND (0.0178) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Toluene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| trans-1,2-Dichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| trans-1,3-Dichloropropene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Trichloroethene | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Trichlorofluoromethane | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Vinyl Chloride | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Xylene O | ND (0.0045) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Xylene P,M | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |
| Xylenes (Total) | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/13/24 21:02 | D4F0279 | DF41335 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *119 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *100 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *112 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *104 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 24ft-36ft
Date Sampled: 06/11/24 14:25
Percent Solids: 92

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-06
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | **EL** ND (1.96) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:39 | 2.77 100 | DF41307 |
| **Barium** | **52.4** (0.78) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:39 | 2.77 100 | DF41307 |
| Cadmium | ND (0.39) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:39 | 2.77 100 | DF41307 |
| **Chromium** | **9.69** (0.78) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:39 | 2.77 100 | DF41307 |
| **Lead** | **8.59** (3.92) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:39 | 2.77 100 | DF41307 |
| Mercury | ND (0.036) | --- | 7471B | --- | 1 | AFV | 06/14/24 18:25 | 0.6 40 | DF41406 |
| Selenium | ND (3.92) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:39 | 2.77 100 | DF41307 |
| Silver | ND (0.39) | --- | 6010D | --- | 1 | KJB | 06/13/24 19:39 | 2.77 100 | DF41307 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 24ft-36ft
Date Sampled: 06/11/24 14:25
Percent Solids: 92
Initial Volume: 19.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/12/24 17:20

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 1,2,4-Trichlorobenzene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 1,2-Dichlorobenzene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 1,3-Dichlorobenzene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 1,4-Dichlorobenzene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 2,4,5-Trichlorophenol | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 2,4,6-Trichlorophenol | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 2,4-Dichlorophenol | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 2,4-Dimethylphenol | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 2,4-Dinitrophenol | ND (1.14) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 2,4-Dinitrotoluene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 2,6-Dinitrotoluene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 2-Chloronaphthalene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 2-Chlorophenol | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 2-Methylnaphthalene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 2-Methylphenol | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 2-Nitrophenol | ND (0.569) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 3,3´-Dichlorobenzidine | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 3+4-Methylphenol | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 4-Bromophenyl-phenylether | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 4-Chloroaniline | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| 4-Nitrophenol | ND (1.14) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Acenaphthene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Acenaphthylene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Acetophenone | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Aniline | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Anthracene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 24ft-36ft
Date Sampled: 06/11/24 14:25
Percent Solids: 92
Initial Volume: 19.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/12/24 17:20

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Benzo(a)anthracene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Benzo(a)pyrene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Benzo(b)fluoranthene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Benzo(g,h,i)perylene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Benzo(k)fluoranthene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| bis(2-Chloroethoxy)methane | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| bis(2-Chloroethyl)ether | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| bis(2-chloroisopropyl)Ether | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| bis(2-Ethylhexyl)phthalate | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Butylbenzylphthalate | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Chrysene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Dibenzo(a,h)Anthracene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Dibenzofuran | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Diethylphthalate | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Dimethylphthalate | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Di-n-butylphthalate | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Di-n-octylphthalate | ND (0.569) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Fluoranthene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Fluorene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Hexachlorobenzene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Hexachlorobutadiene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Hexachloroethane | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Indeno(1,2,3-cd)Pyrene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Isophorone | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Naphthalene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Nitrobenzene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 24ft-36ft
Date Sampled: 06/11/24 14:25
Percent Solids: 92
Initial Volume: 19.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/12/24 17:20

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Pentachlorophenol | ND (1.14) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Phenanthrene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Phenol | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Pyrene | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |
| Pyridine | ND (0.285) | --- | 8270E | --- | 1 | TJ | 06/14/24 21:59 | D4F0304 | DF41253 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *63 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *92 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *65 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *72 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *64 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *71 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *65 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *103 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 24ft-36ft
Date Sampled: 06/11/24 14:25
Percent Solids: 92
Initial Volume: 19.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 17:25

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:42 | --- | DF41207 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:42 | --- | DF41207 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:42 | --- | DF41207 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:42 | --- | DF41207 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:42 | --- | DF41207 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:42 | --- | DF41207 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:42 | --- | DF41207 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:42 | --- | DF41207 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/13/24 16:42 | --- | DF41207 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *80 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *79 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 24ft-36ft
Date Sampled: 06/11/24 14:25
Percent Solids: 92
Initial Volume: 19.5g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/12/24 17:20

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| 4,4´-DDE | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| 4,4´-DDT | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Aldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| alpha-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| alpha-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| beta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Chlordane (Total) | ND (0.0223) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| delta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Dieldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Endosulfan I | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Endosulfan II | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Endosulfan Sulfate | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Endrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Endrin Ketone | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| gamma-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Heptachlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Heptachlor Epoxide | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Hexachlorobenzene | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Methoxychlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |
| Toxaphene | ND (0.139) | --- | 8081B | --- | 1 | 06/19/24 12:38 | D4F0373 | DF41208 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *105 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *105 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 24ft-36ft
Date Sampled: 06/11/24 14:25
Percent Solids: 92
Initial Volume: 10.3g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/19/24 16:00

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/21/24 17:14 | D4F0427 | DF41937 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/21/24 17:14 | D4F0427 | DF41937 |
| 2,4-D | ND (0.050) | --- | 8151A | --- | 1 | 06/21/24 17:14 | D4F0427 | DF41937 |
| 2,4-DB | ND (0.050) | --- | 8151A | --- | 1 | 06/21/24 17:14 | D4F0427 | DF41937 |
| Dalapon | ND (0.048) | --- | 8151A | --- | 1 | 06/21/24 17:14 | D4F0427 | DF41937 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/21/24 17:14 | D4F0427 | DF41937 |
| Dichlorprop | ND (0.050) | --- | 8151A | --- | 1 | 06/21/24 17:14 | D4F0427 | DF41937 |
| Dinoseb | ND (0.050) | --- | 8151A | --- | 1 | 06/21/24 17:14 | D4F0427 | DF41937 |
| MCPA | ND (2.45) | --- | 8151A | --- | 1 | 06/21/24 17:14 | D4F0427 | DF41937 |
| MCPP | ND (2.48) | --- | 8151A | --- | 1 | 06/21/24 17:14 | D4F0427 | DF41937 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *97 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 24ft-36ft
Date Sampled: 06/11/24 14:25
Percent Solids: 92
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/12/24 17:20

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **27.7** (11.0) | --- | 8100M | --- | 1 | 06/17/24 18:13 | --- | DF41257 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 58 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-6A 24ft-36ft
Date Sampled: 06/11/24 14:25
Percent Solids: 92

ESS Laboratory Work Order: 24F0472
ESS Laboratory Sample ID: 24F0472-06
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 848** (5) | --- | 9050A | --- | 1 | EEM | 06/13/24 17:00 | umhos/cm | DF41363 |
| **Corrosivity (pH)** | **8.98** (N/A) | --- | 9045 | --- | 1 | EAM | 06/12/24 19:52 | S.U. | DF41263 |
| **Corrosivity (pH) Sample Temp** | **20.5** | --- | 2550B | --- | 1 | EAM | 06/12/24 19:52 | °C | DF41263 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/12/24 20:45 | °F | DF41269 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/12/24 21:25 | ml/5 min | DF41164 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/13/24 15:08 | mg/kg | DF41272 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/13/24 15:08 | mg/kg | DF41272 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DF41307 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Arsenic | ND | 2.50 | mg/kg wet | | | | | | | |
| Barium | ND | 1.00 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| **Blank** | | | | | | | | | | |
| Selenium | ND | 2.00 | mg/kg wet | | | | | | | , |
| **LCS** | | | | | | | | | | |
| Arsenic | 171 | 7.81 | mg/kg wet | 223.0 | | 76 | 70-102 | | | |
| Barium | 379 | 3.12 | mg/kg wet | 445.0 | | 85 | 78-111 | | | |
| Cadmium | 179 | 1.56 | mg/kg wet | 226.0 | | 79 | 74-105 | | | |
| Chromium | 196 | 3.12 | mg/kg wet | 230.0 | | 85 | 73-107 | | | |
| Lead | 236 | 15.6 | mg/kg wet | 275.0 | | 86 | 74-108 | | | |
| Selenium | 108 | 15.6 | mg/kg wet | 137.0 | | 79 | 71-109 | | | |
| Silver | 63.5 | 1.56 | mg/kg wet | 75.30 | | 84 | 72-110 | | | |
| **LCS** | | | | | | | | | | |
| Selenium | 73.5 | 30.3 | mg/kg wet | 82.70 | | 89 | 70-130 | | | |
| **LCS Dup** | | | | | | | | | | |
| Arsenic | 189 | 3.33 | mg/kg wet | 223.0 | | 85 | 70-102 | 10 | 30 | |
| Barium | 439 | 3.33 | mg/kg wet | 445.0 | | 99 | 78-111 | 15 | 30 | |
| Cadmium | 196 | 1.67 | mg/kg wet | 226.0 | | 87 | 74-105 | 9 | 30 | |
| Chromium | 215 | 3.33 | mg/kg wet | 230.0 | | 93 | 73-107 | 9 | 30 | |
| Lead | 253 | 16.7 | mg/kg wet | 275.0 | | 92 | 74-108 | 7 | 30 | |
| Selenium | 118 | 16.7 | mg/kg wet | 137.0 | | 86 | 71-109 | 9 | 30 | |
| Silver | 69.7 | 1.67 | mg/kg wet | 75.30 | | 93 | 72-110 | 9 | 30 | |
| **LCS Dup** | | | | | | | | | | |
| Selenium | 63.4 | 29.9 | mg/kg wet | 82.70 | | 77 | 70-130 | 15 | 30 | |
| **Batch DF41406 - 245.1/7470A** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Mercury | ND | 0.030 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 22.1 | 3.30 | mg/kg wet | 25.50 | | 87 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 20.8 | 2.96 | mg/kg wet | 25.50 | | 82 | 80-120 | 6 | 30 | |
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,1-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromoethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dioxane | ND | 0.100 | mg/kg wet | | | | | | | |
| 2,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Butanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 2-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Hexanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 4-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Isopropyltoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Methyl-2-Pentanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Acetone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Benzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromodichloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromoform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromomethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Carbon Disulfide | ND | 0.0050 | mg/kg wet | | | | | | | |
| Carbon Tetrachloride | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloroethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Chloroform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| cis-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| cis-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromomethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dichlorodifluoromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Diethyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| Di-isopropyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethyl tertiary-butyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Isopropylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methyl tert-Butyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methylene Chloride | ND | 0.0250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Propylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| sec-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Styrene | ND | 0.0050 | mg/kg wet | | | | | | | |
| tert-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tertiary-amyl methyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrachloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrahydrofuran | ND | 0.0200 | mg/kg wet | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichlorofluoromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Vinyl Chloride | ND | 0.0100 | mg/kg wet | | | | | | | |
| Xylene O | ND | 0.0050 | mg/kg wet | | | | | | | |
| Xylene P,M | ND | 0.0100 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0563* | | mg/kg wet | *0.05000* | | *113* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0495* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0544* | | mg/kg wet | *0.05000* | | *109* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0524* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 1,1,1-Trichloroethane | 0.0542 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| 1,1,2,2-Tetrachloroethane | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 40-160 | | | |
| 1,1,2-Trichloroethane | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,1-Dichloroethane | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,1-Dichloroethene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,1-Dichloropropene | 0.0538 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| 1,2,3-Trichlorobenzene | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| 1,2,3-Trichloropropane | 0.0455 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | | | |
| 1,2,4-Trichlorobenzene | 0.0540 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| 1,2,4-Trimethylbenzene | 0.0546 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| 1,2-Dibromo-3-Chloropropane | 0.0421 | 0.0050 | mg/kg wet | 0.05000 | | 84 | 70-130 | | | |
| 1,2-Dibromoethane | 0.0528 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| 1,2-Dichlorobenzene | 0.0503 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| 1,2-Dichloroethane | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| 1,2-Dichloropropane | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| 1,3,5-Trimethylbenzene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| 1,3-Dichlorobenzene | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,3-Dichloropropane | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| 1,4-Dichlorobenzene | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,4-Dioxane | 0.845 | 0.100 | mg/kg wet | 1.000 | | 85 | 70-130 | | | |
| 2,2-Dichloropropane | 0.0548 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| 2-Butanone | 0.259 | 0.0500 | mg/kg wet | 0.2500 | | 103 | 40-160 | | | |
| 2-Chlorotoluene | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 2-Hexanone | 0.219 | 0.0500 | mg/kg wet | 0.2500 | | 88 | 40-160 | | | |
| 4-Chlorotoluene | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 4-Isopropyltoluene | 0.0518 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 4-Methyl-2-Pentanone | 0.217 | 0.0500 | mg/kg wet | 0.2500 | | 87 | 40-160 | | | |
| Acetone | 0.228 | 0.0500 | mg/kg wet | 0.2500 | | 91 | 40-160 | | | |
| Benzene | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Bromobenzene | 0.0514 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| Bromochloromethane | 0.0524 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Bromodichloromethane | 0.0579 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | | | |
| Bromoform | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 40-160 | | | |
| Bromomethane | 0.0475 | 0.0100 | mg/kg wet | 0.05000 | | 95 | 40-160 | | | |
| Carbon Disulfide | 0.0578 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | | | |
| Carbon Tetrachloride | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Chlorobenzene | 0.0540 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Chloroethane | 0.0557 | 0.0100 | mg/kg wet | 0.05000 | | 111 | 40-160 | | | |
| Chloroform | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| Chloromethane | 0.0576 | 0.0100 | mg/kg wet | 0.05000 | | 115 | 40-160 | | | |
| cis-1,2-Dichloroethene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| cis-1,3-Dichloropropene | 0.0556 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 40-160 | | | |
| Dibromochloromethane | 0.0579 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 40-160 | | | |
| Dibromomethane | 0.0522 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| Dichlorodifluoromethane | 0.0442 | 0.0100 | mg/kg wet | 0.05000 | | 88 | 40-160 | | | |
| Diethyl Ether | 0.0473 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| Di-isopropyl ether | 0.0552 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Ethyl tertiary-butyl ether | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | | | |
| Ethylbenzene | 0.0561 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | | | |
| Hexachlorobutadiene | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 40-160 | | | |
| Isopropylbenzene | 0.0587 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | | | |
| Methyl tert-Butyl Ether | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Methylene Chloride | 0.0524 | 0.0250 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Naphthalene | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | | | |
| n-Butylbenzene | 0.0552 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| n-Propylbenzene | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| sec-Butylbenzene | 0.0546 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| Styrene | 0.0562 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 40-160 | | | |
| tert-Butylbenzene | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Tertiary-amyl methyl ether | 0.0548 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| Tetrachloroethene | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Tetrahydrofuran | 0.0452 | 0.0200 | mg/kg wet | 0.05000 | | 90 | 70-130 | | | |
| Toluene | 0.0538 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| trans-1,2-Dichloroethene | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| trans-1,3-Dichloropropene | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Trichloroethene | 0.0537 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Trichlorofluoromethane | 0.0456 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 40-160 | | | |
| Vinyl Chloride | 0.0520 | 0.0100 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| Xylene O | 0.0583 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | | | |
| Xylene P,M | 0.118 | 0.0100 | mg/kg wet | 0.1000 | | 118 | 70-130 | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0523* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0524* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0522* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0527* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0530 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 1 | 20 | |
| 1,1,1-Trichloroethane | 0.0525 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 3 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0526 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 40-160 | 5 | 20 | |
| 1,1,2-Trichloroethane | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 1 | 20 | |
| 1,1-Dichloroethane | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 2 | 20 | |
| 1,1-Dichloroethene | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 3 | 20 | |
| 1,1-Dichloropropene | 0.0518 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 4 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 3 | 20 | |
| 1,2,3-Trichloropropane | 0.0474 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 4 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0566 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | 5 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0584 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | 7 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0418 | 0.0050 | mg/kg wet | 0.05000 | | 84 | 70-130 | 0.7 | 20 | |
| 1,2-Dibromoethane | 0.0524 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 0.7 | 20 | |
| 1,2-Dichlorobenzene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 8 | 20 | |
| 1,2-Dichloroethane | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 1 | 20 | |
| 1,2-Dichloropropane | 0.0510 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 2 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0580 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 6 | 20 | |
| 1,3-Dichlorobenzene | 0.0549 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 7 | 20 | |
| 1,3-Dichloropropane | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 0.3 | 20 | |
| 1,4-Dichlorobenzene | 0.0557 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 7 | 20 | |
| 1,4-Dioxane | 0.818 | 0.100 | mg/kg wet | 1.000 | | 82 | 70-130 | 3 | 20 | |
| 2,2-Dichloropropane | 0.0526 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 4 | 20 | |
| 2-Butanone | 0.271 | 0.0500 | mg/kg wet | 0.2500 | | 108 | 40-160 | 5 | 20 | |
| 2-Chlorotoluene | 0.0572 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | 7 | 20 | |
| 2-Hexanone | 0.224 | 0.0500 | mg/kg wet | 0.2500 | | 90 | 40-160 | 2 | 20 | |
| 4-Chlorotoluene | 0.0566 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | 6 | 20 | |
| 4-Isopropyltoluene | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 6 | 20 | |
| 4-Methyl-2-Pentanone | 0.206 | 0.0500 | mg/kg wet | 0.2500 | | 82 | 40-160 | 5 | 20 | |
| Acetone | 0.227 | 0.0500 | mg/kg wet | 0.2500 | | 91 | 40-160 | 0.7 | 20 | |
| Benzene | 0.0525 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 2 | 20 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF41335 - 5035** | | | | | | | | | | |
| Bromobenzene | 0.0560 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | 8 | 20 | |
| Bromochloromethane | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 2 | 20 | |
| Bromodichloromethane | 0.0573 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 0.9 | 20 | |
| Bromoform | 0.0472 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 40-160 | 1 | 20 | |
| Bromomethane | 0.0467 | 0.0100 | mg/kg wet | 0.05000 | | 93 | 40-160 | 2 | 20 | |
| Carbon Disulfide | 0.0550 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 5 | 20 | |
| Carbon Tetrachloride | 0.0523 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 3 | 20 | |
| Chlorobenzene | 0.0537 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 0.6 | 20 | |
| Chloroethane | 0.0511 | 0.0100 | mg/kg wet | 0.05000 | | 102 | 40-160 | 9 | 20 | |
| Chloroform | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 2 | 20 | |
| Chloromethane | 0.0566 | 0.0100 | mg/kg wet | 0.05000 | | 113 | 40-160 | 2 | 20 | |
| cis-1,2-Dichloroethene | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 2 | 20 | |
| cis-1,3-Dichloropropene | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 40-160 | 0.2 | 20 | |
| Dibromochloromethane | 0.0575 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 40-160 | 0.7 | 20 | |
| Dibromomethane | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 0.6 | 20 | |
| Dichlorodifluoromethane | 0.0422 | 0.0100 | mg/kg wet | 0.05000 | | 84 | 40-160 | 4 | 20 | |
| Diethyl Ether | 0.0465 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 2 | 20 | |
| Di-isopropyl ether | 0.0549 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 0.6 | 20 | |
| Ethyl tertiary-butyl ether | 0.0553 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 0.3 | 20 | |
| Ethylbenzene | 0.0553 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 1 | 20 | |
| Hexachlorobutadiene | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 40-160 | 5 | 20 | |
| Isopropylbenzene | 0.0629 | 0.0050 | mg/kg wet | 0.05000 | | 126 | 70-130 | 7 | 20 | |
| Methyl tert-Butyl Ether | 0.0542 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 0.2 | 20 | |
| Methylene Chloride | 0.0487 | 0.0250 | mg/kg wet | 0.05000 | | 97 | 70-130 | 7 | 20 | |
| Naphthalene | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 40-160 | 2 | 20 | |
| n-Butylbenzene | 0.0576 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 4 | 20 | |
| n-Propylbenzene | 0.0582 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 7 | 20 | |
| sec-Butylbenzene | 0.0584 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | 7 | 20 | |
| Styrene | 0.0559 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 40-160 | 0.6 | 20 | |
| tert-Butylbenzene | 0.0573 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 7 | 20 | |
| Tertiary-amyl methyl ether | 0.0546 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 0.3 | 20 | |
| Tetrachloroethene | 0.0520 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 3 | 20 | |
| Tetrahydrofuran | 0.0433 | 0.0200 | mg/kg wet | 0.05000 | | 87 | 70-130 | 4 | 20 | |
| Toluene | 0.0525 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 2 | 20 | |
| trans-1,2-Dichloroethene | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 2 | 20 | |
| trans-1,3-Dichloropropene | 0.0522 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 0.9 | 20 | |
| Trichloroethene | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 3 | 20 | |
| Trichlorofluoromethane | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | 7 | 20 | |
| Vinyl Chloride | 0.0509 | 0.0100 | mg/kg wet | 0.05000 | | 102 | 70-130 | 2 | 20 | |
| Xylene O | 0.0581 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 0.3 | 20 | |
| Xylene P,M | 0.117 | 0.0100 | mg/kg wet | 0.1000 | | 117 | 70-130 | 0.4 | 20 | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0522* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0510* | | mg/kg wet | *0.05000* | | *102* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0524* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0530* | | mg/kg wet | *0.05000* | | *106* | *70-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41253 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41253 - 3546** | | | | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyridine | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.73* | | mg/kg wet | *2.500* | | *109* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.77* | | mg/kg wet | *3.750* | | *100* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.18* | | mg/kg wet | *3.750* | | *112* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.54* | | mg/kg wet | *2.500* | | *102* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.19* | | mg/kg wet | *3.750* | | *112* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.73* | | mg/kg wet | *2.500* | | *109* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.45* | | mg/kg wet | *3.750* | | *119* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.73* | | mg/kg wet | *2.500* | | *109* | *30-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.81 | 0.025 | mg/kg wet | 2.500 | | 112 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.58 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.74 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.79 | 0.250 | mg/kg wet | 2.500 | | 111 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.64 | 0.250 | mg/kg wet | 2.500 | | 106 | 30-130 | | | |
| 2,4-Dimethylphenol | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | | | |
| 2,4-Dinitrophenol | 3.49 | 1.00 | mg/kg wet | 2.500 | | 140 | 15-140 | | | |
| 2,4-Dinitrotoluene | 2.92 | 0.250 | mg/kg wet | 2.500 | | 117 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.84 | 0.250 | mg/kg wet | 2.500 | | 114 | 40-140 | | | |
| 2-Chloronaphthalene | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | | | |
| 2-Chlorophenol | 2.88 | 0.250 | mg/kg wet | 2.500 | | 115 | 30-130 | | | |
| 2-Methylnaphthalene | 2.66 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | | | |
| 2-Methylphenol | 2.94 | 0.250 | mg/kg wet | 2.500 | | 117 | 15-140 | | | |
| 2-Nitrophenol | 2.75 | 0.500 | mg/kg wet | 2.500 | | 110 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.62 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| 3+4-Methylphenol | 3.69 | 0.250 | mg/kg wet | 5.000 | | 74 | 15-140 | | | |
| 4-Bromophenyl-phenylether | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41253 - 3546** | | | | | | | | | | |
| 4-Chloroaniline | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 15-140 | | | |
| 4-Nitrophenol | 3.29 | 1.00 | mg/kg wet | 2.500 | | 132 | 15-140 | | | |
| Acenaphthene | 2.72 | 0.250 | mg/kg wet | 2.500 | | 109 | 40-140 | | | |
| Acenaphthylene | 2.62 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| Acetophenone | 2.89 | 0.250 | mg/kg wet | 2.500 | | 116 | 40-140 | | | |
| Aniline | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| Anthracene | 2.80 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | | | |
| Azobenzene | 2.94 | 0.250 | mg/kg wet | 2.500 | | 118 | 40-140 | | | |
| Benzo(a)anthracene | 2.77 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | | | |
| Benzo(a)pyrene | 2.82 | 0.250 | mg/kg wet | 2.500 | | 113 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.80 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.96 | 0.250 | mg/kg wet | 2.500 | | 119 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.74 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 2.83 | 0.250 | mg/kg wet | 2.500 | | 113 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 2.61 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.64 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | | | |
| Butylbenzylphthalate | 2.88 | 0.250 | mg/kg wet | 2.500 | | 115 | 40-140 | | | |
| Chrysene | 2.85 | 0.250 | mg/kg wet | 2.500 | | 114 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.90 | 0.250 | mg/kg wet | 2.500 | | 116 | 40-140 | | | |
| Dibenzofuran | 2.75 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | | | |
| Diethylphthalate | 2.77 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | | | |
| Dimethylphthalate | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 15-140 | | | |
| Di-n-butylphthalate | 2.81 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | | | |
| Di-n-octylphthalate | 2.69 | 0.500 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| Fluoranthene | 2.95 | 0.250 | mg/kg wet | 2.500 | | 118 | 40-140 | | | |
| Fluorene | 2.81 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | | | |
| Hexachlorobenzene | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | | | |
| Hexachlorobutadiene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Hexachloroethane | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.93 | 0.250 | mg/kg wet | 2.500 | | 117 | 40-140 | | | |
| Isophorone | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| Naphthalene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Nitrobenzene | 2.74 | 0.250 | mg/kg wet | 2.500 | | 109 | 40-140 | | | |
| N-Nitrosodimethylamine | 3.56 | 0.250 | mg/kg wet | 2.500 | | 142 | 40-140 | | | B+ |
| Pentachlorophenol | 2.56 | 1.00 | mg/kg wet | 2.500 | | 103 | 15-140 | | | |
| Phenanthrene | 2.76 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | | | |
| Phenol | 3.03 | 0.250 | mg/kg wet | 2.500 | | 121 | 15-140 | | | |
| Pyrene | 2.82 | 0.250 | mg/kg wet | 2.500 | | 113 | 40-140 | | | |
| Pyridine | 2.20 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.96* | | mg/kg wet | *2.500* | | *118* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.99* | | mg/kg wet | *3.750* | | *106* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.51* | | mg/kg wet | *3.750* | | *120* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.76* | | mg/kg wet | *2.500* | | *110* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.52* | | mg/kg wet | *3.750* | | *120* | *30-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41253 - 3546** | | | | | | | | | | |
| *Surrogate: Nitrobenzene-d5* | *2.82* | | mg/kg wet | *2.500* | | *113* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.78* | | mg/kg wet | *3.750* | | *128* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.84* | | mg/kg wet | *2.500* | | *113* | *30-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.69 | 0.025 | mg/kg wet | 2.500 | | 107 | 40-140 | 4 | 30 | |
| 1,2,4-Trichlorobenzene | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 6 | 30 | |
| 1,2-Dichlorobenzene | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | 4 | 30 | |
| 1,3-Dichlorobenzene | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 6 | 30 | |
| 1,4-Dichlorobenzene | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 5 | 30 | |
| 2,4,5-Trichlorophenol | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 30-130 | 4 | 30 | |
| 2,4,6-Trichlorophenol | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 30-130 | 3 | 30 | |
| 2,4-Dichlorophenol | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 30-130 | 5 | 30 | |
| 2,4-Dimethylphenol | 2.11 | 0.250 | mg/kg wet | 2.500 | | 85 | 30-130 | 8 | 30 | |
| 2,4-Dinitrophenol | 3.54 | 1.00 | mg/kg wet | 2.500 | | 141 | 15-140 | 1 | 30 | B+ |
| 2,4-Dinitrotoluene | 2.88 | 0.250 | mg/kg wet | 2.500 | | 115 | 40-140 | 1 | 30 | |
| 2,6-Dinitrotoluene | 2.75 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | 3 | 30 | |
| 2-Chloronaphthalene | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 5 | 30 | |
| 2-Chlorophenol | 2.75 | 0.250 | mg/kg wet | 2.500 | | 110 | 30-130 | 5 | 30 | |
| 2-Methylnaphthalene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 6 | 30 | |
| 2-Methylphenol | 2.71 | 0.250 | mg/kg wet | 2.500 | | 108 | 15-140 | 8 | 30 | |
| 2-Nitrophenol | 2.63 | 0.500 | mg/kg wet | 2.500 | | 105 | 30-130 | 5 | 30 | |
| 3,3´-Dichlorobenzidine | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 7 | 30 | |
| 3+4-Methylphenol | 3.48 | 0.250 | mg/kg wet | 5.000 | | 70 | 15-140 | 6 | 30 | |
| 4-Bromophenyl-phenylether | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 7 | 30 | |
| 4-Chloroaniline | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 15-140 | 6 | 30 | |
| 4-Nitrophenol | 3.28 | 1.00 | mg/kg wet | 2.500 | | 131 | 15-140 | 0.3 | 30 | |
| Acenaphthene | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 5 | 30 | |
| Acenaphthylene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 4 | 30 | |
| Acetophenone | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 4 | 30 | |
| Aniline | 2.10 | 0.250 | mg/kg wet | 2.500 | | 84 | 40-140 | 5 | 30 | |
| Anthracene | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | 6 | 30 | |
| Azobenzene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 5 | 30 | |
| Benzo(a)anthracene | 2.62 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | 6 | 30 | |
| Benzo(a)pyrene | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 5 | 30 | |
| Benzo(b)fluoranthene | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | 4 | 30 | |
| Benzo(g,h,i)perylene | 2.77 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 7 | 30 | |
| Benzo(k)fluoranthene | 2.66 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 3 | 30 | |
| bis(2-Chloroethoxy)methane | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 5 | 30 | |
| bis(2-Chloroethyl)ether | 2.62 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | 7 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 8 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.53 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 4 | 30 | |
| Butylbenzylphthalate | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | 6 | 30 | |
| Chrysene | 2.69 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | 6 | 30 | |
| Dibenzo(a,h)Anthracene | 2.69 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| Dibenzofuran | 2.66 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 4 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF41253 - 3546** | | | | | | | | | | |
| Diethylphthalate | 2.64 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | 5 | 30 | |
| Dimethylphthalate | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 15-140 | 2 | 30 | |
| Di-n-butylphthalate | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 5 | 30 | |
| Di-n-octylphthalate | 2.60 | 0.500 | mg/kg wet | 2.500 | | 104 | 40-140 | 3 | 30 | |
| Fluoranthene | 2.75 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | 7 | 30 | |
| Fluorene | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | 4 | 30 | |
| Hexachlorobenzene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 7 | 30 | |
| Hexachlorobutadiene | 2.24 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 6 | 30 | |
| Hexachloroethane | 2.59 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | 4 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.74 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | 7 | 30 | |
| Isophorone | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 6 | 30 | |
| Naphthalene | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 5 | 30 | |
| Nitrobenzene | 2.59 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | 6 | 30 | |
| N-Nitrosodimethylamine | 3.35 | 0.250 | mg/kg wet | 2.500 | | 134 | 40-140 | 6 | 30 | |
| Pentachlorophenol | 2.42 | 1.00 | mg/kg wet | 2.500 | | 97 | 15-140 | 6 | 30 | |
| Phenanthrene | 2.61 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 5 | 30 | |
| Phenol | 2.80 | 0.250 | mg/kg wet | 2.500 | | 112 | 15-140 | 8 | 30 | |
| Pyrene | 2.69 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | 5 | 30 | |
| Pyridine | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | 1 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.77* | | mg/kg wet | *2.500* | | *111* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.87* | | mg/kg wet | *3.750* | | *103* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.31* | | mg/kg wet | *3.750* | | *115* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.62* | | mg/kg wet | *2.500* | | *105* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.23* | | mg/kg wet | *3.750* | | *113* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.73* | | mg/kg wet | *2.500* | | *109* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.54* | | mg/kg wet | *3.750* | | *121* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.73* | | mg/kg wet | *2.500* | | *109* | *30-130* | | | |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF41207 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF41207 - 3540C** | | | | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0245* | | mg/kg wet | *0.02500* | | *98* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0256* | | mg/kg wet | *0.02500* | | *103* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0221* | | mg/kg wet | *0.02500* | | *88* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0233* | | mg/kg wet | *0.02500* | | *93* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 92 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 96 | 40-140 | | | |
| Aroclor 1260 | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 101 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 102 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0242* | | mg/kg wet | *0.02500* | | *97* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0253* | | mg/kg wet | *0.02500* | | *101* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0209* | | mg/kg wet | *0.02500* | | *84* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0217* | | mg/kg wet | *0.02500* | | *87* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 96 | 40-140 | 4 | 30 | |
| Aroclor 1016 [2C] | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 102 | 40-140 | 6 | 30 | |
| Aroclor 1260 | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 105 | 40-140 | 4 | 30 | |
| Aroclor 1260 [2C] | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 106 | 40-140 | 5 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0251* | | mg/kg wet | *0.02500* | | *100* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0263* | | mg/kg wet | *0.02500* | | *105* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0221* | | mg/kg wet | *0.02500* | | *88* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0228* | | mg/kg wet | *0.02500* | | *91* | *30-150* | | | |
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41208 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 4,4´-DDD | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDD [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Chlordane (Total) | ND | 0.0200 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41208 - 3546** | | | | | | | | | | |
| Chlordane (Total) [2C] | ND | 0.0200 | mg/kg wet | | | | | | | |
| delta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| delta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) [2C] | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Toxaphene | ND | 0.125 | mg/kg wet | | | | | | | |
| Toxaphene [2C] | ND | 0.125 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0131* | | mg/kg wet | *0.01250* | | *105* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0136* | | mg/kg wet | *0.01250* | | *109* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0126* | | mg/kg wet | *0.01250* | | *101* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0126* | | mg/kg wet | *0.01250* | | *101* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 4,4´-DDD | 0.0148 | 0.0025 | mg/kg wet | 0.01250 | | 119 | 40-140 | | | |
| 4,4´-DDD [2C] | 0.0149 | 0.0025 | mg/kg wet | 0.01250 | | 120 | 40-140 | | | |
| 4,4´-DDE | 0.0142 | 0.0025 | mg/kg wet | 0.01250 | | 113 | 40-140 | | | |
| 4,4´-DDE [2C] | 0.0142 | 0.0025 | mg/kg wet | 0.01250 | | 114 | 40-140 | | | |
| 4,4´-DDT | 0.0146 | 0.0025 | mg/kg wet | 0.01250 | | 117 | 40-140 | | | |
| 4,4´-DDT [2C] | 0.0152 | 0.0025 | mg/kg wet | 0.01250 | | 122 | 40-140 | | | |
| Aldrin | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | | | |
| Aldrin [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| alpha-BHC | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 109 | 40-140 | | | |
| alpha-BHC [2C] | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 109 | 40-140 | | | |
| alpha-Chlordane | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41208 - 3546** | | | | | | | | | | |
| alpha-Chlordane [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| beta-BHC | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | | | |
| beta-BHC [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | | | |
| delta-BHC | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | | | |
| delta-BHC [2C] | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Dieldrin | 0.0145 | 0.0025 | mg/kg wet | 0.01250 | | 116 | 40-140 | | | |
| Dieldrin [2C] | 0.0147 | 0.0025 | mg/kg wet | 0.01250 | | 117 | 40-140 | | | |
| Endosulfan I | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| Endosulfan I [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | | | |
| Endosulfan II | 0.0142 | 0.0025 | mg/kg wet | 0.01250 | | 113 | 40-140 | | | |
| Endosulfan II [2C] | 0.0143 | 0.0025 | mg/kg wet | 0.01250 | | 114 | 40-140 | | | |
| Endosulfan Sulfate | 0.0136 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| Endosulfan Sulfate [2C] | 0.0142 | 0.0025 | mg/kg wet | 0.01250 | | 114 | 40-140 | | | |
| Endrin | 0.0138 | 0.0025 | mg/kg wet | 0.01250 | | 111 | 40-140 | | | |
| Endrin [2C] | 0.0141 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | | | |
| Endrin Ketone | 0.0150 | 0.0025 | mg/kg wet | 0.01250 | | 120 | 40-140 | | | |
| Endrin Ketone [2C] | 0.0153 | 0.0025 | mg/kg wet | 0.01250 | | 122 | 40-140 | | | |
| gamma-BHC (Lindane) | 0.0133 | 0.0015 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| gamma-BHC (Lindane) [2C] | 0.0134 | 0.0015 | mg/kg wet | 0.01250 | | 107 | 40-140 | | | |
| gamma-Chlordane | 0.0151 | 0.0025 | mg/kg wet | 0.01250 | | 121 | 40-140 | | | |
| gamma-Chlordane [2C] | 0.0152 | 0.0025 | mg/kg wet | 0.01250 | | 121 | 40-140 | | | |
| Heptachlor | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | | | |
| Heptachlor [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| Heptachlor Epoxide | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | | | |
| Heptachlor Epoxide [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| Hexachlorobenzene | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | | | |
| Hexachlorobenzene [2C] | 0.0122 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| Methoxychlor | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 109 | 40-140 | | | |
| Methoxychlor [2C] | 0.0141 | 0.0025 | mg/kg wet | 0.01250 | | 113 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0136* | | mg/kg wet | *0.01250* | | *109* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0140* | | mg/kg wet | *0.01250* | | *112* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0125* | | mg/kg wet | *0.01250* | | *100* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0127* | | mg/kg wet | *0.01250* | | *102* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 4,4´-DDD | 0.0142 | 0.0025 | mg/kg wet | 0.01250 | | 113 | 40-140 | 5 | 30 | |
| 4,4´-DDD [2C] | 0.0143 | 0.0025 | mg/kg wet | 0.01250 | | 115 | 40-140 | 4 | 30 | |
| 4,4´-DDE | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 110 | 40-140 | 3 | 30 | |
| 4,4´-DDE [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | 2 | 30 | |
| 4,4´-DDT | 0.0139 | 0.0025 | mg/kg wet | 0.01250 | | 111 | 40-140 | 5 | 30 | |
| 4,4´-DDT [2C] | 0.0144 | 0.0025 | mg/kg wet | 0.01250 | | 115 | 40-140 | 6 | 30 | |
| Aldrin | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 0.009 | 30 | |
| Aldrin [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 0.1 | 30 | |
| alpha-BHC | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | 1 | 30 | |
| alpha-BHC [2C] | 0.0136 | 0.0025 | mg/kg wet | 0.01250 | | 109 | 40-140 | 0.4 | 30 | |
| alpha-Chlordane | 0.0129 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 0.7 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF41208 - 3546** | | | | | | | | | | |
| alpha-Chlordane [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 0.3 | 30 | |
| beta-BHC | 0.0124 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 0.8 | 30 | |
| beta-BHC [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 0.8 | 30 | |
| delta-BHC | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | 2 | 30 | |
| delta-BHC [2C] | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 2 | 30 | |
| Dieldrin | 0.0144 | 0.0025 | mg/kg wet | 0.01250 | | 116 | 40-140 | 0.7 | 30 | |
| Dieldrin [2C] | 0.0146 | 0.0025 | mg/kg wet | 0.01250 | | 117 | 40-140 | 0.4 | 30 | |
| Endosulfan I | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 0.5 | 30 | |
| Endosulfan I [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 0.2 | 30 | |
| Endosulfan II | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | 4 | 30 | |
| Endosulfan II [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | 2 | 30 | |
| Endosulfan Sulfate | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 6 | 30 | |
| Endosulfan Sulfate [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | 5 | 30 | |
| Endrin | 0.0136 | 0.0025 | mg/kg wet | 0.01250 | | 109 | 40-140 | 1 | 30 | |
| Endrin [2C] | 0.0139 | 0.0025 | mg/kg wet | 0.01250 | | 111 | 40-140 | 1 | 30 | |
| Endrin Ketone | 0.0141 | 0.0025 | mg/kg wet | 0.01250 | | 113 | 40-140 | 6 | 30 | |
| Endrin Ketone [2C] | 0.0145 | 0.0025 | mg/kg wet | 0.01250 | | 116 | 40-140 | 6 | 30 | |
| gamma-BHC (Lindane) | 0.0131 | 0.0015 | mg/kg wet | 0.01250 | | 105 | 40-140 | 0.8 | 30 | |
| gamma-BHC (Lindane) [2C] | 0.0133 | 0.0015 | mg/kg wet | 0.01250 | | 107 | 40-140 | 0.4 | 30 | |
| gamma-Chlordane | 0.0150 | 0.0025 | mg/kg wet | 0.01250 | | 120 | 40-140 | 0.6 | 30 | |
| gamma-Chlordane [2C] | 0.0151 | 0.0025 | mg/kg wet | 0.01250 | | 121 | 40-140 | 0.2 | 30 | |
| Heptachlor | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 0.8 | 30 | |
| Heptachlor [2C] | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 0.6 | 30 | |
| Heptachlor Epoxide | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 0.1 | 30 | |
| Heptachlor Epoxide [2C] | 0.0136 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | 0.1 | 30 | |
| Hexachlorobenzene | 0.0124 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 0.8 | 30 | |
| Hexachlorobenzene [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | 0.8 | 30 | |
| Methoxychlor | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 6 | 30 | |
| Methoxychlor [2C] | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 7 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0125* | | mg/kg wet | *0.01250* | | *100* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0130* | | mg/kg wet | *0.01250* | | *104* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0123* | | mg/kg wet | *0.01250* | | *98* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0126* | | mg/kg wet | *0.01250* | | *101* | *30-150* | | | |
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41937 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 2,4,5-T | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-T [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4-D | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-D [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-DB | ND | 0.048 | mg/kg wet | | | | | | | |
| 2,4-DB [2C] | ND | 0.048 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41937 - 3546** | | | | | | | | | | |
| Dalapon | ND | 0.046 | mg/kg wet | | | | | | | |
| Dalapon [2C] | ND | 0.046 | mg/kg wet | | | | | | | |
| Dicamba | ND | 0.009 | mg/kg wet | | | | | | | |
| Dicamba [2C] | ND | 0.009 | mg/kg wet | | | | | | | |
| Dichlorprop | ND | 0.047 | mg/kg wet | | | | | | | |
| Dichlorprop [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| Dinoseb | ND | 0.048 | mg/kg wet | | | | | | | |
| Dinoseb [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| MCPA | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPA [2C] | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPP | ND | 2.35 | mg/kg wet | | | | | | | |
| MCPP [2C] | ND | 2.35 | mg/kg wet | | | | | | | |
| *Surrogate: DCAA* | *0.203* | | mg/kg wet | *0.2000* | | *102* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.180* | | mg/kg wet | *0.2000* | | *90* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 2,4,5-T | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 76 | 40-140 | | | |
| 2,4,5-T [2C] | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 72 | 40-140 | | | |
| 2,4,5-TP (Silvex) | 0.016 | 0.010 | mg/kg wet | 0.01900 | | 82 | 40-140 | | | |
| 2,4,5-TP (Silvex) [2C] | 0.015 | 0.010 | mg/kg wet | 0.01900 | | 78 | 40-140 | | | |
| 2,4-D | 0.141 | 0.047 | mg/kg wet | 0.1880 | | 75 | 40-140 | | | |
| 2,4-D [2C] | 0.130 | 0.047 | mg/kg wet | 0.1880 | | 69 | 40-140 | | | |
| 2,4-DB | 0.163 | 0.048 | mg/kg wet | 0.1900 | | 86 | 40-140 | | | |
| 2,4-DB [2C] | 0.165 | 0.048 | mg/kg wet | 0.1900 | | 87 | 40-140 | | | |
| Dalapon | 0.309 | 0.046 | mg/kg wet | 0.4550 | | 68 | 40-140 | | | |
| Dalapon [2C] | 0.309 | 0.046 | mg/kg wet | 0.4550 | | 68 | 40-140 | | | |
| Dicamba | 0.014 | 0.009 | mg/kg wet | 0.01880 | | 74 | 40-140 | | | |
| Dicamba [2C] | 0.015 | 0.009 | mg/kg wet | 0.01880 | | 82 | 40-140 | | | |
| Dichlorprop | 0.194 | 0.047 | mg/kg wet | 0.1880 | | 103 | 40-140 | | | |
| Dichlorprop [2C] | 0.159 | 0.047 | mg/kg wet | 0.1880 | | 85 | 40-140 | | | |
| Dinoseb | 0.016 | 0.048 | mg/kg wet | 0.09500 | | 17 | 10-100 | | | |
| Dinoseb [2C] | 0.016 | 0.048 | mg/kg wet | 0.09500 | | 17 | 10-100 | | | |
| MCPA | 16.3 | 2.32 | mg/kg wet | 18.60 | | 87 | 40-140 | | | |
| MCPA [2C] | 16.5 | 2.32 | mg/kg wet | 18.60 | | 89 | 40-140 | | | |
| MCPP | 16.2 | 2.35 | mg/kg wet | 18.80 | | 86 | 40-140 | | | |
| MCPP [2C] | 16.4 | 2.35 | mg/kg wet | 18.80 | | 87 | 40-140 | | | |
| *Surrogate: DCAA* | *0.220* | | mg/kg wet | *0.2000* | | *110* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.190* | | mg/kg wet | *0.2000* | | *95* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 2,4,5-T | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 74 | 40-140 | 3 | 30 | |
| 2,4,5-T [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | 6 | 30 | |
| 2,4,5-TP (Silvex) | 0.015 | 0.010 | mg/kg wet | 0.01900 | | 78 | 40-140 | 5 | 30 | |
| 2,4,5-TP (Silvex) [2C] | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 74 | 40-140 | 5 | 30 | |
| 2,4-D | 0.136 | 0.047 | mg/kg wet | 0.1880 | | 72 | 40-140 | 3 | 30 | |
| 2,4-D [2C] | 0.124 | 0.047 | mg/kg wet | 0.1880 | | 66 | 40-140 | 4 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41937 - 3546** | | | | | | | | | | |
| 2,4-DB | 0.156 | 0.048 | mg/kg wet | 0.1900 | | 82 | 40-140 | 4 | 30 | |
| 2,4-DB [2C] | 0.157 | 0.048 | mg/kg wet | 0.1900 | | 83 | 40-140 | 5 | 30 | |
| Dalapon | 0.317 | 0.046 | mg/kg wet | 0.4550 | | 70 | 40-140 | 3 | 30 | |
| Dalapon [2C] | 0.316 | 0.046 | mg/kg wet | 0.4550 | | 69 | 40-140 | 2 | 30 | |
| Dicamba | 0.014 | 0.009 | mg/kg wet | 0.01880 | | 74 | 40-140 | 0 | 30 | |
| Dicamba [2C] | 0.015 | 0.009 | mg/kg wet | 0.01880 | | 78 | 40-140 | 5 | 30 | |
| Dichlorprop | 0.189 | 0.047 | mg/kg wet | 0.1880 | | 101 | 40-140 | 2 | 30 | |
| Dichlorprop [2C] | 0.157 | 0.047 | mg/kg wet | 0.1880 | | 83 | 40-140 | 2 | 30 | |
| Dinoseb | 0.016 | 0.048 | mg/kg wet | 0.09500 | | 16 | 10-100 | 5 | 30 | |
| Dinoseb [2C] | 0.016 | 0.048 | mg/kg wet | 0.09500 | | 16 | 10-100 | 5 | 30 | |
| MCPA | 15.8 | 2.32 | mg/kg wet | 18.60 | | 85 | 40-140 | 3 | 30 | |
| MCPA [2C] | 16.2 | 2.32 | mg/kg wet | 18.60 | | 87 | 40-140 | 2 | 30 | |
| MCPP | 16.0 | 2.35 | mg/kg wet | 18.80 | | 85 | 40-140 | 2 | 30 | |
| MCPP [2C] | 15.6 | 2.35 | mg/kg wet | 18.80 | | 83 | 40-140 | 5 | 30 | |
| *Surrogate: DCAA* | *0.207* | | mg/kg wet | *0.2000* | | *103* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.178* | | mg/kg wet | *0.2000* | | *89* | *30-150* | | | |
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF41257 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Decane (C10) | ND | 0.2 | mg/kg wet | | | | | | | |
| Docosane (C22) | ND | 0.2 | mg/kg wet | | | | | | | |
| Dodecane (C12) | ND | 0.2 | mg/kg wet | | | | | | | |
| Eicosane (C20) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexacosane (C26) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexadecane (C16) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexatriacontane (C36) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonadecane (C19) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonane (C9) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octacosane (C28) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octadecane (C18) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetracosane (C24) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetradecane (C14) | ND | 0.2 | mg/kg wet | | | | | | | |
| Total Petroleum Hydrocarbons (C9-C36) | ND | 10.0 | mg/kg wet | | | | | | | |
| Triacontane (C30) | ND | 0.2 | mg/kg wet | | | | | | | |
| *Surrogate: O-Terphenyl* | *3.96* | | mg/kg wet | *5.000* | | *79* | *40-140* | | | |
| **LCS** | | | | | | | | | | |
| Decane (C10) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 74 | 40-140 | | | |
| Docosane (C22) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Dodecane (C12) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 79 | 40-140 | | | |
| Eicosane (C20) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Hexacosane (C26) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Hexadecane (C16) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Hexatriacontane (C36) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 69 | 40-140 | | | |
| Nonadecane (C19) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF41257 - 3546** | | | | | | | | | | |
| Nonane (C9) | 1.6 | 0.2 | mg/kg wet | 2.500 | | 65 | 30-140 | | | |
| Octacosane (C28) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Octadecane (C18) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Tetracosane (C24) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | | | |
| Tetradecane (C14) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Total Petroleum Hydrocarbons (C9-C36) | 28.9 | 10.0 | mg/kg wet | 35.00 | | 83 | 40-140 | | | |
| Triacontane (C30) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| *Surrogate: O-Terphenyl* | *3.91* | | mg/kg wet | *5.000* | | *78* | *40-140* | | | |
| **LCS Dup** | | | | | | | | | | |
| Decane (C10) | 1.6 | 0.2 | mg/kg wet | 2.500 | | 63 | 40-140 | 15 | 25 | |
| Docosane (C22) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 69 | 40-140 | 17 | 25 | |
| Dodecane (C12) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 67 | 40-140 | 17 | 25 | |
| Eicosane (C20) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 68 | 40-140 | 17 | 25 | |
| Hexacosane (C26) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 17 | 25 | |
| Hexadecane (C16) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 69 | 40-140 | 17 | 25 | |
| Hexatriacontane (C36) | 1.4 | 0.2 | mg/kg wet | 2.500 | | 55 | 40-140 | 22 | 25 | |
| Nonadecane (C19) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 76 | 40-140 | 20 | 25 | |
| Nonane (C9) | 1.4 | 0.2 | mg/kg wet | 2.500 | | 57 | 30-140 | 13 | 25 | |
| Octacosane (C28) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 17 | 25 | |
| Octadecane (C18) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 68 | 40-140 | 18 | 25 | |
| Tetracosane (C24) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 67 | 40-140 | 17 | 25 | |
| Tetradecane (C14) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 69 | 40-140 | 17 | 25 | |
| Total Petroleum Hydrocarbons (C9-C36) | 24.2 | 10.0 | mg/kg wet | 35.00 | | 69 | 40-140 | 18 | 25 | |
| Triacontane (C30) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 19 | 25 | |
| *Surrogate: O-Terphenyl* | *3.36* | | mg/kg wet | *5.000* | | *67* | *40-140* | | | |
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DF41269 - General Preparation** | | | | | | | | | | |
| **Reference** | | | | | | | | | | |
| Flashpoint | 80 | | °F | 81.00 | | 99 | 97.9-102.1 | | | |
| **Batch DF41272 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Reactive Cyanide | ND | 2.0 | mg/kg | | | | | | | |
| Reactive Sulfide | ND | 2.0 | mg/kg | | | | | | | |
| **LCS** | | | | | | | | | | |
| Reactive Cyanide | 4.2 | 2.0 | mg/kg | 100.3 | | 4 | 0.68-5.41 | | | |
| Reactive Sulfide | 2.1 | 2.0 | mg/kg | 10.00 | | 21 | 0-44 | | | |
| **Batch DF41363 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Conductivity | ND | 5 | umhos/cm | | | | | | | |
| **LCS** | | | | | | | | | | |
| Conductivity | 1380 | | umhos/cm | 1410 | | 98 | 90-110 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

**Notes and Definitions**

| | |
|---|---|
| WL | Results obtained from a deionized water leach of the sample. |
| U | Analyte included in the analysis, but not detected |
| RRF | Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration |
| Q | Calibration required quadratic regression (Q). |
| EL | Elevated Method Reporting Limits due to sample matrix (EL). |
| D | Diluted. |
| CD+ | Continuing Calibration %Diff/Drift is above control limit (CD+). |
| B+ | Blank Spike recovery is above upper control limit (B+). |
| > | Greater than. |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0472

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24F0472
Date Received: 6/12/2024
Project Due Date: 6/19/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 4.7 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: 6/12/24 Time: 1500 By: TD

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted: Date: Time: By:

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 560286 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 1 | 560289 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 560290 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 2 | 560295 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 560296 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 560301 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 3 | 560287 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 3 | 560291 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 560292 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 4 | 560297 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 560298 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 560302 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 5 | 560288 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 5 | 560293 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 5 | 560294 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 6 | 560299 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 560300 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 560303 | Yes | N/A | Yes | 4 oz. Jar | NP | |

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

ESS Project ID: 24F0472

Date Received: 6/12/2024

**2nd Review**

**Were all containers scanned into storage/lab?** Initials MM

Are barcode labels on correct containers? Yes / No

Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA

Are all Hex Chrome stickers attached? Yes / No / NA

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: [signature] Date & Time: 6/12/24 1705

Reviewed By: [signature] Date & Time: 6/12/24 1300

# ESS Laboratory

*Division of Thielsch Engineering, Inc.*
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

## CHAIN OF CUSTODY

ESS Lab # 24F0472

| | | |
|---|---|---|
| **Turn Time** | 5 | Days |
| **Regulatory State** | Massachusetts | |

**Reporting Limits:** compare results to RCS-1, RCS-2, Lined and unlined landfills, TCLP, and 20X if needed.

**Is this project for any of the following?:** ○ CT RCP ◉ MA MCP ○ RGP

**Electonic Deliverables:** ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) EDD

| Company Name | Project # | Project Name |
|---|---|---|
| Civil and Environmental Consultants | 332-344 | MassCEC Phase III - Site #4 |

| Contact Person | Address |
|---|---|
| Cassia Dal Bello | 31 Bellows Road |

| City | State | Zip Code | PO # |
|---|---|---|---|
| Raynham | MA | 02767 | |

| Telephone Number | FAX Number | Email Address |
|---|---|---|
| 774-501-2176 | | cdalbello; jkitchen, dbarboza@cecinc.com |

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | RCRA8 Metals | PCBs via 3540C | TPH | SVOC - incl pyr | Pest - incl Tox | Herbicides | Reactivity | Conductivity | pH | Free Liquid | Flashpoint | VOC - high | VOC - low | Grain Size Analysis (State Only) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6/11/24 | 12:35 | Solid | Soil | CEC-6A 9'-11' | | | | | | | | | | | | X | X | | | |
| 2 | | 12:45 | | | CEC-6A 0'-12' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 3 | | 13:10 | | | CEC-6A 19'-21' | | | | | | | | | | | | X | X | | | |
| 4 | | 13:15 | | | CEC-6A 12'-24' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 5 | | 13:55 | | | CEC-6A 29'-31' | | | | | | | | | | | | X | X | | | |
| 6 | ↓ | 14:25 | ↓ | ↓ | CEC-6A 24'-36' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Container Type:** | AC-Air Cassette | AG-Amber Glass | B-BOD Bottle | C-Cubitainer | J-Jar | O-Other | P-Poly | S-Sterile | V-Vial | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | V | V | J | J |
| **Container Volume:** | 1-100 mL | 2-2.5 gal | 3-250 mL | 4-300 mL | 5-500 mL | 6-1L | 7-VOA | 8-2 oz | 9-4 oz | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7 | 7 | 10 | 9 |
| **Preservation Code:** | 1-Non Preserved | 2-HCl | 3-H2SO4 | 4-HNO3 | 5-NaOH | 6-Methanol | 7-Na2S2O3 | 8-ZnAce, NaOH | 9-NH4Cl | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 10 | 1 | 1 |
| | 10-DI H2O | 11-Other* | | | | | | | | | | | | | | | | | | | | | |
| **Number of Containers per Sample:** | | | | | | | | | | 1 | | | | | 1 | | | | 1 | 1 | 2 | 1 | 1 |

**Laboratory Use Only**

Cooler Present: Yes ○ Drop Off
Seals Intact: ○ Pickup
Cooler Temperature: 4.7 °C IR

**Sampled by :** CI

**Comments:** Please specify "Other" preservative and containers types in this space

Run TCLP if fails 20x

| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
|---|---|---|---|
| 6/17/24 5:20 | Secured Fridge | 6/12/24 13:30 | 6/12/24 13:30 |
| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
| 6/18/24 16:45 | 6/12/24 1645 | | |

ESS Laboratory
DIVISION OF THE RISE GROUP
BAL Laboratory Analytical Balance

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC Phase III - Site 4 (332-344)**
**ESS Laboratory Work Order Number: 24E0882**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

**REVIEWED**
**By ESS Laboratory at 4:33 pm, May 29, 2024**

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

## SAMPLE RECEIPT

The following samples were received on May 21, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

**Low Level VOA vials were frozen by ESS Laboratory on May 21, 2024 at 17:25.**
**Tetrahydrofuran is reported above the MA CAM reporting limit of 0.010 mg/kg.**

**Question I: All samples for metals and EPH were analyzed for a subset of the required MCP list per the client's request.**

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 24E0882-01 | SEC-13A 0ft-12ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24E0882-02 | CEC-13A 4ft-6ft | Soil | 8260D Low |
| 24E0882-03 | CEC-13A 12ft-24ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24E0882-04 | CEC-13A 14ft-16ft | Soil | 8260D Low |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

## PROJECT NARRATIVE

**8100M Total Petroleum Hydrocarbons**
DE42151-BS1 **Blank Spike recovery is above upper control limit (B+).**
Hexatriacontane (C36) (143% @ 40-140%)
DE42151-BSD1 **Blank Spike recovery is above upper control limit (B+).**
Hexatriacontane (C36) (145% @ 40-140%)

**Semi-Volatile Organic Compounds**
D4E0467-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (103% @ 40-160%), Pentachlorophenol (98% @ 40-160%)

**Volatile Organics Low Level**
D4E0458-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
sec-Butylbenzene (25% @ 20%), Tetrachloroethene (29% @ 20%)
DE42218-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
Acetone (38% @ 20%)

**No other observations noted.**

**End of Project Narrative.**

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24E0882-01 through 24E0882-04**

Matrices: ( ) Ground Water/Surface Water (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| (X) 8260 VOC CAM II A | (X) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | (X) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (X) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | (X) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (X) 6010 Metals CAM III A | ( ) 6020 Metals CAM III D | (X) MassDEP EPH CAM IV B | (X) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (X) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (X) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (X) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (X) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes (X) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (X) No ( ) |

***Responses to Questions G, H and I below are required for '"Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? | Yes ( ) No (X)* |
| | ***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.** | |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (X)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes ( ) No (X)* |

***All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: May 29, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: SEC-13A 0ft-12ft
Date Sampled: 05/20/24 12:10
Percent Solids: 89

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **3.77** (0.85) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:03 | 2.66 100 | DE42204 |
| **Barium** | **12.1** (0.85) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:03 | 2.66 100 | DE42204 |
| Cadmium | ND (0.42) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:03 | 2.66 100 | DE42204 |
| **Chromium** | **7.85** (0.85) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:03 | 2.66 100 | DE42204 |
| **Lead** | **8.85** (4.24) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:03 | 2.66 100 | DE42204 |
| Mercury | ND (0.036) | --- | 7471B | --- | 1 | AFV | 05/22/24 15:54 | 0.62 40 | DE42203 |
| Selenium | ND (4.24) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:03 | 2.66 100 | DE42204 |
| Silver | ND (0.42) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:03 | 2.66 100 | DE42204 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: SEC-13A 0ft-12ft
Date Sampled: 05/20/24 12:10
Percent Solids: 89
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/21/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 1,2,4-Trichlorobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 1,2-Dichlorobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 1,3-Dichlorobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 1,4-Dichlorobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 2,4,5-Trichlorophenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 2,4,6-Trichlorophenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 2,4-Dichlorophenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 2,4-Dimethylphenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 2,4-Dinitrophenol | ND (1.11) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 2,4-Dinitrotoluene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 2,6-Dinitrotoluene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 2-Chloronaphthalene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 2-Chlorophenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 2-Methylnaphthalene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 2-Methylphenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 2-Nitrophenol | ND (0.556) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 3,3´-Dichlorobenzidine | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 3+4-Methylphenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 4-Bromophenyl-phenylether | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 4-Chloroaniline | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| 4-Nitrophenol | ND (1.11) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Acenaphthene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Acenaphthylene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Acetophenone | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Aniline | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Anthracene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: SEC-13A 0ft-12ft
Date Sampled: 05/20/24 12:10
Percent Solids: 89
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/21/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Benzo(a)anthracene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Benzo(a)pyrene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Benzo(b)fluoranthene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Benzo(g,h,i)perylene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Benzo(k)fluoranthene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| bis(2-Chloroethoxy)methane | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| bis(2-Chloroethyl)ether | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| bis(2-chloroisopropyl)Ether | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| bis(2-Ethylhexyl)phthalate | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Butylbenzylphthalate | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Chrysene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Dibenzo(a,h)Anthracene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Dibenzofuran | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Diethylphthalate | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Dimethylphthalate | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Di-n-butylphthalate | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Di-n-octylphthalate | ND (0.556) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Fluoranthene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Fluorene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Hexachlorobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Hexachlorobutadiene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Hexachloroethane | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Indeno(1,2,3-cd)Pyrene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Isophorone | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Naphthalene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Nitrobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: SEC-13A 0ft-12ft
Date Sampled: 05/20/24 12:10
Percent Solids: 89
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/21/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Pentachlorophenol | ND (1.11) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Phenanthrene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Phenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Pyrene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |
| Pyridine | ND (0.278) | --- | 8270E | --- | 1 | TJ | 05/23/24 5:44 | D4E0467 | DE42150 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *89 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *83 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *96 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *95 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *92 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *91 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *95 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *101 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: SEC-13A 0ft-12ft
Date Sampled: 05/20/24 12:10
Percent Solids: 89
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 5/22/24 12:00

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:06 | --- | DE42209 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:06 | --- | DE42209 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:06 | --- | DE42209 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:06 | --- | DE42209 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:06 | --- | DE42209 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:06 | --- | DE42209 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:06 | --- | DE42209 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:06 | --- | DE42209 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:06 | --- | DE42209 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *77 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *75 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: SEC-13A 0ft-12ft
Date Sampled: 05/20/24 12:10
Percent Solids: 89
Initial Volume: 19.8g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 5/22/24 9:55

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| 4,4´-DDE | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| 4,4´-DDT | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Aldrin | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| alpha-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| alpha-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| beta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Chlordane (Total) | ND (0.0228) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| delta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Dieldrin | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Endosulfan I | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Endosulfan II | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Endosulfan Sulfate | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Endrin | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Endrin Ketone | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| gamma-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Heptachlor | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Heptachlor Epoxide | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Hexachlorobenzene | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Methoxychlor | ND (0.0029) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |
| Toxaphene | ND (0.143) | --- | 8081B | --- | 1 | 05/23/24 22:10 | D4E0488 | DE42206 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *88 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *66 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: SEC-13A 0ft-12ft
Date Sampled: 05/20/24 12:10
Percent Solids: 89
Initial Volume: 10.1g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 5/23/24 17:00

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.011) | --- | 8151A | --- | 1 | 05/28/24 12:30 | D4E0535 | DE42344 |
| 2,4,5-TP (Silvex) | ND (0.011) | --- | 8151A | --- | 1 | 05/28/24 12:30 | D4E0535 | DE42344 |
| 2,4-D | ND (0.053) | --- | 8151A | --- | 1 | 05/28/24 12:30 | D4E0535 | DE42344 |
| 2,4-DB | ND (0.053) | --- | 8151A | --- | 1 | 05/28/24 12:30 | D4E0535 | DE42344 |
| Dalapon | ND (0.051) | --- | 8151A | --- | 1 | 05/28/24 12:30 | D4E0535 | DE42344 |
| Dicamba | ND (0.011) | --- | 8151A | --- | 1 | 05/28/24 12:30 | D4E0535 | DE42344 |
| Dichlorprop | ND (0.053) | --- | 8151A | --- | 1 | 05/28/24 12:30 | D4E0535 | DE42344 |
| Dinoseb | ND (0.053) | --- | 8151A | --- | 1 | 05/28/24 12:30 | D4E0535 | DE42344 |
| MCPA | ND (2.60) | --- | 8151A | --- | 1 | 05/28/24 12:30 | D4E0535 | DE42344 |
| MCPP | ND (2.63) | --- | 8151A | --- | 1 | 05/28/24 12:30 | D4E0535 | DE42344 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: DCAA* | *88 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: SEC-13A 0ft-12ft
Date Sampled: 05/20/24 12:10
Percent Solids: 89
Initial Volume: 19.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 5/21/24 20:05

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **50.5** (11.8) | --- | 8100M | --- | 1 | 05/22/24 19:28 | --- | DE42151 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | *74 %* | | *40-140* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: SEC-13A 0ft-12ft
Date Sampled: 05/20/24 12:10
Percent Solids: 89

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-01
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 299** (5) | --- | 9050A | --- | 1 | JLK | 05/22/24 20:29 | umhos/cm | DE42250 |
| **Corrosivity (pH)** | **6.89** (N/A) | --- | 9045 | --- | 1 | JLK | 05/21/24 19:05 | S.U. | DE42141 |
| **Corrosivity (pH) Sample Temp** | **20.5** | --- | 2550B | --- | 1 | JLK | 05/21/24 19:05 | °C | DE42141 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EEM | 05/22/24 14:00 | °F | DE42230 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 05/21/24 20:42 | ml/5 min | DE42152 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 05/23/24 16:06 | mg/kg | DE42334 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 05/23/24 16:06 | mg/kg | DE42334 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 4ft-6ft
Date Sampled: 05/20/24 12:15
Percent Solids: 89
Initial Volume: 6.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 5/22/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,1,1-Trichloroethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,1,2,2-Tetrachloroethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,1,2-Trichloroethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,1-Dichloroethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,1-Dichloroethene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,1-Dichloropropene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,2,3-Trichlorobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,2,3-Trichloropropane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,2,4-Trichlorobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,2,4-Trimethylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,2-Dibromoethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,2-Dichlorobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,2-Dichloroethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,2-Dichloropropane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,3,5-Trimethylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,3-Dichlorobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,3-Dichloropropane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,4-Dichlorobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 1,4-Dioxane | ND (0.0925) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 2,2-Dichloropropane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 2-Butanone | ND (0.0463) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 2-Chlorotoluene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 2-Hexanone | ND (0.0463) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 4-Chlorotoluene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| 4-Isopropyltoluene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 4ft-6ft
Date Sampled: 05/20/24 12:15
Percent Solids: 89
Initial Volume: 6.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 5/22/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0463) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Acetone | ND (0.0463) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Benzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Bromobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Bromochloromethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Bromodichloromethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Bromoform | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Bromomethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Carbon Disulfide | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Carbon Tetrachloride | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Chlorobenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Chloroethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Chloroform | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Chloromethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| cis-1,2-Dichloroethene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| cis-1,3-Dichloropropene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Dibromochloromethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Dibromomethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Dichlorodifluoromethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Diethyl Ether | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Di-isopropyl ether | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Ethyl tertiary-butyl ether | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Ethylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Hexachlorobutadiene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Isopropylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Methyl tert-Butyl Ether | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Methylene Chloride | ND (0.0231) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 4ft-6ft
Date Sampled: 05/20/24 12:15
Percent Solids: 89
Initial Volume: 6.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 5/22/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| n-Butylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| n-Propylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| sec-Butylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Styrene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| tert-Butylbenzene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Tertiary-amyl methyl ether | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Tetrachloroethene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Tetrahydrofuran | ND (0.0185) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Toluene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| trans-1,2-Dichloroethene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| trans-1,3-Dichloropropene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Trichloroethene | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Trichlorofluoromethane | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Vinyl Chloride | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Xylene O | ND (0.0046) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Xylene P,M | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |
| Xylenes (Total) | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:18 | D4E0458 | DE42218 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *110 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *101 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *106 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *104 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 12ft-24ft
Date Sampled: 05/20/24 12:40
Percent Solids: 88

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-03
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **4.29** (0.91) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:05 | 2.5 100 | DE42204 |
| **Barium** | **10.3** (0.91) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:05 | 2.5 100 | DE42204 |
| Cadmium | ND (0.45) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:05 | 2.5 100 | DE42204 |
| **Chromium** | **7.44** (0.91) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:05 | 2.5 100 | DE42204 |
| **Lead** | **7.38** (4.55) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:05 | 2.5 100 | DE42204 |
| Mercury | ND (0.034) | --- | 7471B | --- | 1 | AFV | 05/22/24 15:57 | 0.67 40 | DE42203 |
| Selenium | ND (4.55) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:05 | 2.5 100 | DE42204 |
| Silver | ND (0.45) | --- | 6010D | --- | 1 | KJB | 05/22/24 13:05 | 2.5 100 | DE42204 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 12ft-24ft
Date Sampled: 05/20/24 12:40
Percent Solids: 88
Initial Volume: 20.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/21/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 1,2,4-Trichlorobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 1,2-Dichlorobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 1,3-Dichlorobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 1,4-Dichlorobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 2,4,5-Trichlorophenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 2,4,6-Trichlorophenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 2,4-Dichlorophenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 2,4-Dimethylphenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 2,4-Dinitrophenol | ND (1.11) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 2,4-Dinitrotoluene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 2,6-Dinitrotoluene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 2-Chloronaphthalene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 2-Chlorophenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 2-Methylnaphthalene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 2-Methylphenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 2-Nitrophenol | ND (0.554) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 3,3´-Dichlorobenzidine | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 3+4-Methylphenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 4-Bromophenyl-phenylether | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 4-Chloroaniline | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| 4-Nitrophenol | ND (1.11) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Acenaphthene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Acenaphthylene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Acetophenone | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Aniline | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Anthracene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 12ft-24ft
Date Sampled: 05/20/24 12:40
Percent Solids: 88
Initial Volume: 20.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/21/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Benzo(a)anthracene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Benzo(a)pyrene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Benzo(b)fluoranthene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Benzo(g,h,i)perylene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Benzo(k)fluoranthene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| bis(2-Chloroethoxy)methane | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| bis(2-Chloroethyl)ether | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| bis(2-chloroisopropyl)Ether | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| bis(2-Ethylhexyl)phthalate | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Butylbenzylphthalate | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Chrysene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Dibenzo(a,h)Anthracene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Dibenzofuran | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Diethylphthalate | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Dimethylphthalate | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Di-n-butylphthalate | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Di-n-octylphthalate | ND (0.554) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Fluoranthene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Fluorene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Hexachlorobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Hexachlorobutadiene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Hexachloroethane | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Indeno(1,2,3-cd)Pyrene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Isophorone | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Naphthalene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Nitrobenzene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 12ft-24ft
Date Sampled: 05/20/24 12:40
Percent Solids: 88
Initial Volume: 20.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/21/24 19:45

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Pentachlorophenol | ND (1.11) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Phenanthrene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Phenol | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Pyrene | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |
| Pyridine | ND (0.277) | --- | 8270E | --- | 1 | TJ | 05/23/24 6:14 | D4E0467 | DE42150 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *93 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *78 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *96 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *96 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *95 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *95 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *96 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *104 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 12ft-24ft
Date Sampled: 05/20/24 12:40
Percent Solids: 88
Initial Volume: 20.4g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 5/22/24 12:00

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:26 | --- | DE42209 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:26 | --- | DE42209 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:26 | --- | DE42209 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:26 | --- | DE42209 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:26 | --- | DE42209 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:26 | --- | DE42209 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:26 | --- | DE42209 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:26 | --- | DE42209 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 05/24/24 11:26 | --- | DE42209 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *80 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *84 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 12ft-24ft
Date Sampled: 05/20/24 12:40
Percent Solids: 88
Initial Volume: 20.2g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 5/22/24 9:55

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| 4,4´-DDE | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| 4,4´-DDT | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Aldrin | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| alpha-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| alpha-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| beta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Chlordane (Total) | ND (0.0225) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| delta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Dieldrin | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Endosulfan I | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Endosulfan II | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Endosulfan Sulfate | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Endrin | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Endrin Ketone | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| gamma-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Heptachlor | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Heptachlor Epoxide | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Hexachlorobenzene | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Methoxychlor | ND (0.0028) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |
| Toxaphene | ND (0.141) | --- | 8081B | --- | 1 | 05/23/24 22:38 | D4E0488 | DE42206 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *68 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *58 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 12ft-24ft
Date Sampled: 05/20/24 12:40
Percent Solids: 88
Initial Volume: 10.2g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 5/23/24 17:00

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.011) | --- | 8151A | --- | 1 | 05/28/24 13:00 | D4E0535 | DE42344 |
| 2,4,5-TP (Silvex) | ND (0.011) | --- | 8151A | --- | 1 | 05/28/24 13:00 | D4E0535 | DE42344 |
| 2,4-D | ND (0.052) | --- | 8151A | --- | 1 | 05/28/24 13:00 | D4E0535 | DE42344 |
| 2,4-DB | ND (0.053) | --- | 8151A | --- | 1 | 05/28/24 13:00 | D4E0535 | DE42344 |
| Dalapon | ND (0.051) | --- | 8151A | --- | 1 | 05/28/24 13:00 | D4E0535 | DE42344 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 05/28/24 13:00 | D4E0535 | DE42344 |
| Dichlorprop | ND (0.052) | --- | 8151A | --- | 1 | 05/28/24 13:00 | D4E0535 | DE42344 |
| Dinoseb | ND (0.053) | --- | 8151A | --- | 1 | 05/28/24 13:00 | D4E0535 | DE42344 |
| MCPA | ND (2.59) | --- | 8151A | --- | 1 | 05/28/24 13:00 | D4E0535 | DE42344 |
| MCPP | ND (2.62) | --- | 8151A | --- | 1 | 05/28/24 13:00 | D4E0535 | DE42344 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: DCAA* | *92 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 12ft-24ft
Date Sampled: 05/20/24 12:40
Percent Solids: 88
Initial Volume: 20.4g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 5/21/24 20:05

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Total Petroleum Hydrocarbons (C9-C36) | ND (11.1) | --- | 8100M | --- | 1 | 05/22/24 20:08 | --- | DE42151 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | *76 %* | | *40-140* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 12ft-24ft
Date Sampled: 05/20/24 12:40
Percent Solids: 88

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-03
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 1090** (5) | --- | 9050A | --- | 1 | JLK | 05/22/24 20:29 | umhos/cm | DE42250 |
| **Corrosivity (pH)** | **8.55** (N/A) | --- | 9045 | --- | 1 | JLK | 05/21/24 19:05 | S.U. | DE42141 |
| **Corrosivity (pH) Sample Temp** | **20.6** | --- | 2550B | --- | 1 | JLK | 05/21/24 19:05 | °C | DE42141 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EEM | 05/22/24 14:00 | °F | DE42230 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 05/21/24 20:42 | ml/5 min | DE42152 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 05/23/24 16:06 | mg/kg | DE42334 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 05/23/24 16:06 | mg/kg | DE42334 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 14ft-16ft
Date Sampled: 05/20/24 12:45
Percent Solids: 88
Initial Volume: 6.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 5/22/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,1,1-Trichloroethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,1,2,2-Tetrachloroethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,1,2-Trichloroethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,1-Dichloroethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,1-Dichloroethene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,1-Dichloropropene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,2,3-Trichlorobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,2,3-Trichloropropane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,2,4-Trichlorobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,2,4-Trimethylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,2-Dibromoethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,2-Dichlorobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,2-Dichloroethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,2-Dichloropropane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,3,5-Trimethylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,3-Dichlorobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,3-Dichloropropane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,4-Dichlorobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 1,4-Dioxane | ND (0.0931) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 2,2-Dichloropropane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 2-Butanone | ND (0.0466) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 2-Chlorotoluene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 2-Hexanone | ND (0.0466) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 4-Chlorotoluene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| 4-Isopropyltoluene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 14ft-16ft
Date Sampled: 05/20/24 12:45
Percent Solids: 88
Initial Volume: 6.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 5/22/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0466) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Acetone | ND (0.0466) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Benzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Bromobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Bromochloromethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Bromodichloromethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Bromoform | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Bromomethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Carbon Disulfide | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Carbon Tetrachloride | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Chlorobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Chloroethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Chloroform | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Chloromethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| cis-1,2-Dichloroethene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| cis-1,3-Dichloropropene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Dibromochloromethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Dibromomethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Dichlorodifluoromethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Diethyl Ether | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Di-isopropyl ether | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Ethyl tertiary-butyl ether | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Ethylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Hexachlorobutadiene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Isopropylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Methyl tert-Butyl Ether | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Methylene Chloride | ND (0.0233) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-13A 14ft-16ft
Date Sampled: 05/20/24 12:45
Percent Solids: 88
Initial Volume: 6.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E0882
ESS Laboratory Sample ID: 24E0882-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 5/22/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| n-Butylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| n-Propylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| sec-Butylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Styrene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| tert-Butylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Tertiary-amyl methyl ether | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Tetrachloroethene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Tetrahydrofuran | ND (0.0186) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Toluene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| trans-1,2-Dichloroethene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| trans-1,3-Dichloropropene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Trichloroethene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Trichlorofluoromethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Vinyl Chloride | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Xylene O | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Xylene P,M | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |
| Xylenes (Total) | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 05/22/24 19:44 | D4E0458 | DE42218 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *109 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *104 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *106 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *105 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DE42203 - 245.1/7470A** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Mercury | ND | 0.032 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 20.1 | 2.96 | mg/kg wet | 25.50 | | 79 | 71.37-125.1 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 20.2 | 3.25 | mg/kg wet | 25.50 | | 79 | 71.37-125.1 | 0.3 | 30 | |
| **Batch DE42204 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Arsenic | ND | 1.00 | mg/kg wet | | | | | | | |
| Barium | ND | 1.00 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Arsenic | 81.2 | 3.33 | mg/kg wet | 75.60 | | 107 | 80-120 | | | |
| Barium | 783 | 3.33 | mg/kg wet | 372.0 | | 211 | 40-297 | | | |
| Cadmium | 269 | 1.67 | mg/kg wet | 259.0 | | 104 | 80-120 | | | |
| Chromium | 171 | 3.33 | mg/kg wet | 156.0 | | 110 | 80-120 | | | |
| Lead | 239 | 16.7 | mg/kg wet | 225.0 | | 106 | 80-120 | | | |
| Selenium | 83.3 | 16.7 | mg/kg wet | 82.70 | | 101 | 80-120 | | | |
| Silver | 56.1 | 1.67 | mg/kg wet | 51.00 | | 110 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Arsenic | 70.0 | 2.99 | mg/kg wet | 75.60 | | 93 | 80-120 | 15 | 30 | |
| Barium | 615 | 2.99 | mg/kg wet | 372.0 | | 165 | 40-297 | 24 | 30 | |
| Cadmium | 230 | 1.49 | mg/kg wet | 259.0 | | 89 | 80-120 | 16 | 30 | |
| Chromium | 146 | 2.99 | mg/kg wet | 156.0 | | 93 | 80-120 | 16 | 30 | |
| Lead | 207 | 14.9 | mg/kg wet | 225.0 | | 92 | 80-120 | 14 | 30 | |
| Selenium | 70.5 | 14.9 | mg/kg wet | 82.70 | | 85 | 80-120 | 17 | 30 | |
| Silver | 47.9 | 1.49 | mg/kg wet | 51.00 | | 94 | 80-120 | 16 | 30 | |
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DE42218 - 5035** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,1-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DE42218 - 5035** | | | | | | | | | | |
| 1,2,3-Trichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromoethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dioxane | ND | 0.100 | mg/kg wet | | | | | | | |
| 2,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Butanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 2-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Hexanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 4-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Isopropyltoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Methyl-2-Pentanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Acetone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Benzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromodichloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromoform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromomethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Carbon Disulfide | ND | 0.0050 | mg/kg wet | | | | | | | |
| Carbon Tetrachloride | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloroethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Chloroform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| cis-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| cis-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromomethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dichlorodifluoromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Diethyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Di-isopropyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethyl tertiary-butyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Isopropylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methyl tert-Butyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DE42218 - 5035** | | | | | | | | | | |
| Methylene Chloride | ND | 0.0250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Propylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| sec-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Styrene | ND | 0.0050 | mg/kg wet | | | | | | | |
| tert-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tertiary-amyl methyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrachloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrahydrofuran | ND | 0.0200 | mg/kg wet | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichlorofluoromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Vinyl Chloride | ND | 0.0100 | mg/kg wet | | | | | | | |
| Xylene O | ND | 0.0050 | mg/kg wet | | | | | | | |
| Xylene P,M | ND | 0.0100 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0542* | | mg/kg wet | *0.05000* | | *108* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0484* | | mg/kg wet | *0.05000* | | *97* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0512* | | mg/kg wet | *0.05000* | | *102* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0504* | | mg/kg wet | *0.05000* | | *101* | *70-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0520 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,1,1-Trichloroethane | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,1,2,2-Tetrachloroethane | 0.0455 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 40-160 | | | |
| 1,1,2-Trichloroethane | 0.0482 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| 1,1-Dichloroethane | 0.0496 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| 1,1-Dichloroethene | 0.0506 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| 1,1-Dichloropropene | 0.0504 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| 1,2,3-Trichlorobenzene | 0.0462 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | | | |
| 1,2,3-Trichloropropane | 0.0401 | 0.0050 | mg/kg wet | 0.05000 | | 80 | 70-130 | | | |
| 1,2,4-Trichlorobenzene | 0.0483 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| 1,2,4-Trimethylbenzene | 0.0476 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| 1,2-Dibromo-3-Chloropropane | 0.0393 | 0.0050 | mg/kg wet | 0.05000 | | 79 | 70-130 | | | |
| 1,2-Dibromoethane | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| 1,2-Dichlorobenzene | 0.0441 | 0.0050 | mg/kg wet | 0.05000 | | 88 | 70-130 | | | |
| 1,2-Dichloroethane | 0.0484 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| 1,2-Dichloropropane | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 1,3,5-Trimethylbenzene | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| 1,3-Dichlorobenzene | 0.0453 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | | | |
| 1,3-Dichloropropane | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,4-Dichlorobenzene | 0.0457 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | | | |
| 1,4-Dioxane | 0.894 | 0.100 | mg/kg wet | 1.000 | | 89 | 70-130 | | | |
| 2,2-Dichloropropane | 0.0525 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DE42218 - 5035** | | | | | | | | | | |
| 2-Butanone | 0.231 | 0.0500 | mg/kg wet | 0.2500 | | 92 | 40-160 | | | |
| 2-Chlorotoluene | 0.0474 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| 2-Hexanone | 0.231 | 0.0500 | mg/kg wet | 0.2500 | | 92 | 40-160 | | | |
| 4-Chlorotoluene | 0.0466 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | | | |
| 4-Isopropyltoluene | 0.0456 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | | | |
| 4-Methyl-2-Pentanone | 0.224 | 0.0500 | mg/kg wet | 0.2500 | | 90 | 40-160 | | | |
| Acetone | 0.205 | 0.0500 | mg/kg wet | 0.2500 | | 82 | 40-160 | | | |
| Benzene | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| Bromobenzene | 0.0461 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | | | |
| Bromochloromethane | 0.0484 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| Bromodichloromethane | 0.0571 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | | | |
| Bromoform | 0.0412 | 0.0050 | mg/kg wet | 0.05000 | | 82 | 40-160 | | | |
| Bromomethane | 0.0457 | 0.0100 | mg/kg wet | 0.05000 | | 91 | 40-160 | | | |
| Carbon Disulfide | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Carbon Tetrachloride | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Chlorobenzene | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Chloroethane | 0.0492 | 0.0100 | mg/kg wet | 0.05000 | | 98 | 40-160 | | | |
| Chloroform | 0.0506 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| Chloromethane | 0.0443 | 0.0100 | mg/kg wet | 0.05000 | | 89 | 40-160 | | | |
| cis-1,2-Dichloroethene | 0.0503 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| cis-1,3-Dichloropropene | 0.0518 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 40-160 | | | |
| Dibromochloromethane | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 40-160 | | | |
| Dibromomethane | 0.0483 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| Dichlorodifluoromethane | 0.0286 | 0.0100 | mg/kg wet | 0.05000 | | 57 | 40-160 | | | |
| Diethyl Ether | 0.0506 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| Di-isopropyl ether | 0.0523 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Ethyl tertiary-butyl ether | 0.0502 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| Ethylbenzene | 0.0518 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| Hexachlorobutadiene | 0.0443 | 0.0050 | mg/kg wet | 0.05000 | | 89 | 40-160 | | | |
| Isopropylbenzene | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| Methyl tert-Butyl Ether | 0.0477 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| Methylene Chloride | 0.0520 | 0.0250 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| Naphthalene | 0.0424 | 0.0050 | mg/kg wet | 0.05000 | | 85 | 40-160 | | | |
| n-Butylbenzene | 0.0475 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| n-Propylbenzene | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| sec-Butylbenzene | 0.0375 | 0.0050 | mg/kg wet | 0.05000 | | 75 | 70-130 | | | |
| Styrene | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 40-160 | | | |
| tert-Butylbenzene | 0.0470 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | | | |
| Tertiary-amyl methyl ether | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| Tetrachloroethene | 0.0372 | 0.0050 | mg/kg wet | 0.05000 | | 74 | 70-130 | | | |
| Tetrahydrofuran | 0.0460 | 0.0200 | mg/kg wet | 0.05000 | | 92 | 70-130 | | | |
| Toluene | 0.0490 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| trans-1,2-Dichloroethene | 0.0502 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| trans-1,3-Dichloropropene | 0.0497 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| Trichloroethene | 0.0482 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DE42218 - 5035** | | | | | | | | | | |
| Trichlorofluoromethane | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 40-160 | | | |
| Vinyl Chloride | 0.0455 | 0.0100 | mg/kg wet | 0.05000 | | 91 | 70-130 | | | |
| Xylene O | 0.0530 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| Xylene P,M | 0.108 | 0.0100 | mg/kg wet | 0.1000 | | 108 | 70-130 | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0497* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0516* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0509* | | mg/kg wet | *0.05000* | | *102* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0526* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 1 | 20 | |
| 1,1,1-Trichloroethane | 0.0518 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 0.2 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 40-160 | 13 | 20 | |
| 1,1,2-Trichloroethane | 0.0510 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 6 | 20 | |
| 1,1-Dichloroethane | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 1 | 20 | |
| 1,1-Dichloroethene | 0.0511 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 1 | 20 | |
| 1,1-Dichloropropene | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 0.8 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0505 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 9 | 20 | |
| 1,2,3-Trichloropropane | 0.0458 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | 13 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0524 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 8 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0510 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 7 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0468 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | 17 | 20 | |
| 1,2-Dibromoethane | 0.0516 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 5 | 20 | |
| 1,2-Dichlorobenzene | 0.0475 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 7 | 20 | |
| 1,2-Dichloroethane | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 3 | 20 | |
| 1,2-Dichloropropane | 0.0506 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 1 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 6 | 20 | |
| 1,3-Dichlorobenzene | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 7 | 20 | |
| 1,3-Dichloropropane | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 3 | 20 | |
| 1,4-Dichlorobenzene | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | 6 | 20 | |
| 1,4-Dioxane | 1.04 | 0.100 | mg/kg wet | 1.000 | | 104 | 70-130 | 15 | 20 | |
| 2,2-Dichloropropane | 0.0522 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 0.7 | 20 | |
| 2-Butanone | 0.274 | 0.0500 | mg/kg wet | 0.2500 | | 110 | 40-160 | 17 | 20 | |
| 2-Chlorotoluene | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 5 | 20 | |
| 2-Hexanone | 0.277 | 0.0500 | mg/kg wet | 0.2500 | | 111 | 40-160 | 18 | 20 | |
| 4-Chlorotoluene | 0.0496 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 6 | 20 | |
| 4-Isopropyltoluene | 0.0485 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | 6 | 20 | |
| 4-Methyl-2-Pentanone | 0.257 | 0.0500 | mg/kg wet | 0.2500 | | 103 | 40-160 | 14 | 20 | |
| Acetone | 0.301 | 0.0500 | mg/kg wet | 0.2500 | | 120 | 40-160 | 38 | 20 | D+ |
| Benzene | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 0.9 | 20 | |
| Bromobenzene | 0.0494 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 7 | 20 | |
| Bromochloromethane | 0.0498 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 3 | 20 | |
| Bromodichloromethane | 0.0583 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | 2 | 20 | |
| Bromoform | 0.0428 | 0.0050 | mg/kg wet | 0.05000 | | 86 | 40-160 | 4 | 20 | |
| Bromomethane | 0.0463 | 0.0100 | mg/kg wet | 0.05000 | | 93 | 40-160 | 1 | 20 | |
| Carbon Disulfide | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 1 | 20 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DE42218 - 5035** | | | | | | | | | | |
| Carbon Tetrachloride | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 0.2 | 20 | |
| Chlorobenzene | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 0.04 | 20 | |
| Chloroethane | 0.0493 | 0.0100 | mg/kg wet | 0.05000 | | 99 | 40-160 | 0.3 | 20 | |
| Chloroform | 0.0510 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 0.9 | 20 | |
| Chloromethane | 0.0438 | 0.0100 | mg/kg wet | 0.05000 | | 88 | 40-160 | 1 | 20 | |
| cis-1,2-Dichloroethene | 0.0506 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 0.6 | 20 | |
| cis-1,3-Dichloropropene | 0.0538 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 40-160 | 4 | 20 | |
| Dibromochloromethane | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 40-160 | 3 | 20 | |
| Dibromomethane | 0.0511 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 6 | 20 | |
| Dichlorodifluoromethane | 0.0275 | 0.0100 | mg/kg wet | 0.05000 | | 55 | 40-160 | 4 | 20 | |
| Diethyl Ether | 0.0530 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 5 | 20 | |
| Di-isopropyl ether | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 3 | 20 | |
| Ethyl tertiary-butyl ether | 0.0520 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 4 | 20 | |
| Ethylbenzene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 0.6 | 20 | |
| Hexachlorobutadiene | 0.0477 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 40-160 | 7 | 20 | |
| Isopropylbenzene | 0.0554 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 6 | 20 | |
| Methyl tert-Butyl Ether | 0.0506 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 6 | 20 | |
| Methylene Chloride | 0.0532 | 0.0250 | mg/kg wet | 0.05000 | | 106 | 70-130 | 2 | 20 | |
| Naphthalene | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | 14 | 20 | |
| n-Butylbenzene | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 6 | 20 | |
| n-Propylbenzene | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 6 | 20 | |
| sec-Butylbenzene | 0.0402 | 0.0050 | mg/kg wet | 0.05000 | | 80 | 70-130 | 7 | 20 | |
| Styrene | 0.0508 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 40-160 | 1 | 20 | |
| tert-Butylbenzene | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 6 | 20 | |
| Tertiary-amyl methyl ether | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 6 | 20 | |
| Tetrachloroethene | 0.0373 | 0.0050 | mg/kg wet | 0.05000 | | 75 | 70-130 | 0.4 | 20 | |
| Tetrahydrofuran | 0.0555 | 0.0200 | mg/kg wet | 0.05000 | | 111 | 70-130 | 19 | 20 | |
| Toluene | 0.0498 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 2 | 20 | |
| trans-1,2-Dichloroethene | 0.0505 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 0.6 | 20 | |
| trans-1,3-Dichloropropene | 0.0518 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 4 | 20 | |
| Trichloroethene | 0.0485 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | 0.7 | 20 | |
| Trichlorofluoromethane | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 40-160 | 0.04 | 20 | |
| Vinyl Chloride | 0.0454 | 0.0100 | mg/kg wet | 0.05000 | | 91 | 70-130 | 0.3 | 20 | |
| Xylene O | 0.0530 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 0.1 | 20 | |
| Xylene P,M | 0.107 | 0.0100 | mg/kg wet | 0.1000 | | 107 | 70-130 | 1 | 20 | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0511* | | mg/kg wet | *0.05000* | | *102* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0486* | | mg/kg wet | *0.05000* | | *97* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0504* | | mg/kg wet | *0.05000* | | *101* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0511* | | mg/kg wet | *0.05000* | | *102* | *70-130* | | | |
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE42150 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE42150 - 3546** | | | | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE42150 - 3546** | | | | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyridine | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.29* | | mg/kg wet | *2.500* | | *91* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.09* | | mg/kg wet | *3.750* | | *83* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.58* | | mg/kg wet | *3.750* | | *96* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.36* | | mg/kg wet | *2.500* | | *94* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.53* | | mg/kg wet | *3.750* | | *94* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.36* | | mg/kg wet | *2.500* | | *95* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.45* | | mg/kg wet | *3.750* | | *92* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.52* | | mg/kg wet | *2.500* | | *101* | *30-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.55 | 0.025 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.59 | 0.250 | mg/kg wet | 2.500 | | 103 | 30-130 | | | |
| 2,4-Dimethylphenol | 1.83 | 0.250 | mg/kg wet | 2.500 | | 73 | 30-130 | | | |
| 2,4-Dinitrophenol | 2.37 | 1.00 | mg/kg wet | 2.500 | | 95 | 15-140 | | | |
| 2,4-Dinitrotoluene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| 2-Chloronaphthalene | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| 2-Chlorophenol | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 30-130 | | | |
| 2-Methylnaphthalene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | | | |
| 2-Methylphenol | 2.49 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | | | |
| 2-Nitrophenol | 2.38 | 0.500 | mg/kg wet | 2.500 | | 95 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| 3+4-Methylphenol | 2.54 | 0.250 | mg/kg wet | 2.500 | | 101 | 15-140 | | | |
| 4-Bromophenyl-phenylether | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| 4-Chloroaniline | 2.22 | 0.250 | mg/kg wet | 2.500 | | 89 | 15-140 | | | |
| 4-Nitrophenol | 2.29 | 1.00 | mg/kg wet | 2.500 | | 92 | 15-140 | | | |
| Acenaphthene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE42150 - 3546** | | | | | | | | | | |
| Acenaphthylene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Acetophenone | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Aniline | 1.96 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | | | |
| Anthracene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Azobenzene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Benzo(a)anthracene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Benzo(a)pyrene | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| Butylbenzylphthalate | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Chrysene | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Dibenzofuran | 2.49 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Diethylphthalate | 2.51 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | | | |
| Dimethylphthalate | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 15-140 | | | |
| Di-n-butylphthalate | 2.61 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| Di-n-octylphthalate | 2.22 | 0.500 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Fluoranthene | 2.58 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| Fluorene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Hexachlorobenzene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Hexachlorobutadiene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Hexachloroethane | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.29 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| Isophorone | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Naphthalene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Nitrobenzene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| N-Nitrosodimethylamine | 2.24 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Pentachlorophenol | 2.21 | 1.00 | mg/kg wet | 2.500 | | 88 | 15-140 | | | |
| Phenanthrene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Phenol | 2.57 | 0.250 | mg/kg wet | 2.500 | | 103 | 15-140 | | | |
| Pyrene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Pyridine | 1.40 | 0.250 | mg/kg wet | 2.500 | | 56 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.63* | | mg/kg wet | *2.500* | | *105* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.08* | | mg/kg wet | *3.750* | | *109* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.20* | | mg/kg wet | *3.750* | | *112* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.65* | | mg/kg wet | *2.500* | | *106* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.12* | | mg/kg wet | *3.750* | | *110* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.72* | | mg/kg wet | *2.500* | | *109* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.10* | | mg/kg wet | *3.750* | | *109* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.77* | | mg/kg wet | *2.500* | | *111* | *30-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE42150 - 3546** | | | | | | | | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.52 | 0.025 | mg/kg wet | 2.500 | | 101 | 40-140 | 1 | 30 | |
| 1,2,4-Trichlorobenzene | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 3 | 30 | |
| 1,2-Dichlorobenzene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 1 | 30 | |
| 1,3-Dichlorobenzene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 2 | 30 | |
| 1,4-Dichlorobenzene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 1 | 30 | |
| 2,4,5-Trichlorophenol | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 30-130 | 3 | 30 | |
| 2,4,6-Trichlorophenol | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 30-130 | 2 | 30 | |
| 2,4-Dichlorophenol | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 30-130 | 3 | 30 | |
| 2,4-Dimethylphenol | 1.79 | 0.250 | mg/kg wet | 2.500 | | 72 | 30-130 | 2 | 30 | |
| 2,4-Dinitrophenol | 2.28 | 1.00 | mg/kg wet | 2.500 | | 91 | 15-140 | 4 | 30 | |
| 2,4-Dinitrotoluene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 4 | 30 | |
| 2,6-Dinitrotoluene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 4 | 30 | |
| 2-Chloronaphthalene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 0.7 | 30 | |
| 2-Chlorophenol | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 30-130 | 3 | 30 | |
| 2-Methylnaphthalene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 2 | 30 | |
| 2-Methylphenol | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 15-140 | 4 | 30 | |
| 2-Nitrophenol | 2.32 | 0.500 | mg/kg wet | 2.500 | | 93 | 30-130 | 3 | 30 | |
| 3,3´-Dichlorobenzidine | 2.20 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | 5 | 30 | |
| 3+4-Methylphenol | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 15-140 | 3 | 30 | |
| 4-Bromophenyl-phenylether | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 6 | 30 | |
| 4-Chloroaniline | 2.19 | 0.250 | mg/kg wet | 2.500 | | 87 | 15-140 | 2 | 30 | |
| 4-Nitrophenol | 2.22 | 1.00 | mg/kg wet | 2.500 | | 89 | 15-140 | 3 | 30 | |
| Acenaphthene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 4 | 30 | |
| Acenaphthylene | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 3 | 30 | |
| Acetophenone | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 3 | 30 | |
| Aniline | 1.91 | 0.250 | mg/kg wet | 2.500 | | 76 | 40-140 | 2 | 30 | |
| Anthracene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 4 | 30 | |
| Azobenzene | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 2 | 30 | |
| Benzo(a)anthracene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 4 | 30 | |
| Benzo(a)pyrene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 3 | 30 | |
| Benzo(b)fluoranthene | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 6 | 30 | |
| Benzo(g,h,i)perylene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 2 | 30 | |
| Benzo(k)fluoranthene | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 0.2 | 30 | |
| bis(2-Chloroethoxy)methane | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 3 | 30 | |
| bis(2-Chloroethyl)ether | 2.24 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 3 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.25 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 3 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.19 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | 5 | 30 | |
| Butylbenzylphthalate | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 4 | 30 | |
| Chrysene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 3 | 30 | |
| Dibenzo(a,h)Anthracene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 0.5 | 30 | |
| Dibenzofuran | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 2 | 30 | |
| Diethylphthalate | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 5 | 30 | |
| Dimethylphthalate | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 15-140 | 3 | 30 | |
| Di-n-butylphthalate | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 6 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE42150 - 3546** | | | | | | | | | | |
| Di-n-octylphthalate | 2.10 | 0.500 | mg/kg wet | 2.500 | | 84 | 40-140 | 6 | 30 | |
| Fluoranthene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 6 | 30 | |
| Fluorene | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 3 | 30 | |
| Hexachlorobenzene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 4 | 30 | |
| Hexachlorobutadiene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 3 | 30 | |
| Hexachloroethane | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 2 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 1 | 30 | |
| Isophorone | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 3 | 30 | |
| Naphthalene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 3 | 30 | |
| Nitrobenzene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 1 | 30 | |
| N-Nitrosodimethylamine | 2.24 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 0.002 | 30 | |
| Pentachlorophenol | 2.09 | 1.00 | mg/kg wet | 2.500 | | 84 | 15-140 | 6 | 30 | |
| Phenanthrene | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 5 | 30 | |
| Phenol | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | 4 | 30 | |
| Pyrene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 0.2 | 30 | |
| Pyridine | 1.42 | 0.250 | mg/kg wet | 2.500 | | 57 | 40-140 | 2 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.52* | | mg/kg wet | *2.500* | | *101* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.80* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.00* | | mg/kg wet | *3.750* | | *107* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.56* | | mg/kg wet | *2.500* | | *102* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.96* | | mg/kg wet | *3.750* | | *106* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.61* | | mg/kg wet | *2.500* | | *104* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.86* | | mg/kg wet | *3.750* | | *103* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.66* | | mg/kg wet | *2.500* | | *106* | *30-130* | | | |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DE42209 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DE42209 - 3540C** | | | | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0203* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0207* | | mg/kg wet | *0.02500* | | *83* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0204* | | mg/kg wet | *0.02500* | | *82* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 81 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 85 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 88 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 92 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0218* | | mg/kg wet | *0.02500* | | *87* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0223* | | mg/kg wet | *0.02500* | | *89* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0212* | | mg/kg wet | *0.02500* | | *85* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0215* | | mg/kg wet | *0.02500* | | *86* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.3 | 0.05 | mg/kg wet | 0.5000 | | 66 | 40-140 | 20 | 30 | |
| Aroclor 1016 [2C] | 0.3 | 0.05 | mg/kg wet | 0.5000 | | 66 | 40-140 | 25 | 30 | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 71 | 40-140 | 21 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 72 | 40-140 | 24 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0173* | | mg/kg wet | *0.02500* | | *69* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0174* | | mg/kg wet | *0.02500* | | *70* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0162* | | mg/kg wet | *0.02500* | | *65* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0163* | | mg/kg wet | *0.02500* | | *65* | *30-150* | | | |
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DE42206 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 4,4´-DDD | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDD [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Chlordane (Total) | ND | 0.0200 | mg/kg wet | | | | | | | |
| Chlordane (Total) [2C] | ND | 0.0200 | mg/kg wet | | | | | | | |
| delta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| delta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DE42206 - 3546** | | | | | | | | | | |
| Dieldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) [2C] | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Toxaphene | ND | 0.125 | mg/kg wet | | | | | | | |
| Toxaphene [2C] | ND | 0.125 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0142* | | mg/kg wet | *0.01250* | | *113* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0136* | | mg/kg wet | *0.01250* | | *109* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.00781* | | mg/kg wet | *0.01250* | | *62* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.00748* | | mg/kg wet | *0.01250* | | *60* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 4,4´-DDD | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| 4,4´-DDD [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| 4,4´-DDE | 0.0102 | 0.0025 | mg/kg wet | 0.01250 | | 82 | 40-140 | | | |
| 4,4´-DDE [2C] | 0.0098 | 0.0025 | mg/kg wet | 0.01250 | | 78 | 40-140 | | | |
| 4,4´-DDT | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | | | |
| 4,4´-DDT [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| Aldrin | 0.0075 | 0.0025 | mg/kg wet | 0.01250 | | 60 | 40-140 | | | |
| Aldrin [2C] | 0.0074 | 0.0025 | mg/kg wet | 0.01250 | | 60 | 40-140 | | | |
| alpha-BHC | 0.0074 | 0.0025 | mg/kg wet | 0.01250 | | 59 | 40-140 | | | |
| alpha-BHC [2C] | 0.0073 | 0.0025 | mg/kg wet | 0.01250 | | 58 | 40-140 | | | |
| alpha-Chlordane | 0.0082 | 0.0025 | mg/kg wet | 0.01250 | | 66 | 40-140 | | | |
| alpha-Chlordane [2C] | 0.0084 | 0.0025 | mg/kg wet | 0.01250 | | 67 | 40-140 | | | |
| beta-BHC | 0.0076 | 0.0025 | mg/kg wet | 0.01250 | | 61 | 40-140 | | | |
| beta-BHC [2C] | 0.0074 | 0.0025 | mg/kg wet | 0.01250 | | 59 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DE42206 - 3546** | | | | | | | | | | |
| delta-BHC | 0.0099 | 0.0025 | mg/kg wet | 0.01250 | | 79 | 40-140 | | | |
| delta-BHC [2C] | 0.0074 | 0.0025 | mg/kg wet | 0.01250 | | 59 | 40-140 | | | |
| Dieldrin | 0.0095 | 0.0025 | mg/kg wet | 0.01250 | | 76 | 40-140 | | | |
| Dieldrin [2C] | 0.0096 | 0.0025 | mg/kg wet | 0.01250 | | 77 | 40-140 | | | |
| Endosulfan I | 0.0080 | 0.0025 | mg/kg wet | 0.01250 | | 64 | 40-140 | | | |
| Endosulfan I [2C] | 0.0084 | 0.0025 | mg/kg wet | 0.01250 | | 67 | 40-140 | | | |
| Endosulfan II | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Endosulfan II [2C] | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| Endosulfan Sulfate | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| Endosulfan Sulfate [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | | | |
| Endrin | 0.0095 | 0.0025 | mg/kg wet | 0.01250 | | 76 | 40-140 | | | |
| Endrin [2C] | 0.0095 | 0.0025 | mg/kg wet | 0.01250 | | 76 | 40-140 | | | |
| Endrin Ketone | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | | | |
| Endrin Ketone [2C] | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| gamma-BHC (Lindane) | 0.0076 | 0.0015 | mg/kg wet | 0.01250 | | 61 | 40-140 | | | |
| gamma-BHC (Lindane) [2C] | 0.0075 | 0.0015 | mg/kg wet | 0.01250 | | 60 | 40-140 | | | |
| gamma-Chlordane | 0.0094 | 0.0025 | mg/kg wet | 0.01250 | | 75 | 40-140 | | | |
| gamma-Chlordane [2C] | 0.0095 | 0.0025 | mg/kg wet | 0.01250 | | 76 | 40-140 | | | |
| Heptachlor | 0.0077 | 0.0025 | mg/kg wet | 0.01250 | | 61 | 40-140 | | | |
| Heptachlor [2C] | 0.0075 | 0.0025 | mg/kg wet | 0.01250 | | 60 | 40-140 | | | |
| Heptachlor Epoxide | 0.0080 | 0.0025 | mg/kg wet | 0.01250 | | 64 | 40-140 | | | |
| Heptachlor Epoxide [2C] | 0.0079 | 0.0025 | mg/kg wet | 0.01250 | | 63 | 40-140 | | | |
| Hexachlorobenzene | 0.0068 | 0.0025 | mg/kg wet | 0.01250 | | 54 | 40-140 | | | |
| Hexachlorobenzene [2C] | 0.0068 | 0.0025 | mg/kg wet | 0.01250 | | 55 | 40-140 | | | |
| Methoxychlor | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 110 | 40-140 | | | |
| Methoxychlor [2C] | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0148* | | mg/kg wet | *0.01250* | | *118* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0141* | | mg/kg wet | *0.01250* | | *113* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.00738* | | mg/kg wet | *0.01250* | | *59* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.00740* | | mg/kg wet | *0.01250* | | *59* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 4,4´-DDD | 0.0135 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | 6 | 30 | |
| 4,4´-DDD [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 6 | 30 | |
| 4,4´-DDE | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 14 | 30 | |
| 4,4´-DDE [2C] | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 13 | 30 | |
| 4,4´-DDT | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 4 | 30 | |
| 4,4´-DDT [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 5 | 30 | |
| Aldrin | 0.0088 | 0.0025 | mg/kg wet | 0.01250 | | 70 | 40-140 | 15 | 30 | |
| Aldrin [2C] | 0.0089 | 0.0025 | mg/kg wet | 0.01250 | | 71 | 40-140 | 17 | 30 | |
| alpha-BHC | 0.0088 | 0.0025 | mg/kg wet | 0.01250 | | 70 | 40-140 | 17 | 30 | |
| alpha-BHC [2C] | 0.0086 | 0.0025 | mg/kg wet | 0.01250 | | 69 | 40-140 | 16 | 30 | |
| alpha-Chlordane | 0.0097 | 0.0025 | mg/kg wet | 0.01250 | | 78 | 40-140 | 17 | 30 | |
| alpha-Chlordane [2C] | 0.0099 | 0.0025 | mg/kg wet | 0.01250 | | 79 | 40-140 | 17 | 30 | |
| beta-BHC | 0.0090 | 0.0025 | mg/kg wet | 0.01250 | | 72 | 40-140 | 16 | 30 | |
| beta-BHC [2C] | 0.0088 | 0.0025 | mg/kg wet | 0.01250 | | 70 | 40-140 | 17 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DE42206 - 3546** | | | | | | | | | | |
| delta-BHC | 0.0083 | 0.0025 | mg/kg wet | 0.01250 | | 67 | 40-140 | 17 | 30 | |
| delta-BHC [2C] | 0.0084 | 0.0025 | mg/kg wet | 0.01250 | | 67 | 40-140 | 12 | 30 | |
| Dieldrin | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 16 | 30 | |
| Dieldrin [2C] | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | 17 | 30 | |
| Endosulfan I | 0.0094 | 0.0025 | mg/kg wet | 0.01250 | | 75 | 40-140 | 16 | 30 | |
| Endosulfan I [2C] | 0.0099 | 0.0025 | mg/kg wet | 0.01250 | | 79 | 40-140 | 17 | 30 | |
| Endosulfan II | 0.0122 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | 7 | 30 | |
| Endosulfan II [2C] | 0.0124 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 7 | 30 | |
| Endosulfan Sulfate | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 0.3 | 30 | |
| Endosulfan Sulfate [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 0.2 | 30 | |
| Endrin | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 15 | 30 | |
| Endrin [2C] | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 16 | 30 | |
| Endrin Ketone | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 110 | 40-140 | 2 | 30 | |
| Endrin Ketone [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 1 | 30 | |
| gamma-BHC (Lindane) | 0.0090 | 0.0015 | mg/kg wet | 0.01250 | | 72 | 40-140 | 16 | 30 | |
| gamma-BHC (Lindane) [2C] | 0.0088 | 0.0015 | mg/kg wet | 0.01250 | | 71 | 40-140 | 16 | 30 | |
| gamma-Chlordane | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 17 | 30 | |
| gamma-Chlordane [2C] | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 17 | 30 | |
| Heptachlor | 0.0086 | 0.0025 | mg/kg wet | 0.01250 | | 69 | 40-140 | 11 | 30 | |
| Heptachlor [2C] | 0.0087 | 0.0025 | mg/kg wet | 0.01250 | | 69 | 40-140 | 15 | 30 | |
| Heptachlor Epoxide | 0.0095 | 0.0025 | mg/kg wet | 0.01250 | | 76 | 40-140 | 18 | 30 | |
| Heptachlor Epoxide [2C] | 0.0095 | 0.0025 | mg/kg wet | 0.01250 | | 76 | 40-140 | 18 | 30 | |
| Hexachlorobenzene | 0.0079 | 0.0025 | mg/kg wet | 0.01250 | | 63 | 40-140 | 14 | 30 | |
| Hexachlorobenzene [2C] | 0.0078 | 0.0025 | mg/kg wet | 0.01250 | | 62 | 40-140 | 13 | 30 | |
| Methoxychlor | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 4 | 30 | |
| Methoxychlor [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 3 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0136* | | mg/kg wet | *0.01250* | | *109* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0129* | | mg/kg wet | *0.01250* | | *103* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.00798* | | mg/kg wet | *0.01250* | | *64* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.00813* | | mg/kg wet | *0.01250* | | *65* | *30-150* | | | |
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DE42344 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 2,4,5-T | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-T [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4-D | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-D [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-DB | ND | 0.048 | mg/kg wet | | | | | | | |
| 2,4-DB [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| Dalapon | ND | 0.046 | mg/kg wet | | | | | | | |
| Dalapon [2C] | ND | 0.046 | mg/kg wet | | | | | | | |
| Dicamba | ND | 0.009 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DE42344 - 3546** | | | | | | | | | | |
| Dicamba [2C] | ND | 0.009 | mg/kg wet | | | | | | | |
| Dichlorprop | ND | 0.047 | mg/kg wet | | | | | | | |
| Dichlorprop [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| Dinoseb | ND | 0.048 | mg/kg wet | | | | | | | |
| Dinoseb [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| MCPA | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPA [2C] | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPP | ND | 2.35 | mg/kg wet | | | | | | | |
| MCPP [2C] | ND | 2.35 | mg/kg wet | | | | | | | |
| *Surrogate: DCAA* | *0.165* | | mg/kg wet | *0.2000* | | *83* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.139* | | mg/kg wet | *0.2000* | | *70* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 2,4,5-T | 0.011 | 0.010 | mg/kg wet | 0.01900 | | 58 | 40-140 | | | |
| 2,4,5-T [2C] | 0.010 | 0.010 | mg/kg wet | 0.01900 | | 54 | 40-140 | | | |
| 2,4,5-TP (Silvex) | 0.012 | 0.010 | mg/kg wet | 0.01900 | | 62 | 40-140 | | | |
| 2,4,5-TP (Silvex) [2C] | 0.011 | 0.010 | mg/kg wet | 0.01900 | | 60 | 40-140 | | | |
| 2,4-D | 0.123 | 0.047 | mg/kg wet | 0.1880 | | 66 | 40-140 | | | |
| 2,4-D [2C] | 0.103 | 0.047 | mg/kg wet | 0.1880 | | 55 | 40-140 | | | |
| 2,4-DB | 0.118 | 0.048 | mg/kg wet | 0.1900 | | 62 | 40-140 | | | |
| 2,4-DB [2C] | 0.116 | 0.048 | mg/kg wet | 0.1900 | | 61 | 40-140 | | | |
| Dalapon | 0.270 | 0.046 | mg/kg wet | 0.4550 | | 59 | 40-140 | | | |
| Dalapon [2C] | 0.244 | 0.046 | mg/kg wet | 0.4550 | | 54 | 40-140 | | | |
| Dicamba | 0.011 | 0.009 | mg/kg wet | 0.01880 | | 60 | 40-140 | | | |
| Dicamba [2C] | 0.011 | 0.009 | mg/kg wet | 0.01880 | | 60 | 40-140 | | | |
| Dichlorprop | 0.159 | 0.047 | mg/kg wet | 0.1880 | | 85 | 40-140 | | | |
| Dichlorprop [2C] | 0.138 | 0.047 | mg/kg wet | 0.1880 | | 73 | 40-140 | | | |
| Dinoseb | 0.010 | 0.048 | mg/kg wet | 0.09500 | | 11 | 10-100 | | | |
| Dinoseb [2C] | 0.012 | 0.048 | mg/kg wet | 0.09500 | | 13 | 10-100 | | | |
| MCPA | 12.7 | 2.32 | mg/kg wet | 18.60 | | 68 | 40-140 | | | |
| MCPA [2C] | 12.8 | 2.32 | mg/kg wet | 18.60 | | 69 | 40-140 | | | |
| MCPP | 12.9 | 2.35 | mg/kg wet | 18.80 | | 68 | 40-140 | | | |
| MCPP [2C] | 12.6 | 2.35 | mg/kg wet | 18.80 | | 67 | 40-140 | | | |
| *Surrogate: DCAA* | *0.199* | | mg/kg wet | *0.2000* | | *99* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.167* | | mg/kg wet | *0.2000* | | *84* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 2,4,5-T | 0.012 | 0.010 | mg/kg wet | 0.01900 | | 62 | 40-140 | 7 | 30 | |
| 2,4,5-T [2C] | 0.011 | 0.010 | mg/kg wet | 0.01900 | | 58 | 40-140 | 7 | 30 | |
| 2,4,5-TP (Silvex) | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 66 | 40-140 | 6 | 30 | |
| 2,4,5-TP (Silvex) [2C] | 0.012 | 0.010 | mg/kg wet | 0.01900 | | 64 | 40-140 | 6 | 30 | |
| 2,4-D | 0.132 | 0.047 | mg/kg wet | 0.1880 | | 70 | 40-140 | 7 | 30 | |
| 2,4-D [2C] | 0.110 | 0.047 | mg/kg wet | 0.1880 | | 58 | 40-140 | 7 | 30 | |
| 2,4-DB | 0.129 | 0.048 | mg/kg wet | 0.1900 | | 68 | 40-140 | 9 | 30 | |
| 2,4-DB [2C] | 0.125 | 0.048 | mg/kg wet | 0.1900 | | 66 | 40-140 | 8 | 30 | |
| Dalapon | 0.285 | 0.046 | mg/kg wet | 0.4550 | | 63 | 40-140 | 5 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DE42344 - 3546** | | | | | | | | | | |
| Dalapon [2C] | 0.266 | 0.046 | mg/kg wet | 0.4550 | | 59 | 40-140 | 9 | 30 | |
| Dicamba | 0.011 | 0.009 | mg/kg wet | 0.01880 | | 60 | 40-140 | 0 | 30 | |
| Dicamba [2C] | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 62 | 40-140 | 3 | 30 | |
| Dichlorprop | 0.169 | 0.047 | mg/kg wet | 0.1880 | | 90 | 40-140 | 6 | 30 | |
| Dichlorprop [2C] | 0.142 | 0.047 | mg/kg wet | 0.1880 | | 76 | 40-140 | 3 | 30 | |
| Dinoseb | 0.012 | 0.048 | mg/kg wet | 0.09500 | | 12 | 10-100 | 14 | 30 | |
| Dinoseb [2C] | 0.014 | 0.048 | mg/kg wet | 0.09500 | | 15 | 10-100 | 17 | 30 | |
| MCPA | 13.6 | 2.32 | mg/kg wet | 18.60 | | 73 | 40-140 | 7 | 30 | |
| MCPA [2C] | 13.6 | 2.32 | mg/kg wet | 18.60 | | 73 | 40-140 | 6 | 30 | |
| MCPP | 13.9 | 2.35 | mg/kg wet | 18.80 | | 74 | 40-140 | 8 | 30 | |
| MCPP [2C] | 13.3 | 2.35 | mg/kg wet | 18.80 | | 71 | 40-140 | 5 | 30 | |
| *Surrogate: DCAA* | *0.184* | | mg/kg wet | *0.2000* | | *92* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.154* | | mg/kg wet | *0.2000* | | *77* | *30-150* | | | |
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DE42151 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Decane (C10) | ND | 0.2 | mg/kg wet | | | | | | | |
| Docosane (C22) | ND | 0.2 | mg/kg wet | | | | | | | |
| Dodecane (C12) | ND | 0.2 | mg/kg wet | | | | | | | |
| Eicosane (C20) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexacosane (C26) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexadecane (C16) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexatriacontane (C36) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonadecane (C19) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonane (C9) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octacosane (C28) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octadecane (C18) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetracosane (C24) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetradecane (C14) | ND | 0.2 | mg/kg wet | | | | | | | |
| Total Petroleum Hydrocarbons (C9-C36) | ND | 10.0 | mg/kg wet | | | | | | | |
| Triacontane (C30) | ND | 0.2 | mg/kg wet | | | | | | | |
| *Surrogate: O-Terphenyl* | *4.50* | | mg/kg wet | *5.000* | | *90* | *40-140* | | | |
| **LCS** | | | | | | | | | | |
| Decane (C10) | 2.5 | 0.2 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Docosane (C22) | 3.2 | 0.2 | mg/kg wet | 2.500 | | 128 | 40-140 | | | |
| Dodecane (C12) | 2.9 | 0.2 | mg/kg wet | 2.500 | | 116 | 40-140 | | | |
| Eicosane (C20) | 3.1 | 0.2 | mg/kg wet | 2.500 | | 124 | 40-140 | | | |
| Hexacosane (C26) | 3.4 | 0.2 | mg/kg wet | 2.500 | | 134 | 40-140 | | | |
| Hexadecane (C16) | 3.0 | 0.2 | mg/kg wet | 2.500 | | 122 | 40-140 | | | |
| Hexatriacontane (C36) | 3.6 | 0.2 | mg/kg wet | 2.500 | | 143 | 40-140 | | | B+ |
| Nonadecane (C19) | 3.2 | 0.2 | mg/kg wet | 2.500 | | 129 | 40-140 | | | |
| Nonane (C9) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 30-140 | | | |
| Octacosane (C28) | 3.3 | 0.2 | mg/kg wet | 2.500 | | 133 | 40-140 | | | |
| Octadecane (C18) | 3.0 | 0.2 | mg/kg wet | 2.500 | | 121 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DE42151 - 3546** | | | | | | | | | | |
| Tetracosane (C24) | 3.1 | 0.2 | mg/kg wet | 2.500 | | 123 | 40-140 | | | |
| Tetradecane (C14) | 3.0 | 0.2 | mg/kg wet | 2.500 | | 121 | 40-140 | | | |
| Total Petroleum Hydrocarbons (C9-C36) | 44.5 | 10.0 | mg/kg wet | 35.00 | | 127 | 40-140 | | | |
| Triacontane (C30) | 3.3 | 0.2 | mg/kg wet | 2.500 | | 132 | 40-140 | | | |
| *Surrogate: O-Terphenyl* | *3.98* | | mg/kg wet | *5.000* | | *80* | *40-140* | | | |
| **LCS Dup** | | | | | | | | | | |
| Decane (C10) | 2.5 | 0.2 | mg/kg wet | 2.500 | | 99 | 40-140 | 1 | 25 | |
| Docosane (C22) | 3.3 | 0.2 | mg/kg wet | 2.500 | | 134 | 40-140 | 5 | 25 | |
| Dodecane (C12) | 3.0 | 0.2 | mg/kg wet | 2.500 | | 118 | 40-140 | 2 | 25 | |
| Eicosane (C20) | 3.2 | 0.2 | mg/kg wet | 2.500 | | 130 | 40-140 | 5 | 25 | |
| Hexacosane (C26) | 3.5 | 0.2 | mg/kg wet | 2.500 | | 140 | 40-140 | 4 | 25 | |
| Hexadecane (C16) | 3.2 | 0.2 | mg/kg wet | 2.500 | | 126 | 40-140 | 3 | 25 | |
| Hexatriacontane (C36) | 3.6 | 0.2 | mg/kg wet | 2.500 | | 145 | 40-140 | 1 | 25 | B+ |
| Nonadecane (C19) | 3.3 | 0.2 | mg/kg wet | 2.500 | | 133 | 40-140 | 3 | 25 | |
| Nonane (C9) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 77 | 30-140 | 4 | 25 | |
| Octacosane (C28) | 3.4 | 0.2 | mg/kg wet | 2.500 | | 137 | 40-140 | 3 | 25 | |
| Octadecane (C18) | 3.1 | 0.2 | mg/kg wet | 2.500 | | 125 | 40-140 | 3 | 25 | |
| Tetracosane (C24) | 3.2 | 0.2 | mg/kg wet | 2.500 | | 129 | 40-140 | 5 | 25 | |
| Tetradecane (C14) | 3.1 | 0.2 | mg/kg wet | 2.500 | | 124 | 40-140 | 3 | 25 | |
| Total Petroleum Hydrocarbons (C9-C36) | 45.5 | 10.0 | mg/kg wet | 35.00 | | 130 | 40-140 | 2 | 25 | |
| Triacontane (C30) | 3.4 | 0.2 | mg/kg wet | 2.500 | | 135 | 40-140 | 2 | 25 | |
| *Surrogate: O-Terphenyl* | *4.04* | | mg/kg wet | *5.000* | | *81* | *40-140* | | | |
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DE42230 - General Preparation** | | | | | | | | | | |
| **Reference** | | | | | | | | | | |
| Flashpoint | 81 | | °F | 81.00 | | 100 | 97.9-102.1 | | | |
| **Batch DE42250 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Conductivity | ND | 5 | umhos/cm | | | | | | | |
| **LCS** | | | | | | | | | | |
| Conductivity | 1380 | | umhos/cm | 1410 | | 98 | 90-110 | | | |
| **Batch DE42334 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Reactive Cyanide | ND | 2.0 | mg/kg | | | | | | | |
| Reactive Sulfide | ND | 2.0 | mg/kg | | | | | | | |
| **LCS** | | | | | | | | | | |
| Reactive Cyanide | 4.1 | 2.0 | mg/kg | 100.3 | | 4 | 0.68-5.41 | | | |
| Reactive Sulfide | 2.0 | 2.0 | mg/kg | 10.00 | | 20 | 0-44 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

**Notes and Definitions**

| | |
|---|---|
| WL | Results obtained from a deionized water leach of the sample. |
| U | Analyte included in the analysis, but not detected |
| Q | Calibration required quadratic regression (Q). |
| D+ | Relative percent difference for duplicate is outside of criteria (D+). |
| D | Diluted. |
| CD- | Continuing Calibration %Diff/Drift is below control limit (CD-). |
| B+ | Blank Spike recovery is above upper control limit (B+). |
| > | Greater than. |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E0882

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24E0882
Date Received: 5/21/2024
Project Due Date: 5/29/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 5.4 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs: **2,4**
    Analysis: **Grain size**
    TAT: **5 day**
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: ____ Time: ____ By/Acid Lot#: ____
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: 5/21/24 Time: 1725 By: NA

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? ____ Date: ____ Time: ____ By: ____

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 551993 | Yes | N/A | Yes | 8 oz jar | NP | |
| 1 | 551994 | Yes | N/A | Yes | 8 oz jar | NP | |
| 1 | 552491 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 2 | 551987 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 2 | 551988 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 2 | 551991 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 3 | 551995 | Yes | N/A | Yes | 8 oz jar | NP | |
| 3 | 551996 | Yes | N/A | Yes | 8 oz jar | NP | |
| 3 | 552492 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 4 | 551989 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 4 | 551990 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 4 | 551992 | Yes | N/A | Yes | VOA Vial | MeOH | |

**2nd Review**
**Were all containers scanned into storage/lab?** Initials TB
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

ESS Project ID: 24E0882

Date Received: 5/21/2024

Completed By: [signature] Date & Time: 5/21/24 1713.

Reviewed By: [signature] Date & Time: 5/21/24 1725

# ESS Laboratory

*Division of Thielsch Engineering, Inc.*
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

## CHAIN OF CUSTODY

ESS Lab # 24ED882

| | | |
|---|---|---|
| Turn Time | 5 | Days |
| Regulatory State | Massachusetts | |
| Reporting Limits | compare results to RCS-1, RCS-2, Lined and unlined landfills, TCLP, and 20X if needed. | |

Is this project for any of the following?: ○ CT RCP ◉ MA MCP ○ RGP

Electonic Deliverables: ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) EDD

| Company Name | Project # | Project Name |
|---|---|---|
| Civil and Environmental Consultants | 332-344 | MassCEC Phase III ~~Site 1~~ Site 4 |

| Contact Person | Address |
|---|---|
| Cassia Dal Bello | 31 Bellows Road ML - 5/22/24 |

| City | State | Zip Code | PO # |
|---|---|---|---|
| Raynham | MA | 02767 | |

| Telephone Number | FAX Number | Email Address |
|---|---|---|
| 774-501-2176 | | cdalbello; jkitchen, dbarboza@cecinc.com |

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | RCRA8 Metals | PCBs via 3540C | TPH | SVOC - incl pyr | Pest - incl Tox | Herbicides | Reactivity | Conductivity | pH | Free Liquid | Flashpoint | VOC - high | VOC - low | Grain Size Analysis (Sieve Only) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5/20/24 | 12:10 | ~~Soil~~ Solid | Soil | CEC-13A 0'-12' | X | X | X | X | X | X | X | X | X | X | X | | | X | | |
| 2 | ↓ | 12:15 | ↓ | ↓ | CEC-13A 4'-6' | | | | | | | | | | | | X | X | | | |
| 3 | | 12:40 | | | CEC-13A 12'-14' | X | X | X | X | X | X | X | X | X | X | X | | | X | | |
| 4 | | 12:45 | | | CEC-13A 14'-16' | | | | | | | | | | | | X | X | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

| Container Type: | AC-Air Cassette | AG-Amber Glass | B-BOD Bottle | C-Cubitainer | J-Jar | O-Other | P-Poly | S-Sterile | V-Vial | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | V | V | J | J |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Container Volume: | 1-100 mL | 2-2.5 gal | 3-250 mL | 4-300 mL | 5-500 mL | 6-1L | 7-VOA | 8-2 oz | 9-4 oz | 10-8 oz | 11-Other* | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7 | 7 | 10 | 9 |
| Preservation Code: | 1-Non Preserved | 2-HCl | 3-H2SO4 | 4-HNO3 | 5-NaOH | 6-Methanol | 7-Na2S2O3 | 8-ZnAce, NaOH | 9-NH4Cl | 10-DI H2O | 11-Other* | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 10 | 1 | 1 |
| Number of Containers per Sample: | | | | | | | | | | | | 1 | | | | | 1 | | | | | 1 | 1 | 2 | 1 | 1 |

**Laboratory Use Only**

Cooler Present: ~~—~~ ○ Drop Off
Seals Intact: ~~—~~ ○ Pickup
Cooler Temperature: 5.4 I.R. °C

Sampled by : CI

**Comments:** Please specify "Other" preservative and containers types in this space

Run TCLP if fails 20x

| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
|---|---|---|---|
| Cassia Dal Bello 5/21/24 | 5/21/24 11:02 | 5/21/24 16:57 | 1657 5/21/24 |
| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
| | | | |

ESS Laboratory
DIVISION OF THE RISE GROUP
BAL Laboratory Analytical Balance

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC Phase III - Site 4 (332-344)**
**ESS Laboratory Work Order Number: 24E1195**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

**REVIEWED**
**By ESS Laboratory at 5:38 pm, Jun 06, 2024**

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

## SAMPLE RECEIPT

The following samples were received on May 30, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

**Low Level VOA vials were frozen by ESS Laboratory on 5/30/22 at 17:22.**
**Tetrahydrofuran is reported above the MA CAM reporting limit of 0.010 mg/kg.**

**Question I: All samples for EPH and Metals were analyzed for a subset of the required MCP list per the client's request.**

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 24E1195-01 | CEC-12A 4ft-6ft | Soil | 8260D Low |
| 24E1195-02 | CEC-12A 0ft-12ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24E1195-03 | CEC-12A 19ft-21ft | Soil | 8260D Low |
| 24E1195-04 | CEC-12A 12ft-24ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

## PROJECT NARRATIVE

**Semi-Volatile Organic Compounds**

D4E0637-CCV1 **Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration**
2,4-Dimethylphenol (180% @ 80-120%)

D4E0637-CCV1 **Calibration required quadratic regression (Q).**
Pentachlorophenol (89% @ 40-160%)

D4E0637-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4-Dimethylphenol (80% @ 20%), 3,3′-Dichlorobenzidine (22% @ 20%), Aniline (36% @ 20%), Hexachlorobutadiene (31% @ 20%)

D4F0069-CCV1 **Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration**
2,4-Dinitrophenol (95% @ 40-160%)

D4F0069-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (95% @ 40-160%), Pentachlorophenol (107% @ 40-160%)

**Total Metals**

DE43107-BSD2 **Blank Spike recovery is below lower control limit (B-).**
Arsenic (65% @ 70-102%), Barium (71% @ 78-111%), Cadmium (66% @ 74-105%), Chromium (72% @ 73-107%), Lead (72% @ 74-108%), Selenium (66% @ 71-109%)

**Volatile Organics Low Level**

D4F0006-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
1,4-Dioxane (34% @ 20%), sec-Butylbenzene (27% @ 20%), Tetrachloroethene (38% @ 20%)

D4F0011-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
1,2-Dichlorobenzene (21% @ 20%), 1,3-Dichlorobenzene (21% @ 20%), Bromobenzene (21% @ 20%), sec-Butylbenzene (35% @ 20%), Tetrachloroethene (38% @ 20%)

DF40102-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Tetrachloroethene (67% @ 70-130%)

DF40305-BS1 **Blank Spike recovery is below lower control limit (B-).**
Tetrachloroethene (69% @ 70-130%)

DF40305-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
Acetone (51% @ 20%)

**No other observations noted.**

**End of Project Narrative.**

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24E1195-01 through 24E1195-04**

Matrices: ( ) Ground Water/Surface Water (x) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| (x) 8260 VOC CAM II A | (x) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | ( ) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (x) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | (x) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (x) 6010 Metals CAM III A | ( ) 6020 Metals CAM III D | (x) MassDEP EPH CAM IV B | (x) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (x) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (x) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (x) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (x) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes (x) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (x) No ( ) |

***Responses to Questions G, H and I below are required for '"Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? | Yes ( ) No (x)* |
| | ***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.** | |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (x)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes ( ) No (x)* |

***All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: June 06, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 4ft-6ft
Date Sampled: 05/29/24 15:30
Percent Solids: 93
Initial Volume: 6.5g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/1/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,1,1-Trichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,1,2,2-Tetrachloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,1,2-Trichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,1-Dichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,1-Dichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,1-Dichloropropene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,2,3-Trichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,2,3-Trichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,2,4-Trichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,2,4-Trimethylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,2-Dibromoethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,2-Dichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,2-Dichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,2-Dichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,3,5-Trimethylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,3-Dichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,3-Dichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,4-Dichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 1,4-Dioxane | ND (0.0823) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 2,2-Dichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 2-Butanone | ND (0.0412) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 2-Chlorotoluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 2-Hexanone | ND (0.0412) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 4-Chlorotoluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| 4-Isopropyltoluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 4ft-6ft
Date Sampled: 05/29/24 15:30
Percent Solids: 93
Initial Volume: 6.5g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/1/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0412) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| **Acetone** | **0.272** (0.0412) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Benzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Bromobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Bromochloromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Bromodichloromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Bromoform | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Bromomethane | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Carbon Disulfide | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Carbon Tetrachloride | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Chlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Chloroethane | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Chloroform | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Chloromethane | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| cis-1,2-Dichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| cis-1,3-Dichloropropene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Dibromochloromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Dibromomethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Dichlorodifluoromethane | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Diethyl Ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Di-isopropyl ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Ethyl tertiary-butyl ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Ethylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Hexachlorobutadiene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Isopropylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Methyl tert-Butyl Ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Methylene Chloride | ND (0.0206) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 4ft-6ft
Date Sampled: 05/29/24 15:30
Percent Solids: 93
Initial Volume: 6.5g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/1/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| n-Butylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| n-Propylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| sec-Butylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Styrene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| tert-Butylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Tertiary-amyl methyl ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Tetrachloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Tetrahydrofuran | ND (0.0165) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Toluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| trans-1,2-Dichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| trans-1,3-Dichloropropene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Trichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Trichlorofluoromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Vinyl Chloride | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Xylene O | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Xylene P,M | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |
| Xylenes (Total) | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/02/24 3:19 | D4F0006 | DF40102 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *115 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *98 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *110 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *102 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 0ft-12ft
Date Sampled: 05/29/24 15:40
Percent Solids: 93

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **1.49** (0.75) | --- | 6010D | --- | 1 | KJB | 06/03/24 16:56 | 2.87 100 | DE43107 |
| **Barium** | **10.9** (0.75) | --- | 6010D | --- | 1 | KJB | 05/31/24 17:13 | 2.87 100 | DE43107 |
| Cadmium | ND (0.37) | --- | 6010D | --- | 1 | KJB | 05/31/24 17:13 | 2.87 100 | DE43107 |
| **Chromium** | **6.22** (0.75) | --- | 6010D | --- | 1 | KJB | 05/31/24 17:13 | 2.87 100 | DE43107 |
| **Lead** | **9.48** (3.73) | --- | 6010D | --- | 1 | KJB | 05/31/24 17:13 | 2.87 100 | DE43107 |
| Mercury | ND (0.031) | --- | 7471B | --- | 1 | CEV | 06/03/24 10:23 | 0.69 40 | DE43111 |
| Selenium | ND (3.73) | --- | 6010D | --- | 1 | KJB | 05/31/24 17:13 | 2.87 100 | DE43107 |
| Silver | ND (0.37) | --- | 6010D | --- | 1 | KJB | 05/31/24 17:13 | 2.87 100 | DE43107 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 0ft-12ft
Date Sampled: 05/29/24 15:40
Percent Solids: 93
Initial Volume: 20.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/31/24 10:00

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.026) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 1,2,4-Trichlorobenzene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 1,2-Dichlorobenzene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 1,3-Dichlorobenzene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 1,4-Dichlorobenzene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 2,4,5-Trichlorophenol | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 2,4,6-Trichlorophenol | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 2,4-Dichlorophenol | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 2,4-Dimethylphenol | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 2,4-Dinitrophenol | ND (1.06) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 2,4-Dinitrotoluene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 2,6-Dinitrotoluene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 2-Chloronaphthalene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 2-Chlorophenol | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 2-Methylnaphthalene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 2-Methylphenol | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 2-Nitrophenol | ND (0.530) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 3,3´-Dichlorobenzidine | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 3+4-Methylphenol | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 4-Bromophenyl-phenylether | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 4-Chloroaniline | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| 4-Nitrophenol | ND (1.06) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Acenaphthene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Acenaphthylene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Acetophenone | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Aniline | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Anthracene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 0ft-12ft
Date Sampled: 05/29/24 15:40
Percent Solids: 93
Initial Volume: 20.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/31/24 10:00

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Benzo(a)anthracene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Benzo(a)pyrene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Benzo(b)fluoranthene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Benzo(g,h,i)perylene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Benzo(k)fluoranthene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| bis(2-Chloroethoxy)methane | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| bis(2-Chloroethyl)ether | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| bis(2-chloroisopropyl)Ether | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| bis(2-Ethylhexyl)phthalate | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Butylbenzylphthalate | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Chrysene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Dibenzo(a,h)Anthracene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Dibenzofuran | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Diethylphthalate | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Dimethylphthalate | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Di-n-butylphthalate | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Di-n-octylphthalate | ND (0.530) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Fluoranthene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Fluorene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Hexachlorobenzene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Hexachlorobutadiene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Hexachloroethane | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Indeno(1,2,3-cd)Pyrene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Isophorone | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Naphthalene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Nitrobenzene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 0ft-12ft
Date Sampled: 05/29/24 15:40
Percent Solids: 93
Initial Volume: 20.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/31/24 10:00

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Pentachlorophenol | ND (1.06) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Phenanthrene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Phenol | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Pyrene | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |
| Pyridine | ND (0.265) | --- | 8270E | --- | 1 | TJ | 06/04/24 23:35 | D4F0069 | DE43105 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *77 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *83 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *85 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *82 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *85 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *84 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *87 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *91 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 0ft-12ft
Date Sampled: 05/29/24 15:40
Percent Solids: 93
Initial Volume: 20.5g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 5/31/24 11:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | --- | 8082A | --- | 1 | 06/03/24 22:00 | --- | DE43109 |
| Aroclor 1221 | ND (0.05) | --- | 8082A | --- | 1 | 06/03/24 22:00 | --- | DE43109 |
| Aroclor 1232 | ND (0.05) | --- | 8082A | --- | 1 | 06/03/24 22:00 | --- | DE43109 |
| Aroclor 1242 | ND (0.05) | --- | 8082A | --- | 1 | 06/03/24 22:00 | --- | DE43109 |
| Aroclor 1248 | ND (0.05) | --- | 8082A | --- | 1 | 06/03/24 22:00 | --- | DE43109 |
| Aroclor 1254 | ND (0.05) | --- | 8082A | --- | 1 | 06/03/24 22:00 | --- | DE43109 |
| Aroclor 1260 | ND (0.05) | --- | 8082A | --- | 1 | 06/03/24 22:00 | --- | DE43109 |
| Aroclor 1262 | ND (0.05) | --- | 8082A | --- | 1 | 06/03/24 22:00 | --- | DE43109 |
| Aroclor 1268 | ND (0.05) | --- | 8082A | --- | 1 | 06/03/24 22:00 | --- | DE43109 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *87 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *83 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 0ft-12ft
Date Sampled: 05/29/24 15:40
Percent Solids: 93
Initial Volume: 20.1g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 5/31/24 10:30

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| 4,4´-DDE | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| 4,4´-DDT | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Aldrin | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| alpha-BHC | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| alpha-Chlordane | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| beta-BHC | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Chlordane (Total) | ND (0.0213) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| delta-BHC | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Dieldrin | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Endosulfan I | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Endosulfan II | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Endosulfan Sulfate | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Endrin | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Endrin Ketone | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| gamma-BHC (Lindane) | ND (0.0016) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| gamma-Chlordane | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Heptachlor | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Heptachlor Epoxide | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Hexachlorobenzene | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Methoxychlor | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |
| Toxaphene | ND (0.133) | --- | 8081B | --- | 1 | 06/03/24 18:09 | D4F0021 | DE43104 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl [2C]* | *75 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *59 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 0ft-12ft
Date Sampled: 05/29/24 15:40
Percent Solids: 93
Initial Volume: 10.2g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/3/24 18:00

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/05/24 10:42 | D4F0074 | DF40346 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/05/24 10:42 | D4F0074 | DF40346 |
| 2,4-D | ND (0.049) | --- | 8151A | --- | 1 | 06/05/24 10:42 | D4F0074 | DF40346 |
| 2,4-DB | ND (0.050) | --- | 8151A | --- | 1 | 06/05/24 10:42 | D4F0074 | DF40346 |
| Dalapon | ND (0.048) | --- | 8151A | --- | 1 | 06/05/24 10:42 | D4F0074 | DF40346 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/05/24 10:42 | D4F0074 | DF40346 |
| Dichlorprop | ND (0.049) | --- | 8151A | --- | 1 | 06/05/24 10:42 | D4F0074 | DF40346 |
| Dinoseb | ND (0.050) | --- | 8151A | --- | 1 | 06/05/24 10:42 | D4F0074 | DF40346 |
| MCPA | ND (2.44) | --- | 8151A | --- | 1 | 06/05/24 10:42 | D4F0074 | DF40346 |
| MCPP | ND (2.47) | --- | 8151A | --- | 1 | 06/05/24 10:42 | D4F0074 | DF40346 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *80 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 0ft-12ft
Date Sampled: 05/29/24 15:40
Percent Solids: 93
Initial Volume: 20.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 5/30/24 19:01

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **11.5** (10.6) | --- | 8100M | --- | 1 | 06/01/24 1:11 | --- | DE43050 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 81 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 0ft-12ft
Date Sampled: 05/29/24 15:40
Percent Solids: 93

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-02
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 116** (5) | --- | 9050A | --- | 1 | JLK | 05/31/24 21:02 | umhos/cm | DE43141 |
| **Corrosivity (pH)** | **8.60** (N/A) | --- | 9045 | --- | 1 | JLK | 05/30/24 19:31 | S.U. | DE43047 |
| **Corrosivity (pH) Sample Temp** | **20.8** | --- | 2550B | --- | 1 | JLK | 05/30/24 19:31 | °C | DE43047 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/03/24 17:47 | °F | DF40333 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EEM | 06/04/24 12:05 | ml/5 min | DF40417 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/03/24 15:27 | mg/kg | DF40331 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/03/24 15:27 | mg/kg | DF40331 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 19ft-21ft
Date Sampled: 05/30/24 08:45
Percent Solids: 88
Initial Volume: 6g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/3/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,1,1-Trichloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,1,2,2-Tetrachloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,1,2-Trichloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,1-Dichloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,1-Dichloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,1-Dichloropropene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,2,3-Trichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,2,3-Trichloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,2,4-Trichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,2,4-Trimethylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,2-Dibromoethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,2-Dichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,2-Dichloroethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,2-Dichloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,3,5-Trimethylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,3-Dichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,3-Dichloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,4-Dichlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 1,4-Dioxane | ND (0.0951) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 2,2-Dichloropropane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 2-Butanone | ND (0.0475) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 2-Chlorotoluene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 2-Hexanone | ND (0.0475) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 4-Chlorotoluene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| 4-Isopropyltoluene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 19ft-21ft
Date Sampled: 05/30/24 08:45
Percent Solids: 88
Initial Volume: 6g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/3/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0475) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Acetone | ND (0.0475) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Benzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Bromobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Bromochloromethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Bromodichloromethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Bromoform | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Bromomethane | ND (0.0095) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Carbon Disulfide | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Carbon Tetrachloride | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Chlorobenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Chloroethane | ND (0.0095) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Chloroform | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Chloromethane | ND (0.0095) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| cis-1,2-Dichloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| cis-1,3-Dichloropropene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Dibromochloromethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Dibromomethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Dichlorodifluoromethane | ND (0.0095) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Diethyl Ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Di-isopropyl ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Ethyl tertiary-butyl ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Ethylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Hexachlorobutadiene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Isopropylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Methyl tert-Butyl Ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Methylene Chloride | ND (0.0238) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 19ft-21ft
Date Sampled: 05/30/24 08:45
Percent Solids: 88
Initial Volume: 6g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/3/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| n-Butylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| n-Propylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| sec-Butylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Styrene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| tert-Butylbenzene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Tertiary-amyl methyl ether | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Tetrachloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Tetrahydrofuran | ND (0.0190) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Toluene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| trans-1,2-Dichloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| trans-1,3-Dichloropropene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Trichloroethene | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Trichlorofluoromethane | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Vinyl Chloride | ND (0.0095) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Xylene O | ND (0.0048) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Xylene P,M | ND (0.0095) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |
| Xylenes (Total) | ND (0.0095) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 13:13 | D4F0011 | DF40305 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *113 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *96 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *108 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *102 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 12ft-24ft
Date Sampled: 05/30/24 08:55
Percent Solids: 88

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **2.00** (0.88) | --- | 6010D | --- | 1 | KJB | 06/03/24 16:58 | 2.6 100 | DE43107 |
| **Barium** | **10.1** (0.88) | --- | 6010D | --- | 1 | KJB | 05/31/24 17:15 | 2.6 100 | DE43107 |
| Cadmium | ND (0.44) | --- | 6010D | --- | 1 | KJB | 05/31/24 17:15 | 2.6 100 | DE43107 |
| **Chromium** | **6.78** (0.88) | --- | 6010D | --- | 1 | KJB | 05/31/24 17:15 | 2.6 100 | DE43107 |
| **Lead** | **5.99** (4.39) | --- | 6010D | --- | 1 | KJB | 05/31/24 17:15 | 2.6 100 | DE43107 |
| Mercury | ND (0.033) | --- | 7471B | --- | 1 | CEV | 06/03/24 10:25 | 0.69 40 | DE43111 |
| Selenium | ND (4.39) | --- | 6010D | --- | 1 | KJB | 05/31/24 17:15 | 2.6 100 | DE43107 |
| Silver | ND (0.44) | --- | 6010D | --- | 1 | KJB | 05/31/24 17:15 | 2.6 100 | DE43107 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 12ft-24ft
Date Sampled: 05/30/24 08:55
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/31/24 10:00

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 1,2,4-Trichlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 1,2-Dichlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 1,3-Dichlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 1,4-Dichlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 2,4,5-Trichlorophenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 2,4,6-Trichlorophenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 2,4-Dichlorophenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 2,4-Dimethylphenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 2,4-Dinitrophenol | ND (1.16) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 2,4-Dinitrotoluene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 2,6-Dinitrotoluene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 2-Chloronaphthalene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 2-Chlorophenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 2-Methylnaphthalene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 2-Methylphenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 2-Nitrophenol | ND (0.579) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 3,3´-Dichlorobenzidine | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 3+4-Methylphenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 4-Bromophenyl-phenylether | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 4-Chloroaniline | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| 4-Nitrophenol | ND (1.16) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Acenaphthene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Acenaphthylene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Acetophenone | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Aniline | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Anthracene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 12ft-24ft
Date Sampled: 05/30/24 08:55
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/31/24 10:00

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Benzo(a)anthracene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Benzo(a)pyrene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Benzo(b)fluoranthene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Benzo(g,h,i)perylene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Benzo(k)fluoranthene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| bis(2-Chloroethoxy)methane | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| bis(2-Chloroethyl)ether | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| bis(2-chloroisopropyl)Ether | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| bis(2-Ethylhexyl)phthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Butylbenzylphthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Chrysene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Dibenzo(a,h)Anthracene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Dibenzofuran | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Diethylphthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Dimethylphthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Di-n-butylphthalate | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Di-n-octylphthalate | ND (0.579) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Fluoranthene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Fluorene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Hexachlorobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Hexachlorobutadiene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Hexachloroethane | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Indeno(1,2,3-cd)Pyrene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Isophorone | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Naphthalene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Nitrobenzene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 12ft-24ft
Date Sampled: 05/30/24 08:55
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/31/24 10:00

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Pentachlorophenol | ND (1.16) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Phenanthrene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Phenol | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Pyrene | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |
| Pyridine | ND (0.290) | --- | 8270E | --- | 1 | TJ | 06/05/24 0:06 | D4F0069 | DE43105 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *89 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *97 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *98 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *93 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *99 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *97 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *99 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *109 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 12ft-24ft
Date Sampled: 05/30/24 08:55
Percent Solids: 88
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 5/31/24 11:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/03/24 22:19 | --- | DE43109 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/03/24 22:19 | --- | DE43109 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/03/24 22:19 | --- | DE43109 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/03/24 22:19 | --- | DE43109 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/03/24 22:19 | --- | DE43109 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 06/03/24 22:19 | --- | DE43109 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/03/24 22:19 | --- | DE43109 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/03/24 22:19 | --- | DE43109 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/03/24 22:19 | --- | DE43109 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *84 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *85 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 12ft-24ft
Date Sampled: 05/30/24 08:55
Percent Solids: 88
Initial Volume: 19.8g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 5/31/24 10:30

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| 4,4´-DDE | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| 4,4´-DDT | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Aldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| alpha-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| alpha-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| beta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Chlordane (Total) | ND (0.0230) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| delta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Dieldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Endosulfan I | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Endosulfan II | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Endosulfan Sulfate | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Endrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Endrin Ketone | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| gamma-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Heptachlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Heptachlor Epoxide | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Hexachlorobenzene | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Methoxychlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |
| Toxaphene | ND (0.144) | --- | 8081B | --- | 1 | 06/03/24 18:37 | D4F0021 | DE43104 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl [2C]* | *95 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *79 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 12ft-24ft
Date Sampled: 05/30/24 08:55
Percent Solids: 88
Initial Volume: 10.3g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/3/24 18:00

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.011) | --- | 8151A | --- | 1 | 06/05/24 11:12 | D4F0074 | DF40346 |
| 2,4,5-TP (Silvex) | ND (0.011) | --- | 8151A | --- | 1 | 06/05/24 11:12 | D4F0074 | DF40346 |
| 2,4-D | ND (0.052) | --- | 8151A | --- | 1 | 06/05/24 11:12 | D4F0074 | DF40346 |
| 2,4-DB | ND (0.053) | --- | 8151A | --- | 1 | 06/05/24 11:12 | D4F0074 | DF40346 |
| Dalapon | ND (0.050) | --- | 8151A | --- | 1 | 06/05/24 11:12 | D4F0074 | DF40346 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/05/24 11:12 | D4F0074 | DF40346 |
| Dichlorprop | ND (0.052) | --- | 8151A | --- | 1 | 06/05/24 11:12 | D4F0074 | DF40346 |
| Dinoseb | ND (0.053) | --- | 8151A | --- | 1 | 06/05/24 11:12 | D4F0074 | DF40346 |
| MCPA | ND (2.58) | --- | 8151A | --- | 1 | 06/05/24 11:12 | D4F0074 | DF40346 |
| MCPP | ND (2.60) | --- | 8151A | --- | 1 | 06/05/24 11:12 | D4F0074 | DF40346 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *93 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 12ft-24ft
Date Sampled: 05/30/24 08:55
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 5/30/24 19:01

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **71.9** (11.2) | --- | 8100M | --- | 1 | 06/01/24 1:52 | --- | DE43050 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 82 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-12A 12ft-24ft
Date Sampled: 05/30/24 08:55
Percent Solids: 88

ESS Laboratory Work Order: 24E1195
ESS Laboratory Sample ID: 24E1195-04
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 498** (5) | --- | 9050A | --- | 1 | JLK | 05/31/24 21:02 | umhos/cm | DE43141 |
| **Corrosivity (pH)** | **8.23** (N/A) | --- | 9045 | --- | 1 | JLK | 05/30/24 19:31 | S.U. | DE43047 |
| **Corrosivity (pH) Sample Temp** | **20.8** | --- | 2550B | --- | 1 | JLK | 05/30/24 19:31 | °C | DE43047 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/03/24 17:47 | °F | DF40333 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EEM | 06/04/24 12:05 | ml/5 min | DF40417 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/03/24 15:27 | mg/kg | DF40331 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/03/24 15:27 | mg/kg | DF40331 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DE43107 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Arsenic | ND | 1.00 | mg/kg wet | | | | | | | |
| Barium | ND | 1.00 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Arsenic | 170 | 3.33 | mg/kg wet | 223.0 | | 76 | 70-102 | | | |
| Barium | 367 | 3.33 | mg/kg wet | 445.0 | | 82 | 78-111 | | | |
| Cadmium | 174 | 1.67 | mg/kg wet | 226.0 | | 77 | 74-105 | | | |
| Chromium | 188 | 3.33 | mg/kg wet | 230.0 | | 82 | 73-107 | | | |
| Lead | 229 | 16.7 | mg/kg wet | 275.0 | | 83 | 74-108 | | | |
| Selenium | 106 | 16.7 | mg/kg wet | 137.0 | | 77 | 71-109 | | | |
| Silver | 61.1 | 1.67 | mg/kg wet | 75.30 | | 81 | 72-110 | | | |
| **LCS Dup** | | | | | | | | | | |
| Arsenic | 145 | 2.99 | mg/kg wet | 223.0 | | 65 | 70-102 | 16 | 30 | B- |
| Barium | 317 | 2.99 | mg/kg wet | 445.0 | | 71 | 78-111 | 14 | 30 | B- |
| Cadmium | 149 | 1.49 | mg/kg wet | 226.0 | | 66 | 74-105 | 16 | 30 | B- |
| Chromium | 165 | 2.99 | mg/kg wet | 230.0 | | 72 | 73-107 | 13 | 30 | B- |
| Lead | 197 | 14.9 | mg/kg wet | 275.0 | | 72 | 74-108 | 15 | 30 | B- |
| Selenium | 91.0 | 14.9 | mg/kg wet | 137.0 | | 66 | 71-109 | 15 | 30 | B- |
| Silver | 53.3 | 1.49 | mg/kg wet | 75.30 | | 71 | 70-110 | 14 | 30 | |
| **Batch DE43111 - 245.1/7470A** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Mercury | ND | 0.032 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 21.9 | 2.83 | mg/kg wet | 25.50 | | 86 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 22.1 | 3.09 | mg/kg wet | 25.50 | | 87 | 80-120 | 0.9 | 30 | |
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40102 - 5035** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,1-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40102 - 5035** | | | | | | | | | | |
| 1,2,3-Trichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromoethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dioxane | ND | 0.100 | mg/kg wet | | | | | | | |
| 2,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Butanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 2-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Hexanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 4-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Isopropyltoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Methyl-2-Pentanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Acetone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Benzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromodichloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromoform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromomethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Carbon Disulfide | ND | 0.0050 | mg/kg wet | | | | | | | |
| Carbon Tetrachloride | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloroethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Chloroform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| cis-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| cis-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromomethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dichlorodifluoromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Diethyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Di-isopropyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethyl tertiary-butyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Isopropylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methyl tert-Butyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40102 - 5035** | | | | | | | | | | |
| Methylene Chloride | ND | 0.0250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Propylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| sec-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Styrene | ND | 0.0050 | mg/kg wet | | | | | | | |
| tert-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tertiary-amyl methyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrachloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrahydrofuran | ND | 0.0200 | mg/kg wet | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichlorofluoromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Vinyl Chloride | ND | 0.0100 | mg/kg wet | | | | | | | |
| Xylene O | ND | 0.0050 | mg/kg wet | | | | | | | |
| Xylene P,M | ND | 0.0100 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0562* | | mg/kg wet | *0.05000* | | *112* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0497* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0535* | | mg/kg wet | *0.05000* | | *107* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0506* | | mg/kg wet | *0.05000* | | *101* | *70-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,1,1-Trichloroethane | 0.0528 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| 1,1,2,2-Tetrachloroethane | 0.0492 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | | | |
| 1,1,2-Trichloroethane | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| 1,1-Dichloroethane | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 1,1-Dichloroethene | 0.0486 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| 1,1-Dichloropropene | 0.0506 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| 1,2,3-Trichlorobenzene | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| 1,2,3-Trichloropropane | 0.0438 | 0.0050 | mg/kg wet | 0.05000 | | 88 | 70-130 | | | |
| 1,2,4-Trichlorobenzene | 0.0508 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,2,4-Trimethylbenzene | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,2-Dibromo-3-Chloropropane | 0.0438 | 0.0050 | mg/kg wet | 0.05000 | | 88 | 70-130 | | | |
| 1,2-Dibromoethane | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| 1,2-Dichlorobenzene | 0.0465 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | | | |
| 1,2-Dichloroethane | 0.0522 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,2-Dichloropropane | 0.0509 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,3,5-Trimethylbenzene | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,3-Dichlorobenzene | 0.0479 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| 1,3-Dichloropropane | 0.0504 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| 1,4-Dichlorobenzene | 0.0482 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| 1,4-Dioxane | 0.927 | 0.100 | mg/kg wet | 1.000 | | 93 | 70-130 | | | |
| 2,2-Dichloropropane | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40102 - 5035** | | | | | | | | | | |
| 2-Butanone | 0.249 | 0.0500 | mg/kg wet | 0.2500 | | 99 | 40-160 | | | |
| 2-Chlorotoluene | 0.0499 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 2-Hexanone | 0.236 | 0.0500 | mg/kg wet | 0.2500 | | 94 | 40-160 | | | |
| 4-Chlorotoluene | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| 4-Isopropyltoluene | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| 4-Methyl-2-Pentanone | 0.234 | 0.0500 | mg/kg wet | 0.2500 | | 94 | 40-160 | | | |
| Acetone | 0.220 | 0.0500 | mg/kg wet | 0.2500 | | 88 | 40-160 | | | |
| Benzene | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| Bromobenzene | 0.0483 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| Bromochloromethane | 0.0486 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| Bromodichloromethane | 0.0593 | 0.0050 | mg/kg wet | 0.05000 | | 119 | 70-130 | | | |
| Bromoform | 0.0414 | 0.0050 | mg/kg wet | 0.05000 | | 83 | 40-160 | | | |
| Bromomethane | 0.0448 | 0.0100 | mg/kg wet | 0.05000 | | 90 | 40-160 | | | |
| Carbon Disulfide | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Carbon Tetrachloride | 0.0564 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | | | |
| Chlorobenzene | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| Chloroethane | 0.0466 | 0.0100 | mg/kg wet | 0.05000 | | 93 | 40-160 | | | |
| Chloroform | 0.0520 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| Chloromethane | 0.0439 | 0.0100 | mg/kg wet | 0.05000 | | 88 | 40-160 | | | |
| cis-1,2-Dichloroethene | 0.0494 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| cis-1,3-Dichloropropene | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 40-160 | | | |
| Dibromochloromethane | 0.0485 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 40-160 | | | |
| Dibromomethane | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| Dichlorodifluoromethane | 0.0298 | 0.0100 | mg/kg wet | 0.05000 | | 60 | 40-160 | | | |
| Diethyl Ether | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| Di-isopropyl ether | 0.0543 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| Ethyl tertiary-butyl ether | 0.0503 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| Ethylbenzene | 0.0496 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| Hexachlorobutadiene | 0.0482 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 40-160 | | | |
| Isopropylbenzene | 0.0549 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Methyl tert-Butyl Ether | 0.0485 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| Methylene Chloride | 0.0445 | 0.0250 | mg/kg wet | 0.05000 | | 89 | 70-130 | | | |
| Naphthalene | 0.0439 | 0.0050 | mg/kg wet | 0.05000 | | 88 | 40-160 | | | |
| n-Butylbenzene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| n-Propylbenzene | 0.0520 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| sec-Butylbenzene | 0.0404 | 0.0050 | mg/kg wet | 0.05000 | | 81 | 70-130 | | | |
| Styrene | 0.0480 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 40-160 | | | |
| tert-Butylbenzene | 0.0499 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| Tertiary-amyl methyl ether | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| Tetrachloroethene | 0.0350 | 0.0050 | mg/kg wet | 0.05000 | | 70 | 70-130 | | | |
| Tetrahydrofuran | 0.0485 | 0.0200 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| Toluene | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| trans-1,2-Dichloroethene | 0.0495 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| trans-1,3-Dichloropropene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| Trichloroethene | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40102 - 5035** | | | | | | | | | | |
| Trichlorofluoromethane | 0.0505 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 40-160 | | | |
| Vinyl Chloride | 0.0445 | 0.0100 | mg/kg wet | 0.05000 | | 89 | 70-130 | | | |
| Xylene O | 0.0510 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Xylene P,M | 0.103 | 0.0100 | mg/kg wet | 0.1000 | | 103 | 70-130 | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0527* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0495* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0521* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0513* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 2 | 20 | |
| 1,1,1-Trichloroethane | 0.0520 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 1 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0461 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 40-160 | 6 | 20 | |
| 1,1,2-Trichloroethane | 0.0494 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 0.3 | 20 | |
| 1,1-Dichloroethane | 0.0496 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 0.8 | 20 | |
| 1,1-Dichloroethene | 0.0485 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | 0.08 | 20 | |
| 1,1-Dichloropropene | 0.0496 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 2 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0456 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | 8 | 20 | |
| 1,2,3-Trichloropropane | 0.0403 | 0.0050 | mg/kg wet | 0.05000 | | 81 | 70-130 | 8 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 6 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0468 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | 9 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0408 | 0.0050 | mg/kg wet | 0.05000 | | 82 | 70-130 | 7 | 20 | |
| 1,2-Dibromoethane | 0.0475 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 0.6 | 20 | |
| 1,2-Dichlorobenzene | 0.0433 | 0.0050 | mg/kg wet | 0.05000 | | 87 | 70-130 | 7 | 20 | |
| 1,2-Dichloroethane | 0.0514 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 2 | 20 | |
| 1,2-Dichloropropane | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 0.4 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0472 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | 8 | 20 | |
| 1,3-Dichlorobenzene | 0.0444 | 0.0050 | mg/kg wet | 0.05000 | | 89 | 70-130 | 8 | 20 | |
| 1,3-Dichloropropane | 0.0499 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 0.9 | 20 | |
| 1,4-Dichlorobenzene | 0.0449 | 0.0050 | mg/kg wet | 0.05000 | | 90 | 70-130 | 7 | 20 | |
| 1,4-Dioxane | 0.932 | 0.100 | mg/kg wet | 1.000 | | 93 | 70-130 | 0.6 | 20 | |
| 2,2-Dichloropropane | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 1 | 20 | |
| 2-Butanone | 0.250 | 0.0500 | mg/kg wet | 0.2500 | | 100 | 40-160 | 0.4 | 20 | |
| 2-Chlorotoluene | 0.0461 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | 8 | 20 | |
| 2-Hexanone | 0.236 | 0.0500 | mg/kg wet | 0.2500 | | 94 | 40-160 | 0.05 | 20 | |
| 4-Chlorotoluene | 0.0458 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | 7 | 20 | |
| 4-Isopropyltoluene | 0.0447 | 0.0050 | mg/kg wet | 0.05000 | | 89 | 70-130 | 9 | 20 | |
| 4-Methyl-2-Pentanone | 0.236 | 0.0500 | mg/kg wet | 0.2500 | | 94 | 40-160 | 0.7 | 20 | |
| Acetone | 0.223 | 0.0500 | mg/kg wet | 0.2500 | | 89 | 40-160 | 1 | 20 | |
| Benzene | 0.0486 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | 0.9 | 20 | |
| Bromobenzene | 0.0450 | 0.0050 | mg/kg wet | 0.05000 | | 90 | 70-130 | 7 | 20 | |
| Bromochloromethane | 0.0475 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 2 | 20 | |
| Bromodichloromethane | 0.0594 | 0.0050 | mg/kg wet | 0.05000 | | 119 | 70-130 | 0.2 | 20 | |
| Bromoform | 0.0404 | 0.0050 | mg/kg wet | 0.05000 | | 81 | 40-160 | 2 | 20 | |
| Bromomethane | 0.0453 | 0.0100 | mg/kg wet | 0.05000 | | 91 | 40-160 | 1 | 20 | |
| Carbon Disulfide | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 0.5 | 20 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40102 - 5035** | | | | | | | | | | |
| Carbon Tetrachloride | 0.0549 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 3 | 20 | |
| Chlorobenzene | 0.0482 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 1 | 20 | |
| Chloroethane | 0.0465 | 0.0100 | mg/kg wet | 0.05000 | | 93 | 40-160 | 0.3 | 20 | |
| Chloroform | 0.0514 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 1 | 20 | |
| Chloromethane | 0.0432 | 0.0100 | mg/kg wet | 0.05000 | | 86 | 40-160 | 2 | 20 | |
| cis-1,2-Dichloroethene | 0.0495 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 0.3 | 20 | |
| cis-1,3-Dichloropropene | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 40-160 | 0.1 | 20 | |
| Dibromochloromethane | 0.0482 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 40-160 | 0.6 | 20 | |
| Dibromomethane | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 0.9 | 20 | |
| Dichlorodifluoromethane | 0.0277 | 0.0100 | mg/kg wet | 0.05000 | | 55 | 40-160 | 7 | 20 | |
| Diethyl Ether | 0.0516 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 0.6 | 20 | |
| Di-isopropyl ether | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 0.5 | 20 | |
| Ethyl tertiary-butyl ether | 0.0506 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 0.6 | 20 | |
| Ethylbenzene | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 1 | 20 | |
| Hexachlorobutadiene | 0.0443 | 0.0050 | mg/kg wet | 0.05000 | | 89 | 40-160 | 8 | 20 | |
| Isopropylbenzene | 0.0509 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 8 | 20 | |
| Methyl tert-Butyl Ether | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 0.9 | 20 | |
| Methylene Chloride | 0.0443 | 0.0250 | mg/kg wet | 0.05000 | | 89 | 70-130 | 0.6 | 20 | |
| Naphthalene | 0.0422 | 0.0050 | mg/kg wet | 0.05000 | | 84 | 40-160 | 4 | 20 | |
| n-Butylbenzene | 0.0470 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | 9 | 20 | |
| n-Propylbenzene | 0.0482 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 8 | 20 | |
| sec-Butylbenzene | 0.0369 | 0.0050 | mg/kg wet | 0.05000 | | 74 | 70-130 | 9 | 20 | |
| Styrene | 0.0471 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 40-160 | 2 | 20 | |
| tert-Butylbenzene | 0.0458 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | 9 | 20 | |
| Tertiary-amyl methyl ether | 0.0497 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 0.8 | 20 | |
| Tetrachloroethene | 0.0336 | 0.0050 | mg/kg wet | 0.05000 | | 67 | 70-130 | 4 | 20 | B- |
| Tetrahydrofuran | 0.0494 | 0.0200 | mg/kg wet | 0.05000 | | 99 | 70-130 | 2 | 20 | |
| Toluene | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 0.4 | 20 | |
| trans-1,2-Dichloroethene | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 2 | 20 | |
| trans-1,3-Dichloropropene | 0.0520 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 1 | 20 | |
| Trichloroethene | 0.0473 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 2 | 20 | |
| Trichlorofluoromethane | 0.0492 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | 3 | 20 | |
| Vinyl Chloride | 0.0438 | 0.0100 | mg/kg wet | 0.05000 | | 88 | 70-130 | 2 | 20 | |
| Xylene O | 0.0497 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 3 | 20 | |
| Xylene P,M | 0.101 | 0.0100 | mg/kg wet | 0.1000 | | 101 | 70-130 | 2 | 20 | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0532* | | mg/kg wet | *0.05000* | | *106* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0498* | | mg/kg wet | *0.05000* | | *100* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0518* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0510* | | mg/kg wet | *0.05000* | | *102* | *70-130* | | | |
| **Batch DF40305 - 5035** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,1-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40305 - 5035** | | | | | | | | | | |
| 1,1,2-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromoethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dioxane | ND | 0.100 | mg/kg wet | | | | | | | |
| 2,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Butanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 2-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Hexanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 4-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Isopropyltoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Methyl-2-Pentanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Acetone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Benzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromodichloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromoform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromomethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Carbon Disulfide | ND | 0.0050 | mg/kg wet | | | | | | | |
| Carbon Tetrachloride | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloroethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Chloroform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| cis-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| cis-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromomethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dichlorodifluoromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Diethyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Di-isopropyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40305 - 5035** | | | | | | | | | | |
| Ethyl tertiary-butyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Isopropylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methyl tert-Butyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methylene Chloride | ND | 0.0250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Propylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| sec-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Styrene | ND | 0.0050 | mg/kg wet | | | | | | | |
| tert-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tertiary-amyl methyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrachloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrahydrofuran | ND | 0.0200 | mg/kg wet | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichlorofluoromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Vinyl Chloride | ND | 0.0100 | mg/kg wet | | | | | | | |
| Xylene O | ND | 0.0050 | mg/kg wet | | | | | | | |
| Xylene P,M | ND | 0.0100 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0581* | | mg/kg wet | *0.05000* | | *116* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0497* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0544* | | mg/kg wet | *0.05000* | | *109* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0502* | | mg/kg wet | *0.05000* | | *100* | *70-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| 1,1,1-Trichloroethane | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 1,1,2,2-Tetrachloroethane | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 40-160 | | | |
| 1,1,2-Trichloroethane | 0.0485 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| 1,1-Dichloroethane | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,1-Dichloroethene | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| 1,1-Dichloropropene | 0.0526 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| 1,2,3-Trichlorobenzene | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 1,2,3-Trichloropropane | 0.0425 | 0.0050 | mg/kg wet | 0.05000 | | 85 | 70-130 | | | |
| 1,2,4-Trichlorobenzene | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,2,4-Trimethylbenzene | 0.0511 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,2-Dibromo-3-Chloropropane | 0.0443 | 0.0050 | mg/kg wet | 0.05000 | | 89 | 70-130 | | | |
| 1,2-Dibromoethane | 0.0476 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| 1,2-Dichlorobenzene | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| 1,2-Dichloroethane | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,2-Dichloropropane | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,3,5-Trimethylbenzene | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40305 - 5035** | | | | | | | | | | |
| 1,3-Dichlorobenzene | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| 1,3-Dichloropropane | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 1,4-Dichlorobenzene | 0.0494 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| 1,4-Dioxane | 0.797 | 0.100 | mg/kg wet | 1.000 | | 80 | 70-130 | | | |
| 2,2-Dichloropropane | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| 2-Butanone | 0.240 | 0.0500 | mg/kg wet | 0.2500 | | 96 | 40-160 | | | |
| 2-Chlorotoluene | 0.0498 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 2-Hexanone | 0.226 | 0.0500 | mg/kg wet | 0.2500 | | 90 | 40-160 | | | |
| 4-Chlorotoluene | 0.0494 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| 4-Isopropyltoluene | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| 4-Methyl-2-Pentanone | 0.226 | 0.0500 | mg/kg wet | 0.2500 | | 91 | 40-160 | | | |
| Acetone | 0.212 | 0.0500 | mg/kg wet | 0.2500 | | 85 | 40-160 | | | |
| Benzene | 0.0511 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Bromobenzene | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| Bromochloromethane | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| Bromodichloromethane | 0.0570 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | | | |
| Bromoform | 0.0406 | 0.0050 | mg/kg wet | 0.05000 | | 81 | 40-160 | | | |
| Bromomethane | 0.0502 | 0.0100 | mg/kg wet | 0.05000 | | 100 | 40-160 | | | |
| Carbon Disulfide | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Carbon Tetrachloride | 0.0563 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | | | |
| Chlorobenzene | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| Chloroethane | 0.0533 | 0.0100 | mg/kg wet | 0.05000 | | 107 | 40-160 | | | |
| Chloroform | 0.0509 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Chloromethane | 0.0502 | 0.0100 | mg/kg wet | 0.05000 | | 100 | 40-160 | | | |
| cis-1,2-Dichloroethene | 0.0503 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| cis-1,3-Dichloropropene | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 40-160 | | | |
| Dibromochloromethane | 0.0462 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 40-160 | | | |
| Dibromomethane | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| Dichlorodifluoromethane | 0.0440 | 0.0100 | mg/kg wet | 0.05000 | | 88 | 40-160 | | | |
| Diethyl Ether | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Di-isopropyl ether | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Ethyl tertiary-butyl ether | 0.0509 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Ethylbenzene | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| Hexachlorobutadiene | 0.0498 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 40-160 | | | |
| Isopropylbenzene | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| Methyl tert-Butyl Ether | 0.0496 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| Methylene Chloride | 0.0468 | 0.0250 | mg/kg wet | 0.05000 | | 94 | 70-130 | | | |
| Naphthalene | 0.0452 | 0.0050 | mg/kg wet | 0.05000 | | 90 | 40-160 | | | |
| n-Butylbenzene | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| n-Propylbenzene | 0.0516 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| sec-Butylbenzene | 0.0403 | 0.0050 | mg/kg wet | 0.05000 | | 81 | 70-130 | | | |
| Styrene | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | | | |
| tert-Butylbenzene | 0.0502 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| Tertiary-amyl methyl ether | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| Tetrachloroethene | 0.0347 | 0.0050 | mg/kg wet | 0.05000 | | 69 | 70-130 | | | B- |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40305 - 5035** | | | | | | | | | | |
| Tetrahydrofuran | 0.0479 | 0.0200 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| Toluene | 0.0502 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| trans-1,2-Dichloroethene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| trans-1,3-Dichloropropene | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| Trichloroethene | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| Trichlorofluoromethane | 0.0538 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 40-160 | | | |
| Vinyl Chloride | 0.0523 | 0.0100 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Xylene O | 0.0506 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| Xylene P,M | 0.104 | 0.0100 | mg/kg wet | 0.1000 | | 104 | 70-130 | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0523* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0504* | | mg/kg wet | *0.05000* | | *101* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0516* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0518* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0511 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 0.7 | 20 | |
| 1,1,1-Trichloroethane | 0.0528 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 1 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0454 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 40-160 | 8 | 20 | |
| 1,1,2-Trichloroethane | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 0.9 | 20 | |
| 1,1-Dichloroethane | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 0.5 | 20 | |
| 1,1-Dichloroethene | 0.0522 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 2 | 20 | |
| 1,1-Dichloropropene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 2 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0458 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | 9 | 20 | |
| 1,2,3-Trichloropropane | 0.0400 | 0.0050 | mg/kg wet | 0.05000 | | 80 | 70-130 | 6 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 9 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0466 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 9 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0415 | 0.0050 | mg/kg wet | 0.05000 | | 83 | 70-130 | 7 | 20 | |
| 1,2-Dibromoethane | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 0.5 | 20 | |
| 1,2-Dichlorobenzene | 0.0439 | 0.0050 | mg/kg wet | 0.05000 | | 88 | 70-130 | 9 | 20 | |
| 1,2-Dichloroethane | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 1 | 20 | |
| 1,2-Dichloropropane | 0.0514 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 0.3 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0464 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 9 | 20 | |
| 1,3-Dichlorobenzene | 0.0456 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | 7 | 20 | |
| 1,3-Dichloropropane | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 1 | 20 | |
| 1,4-Dichlorobenzene | 0.0441 | 0.0050 | mg/kg wet | 0.05000 | | 88 | 70-130 | 11 | 20 | |
| 1,4-Dioxane | 0.886 | 0.100 | mg/kg wet | 1.000 | | 89 | 70-130 | 11 | 20 | |
| 2,2-Dichloropropane | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 2 | 20 | |
| 2-Butanone | 0.286 | 0.0500 | mg/kg wet | 0.2500 | | 115 | 40-160 | 17 | 20 | |
| 2-Chlorotoluene | 0.0455 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | 9 | 20 | |
| 2-Hexanone | 0.262 | 0.0500 | mg/kg wet | 0.2500 | | 105 | 40-160 | 15 | 20 | |
| 4-Chlorotoluene | 0.0450 | 0.0050 | mg/kg wet | 0.05000 | | 90 | 70-130 | 9 | 20 | |
| 4-Isopropyltoluene | 0.0445 | 0.0050 | mg/kg wet | 0.05000 | | 89 | 70-130 | 10 | 20 | |
| 4-Methyl-2-Pentanone | 0.232 | 0.0500 | mg/kg wet | 0.2500 | | 93 | 40-160 | 2 | 20 | |
| Acetone | 0.359 | 0.0500 | mg/kg wet | 0.2500 | | 144 | 40-160 | 51 | 20 | D+ |
| Benzene | 0.0508 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 0.5 | 20 | |
| Bromobenzene | 0.0444 | 0.0050 | mg/kg wet | 0.05000 | | 89 | 70-130 | 8 | 20 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40305 - 5035** | | | | | | | | | | |
| Bromochloromethane | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 0.6 | 20 | |
| Bromodichloromethane | 0.0573 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 0.5 | 20 | |
| Bromoform | 0.0405 | 0.0050 | mg/kg wet | 0.05000 | | 81 | 40-160 | 0.4 | 20 | |
| Bromomethane | 0.0512 | 0.0100 | mg/kg wet | 0.05000 | | 102 | 40-160 | 2 | 20 | |
| Carbon Disulfide | 0.0547 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 0.7 | 20 | |
| Carbon Tetrachloride | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 1 | 20 | |
| Chlorobenzene | 0.0490 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 0.5 | 20 | |
| Chloroethane | 0.0533 | 0.0100 | mg/kg wet | 0.05000 | | 107 | 40-160 | 0 | 20 | |
| Chloroform | 0.0511 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 0.3 | 20 | |
| Chloromethane | 0.0500 | 0.0100 | mg/kg wet | 0.05000 | | 100 | 40-160 | 0.3 | 20 | |
| cis-1,2-Dichloroethene | 0.0505 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 0.5 | 20 | |
| cis-1,3-Dichloropropene | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 40-160 | 0.5 | 20 | |
| Dibromochloromethane | 0.0466 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 40-160 | 1 | 20 | |
| Dibromomethane | 0.0498 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 1 | 20 | |
| Dichlorodifluoromethane | 0.0432 | 0.0100 | mg/kg wet | 0.05000 | | 86 | 40-160 | 2 | 20 | |
| Diethyl Ether | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 3 | 20 | |
| Di-isopropyl ether | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 0.8 | 20 | |
| Ethyl tertiary-butyl ether | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 0.9 | 20 | |
| Ethylbenzene | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 2 | 20 | |
| Hexachlorobutadiene | 0.0454 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 40-160 | 9 | 20 | |
| Isopropylbenzene | 0.0496 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 9 | 20 | |
| Methyl tert-Butyl Ether | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 0.9 | 20 | |
| Methylene Chloride | 0.0474 | 0.0250 | mg/kg wet | 0.05000 | | 95 | 70-130 | 1 | 20 | |
| Naphthalene | 0.0421 | 0.0050 | mg/kg wet | 0.05000 | | 84 | 40-160 | 7 | 20 | |
| n-Butylbenzene | 0.0469 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | 11 | 20 | |
| n-Propylbenzene | 0.0467 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 10 | 20 | |
| sec-Butylbenzene | 0.0367 | 0.0050 | mg/kg wet | 0.05000 | | 73 | 70-130 | 9 | 20 | |
| Styrene | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | 0.04 | 20 | |
| tert-Butylbenzene | 0.0452 | 0.0050 | mg/kg wet | 0.05000 | | 90 | 70-130 | 10 | 20 | |
| Tertiary-amyl methyl ether | 0.0505 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 2 | 20 | |
| Tetrachloroethene | 0.0348 | 0.0050 | mg/kg wet | 0.05000 | | 70 | 70-130 | 0.5 | 20 | |
| Tetrahydrofuran | 0.0498 | 0.0200 | mg/kg wet | 0.05000 | | 100 | 70-130 | 4 | 20 | |
| Toluene | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 0.4 | 20 | |
| trans-1,2-Dichloroethene | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 0.4 | 20 | |
| trans-1,3-Dichloropropene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 0.3 | 20 | |
| Trichloroethene | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | 0.9 | 20 | |
| Trichlorofluoromethane | 0.0532 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 40-160 | 1 | 20 | |
| Vinyl Chloride | 0.0519 | 0.0100 | mg/kg wet | 0.05000 | | 104 | 70-130 | 0.8 | 20 | |
| Xylene O | 0.0503 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 0.6 | 20 | |
| Xylene P,M | 0.102 | 0.0100 | mg/kg wet | 0.1000 | | 102 | 70-130 | 2 | 20 | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0516* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0515* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0515* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0518* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE43105 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE43105 - 3546** | | | | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyridine | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.48* | | mg/kg wet | *2.500* | | *99* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.08* | | mg/kg wet | *3.750* | | *109* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.46* | | mg/kg wet | *3.750* | | *92* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.43* | | mg/kg wet | *2.500* | | *97* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.63* | | mg/kg wet | *3.750* | | *97* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.60* | | mg/kg wet | *2.500* | | *104* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.51* | | mg/kg wet | *3.750* | | *94* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *3.06* | | mg/kg wet | *2.500* | | *122* | *30-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.33 | 0.025 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.85 | 0.250 | mg/kg wet | 2.500 | | 114 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.62 | 0.250 | mg/kg wet | 2.500 | | 105 | 30-130 | | | |
| 2,4-Dimethylphenol | 3.01 | 0.250 | mg/kg wet | 2.500 | | 120 | 30-130 | | | |
| 2,4-Dinitrophenol | 2.01 | 1.00 | mg/kg wet | 2.500 | | 80 | 15-140 | | | |
| 2,4-Dinitrotoluene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | | | |
| 2-Chloronaphthalene | 2.71 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| 2-Chlorophenol | 2.19 | 0.250 | mg/kg wet | 2.500 | | 88 | 30-130 | | | |
| 2-Methylnaphthalene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| 2-Methylphenol | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 15-140 | | | |
| 2-Nitrophenol | 2.35 | 0.500 | mg/kg wet | 2.500 | | 94 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.61 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| 3+4-Methylphenol | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 15-140 | | | |
| 4-Bromophenyl-phenylether | 2.65 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE43105 - 3546** | | | | | | | | | | |
| 4-Chloroaniline | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | | | |
| 4-Nitrophenol | 2.53 | 1.00 | mg/kg wet | 2.500 | | 101 | 15-140 | | | |
| Acenaphthene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Acenaphthylene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Acetophenone | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Aniline | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Anthracene | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| Azobenzene | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Benzo(a)anthracene | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Benzo(a)pyrene | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.64 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.69 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 2.22 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| Butylbenzylphthalate | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| Chrysene | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.71 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| Dibenzofuran | 2.61 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| Diethylphthalate | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| Dimethylphthalate | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | | | |
| Di-n-butylphthalate | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Di-n-octylphthalate | 2.44 | 0.500 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Fluoranthene | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| Fluorene | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Hexachlorobenzene | 2.72 | 0.250 | mg/kg wet | 2.500 | | 109 | 40-140 | | | |
| Hexachlorobutadiene | 2.83 | 0.250 | mg/kg wet | 2.500 | | 113 | 40-140 | | | |
| Hexachloroethane | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | | | |
| Isophorone | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Naphthalene | 2.16 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Nitrobenzene | 2.53 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | | | |
| N-Nitrosodimethylamine | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Pentachlorophenol | 2.08 | 1.00 | mg/kg wet | 2.500 | | 83 | 15-140 | | | |
| Phenanthrene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Phenol | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 15-140 | | | |
| Pyrene | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| Pyridine | 1.52 | 0.250 | mg/kg wet | 2.500 | | 61 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.44* | | mg/kg wet | *2.500* | | *98* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.95* | | mg/kg wet | *3.750* | | *105* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.60* | | mg/kg wet | *3.750* | | *96* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.59* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.47* | | mg/kg wet | *3.750* | | *93* | *30-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE43105 - 3546** | | | | | | | | | | |
| *Surrogate: Nitrobenzene-d5* | *2.59* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.61* | | mg/kg wet | *3.750* | | *96* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.98* | | mg/kg wet | *2.500* | | *119* | *30-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.39 | 0.025 | mg/kg wet | 2.500 | | 95 | 40-140 | 2 | 30 | |
| 1,2,4-Trichlorobenzene | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| 1,2-Dichlorobenzene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 4 | 30 | |
| 1,3-Dichlorobenzene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 0.5 | 30 | |
| 1,4-Dichlorobenzene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 0.8 | 30 | |
| 2,4,5-Trichlorophenol | 2.92 | 0.250 | mg/kg wet | 2.500 | | 117 | 30-130 | 2 | 30 | |
| 2,4,6-Trichlorophenol | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 30-130 | 2 | 30 | |
| 2,4-Dichlorophenol | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 30-130 | 3 | 30 | |
| 2,4-Dimethylphenol | 3.04 | 0.250 | mg/kg wet | 2.500 | | 122 | 30-130 | 1 | 30 | |
| 2,4-Dinitrophenol | 2.01 | 1.00 | mg/kg wet | 2.500 | | 80 | 15-140 | 0.2 | 30 | |
| 2,4-Dinitrotoluene | 2.88 | 0.250 | mg/kg wet | 2.500 | | 115 | 40-140 | 3 | 30 | |
| 2,6-Dinitrotoluene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 0.09 | 30 | |
| 2-Chloronaphthalene | 2.69 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 1 | 30 | |
| 2-Chlorophenol | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | 4 | 30 | |
| 2-Methylnaphthalene | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 4 | 30 | |
| 2-Methylphenol | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | 4 | 30 | |
| 2-Nitrophenol | 2.52 | 0.500 | mg/kg wet | 2.500 | | 101 | 30-130 | 7 | 30 | |
| 3,3´-Dichlorobenzidine | 2.75 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | 5 | 30 | |
| 3+4-Methylphenol | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 15-140 | 3 | 30 | |
| 4-Bromophenyl-phenylether | 2.89 | 0.250 | mg/kg wet | 2.500 | | 116 | 40-140 | 9 | 30 | |
| 4-Chloroaniline | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 15-140 | 1 | 30 | |
| 4-Nitrophenol | 2.54 | 1.00 | mg/kg wet | 2.500 | | 102 | 15-140 | 0.7 | 30 | |
| Acenaphthene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 1 | 30 | |
| Acenaphthylene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 0.3 | 30 | |
| Acetophenone | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 0.5 | 30 | |
| Aniline | 2.41 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 1 | 30 | |
| Anthracene | 2.71 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | 3 | 30 | |
| Azobenzene | 2.58 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | 6 | 30 | |
| Benzo(a)anthracene | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 2 | 30 | |
| Benzo(a)pyrene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 3 | 30 | |
| Benzo(b)fluoranthene | 2.73 | 0.250 | mg/kg wet | 2.500 | | 109 | 40-140 | 4 | 30 | |
| Benzo(g,h,i)perylene | 2.77 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 3 | 30 | |
| Benzo(k)fluoranthene | 2.72 | 0.250 | mg/kg wet | 2.500 | | 109 | 40-140 | 2 | 30 | |
| bis(2-Chloroethoxy)methane | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | 4 | 30 | |
| bis(2-Chloroethyl)ether | 2.12 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | 4 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.22 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | 0.02 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.80 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | 4 | 30 | |
| Butylbenzylphthalate | 2.77 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 3 | 30 | |
| Chrysene | 2.66 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 2 | 30 | |
| Dibenzo(a,h)Anthracene | 2.90 | 0.250 | mg/kg wet | 2.500 | | 116 | 40-140 | 7 | 30 | |
| Dibenzofuran | 2.65 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 2 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE43105 - 3546** | | | | | | | | | | |
| Diethylphthalate | 2.61 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 0.4 | 30 | |
| Dimethylphthalate | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 15-140 | 1 | 30 | |
| Di-n-butylphthalate | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 6 | 30 | |
| Di-n-octylphthalate | 2.54 | 0.500 | mg/kg wet | 2.500 | | 102 | 40-140 | 4 | 30 | |
| Fluoranthene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 5 | 30 | |
| Fluorene | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 0.3 | 30 | |
| Hexachlorobenzene | 2.84 | 0.250 | mg/kg wet | 2.500 | | 113 | 40-140 | 4 | 30 | |
| Hexachlorobutadiene | 2.83 | 0.250 | mg/kg wet | 2.500 | | 113 | 40-140 | 0.08 | 30 | |
| Hexachloroethane | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 3 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.87 | 0.250 | mg/kg wet | 2.500 | | 115 | 40-140 | 7 | 30 | |
| Isophorone | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 4 | 30 | |
| Naphthalene | 2.23 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | 3 | 30 | |
| Nitrobenzene | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 5 | 30 | |
| N-Nitrosodimethylamine | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 7 | 30 | |
| Pentachlorophenol | 2.28 | 1.00 | mg/kg wet | 2.500 | | 91 | 15-140 | 9 | 30 | |
| Phenanthrene | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 3 | 30 | |
| Phenol | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 15-140 | 6 | 30 | |
| Pyrene | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | 4 | 30 | |
| Pyridine | 1.71 | 0.250 | mg/kg wet | 2.500 | | 68 | 40-140 | 12 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.39* | | mg/kg wet | *2.500* | | *96* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.88* | | mg/kg wet | *3.750* | | *103* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.47* | | mg/kg wet | *3.750* | | *93* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.57* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.48* | | mg/kg wet | *3.750* | | *93* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.64* | | mg/kg wet | *2.500* | | *106* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.47* | | mg/kg wet | *3.750* | | *93* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *3.00* | | mg/kg wet | *2.500* | | *120* | *30-130* | | | |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DE43109 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DE43109 - 3540C** | | | | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0204* | | mg/kg wet | *0.02500* | | *82* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0205* | | mg/kg wet | *0.02500* | | *82* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0191* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0190* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 82 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 80 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 87 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 85 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0210* | | mg/kg wet | *0.02500* | | *84* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0209* | | mg/kg wet | *0.02500* | | *83* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0198* | | mg/kg wet | *0.02500* | | *79* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0185* | | mg/kg wet | *0.02500* | | *74* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 82 | 40-140 | 0.4 | 30 | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 80 | 40-140 | 0.4 | 30 | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 88 | 40-140 | 0.7 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 86 | 40-140 | 1 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0213* | | mg/kg wet | *0.02500* | | *85* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0213* | | mg/kg wet | *0.02500* | | *85* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0201* | | mg/kg wet | *0.02500* | | *80* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0189* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DE43104 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 4,4´-DDD | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDD [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Chlordane (Total) | ND | 0.0200 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DE43104 - 3546** | | | | | | | | | | |
| Chlordane (Total) [2C] | ND | 0.0200 | mg/kg wet | | | | | | | |
| delta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| delta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) [2C] | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Toxaphene | ND | 0.125 | mg/kg wet | | | | | | | |
| Toxaphene [2C] | ND | 0.125 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0135* | | mg/kg wet | *0.01250* | | *108* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0137* | | mg/kg wet | *0.01250* | | *110* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0114* | | mg/kg wet | *0.01250* | | *91* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0117* | | mg/kg wet | *0.01250* | | *94* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 4,4´-DDD | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| 4,4´-DDD [2C] | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | | | |
| 4,4´-DDE | 0.0110 | 0.0025 | mg/kg wet | 0.01250 | | 88 | 40-140 | | | |
| 4,4´-DDE [2C] | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | | | |
| 4,4´-DDT | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | | | |
| 4,4´-DDT [2C] | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |
| Aldrin | 0.0110 | 0.0025 | mg/kg wet | 0.01250 | | 88 | 40-140 | | | |
| Aldrin [2C] | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| alpha-BHC | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | | | |
| alpha-BHC [2C] | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| alpha-Chlordane | 0.0107 | 0.0025 | mg/kg wet | 0.01250 | | 86 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DE43104 - 3546** | | | | | | | | | | |
| alpha-Chlordane [2C] | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| beta-BHC | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| beta-BHC [2C] | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| delta-BHC | 0.0083 | 0.0025 | mg/kg wet | 0.01250 | | 66 | 40-140 | | | |
| delta-BHC [2C] | 0.0089 | 0.0025 | mg/kg wet | 0.01250 | | 71 | 40-140 | | | |
| Dieldrin | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Dieldrin [2C] | 0.0122 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | | | |
| Endosulfan I | 0.0110 | 0.0025 | mg/kg wet | 0.01250 | | 88 | 40-140 | | | |
| Endosulfan I [2C] | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | | | |
| Endosulfan II | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| Endosulfan II [2C] | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |
| Endosulfan Sulfate | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| Endosulfan Sulfate [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| Endrin | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Endrin [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| Endrin Ketone | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| Endrin Ketone [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| gamma-BHC (Lindane) | 0.0108 | 0.0015 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| gamma-BHC (Lindane) [2C] | 0.0111 | 0.0015 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| gamma-Chlordane | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | | | |
| gamma-Chlordane [2C] | 0.0129 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | | | |
| Heptachlor | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| Heptachlor [2C] | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Heptachlor Epoxide | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| Heptachlor Epoxide [2C] | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Hexachlorobenzene | 0.0106 | 0.0025 | mg/kg wet | 0.01250 | | 85 | 40-140 | | | |
| Hexachlorobenzene [2C] | 0.0106 | 0.0025 | mg/kg wet | 0.01250 | | 85 | 40-140 | | | |
| Methoxychlor | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| Methoxychlor [2C] | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0135* | | mg/kg wet | *0.01250* | | *108* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0138* | | mg/kg wet | *0.01250* | | *110* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0110* | | mg/kg wet | *0.01250* | | *88* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0116* | | mg/kg wet | *0.01250* | | *93* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 4,4´-DDD | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 3 | 30 | |
| 4,4´-DDD [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 4 | 30 | |
| 4,4´-DDE | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | 3 | 30 | |
| 4,4´-DDE [2C] | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | 3 | 30 | |
| 4,4´-DDT | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | 1 | 30 | |
| 4,4´-DDT [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | 3 | 30 | |
| Aldrin | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | 3 | 30 | |
| Aldrin [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 3 | 30 | |
| alpha-BHC | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 2 | 30 | |
| alpha-BHC [2C] | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 2 | 30 | |
| alpha-Chlordane | 0.0110 | 0.0025 | mg/kg wet | 0.01250 | | 88 | 40-140 | 2 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DE43104 - 3546** | | | | | | | | | | |
| alpha-Chlordane [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 3 | 30 | |
| beta-BHC | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 3 | 30 | |
| beta-BHC [2C] | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 2 | 30 | |
| delta-BHC | 0.0084 | 0.0025 | mg/kg wet | 0.01250 | | 67 | 40-140 | 2 | 30 | |
| delta-BHC [2C] | 0.0092 | 0.0025 | mg/kg wet | 0.01250 | | 74 | 40-140 | 3 | 30 | |
| Dieldrin | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 2 | 30 | |
| Dieldrin [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 3 | 30 | |
| Endosulfan I | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | 2 | 30 | |
| Endosulfan I [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 3 | 30 | |
| Endosulfan II | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 3 | 30 | |
| Endosulfan II [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | 3 | 30 | |
| Endosulfan Sulfate | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 3 | 30 | |
| Endosulfan Sulfate [2C] | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | 3 | 30 | |
| Endrin | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 2 | 30 | |
| Endrin [2C] | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 3 | 30 | |
| Endrin Ketone | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 3 | 30 | |
| Endrin Ketone [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 4 | 30 | |
| gamma-BHC (Lindane) | 0.0111 | 0.0015 | mg/kg wet | 0.01250 | | 89 | 40-140 | 2 | 30 | |
| gamma-BHC (Lindane) [2C] | 0.0114 | 0.0015 | mg/kg wet | 0.01250 | | 92 | 40-140 | 3 | 30 | |
| gamma-Chlordane | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 2 | 30 | |
| gamma-Chlordane [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 3 | 30 | |
| Heptachlor | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 2 | 30 | |
| Heptachlor [2C] | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 2 | 30 | |
| Heptachlor Epoxide | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | 2 | 30 | |
| Heptachlor Epoxide [2C] | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 3 | 30 | |
| Hexachlorobenzene | 0.0108 | 0.0025 | mg/kg wet | 0.01250 | | 86 | 40-140 | 2 | 30 | |
| Hexachlorobenzene [2C] | 0.0108 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | 2 | 30 | |
| Methoxychlor | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | 3 | 30 | |
| Methoxychlor [2C] | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 4 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0132* | | mg/kg wet | *0.01250* | | *106* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0135* | | mg/kg wet | *0.01250* | | *108* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0106* | | mg/kg wet | *0.01250* | | *85* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0113* | | mg/kg wet | *0.01250* | | *90* | *30-150* | | | |
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF40346 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 2,4,5-T | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-T [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4-D | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-D [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-DB | ND | 0.048 | mg/kg wet | | | | | | | |
| 2,4-DB [2C] | ND | 0.048 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF40346 - 3546** | | | | | | | | | | |
| Dalapon | ND | 0.046 | mg/kg wet | | | | | | | |
| Dalapon [2C] | ND | 0.046 | mg/kg wet | | | | | | | |
| Dicamba | ND | 0.009 | mg/kg wet | | | | | | | |
| Dicamba [2C] | ND | 0.009 | mg/kg wet | | | | | | | |
| Dichlorprop | ND | 0.047 | mg/kg wet | | | | | | | |
| Dichlorprop [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| Dinoseb | ND | 0.048 | mg/kg wet | | | | | | | |
| Dinoseb [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| MCPA | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPA [2C] | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPP | ND | 2.35 | mg/kg wet | | | | | | | |
| MCPP [2C] | ND | 2.35 | mg/kg wet | | | | | | | |
| *Surrogate: DCAA* | *0.163* | | mg/kg wet | *0.2000* | | *82* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.150* | | mg/kg wet | *0.2000* | | *75* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 2,4,5-T | 0.011 | 0.010 | mg/kg wet | 0.01900 | | 60 | 40-140 | | | |
| 2,4,5-T [2C] | 0.012 | 0.010 | mg/kg wet | 0.01900 | | 64 | 40-140 | | | |
| 2,4,5-TP (Silvex) | 0.012 | 0.010 | mg/kg wet | 0.01900 | | 62 | 40-140 | | | |
| 2,4,5-TP (Silvex) [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 66 | 40-140 | | | |
| 2,4-D | 0.129 | 0.047 | mg/kg wet | 0.1880 | | 69 | 40-140 | | | |
| 2,4-D [2C] | 0.117 | 0.047 | mg/kg wet | 0.1880 | | 62 | 40-140 | | | |
| 2,4-DB | 0.139 | 0.048 | mg/kg wet | 0.1900 | | 73 | 40-140 | | | |
| 2,4-DB [2C] | 0.139 | 0.048 | mg/kg wet | 0.1900 | | 73 | 40-140 | | | |
| Dalapon | 0.252 | 0.046 | mg/kg wet | 0.4550 | | 55 | 40-140 | | | |
| Dalapon [2C] | 0.272 | 0.046 | mg/kg wet | 0.4550 | | 60 | 40-140 | | | |
| Dicamba | 0.011 | 0.009 | mg/kg wet | 0.01880 | | 56 | 40-140 | | | |
| Dicamba [2C] | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 64 | 40-140 | | | |
| Dichlorprop | 0.161 | 0.047 | mg/kg wet | 0.1880 | | 85 | 40-140 | | | |
| Dichlorprop [2C] | 0.138 | 0.047 | mg/kg wet | 0.1880 | | 73 | 40-140 | | | |
| Dinoseb | 0.023 | 0.048 | mg/kg wet | 0.09500 | | 24 | 10-100 | | | |
| Dinoseb [2C] | 0.024 | 0.048 | mg/kg wet | 0.09500 | | 26 | 10-100 | | | |
| MCPA | 13.7 | 2.32 | mg/kg wet | 18.60 | | 74 | 40-140 | | | |
| MCPA [2C] | 14.0 | 2.32 | mg/kg wet | 18.60 | | 75 | 40-140 | | | |
| MCPP | 13.5 | 2.35 | mg/kg wet | 18.80 | | 72 | 40-140 | | | |
| MCPP [2C] | 13.8 | 2.35 | mg/kg wet | 18.80 | | 74 | 40-140 | | | |
| *Surrogate: DCAA* | *0.184* | | mg/kg wet | *0.2000* | | *92* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.166* | | mg/kg wet | *0.2000* | | *83* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 2,4,5-T | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | 12 | 30 | |
| 2,4,5-T [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 70 | 40-140 | 9 | 30 | |
| 2,4,5-TP (Silvex) | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | 9 | 30 | |
| 2,4,5-TP (Silvex) [2C] | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 74 | 40-140 | 11 | 30 | |
| 2,4-D | 0.139 | 0.047 | mg/kg wet | 0.1880 | | 74 | 40-140 | 8 | 30 | |
| 2,4-D [2C] | 0.129 | 0.047 | mg/kg wet | 0.1880 | | 69 | 40-140 | 10 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF40346 - 3546** | | | | | | | | | | |
| 2,4-DB | 0.148 | 0.048 | mg/kg wet | 0.1900 | | 78 | 40-140 | 6 | 30 | |
| 2,4-DB [2C] | 0.152 | 0.048 | mg/kg wet | 0.1900 | | 80 | 40-140 | 9 | 30 | |
| Dalapon | 0.282 | 0.046 | mg/kg wet | 0.4550 | | 62 | 40-140 | 12 | 30 | |
| Dalapon [2C] | 0.294 | 0.046 | mg/kg wet | 0.4550 | | 65 | 40-140 | 8 | 30 | |
| Dicamba | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 64 | 40-140 | 13 | 30 | |
| Dicamba [2C] | 0.013 | 0.009 | mg/kg wet | 0.01880 | | 70 | 40-140 | 9 | 30 | |
| Dichlorprop | 0.178 | 0.047 | mg/kg wet | 0.1880 | | 95 | 40-140 | 10 | 30 | |
| Dichlorprop [2C] | 0.149 | 0.047 | mg/kg wet | 0.1880 | | 79 | 40-140 | 8 | 30 | |
| Dinoseb | 0.025 | 0.048 | mg/kg wet | 0.09500 | | 26 | 10-100 | 10 | 30 | |
| Dinoseb [2C] | 0.027 | 0.048 | mg/kg wet | 0.09500 | | 28 | 10-100 | 10 | 30 | |
| MCPA | 14.8 | 2.32 | mg/kg wet | 18.60 | | 80 | 40-140 | 8 | 30 | |
| MCPA [2C] | 15.4 | 2.32 | mg/kg wet | 18.60 | | 83 | 40-140 | 9 | 30 | |
| MCPP | 14.8 | 2.35 | mg/kg wet | 18.80 | | 79 | 40-140 | 9 | 30 | |
| MCPP [2C] | 15.3 | 2.35 | mg/kg wet | 18.80 | | 81 | 40-140 | 10 | 30 | |
| *Surrogate: DCAA* | *0.187* | | mg/kg wet | *0.2000* | | *94* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.172* | | mg/kg wet | *0.2000* | | *86* | *30-150* | | | |
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DE43050 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Decane (C10) | ND | 0.2 | mg/kg wet | | | | | | | |
| Docosane (C22) | ND | 0.2 | mg/kg wet | | | | | | | |
| Dodecane (C12) | ND | 0.2 | mg/kg wet | | | | | | | |
| Eicosane (C20) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexacosane (C26) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexadecane (C16) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexatriacontane (C36) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonadecane (C19) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonane (C9) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octacosane (C28) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octadecane (C18) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetracosane (C24) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetradecane (C14) | ND | 0.2 | mg/kg wet | | | | | | | |
| Total Petroleum Hydrocarbons (C9-C36) | ND | 10.0 | mg/kg wet | | | | | | | |
| Triacontane (C30) | ND | 0.2 | mg/kg wet | | | | | | | |
| *Surrogate: O-Terphenyl* | *4.26* | | mg/kg wet | *5.000* | | *85* | *40-140* | | | |
| **LCS** | | | | | | | | | | |
| Decane (C10) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 68 | 40-140 | | | |
| Docosane (C22) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Dodecane (C12) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 77 | 40-140 | | | |
| Eicosane (C20) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 84 | 40-140 | | | |
| Hexacosane (C26) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Hexadecane (C16) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Hexatriacontane (C36) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Nonadecane (C19) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DE43050 - 3546** | | | | | | | | | | |
| Nonane (C9) | 1.4 | 0.2 | mg/kg wet | 2.500 | | 57 | 30-140 | | | |
| Octacosane (C28) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Octadecane (C18) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Tetracosane (C24) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 78 | 40-140 | | | |
| Tetradecane (C14) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | | | |
| Total Petroleum Hydrocarbons (C9-C36) | 32.9 | 10.0 | mg/kg wet | 35.00 | | 94 | 40-140 | | | |
| Triacontane (C30) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| *Surrogate: O-Terphenyl* | *4.13* | | mg/kg wet | *5.000* | | *83* | *40-140* | | | |
| **LCS Dup** | | | | | | | | | | |
| Decane (C10) | 1.6 | 0.2 | mg/kg wet | 2.500 | | 66 | 40-140 | 4 | 25 | |
| Docosane (C22) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 78 | 40-140 | 4 | 25 | |
| Dodecane (C12) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 74 | 40-140 | 5 | 25 | |
| Eicosane (C20) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | 5 | 25 | |
| Hexacosane (C26) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 84 | 40-140 | 3 | 25 | |
| Hexadecane (C16) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 79 | 40-140 | 4 | 25 | |
| Hexatriacontane (C36) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 94 | 40-140 | 8 | 25 | |
| Nonadecane (C19) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | 5 | 25 | |
| Nonane (C9) | 1.4 | 0.2 | mg/kg wet | 2.500 | | 54 | 30-140 | 5 | 25 | |
| Octacosane (C28) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 85 | 40-140 | 2 | 25 | |
| Octadecane (C18) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 78 | 40-140 | 4 | 25 | |
| Tetracosane (C24) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 76 | 40-140 | 3 | 25 | |
| Tetradecane (C14) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 77 | 40-140 | 4 | 25 | |
| Total Petroleum Hydrocarbons (C9-C36) | 28.6 | 10.0 | mg/kg wet | 35.00 | | 82 | 40-140 | 14 | 25 | |
| Triacontane (C30) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 88 | 40-140 | 0.2 | 25 | |
| *Surrogate: O-Terphenyl* | *3.85* | | mg/kg wet | *5.000* | | *77* | *40-140* | | | |
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DE43141 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Conductivity | ND | 5 | umhos/cm | | | | | | | |
| **LCS** | | | | | | | | | | |
| Conductivity | 1390 | | umhos/cm | 1410 | | 98 | 90-110 | | | |
| **Batch DF40331 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Reactive Cyanide | ND | 2.0 | mg/kg | | | | | | | |
| Reactive Sulfide | ND | 2.0 | mg/kg | | | | | | | |
| **LCS** | | | | | | | | | | |
| Reactive Cyanide | 4.1 | 2.0 | mg/kg | 100.3 | | 4 | 0.68-5.41 | | | |
| Reactive Sulfide | 2.1 | 2.0 | mg/kg | 10.00 | | 21 | 0-44 | | | |
| **Batch DF40333 - General Preparation** | | | | | | | | | | |
| **Reference** | | | | | | | | | | |
| Flashpoint | 80 | | °F | 81.00 | | 99 | 97.9-102.1 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

**Notes and Definitions**

| | |
|---|---|
| WL | Results obtained from a deionized water leach of the sample. |
| U | Analyte included in the analysis, but not detected |
| RRF | Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration |
| Q | Calibration required quadratic regression (Q). |
| D+ | Relative percent difference for duplicate is outside of criteria (D+). |
| D | Diluted. |
| CD+ | Continuing Calibration %Diff/Drift is above control limit (CD+). |
| CD- | Continuing Calibration %Diff/Drift is below control limit (CD-). |
| B- | Blank Spike recovery is below lower control limit (B-). |
| > | Greater than. |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1195

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24E1195
Date Received: 5/30/2024
Project Due Date: 6/6/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 4.5 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? (Yes) / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered
    c. Low Level VOA vials frozen: Date: 5/30/24 Time: 1722 By: [illegible]
    Yes / No To Be Lab Filtered

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted: Date: Time: By:

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 554749 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 554750 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 554753 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 2 | 554755 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 554756 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 555131 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 3 | 554751 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 554752 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 554754 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 4 | 554757 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 554758 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 555132 | Yes | N/A | Yes | 4 oz. Jar | NP | |

**2nd Review**
**Were all containers scanned into storage/lab?** Initials [illegible] Yes / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

**ESS Laboratory Sample and Cooler Receipt Checklist**

Client: CEC - Civil & Envtal Consultants - TB

ESS Project ID: 24E1195

Date Received: 5/30/2024

Completed By: _____ Date & Time: 5/30/24 16:42

Reviewed By: _____ Date & Time: 5/30/24 1722

# ESS Laboratory

*Division of Thielsch Engineering, Inc.*
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

## CHAIN OF CUSTODY

ESS Lab # 24E 1195

| | | |
|---|---|---|
| Turn Time | 5 | Days |
| Regulatory State | Massachusetts | |
| Is this project for any of the following?: | ○ CT RCP ◉ MA MCP ○ RGP | |

**Reporting Limits:** compare results to RCS-1, RCS-2, Lined and unlined landfills, TCLP, and 20X if needed.

**Electonic Deliverables:** ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) EDD

| Company Name | Project # | Project Name |
|---|---|---|
| Civil and Environmental Consultants | 332-344 | MassCEC Phase III - Site #4 |

| Contact Person | Address |
|---|---|
| Cassia Dal Bello | 31 Bellows Road |

| City | State | Zip Code | PO # |
|---|---|---|---|
| Raynham | MA | 02767 | |

| Telephone Number | FAX Number | Email Address |
|---|---|---|
| 774-501-2176 | | cdalbello; jkitchen, dbarboza@cecinc.com |

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | RCRA8 Metals | PCBs via 3540C | TPH | SVOC - incl pyr | Pest - incl Tox | Herbicides | Reactivity | Conductivity | pH | Free Liquid | Flashpoint | VOC - high | VOC - low | ~~Grain Size Analysis (Sieve Only)~~ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5/29/24 | 15:30 | Solid | Soil | CEC-12A 4'-6' | | | | | | | | | | | | X | X | | | |
| 2 | 5/29/24 | 15:40 | Solid | Soil | CEC-12A 0'-12' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 3 | 5/30/24 | 08:45 | Solid | Soil | CEC-12A 19'-21' | | | | | | | | | | | | X | X | | | |
| 4 | 5/30/24 | 08:55 | Solid | Soil | CEC-12A 12'-24' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Container Type:** | AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial | | | | | | | | | | | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | V | V | J | J |
| **Container Volume:** | 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* | | | | | | | | | | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7 | 7 | 10 | 9 |
| **Preservation Code:** | 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* | | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 10 | 1 | 1 |
| | **Number of Containers per Sample:** | | | | | | | | | | | 1 | | | | | 1 | | | | | 1 | 1 | 2 | 1 | 1 |

**Laboratory Use Only**

Cooler Present: yes ○ Drop Off
Seals Intact: ○ Pickup
Cooler Temperature: 4.5 °C Ice

**Sampled by :** CI

**Comments:** Please specify "Other" preservative and containers types in this space

Run TCLP if fails 20x

| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
|---|---|---|---|
| 5/30/24 11:00 | 5/30/24 11:00 | 5/30/24 15:31 | 5/30/24 15:39 |
| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
| | | | |

ESS Laboratory
DIVISION OF THE RISE GROUP
BAL Laboratory Analytical Balance

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC Phase III - Site 4 (332-344)**
**ESS Laboratory Work Order Number: 24E1268**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

***REVIEWED***
***By ESS Laboratory at 6:54 pm, Jun 06, 2024***

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

## SAMPLE RECEIPT

The following samples were received on May 31, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

**Question I: All samples for EPH & Metals were analyzed for a subset of the required MCP list per the client's request.**

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 24E1268-01 | CEC-10A 9ft-11ft | Soil | 8260D Low |
| 24E1268-02 | CEC-10A 0ft-12ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24E1268-03 | CEC-10A 19ft-21ft | Soil | 8260D Low |
| 24E1268-04 | CEC-10A 12ft-24ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

## PROJECT NARRATIVE

**Semi-Volatile Organic Compounds**

D4E0637-CCV1 **Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration**
2,4-Dimethylphenol (180% @ 80-120%)

D4E0637-CCV1 **Calibration required quadratic regression (Q).**
Pentachlorophenol (89% @ 40-160%)

D4E0637-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4-Dimethylphenol (80% @ 20%), 3,3′-Dichlorobenzidine (22% @ 20%), Aniline (36% @ 20%), Hexachlorobutadiene (31% @ 20%)

D4F0069-CCV1 **Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration**
2,4-Dinitrophenol (95% @ 40-160%)

D4F0069-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (95% @ 40-160%), Pentachlorophenol (107% @ 40-160%)

**Total Metals**

24E1268-04 **Elevated Method Reporting Limits due to sample matrix (EL).**
Arsenic

**Volatile Organics Low Level**

D4F0011-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
1,2-Dichlorobenzene (21% @ 20%), 1,3-Dichlorobenzene (21% @ 20%), Bromobenzene (21% @ 20%), sec-Butylbenzene (35% @ 20%), Tetrachloroethene (38% @ 20%)

DF40305-BS1 **Blank Spike recovery is below lower control limit (B-).**
Tetrachloroethene (69% @ 70-130%)

DF40305-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
Acetone (51% @ 20%)

**No other observations noted.**

**End of Project Narrative.**

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24E1268-01 through 24E1268-04**

Matrices: ( ) Ground Water/Surface Water (x) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| ( ) 8260 VOC CAM II A | ( x) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | ( x) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (x) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | ( x) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (x) 6010 Metals CAM III A | ( ) 6020 Metals CAM III D | ( x) MassDEP EPH CAM IV B | ( x) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (x) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (x) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (x) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (x) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes (x) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (x) No ( ) |

***Responses to Questions G, H and I below are required for '"Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? | Yes ( ) No (x)* |
| | ***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.** | |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (x)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes ( ) No (x)* |

***All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: June 06, 2024

Printed Name: Laurel Stoddard Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 9ft-11ft
Date Sampled: 05/30/24 13:55
Percent Solids: 88
Initial Volume: 7.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/3/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,1,1-Trichloroethane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,1,2,2-Tetrachloroethane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,1,2-Trichloroethane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,1-Dichloroethane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,1-Dichloroethene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,1-Dichloropropene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,2,3-Trichlorobenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,2,3-Trichloropropane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,2,4-Trichlorobenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,2,4-Trimethylbenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,2-Dibromoethane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,2-Dichlorobenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,2-Dichloroethane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,2-Dichloropropane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,3,5-Trimethylbenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,3-Dichlorobenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,3-Dichloropropane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,4-Dichlorobenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 1,4-Dioxane | ND (0.0771) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 2,2-Dichloropropane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 2-Butanone | ND (0.0386) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 2-Chlorotoluene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 2-Hexanone | ND (0.0386) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 4-Chlorotoluene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| 4-Isopropyltoluene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 9ft-11ft
Date Sampled: 05/30/24 13:55
Percent Solids: 88
Initial Volume: 7.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/3/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0386) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Acetone | ND (0.0386) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Benzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Bromobenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Bromochloromethane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Bromodichloromethane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Bromoform | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Bromomethane | ND (0.0077) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Carbon Disulfide | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Carbon Tetrachloride | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Chlorobenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Chloroethane | ND (0.0077) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Chloroform | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Chloromethane | ND (0.0077) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| cis-1,2-Dichloroethene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| cis-1,3-Dichloropropene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Dibromochloromethane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Dibromomethane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Dichlorodifluoromethane | ND (0.0077) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Diethyl Ether | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Di-isopropyl ether | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Ethyl tertiary-butyl ether | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Ethylbenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Hexachlorobutadiene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Isopropylbenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Methyl tert-Butyl Ether | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Methylene Chloride | ND (0.0193) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 9ft-11ft
Date Sampled: 05/30/24 13:55
Percent Solids: 88
Initial Volume: 7.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/3/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| n-Butylbenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| n-Propylbenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| sec-Butylbenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Styrene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| tert-Butylbenzene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Tertiary-amyl methyl ether | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Tetrachloroethene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Tetrahydrofuran | ND (0.0154) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Toluene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| trans-1,2-Dichloroethene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| trans-1,3-Dichloropropene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Trichloroethene | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Trichlorofluoromethane | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Vinyl Chloride | ND (0.0077) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Xylene O | ND (0.0039) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Xylene P,M | ND (0.0077) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |
| Xylenes (Total) | ND (0.0077) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:04 | D4F0011 | DF40305 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *115 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *97 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *109 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *101 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 0ft-12ft
Date Sampled: 05/30/24 14:05
Percent Solids: 88

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **3.85** (2.19) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:19 | 2.6 100 | DF40303 |
| **Barium** | **41.0** (0.88) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:19 | 2.6 100 | DF40303 |
| Cadmium | ND (0.44) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:19 | 2.6 100 | DF40303 |
| **Chromium** | **22.7** (0.88) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:19 | 2.6 100 | DF40303 |
| **Lead** | **22.9** (4.39) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:19 | 2.6 100 | DF40303 |
| Mercury | ND (0.033) | --- | 7471B | --- | 1 | CEV | 06/03/24 12:10 | 0.69 40 | DF40304 |
| Selenium | ND (4.39) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:19 | 2.6 100 | DF40303 |
| Silver | ND (0.44) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:19 | 2.6 100 | DF40303 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 0ft-12ft
Date Sampled: 05/30/24 14:05
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/31/24 17:40

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 1,2,4-Trichlorobenzene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 1,2-Dichlorobenzene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 1,3-Dichlorobenzene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 1,4-Dichlorobenzene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 2,4,5-Trichlorophenol | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 2,4,6-Trichlorophenol | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 2,4-Dichlorophenol | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 2,4-Dimethylphenol | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 2,4-Dinitrophenol | ND (1.12) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 2,4-Dinitrotoluene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 2,6-Dinitrotoluene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 2-Chloronaphthalene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 2-Chlorophenol | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 2-Methylnaphthalene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 2-Methylphenol | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 2-Nitrophenol | ND (0.562) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 3,3´-Dichlorobenzidine | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 3+4-Methylphenol | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 4-Bromophenyl-phenylether | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 4-Chloroaniline | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| 4-Nitrophenol | ND (1.12) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Acenaphthene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Acenaphthylene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Acetophenone | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Aniline | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Anthracene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 0ft-12ft
Date Sampled: 05/30/24 14:05
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/31/24 17:40

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Benzo(a)anthracene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Benzo(a)pyrene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Benzo(b)fluoranthene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Benzo(g,h,i)perylene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Benzo(k)fluoranthene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| bis(2-Chloroethoxy)methane | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| bis(2-Chloroethyl)ether | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| bis(2-chloroisopropyl)Ether | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| bis(2-Ethylhexyl)phthalate | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Butylbenzylphthalate | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Chrysene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Dibenzo(a,h)Anthracene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Dibenzofuran | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Diethylphthalate | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Dimethylphthalate | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Di-n-butylphthalate | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Di-n-octylphthalate | ND (0.562) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Fluoranthene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Fluorene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Hexachlorobenzene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Hexachlorobutadiene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Hexachloroethane | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Indeno(1,2,3-cd)Pyrene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Isophorone | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Naphthalene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Nitrobenzene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 0ft-12ft
Date Sampled: 05/30/24 14:05
Percent Solids: 88
Initial Volume: 20.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/31/24 17:40

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Pentachlorophenol | ND (1.12) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Phenanthrene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Phenol | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Pyrene | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |
| Pyridine | ND (0.281) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:07 | D4F0069 | DE43105 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *96 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *97 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *104 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *94 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *105 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *101 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *106 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *126 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 0ft-12ft
Date Sampled: 05/30/24 14:05
Percent Solids: 88
Initial Volume: 20g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 6/3/24 11:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 3:24 | --- | DF40310 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 3:24 | --- | DF40310 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 3:24 | --- | DF40310 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 3:24 | --- | DF40310 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 3:24 | --- | DF40310 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 3:24 | --- | DF40310 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 3:24 | --- | DF40310 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 3:24 | --- | DF40310 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 3:24 | --- | DF40310 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl [2C]* | *88 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *88 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 0ft-12ft
Date Sampled: 05/30/24 14:05
Percent Solids: 88
Initial Volume: 20.1g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 5/31/24 17:41

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| 4,4´-DDE | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| 4,4´-DDT | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Aldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| alpha-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| alpha-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| beta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Chlordane (Total) | ND (0.0227) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| delta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Dieldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Endosulfan I | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Endosulfan II | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Endosulfan Sulfate | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Endrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Endrin Ketone | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| gamma-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Heptachlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Heptachlor Epoxide | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Hexachlorobenzene | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Methoxychlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |
| Toxaphene | ND (0.142) | --- | 8081B | --- | 1 | 06/03/24 19:59 | D4F0021 | DE43104 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl [2C]* | *98 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *78 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 0ft-12ft
Date Sampled: 05/30/24 14:05
Percent Solids: 88
Initial Volume: 10.1g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/3/24 18:00

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.011) | --- | 8151A | --- | 1 | 06/05/24 11:42 | D4F0074 | DF40346 |
| 2,4,5-TP (Silvex) | ND (0.011) | --- | 8151A | --- | 1 | 06/05/24 11:42 | D4F0074 | DF40346 |
| 2,4-D | ND (0.053) | --- | 8151A | --- | 1 | 06/05/24 11:42 | D4F0074 | DF40346 |
| 2,4-DB | ND (0.054) | --- | 8151A | --- | 1 | 06/05/24 11:42 | D4F0074 | DF40346 |
| Dalapon | ND (0.051) | --- | 8151A | --- | 1 | 06/05/24 11:42 | D4F0074 | DF40346 |
| Dicamba | ND (0.011) | --- | 8151A | --- | 1 | 06/05/24 11:42 | D4F0074 | DF40346 |
| Dichlorprop | ND (0.053) | --- | 8151A | --- | 1 | 06/05/24 11:42 | D4F0074 | DF40346 |
| Dinoseb | ND (0.054) | --- | 8151A | --- | 1 | 06/05/24 11:42 | D4F0074 | DF40346 |
| MCPA | ND (2.63) | --- | 8151A | --- | 1 | 06/05/24 11:42 | D4F0074 | DF40346 |
| MCPP | ND (2.66) | --- | 8151A | --- | 1 | 06/05/24 11:42 | D4F0074 | DF40346 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: DCAA* | *91 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 0ft-12ft
Date Sampled: 05/30/24 14:05
Percent Solids: 88
Initial Volume: 20.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/3/24 11:15

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **21.7** (10.9) | --- | 8100M | --- | 1 | 06/03/24 19:25 | --- | DF40312 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 71 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 0ft-12ft
Date Sampled: 05/30/24 14:05
Percent Solids: 88

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-02
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 180** (5) | --- | 9050A | --- | 1 | JLK | 05/31/24 21:02 | umhos/cm | DE43141 |
| **Corrosivity (pH)** | **7.04** (N/A) | --- | 9045 | --- | 1 | CCP | 05/31/24 19:19 | S.U. | DE43135 |
| **Corrosivity (pH) Sample Temp** | **20.8** | --- | 2550B | --- | 1 | CCP | 05/31/24 19:19 | °C | DE43135 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/03/24 17:47 | °F | DF40333 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EEM | 06/04/24 12:05 | ml/5 min | DF40417 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/03/24 15:27 | mg/kg | DF40331 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/03/24 15:27 | mg/kg | DF40331 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 19ft-21ft
Date Sampled: 05/30/24 15:00
Percent Solids: 90
Initial Volume: 6.6g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/3/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,1,1-Trichloroethane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,1,2,2-Tetrachloroethane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,1,2-Trichloroethane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,1-Dichloroethane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,1-Dichloroethene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,1-Dichloropropene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,2,3-Trichlorobenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,2,3-Trichloropropane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,2,4-Trichlorobenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,2,4-Trimethylbenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,2-Dibromoethane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,2-Dichlorobenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,2-Dichloroethane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,2-Dichloropropane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,3,5-Trimethylbenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,3-Dichlorobenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,3-Dichloropropane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,4-Dichlorobenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 1,4-Dioxane | ND (0.0841) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 2,2-Dichloropropane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 2-Butanone | ND (0.0421) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 2-Chlorotoluene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 2-Hexanone | ND (0.0421) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 4-Chlorotoluene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| 4-Isopropyltoluene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 19ft-21ft
Date Sampled: 05/30/24 15:00
Percent Solids: 90
Initial Volume: 6.6g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/3/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0421) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Acetone | ND (0.0421) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Benzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Bromobenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Bromochloromethane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Bromodichloromethane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Bromoform | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Bromomethane | ND (0.0084) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Carbon Disulfide | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Carbon Tetrachloride | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Chlorobenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Chloroethane | ND (0.0084) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Chloroform | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Chloromethane | ND (0.0084) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| cis-1,2-Dichloroethene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| cis-1,3-Dichloropropene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Dibromochloromethane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Dibromomethane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Dichlorodifluoromethane | ND (0.0084) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Diethyl Ether | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Di-isopropyl ether | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Ethyl tertiary-butyl ether | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Ethylbenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Hexachlorobutadiene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Isopropylbenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Methyl tert-Butyl Ether | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Methylene Chloride | ND (0.0210) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 19ft-21ft
Date Sampled: 05/30/24 15:00
Percent Solids: 90
Initial Volume: 6.6g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/3/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| n-Butylbenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| n-Propylbenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| sec-Butylbenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Styrene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| tert-Butylbenzene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Tertiary-amyl methyl ether | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Tetrachloroethene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Tetrahydrofuran | ND (0.0168) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Toluene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| trans-1,2-Dichloroethene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| trans-1,3-Dichloropropene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Trichloroethene | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Trichlorofluoromethane | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Vinyl Chloride | ND (0.0084) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Xylene O | ND (0.0042) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Xylene P,M | ND (0.0084) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |
| Xylenes (Total) | ND (0.0084) | --- | 8260D Low | --- | 1 | MEK | 06/03/24 14:30 | D4F0011 | DF40305 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *115 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *100 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *110 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *100 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 12ft-24ft
Date Sampled: 05/30/24 15:10
Percent Solids: 90

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | **EL** ND (2.22) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:21 | 2.5 100 | DF40303 |
| **Barium** | **13.9** (0.89) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:21 | 2.5 100 | DF40303 |
| Cadmium | ND (0.44) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:21 | 2.5 100 | DF40303 |
| **Chromium** | **9.86** (0.89) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:21 | 2.5 100 | DF40303 |
| **Lead** | **7.40** (4.44) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:21 | 2.5 100 | DF40303 |
| Mercury | ND (0.033) | --- | 7471B | --- | 1 | CEV | 06/03/24 12:12 | 0.67 40 | DF40304 |
| Selenium | ND (4.44) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:21 | 2.5 100 | DF40303 |
| Silver | ND (0.44) | --- | 6010D | --- | 1 | KJB | 06/04/24 14:21 | 2.5 100 | DF40303 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 12ft-24ft
Date Sampled: 05/30/24 15:10
Percent Solids: 90
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/31/24 17:40

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 1,2,4-Trichlorobenzene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 1,2-Dichlorobenzene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 1,3-Dichlorobenzene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 1,4-Dichlorobenzene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 2,4,5-Trichlorophenol | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 2,4,6-Trichlorophenol | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 2,4-Dichlorophenol | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 2,4-Dimethylphenol | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 2,4-Dinitrophenol | ND (1.13) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 2,4-Dinitrotoluene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 2,6-Dinitrotoluene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 2-Chloronaphthalene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 2-Chlorophenol | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 2-Methylnaphthalene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 2-Methylphenol | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 2-Nitrophenol | ND (0.564) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 3,3´-Dichlorobenzidine | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 3+4-Methylphenol | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 4-Bromophenyl-phenylether | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 4-Chloroaniline | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| 4-Nitrophenol | ND (1.13) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Acenaphthene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Acenaphthylene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Acetophenone | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Aniline | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Anthracene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 12ft-24ft
Date Sampled: 05/30/24 15:10
Percent Solids: 90
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/31/24 17:40

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Benzo(a)anthracene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Benzo(a)pyrene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Benzo(b)fluoranthene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Benzo(g,h,i)perylene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Benzo(k)fluoranthene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| bis(2-Chloroethoxy)methane | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| bis(2-Chloroethyl)ether | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| bis(2-chloroisopropyl)Ether | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| bis(2-Ethylhexyl)phthalate | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Butylbenzylphthalate | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Chrysene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Dibenzo(a,h)Anthracene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Dibenzofuran | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Diethylphthalate | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Dimethylphthalate | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Di-n-butylphthalate | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Di-n-octylphthalate | ND (0.564) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Fluoranthene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Fluorene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Hexachlorobenzene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Hexachlorobutadiene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Hexachloroethane | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Indeno(1,2,3-cd)Pyrene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Isophorone | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Naphthalene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Nitrobenzene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 12ft-24ft
Date Sampled: 05/30/24 15:10
Percent Solids: 90
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 5/31/24 17:40

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Pentachlorophenol | ND (1.13) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Phenanthrene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Phenol | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Pyrene | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |
| Pyridine | ND (0.282) | --- | 8270E | --- | 1 | TJ | 06/05/24 3:37 | D4F0069 | DE43105 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *91 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *89 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *99 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *95 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *99 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *98 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *102 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *128 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 12ft-24ft
Date Sampled: 05/30/24 15:10
Percent Solids: 90
Initial Volume: 20.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 6/3/24 11:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | --- | 8082A | --- | 1 | 06/05/24 3:47 | --- | DF40310 |
| Aroclor 1221 | ND (0.05) | --- | 8082A | --- | 1 | 06/05/24 3:47 | --- | DF40310 |
| Aroclor 1232 | ND (0.05) | --- | 8082A | --- | 1 | 06/05/24 3:47 | --- | DF40310 |
| Aroclor 1242 | ND (0.05) | --- | 8082A | --- | 1 | 06/05/24 3:47 | --- | DF40310 |
| Aroclor 1248 | ND (0.05) | --- | 8082A | --- | 1 | 06/05/24 3:47 | --- | DF40310 |
| Aroclor 1254 | ND (0.05) | --- | 8082A | --- | 1 | 06/05/24 3:47 | --- | DF40310 |
| Aroclor 1260 | ND (0.05) | --- | 8082A | --- | 1 | 06/05/24 3:47 | --- | DF40310 |
| Aroclor 1262 | ND (0.05) | --- | 8082A | --- | 1 | 06/05/24 3:47 | --- | DF40310 |
| Aroclor 1268 | ND (0.05) | --- | 8082A | --- | 1 | 06/05/24 3:47 | --- | DF40310 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl [2C]* | *87 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *88 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 12ft-24ft
Date Sampled: 05/30/24 15:10
Percent Solids: 90
Initial Volume: 20.4g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 5/31/24 17:41

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| 4,4´-DDE | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| 4,4´-DDT | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Aldrin | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| alpha-BHC | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| alpha-Chlordane | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| beta-BHC | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Chlordane (Total) | ND (0.0218) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| delta-BHC | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Dieldrin | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Endosulfan I | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Endosulfan II | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Endosulfan Sulfate | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Endrin | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Endrin Ketone | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| gamma-BHC (Lindane) | ND (0.0016) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| gamma-Chlordane | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Heptachlor | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Heptachlor Epoxide | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Hexachlorobenzene | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Methoxychlor | ND (0.0027) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |
| Toxaphene | ND (0.136) | --- | 8081B | --- | 1 | 06/03/24 20:27 | D4F0021 | DE43104 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl [2C]* | *98 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *75 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 12ft-24ft
Date Sampled: 05/30/24 15:10
Percent Solids: 90
Initial Volume: 10.1g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/3/24 18:00

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/05/24 12:12 | D4F0074 | DF40346 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/05/24 12:12 | D4F0074 | DF40346 |
| 2,4-D | ND (0.052) | --- | 8151A | --- | 1 | 06/05/24 12:12 | D4F0074 | DF40346 |
| 2,4-DB | ND (0.052) | --- | 8151A | --- | 1 | 06/05/24 12:12 | D4F0074 | DF40346 |
| Dalapon | ND (0.050) | --- | 8151A | --- | 1 | 06/05/24 12:12 | D4F0074 | DF40346 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/05/24 12:12 | D4F0074 | DF40346 |
| Dichlorprop | ND (0.052) | --- | 8151A | --- | 1 | 06/05/24 12:12 | D4F0074 | DF40346 |
| Dinoseb | ND (0.052) | --- | 8151A | --- | 1 | 06/05/24 12:12 | D4F0074 | DF40346 |
| MCPA | ND (2.56) | --- | 8151A | --- | 1 | 06/05/24 12:12 | D4F0074 | DF40346 |
| MCPP [2C] | ND (2.58) | --- | 8151A | --- | 1 | 06/05/24 12:12 | D4F0074 | DF40346 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *90 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 12ft-24ft
Date Sampled: 05/30/24 15:10
Percent Solids: 90
Initial Volume: 19.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/3/24 11:15

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **13.7** (11.6) | --- | 8100M | --- | 1 | 06/03/24 17:21 | --- | DF40312 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | *72 %* | | *40-140* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-10A 12ft-24ft
Date Sampled: 05/30/24 15:10
Percent Solids: 90

ESS Laboratory Work Order: 24E1268
ESS Laboratory Sample ID: 24E1268-04
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 345** (5) | --- | 9050A | --- | 1 | JLK | 05/31/24 21:02 | umhos/cm | DE43141 |
| **Corrosivity (pH)** | **7.65** (N/A) | --- | 9045 | --- | 1 | CCP | 05/31/24 19:19 | S.U. | DE43135 |
| **Corrosivity (pH) Sample Temp** | **20.6** | --- | 2550B | --- | 1 | CCP | 05/31/24 19:19 | °C | DE43135 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/03/24 17:47 | °F | DF40333 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EEM | 06/04/24 12:05 | ml/5 min | DF40417 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/03/24 17:41 | mg/kg | DF40331 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/03/24 17:41 | mg/kg | DF40331 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DF40303 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Arsenic | ND | 1.00 | mg/kg wet | | | | | | | |
| Barium | ND | 1.00 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Arsenic | 62.5 | 3.33 | mg/kg wet | 75.60 | | 83 | 80-120 | | | |
| Barium | 609 | 3.33 | mg/kg wet | 372.0 | | 164 | 40-297 | | | |
| Cadmium | 215 | 1.67 | mg/kg wet | 259.0 | | 83 | 80-120 | | | |
| Chromium | 138 | 3.33 | mg/kg wet | 156.0 | | 88 | 80-120 | | | |
| Lead | 188 | 16.7 | mg/kg wet | 225.0 | | 84 | 80-120 | | | |
| Selenium | 67.1 | 16.7 | mg/kg wet | 82.70 | | 81 | 80-120 | | | |
| Silver | 44.4 | 1.67 | mg/kg wet | 51.00 | | 87 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Arsenic | 71.5 | 3.33 | mg/kg wet | 75.60 | | 95 | 80-120 | 13 | 30 | |
| Barium | 665 | 3.33 | mg/kg wet | 372.0 | | 179 | 40-297 | 9 | 30 | |
| Cadmium | 240 | 1.67 | mg/kg wet | 259.0 | | 93 | 80-120 | 11 | 30 | |
| Chromium | 154 | 3.33 | mg/kg wet | 156.0 | | 99 | 80-120 | 11 | 30 | |
| Lead | 211 | 16.7 | mg/kg wet | 225.0 | | 94 | 80-120 | 11 | 30 | |
| Selenium | 74.2 | 16.7 | mg/kg wet | 82.70 | | 90 | 80-120 | 10 | 30 | |
| Silver | 49.7 | 1.67 | mg/kg wet | 51.00 | | 98 | 80-120 | 11 | 30 | |
| **Batch DF40304 - 245.1/7470A** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Mercury | ND | 0.030 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 21.7 | 3.14 | mg/kg wet | 25.50 | | 85 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 22.4 | 3.25 | mg/kg wet | 25.50 | | 88 | 80-120 | 3 | 30 | |
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40305 - 5035** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,1-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40305 - 5035** | | | | | | | | | | |
| 1,2,3-Trichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromoethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dioxane | ND | 0.100 | mg/kg wet | | | | | | | |
| 2,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Butanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 2-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Hexanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 4-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Isopropyltoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Methyl-2-Pentanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Acetone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Benzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromodichloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromoform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromomethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Carbon Disulfide | ND | 0.0050 | mg/kg wet | | | | | | | |
| Carbon Tetrachloride | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloroethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Chloroform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| cis-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| cis-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromomethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dichlorodifluoromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Diethyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Di-isopropyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethyl tertiary-butyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Isopropylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methyl tert-Butyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40305 - 5035** | | | | | | | | | | |
| Methylene Chloride | ND | 0.0250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Propylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| sec-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Styrene | ND | 0.0050 | mg/kg wet | | | | | | | |
| tert-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tertiary-amyl methyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrachloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrahydrofuran | ND | 0.0200 | mg/kg wet | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichlorofluoromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Vinyl Chloride | ND | 0.0100 | mg/kg wet | | | | | | | |
| Xylene O | ND | 0.0050 | mg/kg wet | | | | | | | |
| Xylene P,M | ND | 0.0100 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0581* | | mg/kg wet | *0.05000* | | *116* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0497* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0544* | | mg/kg wet | *0.05000* | | *109* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0502* | | mg/kg wet | *0.05000* | | *100* | *70-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| 1,1,1-Trichloroethane | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 1,1,2,2-Tetrachloroethane | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 40-160 | | | |
| 1,1,2-Trichloroethane | 0.0485 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| 1,1-Dichloroethane | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,1-Dichloroethene | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| 1,1-Dichloropropene | 0.0526 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| 1,2,3-Trichlorobenzene | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 1,2,3-Trichloropropane | 0.0425 | 0.0050 | mg/kg wet | 0.05000 | | 85 | 70-130 | | | |
| 1,2,4-Trichlorobenzene | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,2,4-Trimethylbenzene | 0.0511 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,2-Dibromo-3-Chloropropane | 0.0443 | 0.0050 | mg/kg wet | 0.05000 | | 89 | 70-130 | | | |
| 1,2-Dibromoethane | 0.0476 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| 1,2-Dichlorobenzene | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| 1,2-Dichloroethane | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,2-Dichloropropane | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,3,5-Trimethylbenzene | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| 1,3-Dichlorobenzene | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| 1,3-Dichloropropane | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 1,4-Dichlorobenzene | 0.0494 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| 1,4-Dioxane | 0.797 | 0.100 | mg/kg wet | 1.000 | | 80 | 70-130 | | | |
| 2,2-Dichloropropane | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40305 - 5035** | | | | | | | | | | |
| 2-Butanone | 0.240 | 0.0500 | mg/kg wet | 0.2500 | | 96 | 40-160 | | | |
| 2-Chlorotoluene | 0.0498 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 2-Hexanone | 0.226 | 0.0500 | mg/kg wet | 0.2500 | | 90 | 40-160 | | | |
| 4-Chlorotoluene | 0.0494 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| 4-Isopropyltoluene | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| 4-Methyl-2-Pentanone | 0.226 | 0.0500 | mg/kg wet | 0.2500 | | 91 | 40-160 | | | |
| Acetone | 0.212 | 0.0500 | mg/kg wet | 0.2500 | | 85 | 40-160 | | | |
| Benzene | 0.0511 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Bromobenzene | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| Bromochloromethane | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| Bromodichloromethane | 0.0570 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | | | |
| Bromoform | 0.0406 | 0.0050 | mg/kg wet | 0.05000 | | 81 | 40-160 | | | |
| Bromomethane | 0.0502 | 0.0100 | mg/kg wet | 0.05000 | | 100 | 40-160 | | | |
| Carbon Disulfide | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Carbon Tetrachloride | 0.0563 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | | | |
| Chlorobenzene | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| Chloroethane | 0.0533 | 0.0100 | mg/kg wet | 0.05000 | | 107 | 40-160 | | | |
| Chloroform | 0.0509 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Chloromethane | 0.0502 | 0.0100 | mg/kg wet | 0.05000 | | 100 | 40-160 | | | |
| cis-1,2-Dichloroethene | 0.0503 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| cis-1,3-Dichloropropene | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 40-160 | | | |
| Dibromochloromethane | 0.0462 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 40-160 | | | |
| Dibromomethane | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| Dichlorodifluoromethane | 0.0440 | 0.0100 | mg/kg wet | 0.05000 | | 88 | 40-160 | | | |
| Diethyl Ether | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Di-isopropyl ether | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Ethyl tertiary-butyl ether | 0.0509 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Ethylbenzene | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| Hexachlorobutadiene | 0.0498 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 40-160 | | | |
| Isopropylbenzene | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| Methyl tert-Butyl Ether | 0.0496 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| Methylene Chloride | 0.0468 | 0.0250 | mg/kg wet | 0.05000 | | 94 | 70-130 | | | |
| Naphthalene | 0.0452 | 0.0050 | mg/kg wet | 0.05000 | | 90 | 40-160 | | | |
| n-Butylbenzene | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| n-Propylbenzene | 0.0516 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| sec-Butylbenzene | 0.0403 | 0.0050 | mg/kg wet | 0.05000 | | 81 | 70-130 | | | |
| Styrene | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | | | |
| tert-Butylbenzene | 0.0502 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| Tertiary-amyl methyl ether | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| Tetrachloroethene | 0.0347 | 0.0050 | mg/kg wet | 0.05000 | | 69 | 70-130 | | | B- |
| Tetrahydrofuran | 0.0479 | 0.0200 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| Toluene | 0.0502 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| trans-1,2-Dichloroethene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| trans-1,3-Dichloropropene | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| Trichloroethene | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40305 - 5035** | | | | | | | | | | |
| Trichlorofluoromethane | 0.0538 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 40-160 | | | |
| Vinyl Chloride | 0.0523 | 0.0100 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Xylene O | 0.0506 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| Xylene P,M | 0.104 | 0.0100 | mg/kg wet | 0.1000 | | 104 | 70-130 | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0523* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0504* | | mg/kg wet | *0.05000* | | *101* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0516* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0518* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0511 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 0.7 | 20 | |
| 1,1,1-Trichloroethane | 0.0528 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 1 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0454 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 40-160 | 8 | 20 | |
| 1,1,2-Trichloroethane | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 0.9 | 20 | |
| 1,1-Dichloroethane | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 0.5 | 20 | |
| 1,1-Dichloroethene | 0.0522 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 2 | 20 | |
| 1,1-Dichloropropene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 2 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0458 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | 9 | 20 | |
| 1,2,3-Trichloropropane | 0.0400 | 0.0050 | mg/kg wet | 0.05000 | | 80 | 70-130 | 6 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 9 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0466 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 9 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0415 | 0.0050 | mg/kg wet | 0.05000 | | 83 | 70-130 | 7 | 20 | |
| 1,2-Dibromoethane | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 0.5 | 20 | |
| 1,2-Dichlorobenzene | 0.0439 | 0.0050 | mg/kg wet | 0.05000 | | 88 | 70-130 | 9 | 20 | |
| 1,2-Dichloroethane | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 1 | 20 | |
| 1,2-Dichloropropane | 0.0514 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 0.3 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0464 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 9 | 20 | |
| 1,3-Dichlorobenzene | 0.0456 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | 7 | 20 | |
| 1,3-Dichloropropane | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 1 | 20 | |
| 1,4-Dichlorobenzene | 0.0441 | 0.0050 | mg/kg wet | 0.05000 | | 88 | 70-130 | 11 | 20 | |
| 1,4-Dioxane | 0.886 | 0.100 | mg/kg wet | 1.000 | | 89 | 70-130 | 11 | 20 | |
| 2,2-Dichloropropane | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 2 | 20 | |
| 2-Butanone | 0.286 | 0.0500 | mg/kg wet | 0.2500 | | 115 | 40-160 | 17 | 20 | |
| 2-Chlorotoluene | 0.0455 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | 9 | 20 | |
| 2-Hexanone | 0.262 | 0.0500 | mg/kg wet | 0.2500 | | 105 | 40-160 | 15 | 20 | |
| 4-Chlorotoluene | 0.0450 | 0.0050 | mg/kg wet | 0.05000 | | 90 | 70-130 | 9 | 20 | |
| 4-Isopropyltoluene | 0.0445 | 0.0050 | mg/kg wet | 0.05000 | | 89 | 70-130 | 10 | 20 | |
| 4-Methyl-2-Pentanone | 0.232 | 0.0500 | mg/kg wet | 0.2500 | | 93 | 40-160 | 2 | 20 | |
| Acetone | 0.359 | 0.0500 | mg/kg wet | 0.2500 | | 144 | 40-160 | 51 | 20 | D+ |
| Benzene | 0.0508 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 0.5 | 20 | |
| Bromobenzene | 0.0444 | 0.0050 | mg/kg wet | 0.05000 | | 89 | 70-130 | 8 | 20 | |
| Bromochloromethane | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 0.6 | 20 | |
| Bromodichloromethane | 0.0573 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 0.5 | 20 | |
| Bromoform | 0.0405 | 0.0050 | mg/kg wet | 0.05000 | | 81 | 40-160 | 0.4 | 20 | |
| Bromomethane | 0.0512 | 0.0100 | mg/kg wet | 0.05000 | | 102 | 40-160 | 2 | 20 | |
| Carbon Disulfide | 0.0547 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 0.7 | 20 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40305 - 5035** | | | | | | | | | | |
| Carbon Tetrachloride | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 1 | 20 | |
| Chlorobenzene | 0.0490 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 0.5 | 20 | |
| Chloroethane | 0.0533 | 0.0100 | mg/kg wet | 0.05000 | | 107 | 40-160 | 0 | 20 | |
| Chloroform | 0.0511 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 0.3 | 20 | |
| Chloromethane | 0.0500 | 0.0100 | mg/kg wet | 0.05000 | | 100 | 40-160 | 0.3 | 20 | |
| cis-1,2-Dichloroethene | 0.0505 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 0.5 | 20 | |
| cis-1,3-Dichloropropene | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 40-160 | 0.5 | 20 | |
| Dibromochloromethane | 0.0466 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 40-160 | 1 | 20 | |
| Dibromomethane | 0.0498 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 1 | 20 | |
| Dichlorodifluoromethane | 0.0432 | 0.0100 | mg/kg wet | 0.05000 | | 86 | 40-160 | 2 | 20 | |
| Diethyl Ether | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 3 | 20 | |
| Di-isopropyl ether | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 0.8 | 20 | |
| Ethyl tertiary-butyl ether | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 0.9 | 20 | |
| Ethylbenzene | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 2 | 20 | |
| Hexachlorobutadiene | 0.0454 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 40-160 | 9 | 20 | |
| Isopropylbenzene | 0.0496 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 9 | 20 | |
| Methyl tert-Butyl Ether | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 0.9 | 20 | |
| Methylene Chloride | 0.0474 | 0.0250 | mg/kg wet | 0.05000 | | 95 | 70-130 | 1 | 20 | |
| Naphthalene | 0.0421 | 0.0050 | mg/kg wet | 0.05000 | | 84 | 40-160 | 7 | 20 | |
| n-Butylbenzene | 0.0469 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | 11 | 20 | |
| n-Propylbenzene | 0.0467 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 10 | 20 | |
| sec-Butylbenzene | 0.0367 | 0.0050 | mg/kg wet | 0.05000 | | 73 | 70-130 | 9 | 20 | |
| Styrene | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 40-160 | 0.04 | 20 | |
| tert-Butylbenzene | 0.0452 | 0.0050 | mg/kg wet | 0.05000 | | 90 | 70-130 | 10 | 20 | |
| Tertiary-amyl methyl ether | 0.0505 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 2 | 20 | |
| Tetrachloroethene | 0.0348 | 0.0050 | mg/kg wet | 0.05000 | | 70 | 70-130 | 0.5 | 20 | |
| Tetrahydrofuran | 0.0498 | 0.0200 | mg/kg wet | 0.05000 | | 100 | 70-130 | 4 | 20 | |
| Toluene | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 0.4 | 20 | |
| trans-1,2-Dichloroethene | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 0.4 | 20 | |
| trans-1,3-Dichloropropene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 0.3 | 20 | |
| Trichloroethene | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | 0.9 | 20 | |
| Trichlorofluoromethane | 0.0532 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 40-160 | 1 | 20 | |
| Vinyl Chloride | 0.0519 | 0.0100 | mg/kg wet | 0.05000 | | 104 | 70-130 | 0.8 | 20 | |
| Xylene O | 0.0503 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 0.6 | 20 | |
| Xylene P,M | 0.102 | 0.0100 | mg/kg wet | 0.1000 | | 102 | 70-130 | 2 | 20 | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0516* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0515* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0515* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0518* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE43105 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE43105 - 3546** | | | | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE43105 - 3546** | | | | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyridine | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.48* | | mg/kg wet | *2.500* | | *99* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.08* | | mg/kg wet | *3.750* | | *109* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.46* | | mg/kg wet | *3.750* | | *92* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.43* | | mg/kg wet | *2.500* | | *97* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.63* | | mg/kg wet | *3.750* | | *97* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.60* | | mg/kg wet | *2.500* | | *104* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.51* | | mg/kg wet | *3.750* | | *94* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *3.06* | | mg/kg wet | *2.500* | | *122* | *30-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.33 | 0.025 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.85 | 0.250 | mg/kg wet | 2.500 | | 114 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.62 | 0.250 | mg/kg wet | 2.500 | | 105 | 30-130 | | | |
| 2,4-Dimethylphenol | 3.01 | 0.250 | mg/kg wet | 2.500 | | 120 | 30-130 | | | |
| 2,4-Dinitrophenol | 2.01 | 1.00 | mg/kg wet | 2.500 | | 80 | 15-140 | | | |
| 2,4-Dinitrotoluene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | | | |
| 2-Chloronaphthalene | 2.71 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| 2-Chlorophenol | 2.19 | 0.250 | mg/kg wet | 2.500 | | 88 | 30-130 | | | |
| 2-Methylnaphthalene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| 2-Methylphenol | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 15-140 | | | |
| 2-Nitrophenol | 2.35 | 0.500 | mg/kg wet | 2.500 | | 94 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.61 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| 3+4-Methylphenol | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 15-140 | | | |
| 4-Bromophenyl-phenylether | 2.65 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | | | |
| 4-Chloroaniline | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | | | |
| 4-Nitrophenol | 2.53 | 1.00 | mg/kg wet | 2.500 | | 101 | 15-140 | | | |
| Acenaphthene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE43105 - 3546** | | | | | | | | | | |
| Acenaphthylene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Acetophenone | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Aniline | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Anthracene | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| Azobenzene | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Benzo(a)anthracene | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Benzo(a)pyrene | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.64 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.69 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 2.22 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| Butylbenzylphthalate | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| Chrysene | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.71 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | | | |
| Dibenzofuran | 2.61 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| Diethylphthalate | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| Dimethylphthalate | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | | | |
| Di-n-butylphthalate | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Di-n-octylphthalate | 2.44 | 0.500 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Fluoranthene | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| Fluorene | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Hexachlorobenzene | 2.72 | 0.250 | mg/kg wet | 2.500 | | 109 | 40-140 | | | |
| Hexachlorobutadiene | 2.83 | 0.250 | mg/kg wet | 2.500 | | 113 | 40-140 | | | |
| Hexachloroethane | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | | | |
| Isophorone | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Naphthalene | 2.16 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Nitrobenzene | 2.53 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | | | |
| N-Nitrosodimethylamine | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Pentachlorophenol | 2.08 | 1.00 | mg/kg wet | 2.500 | | 83 | 15-140 | | | |
| Phenanthrene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Phenol | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 15-140 | | | |
| Pyrene | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| Pyridine | 1.52 | 0.250 | mg/kg wet | 2.500 | | 61 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.44* | | mg/kg wet | *2.500* | | *98* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.95* | | mg/kg wet | *3.750* | | *105* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.60* | | mg/kg wet | *3.750* | | *96* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.59* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.47* | | mg/kg wet | *3.750* | | *93* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.59* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.61* | | mg/kg wet | *3.750* | | *96* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.98* | | mg/kg wet | *2.500* | | *119* | *30-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE43105 - 3546** | | | | | | | | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.39 | 0.025 | mg/kg wet | 2.500 | | 95 | 40-140 | 2 | 30 | |
| 1,2,4-Trichlorobenzene | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 8 | 30 | |
| 1,2-Dichlorobenzene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 4 | 30 | |
| 1,3-Dichlorobenzene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 0.5 | 30 | |
| 1,4-Dichlorobenzene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 0.8 | 30 | |
| 2,4,5-Trichlorophenol | 2.92 | 0.250 | mg/kg wet | 2.500 | | 117 | 30-130 | 2 | 30 | |
| 2,4,6-Trichlorophenol | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 30-130 | 2 | 30 | |
| 2,4-Dichlorophenol | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 30-130 | 3 | 30 | |
| 2,4-Dimethylphenol | 3.04 | 0.250 | mg/kg wet | 2.500 | | 122 | 30-130 | 1 | 30 | |
| 2,4-Dinitrophenol | 2.01 | 1.00 | mg/kg wet | 2.500 | | 80 | 15-140 | 0.2 | 30 | |
| 2,4-Dinitrotoluene | 2.88 | 0.250 | mg/kg wet | 2.500 | | 115 | 40-140 | 3 | 30 | |
| 2,6-Dinitrotoluene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 0.09 | 30 | |
| 2-Chloronaphthalene | 2.69 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 1 | 30 | |
| 2-Chlorophenol | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | 4 | 30 | |
| 2-Methylnaphthalene | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 4 | 30 | |
| 2-Methylphenol | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | 4 | 30 | |
| 2-Nitrophenol | 2.52 | 0.500 | mg/kg wet | 2.500 | | 101 | 30-130 | 7 | 30 | |
| 3,3´-Dichlorobenzidine | 2.75 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | 5 | 30 | |
| 3+4-Methylphenol | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 15-140 | 3 | 30 | |
| 4-Bromophenyl-phenylether | 2.89 | 0.250 | mg/kg wet | 2.500 | | 116 | 40-140 | 9 | 30 | |
| 4-Chloroaniline | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 15-140 | 1 | 30 | |
| 4-Nitrophenol | 2.54 | 1.00 | mg/kg wet | 2.500 | | 102 | 15-140 | 0.7 | 30 | |
| Acenaphthene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 1 | 30 | |
| Acenaphthylene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 0.3 | 30 | |
| Acetophenone | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 0.5 | 30 | |
| Aniline | 2.41 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 1 | 30 | |
| Anthracene | 2.71 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | 3 | 30 | |
| Azobenzene | 2.58 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | 6 | 30 | |
| Benzo(a)anthracene | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 2 | 30 | |
| Benzo(a)pyrene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 3 | 30 | |
| Benzo(b)fluoranthene | 2.73 | 0.250 | mg/kg wet | 2.500 | | 109 | 40-140 | 4 | 30 | |
| Benzo(g,h,i)perylene | 2.77 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 3 | 30 | |
| Benzo(k)fluoranthene | 2.72 | 0.250 | mg/kg wet | 2.500 | | 109 | 40-140 | 2 | 30 | |
| bis(2-Chloroethoxy)methane | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | 4 | 30 | |
| bis(2-Chloroethyl)ether | 2.12 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | 4 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.22 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | 0.02 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.80 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | 4 | 30 | |
| Butylbenzylphthalate | 2.77 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 3 | 30 | |
| Chrysene | 2.66 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 2 | 30 | |
| Dibenzo(a,h)Anthracene | 2.90 | 0.250 | mg/kg wet | 2.500 | | 116 | 40-140 | 7 | 30 | |
| Dibenzofuran | 2.65 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 2 | 30 | |
| Diethylphthalate | 2.61 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 0.4 | 30 | |
| Dimethylphthalate | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 15-140 | 1 | 30 | |
| Di-n-butylphthalate | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 6 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DE43105 - 3546** | | | | | | | | | | |
| Di-n-octylphthalate | 2.54 | 0.500 | mg/kg wet | 2.500 | | 102 | 40-140 | 4 | 30 | |
| Fluoranthene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 5 | 30 | |
| Fluorene | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 0.3 | 30 | |
| Hexachlorobenzene | 2.84 | 0.250 | mg/kg wet | 2.500 | | 113 | 40-140 | 4 | 30 | |
| Hexachlorobutadiene | 2.83 | 0.250 | mg/kg wet | 2.500 | | 113 | 40-140 | 0.08 | 30 | |
| Hexachloroethane | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 3 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.87 | 0.250 | mg/kg wet | 2.500 | | 115 | 40-140 | 7 | 30 | |
| Isophorone | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 4 | 30 | |
| Naphthalene | 2.23 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | 3 | 30 | |
| Nitrobenzene | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 5 | 30 | |
| N-Nitrosodimethylamine | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 7 | 30 | |
| Pentachlorophenol | 2.28 | 1.00 | mg/kg wet | 2.500 | | 91 | 15-140 | 9 | 30 | |
| Phenanthrene | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 3 | 30 | |
| Phenol | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 15-140 | 6 | 30 | |
| Pyrene | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 40-140 | 4 | 30 | |
| Pyridine | 1.71 | 0.250 | mg/kg wet | 2.500 | | 68 | 40-140 | 12 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.39* | | mg/kg wet | *2.500* | | *96* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.88* | | mg/kg wet | *3.750* | | *103* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.47* | | mg/kg wet | *3.750* | | *93* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.57* | | mg/kg wet | *2.500* | | *103* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.48* | | mg/kg wet | *3.750* | | *93* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.64* | | mg/kg wet | *2.500* | | *106* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.47* | | mg/kg wet | *3.750* | | *93* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *3.00* | | mg/kg wet | *2.500* | | *120* | *30-130* | | | |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF40310 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF40310 - 3540C** | | | | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0221* | | mg/kg wet | *0.02500* | | *89* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0238* | | mg/kg wet | *0.02500* | | *95* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0202* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0216* | | mg/kg wet | *0.02500* | | *87* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 83 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 89 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 88 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 91 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0217* | | mg/kg wet | *0.02500* | | *87* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0230* | | mg/kg wet | *0.02500* | | *92* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0198* | | mg/kg wet | *0.02500* | | *79* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0208* | | mg/kg wet | *0.02500* | | *83* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 85 | 40-140 | 3 | 30 | |
| Aroclor 1016 [2C] | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 91 | 40-140 | 2 | 30 | |
| Aroclor 1260 | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 91 | 40-140 | 3 | 30 | |
| Aroclor 1260 [2C] | 0.5 | 0.05 | mg/kg wet | 0.5000 | | 94 | 40-140 | 3 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0221* | | mg/kg wet | *0.02500* | | *89* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0236* | | mg/kg wet | *0.02500* | | *94* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0203* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0213* | | mg/kg wet | *0.02500* | | *85* | *30-150* | | | |
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DE43104 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 4,4´-DDD | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDD [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Chlordane (Total) | ND | 0.0200 | mg/kg wet | | | | | | | |
| Chlordane (Total) [2C] | ND | 0.0200 | mg/kg wet | | | | | | | |
| delta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| delta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| 8081B Organochlorine Pesticides | | | | | | | | | | |
| **Batch DE43104 - 3546** | | | | | | | | | | |
| Dieldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) [2C] | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Toxaphene | ND | 0.125 | mg/kg wet | | | | | | | |
| Toxaphene [2C] | ND | 0.125 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0135* | | mg/kg wet | *0.01250* | | *108* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0137* | | mg/kg wet | *0.01250* | | *110* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0114* | | mg/kg wet | *0.01250* | | *91* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0117* | | mg/kg wet | *0.01250* | | *94* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 4,4´-DDD | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| 4,4´-DDD [2C] | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | | | |
| 4,4´-DDE | 0.0110 | 0.0025 | mg/kg wet | 0.01250 | | 88 | 40-140 | | | |
| 4,4´-DDE [2C] | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | | | |
| 4,4´-DDT | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | | | |
| 4,4´-DDT [2C] | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |
| Aldrin | 0.0110 | 0.0025 | mg/kg wet | 0.01250 | | 88 | 40-140 | | | |
| Aldrin [2C] | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| alpha-BHC | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | | | |
| alpha-BHC [2C] | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| alpha-Chlordane | 0.0107 | 0.0025 | mg/kg wet | 0.01250 | | 86 | 40-140 | | | |
| alpha-Chlordane [2C] | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| beta-BHC | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| beta-BHC [2C] | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DE43104 - 3546** | | | | | | | | | | |
| delta-BHC | 0.0083 | 0.0025 | mg/kg wet | 0.01250 | | 66 | 40-140 | | | |
| delta-BHC [2C] | 0.0089 | 0.0025 | mg/kg wet | 0.01250 | | 71 | 40-140 | | | |
| Dieldrin | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Dieldrin [2C] | 0.0122 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | | | |
| Endosulfan I | 0.0110 | 0.0025 | mg/kg wet | 0.01250 | | 88 | 40-140 | | | |
| Endosulfan I [2C] | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | | | |
| Endosulfan II | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| Endosulfan II [2C] | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |
| Endosulfan Sulfate | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| Endosulfan Sulfate [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| Endrin | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Endrin [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| Endrin Ketone | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| Endrin Ketone [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| gamma-BHC (Lindane) | 0.0108 | 0.0015 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| gamma-BHC (Lindane) [2C] | 0.0111 | 0.0015 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| gamma-Chlordane | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | | | |
| gamma-Chlordane [2C] | 0.0129 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | | | |
| Heptachlor | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| Heptachlor [2C] | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Heptachlor Epoxide | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| Heptachlor Epoxide [2C] | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Hexachlorobenzene | 0.0106 | 0.0025 | mg/kg wet | 0.01250 | | 85 | 40-140 | | | |
| Hexachlorobenzene [2C] | 0.0106 | 0.0025 | mg/kg wet | 0.01250 | | 85 | 40-140 | | | |
| Methoxychlor | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| Methoxychlor [2C] | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0135* | | mg/kg wet | *0.01250* | | *108* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0138* | | mg/kg wet | *0.01250* | | *110* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0110* | | mg/kg wet | *0.01250* | | *88* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0116* | | mg/kg wet | *0.01250* | | *93* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 4,4´-DDD | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 3 | 30 | |
| 4,4´-DDD [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 4 | 30 | |
| 4,4´-DDE | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | 3 | 30 | |
| 4,4´-DDE [2C] | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | 3 | 30 | |
| 4,4´-DDT | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | 1 | 30 | |
| 4,4´-DDT [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | 3 | 30 | |
| Aldrin | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | 3 | 30 | |
| Aldrin [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 3 | 30 | |
| alpha-BHC | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 2 | 30 | |
| alpha-BHC [2C] | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 2 | 30 | |
| alpha-Chlordane | 0.0110 | 0.0025 | mg/kg wet | 0.01250 | | 88 | 40-140 | 2 | 30 | |
| alpha-Chlordane [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 3 | 30 | |
| beta-BHC | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 3 | 30 | |
| beta-BHC [2C] | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 2 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DE43104 - 3546** | | | | | | | | | | |
| delta-BHC | 0.0084 | 0.0025 | mg/kg wet | 0.01250 | | 67 | 40-140 | 2 | 30 | |
| delta-BHC [2C] | 0.0092 | 0.0025 | mg/kg wet | 0.01250 | | 74 | 40-140 | 3 | 30 | |
| Dieldrin | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 2 | 30 | |
| Dieldrin [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 3 | 30 | |
| Endosulfan I | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | 2 | 30 | |
| Endosulfan I [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 3 | 30 | |
| Endosulfan II | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 3 | 30 | |
| Endosulfan II [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | 3 | 30 | |
| Endosulfan Sulfate | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 3 | 30 | |
| Endosulfan Sulfate [2C] | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | 3 | 30 | |
| Endrin | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 2 | 30 | |
| Endrin [2C] | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 3 | 30 | |
| Endrin Ketone | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 3 | 30 | |
| Endrin Ketone [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 4 | 30 | |
| gamma-BHC (Lindane) | 0.0111 | 0.0015 | mg/kg wet | 0.01250 | | 89 | 40-140 | 2 | 30 | |
| gamma-BHC (Lindane) [2C] | 0.0114 | 0.0015 | mg/kg wet | 0.01250 | | 92 | 40-140 | 3 | 30 | |
| gamma-Chlordane | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 2 | 30 | |
| gamma-Chlordane [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 3 | 30 | |
| Heptachlor | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 2 | 30 | |
| Heptachlor [2C] | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | 2 | 30 | |
| Heptachlor Epoxide | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | 2 | 30 | |
| Heptachlor Epoxide [2C] | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 3 | 30 | |
| Hexachlorobenzene | 0.0108 | 0.0025 | mg/kg wet | 0.01250 | | 86 | 40-140 | 2 | 30 | |
| Hexachlorobenzene [2C] | 0.0108 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | 2 | 30 | |
| Methoxychlor | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | 3 | 30 | |
| Methoxychlor [2C] | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 4 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0132* | | mg/kg wet | *0.01250* | | *106* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0135* | | mg/kg wet | *0.01250* | | *108* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0106* | | mg/kg wet | *0.01250* | | *85* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0113* | | mg/kg wet | *0.01250* | | *90* | *30-150* | | | |
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF40346 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 2,4,5-T | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-T [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4-D | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-D [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-DB | ND | 0.048 | mg/kg wet | | | | | | | |
| 2,4-DB [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| Dalapon | ND | 0.046 | mg/kg wet | | | | | | | |
| Dalapon [2C] | ND | 0.046 | mg/kg wet | | | | | | | |
| Dicamba | ND | 0.009 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF40346 - 3546** | | | | | | | | | | |
| Dicamba [2C] | ND | 0.009 | mg/kg wet | | | | | | | |
| Dichlorprop | ND | 0.047 | mg/kg wet | | | | | | | |
| Dichlorprop [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| Dinoseb | ND | 0.048 | mg/kg wet | | | | | | | |
| Dinoseb [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| MCPA | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPA [2C] | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPP | ND | 2.35 | mg/kg wet | | | | | | | |
| MCPP [2C] | ND | 2.35 | mg/kg wet | | | | | | | |
| *Surrogate: DCAA* | *0.163* | | mg/kg wet | *0.2000* | | *82* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.150* | | mg/kg wet | *0.2000* | | *75* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 2,4,5-T | 0.011 | 0.010 | mg/kg wet | 0.01900 | | 60 | 40-140 | | | |
| 2,4,5-T [2C] | 0.012 | 0.010 | mg/kg wet | 0.01900 | | 64 | 40-140 | | | |
| 2,4,5-TP (Silvex) | 0.012 | 0.010 | mg/kg wet | 0.01900 | | 62 | 40-140 | | | |
| 2,4,5-TP (Silvex) [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 66 | 40-140 | | | |
| 2,4-D | 0.129 | 0.047 | mg/kg wet | 0.1880 | | 69 | 40-140 | | | |
| 2,4-D [2C] | 0.117 | 0.047 | mg/kg wet | 0.1880 | | 62 | 40-140 | | | |
| 2,4-DB | 0.139 | 0.048 | mg/kg wet | 0.1900 | | 73 | 40-140 | | | |
| 2,4-DB [2C] | 0.139 | 0.048 | mg/kg wet | 0.1900 | | 73 | 40-140 | | | |
| Dalapon | 0.252 | 0.046 | mg/kg wet | 0.4550 | | 55 | 40-140 | | | |
| Dalapon [2C] | 0.272 | 0.046 | mg/kg wet | 0.4550 | | 60 | 40-140 | | | |
| Dicamba | 0.011 | 0.009 | mg/kg wet | 0.01880 | | 56 | 40-140 | | | |
| Dicamba [2C] | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 64 | 40-140 | | | |
| Dichlorprop | 0.161 | 0.047 | mg/kg wet | 0.1880 | | 85 | 40-140 | | | |
| Dichlorprop [2C] | 0.138 | 0.047 | mg/kg wet | 0.1880 | | 73 | 40-140 | | | |
| Dinoseb | 0.023 | 0.048 | mg/kg wet | 0.09500 | | 24 | 10-100 | | | |
| Dinoseb [2C] | 0.024 | 0.048 | mg/kg wet | 0.09500 | | 26 | 10-100 | | | |
| MCPA | 13.7 | 2.32 | mg/kg wet | 18.60 | | 74 | 40-140 | | | |
| MCPA [2C] | 14.0 | 2.32 | mg/kg wet | 18.60 | | 75 | 40-140 | | | |
| MCPP | 13.5 | 2.35 | mg/kg wet | 18.80 | | 72 | 40-140 | | | |
| MCPP [2C] | 13.8 | 2.35 | mg/kg wet | 18.80 | | 74 | 40-140 | | | |
| *Surrogate: DCAA* | *0.184* | | mg/kg wet | *0.2000* | | *92* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.166* | | mg/kg wet | *0.2000* | | *83* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 2,4,5-T | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | 12 | 30 | |
| 2,4,5-T [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 70 | 40-140 | 9 | 30 | |
| 2,4,5-TP (Silvex) | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | 9 | 30 | |
| 2,4,5-TP (Silvex) [2C] | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 74 | 40-140 | 11 | 30 | |
| 2,4-D | 0.139 | 0.047 | mg/kg wet | 0.1880 | | 74 | 40-140 | 8 | 30 | |
| 2,4-D [2C] | 0.129 | 0.047 | mg/kg wet | 0.1880 | | 69 | 40-140 | 10 | 30 | |
| 2,4-DB | 0.148 | 0.048 | mg/kg wet | 0.1900 | | 78 | 40-140 | 6 | 30 | |
| 2,4-DB [2C] | 0.152 | 0.048 | mg/kg wet | 0.1900 | | 80 | 40-140 | 9 | 30 | |
| Dalapon | 0.282 | 0.046 | mg/kg wet | 0.4550 | | 62 | 40-140 | 12 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF40346 - 3546** | | | | | | | | | | |
| Dalapon [2C] | 0.294 | 0.046 | mg/kg wet | 0.4550 | | 65 | 40-140 | 8 | 30 | |
| Dicamba | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 64 | 40-140 | 13 | 30 | |
| Dicamba [2C] | 0.013 | 0.009 | mg/kg wet | 0.01880 | | 70 | 40-140 | 9 | 30 | |
| Dichlorprop | 0.178 | 0.047 | mg/kg wet | 0.1880 | | 95 | 40-140 | 10 | 30 | |
| Dichlorprop [2C] | 0.149 | 0.047 | mg/kg wet | 0.1880 | | 79 | 40-140 | 8 | 30 | |
| Dinoseb | 0.025 | 0.048 | mg/kg wet | 0.09500 | | 26 | 10-100 | 10 | 30 | |
| Dinoseb [2C] | 0.027 | 0.048 | mg/kg wet | 0.09500 | | 28 | 10-100 | 10 | 30 | |
| MCPA | 14.8 | 2.32 | mg/kg wet | 18.60 | | 80 | 40-140 | 8 | 30 | |
| MCPA [2C] | 15.4 | 2.32 | mg/kg wet | 18.60 | | 83 | 40-140 | 9 | 30 | |
| MCPP | 14.8 | 2.35 | mg/kg wet | 18.80 | | 79 | 40-140 | 9 | 30 | |
| MCPP [2C] | 15.3 | 2.35 | mg/kg wet | 18.80 | | 81 | 40-140 | 10 | 30 | |
| *Surrogate: DCAA* | *0.187* | | mg/kg wet | *0.2000* | | *94* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.172* | | mg/kg wet | *0.2000* | | *86* | *30-150* | | | |
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF40312 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Decane (C10) | ND | 0.2 | mg/kg wet | | | | | | | |
| Docosane (C22) | ND | 0.2 | mg/kg wet | | | | | | | |
| Dodecane (C12) | ND | 0.2 | mg/kg wet | | | | | | | |
| Eicosane (C20) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexacosane (C26) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexadecane (C16) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexatriacontane (C36) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonadecane (C19) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonane (C9) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octacosane (C28) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octadecane (C18) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetracosane (C24) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetradecane (C14) | ND | 0.2 | mg/kg wet | | | | | | | |
| Total Petroleum Hydrocarbons (C9-C36) | ND | 10.0 | mg/kg wet | | | | | | | |
| Triacontane (C30) | ND | 0.2 | mg/kg wet | | | | | | | |
| *Surrogate: O-Terphenyl* | *3.77* | | mg/kg wet | *5.000* | | *75* | *40-140* | | | |
| **LCS** | | | | | | | | | | |
| Decane (C10) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 66 | 40-140 | | | |
| Docosane (C22) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Dodecane (C12) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 71 | 40-140 | | | |
| Eicosane (C20) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Hexacosane (C26) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Hexadecane (C16) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 76 | 40-140 | | | |
| Hexatriacontane (C36) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Nonadecane (C19) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | | | |
| Nonane (C9) | 1.4 | 0.2 | mg/kg wet | 2.500 | | 58 | 30-140 | | | |
| Octacosane (C28) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 76 | 40-140 | | | |
| Octadecane (C18) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 77 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF40312 - 3546** | | | | | | | | | | |
| Tetracosane (C24) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 77 | 40-140 | | | |
| Tetradecane (C14) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 74 | 40-140 | | | |
| Total Petroleum Hydrocarbons (C9-C36) | 26.4 | 10.0 | mg/kg wet | 35.00 | | 75 | 40-140 | | | |
| Triacontane (C30) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 74 | 40-140 | | | |
| *Surrogate: O-Terphenyl* | *3.88* | | mg/kg wet | *5.000* | | *78* | *40-140* | | | |
| **LCS Dup** | | | | | | | | | | |
| Decane (C10) | 1.6 | 0.2 | mg/kg wet | 2.500 | | 65 | 40-140 | 2 | 25 | |
| Docosane (C22) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | 3 | 25 | |
| Dodecane (C12) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 70 | 40-140 | 1 | 25 | |
| Eicosane (C20) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 78 | 40-140 | 3 | 25 | |
| Hexacosane (C26) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 79 | 40-140 | 2 | 25 | |
| Hexadecane (C16) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 1 | 25 | |
| Hexatriacontane (C36) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 89 | 40-140 | 1 | 25 | |
| Nonadecane (C19) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 77 | 40-140 | 3 | 25 | |
| Nonane (C9) | 1.4 | 0.2 | mg/kg wet | 2.500 | | 57 | 30-140 | 2 | 25 | |
| Octacosane (C28) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 0.6 | 25 | |
| Octadecane (C18) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 2 | 25 | |
| Tetracosane (C24) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 3 | 25 | |
| Tetradecane (C14) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 73 | 40-140 | 0.9 | 25 | |
| Total Petroleum Hydrocarbons (C9-C36) | 25.8 | 10.0 | mg/kg wet | 35.00 | | 74 | 40-140 | 3 | 25 | |
| Triacontane (C30) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 73 | 40-140 | 0.5 | 25 | |
| *Surrogate: O-Terphenyl* | *3.70* | | mg/kg wet | *5.000* | | *74* | *40-140* | | | |
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DE43141 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Conductivity | ND | 5 | umhos/cm | | | | | | | |
| **LCS** | | | | | | | | | | |
| Conductivity | 1390 | | umhos/cm | 1410 | | 98 | 90-110 | | | |
| **Batch DF40331 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Reactive Cyanide | ND | 2.0 | mg/kg | | | | | | | |
| Reactive Sulfide | ND | 2.0 | mg/kg | | | | | | | |
| **LCS** | | | | | | | | | | |
| Reactive Cyanide | 4.1 | 2.0 | mg/kg | 100.3 | | 4 | 0.68-5.41 | | | |
| Reactive Sulfide | 2.1 | 2.0 | mg/kg | 10.00 | | 21 | 0-44 | | | |
| **Batch DF40333 - General Preparation** | | | | | | | | | | |
| **Reference** | | | | | | | | | | |
| Flashpoint | 80 | | °F | 81.00 | | 99 | 97.9-102.1 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

**Notes and Definitions**

| | |
|---|---|
| WL | Results obtained from a deionized water leach of the sample. |
| U | Analyte included in the analysis, but not detected |
| RRF | Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration |
| Q | Calibration required quadratic regression (Q). |
| EL | Elevated Method Reporting Limits due to sample matrix (EL). |
| D+ | Relative percent difference for duplicate is outside of criteria (D+). |
| D | Diluted. |
| CD+ | Continuing Calibration %Diff/Drift is above control limit (CD+). |
| CD- | Continuing Calibration %Diff/Drift is below control limit (CD-). |
| B- | Blank Spike recovery is below lower control limit (B-). |
| > | Greater than. |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24E1268

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24E1268
Date Received: 5/31/2024
Project Due Date: 6/7/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: 5/31/24 Time: 1622 By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 555206 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 1 | 555208 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 555209 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 2 | 555212 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 555213 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 555216 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 3 | 555207 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 3 | 555210 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 555211 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 4 | 555214 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 555215 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 555217 | Yes | N/A | Yes | 4 oz. Jar | NP | |

**2nd Review**
**Were all containers scanned into storage/lab?** Initials BB
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

ESS Project ID: 24E1268

Date Received: 5/31/2024

Completed By: _____ Date & Time: 5/31/24 15:48

Reviewed By: _____ Date & Time: 5/31/24 1623

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

# CHAIN OF CUSTODY

ESS Lab # 24F1268

| | |
|---|---|
| Turn Time | 5 Days |
| Regulatory State | Massachusetts |
| Is this project for any of the following? | ○ CT RCP ◉ MA MCP ○ RGP |
| Company Name | Civil and Environmental Consultants |
| Contact Person | Cassia Dal Bello |
| Project # | 332-344 |
| Project Name | MassCEC Phase III - Site # 4 |
| Address | 31 Bellows Road |
| City | Raynham |
| State | MA |
| Zip Code | 02767 |
| PO # | |
| Telephone Number | 774-501-2176 |
| FAX Number | |
| Email Address | cdalbello, jkitchen, dbarboza@cecinc.com |

Reporting Limits: compare results to RCS-1, RCS-2, Lined and unlined landfills, TCLP, and 20X if needed.

Electonic Deliverables: ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) EDD

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | RCRA8 Metals | PCBs via 3540C | TPH | SVOC - incl pyr | Pest - incl Tox | Herbicides | Reactivity | Conductivity | pH | Free Liquid | Flashpoint | VOC - high | VOC - low | Grain Size Analysis (Sieve Only) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5/30/24 | 13:55 | Solid | Soil | CEC-10A 9'-11' | | | | | | | | | | | | X | X | | | |
| 2 | 5/30/24 | 14:05 | ↓ | ↓ | CEC-10A 0'-12' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 3 | 5/30/24 | 15:00 | | | CEC-10A 14'-21' | | | | | | | | | | | | X | X | | | |
| 4 | 5/30/24 | 15:10 | ↓ | ↓ | CEC-10A 12'-24' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial

Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analysis | | | | | | | | | | | | | | | | | | | | | |
| Container Type | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | V | V | J | J | | | | | | |
| Container Volume | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7 | 7 | 10 | 9 | | | | | | |
| Preservation Code | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 10 | 1 | 1 | | | | | | |
| Number of Containers per Sample: | 1 | | | | | 1 | | | | | 1 | 1 | 2 | 1 | 1 | | | | | | |

**Laboratory Use Only**

Cooler Present: Y
Seals Intact: ○ Drop Off ○ Pickup
Cooler Temperature: 3.3 °C / CQ

Sampled by : CI

Comments: Please specify "Other" preservative and containers types in this space

Run TCLP if fails 20x

| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
|---|---|---|---|
| 5/31/24 11:14 | 5/31/24 11:30 | 5/31/24 15:10 | 5/31/24 1520 |
| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |

# ESS Laboratory

*Division of Thielsch Engineering, Inc.*
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

## CHAIN OF CUSTODY

ESS Lab # 24E1268

| | | |
|---|---|---|
| **Turn Time** | 5 | Days |
| **Regulatory State** | Massachusetts | |

**Reporting Limits:** compare results to RCS-1, RCS-2, Lined and unlined landfills, TCLP, and 20X if needed.

**Is this project for any of the following?:** ○ CT RCP ◉ MA MCP ○ RGP

**Electonic Deliverables:** ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) EDD

| Company Name | Project # | Project Name |
|---|---|---|
| Civil and Environmental Consultants | 332-344 | MassCEC Phase III - Site #4 |

| Contact Person | Address |
|---|---|
| Cassia Dal Bello | 31 Bellows Road |

| City | State | Zip Code | PO # |
|---|---|---|---|
| Raynham | MA | 02767 | |

| Telephone Number | FAX Number | Email Address |
|---|---|---|
| 774-501-2176 | | cdalbello; jkitchen, dbarboza@cecinc.com |

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | RCRA8 Metals | PCBs via 3540C | TPH | SVOC - incl pyr | Pest - incl Tox | Herbicides | Reactivity | Conductivity | pH | Free Liquid | Flashpoint | VOC - high | VOC - low | Grain Size Analysis (Sieve Only) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5/30/24 | 13:55 | Solid | Soil | CEC-10A 9'-11' | | | | | | | | | | | | X | X | | | |
| 2 | 5/30/24 | 14:05 | " | " | CEC-10A 0'-12' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 3 | 5/30/24 | 15:00 | " | " | CEC-10A 14'-21' | | | | | | | | | | | | X | X | | | |
| 4 | 5/30/24 | 15:10 | " | " | CEC-10A 12'-24' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Container Type:** | AC-Air Cassette | AG-Amber Glass | B-BOD Bottle | C-Cubitainer | J-Jar | O-Other | P-Poly | S-Sterile | V-Vial | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | V | V | J | J |
| **Container Volume:** | 1-100 mL | 2-2.5 gal | 3-250 mL | 4-300 mL | 5-500 mL | 6-1L | 7-VOA | 8-2 oz | 9-4 oz | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7 | 7 | 10 | 9 |
| **Preservation Code:** | 1-Non Preserved | 2-HCl | 3-H2SO4 | 4-HNO3 | 5-NaOH | 6-Methanol | 7-Na2S2O3 | 8-ZnAce, NaOH | 9-NH4Cl | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 10 | 1 | 1 |
| | 10-DI H2O | 11-Other* | | | | | | | | | | | | | | | | | | | | | | |
| **Number of Containers per Sample:** | | | | | | | | | | 1 | | | | | 1 | | | | | 1 | 1 | 2 | 1 | 1 |

**Laboratory Use Only**

Cooler Present: YES ○ Drop Off
Seals Intact: ○ Pickup
Cooler Temperature: 3.3 °C / CC

**Sampled by :** CI

**Comments:** Please specify "Other" preservative and containers types in this space

Run TCLP if fails 20x

| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
|---|---|---|---|
| 5/31/24 11:24 | 5/31/24 11:30 | 5/31/24 15:20 | |
| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
| | | | |

ESS Laboratory
DIVISION OF THE RISE GROUP
BAL Laboratory Analytical Balance

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC Phase III - Site 4 (332-344)**
**ESS Laboratory Work Order Number: 24F0027**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

**REVIEWED**
**By ESS Laboratory at 2:44 pm, Jun 10, 2024**

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

## SAMPLE RECEIPT

The following samples were received on June 03, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

**Low Level VOA vials were frozen by the client on May 31, 2024 at 17:00.**
**Tetrahydrofuran is reported above the MA CAM reporting limit of 0.010 mg/kg.**

**Question I: All samples for EPH and metals were analyzed for a subset of the required MCP list per the client's request.**

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 24F0027-01 | CEC-9A 9-11ft | Soil | 8260D Low |
| 24F0027-02 | CEC-9A 0-12ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

## PROJECT NARRATIVE

**Semi-Volatile Organic Compounds**

| | |
|---|---|
| 24F0027-02 | **Surrogate recovery(ies) below lower control limit (S-).** |
| | p-Terphenyl-d14 (138% @ 30-130%) |
| D4F0118-CCV1 | **Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration** |
| | 2,4-Dinitrophenol (101% @ 40-160%) |
| D4F0118-CCV1 | **Calibration required quadratic regression (Q).** |
| | 2,4-Dinitrophenol (101% @ 40-160%), Pentachlorophenol (108% @ 40-160%) |
| DF40337-BLK1 | **Surrogate recovery(ies) below lower control limit (S-).** |
| | p-Terphenyl-d14 (140% @ 30-130%) |
| DF40337-BS1 | **Surrogate recovery(ies) below lower control limit (S-).** |
| | 2,4,6-Tribromophenol (133% @ 30-130%), p-Terphenyl-d14 (138% @ 30-130%) |
| DF40337-BSD1 | **Surrogate recovery(ies) below lower control limit (S-).** |
| | p-Terphenyl-d14 (133% @ 30-130%) |

**Volatile Organics Low Level**

| | |
|---|---|
| D4F0050-CCV1 | **Continuing Calibration %Diff/Drift is above control limit (CD+).** |
| | 1,1,1-Trichloroethane (22% @ 20%), 1,1-Dichloropropene (21% @ 20%), 2,2-Dichloropropane (23% @ 20%), Bromodichloromethane (25% @ 20%), Carbon Tetrachloride (30% @ 20%) |
| D4F0050-CCV1 | **Continuing Calibration %Diff/Drift is below control limit (CD-).** |
| | Tetrachloroethene (22% @ 20%) |
| DF40419-BS1 | **Blank Spike recovery is above upper control limit (B+).** |
| | Acetone (193% @ 40-160%), Bromodichloromethane (136% @ 70-130%), Carbon Tetrachloride (133% @ 70-130%), Di-isopropyl ether (132% @ 70-130%) |
| DF40419-BSD1 | **Blank Spike recovery is above upper control limit (B+).** |
| | Acetone (169% @ 40-160%), Bromodichloromethane (133% @ 70-130%) |

**No other observations noted.**

**End of Project Narrative.**

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24F0027-01 through 24F0027-02**

Matrices: ( ) Ground Water/Surface Water (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| (X) 8260 VOC CAM II A | (X) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | (X) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (X) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | (X) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (X) 6010 Metals CAM III A | ( ) 6020 Metals CAM III D | (X) MassDEP EPH CAM IV B | (X) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (X) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (X) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (X) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (X) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes (X) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (X) No ( ) |

***Responses to Questions G, H and I below are required for '"Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? | Yes ( ) No (X)* |
| | ***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.** | |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (X)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes ( ) No (X)* |

***All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: June 10, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-9A 9-11ft
Date Sampled: 05/31/24 14:30
Percent Solids: 89
Initial Volume: 6.3g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0027
ESS Laboratory Sample ID: 24F0027-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/4/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,1,1-Trichloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,1,2,2-Tetrachloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,1,2-Trichloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,1-Dichloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,1-Dichloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,1-Dichloropropene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,2,3-Trichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,2,3-Trichloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,2,4-Trichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,2,4-Trimethylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,2-Dibromoethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,2-Dichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,2-Dichloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,2-Dichloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,3,5-Trimethylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,3-Dichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,3-Dichloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,4-Dichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 1,4-Dioxane | ND (0.0888) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 2,2-Dichloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 2-Butanone | ND (0.0444) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 2-Chlorotoluene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 2-Hexanone | ND (0.0444) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 4-Chlorotoluene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| 4-Isopropyltoluene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-9A 9-11ft
Date Sampled: 05/31/24 14:30
Percent Solids: 89
Initial Volume: 6.3g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0027
ESS Laboratory Sample ID: 24F0027-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/4/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0444) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Acetone | ND (0.0444) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Benzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Bromobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Bromochloromethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Bromodichloromethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Bromoform | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Bromomethane | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Carbon Disulfide | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Carbon Tetrachloride | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Chlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Chloroethane | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Chloroform | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Chloromethane | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| cis-1,2-Dichloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| cis-1,3-Dichloropropene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Dibromochloromethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Dibromomethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Dichlorodifluoromethane | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Diethyl Ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Di-isopropyl ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Ethyl tertiary-butyl ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Ethylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Hexachlorobutadiene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Isopropylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Methyl tert-Butyl Ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Methylene Chloride | ND (0.0222) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-9A 9-11ft
Date Sampled: 05/31/24 14:30
Percent Solids: 89
Initial Volume: 6.3g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0027
ESS Laboratory Sample ID: 24F0027-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/4/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| n-Butylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| n-Propylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| sec-Butylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Styrene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| tert-Butylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Tertiary-amyl methyl ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Tetrachloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Tetrahydrofuran | ND (0.0178) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Toluene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| trans-1,2-Dichloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| trans-1,3-Dichloropropene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Trichloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Trichlorofluoromethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Vinyl Chloride | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Xylene O | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Xylene P,M | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |
| Xylenes (Total) | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/04/24 13:50 | D4F0050 | DF40419 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *123 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *96 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *116 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *101 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-9A 0-12ft
Date Sampled: 05/31/24 14:40
Percent Solids: 89

ESS Laboratory Work Order: 24F0027
ESS Laboratory Sample ID: 24F0027-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **2.87** (2.01) | --- | 6010D | --- | 1 | KJB | 06/04/24 15:49 | 2.78 100 | DF40404 |
| **Barium** | **13.8** (0.80) | --- | 6010D | --- | 1 | KJB | 06/04/24 15:49 | 2.78 100 | DF40404 |
| Cadmium | ND (0.40) | --- | 6010D | --- | 1 | KJB | 06/04/24 15:49 | 2.78 100 | DF40404 |
| **Chromium** | **9.14** (0.80) | --- | 6010D | --- | 1 | KJB | 06/04/24 15:49 | 2.78 100 | DF40404 |
| **Lead** | **10.4** (4.02) | --- | 6010D | --- | 1 | KJB | 06/04/24 15:49 | 2.78 100 | DF40404 |
| Mercury | ND (0.036) | --- | 7471B | --- | 1 | AFV | 06/04/24 16:04 | 0.62 40 | DF40403 |
| Selenium | ND (4.02) | --- | 6010D | --- | 1 | KJB | 06/04/24 15:49 | 2.78 100 | DF40404 |
| Silver | ND (0.40) | --- | 6010D | --- | 1 | KJB | 06/04/24 15:49 | 2.78 100 | DF40404 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-9A 0-12ft
Date Sampled: 05/31/24 14:40
Percent Solids: 89
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0027
ESS Laboratory Sample ID: 24F0027-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/3/24 18:34

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 1,2,4-Trichlorobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 1,2-Dichlorobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 1,3-Dichlorobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 1,4-Dichlorobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 2,4,5-Trichlorophenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 2,4,6-Trichlorophenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 2,4-Dichlorophenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 2,4-Dimethylphenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 2,4-Dinitrophenol | ND (1.11) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 2,4-Dinitrotoluene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 2,6-Dinitrotoluene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 2-Chloronaphthalene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 2-Chlorophenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 2-Methylnaphthalene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 2-Methylphenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 2-Nitrophenol | ND (0.556) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 3,3´-Dichlorobenzidine | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 3+4-Methylphenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 4-Bromophenyl-phenylether | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 4-Chloroaniline | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| 4-Nitrophenol | ND (1.11) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Acenaphthene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Acenaphthylene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Acetophenone | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Aniline | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Anthracene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-9A 0-12ft
Date Sampled: 05/31/24 14:40
Percent Solids: 89
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0027
ESS Laboratory Sample ID: 24F0027-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/3/24 18:34

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Benzo(a)anthracene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Benzo(a)pyrene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Benzo(b)fluoranthene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Benzo(g,h,i)perylene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Benzo(k)fluoranthene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| bis(2-Chloroethoxy)methane | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| bis(2-Chloroethyl)ether | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| bis(2-chloroisopropyl)Ether | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| bis(2-Ethylhexyl)phthalate | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Butylbenzylphthalate | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Chrysene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Dibenzo(a,h)Anthracene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Dibenzofuran | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Diethylphthalate | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Dimethylphthalate | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Di-n-butylphthalate | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Di-n-octylphthalate | ND (0.556) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Fluoranthene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Fluorene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Hexachlorobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Hexachlorobutadiene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Hexachloroethane | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Indeno(1,2,3-cd)Pyrene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Isophorone | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Naphthalene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Nitrobenzene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-9A 0-12ft
Date Sampled: 05/31/24 14:40
Percent Solids: 89
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0027
ESS Laboratory Sample ID: 24F0027-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/3/24 18:34

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Pentachlorophenol | ND (1.11) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Phenanthrene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Phenol | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Pyrene | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |
| Pyridine | ND (0.278) | --- | 8270E | --- | 1 | TJ | 06/07/24 0:13 | D4F0118 | DF40337 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *103 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *116 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *110 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *117 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *109 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *111 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *106 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *138 %* | *S-* | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-9A 0-12ft
Date Sampled: 05/31/24 14:40
Percent Solids: 89
Initial Volume: 20.2g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0027
ESS Laboratory Sample ID: 24F0027-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 6/4/24 12:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 13:54 | --- | DF40401 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 13:54 | --- | DF40401 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 13:54 | --- | DF40401 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 13:54 | --- | DF40401 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 13:54 | --- | DF40401 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 13:54 | --- | DF40401 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 13:54 | --- | DF40401 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 13:54 | --- | DF40401 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 13:54 | --- | DF40401 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl [2C]* | *93 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *95 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-9A 0-12ft
Date Sampled: 05/31/24 14:40
Percent Solids: 89
Initial Volume: 19.5g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0027
ESS Laboratory Sample ID: 24F0027-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/4/24 10:45

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| 4,4´-DDE | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| 4,4´-DDT | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Aldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| alpha-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| alpha-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| beta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Chlordane (Total) | ND (0.0229) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| delta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Dieldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Endosulfan I | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Endosulfan II | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Endosulfan Sulfate | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Endrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Endrin Ketone | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| gamma-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Heptachlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Heptachlor Epoxide | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Hexachlorobenzene | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Methoxychlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |
| Toxaphene | ND (0.143) | --- | 8081B | --- | 1 | 06/05/24 21:25 | D4F0072 | DF40402 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *69 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *64 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-9A 0-12ft
Date Sampled: 05/31/24 14:40
Percent Solids: 89
Initial Volume: 10g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0027
ESS Laboratory Sample ID: 24F0027-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/3/24 18:00

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.011) | --- | 8151A | --- | 1 | 06/05/24 13:12 | D4F0074 | DF40346 |
| 2,4,5-TP (Silvex) | ND (0.011) | --- | 8151A | --- | 1 | 06/05/24 13:12 | D4F0074 | DF40346 |
| 2,4-D | ND (0.053) | --- | 8151A | --- | 1 | 06/05/24 13:12 | D4F0074 | DF40346 |
| 2,4-DB | ND (0.053) | --- | 8151A | --- | 1 | 06/05/24 13:12 | D4F0074 | DF40346 |
| Dalapon | ND (0.051) | --- | 8151A | --- | 1 | 06/05/24 13:12 | D4F0074 | DF40346 |
| Dicamba | ND (0.011) | --- | 8151A | --- | 1 | 06/05/24 13:12 | D4F0074 | DF40346 |
| Dichlorprop | ND (0.053) | --- | 8151A | --- | 1 | 06/05/24 13:12 | D4F0074 | DF40346 |
| Dinoseb | ND (0.053) | --- | 8151A | --- | 1 | 06/05/24 13:12 | D4F0074 | DF40346 |
| MCPA | ND (2.60) | --- | 8151A | --- | 1 | 06/05/24 13:12 | D4F0074 | DF40346 |
| MCPP | ND (2.63) | --- | 8151A | --- | 1 | 06/05/24 13:12 | D4F0074 | DF40346 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *84 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-9A 0-12ft
Date Sampled: 05/31/24 14:40
Percent Solids: 89
Initial Volume: 20.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0027
ESS Laboratory Sample ID: 24F0027-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/3/24 18:12

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **48.5** (10.9) | --- | 8100M | --- | 1 | 06/04/24 23:15 | --- | DF40312 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | *78 %* | | *40-140* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-9A 0-12ft
Date Sampled: 05/31/24 14:40
Percent Solids: 89

ESS Laboratory Work Order: 24F0027
ESS Laboratory Sample ID: 24F0027-02
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 465** (5) | --- | 9050A | --- | 1 | EEM | 06/05/24 16:50 | umhos/cm | DF40557 |
| **Corrosivity (pH)** | **7.69** (N/A) | --- | 9045 | --- | 1 | JLK | 06/03/24 19:05 | S.U. | DF40341 |
| **Corrosivity (pH) Sample Temp** | **20.7** | --- | 2550B | --- | 1 | JLK | 06/03/24 19:05 | °C | DF40341 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | EAM | 06/03/24 17:47 | °F | DF40333 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EEM | 06/04/24 12:05 | ml/5 min | DF40417 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/03/24 17:41 | mg/kg | DF40331 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/03/24 17:41 | mg/kg | DF40331 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DF40403 - 245.1/7470A** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Mercury | ND | 0.031 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 22.0 | 2.87 | mg/kg wet | 25.50 | | 86 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 21.8 | 2.87 | mg/kg wet | 25.50 | | 86 | 80-120 | 0.8 | 30 | |
| **Batch DF40404 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Arsenic | ND | 2.50 | mg/kg wet | | | | | | | |
| Barium | ND | 1.00 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Arsenic | 70.5 | 8.33 | mg/kg wet | 75.60 | | 93 | 80-120 | | | |
| Barium | 764 | 3.33 | mg/kg wet | 372.0 | | 206 | 40-297 | | | |
| Cadmium | 239 | 1.67 | mg/kg wet | 259.0 | | 92 | 69-131 | | | |
| Chromium | 152 | 3.33 | mg/kg wet | 156.0 | | 97 | 80-120 | | | |
| Lead | 208 | 16.7 | mg/kg wet | 225.0 | | 93 | 80-120 | | | |
| Selenium | 75.0 | 16.7 | mg/kg wet | 82.70 | | 91 | 70-129 | | | |
| Silver | 49.2 | 1.67 | mg/kg wet | 51.00 | | 96 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Arsenic | 61.0 | 7.69 | mg/kg wet | 75.60 | | 81 | 80-120 | 14 | 30 | |
| Barium | 665 | 3.08 | mg/kg wet | 372.0 | | 179 | 40-297 | 14 | 30 | |
| Cadmium | 204 | 1.54 | mg/kg wet | 259.0 | | 79 | 69-131 | 16 | 30 | |
| Chromium | 129 | 3.08 | mg/kg wet | 156.0 | | 83 | 80-120 | 16 | 30 | |
| Lead | 180 | 15.4 | mg/kg wet | 225.0 | | 80 | 80-120 | 15 | 30 | |
| Selenium | 62.4 | 15.4 | mg/kg wet | 82.70 | | 75 | 70-129 | 18 | 30 | |
| Silver | 42.2 | 1.54 | mg/kg wet | 51.00 | | 83 | 80-120 | 15 | 30 | |
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40419 - 5035** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,1-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40419 - 5035** | | | | | | | | | | |
| 1,2,3-Trichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromoethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dioxane | ND | 0.100 | mg/kg wet | | | | | | | |
| 2,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Butanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 2-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Hexanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 4-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Isopropyltoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Methyl-2-Pentanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Acetone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Benzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromodichloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromoform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromomethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Carbon Disulfide | ND | 0.0050 | mg/kg wet | | | | | | | |
| Carbon Tetrachloride | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloroethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Chloroform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| cis-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| cis-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromomethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dichlorodifluoromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Diethyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Di-isopropyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethyl tertiary-butyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Isopropylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methyl tert-Butyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40419 - 5035** | | | | | | | | | | |
| Methylene Chloride | ND | 0.0250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Propylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| sec-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Styrene | ND | 0.0050 | mg/kg wet | | | | | | | |
| tert-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tertiary-amyl methyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrachloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrahydrofuran | ND | 0.0200 | mg/kg wet | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichlorofluoromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Vinyl Chloride | ND | 0.0100 | mg/kg wet | | | | | | | |
| Xylene O | ND | 0.0050 | mg/kg wet | | | | | | | |
| Xylene P,M | ND | 0.0100 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0605* | | mg/kg wet | *0.05000* | | *121* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0490* | | mg/kg wet | *0.05000* | | *98* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0569* | | mg/kg wet | *0.05000* | | *114* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0499* | | mg/kg wet | *0.05000* | | *100* | *70-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0567 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | | | |
| 1,1,1-Trichloroethane | 0.0627 | 0.0050 | mg/kg wet | 0.05000 | | 125 | 70-130 | | | |
| 1,1,2,2-Tetrachloroethane | 0.0557 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 40-160 | | | |
| 1,1,2-Trichloroethane | 0.0587 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | | | |
| 1,1-Dichloroethane | 0.0603 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | | | |
| 1,1-Dichloroethene | 0.0613 | 0.0050 | mg/kg wet | 0.05000 | | 123 | 70-130 | | | |
| 1,1-Dichloropropene | 0.0612 | 0.0050 | mg/kg wet | 0.05000 | | 122 | 70-130 | | | |
| 1,2,3-Trichlorobenzene | 0.0554 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | | | |
| 1,2,3-Trichloropropane | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| 1,2,4-Trichlorobenzene | 0.0575 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | | | |
| 1,2,4-Trimethylbenzene | 0.0553 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | | | |
| 1,2-Dibromo-3-Chloropropane | 0.0524 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| 1,2-Dibromoethane | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 1,2-Dichlorobenzene | 0.0523 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| 1,2-Dichloroethane | 0.0627 | 0.0050 | mg/kg wet | 0.05000 | | 125 | 70-130 | | | |
| 1,2-Dichloropropane | 0.0604 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | | | |
| 1,3,5-Trimethylbenzene | 0.0550 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| 1,3-Dichlorobenzene | 0.0535 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 1,3-Dichloropropane | 0.0562 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | | | |
| 1,4-Dichlorobenzene | 0.0535 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 1,4-Dioxane | 1.02 | 0.100 | mg/kg wet | 1.000 | | 102 | 70-130 | | | |
| 2,2-Dichloropropane | 0.0638 | 0.0050 | mg/kg wet | 0.05000 | | 128 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40419 - 5035** | | | | | | | | | | |
| 2-Butanone | 0.360 | 0.0500 | mg/kg wet | 0.2500 | | 144 | 40-160 | | | |
| 2-Chlorotoluene | 0.0535 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| 2-Hexanone | 0.324 | 0.0500 | mg/kg wet | 0.2500 | | 130 | 40-160 | | | |
| 4-Chlorotoluene | 0.0530 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| 4-Isopropyltoluene | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| 4-Methyl-2-Pentanone | 0.293 | 0.0500 | mg/kg wet | 0.2500 | | 117 | 40-160 | | | |
| Acetone | 0.482 | 0.0500 | mg/kg wet | 0.2500 | | 193 | 40-160 | | | B+ |
| Benzene | 0.0603 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | | | |
| Bromobenzene | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Bromochloromethane | 0.0582 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | | | |
| Bromodichloromethane | 0.0679 | 0.0050 | mg/kg wet | 0.05000 | | 136 | 70-130 | | | B+ |
| Bromoform | 0.0453 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 40-160 | | | |
| Bromomethane | 0.0590 | 0.0100 | mg/kg wet | 0.05000 | | 118 | 40-160 | | | |
| Carbon Disulfide | 0.0642 | 0.0050 | mg/kg wet | 0.05000 | | 128 | 70-130 | | | |
| Carbon Tetrachloride | 0.0667 | 0.0050 | mg/kg wet | 0.05000 | | 133 | 70-130 | | | B+ |
| Chlorobenzene | 0.0542 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Chloroethane | 0.0631 | 0.0100 | mg/kg wet | 0.05000 | | 126 | 40-160 | | | |
| Chloroform | 0.0603 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | | | |
| Chloromethane | 0.0597 | 0.0100 | mg/kg wet | 0.05000 | | 119 | 40-160 | | | |
| cis-1,2-Dichloroethene | 0.0599 | 0.0050 | mg/kg wet | 0.05000 | | 120 | 70-130 | | | |
| cis-1,3-Dichloropropene | 0.0637 | 0.0050 | mg/kg wet | 0.05000 | | 127 | 40-160 | | | |
| Dibromochloromethane | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 40-160 | | | |
| Dibromomethane | 0.0601 | 0.0050 | mg/kg wet | 0.05000 | | 120 | 70-130 | | | |
| Dichlorodifluoromethane | 0.0520 | 0.0100 | mg/kg wet | 0.05000 | | 104 | 40-160 | | | |
| Diethyl Ether | 0.0633 | 0.0050 | mg/kg wet | 0.05000 | | 127 | 70-130 | | | |
| Di-isopropyl ether | 0.0658 | 0.0050 | mg/kg wet | 0.05000 | | 132 | 70-130 | | | B+ |
| Ethyl tertiary-butyl ether | 0.0612 | 0.0050 | mg/kg wet | 0.05000 | | 122 | 70-130 | | | |
| Ethylbenzene | 0.0548 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Hexachlorobutadiene | 0.0540 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 40-160 | | | |
| Isopropylbenzene | 0.0588 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 70-130 | | | |
| Methyl tert-Butyl Ether | 0.0601 | 0.0050 | mg/kg wet | 0.05000 | | 120 | 70-130 | | | |
| Methylene Chloride | 0.0551 | 0.0250 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Naphthalene | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 40-160 | | | |
| n-Butylbenzene | 0.0565 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | | | |
| n-Propylbenzene | 0.0562 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | | | |
| sec-Butylbenzene | 0.0436 | 0.0050 | mg/kg wet | 0.05000 | | 87 | 70-130 | | | |
| Styrene | 0.0532 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 40-160 | | | |
| tert-Butylbenzene | 0.0540 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Tertiary-amyl methyl ether | 0.0602 | 0.0050 | mg/kg wet | 0.05000 | | 120 | 70-130 | | | |
| Tetrachloroethene | 0.0399 | 0.0050 | mg/kg wet | 0.05000 | | 80 | 70-130 | | | |
| Tetrahydrofuran | 0.0622 | 0.0200 | mg/kg wet | 0.05000 | | 124 | 70-130 | | | |
| Toluene | 0.0591 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 70-130 | | | |
| trans-1,2-Dichloroethene | 0.0603 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | | | |
| trans-1,3-Dichloropropene | 0.0614 | 0.0050 | mg/kg wet | 0.05000 | | 123 | 70-130 | | | |
| Trichloroethene | 0.0582 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40419 - 5035** | | | | | | | | | | |
| Trichlorofluoromethane | 0.0629 | 0.0050 | mg/kg wet | 0.05000 | | 126 | 40-160 | | | |
| Vinyl Chloride | 0.0619 | 0.0100 | mg/kg wet | 0.05000 | | 124 | 70-130 | | | |
| Xylene O | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | | | |
| Xylene P,M | 0.114 | 0.0100 | mg/kg wet | 0.1000 | | 114 | 70-130 | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0575* | | mg/kg wet | *0.05000* | | *115* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0492* | | mg/kg wet | *0.05000* | | *98* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0571* | | mg/kg wet | *0.05000* | | *114* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0511* | | mg/kg wet | *0.05000* | | *102* | *70-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0580 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | 2 | 20 | |
| 1,1,1-Trichloroethane | 0.0611 | 0.0050 | mg/kg wet | 0.05000 | | 122 | 70-130 | 2 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0526 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 40-160 | 6 | 20 | |
| 1,1,2-Trichloroethane | 0.0576 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 2 | 20 | |
| 1,1-Dichloroethane | 0.0590 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 70-130 | 2 | 20 | |
| 1,1-Dichloroethene | 0.0595 | 0.0050 | mg/kg wet | 0.05000 | | 119 | 70-130 | 3 | 20 | |
| 1,1-Dichloropropene | 0.0591 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 70-130 | 4 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0539 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 3 | 20 | |
| 1,2,3-Trichloropropane | 0.0460 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | 7 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0556 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | 3 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0532 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 4 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0471 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | 10 | 20 | |
| 1,2-Dibromoethane | 0.0549 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | 3 | 20 | |
| 1,2-Dichlorobenzene | 0.0502 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 4 | 20 | |
| 1,2-Dichloroethane | 0.0613 | 0.0050 | mg/kg wet | 0.05000 | | 123 | 70-130 | 2 | 20 | |
| 1,2-Dichloropropane | 0.0597 | 0.0050 | mg/kg wet | 0.05000 | | 119 | 70-130 | 1 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 4 | 20 | |
| 1,3-Dichlorobenzene | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 4 | 20 | |
| 1,3-Dichloropropane | 0.0576 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 3 | 20 | |
| 1,4-Dichlorobenzene | 0.0520 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 3 | 20 | |
| 1,4-Dioxane | 0.891 | 0.100 | mg/kg wet | 1.000 | | 89 | 70-130 | 14 | 20 | |
| 2,2-Dichloropropane | 0.0609 | 0.0050 | mg/kg wet | 0.05000 | | 122 | 70-130 | 5 | 20 | |
| 2-Butanone | 0.335 | 0.0500 | mg/kg wet | 0.2500 | | 134 | 40-160 | 7 | 20 | |
| 2-Chlorotoluene | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 3 | 20 | |
| 2-Hexanone | 0.315 | 0.0500 | mg/kg wet | 0.2500 | | 126 | 40-160 | 3 | 20 | |
| 4-Chlorotoluene | 0.0514 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 3 | 20 | |
| 4-Isopropyltoluene | 0.0510 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 4 | 20 | |
| 4-Methyl-2-Pentanone | 0.272 | 0.0500 | mg/kg wet | 0.2500 | | 109 | 40-160 | 8 | 20 | |
| Acetone | 0.423 | 0.0500 | mg/kg wet | 0.2500 | | 169 | 40-160 | 13 | 20 | B+ |
| Benzene | 0.0587 | 0.0050 | mg/kg wet | 0.05000 | | 117 | 70-130 | 3 | 20 | |
| Bromobenzene | 0.0510 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 3 | 20 | |
| Bromochloromethane | 0.0565 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | 3 | 20 | |
| Bromodichloromethane | 0.0667 | 0.0050 | mg/kg wet | 0.05000 | | 133 | 70-130 | 2 | 20 | B+ |
| Bromoform | 0.0462 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 40-160 | 2 | 20 | |
| Bromomethane | 0.0576 | 0.0100 | mg/kg wet | 0.05000 | | 115 | 40-160 | 2 | 20 | |
| Carbon Disulfide | 0.0622 | 0.0050 | mg/kg wet | 0.05000 | | 124 | 70-130 | 3 | 20 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40419 - 5035** | | | | | | | | | | |
| Carbon Tetrachloride | 0.0645 | 0.0050 | mg/kg wet | 0.05000 | | 129 | 70-130 | 3 | 20 | |
| Chlorobenzene | 0.0558 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | 3 | 20 | |
| Chloroethane | 0.0612 | 0.0100 | mg/kg wet | 0.05000 | | 122 | 40-160 | 3 | 20 | |
| Chloroform | 0.0592 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 70-130 | 2 | 20 | |
| Chloromethane | 0.0569 | 0.0100 | mg/kg wet | 0.05000 | | 114 | 40-160 | 5 | 20 | |
| cis-1,2-Dichloroethene | 0.0577 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 4 | 20 | |
| cis-1,3-Dichloropropene | 0.0627 | 0.0050 | mg/kg wet | 0.05000 | | 125 | 40-160 | 2 | 20 | |
| Dibromochloromethane | 0.0537 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 40-160 | 3 | 20 | |
| Dibromomethane | 0.0577 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 4 | 20 | |
| Dichlorodifluoromethane | 0.0491 | 0.0100 | mg/kg wet | 0.05000 | | 98 | 40-160 | 6 | 20 | |
| Diethyl Ether | 0.0621 | 0.0050 | mg/kg wet | 0.05000 | | 124 | 70-130 | 2 | 20 | |
| Di-isopropyl ether | 0.0649 | 0.0050 | mg/kg wet | 0.05000 | | 130 | 70-130 | 1 | 20 | |
| Ethyl tertiary-butyl ether | 0.0606 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | 1 | 20 | |
| Ethylbenzene | 0.0558 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | 2 | 20 | |
| Hexachlorobutadiene | 0.0510 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 40-160 | 6 | 20 | |
| Isopropylbenzene | 0.0564 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | 4 | 20 | |
| Methyl tert-Butyl Ether | 0.0589 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 70-130 | 2 | 20 | |
| Methylene Chloride | 0.0538 | 0.0250 | mg/kg wet | 0.05000 | | 108 | 70-130 | 2 | 20 | |
| Naphthalene | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 40-160 | 6 | 20 | |
| n-Butylbenzene | 0.0535 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 5 | 20 | |
| n-Propylbenzene | 0.0537 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 5 | 20 | |
| sec-Butylbenzene | 0.0419 | 0.0050 | mg/kg wet | 0.05000 | | 84 | 70-130 | 4 | 20 | |
| Styrene | 0.0558 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 40-160 | 5 | 20 | |
| tert-Butylbenzene | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 4 | 20 | |
| Tertiary-amyl methyl ether | 0.0595 | 0.0050 | mg/kg wet | 0.05000 | | 119 | 70-130 | 1 | 20 | |
| Tetrachloroethene | 0.0401 | 0.0050 | mg/kg wet | 0.05000 | | 80 | 70-130 | 0.5 | 20 | |
| Tetrahydrofuran | 0.0582 | 0.0200 | mg/kg wet | 0.05000 | | 116 | 70-130 | 7 | 20 | |
| Toluene | 0.0572 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | 3 | 20 | |
| trans-1,2-Dichloroethene | 0.0588 | 0.0050 | mg/kg wet | 0.05000 | | 118 | 70-130 | 2 | 20 | |
| trans-1,3-Dichloropropene | 0.0603 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 70-130 | 2 | 20 | |
| Trichloroethene | 0.0569 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | 2 | 20 | |
| Trichlorofluoromethane | 0.0606 | 0.0050 | mg/kg wet | 0.05000 | | 121 | 40-160 | 4 | 20 | |
| Vinyl Chloride | 0.0593 | 0.0100 | mg/kg wet | 0.05000 | | 119 | 70-130 | 4 | 20 | |
| Xylene O | 0.0574 | 0.0050 | mg/kg wet | 0.05000 | | 115 | 70-130 | 3 | 20 | |
| Xylene P,M | 0.116 | 0.0100 | mg/kg wet | 0.1000 | | 116 | 70-130 | 2 | 20 | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0569* | | mg/kg wet | *0.05000* | | *114* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0514* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0557* | | mg/kg wet | *0.05000* | | *111* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0523* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40337 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40337 - 3546** | | | | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40337 - 3546** | | | | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyridine | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.72* | | mg/kg wet | *2.500* | | *109* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.18* | | mg/kg wet | *3.750* | | *111* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.40* | | mg/kg wet | *3.750* | | *117* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.98* | | mg/kg wet | *2.500* | | *119* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.45* | | mg/kg wet | *3.750* | | *119* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *3.03* | | mg/kg wet | *2.500* | | *121* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.23* | | mg/kg wet | *3.750* | | *113* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *3.49* | | mg/kg wet | *2.500* | | *140* | *30-130* | | | S- |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.68 | 0.025 | mg/kg wet | 2.500 | | 107 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.70 | 0.250 | mg/kg wet | 2.500 | | 108 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.69 | 0.250 | mg/kg wet | 2.500 | | 108 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 30-130 | | | |
| 2,4-Dimethylphenol | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 30-130 | | | |
| 2,4-Dinitrophenol | 2.05 | 1.00 | mg/kg wet | 2.500 | | 82 | 15-140 | | | |
| 2,4-Dinitrotoluene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.54 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | | | |
| 2-Chloronaphthalene | 2.72 | 0.250 | mg/kg wet | 2.500 | | 109 | 40-140 | | | |
| 2-Chlorophenol | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 30-130 | | | |
| 2-Methylnaphthalene | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| 2-Methylphenol | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 15-140 | | | |
| 2-Nitrophenol | 2.19 | 0.500 | mg/kg wet | 2.500 | | 88 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.46 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| 3+4-Methylphenol | 4.57 | 0.250 | mg/kg wet | 5.000 | | 91 | 15-140 | | | |
| 4-Bromophenyl-phenylether | 2.80 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | | | |
| 4-Chloroaniline | 1.58 | 0.250 | mg/kg wet | 2.500 | | 63 | 15-140 | | | |
| 4-Nitrophenol | 2.27 | 1.00 | mg/kg wet | 2.500 | | 91 | 15-140 | | | |
| Acenaphthene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40337 - 3546** | | | | | | | | | | |
| Acenaphthylene | 2.57 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| Acetophenone | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Aniline | 1.27 | 0.250 | mg/kg wet | 2.500 | | 51 | 40-140 | | | |
| Anthracene | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| Azobenzene | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | | | |
| Benzo(a)anthracene | 2.66 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | | | |
| Benzo(a)pyrene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.74 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 2.03 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 1.99 | 0.250 | mg/kg wet | 2.500 | | 80 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Butylbenzylphthalate | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| Chrysene | 2.58 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.75 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | | | |
| Dibenzofuran | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Diethylphthalate | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Dimethylphthalate | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 15-140 | | | |
| Di-n-butylphthalate | 2.61 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| Di-n-octylphthalate | 2.49 | 0.500 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Fluoranthene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Fluorene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | | | |
| Hexachlorobenzene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | | | |
| Hexachlorobutadiene | 2.19 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| Hexachloroethane | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.58 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| Isophorone | 1.99 | 0.250 | mg/kg wet | 2.500 | | 80 | 40-140 | | | |
| Naphthalene | 2.06 | 0.250 | mg/kg wet | 2.500 | | 83 | 40-140 | | | |
| Nitrobenzene | 2.26 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| N-Nitrosodimethylamine | 2.26 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Pentachlorophenol | 2.43 | 1.00 | mg/kg wet | 2.500 | | 97 | 15-140 | | | |
| Phenanthrene | 2.54 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | | | |
| Phenol | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 15-140 | | | |
| Pyrene | 2.95 | 0.250 | mg/kg wet | 2.500 | | 118 | 40-140 | | | |
| Pyridine | 2.16 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.71* | | mg/kg wet | *2.500* | | *109* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.99* | | mg/kg wet | *3.750* | | *133* | *30-130* | | | S- |
| *Surrogate: 2-Chlorophenol-d4* | *4.32* | | mg/kg wet | *3.750* | | *115* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *3.00* | | mg/kg wet | *2.500* | | *120* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.38* | | mg/kg wet | *3.750* | | *117* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.63* | | mg/kg wet | *2.500* | | *105* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.14* | | mg/kg wet | *3.750* | | *111* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *3.44* | | mg/kg wet | *2.500* | | *138* | *30-130* | | | S- |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40337 - 3546** | | | | | | | | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.64 | 0.025 | mg/kg wet | 2.500 | | 106 | 40-140 | 2 | 30 | |
| 1,2,4-Trichlorobenzene | 2.14 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | 0.6 | 30 | |
| 1,2-Dichlorobenzene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 2 | 30 | |
| 1,3-Dichlorobenzene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 0.6 | 30 | |
| 1,4-Dichlorobenzene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 0.6 | 30 | |
| 2,4,5-Trichlorophenol | 2.73 | 0.250 | mg/kg wet | 2.500 | | 109 | 30-130 | 1 | 30 | |
| 2,4,6-Trichlorophenol | 2.72 | 0.250 | mg/kg wet | 2.500 | | 109 | 30-130 | 0.9 | 30 | |
| 2,4-Dichlorophenol | 2.22 | 0.250 | mg/kg wet | 2.500 | | 89 | 30-130 | 3 | 30 | |
| 2,4-Dimethylphenol | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 30-130 | 1 | 30 | |
| 2,4-Dinitrophenol | 2.39 | 1.00 | mg/kg wet | 2.500 | | 96 | 15-140 | 15 | 30 | |
| 2,4-Dinitrotoluene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 6 | 30 | |
| 2,6-Dinitrotoluene | 2.66 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 5 | 30 | |
| 2-Chloronaphthalene | 2.65 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 3 | 30 | |
| 2-Chlorophenol | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 30-130 | 2 | 30 | |
| 2-Methylnaphthalene | 2.10 | 0.250 | mg/kg wet | 2.500 | | 84 | 40-140 | 3 | 30 | |
| 2-Methylphenol | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | 5 | 30 | |
| 2-Nitrophenol | 2.24 | 0.500 | mg/kg wet | 2.500 | | 90 | 30-130 | 2 | 30 | |
| 3,3´-Dichlorobenzidine | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 2 | 30 | |
| 3+4-Methylphenol | 4.77 | 0.250 | mg/kg wet | 5.000 | | 95 | 15-140 | 4 | 30 | |
| 4-Bromophenyl-phenylether | 2.77 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 1 | 30 | |
| 4-Chloroaniline | 1.71 | 0.250 | mg/kg wet | 2.500 | | 69 | 15-140 | 8 | 30 | |
| 4-Nitrophenol | 2.39 | 1.00 | mg/kg wet | 2.500 | | 96 | 15-140 | 5 | 30 | |
| Acenaphthene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 0.02 | 30 | |
| Acenaphthylene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 0.2 | 30 | |
| Acetophenone | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 4 | 30 | |
| Aniline | 1.35 | 0.250 | mg/kg wet | 2.500 | | 54 | 40-140 | 6 | 30 | |
| Anthracene | 2.64 | 0.250 | mg/kg wet | 2.500 | | 106 | 40-140 | 1 | 30 | |
| Azobenzene | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | 2 | 30 | |
| Benzo(a)anthracene | 2.67 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 0.5 | 30 | |
| Benzo(a)pyrene | 2.62 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | 3 | 30 | |
| Benzo(b)fluoranthene | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | 6 | 30 | |
| Benzo(g,h,i)perylene | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 6 | 30 | |
| Benzo(k)fluoranthene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 3 | 30 | |
| bis(2-Chloroethoxy)methane | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | 0.6 | 30 | |
| bis(2-Chloroethyl)ether | 2.19 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | 2 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.08 | 0.250 | mg/kg wet | 2.500 | | 83 | 40-140 | 4 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.52 | 0.250 | mg/kg wet | 2.500 | | 101 | 40-140 | 5 | 30 | |
| Butylbenzylphthalate | 2.73 | 0.250 | mg/kg wet | 2.500 | | 109 | 40-140 | 4 | 30 | |
| Chrysene | 2.60 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 0.6 | 30 | |
| Dibenzo(a,h)Anthracene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | 7 | 30 | |
| Dibenzofuran | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 0.4 | 30 | |
| Diethylphthalate | 2.57 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | 5 | 30 | |
| Dimethylphthalate | 2.58 | 0.250 | mg/kg wet | 2.500 | | 103 | 15-140 | 3 | 30 | |
| Di-n-butylphthalate | 2.76 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 6 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40337 - 3546** | | | | | | | | | | |
| Di-n-octylphthalate | 2.83 | 0.500 | mg/kg wet | 2.500 | | 113 | 40-140 | 13 | 30 | |
| Fluoranthene | 2.57 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | 4 | 30 | |
| Fluorene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | 2 | 30 | |
| Hexachlorobenzene | 2.78 | 0.250 | mg/kg wet | 2.500 | | 111 | 40-140 | 0.2 | 30 | |
| Hexachlorobutadiene | 2.16 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | 1 | 30 | |
| Hexachloroethane | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 1 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 5 | 30 | |
| Isophorone | 2.04 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | 2 | 30 | |
| Naphthalene | 2.08 | 0.250 | mg/kg wet | 2.500 | | 83 | 40-140 | 0.8 | 30 | |
| Nitrobenzene | 2.25 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 0.3 | 30 | |
| N-Nitrosodimethylamine | 2.24 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | 1 | 30 | |
| Pentachlorophenol | 2.58 | 1.00 | mg/kg wet | 2.500 | | 103 | 15-140 | 6 | 30 | |
| Phenanthrene | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 0.6 | 30 | |
| Phenol | 2.54 | 0.250 | mg/kg wet | 2.500 | | 102 | 15-140 | 4 | 30 | |
| Pyrene | 2.91 | 0.250 | mg/kg wet | 2.500 | | 116 | 40-140 | 2 | 30 | |
| Pyridine | 2.08 | 0.250 | mg/kg wet | 2.500 | | 83 | 40-140 | 4 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.60* | | mg/kg wet | *2.500* | | *104* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.87* | | mg/kg wet | *3.750* | | *130* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.22* | | mg/kg wet | *3.750* | | *112* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.85* | | mg/kg wet | *2.500* | | *114* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.31* | | mg/kg wet | *3.750* | | *115* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.56* | | mg/kg wet | *2.500* | | *102* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.14* | | mg/kg wet | *3.750* | | *110* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *3.33* | | mg/kg wet | *2.500* | | *133* | *30-130* | | | S- |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF40401 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF40401 - 3540C** | | | | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0224* | | mg/kg wet | *0.02500* | | *89* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0240* | | mg/kg wet | *0.02500* | | *96* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0204* | | mg/kg wet | *0.02500* | | *82* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0218* | | mg/kg wet | *0.02500* | | *87* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 82 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 87 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 86 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 88 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0225* | | mg/kg wet | *0.02500* | | *90* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0242* | | mg/kg wet | *0.02500* | | *97* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0206* | | mg/kg wet | *0.02500* | | *82* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0215* | | mg/kg wet | *0.02500* | | *86* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 84 | 40-140 | 2 | 30 | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 89 | 40-140 | 2 | 30 | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 87 | 40-140 | 1 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 90 | 40-140 | 1 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0229* | | mg/kg wet | *0.02500* | | *91* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0246* | | mg/kg wet | *0.02500* | | *98* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0213* | | mg/kg wet | *0.02500* | | *85* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0222* | | mg/kg wet | *0.02500* | | *89* | *30-150* | | | |
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF40402 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 4,4´-DDD | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDD [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Chlordane (Total) | ND | 0.0200 | mg/kg wet | | | | | | | |
| Chlordane (Total) [2C] | ND | 0.0200 | mg/kg wet | | | | | | | |
| delta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| delta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| 8081B Organochlorine Pesticides | | | | | | | | | | |
| **Batch DF40402 - 3546** | | | | | | | | | | |
| Dieldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) [2C] | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Toxaphene | ND | 0.125 | mg/kg wet | | | | | | | |
| Toxaphene [2C] | ND | 0.125 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0137* | | mg/kg wet | *0.01250* | | *110* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0146* | | mg/kg wet | *0.01250* | | *117* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0114* | | mg/kg wet | *0.01250* | | *91* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0121* | | mg/kg wet | *0.01250* | | *97* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 4,4´-DDD | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | | | |
| 4,4´-DDD [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | | | |
| 4,4´-DDE | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| 4,4´-DDE [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| 4,4´-DDT | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | | | |
| 4,4´-DDT [2C] | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 109 | 40-140 | | | |
| Aldrin | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Aldrin [2C] | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |
| alpha-BHC | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | | | |
| alpha-BHC [2C] | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| alpha-Chlordane | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| alpha-Chlordane [2C] | 0.0122 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| beta-BHC | 0.0110 | 0.0025 | mg/kg wet | 0.01250 | | 88 | 40-140 | | | |
| beta-BHC [2C] | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF40402 - 3546** | | | | | | | | | | |
| delta-BHC | 0.0087 | 0.0025 | mg/kg wet | 0.01250 | | 70 | 40-140 | | | |
| delta-BHC [2C] | 0.0098 | 0.0025 | mg/kg wet | 0.01250 | | 78 | 40-140 | | | |
| Dieldrin | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| Dieldrin [2C] | 0.0136 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| Endosulfan I | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | | | |
| Endosulfan I [2C] | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | | | |
| Endosulfan II | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | | | |
| Endosulfan II [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | | | |
| Endosulfan Sulfate | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Endosulfan Sulfate [2C] | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | | | |
| Endrin | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| Endrin [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | | | |
| Endrin Ketone | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| Endrin Ketone [2C] | 0.0145 | 0.0025 | mg/kg wet | 0.01250 | | 116 | 40-140 | | | |
| gamma-BHC (Lindane) | 0.0111 | 0.0015 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| gamma-BHC (Lindane) [2C] | 0.0118 | 0.0015 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |
| gamma-Chlordane | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| gamma-Chlordane [2C] | 0.0141 | 0.0025 | mg/kg wet | 0.01250 | | 113 | 40-140 | | | |
| Heptachlor | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Heptachlor [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| Heptachlor Epoxide | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | | | |
| Heptachlor Epoxide [2C] | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | | | |
| Hexachlorobenzene | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| Hexachlorobenzene [2C] | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | | | |
| Methoxychlor | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Methoxychlor [2C] | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0145* | | mg/kg wet | *0.01250* | | *116* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0154* | | mg/kg wet | *0.01250* | | *123* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0112* | | mg/kg wet | *0.01250* | | *90* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0124* | | mg/kg wet | *0.01250* | | *99* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 4,4´-DDD | 0.0136 | 0.0025 | mg/kg wet | 0.01250 | | 109 | 40-140 | 4 | 30 | |
| 4,4´-DDD [2C] | 0.0144 | 0.0025 | mg/kg wet | 0.01250 | | 115 | 40-140 | 3 | 30 | |
| 4,4´-DDE | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 7 | 30 | |
| 4,4´-DDE [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 5 | 30 | |
| 4,4´-DDT | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 3 | 30 | |
| 4,4´-DDT [2C] | 0.0139 | 0.0025 | mg/kg wet | 0.01250 | | 111 | 40-140 | 2 | 30 | |
| Aldrin | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 7 | 30 | |
| Aldrin [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 6 | 30 | |
| alpha-BHC | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | 7 | 30 | |
| alpha-BHC [2C] | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 9 | 30 | |
| alpha-Chlordane | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 7 | 30 | |
| alpha-Chlordane [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 4 | 30 | |
| beta-BHC | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 4 | 30 | |
| beta-BHC [2C] | 0.0129 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 10 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF40402 - 3546** | | | | | | | | | | |
| delta-BHC | 0.0098 | 0.0025 | mg/kg wet | 0.01250 | | 78 | 40-140 | 11 | 30 | |
| delta-BHC [2C] | 0.0102 | 0.0025 | mg/kg wet | 0.01250 | | 82 | 40-140 | 4 | 30 | |
| Dieldrin | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 3 | 30 | |
| Dieldrin [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | 3 | 30 | |
| Endosulfan I | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | 4 | 30 | |
| Endosulfan I [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 3 | 30 | |
| Endosulfan II | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 3 | 30 | |
| Endosulfan II [2C] | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 110 | 40-140 | 3 | 30 | |
| Endosulfan Sulfate | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 3 | 30 | |
| Endosulfan Sulfate [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 2 | 30 | |
| Endrin | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 3 | 30 | |
| Endrin [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 3 | 30 | |
| Endrin Ketone | 0.0136 | 0.0025 | mg/kg wet | 0.01250 | | 109 | 40-140 | 3 | 30 | |
| Endrin Ketone [2C] | 0.0148 | 0.0025 | mg/kg wet | 0.01250 | | 119 | 40-140 | 2 | 30 | |
| gamma-BHC (Lindane) | 0.0125 | 0.0015 | mg/kg wet | 0.01250 | | 100 | 40-140 | 12 | 30 | |
| gamma-BHC (Lindane) [2C] | 0.0127 | 0.0015 | mg/kg wet | 0.01250 | | 102 | 40-140 | 8 | 30 | |
| gamma-Chlordane | 0.0138 | 0.0025 | mg/kg wet | 0.01250 | | 110 | 40-140 | 5 | 30 | |
| gamma-Chlordane [2C] | 0.0146 | 0.0025 | mg/kg wet | 0.01250 | | 117 | 40-140 | 3 | 30 | |
| Heptachlor | 0.0124 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 9 | 30 | |
| Heptachlor [2C] | 0.0129 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 7 | 30 | |
| Heptachlor Epoxide | 0.0124 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 6 | 30 | |
| Heptachlor Epoxide [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 3 | 30 | |
| Hexachlorobenzene | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 2 | 30 | |
| Hexachlorobenzene [2C] | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | 7 | 30 | |
| Methoxychlor | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 0.5 | 30 | |
| Methoxychlor [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 0.7 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0144* | | mg/kg wet | *0.01250* | | *115* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0153* | | mg/kg wet | *0.01250* | | *122* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0114* | | mg/kg wet | *0.01250* | | *92* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0126* | | mg/kg wet | *0.01250* | | *101* | *30-150* | | | |
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF40346 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 2,4,5-T | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-T [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4-D | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-D [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-DB | ND | 0.048 | mg/kg wet | | | | | | | |
| 2,4-DB [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| Dalapon | ND | 0.046 | mg/kg wet | | | | | | | |
| Dalapon [2C] | ND | 0.046 | mg/kg wet | | | | | | | |
| Dicamba | ND | 0.009 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF40346 - 3546** | | | | | | | | | | |
| Dicamba [2C] | ND | 0.009 | mg/kg wet | | | | | | | |
| Dichlorprop | ND | 0.047 | mg/kg wet | | | | | | | |
| Dichlorprop [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| Dinoseb | ND | 0.048 | mg/kg wet | | | | | | | |
| Dinoseb [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| MCPA | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPA [2C] | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPP | ND | 2.35 | mg/kg wet | | | | | | | |
| MCPP [2C] | ND | 2.35 | mg/kg wet | | | | | | | |
| *Surrogate: DCAA* | *0.163* | | mg/kg wet | *0.2000* | | *82* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.150* | | mg/kg wet | *0.2000* | | *75* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 2,4,5-T | 0.011 | 0.010 | mg/kg wet | 0.01900 | | 60 | 40-140 | | | |
| 2,4,5-T [2C] | 0.012 | 0.010 | mg/kg wet | 0.01900 | | 64 | 40-140 | | | |
| 2,4,5-TP (Silvex) | 0.012 | 0.010 | mg/kg wet | 0.01900 | | 62 | 40-140 | | | |
| 2,4,5-TP (Silvex) [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 66 | 40-140 | | | |
| 2,4-D | 0.129 | 0.047 | mg/kg wet | 0.1880 | | 69 | 40-140 | | | |
| 2,4-D [2C] | 0.117 | 0.047 | mg/kg wet | 0.1880 | | 62 | 40-140 | | | |
| 2,4-DB | 0.139 | 0.048 | mg/kg wet | 0.1900 | | 73 | 40-140 | | | |
| 2,4-DB [2C] | 0.139 | 0.048 | mg/kg wet | 0.1900 | | 73 | 40-140 | | | |
| Dalapon | 0.252 | 0.046 | mg/kg wet | 0.4550 | | 55 | 40-140 | | | |
| Dalapon [2C] | 0.272 | 0.046 | mg/kg wet | 0.4550 | | 60 | 40-140 | | | |
| Dicamba | 0.011 | 0.009 | mg/kg wet | 0.01880 | | 56 | 40-140 | | | |
| Dicamba [2C] | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 64 | 40-140 | | | |
| Dichlorprop | 0.161 | 0.047 | mg/kg wet | 0.1880 | | 85 | 40-140 | | | |
| Dichlorprop [2C] | 0.138 | 0.047 | mg/kg wet | 0.1880 | | 73 | 40-140 | | | |
| Dinoseb | 0.023 | 0.048 | mg/kg wet | 0.09500 | | 24 | 10-100 | | | |
| Dinoseb [2C] | 0.024 | 0.048 | mg/kg wet | 0.09500 | | 26 | 10-100 | | | |
| MCPA | 13.7 | 2.32 | mg/kg wet | 18.60 | | 74 | 40-140 | | | |
| MCPA [2C] | 14.0 | 2.32 | mg/kg wet | 18.60 | | 75 | 40-140 | | | |
| MCPP | 13.5 | 2.35 | mg/kg wet | 18.80 | | 72 | 40-140 | | | |
| MCPP [2C] | 13.8 | 2.35 | mg/kg wet | 18.80 | | 74 | 40-140 | | | |
| *Surrogate: DCAA* | *0.184* | | mg/kg wet | *0.2000* | | *92* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.166* | | mg/kg wet | *0.2000* | | *83* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 2,4,5-T | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | 12 | 30 | |
| 2,4,5-T [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 70 | 40-140 | 9 | 30 | |
| 2,4,5-TP (Silvex) | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | 9 | 30 | |
| 2,4,5-TP (Silvex) [2C] | 0.014 | 0.010 | mg/kg wet | 0.01900 | | 74 | 40-140 | 11 | 30 | |
| 2,4-D | 0.139 | 0.047 | mg/kg wet | 0.1880 | | 74 | 40-140 | 8 | 30 | |
| 2,4-D [2C] | 0.129 | 0.047 | mg/kg wet | 0.1880 | | 69 | 40-140 | 10 | 30 | |
| 2,4-DB | 0.148 | 0.048 | mg/kg wet | 0.1900 | | 78 | 40-140 | 6 | 30 | |
| 2,4-DB [2C] | 0.152 | 0.048 | mg/kg wet | 0.1900 | | 80 | 40-140 | 9 | 30 | |
| Dalapon | 0.282 | 0.046 | mg/kg wet | 0.4550 | | 62 | 40-140 | 12 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF40346 - 3546** | | | | | | | | | | |
| Dalapon [2C] | 0.294 | 0.046 | mg/kg wet | 0.4550 | | 65 | 40-140 | 8 | 30 | |
| Dicamba | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 64 | 40-140 | 13 | 30 | |
| Dicamba [2C] | 0.013 | 0.009 | mg/kg wet | 0.01880 | | 70 | 40-140 | 9 | 30 | |
| Dichlorprop | 0.178 | 0.047 | mg/kg wet | 0.1880 | | 95 | 40-140 | 10 | 30 | |
| Dichlorprop [2C] | 0.149 | 0.047 | mg/kg wet | 0.1880 | | 79 | 40-140 | 8 | 30 | |
| Dinoseb | 0.025 | 0.048 | mg/kg wet | 0.09500 | | 26 | 10-100 | 10 | 30 | |
| Dinoseb [2C] | 0.027 | 0.048 | mg/kg wet | 0.09500 | | 28 | 10-100 | 10 | 30 | |
| MCPA | 14.8 | 2.32 | mg/kg wet | 18.60 | | 80 | 40-140 | 8 | 30 | |
| MCPA [2C] | 15.4 | 2.32 | mg/kg wet | 18.60 | | 83 | 40-140 | 9 | 30 | |
| MCPP | 14.8 | 2.35 | mg/kg wet | 18.80 | | 79 | 40-140 | 9 | 30 | |
| MCPP [2C] | 15.3 | 2.35 | mg/kg wet | 18.80 | | 81 | 40-140 | 10 | 30 | |
| *Surrogate: DCAA* | *0.187* | | mg/kg wet | *0.2000* | | *94* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.172* | | mg/kg wet | *0.2000* | | *86* | *30-150* | | | |
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF40312 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Decane (C10) | ND | 0.2 | mg/kg wet | | | | | | | |
| Docosane (C22) | ND | 0.2 | mg/kg wet | | | | | | | |
| Dodecane (C12) | ND | 0.2 | mg/kg wet | | | | | | | |
| Eicosane (C20) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexacosane (C26) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexadecane (C16) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexatriacontane (C36) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonadecane (C19) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonane (C9) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octacosane (C28) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octadecane (C18) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetracosane (C24) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetradecane (C14) | ND | 0.2 | mg/kg wet | | | | | | | |
| Total Petroleum Hydrocarbons (C9-C36) | ND | 10.0 | mg/kg wet | | | | | | | |
| Triacontane (C30) | ND | 0.2 | mg/kg wet | | | | | | | |
| *Surrogate: O-Terphenyl* | *3.77* | | mg/kg wet | *5.000* | | *75* | *40-140* | | | |
| **LCS** | | | | | | | | | | |
| Decane (C10) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 66 | 40-140 | | | |
| Docosane (C22) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Dodecane (C12) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 71 | 40-140 | | | |
| Eicosane (C20) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Hexacosane (C26) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Hexadecane (C16) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 76 | 40-140 | | | |
| Hexatriacontane (C36) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Nonadecane (C19) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | | | |
| Nonane (C9) | 1.4 | 0.2 | mg/kg wet | 2.500 | | 58 | 30-140 | | | |
| Octacosane (C28) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 76 | 40-140 | | | |
| Octadecane (C18) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 77 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF40312 - 3546** | | | | | | | | | | |
| Tetracosane (C24) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 77 | 40-140 | | | |
| Tetradecane (C14) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 74 | 40-140 | | | |
| Total Petroleum Hydrocarbons (C9-C36) | 26.4 | 10.0 | mg/kg wet | 35.00 | | 75 | 40-140 | | | |
| Triacontane (C30) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 74 | 40-140 | | | |
| *Surrogate: O-Terphenyl* | *3.88* | | mg/kg wet | *5.000* | | *78* | *40-140* | | | |
| **LCS Dup** | | | | | | | | | | |
| Decane (C10) | 1.6 | 0.2 | mg/kg wet | 2.500 | | 65 | 40-140 | 2 | 25 | |
| Docosane (C22) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | 3 | 25 | |
| Dodecane (C12) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 70 | 40-140 | 1 | 25 | |
| Eicosane (C20) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 78 | 40-140 | 3 | 25 | |
| Hexacosane (C26) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 79 | 40-140 | 2 | 25 | |
| Hexadecane (C16) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 1 | 25 | |
| Hexatriacontane (C36) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 89 | 40-140 | 1 | 25 | |
| Nonadecane (C19) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 77 | 40-140 | 3 | 25 | |
| Nonane (C9) | 1.4 | 0.2 | mg/kg wet | 2.500 | | 57 | 30-140 | 2 | 25 | |
| Octacosane (C28) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 0.6 | 25 | |
| Octadecane (C18) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 2 | 25 | |
| Tetracosane (C24) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 75 | 40-140 | 3 | 25 | |
| Tetradecane (C14) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 73 | 40-140 | 0.9 | 25 | |
| Total Petroleum Hydrocarbons (C9-C36) | 25.8 | 10.0 | mg/kg wet | 35.00 | | 74 | 40-140 | 3 | 25 | |
| Triacontane (C30) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 73 | 40-140 | 0.5 | 25 | |
| *Surrogate: O-Terphenyl* | *3.70* | | mg/kg wet | *5.000* | | *74* | *40-140* | | | |
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DF40331 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Reactive Cyanide | ND | 2.0 | mg/kg | | | | | | | |
| Reactive Sulfide | ND | 2.0 | mg/kg | | | | | | | |
| **LCS** | | | | | | | | | | |
| Reactive Cyanide | 4.1 | 2.0 | mg/kg | 100.3 | | 4 | 0.68-5.41 | | | |
| Reactive Sulfide | 2.1 | 2.0 | mg/kg | 10.00 | | 21 | 0-44 | | | |
| **Batch DF40333 - General Preparation** | | | | | | | | | | |
| **Reference** | | | | | | | | | | |
| Flashpoint | 80 | | °F | 81.00 | | 99 | 97.9-102.1 | | | |
| **Batch DF40557 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Conductivity | ND | 5 | umhos/cm | | | | | | | |
| **LCS** | | | | | | | | | | |
| Conductivity | 1400 | | umhos/cm | 1410 | | 99 | 90-110 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

**Notes and Definitions**

| | |
|---|---|
| WL | Results obtained from a deionized water leach of the sample. |
| U | Analyte included in the analysis, but not detected |
| S- | Surrogate recovery(ies) below lower control limit (S-). |
| RRF | Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration |
| Q | Calibration required quadratic regression (Q). |
| D | Diluted. |
| CD+ | Continuing Calibration %Diff/Drift is above control limit (CD+). |
| CD- | Continuing Calibration %Diff/Drift is below control limit (CD-). |
| B+ | Blank Spike recovery is above upper control limit (B+). |
| > | Greater than. |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0027

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24F0027
Date Received: 6/3/2024
Project Due Date: 6/10/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.4 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? (Yes) / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered
    c. Low Level VOA vials frozen: Date: N/A Time: N/A By: Client
       Yes / No To Be Lab Filtered

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 555646 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 1 | 555647 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 555648 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 2 | 555638 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 2 | 555649 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 555650 | Yes | N/A | Yes | 8 oz jar | NP | |

**2nd Review**
**Were all containers scanned into storage/lab?** Initials BB (Yes / No)
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 6/3/24 16:21
Reviewed By: Date & Time: 6/3/24 1605

# ESS Laboratory

*Division of Thielsch Engineering, Inc.*
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

## CHAIN OF CUSTODY

ESS Lab # 24F0027

| | | |
|---|---|---|
| Turn Time | 5 | Days |
| Regulatory State | Massachusetts | |
| Is this project for any of the following?: | ○ CT RCP ◉ MA MCP ○ RGP | |

Reporting Limits: compare results to RCS-1, RCS-2, Lined and unlined landfills, TCLP, and 20X if needed.

Electonic Deliverables: ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) EDD

| Company Name | Project # | Project Name |
|---|---|---|
| Civil and Environmental Consultants | 332-344 | MassCEC Phase III - Site 4 |

| Contact Person | Address |
|---|---|
| Cassia Dal Bello | 31 Bellows Road |

| City | State | Zip Code | PO # |
|---|---|---|---|
| Raynham | MA | 02767 | |

| Telephone Number | FAX Number | Email Address |
|---|---|---|
| 774-501-2176 | | cdalbello; jkitchen, dbarboza@cecinc.com |

Analysis

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | RCRA8 Metals | PCBs via 3540C | TPH | SVOC - incl pyr | Pest - incl Tox | Herbicides | Reactivity | Conductivity | pH | Free Liquid | Flashpoint | VOC - high | VOC - low | Grain Size Analysis (Sieve Only) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5/31/24 | 14:30 | Solid | Soil | CEC-9A 9'-11' | | | | | | | | | | | | X | X | | | |
| 2 | 5/31/24 | 14:40 | Solid | Soil | CEC-9A 0'-12' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Container Type:** | AC-Air Cassette | AG-Amber Glass | B-BOD Bottle | C-Cubitainer | J-Jar | O-Other | P-Poly | S-Sterile | V-Vial | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | V | V | J | J |
| **Container Volume:** | 1-100 mL | 2-2.5 gal | 3-250 mL | 4-300 mL | 5-500 mL | 6-1L | 7-VOA | 8-2 oz | 9-4 oz | 10-8 oz | 11-Other* | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7 | 7 | 10 | 9 |
| **Preservation Code:** | 1-Non Preserved | 2-HCl | 3-H2SO4 | 4-HNO3 | 5-NaOH | 6-Methanol | 7-Na2S2O3 | 8-ZnAce, NaOH | 9-NH4Cl | 10-DI H2O | 11-Other* | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 10 | 1 | 1 |
| | | | | | | | | | | | **Number of Containers per Sample:** | 1 | | | | | 1 | | | | | 1 | 1 | 2 | 1 | 1 |

**Laboratory Use Only**

Cooler Present: Yes ○ Drop Off
Seals Intact: ○ Pickup
Cooler Temperature: 3.4 °C Ice

Sampled by : CI

Comments: Please specify "Other" preservative and containers types in this space

Run TCLP if fails 20x ** VOAs in Freezer **

| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
|---|---|---|---|
| [signature] 5/31/24 17:00 | Secured Fridge | [signature] 6/3/24 15:40 | [signature] 6/3/24 15:46 |
| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
| [signature] 6/3/24 15:53 | [signature] 6/3/24 15:53 | | |

ESS Laboratory
DIVISION OF THE RISE GROUP
BAL Laboratory Analytical Balance

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC Phase III - Site 4 (332-344)**
**ESS Laboratory Work Order Number: 24F0072**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

**REVIEWED**
**By ESS Laboratory at 4:23 pm, Jun 11, 2024**

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

## SAMPLE RECEIPT

The following samples were received on June 04, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

**Low Level VOA vials were frozen by ESS Laboratory on 6/04/24 at 16:13.**
**Tetrahydrofuran is reported above the MA CAM reporting limit of 0.010 mg/kg.**

**Question I: All samples for EPH and Metals were analyzed for a subset of the required MCP list per the client's request.**

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 24F0072-01 | CEC-4A 9-11ft | Soil | 8260D Low |
| 24F0072-02 | CEC-4A 0-12ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24F0072-03 | CEC-4A 19-21ft | Soil | 8260D Low |
| 24F0072-04 | CEC-4A 12-24ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24F0072-05 | CEC-4A 29-31ft | Soil | 8260D Low |
| 24F0072-06 | CEC-4A 24-36ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

## PROJECT NARRATIVE

**Semi-Volatile Organic Compounds**

| | |
|---|---|
| 24F0072-02 | **Surrogate recovery(ies) above upper control limit (S+).** |
| | p-Terphenyl-d14 (157% @ 30-130%) |
| 24F0072-04 | **Surrogate recovery(ies) above upper control limit (S+).** |
| | p-Terphenyl-d14 (140% @ 30-130%) |
| 24F0072-06 | **Surrogate recovery(ies) above upper control limit (S+).** |
| | p-Terphenyl-d14 (144% @ 30-130%) |
| D4F0088-CCV1 | **Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration** |
| | 2,4-Dinitrophenol (125% @ 40-160%) |
| D4F0088-CCV1 | **Calibration required quadratic regression (Q).** |
| | 2,4-Dinitrophenol (125% @ 40-160%), Pentachlorophenol (107% @ 40-160%) |
| D4F0146-CCV1 | **Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration** |
| | 2,4-Dinitrophenol (69% @ 40-160%) |
| D4F0146-CCV1 | **Calibration required quadratic regression (Q).** |
| | 2,4-Dinitrophenol (69% @ 40-160%), Pentachlorophenol (107% @ 40-160%) |
| DF40439-BLK1 | **Surrogate recovery(ies) above upper control limit (S+).** |
| | p-Terphenyl-d14 (140% @ 30-130%) |
| DF40439-BS1 | **Surrogate recovery(ies) above upper control limit (S+).** |
| | p-Terphenyl-d14 (147% @ 30-130%) |
| DF40439-BSD1 | **Surrogate recovery(ies) above upper control limit (S+).** |
| | p-Terphenyl-d14 (137% @ 30-130%) |

**Total Metals**

| | |
|---|---|
| 24F0072-02 | **Elevated Method Reporting Limits due to sample matrix (EL).** |
| | Arsenic |
| 24F0072-06 | **Elevated Method Reporting Limits due to sample matrix (EL).** |
| | Arsenic |

**Volatile Organics Low Level**

| | |
|---|---|
| D4F0139-CCV1 | **Calibration required quadratic regression (Q).** |
| | Naphthalene (80% @ 40-160%) |
| D4F0139-CCV1 | **Continuing Calibration %Diff/Drift is below control limit (CD-).** |
| | 1,2-Dibromo-3-Chloropropane (27% @ 20%) |

**No other observations noted.**

**End of Project Narrative.**

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24F0072-01 through 24F0072-06**

Matrices: ( ) Ground Water/Surface Water (x) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| (x) 8260 VOC CAM II A | (x) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | (x) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (x) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | (x) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (x) 6010 Metals CAM III A | ( ) 6020 Metals CAM III D | (x) MassDEP EPH CAM IV B | (x) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (x) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (x) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (x) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (x) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes (x) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (x) No ( ) |

***Responses to Questions G, H and I below are required for '"Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? ***Data User Note:** Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.* | Yes ( ) No (x)* |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (x)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes ( ) No (x)* |

***All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: June 11, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 9-11ft
Date Sampled: 06/03/24 12:35
Percent Solids: 92
Initial Volume: 6.6g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/7/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,1,1-Trichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,1,2,2-Tetrachloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,1,2-Trichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,1-Dichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,1-Dichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,1-Dichloropropene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,2,3-Trichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,2,3-Trichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,2,4-Trichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,2,4-Trimethylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,2-Dibromoethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,2-Dichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,2-Dichloroethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,2-Dichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,3,5-Trimethylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,3-Dichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,3-Dichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,4-Dichlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 1,4-Dioxane | ND (0.0823) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 2,2-Dichloropropane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 2-Butanone | ND (0.0412) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 2-Chlorotoluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 2-Hexanone | ND (0.0412) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 4-Chlorotoluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| 4-Isopropyltoluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 9-11ft
Date Sampled: 06/03/24 12:35
Percent Solids: 92
Initial Volume: 6.6g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/7/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0412) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Acetone | ND (0.0412) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Benzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Bromobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Bromochloromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Bromodichloromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Bromoform | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Bromomethane | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Carbon Disulfide | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Carbon Tetrachloride | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Chlorobenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Chloroethane | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Chloroform | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Chloromethane | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| cis-1,2-Dichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| cis-1,3-Dichloropropene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Dibromochloromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Dibromomethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Dichlorodifluoromethane | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Diethyl Ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Di-isopropyl ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Ethyl tertiary-butyl ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Ethylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Hexachlorobutadiene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Isopropylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Methyl tert-Butyl Ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Methylene Chloride | ND (0.0206) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 9-11ft
Date Sampled: 06/03/24 12:35
Percent Solids: 92
Initial Volume: 6.6g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/7/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| n-Butylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| n-Propylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| sec-Butylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Styrene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| tert-Butylbenzene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Tertiary-amyl methyl ether | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Tetrachloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Tetrahydrofuran | ND (0.0165) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Toluene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| trans-1,2-Dichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| trans-1,3-Dichloropropene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Trichloroethene | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Trichlorofluoromethane | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Vinyl Chloride | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Xylene O | ND (0.0041) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Xylene P,M | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |
| Xylenes (Total) | ND (0.0082) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:14 | D4F0139 | DF40729 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *102 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *98 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *101 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *99 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 0-12ft
Date Sampled: 06/03/24 12:45
Percent Solids: 92

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | **EL** ND (1.89) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:03 | 2.88 100 | DF40511 |
| **Barium** | **16.4** (0.75) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:03 | 2.88 100 | DF40511 |
| Cadmium | ND (0.38) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:03 | 2.88 100 | DF40511 |
| **Chromium** | **17.0** (0.75) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:03 | 2.88 100 | DF40511 |
| **Lead** | **11.2** (3.77) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:03 | 2.88 100 | DF40511 |
| Mercury | ND (0.035) | --- | 7471B | --- | 1 | AFV | 06/06/24 15:33 | 0.62 40 | DF40510 |
| Selenium | ND (3.77) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:03 | 2.88 100 | DF40511 |
| Silver | ND (0.38) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:03 | 2.88 100 | DF40511 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 0-12ft
Date Sampled: 06/03/24 12:45
Percent Solids: 92
Initial Volume: 20.4g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/4/24 17:09

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.027) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 1,2,4-Trichlorobenzene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 1,2-Dichlorobenzene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 1,3-Dichlorobenzene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 1,4-Dichlorobenzene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 2,4,5-Trichlorophenol | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 2,4,6-Trichlorophenol | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 2,4-Dichlorophenol | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 2,4-Dimethylphenol | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 2,4-Dinitrophenol | ND (1.07) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 2,4-Dinitrotoluene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 2,6-Dinitrotoluene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 2-Chloronaphthalene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 2-Chlorophenol | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 2-Methylnaphthalene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 2-Methylphenol | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 2-Nitrophenol | ND (0.533) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 3,3´-Dichlorobenzidine | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 3+4-Methylphenol | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 4-Bromophenyl-phenylether | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 4-Chloroaniline | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| 4-Nitrophenol | ND (1.07) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Acenaphthene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Acenaphthylene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Acetophenone | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Aniline | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Anthracene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 0-12ft
Date Sampled: 06/03/24 12:45
Percent Solids: 92
Initial Volume: 20.4g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/4/24 17:09

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Benzo(a)anthracene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Benzo(a)pyrene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Benzo(b)fluoranthene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Benzo(g,h,i)perylene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Benzo(k)fluoranthene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| bis(2-Chloroethoxy)methane | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| bis(2-Chloroethyl)ether | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| bis(2-chloroisopropyl)Ether | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| bis(2-Ethylhexyl)phthalate | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Butylbenzylphthalate | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Chrysene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Dibenzo(a,h)Anthracene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Dibenzofuran | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Diethylphthalate | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Dimethylphthalate | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Di-n-butylphthalate | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Di-n-octylphthalate | ND (0.533) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Fluoranthene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Fluorene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Hexachlorobenzene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Hexachlorobutadiene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Hexachloroethane | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Indeno(1,2,3-cd)Pyrene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Isophorone | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Naphthalene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Nitrobenzene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 0-12ft
Date Sampled: 06/03/24 12:45
Percent Solids: 92
Initial Volume: 20.4g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/4/24 17:09

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Pentachlorophenol | ND (1.07) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Phenanthrene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Phenol | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Pyrene | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |
| Pyridine | ND (0.266) | --- | 8270E | --- | 1 | TJ | 06/07/24 23:31 | D4F0146 | DF40439 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *111 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *112 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *120 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *121 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *118 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *122 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *117 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *157 %* | *S+* | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 0-12ft
Date Sampled: 06/03/24 12:45
Percent Solids: 92
Initial Volume: 19.7g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 6/4/24 16:49

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:20 | --- | DF40401 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:20 | --- | DF40401 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:20 | --- | DF40401 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:20 | --- | DF40401 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:20 | --- | DF40401 |
| **Aroclor 1254 [2C]** | **0.06** (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:20 | --- | DF40401 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:20 | --- | DF40401 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:20 | --- | DF40401 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:20 | --- | DF40401 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl [2C]* | *82 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *99 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 0-12ft
Date Sampled: 06/03/24 12:45
Percent Solids: 92
Initial Volume: 19.7g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/4/24 17:20

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| 4,4´-DDE | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| 4,4´-DDT | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Aldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| alpha-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| alpha-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| beta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Chlordane (Total) | ND (0.0221) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| delta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Dieldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Endosulfan I | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Endosulfan II | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Endosulfan Sulfate | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Endrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Endrin Ketone | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| gamma-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Heptachlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Heptachlor Epoxide | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Hexachlorobenzene | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Methoxychlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |
| Toxaphene | ND (0.138) | --- | 8081B | --- | 1 | 06/06/24 8:57 | D4F0072 | DF40402 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *107 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *98 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 0-12ft
Date Sampled: 06/03/24 12:45
Percent Solids: 92
Initial Volume: 10.1g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/5/24 18:20

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/07/24 17:18 | D4F0134 | DF40558 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/07/24 17:18 | D4F0134 | DF40558 |
| 2,4-D | ND (0.051) | --- | 8151A | --- | 1 | 06/07/24 17:18 | D4F0134 | DF40558 |
| 2,4-DB | ND (0.051) | --- | 8151A | --- | 1 | 06/07/24 17:18 | D4F0134 | DF40558 |
| Dalapon | ND (0.049) | --- | 8151A | --- | 1 | 06/07/24 17:18 | D4F0134 | DF40558 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/07/24 17:18 | D4F0134 | DF40558 |
| Dichlorprop | ND (0.051) | --- | 8151A | --- | 1 | 06/07/24 17:18 | D4F0134 | DF40558 |
| Dinoseb | ND (0.051) | --- | 8151A | --- | 1 | 06/07/24 17:18 | D4F0134 | DF40558 |
| MCPA | ND (2.50) | --- | 8151A | --- | 1 | 06/07/24 17:18 | D4F0134 | DF40558 |
| MCPP | ND (2.53) | --- | 8151A | --- | 1 | 06/07/24 17:18 | D4F0134 | DF40558 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *98 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 0-12ft
Date Sampled: 06/03/24 12:45
Percent Solids: 92
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/4/24 17:15

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **33.8** (11.0) | --- | 8100M | --- | 1 | 06/06/24 1:22 | --- | DF40440 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | *85 %* | | *40-140* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 0-12ft
Date Sampled: 06/03/24 12:45
Percent Solids: 92

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-02
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 607** (5) | --- | 9050A | --- | 1 | EEM | 06/05/24 16:50 | umhos/cm | DF40557 |
| **Corrosivity (pH)** | **7.40** (N/A) | --- | 9045 | --- | 1 | EAM | 06/04/24 17:50 | S.U. | DF40435 |
| **Corrosivity (pH) Sample Temp** | **20.6** | --- | 2550B | --- | 1 | EAM | 06/04/24 17:50 | °C | DF40435 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | CCP | 06/04/24 19:33 | °F | DF40447 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/04/24 16:57 | ml/5 min | DF40417 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/05/24 17:08 | mg/kg | DF40442 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/05/24 17:08 | mg/kg | DF40442 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 19-21ft
Date Sampled: 06/03/24 13:10
Percent Solids: 88
Initial Volume: 6.5g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/7/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,1,1-Trichloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,1,2,2-Tetrachloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,1,2-Trichloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,1-Dichloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,1-Dichloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,1-Dichloropropene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,2,3-Trichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,2,3-Trichloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,2,4-Trichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,2,4-Trimethylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,2-Dibromoethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,2-Dichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,2-Dichloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,2-Dichloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,3,5-Trimethylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,3-Dichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,3-Dichloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,4-Dichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 1,4-Dioxane | ND (0.0874) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 2,2-Dichloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 2-Butanone | ND (0.0437) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 2-Chlorotoluene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 2-Hexanone | ND (0.0437) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 4-Chlorotoluene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| 4-Isopropyltoluene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 19-21ft
Date Sampled: 06/03/24 13:10
Percent Solids: 88
Initial Volume: 6.5g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/7/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0437) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| **Acetone** | **0.113** (0.0437) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Benzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Bromobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Bromochloromethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Bromodichloromethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Bromoform | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Bromomethane | ND (0.0087) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Carbon Disulfide | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Carbon Tetrachloride | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Chlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Chloroethane | ND (0.0087) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Chloroform | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Chloromethane | ND (0.0087) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| cis-1,2-Dichloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| cis-1,3-Dichloropropene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Dibromochloromethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Dibromomethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Dichlorodifluoromethane | ND (0.0087) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Diethyl Ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Di-isopropyl ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Ethyl tertiary-butyl ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Ethylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Hexachlorobutadiene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Isopropylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Methyl tert-Butyl Ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Methylene Chloride | ND (0.0218) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 19-21ft
Date Sampled: 06/03/24 13:10
Percent Solids: 88
Initial Volume: 6.5g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/7/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| n-Butylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| n-Propylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| sec-Butylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Styrene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| tert-Butylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Tertiary-amyl methyl ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Tetrachloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Tetrahydrofuran | ND (0.0175) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Toluene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| trans-1,2-Dichloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| trans-1,3-Dichloropropene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Trichloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Trichlorofluoromethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Vinyl Chloride | ND (0.0087) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Xylene O | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Xylene P,M | ND (0.0087) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |
| Xylenes (Total) | ND (0.0087) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 13:40 | D4F0139 | DF40729 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *104 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *99 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *100 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *98 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 12-24ft
Date Sampled: 06/03/24 13:15
Percent Solids: 88

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **2.69** (2.05) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:06 | 2.77 100 | DF40511 |
| **Barium** | **11.9** (0.82) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:06 | 2.77 100 | DF40511 |
| Cadmium | ND (0.41) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:06 | 2.77 100 | DF40511 |
| **Chromium** | **9.63** (0.82) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:06 | 2.77 100 | DF40511 |
| **Lead** | **10.8** (4.10) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:06 | 2.77 100 | DF40511 |
| Mercury | ND (0.037) | --- | 7471B | --- | 1 | AFV | 06/06/24 15:35 | 0.61 40 | DF40510 |
| Selenium | ND (4.10) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:06 | 2.77 100 | DF40511 |
| Silver | ND (0.41) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:06 | 2.77 100 | DF40511 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 12-24ft
Date Sampled: 06/03/24 13:15
Percent Solids: 88
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/4/24 17:09

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 1,2,4-Trichlorobenzene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 1,2-Dichlorobenzene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 1,3-Dichlorobenzene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 1,4-Dichlorobenzene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 2,4,5-Trichlorophenol | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 2,4,6-Trichlorophenol | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 2,4-Dichlorophenol | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 2,4-Dimethylphenol | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 2,4-Dinitrophenol | ND (1.18) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 2,4-Dinitrotoluene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 2,6-Dinitrotoluene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 2-Chloronaphthalene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 2-Chlorophenol | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 2-Methylnaphthalene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 2-Methylphenol | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 2-Nitrophenol | ND (0.588) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 3,3´-Dichlorobenzidine | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 3+4-Methylphenol | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 4-Bromophenyl-phenylether | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 4-Chloroaniline | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| 4-Nitrophenol | ND (1.18) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Acenaphthene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Acenaphthylene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Acetophenone | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Aniline | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Anthracene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 12-24ft
Date Sampled: 06/03/24 13:15
Percent Solids: 88
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/4/24 17:09

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Benzo(a)anthracene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Benzo(a)pyrene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Benzo(b)fluoranthene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Benzo(g,h,i)perylene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Benzo(k)fluoranthene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| bis(2-Chloroethoxy)methane | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| bis(2-Chloroethyl)ether | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| bis(2-chloroisopropyl)Ether | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| bis(2-Ethylhexyl)phthalate | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Butylbenzylphthalate | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Chrysene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Dibenzo(a,h)Anthracene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Dibenzofuran | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Diethylphthalate | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Dimethylphthalate | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Di-n-butylphthalate | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Di-n-octylphthalate | ND (0.588) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Fluoranthene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Fluorene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Hexachlorobenzene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Hexachlorobutadiene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Hexachloroethane | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Indeno(1,2,3-cd)Pyrene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Isophorone | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Naphthalene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Nitrobenzene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 12-24ft
Date Sampled: 06/03/24 13:15
Percent Solids: 88
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/4/24 17:09

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Pentachlorophenol | ND (1.18) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Phenanthrene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Phenol | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Pyrene | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |
| Pyridine | ND (0.294) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:01 | D4F0146 | DF40439 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *110 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *124 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *115 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *122 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *114 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *121 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *109 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *140 %* | *S+* | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 12-24ft
Date Sampled: 06/03/24 13:15
Percent Solids: 88
Initial Volume: 20.1g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 6/4/24 16:49

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:43 | --- | DF40401 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:43 | --- | DF40401 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:43 | --- | DF40401 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:43 | --- | DF40401 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:43 | --- | DF40401 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:43 | --- | DF40401 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:43 | --- | DF40401 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:43 | --- | DF40401 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/05/24 23:43 | --- | DF40401 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl [2C]* | *70 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *77 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 12-24ft
Date Sampled: 06/03/24 13:15
Percent Solids: 88
Initial Volume: 19.7g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/4/24 17:20

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| 4,4´-DDE | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| 4,4´-DDT | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Aldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| alpha-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| alpha-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| beta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Chlordane (Total) | ND (0.0231) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| delta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Dieldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Endosulfan I | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Endosulfan II | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Endosulfan Sulfate | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Endrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Endrin Ketone | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| gamma-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Heptachlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Heptachlor Epoxide | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Hexachlorobenzene | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Methoxychlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |
| Toxaphene | ND (0.144) | --- | 8081B | --- | 1 | 06/06/24 9:24 | D4F0072 | DF40402 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *103 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *94 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 12-24ft
Date Sampled: 06/03/24 13:15
Percent Solids: 88
Initial Volume: 10.3g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/5/24 18:20

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/07/24 17:48 | D4F0134 | DF40558 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/07/24 17:48 | D4F0134 | DF40558 |
| 2,4-D | ND (0.052) | --- | 8151A | --- | 1 | 06/07/24 17:48 | D4F0134 | DF40558 |
| 2,4-DB | ND (0.052) | --- | 8151A | --- | 1 | 06/07/24 17:48 | D4F0134 | DF40558 |
| Dalapon | ND (0.050) | --- | 8151A | --- | 1 | 06/07/24 17:48 | D4F0134 | DF40558 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/07/24 17:48 | D4F0134 | DF40558 |
| Dichlorprop | ND (0.052) | --- | 8151A | --- | 1 | 06/07/24 17:48 | D4F0134 | DF40558 |
| Dinoseb | ND (0.052) | --- | 8151A | --- | 1 | 06/07/24 17:48 | D4F0134 | DF40558 |
| MCPA | ND (2.56) | --- | 8151A | --- | 1 | 06/07/24 17:48 | D4F0134 | DF40558 |
| MCPP | ND (2.59) | --- | 8151A | --- | 1 | 06/07/24 17:48 | D4F0134 | DF40558 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: DCAA* | *107 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 12-24ft
Date Sampled: 06/03/24 13:15
Percent Solids: 88
Initial Volume: 20.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/4/24 17:15

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **105** (11.1) | --- | 8100M | --- | 1 | 06/05/24 23:58 | --- | DF40440 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 87 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 12-24ft
Date Sampled: 06/03/24 13:15
Percent Solids: 88

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-04
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 973** (5) | --- | 9050A | --- | 1 | EEM | 06/05/24 16:50 | umhos/cm | DF40557 |
| **Corrosivity (pH)** | **7.82** (N/A) | --- | 9045 | --- | 1 | EAM | 06/04/24 17:50 | S.U. | DF40435 |
| **Corrosivity (pH) Sample Temp** | **20.8** | --- | 2550B | --- | 1 | EAM | 06/04/24 17:50 | °C | DF40435 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | CCP | 06/04/24 19:33 | °F | DF40447 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/04/24 16:57 | ml/5 min | DF40417 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/05/24 21:06 | mg/kg | DF40559 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/05/24 21:06 | mg/kg | DF40559 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 29-31ft
Date Sampled: 06/03/24 13:50
Percent Solids: 92
Initial Volume: 5.8g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/7/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,1,1-Trichloroethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,1,2,2-Tetrachloroethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,1,2-Trichloroethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,1-Dichloroethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,1-Dichloroethene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,1-Dichloropropene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,2,3-Trichlorobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,2,3-Trichloropropane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,2,4-Trichlorobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,2,4-Trimethylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,2-Dibromoethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,2-Dichlorobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,2-Dichloroethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,2-Dichloropropane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,3,5-Trimethylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,3-Dichlorobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,3-Dichloropropane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,4-Dichlorobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 1,4-Dioxane | ND (0.0933) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 2,2-Dichloropropane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 2-Butanone | ND (0.0467) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 2-Chlorotoluene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 2-Hexanone | ND (0.0467) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 4-Chlorotoluene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| 4-Isopropyltoluene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 29-31ft
Date Sampled: 06/03/24 13:50
Percent Solids: 92
Initial Volume: 5.8g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/7/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0467) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Acetone | ND (0.0467) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Benzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Bromobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Bromochloromethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Bromodichloromethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Bromoform | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Bromomethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Carbon Disulfide | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Carbon Tetrachloride | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Chlorobenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Chloroethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Chloroform | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Chloromethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| cis-1,2-Dichloroethene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| cis-1,3-Dichloropropene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Dibromochloromethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Dibromomethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Dichlorodifluoromethane | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Diethyl Ether | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Di-isopropyl ether | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Ethyl tertiary-butyl ether | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Ethylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Hexachlorobutadiene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Isopropylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Methyl tert-Butyl Ether | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Methylene Chloride | ND (0.0233) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 29-31ft
Date Sampled: 06/03/24 13:50
Percent Solids: 92
Initial Volume: 5.8g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/7/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| n-Butylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| n-Propylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| sec-Butylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Styrene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| tert-Butylbenzene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Tertiary-amyl methyl ether | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Tetrachloroethene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Tetrahydrofuran | ND (0.0187) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Toluene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| trans-1,2-Dichloroethene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| trans-1,3-Dichloropropene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Trichloroethene | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Trichlorofluoromethane | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Vinyl Chloride | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Xylene O | ND (0.0047) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Xylene P,M | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |
| Xylenes (Total) | ND (0.0093) | --- | 8260D Low | --- | 1 | MEK | 06/07/24 14:05 | D4F0139 | DF40729 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *103 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *106 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *102 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *98 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 24-36ft
Date Sampled: 06/03/24 14:00
Percent Solids: 92

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-06
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | **EL** ND (2.06) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:08 | 2.63 100 | DF40511 |
| **Barium** | **24.7** (0.82) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:08 | 2.63 100 | DF40511 |
| Cadmium | ND (0.41) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:08 | 2.63 100 | DF40511 |
| **Chromium** | **9.80** (0.82) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:08 | 2.63 100 | DF40511 |
| **Lead** | **5.67** (4.12) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:08 | 2.63 100 | DF40511 |
| Mercury | ND (0.035) | --- | 7471B | --- | 1 | AFV | 06/06/24 15:37 | 0.61 40 | DF40510 |
| Selenium | ND (4.12) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:08 | 2.63 100 | DF40511 |
| Silver | ND (0.41) | --- | 6010D | --- | 1 | KJB | 06/05/24 16:08 | 2.63 100 | DF40511 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 24-36ft
Date Sampled: 06/03/24 14:00
Percent Solids: 92
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/4/24 17:09

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.027) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 1,2,4-Trichlorobenzene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 1,2-Dichlorobenzene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 1,3-Dichlorobenzene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 1,4-Dichlorobenzene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 2,4,5-Trichlorophenol | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 2,4,6-Trichlorophenol | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 2,4-Dichlorophenol | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 2,4-Dimethylphenol | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 2,4-Dinitrophenol | ND (1.09) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 2,4-Dinitrotoluene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 2,6-Dinitrotoluene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 2-Chloronaphthalene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 2-Chlorophenol | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 2-Methylnaphthalene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 2-Methylphenol | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 2-Nitrophenol | ND (0.547) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 3,3´-Dichlorobenzidine | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 3+4-Methylphenol | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 4-Bromophenyl-phenylether | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 4-Chloroaniline | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| 4-Nitrophenol | ND (1.09) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Acenaphthene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Acenaphthylene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Acetophenone | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Aniline | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Anthracene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 24-36ft
Date Sampled: 06/03/24 14:00
Percent Solids: 92
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/4/24 17:09

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Benzo(a)anthracene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Benzo(a)pyrene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Benzo(b)fluoranthene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Benzo(g,h,i)perylene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Benzo(k)fluoranthene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| bis(2-Chloroethoxy)methane | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| bis(2-Chloroethyl)ether | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| bis(2-chloroisopropyl)Ether | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| bis(2-Ethylhexyl)phthalate | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Butylbenzylphthalate | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Chrysene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Dibenzo(a,h)Anthracene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Dibenzofuran | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Diethylphthalate | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Dimethylphthalate | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Di-n-butylphthalate | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Di-n-octylphthalate | ND (0.547) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Fluoranthene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Fluorene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Hexachlorobenzene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Hexachlorobutadiene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Hexachloroethane | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Indeno(1,2,3-cd)Pyrene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Isophorone | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Naphthalene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Nitrobenzene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 24-36ft
Date Sampled: 06/03/24 14:00
Percent Solids: 92
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/4/24 17:09

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Pentachlorophenol | ND (1.09) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Phenanthrene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Phenol | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Pyrene | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |
| Pyridine | ND (0.273) | --- | 8270E | --- | 1 | TJ | 06/08/24 0:31 | D4F0146 | DF40439 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *105 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *127 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *109 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *119 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *111 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *117 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *107 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *144 %* | *S+* | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 24-36ft
Date Sampled: 06/03/24 14:00
Percent Solids: 92
Initial Volume: 19.7g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JLG
Prepared: 6/4/24 16:49

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | --- | 8082A | --- | 1 | 06/06/24 0:06 | --- | DF40401 |
| Aroclor 1221 | ND (0.05) | --- | 8082A | --- | 1 | 06/06/24 0:06 | --- | DF40401 |
| Aroclor 1232 | ND (0.05) | --- | 8082A | --- | 1 | 06/06/24 0:06 | --- | DF40401 |
| Aroclor 1242 | ND (0.05) | --- | 8082A | --- | 1 | 06/06/24 0:06 | --- | DF40401 |
| Aroclor 1248 | ND (0.05) | --- | 8082A | --- | 1 | 06/06/24 0:06 | --- | DF40401 |
| Aroclor 1254 | ND (0.05) | --- | 8082A | --- | 1 | 06/06/24 0:06 | --- | DF40401 |
| Aroclor 1260 | ND (0.05) | --- | 8082A | --- | 1 | 06/06/24 0:06 | --- | DF40401 |
| Aroclor 1262 | ND (0.05) | --- | 8082A | --- | 1 | 06/06/24 0:06 | --- | DF40401 |
| Aroclor 1268 | ND (0.05) | --- | 8082A | --- | 1 | 06/06/24 0:06 | --- | DF40401 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl [2C]* | *84 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *86 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 24-36ft
Date Sampled: 06/03/24 14:00
Percent Solids: 92
Initial Volume: 20.5g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/4/24 17:20

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| 4,4´-DDE | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| 4,4´-DDT | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Aldrin | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| alpha-BHC | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| alpha-Chlordane | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| beta-BHC | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Chlordane (Total) | ND (0.0211) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| delta-BHC | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Dieldrin | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Endosulfan I | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Endosulfan II | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Endosulfan Sulfate | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Endrin | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Endrin Ketone | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| gamma-BHC (Lindane) | ND (0.0016) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| gamma-Chlordane | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Heptachlor | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Heptachlor Epoxide | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Hexachlorobenzene | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Methoxychlor | ND (0.0026) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |
| Toxaphene | ND (0.132) | --- | 8081B | --- | 1 | 06/06/24 9:52 | D4F0072 | DF40402 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *97 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *87 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 24-36ft
Date Sampled: 06/03/24 14:00
Percent Solids: 92
Initial Volume: 10.5g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/5/24 18:20

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/07/24 18:18 | D4F0134 | DF40558 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/07/24 18:18 | D4F0134 | DF40558 |
| 2,4-D | ND (0.048) | --- | 8151A | --- | 1 | 06/07/24 18:18 | D4F0134 | DF40558 |
| 2,4-DB | ND (0.049) | --- | 8151A | --- | 1 | 06/07/24 18:18 | D4F0134 | DF40558 |
| Dalapon | ND (0.047) | --- | 8151A | --- | 1 | 06/07/24 18:18 | D4F0134 | DF40558 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/07/24 18:18 | D4F0134 | DF40558 |
| Dichlorprop | ND (0.048) | --- | 8151A | --- | 1 | 06/07/24 18:18 | D4F0134 | DF40558 |
| Dinoseb | ND (0.049) | --- | 8151A | --- | 1 | 06/07/24 18:18 | D4F0134 | DF40558 |
| MCPA | ND (2.40) | --- | 8151A | --- | 1 | 06/07/24 18:18 | D4F0134 | DF40558 |
| MCPP | ND (2.42) | --- | 8151A | --- | 1 | 06/07/24 18:18 | D4F0134 | DF40558 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: DCAA* | *91 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 24-36ft
Date Sampled: 06/03/24 14:00
Percent Solids: 92
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/4/24 17:15

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **53.8** (11.2) | --- | 8100M | --- | 1 | 06/06/24 0:41 | --- | DF40440 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | *85 %* | | *40-140* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-4A 24-36ft
Date Sampled: 06/03/24 14:00
Percent Solids: 92

ESS Laboratory Work Order: 24F0072
ESS Laboratory Sample ID: 24F0072-06
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 1570** (5) | --- | 9050A | --- | 1 | EEM | 06/05/24 16:50 | umhos/cm | DF40557 |
| **Corrosivity (pH)** | **7.93** (N/A) | --- | 9045 | --- | 1 | EAM | 06/04/24 17:50 | S.U. | DF40435 |
| **Corrosivity (pH) Sample Temp** | **20.8** | --- | 2550B | --- | 1 | EAM | 06/04/24 17:50 | °C | DF40435 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | CCP | 06/04/24 19:33 | °F | DF40448 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/04/24 16:57 | ml/5 min | DF40417 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/05/24 21:06 | mg/kg | DF40559 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/05/24 21:06 | mg/kg | DF40559 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DF40510 - 245.1/7470A** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Mercury | ND | 0.032 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 21.5 | 2.91 | mg/kg wet | 25.50 | | 84 | 71.27-125.1 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 20.1 | 3.19 | mg/kg wet | 25.50 | | 79 | 71.27-125.1 | 7 | 30 | |
| **Batch DF40511 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Arsenic | ND | 2.50 | mg/kg wet | | | | | | | |
| Barium | ND | 1.00 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Arsenic | 68.2 | 8.33 | mg/kg wet | 75.60 | | 90 | 80-120 | | | |
| Barium | 842 | 3.33 | mg/kg wet | 372.0 | | 226 | 40-297 | | | |
| Cadmium | 235 | 1.67 | mg/kg wet | 259.0 | | 91 | 80-120 | | | |
| Chromium | 151 | 3.33 | mg/kg wet | 156.0 | | 96 | 80-120 | | | |
| Lead | 209 | 16.7 | mg/kg wet | 225.0 | | 93 | 80-120 | | | |
| Selenium | 71.0 | 16.7 | mg/kg wet | 82.70 | | 86 | 70-129 | | | |
| Silver | 48.8 | 1.67 | mg/kg wet | 51.00 | | 96 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Arsenic | 64.0 | 7.69 | mg/kg wet | 75.60 | | 85 | 80-120 | 6 | 30 | |
| Barium | 893 | 3.08 | mg/kg wet | 372.0 | | 240 | 40-297 | 6 | 30 | |
| Cadmium | 218 | 1.54 | mg/kg wet | 259.0 | | 84 | 80-120 | 7 | 30 | |
| Chromium | 139 | 3.08 | mg/kg wet | 156.0 | | 89 | 80-120 | 8 | 30 | |
| Lead | 192 | 15.4 | mg/kg wet | 225.0 | | 85 | 80-120 | 8 | 30 | |
| Selenium | 65.7 | 15.4 | mg/kg wet | 82.70 | | 79 | 70-129 | 8 | 30 | |
| Silver | 45.5 | 1.54 | mg/kg wet | 51.00 | | 89 | 80-120 | 7 | 30 | |
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40729 - 5035** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,1-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40729 - 5035** | | | | | | | | | | |
| 1,2,3-Trichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromoethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dioxane | ND | 0.100 | mg/kg wet | | | | | | | |
| 2,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Butanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 2-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Hexanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 4-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Isopropyltoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Methyl-2-Pentanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Acetone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Benzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromodichloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromoform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromomethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Carbon Disulfide | ND | 0.0050 | mg/kg wet | | | | | | | |
| Carbon Tetrachloride | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloroethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Chloroform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| cis-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| cis-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromomethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dichlorodifluoromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Diethyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Di-isopropyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethyl tertiary-butyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Isopropylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methyl tert-Butyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40729 - 5035** | | | | | | | | | | |
| Methylene Chloride | ND | 0.0250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Propylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| sec-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Styrene | ND | 0.0050 | mg/kg wet | | | | | | | |
| tert-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tertiary-amyl methyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrachloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrahydrofuran | ND | 0.0200 | mg/kg wet | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichlorofluoromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Vinyl Chloride | ND | 0.0100 | mg/kg wet | | | | | | | |
| Xylene O | ND | 0.0050 | mg/kg wet | | | | | | | |
| Xylene P,M | ND | 0.0100 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0501* | | mg/kg wet | *0.05000* | | *100* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0494* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0494* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0493* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,1,1-Trichloroethane | 0.0476 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| 1,1,2,2-Tetrachloroethane | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 40-160 | | | |
| 1,1,2-Trichloroethane | 0.0480 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| 1,1-Dichloroethane | 0.0468 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | | | |
| 1,1-Dichloroethene | 0.0502 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 1,1-Dichloropropene | 0.0470 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | | | |
| 1,2,3-Trichlorobenzene | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 1,2,3-Trichloropropane | 0.0454 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | | | |
| 1,2,4-Trichlorobenzene | 0.0510 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,2,4-Trimethylbenzene | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,2-Dibromo-3-Chloropropane | 0.0397 | 0.0050 | mg/kg wet | 0.05000 | | 79 | 70-130 | | | |
| 1,2-Dibromoethane | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| 1,2-Dichlorobenzene | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| 1,2-Dichloroethane | 0.0475 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| 1,2-Dichloropropane | 0.0477 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| 1,3,5-Trimethylbenzene | 0.0509 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,3-Dichlorobenzene | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| 1,3-Dichloropropane | 0.0524 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| 1,4-Dichlorobenzene | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| 1,4-Dioxane | 0.888 | 0.100 | mg/kg wet | 1.000 | | 89 | 70-130 | | | |
| 2,2-Dichloropropane | 0.0466 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40729 - 5035** | | | | | | | | | | |
| 2-Butanone | 0.276 | 0.0500 | mg/kg wet | 0.2500 | | 110 | 40-160 | | | |
| 2-Chlorotoluene | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| 2-Hexanone | 0.237 | 0.0500 | mg/kg wet | 0.2500 | | 95 | 40-160 | | | |
| 4-Chlorotoluene | 0.0495 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| 4-Isopropyltoluene | 0.0483 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| 4-Methyl-2-Pentanone | 0.211 | 0.0500 | mg/kg wet | 0.2500 | | 84 | 40-160 | | | |
| Acetone | 0.324 | 0.0500 | mg/kg wet | 0.2500 | | 130 | 40-160 | | | |
| Benzene | 0.0486 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| Bromobenzene | 0.0509 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Bromochloromethane | 0.0497 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| Bromodichloromethane | 0.0525 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Bromoform | 0.0480 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 40-160 | | | |
| Bromomethane | 0.0477 | 0.0100 | mg/kg wet | 0.05000 | | 95 | 40-160 | | | |
| Carbon Disulfide | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| Carbon Tetrachloride | 0.0471 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | | | |
| Chlorobenzene | 0.0509 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Chloroethane | 0.0520 | 0.0100 | mg/kg wet | 0.05000 | | 104 | 40-160 | | | |
| Chloroform | 0.0474 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| Chloromethane | 0.0450 | 0.0100 | mg/kg wet | 0.05000 | | 90 | 40-160 | | | |
| cis-1,2-Dichloroethene | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| cis-1,3-Dichloropropene | 0.0519 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 40-160 | | | |
| Dibromochloromethane | 0.0559 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 40-160 | | | |
| Dibromomethane | 0.0484 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| Dichlorodifluoromethane | 0.0372 | 0.0100 | mg/kg wet | 0.05000 | | 74 | 40-160 | | | |
| Diethyl Ether | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Di-isopropyl ether | 0.0518 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| Ethyl tertiary-butyl ether | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| Ethylbenzene | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| Hexachlorobutadiene | 0.0475 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 40-160 | | | |
| Isopropylbenzene | 0.0551 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| Methyl tert-Butyl Ether | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| Methylene Chloride | 0.0482 | 0.0250 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| Naphthalene | 0.0479 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 40-160 | | | |
| n-Butylbenzene | 0.0496 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| n-Propylbenzene | 0.0505 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| sec-Butylbenzene | 0.0512 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Styrene | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 40-160 | | | |
| tert-Butylbenzene | 0.0506 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| Tertiary-amyl methyl ether | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Tetrachloroethene | 0.0613 | 0.0050 | mg/kg wet | 0.05000 | | 123 | 70-130 | | | |
| Tetrahydrofuran | 0.0458 | 0.0200 | mg/kg wet | 0.05000 | | 92 | 70-130 | | | |
| Toluene | 0.0486 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| trans-1,2-Dichloroethene | 0.0497 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| trans-1,3-Dichloropropene | 0.0492 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| Trichloroethene | 0.0483 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40729 - 5035** | | | | | | | | | | |
| Trichlorofluoromethane | 0.0472 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 40-160 | | | |
| Vinyl Chloride | 0.0467 | 0.0100 | mg/kg wet | 0.05000 | | 93 | 70-130 | | | |
| Xylene O | 0.0540 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Xylene P,M | 0.109 | 0.0100 | mg/kg wet | 0.1000 | | 109 | 70-130 | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0461* | | mg/kg wet | *0.05000* | | *92* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0523* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0475* | | mg/kg wet | *0.05000* | | *95* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0510* | | mg/kg wet | *0.05000* | | *102* | *70-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0497 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 3 | 20 | |
| 1,1,1-Trichloroethane | 0.0471 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | 0.9 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0462 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 40-160 | 5 | 20 | |
| 1,1,2-Trichloroethane | 0.0477 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 0.8 | 20 | |
| 1,1-Dichloroethane | 0.0463 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 1 | 20 | |
| 1,1-Dichloroethene | 0.0498 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 0.9 | 20 | |
| 1,1-Dichloropropene | 0.0470 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | 0.09 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0469 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | 6 | 20 | |
| 1,2,3-Trichloropropane | 0.0422 | 0.0050 | mg/kg wet | 0.05000 | | 84 | 70-130 | 7 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 6 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 7 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0388 | 0.0050 | mg/kg wet | 0.05000 | | 78 | 70-130 | 2 | 20 | |
| 1,2-Dibromoethane | 0.0503 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 3 | 20 | |
| 1,2-Dichlorobenzene | 0.0462 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | 5 | 20 | |
| 1,2-Dichloroethane | 0.0470 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | 0.9 | 20 | |
| 1,2-Dichloropropane | 0.0473 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 0.8 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 6 | 20 | |
| 1,3-Dichlorobenzene | 0.0459 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | 6 | 20 | |
| 1,3-Dichloropropane | 0.0508 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 3 | 20 | |
| 1,4-Dichlorobenzene | 0.0467 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 5 | 20 | |
| 1,4-Dioxane | 0.848 | 0.100 | mg/kg wet | 1.000 | | 85 | 70-130 | 5 | 20 | |
| 2,2-Dichloropropane | 0.0456 | 0.0050 | mg/kg wet | 0.05000 | | 91 | 70-130 | 2 | 20 | |
| 2-Butanone | 0.260 | 0.0500 | mg/kg wet | 0.2500 | | 104 | 40-160 | 6 | 20 | |
| 2-Chlorotoluene | 0.0475 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 5 | 20 | |
| 2-Hexanone | 0.219 | 0.0500 | mg/kg wet | 0.2500 | | 88 | 40-160 | 8 | 20 | |
| 4-Chlorotoluene | 0.0466 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 6 | 20 | |
| 4-Isopropyltoluene | 0.0449 | 0.0050 | mg/kg wet | 0.05000 | | 90 | 70-130 | 7 | 20 | |
| 4-Methyl-2-Pentanone | 0.208 | 0.0500 | mg/kg wet | 0.2500 | | 83 | 40-160 | 2 | 20 | |
| Acetone | 0.281 | 0.0500 | mg/kg wet | 0.2500 | | 112 | 40-160 | 14 | 20 | |
| Benzene | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 1 | 20 | |
| Bromobenzene | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 6 | 20 | |
| Bromochloromethane | 0.0492 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 1 | 20 | |
| Bromodichloromethane | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 0.3 | 20 | |
| Bromoform | 0.0467 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 40-160 | 3 | 20 | |
| Bromomethane | 0.0475 | 0.0100 | mg/kg wet | 0.05000 | | 95 | 40-160 | 0.5 | 20 | |
| Carbon Disulfide | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 0.2 | 20 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40729 - 5035** | | | | | | | | | | |
| Carbon Tetrachloride | 0.0464 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 70-130 | 1 | 20 | |
| Chlorobenzene | 0.0495 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 3 | 20 | |
| Chloroethane | 0.0507 | 0.0100 | mg/kg wet | 0.05000 | | 101 | 40-160 | 2 | 20 | |
| Chloroform | 0.0469 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | 1 | 20 | |
| Chloromethane | 0.0445 | 0.0100 | mg/kg wet | 0.05000 | | 89 | 40-160 | 1 | 20 | |
| cis-1,2-Dichloroethene | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 2 | 20 | |
| cis-1,3-Dichloropropene | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 40-160 | 1 | 20 | |
| Dibromochloromethane | 0.0538 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 40-160 | 4 | 20 | |
| Dibromomethane | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 0.5 | 20 | |
| Dichlorodifluoromethane | 0.0363 | 0.0100 | mg/kg wet | 0.05000 | | 73 | 40-160 | 3 | 20 | |
| Diethyl Ether | 0.0530 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 0.5 | 20 | |
| Di-isopropyl ether | 0.0513 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 1 | 20 | |
| Ethyl tertiary-butyl ether | 0.0528 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 0.1 | 20 | |
| Ethylbenzene | 0.0498 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 3 | 20 | |
| Hexachlorobutadiene | 0.0445 | 0.0050 | mg/kg wet | 0.05000 | | 89 | 40-160 | 7 | 20 | |
| Isopropylbenzene | 0.0520 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 6 | 20 | |
| Methyl tert-Butyl Ether | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 0.08 | 20 | |
| Methylene Chloride | 0.0477 | 0.0250 | mg/kg wet | 0.05000 | | 95 | 70-130 | 0.9 | 20 | |
| Naphthalene | 0.0462 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 40-160 | 4 | 20 | |
| n-Butylbenzene | 0.0462 | 0.0050 | mg/kg wet | 0.05000 | | 92 | 70-130 | 7 | 20 | |
| n-Propylbenzene | 0.0477 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 6 | 20 | |
| sec-Butylbenzene | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | 7 | 20 | |
| Styrene | 0.0520 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 40-160 | 2 | 20 | |
| tert-Butylbenzene | 0.0473 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 7 | 20 | |
| Tertiary-amyl methyl ether | 0.0533 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 0.2 | 20 | |
| Tetrachloroethene | 0.0565 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | 8 | 20 | |
| Tetrahydrofuran | 0.0457 | 0.0200 | mg/kg wet | 0.05000 | | 91 | 70-130 | 0.09 | 20 | |
| Toluene | 0.0483 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | 0.5 | 20 | |
| trans-1,2-Dichloroethene | 0.0490 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 2 | 20 | |
| trans-1,3-Dichloropropene | 0.0488 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 0.9 | 20 | |
| Trichloroethene | 0.0473 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | 2 | 20 | |
| Trichlorofluoromethane | 0.0466 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 40-160 | 1 | 20 | |
| Vinyl Chloride | 0.0464 | 0.0100 | mg/kg wet | 0.05000 | | 93 | 70-130 | 0.6 | 20 | |
| Xylene O | 0.0530 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 2 | 20 | |
| Xylene P,M | 0.106 | 0.0100 | mg/kg wet | 0.1000 | | 106 | 70-130 | 3 | 20 | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0452* | | mg/kg wet | *0.05000* | | *90* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0515* | | mg/kg wet | *0.05000* | | *103* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0479* | | mg/kg wet | *0.05000* | | *96* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0496* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40439 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40439 - 3546** | | | | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40439 - 3546** | | | | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyridine | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.82* | | mg/kg wet | *2.500* | | *113* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.20* | | mg/kg wet | *3.750* | | *112* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.50* | | mg/kg wet | *3.750* | | *120* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.94* | | mg/kg wet | *2.500* | | *118* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.51* | | mg/kg wet | *3.750* | | *120* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *3.10* | | mg/kg wet | *2.500* | | *124* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.41* | | mg/kg wet | *3.750* | | *118* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *3.51* | | mg/kg wet | *2.500* | | *140* | *30-130* | | | S+ |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.58 | 0.025 | mg/kg wet | 2.500 | | 103 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.11 | 0.250 | mg/kg wet | 2.500 | | 84 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.66 | 0.250 | mg/kg wet | 2.500 | | 106 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.19 | 0.250 | mg/kg wet | 2.500 | | 87 | 30-130 | | | |
| 2,4-Dimethylphenol | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 30-130 | | | |
| 2,4-Dinitrophenol | 2.74 | 1.00 | mg/kg wet | 2.500 | | 110 | 15-140 | | | |
| 2,4-Dinitrotoluene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| 2-Chloronaphthalene | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| 2-Chlorophenol | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 30-130 | | | |
| 2-Methylnaphthalene | 2.09 | 0.250 | mg/kg wet | 2.500 | | 84 | 40-140 | | | |
| 2-Methylphenol | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 15-140 | | | |
| 2-Nitrophenol | 2.20 | 0.500 | mg/kg wet | 2.500 | | 88 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| 3+4-Methylphenol | 4.75 | 0.250 | mg/kg wet | 5.000 | | 95 | 15-140 | | | |
| 4-Bromophenyl-phenylether | 2.66 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | | | |
| 4-Chloroaniline | 1.65 | 0.250 | mg/kg wet | 2.500 | | 66 | 15-140 | | | |
| 4-Nitrophenol | 2.18 | 1.00 | mg/kg wet | 2.500 | | 87 | 15-140 | | | |
| Acenaphthene | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40439 - 3546** | | | | | | | | | | |
| Acenaphthylene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Acetophenone | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Aniline | 1.32 | 0.250 | mg/kg wet | 2.500 | | 53 | 40-140 | | | |
| Anthracene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Azobenzene | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| Benzo(a)anthracene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Benzo(a)pyrene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 2.05 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 2.19 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 2.08 | 0.250 | mg/kg wet | 2.500 | | 83 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.62 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| Butylbenzylphthalate | 2.82 | 0.250 | mg/kg wet | 2.500 | | 113 | 40-140 | | | |
| Chrysene | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Dibenzofuran | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Diethylphthalate | 2.46 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Dimethylphthalate | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 15-140 | | | |
| Di-n-butylphthalate | 2.63 | 0.250 | mg/kg wet | 2.500 | | 105 | 40-140 | | | |
| Di-n-octylphthalate | 3.14 | 0.500 | mg/kg wet | 2.500 | | 126 | 40-140 | | | |
| Fluoranthene | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Fluorene | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Hexachlorobenzene | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | | | |
| Hexachlorobutadiene | 2.16 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Hexachloroethane | 2.36 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Isophorone | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Naphthalene | 2.07 | 0.250 | mg/kg wet | 2.500 | | 83 | 40-140 | | | |
| Nitrobenzene | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| N-Nitrosodimethylamine | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| Pentachlorophenol | 2.30 | 1.00 | mg/kg wet | 2.500 | | 92 | 15-140 | | | |
| Phenanthrene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Phenol | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | | | |
| Pyrene | 2.97 | 0.250 | mg/kg wet | 2.500 | | 119 | 40-140 | | | |
| Pyridine | 2.11 | 0.250 | mg/kg wet | 2.500 | | 84 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.83* | | mg/kg wet | *2.500* | | *113* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.87* | | mg/kg wet | *3.750* | | *130* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.58* | | mg/kg wet | *3.750* | | *122* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *3.02* | | mg/kg wet | *2.500* | | *121* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.63* | | mg/kg wet | *3.750* | | *124* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.76* | | mg/kg wet | *2.500* | | *110* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.44* | | mg/kg wet | *3.750* | | *118* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *3.68* | | mg/kg wet | *2.500* | | *147* | *30-130* | | | S+ |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40439 - 3546** | | | | | | | | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.49 | 0.025 | mg/kg wet | 2.500 | | 100 | 40-140 | 4 | 30 | |
| 1,2,4-Trichlorobenzene | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | 3 | 30 | |
| 1,2-Dichlorobenzene | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | 2 | 30 | |
| 1,3-Dichlorobenzene | 2.25 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 4 | 30 | |
| 1,4-Dichlorobenzene | 2.23 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | 4 | 30 | |
| 2,4,5-Trichlorophenol | 2.51 | 0.250 | mg/kg wet | 2.500 | | 101 | 30-130 | 1 | 30 | |
| 2,4,6-Trichlorophenol | 2.55 | 0.250 | mg/kg wet | 2.500 | | 102 | 30-130 | 4 | 30 | |
| 2,4-Dichlorophenol | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 30-130 | 0.6 | 30 | |
| 2,4-Dimethylphenol | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 30-130 | 1 | 30 | |
| 2,4-Dinitrophenol | 3.01 | 1.00 | mg/kg wet | 2.500 | | 120 | 15-140 | 9 | 30 | |
| 2,4-Dinitrotoluene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 0.8 | 30 | |
| 2,6-Dinitrotoluene | 2.46 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 0.5 | 30 | |
| 2-Chloronaphthalene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 4 | 30 | |
| 2-Chlorophenol | 2.44 | 0.250 | mg/kg wet | 2.500 | | 97 | 30-130 | 1 | 30 | |
| 2-Methylnaphthalene | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | 2 | 30 | |
| 2-Methylphenol | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 15-140 | 0.4 | 30 | |
| 2-Nitrophenol | 2.22 | 0.500 | mg/kg wet | 2.500 | | 89 | 30-130 | 0.9 | 30 | |
| 3,3´-Dichlorobenzidine | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 0.8 | 30 | |
| 3+4-Methylphenol | 4.75 | 0.250 | mg/kg wet | 5.000 | | 95 | 15-140 | 0.05 | 30 | |
| 4-Bromophenyl-phenylether | 2.61 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 2 | 30 | |
| 4-Chloroaniline | 1.62 | 0.250 | mg/kg wet | 2.500 | | 65 | 15-140 | 2 | 30 | |
| 4-Nitrophenol | 2.24 | 1.00 | mg/kg wet | 2.500 | | 90 | 15-140 | 3 | 30 | |
| Acenaphthene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 3 | 30 | |
| Acenaphthylene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 3 | 30 | |
| Acetophenone | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 2 | 30 | |
| Aniline | 1.35 | 0.250 | mg/kg wet | 2.500 | | 54 | 40-140 | 2 | 30 | |
| Anthracene | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 2 | 30 | |
| Azobenzene | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 3 | 30 | |
| Benzo(a)anthracene | 2.51 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 2 | 30 | |
| Benzo(a)pyrene | 2.45 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 3 | 30 | |
| Benzo(b)fluoranthene | 2.44 | 0.250 | mg/kg wet | 2.500 | | 98 | 40-140 | 2 | 30 | |
| Benzo(g,h,i)perylene | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 4 | 30 | |
| Benzo(k)fluoranthene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 6 | 30 | |
| bis(2-Chloroethoxy)methane | 1.99 | 0.250 | mg/kg wet | 2.500 | | 80 | 40-140 | 3 | 30 | |
| bis(2-Chloroethyl)ether | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | 2 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.04 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | 2 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 5 | 30 | |
| Butylbenzylphthalate | 2.68 | 0.250 | mg/kg wet | 2.500 | | 107 | 40-140 | 5 | 30 | |
| Chrysene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 1 | 30 | |
| Dibenzo(a,h)Anthracene | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 1 | 30 | |
| Dibenzofuran | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 2 | 30 | |
| Diethylphthalate | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 2 | 30 | |
| Dimethylphthalate | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 15-140 | 2 | 30 | |
| Di-n-butylphthalate | 2.56 | 0.250 | mg/kg wet | 2.500 | | 102 | 40-140 | 3 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40439 - 3546** | | | | | | | | | | |
| Di-n-octylphthalate | 2.87 | 0.500 | mg/kg wet | 2.500 | | 115 | 40-140 | 9 | 30 | |
| Fluoranthene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 0.4 | 30 | |
| Fluorene | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 2 | 30 | |
| Hexachlorobenzene | 2.50 | 0.250 | mg/kg wet | 2.500 | | 100 | 40-140 | 4 | 30 | |
| Hexachlorobutadiene | 2.06 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | 5 | 30 | |
| Hexachloroethane | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | 4 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | 4 | 30 | |
| Isophorone | 1.99 | 0.250 | mg/kg wet | 2.500 | | 80 | 40-140 | 3 | 30 | |
| Naphthalene | 2.00 | 0.250 | mg/kg wet | 2.500 | | 80 | 40-140 | 3 | 30 | |
| Nitrobenzene | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | 3 | 30 | |
| N-Nitrosodimethylamine | 2.24 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 3 | 30 | |
| Pentachlorophenol | 2.37 | 1.00 | mg/kg wet | 2.500 | | 95 | 15-140 | 3 | 30 | |
| Phenanthrene | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 2 | 30 | |
| Phenol | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | 0.2 | 30 | |
| Pyrene | 2.79 | 0.250 | mg/kg wet | 2.500 | | 112 | 40-140 | 6 | 30 | |
| Pyridine | 2.00 | 0.250 | mg/kg wet | 2.500 | | 80 | 40-140 | 6 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.76* | | mg/kg wet | *2.500* | | *111* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *4.83* | | mg/kg wet | *3.750* | | *129* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *4.58* | | mg/kg wet | *3.750* | | *122* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.90* | | mg/kg wet | *2.500* | | *116* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *4.53* | | mg/kg wet | *3.750* | | *121* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.73* | | mg/kg wet | *2.500* | | *109* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *4.42* | | mg/kg wet | *3.750* | | *118* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *3.43* | | mg/kg wet | *2.500* | | *137* | *30-130* | | | S+ |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF40401 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.05 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF40401 - 3540C** | | | | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.05 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0224* | | mg/kg wet | *0.02500* | | *89* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0240* | | mg/kg wet | *0.02500* | | *96* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0204* | | mg/kg wet | *0.02500* | | *82* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0218* | | mg/kg wet | *0.02500* | | *87* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 82 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 87 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 86 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 88 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0225* | | mg/kg wet | *0.02500* | | *90* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0242* | | mg/kg wet | *0.02500* | | *97* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0206* | | mg/kg wet | *0.02500* | | *82* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0215* | | mg/kg wet | *0.02500* | | *86* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 84 | 40-140 | 2 | 30 | |
| Aroclor 1016 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 89 | 40-140 | 2 | 30 | |
| Aroclor 1260 | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 87 | 40-140 | 1 | 30 | |
| Aroclor 1260 [2C] | 0.4 | 0.05 | mg/kg wet | 0.5000 | | 90 | 40-140 | 1 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0229* | | mg/kg wet | *0.02500* | | *91* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0246* | | mg/kg wet | *0.02500* | | *98* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0213* | | mg/kg wet | *0.02500* | | *85* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0222* | | mg/kg wet | *0.02500* | | *89* | *30-150* | | | |
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF40402 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 4,4´-DDD | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDD [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Chlordane (Total) | ND | 0.0200 | mg/kg wet | | | | | | | |
| Chlordane (Total) [2C] | ND | 0.0200 | mg/kg wet | | | | | | | |
| delta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| delta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF40402 - 3546** | | | | | | | | | | |
| Dieldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) [2C] | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Toxaphene | ND | 0.125 | mg/kg wet | | | | | | | |
| Toxaphene [2C] | ND | 0.125 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0137* | | mg/kg wet | *0.01250* | | *110* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0146* | | mg/kg wet | *0.01250* | | *117* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0114* | | mg/kg wet | *0.01250* | | *91* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0121* | | mg/kg wet | *0.01250* | | *97* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 4,4´-DDD | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | | | |
| 4,4´-DDD [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | | | |
| 4,4´-DDE | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| 4,4´-DDE [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| 4,4´-DDT | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | | | |
| 4,4´-DDT [2C] | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 109 | 40-140 | | | |
| Aldrin | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Aldrin [2C] | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |
| alpha-BHC | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | | | |
| alpha-BHC [2C] | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| alpha-Chlordane | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| alpha-Chlordane [2C] | 0.0122 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| beta-BHC | 0.0110 | 0.0025 | mg/kg wet | 0.01250 | | 88 | 40-140 | | | |
| beta-BHC [2C] | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF40402 - 3546** | | | | | | | | | | |
| delta-BHC | 0.0087 | 0.0025 | mg/kg wet | 0.01250 | | 70 | 40-140 | | | |
| delta-BHC [2C] | 0.0098 | 0.0025 | mg/kg wet | 0.01250 | | 78 | 40-140 | | | |
| Dieldrin | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| Dieldrin [2C] | 0.0136 | 0.0025 | mg/kg wet | 0.01250 | | 108 | 40-140 | | | |
| Endosulfan I | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | | | |
| Endosulfan I [2C] | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | | | |
| Endosulfan II | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | | | |
| Endosulfan II [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | | | |
| Endosulfan Sulfate | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Endosulfan Sulfate [2C] | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | | | |
| Endrin | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| Endrin [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | | | |
| Endrin Ketone | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | | | |
| Endrin Ketone [2C] | 0.0145 | 0.0025 | mg/kg wet | 0.01250 | | 116 | 40-140 | | | |
| gamma-BHC (Lindane) | 0.0111 | 0.0015 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| gamma-BHC (Lindane) [2C] | 0.0118 | 0.0015 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |
| gamma-Chlordane | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| gamma-Chlordane [2C] | 0.0141 | 0.0025 | mg/kg wet | 0.01250 | | 113 | 40-140 | | | |
| Heptachlor | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Heptachlor [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| Heptachlor Epoxide | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | | | |
| Heptachlor Epoxide [2C] | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | | | |
| Hexachlorobenzene | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | | | |
| Hexachlorobenzene [2C] | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | | | |
| Methoxychlor | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Methoxychlor [2C] | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0145* | | mg/kg wet | *0.01250* | | *116* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0154* | | mg/kg wet | *0.01250* | | *123* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0112* | | mg/kg wet | *0.01250* | | *90* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0124* | | mg/kg wet | *0.01250* | | *99* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 4,4´-DDD | 0.0136 | 0.0025 | mg/kg wet | 0.01250 | | 109 | 40-140 | 4 | 30 | |
| 4,4´-DDD [2C] | 0.0144 | 0.0025 | mg/kg wet | 0.01250 | | 115 | 40-140 | 3 | 30 | |
| 4,4´-DDE | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 7 | 30 | |
| 4,4´-DDE [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 5 | 30 | |
| 4,4´-DDT | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 3 | 30 | |
| 4,4´-DDT [2C] | 0.0139 | 0.0025 | mg/kg wet | 0.01250 | | 111 | 40-140 | 2 | 30 | |
| Aldrin | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 7 | 30 | |
| Aldrin [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 6 | 30 | |
| alpha-BHC | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | 7 | 30 | |
| alpha-BHC [2C] | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 9 | 30 | |
| alpha-Chlordane | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 7 | 30 | |
| alpha-Chlordane [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 4 | 30 | |
| beta-BHC | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | 4 | 30 | |
| beta-BHC [2C] | 0.0129 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 10 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF40402 - 3546** | | | | | | | | | | |
| delta-BHC | 0.0098 | 0.0025 | mg/kg wet | 0.01250 | | 78 | 40-140 | 11 | 30 | |
| delta-BHC [2C] | 0.0102 | 0.0025 | mg/kg wet | 0.01250 | | 82 | 40-140 | 4 | 30 | |
| Dieldrin | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 3 | 30 | |
| Dieldrin [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | 3 | 30 | |
| Endosulfan I | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | 4 | 30 | |
| Endosulfan I [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 3 | 30 | |
| Endosulfan II | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 3 | 30 | |
| Endosulfan II [2C] | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 110 | 40-140 | 3 | 30 | |
| Endosulfan Sulfate | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 3 | 30 | |
| Endosulfan Sulfate [2C] | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 2 | 30 | |
| Endrin | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 3 | 30 | |
| Endrin [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 3 | 30 | |
| Endrin Ketone | 0.0136 | 0.0025 | mg/kg wet | 0.01250 | | 109 | 40-140 | 3 | 30 | |
| Endrin Ketone [2C] | 0.0148 | 0.0025 | mg/kg wet | 0.01250 | | 119 | 40-140 | 2 | 30 | |
| gamma-BHC (Lindane) | 0.0125 | 0.0015 | mg/kg wet | 0.01250 | | 100 | 40-140 | 12 | 30 | |
| gamma-BHC (Lindane) [2C] | 0.0127 | 0.0015 | mg/kg wet | 0.01250 | | 102 | 40-140 | 8 | 30 | |
| gamma-Chlordane | 0.0138 | 0.0025 | mg/kg wet | 0.01250 | | 110 | 40-140 | 5 | 30 | |
| gamma-Chlordane [2C] | 0.0146 | 0.0025 | mg/kg wet | 0.01250 | | 117 | 40-140 | 3 | 30 | |
| Heptachlor | 0.0124 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 9 | 30 | |
| Heptachlor [2C] | 0.0129 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 7 | 30 | |
| Heptachlor Epoxide | 0.0124 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 6 | 30 | |
| Heptachlor Epoxide [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 3 | 30 | |
| Hexachlorobenzene | 0.0111 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | 2 | 30 | |
| Hexachlorobenzene [2C] | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | 7 | 30 | |
| Methoxychlor | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | 0.5 | 30 | |
| Methoxychlor [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 0.7 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0144* | | mg/kg wet | *0.01250* | | *115* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0153* | | mg/kg wet | *0.01250* | | *122* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0114* | | mg/kg wet | *0.01250* | | *92* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0126* | | mg/kg wet | *0.01250* | | *101* | *30-150* | | | |
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF40558 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 2,4,5-T | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-T [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4-D | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-D [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-DB | ND | 0.048 | mg/kg wet | | | | | | | |
| 2,4-DB [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| Dalapon | ND | 0.046 | mg/kg wet | | | | | | | |
| Dalapon [2C] | ND | 0.046 | mg/kg wet | | | | | | | |
| Dicamba | ND | 0.009 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF40558 - 3546** | | | | | | | | | | |
| Dicamba [2C] | ND | 0.009 | mg/kg wet | | | | | | | |
| Dichlorprop | ND | 0.047 | mg/kg wet | | | | | | | |
| Dichlorprop [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| Dinoseb | ND | 0.048 | mg/kg wet | | | | | | | |
| Dinoseb [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| MCPA | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPA [2C] | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPP | ND | 2.35 | mg/kg wet | | | | | | | |
| MCPP [2C] | ND | 2.35 | mg/kg wet | | | | | | | |
| *Surrogate: DCAA* | *0.186* | | mg/kg wet | *0.2000* | | *93* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.149* | | mg/kg wet | *0.2000* | | *74* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 2,4,5-T | 0.011 | 0.010 | mg/kg wet | 0.01900 | | 56 | 40-140 | | | |
| 2,4,5-T [2C] | 0.010 | 0.010 | mg/kg wet | 0.01900 | | 54 | 40-140 | | | |
| 2,4,5-TP (Silvex) | 0.011 | 0.010 | mg/kg wet | 0.01900 | | 60 | 40-140 | | | |
| 2,4,5-TP (Silvex) [2C] | 0.011 | 0.010 | mg/kg wet | 0.01900 | | 58 | 40-140 | | | |
| 2,4-D | 0.116 | 0.047 | mg/kg wet | 0.1880 | | 62 | 40-140 | | | |
| 2,4-D [2C] | 0.101 | 0.047 | mg/kg wet | 0.1880 | | 54 | 40-140 | | | |
| 2,4-DB | 0.125 | 0.048 | mg/kg wet | 0.1900 | | 66 | 40-140 | | | |
| 2,4-DB [2C] | 0.123 | 0.048 | mg/kg wet | 0.1900 | | 65 | 40-140 | | | |
| Dalapon | 0.230 | 0.046 | mg/kg wet | 0.4550 | | 51 | 40-140 | | | |
| Dalapon [2C] | 0.226 | 0.046 | mg/kg wet | 0.4550 | | 50 | 40-140 | | | |
| Dicamba | 0.011 | 0.009 | mg/kg wet | 0.01880 | | 56 | 40-140 | | | |
| Dicamba [2C] | 0.011 | 0.009 | mg/kg wet | 0.01880 | | 60 | 40-140 | | | |
| Dichlorprop | 0.147 | 0.047 | mg/kg wet | 0.1880 | | 78 | 40-140 | | | |
| Dichlorprop [2C] | 0.118 | 0.047 | mg/kg wet | 0.1880 | | 63 | 40-140 | | | |
| Dinoseb | 0.016 | 0.048 | mg/kg wet | 0.09500 | | 16 | 10-100 | | | |
| Dinoseb [2C] | 0.016 | 0.048 | mg/kg wet | 0.09500 | | 17 | 10-100 | | | |
| MCPA | 11.5 | 2.32 | mg/kg wet | 18.60 | | 62 | 40-140 | | | |
| MCPA [2C] | 12.5 | 2.32 | mg/kg wet | 18.60 | | 67 | 40-140 | | | |
| MCPP | 12.1 | 2.35 | mg/kg wet | 18.80 | | 64 | 40-140 | | | |
| MCPP [2C] | 11.9 | 2.35 | mg/kg wet | 18.80 | | 63 | 40-140 | | | |
| *Surrogate: DCAA* | *0.175* | | mg/kg wet | *0.2000* | | *87* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.151* | | mg/kg wet | *0.2000* | | *75* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 2,4,5-T | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 66 | 40-140 | 16 | 30 | |
| 2,4,5-T [2C] | 0.012 | 0.010 | mg/kg wet | 0.01900 | | 62 | 40-140 | 14 | 30 | |
| 2,4,5-TP (Silvex) | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | 12 | 30 | |
| 2,4,5-TP (Silvex) [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | 16 | 30 | |
| 2,4-D | 0.143 | 0.047 | mg/kg wet | 0.1880 | | 76 | 40-140 | 21 | 30 | |
| 2,4-D [2C] | 0.120 | 0.047 | mg/kg wet | 0.1880 | | 64 | 40-140 | 17 | 30 | |
| 2,4-DB | 0.139 | 0.048 | mg/kg wet | 0.1900 | | 73 | 40-140 | 11 | 30 | |
| 2,4-DB [2C] | 0.137 | 0.048 | mg/kg wet | 0.1900 | | 72 | 40-140 | 11 | 30 | |
| Dalapon | 0.303 | 0.046 | mg/kg wet | 0.4550 | | 67 | 40-140 | 27 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF40558 - 3546** | | | | | | | | | | |
| Dalapon [2C] | 0.297 | 0.046 | mg/kg wet | 0.4550 | | 65 | 40-140 | 27 | 30 | |
| Dicamba | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 66 | 40-140 | 16 | 30 | |
| Dicamba [2C] | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 66 | 40-140 | 10 | 30 | |
| Dichlorprop | 0.175 | 0.047 | mg/kg wet | 0.1880 | | 93 | 40-140 | 17 | 30 | |
| Dichlorprop [2C] | 0.138 | 0.047 | mg/kg wet | 0.1880 | | 73 | 40-140 | 15 | 30 | |
| Dinoseb | 0.020 | 0.048 | mg/kg wet | 0.09500 | | 21 | 10-100 | 24 | 30 | |
| Dinoseb [2C] | 0.019 | 0.048 | mg/kg wet | 0.09500 | | 20 | 10-100 | 17 | 30 | |
| MCPA | 14.3 | 2.32 | mg/kg wet | 18.60 | | 77 | 40-140 | 21 | 30 | |
| MCPA [2C] | 14.9 | 2.32 | mg/kg wet | 18.60 | | 80 | 40-140 | 17 | 30 | |
| MCPP | 14.2 | 2.35 | mg/kg wet | 18.80 | | 76 | 40-140 | 17 | 30 | |
| MCPP [2C] | 14.2 | 2.35 | mg/kg wet | 18.80 | | 76 | 40-140 | 18 | 30 | |
| *Surrogate: DCAA* | *0.187* | | mg/kg wet | *0.2000* | | *93* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.157* | | mg/kg wet | *0.2000* | | *79* | *30-150* | | | |
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF40440 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Decane (C10) | ND | 0.2 | mg/kg wet | | | | | | | |
| Docosane (C22) | ND | 0.2 | mg/kg wet | | | | | | | |
| Dodecane (C12) | ND | 0.2 | mg/kg wet | | | | | | | |
| Eicosane (C20) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexacosane (C26) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexadecane (C16) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexatriacontane (C36) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonadecane (C19) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonane (C9) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octacosane (C28) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octadecane (C18) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetracosane (C24) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetradecane (C14) | ND | 0.2 | mg/kg wet | | | | | | | |
| Total Petroleum Hydrocarbons (C9-C36) | ND | 10.0 | mg/kg wet | | | | | | | |
| Triacontane (C30) | ND | 0.2 | mg/kg wet | | | | | | | |
| *Surrogate: O-Terphenyl* | *4.16* | | mg/kg wet | *5.000* | | *83* | *40-140* | | | |
| **LCS** | | | | | | | | | | |
| Decane (C10) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | | | |
| Docosane (C22) | 2.5 | 0.2 | mg/kg wet | 2.500 | | 98 | 40-140 | | | |
| Dodecane (C12) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Eicosane (C20) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Hexacosane (C26) | 2.5 | 0.2 | mg/kg wet | 2.500 | | 99 | 40-140 | | | |
| Hexadecane (C16) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| Hexatriacontane (C36) | 2.8 | 0.2 | mg/kg wet | 2.500 | | 113 | 40-140 | | | |
| Nonadecane (C19) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| Nonane (C9) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 69 | 30-140 | | | |
| Octacosane (C28) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Octadecane (C18) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF40440 - 3546** | | | | | | | | | | |
| Tetracosane (C24) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Tetradecane (C14) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Total Petroleum Hydrocarbons (C9-C36) | 32.1 | 10.0 | mg/kg wet | 35.00 | | 92 | 40-140 | | | |
| Triacontane (C30) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| *Surrogate: O-Terphenyl* | *4.63* | | mg/kg wet | *5.000* | | *93* | *40-140* | | | |
| **LCS Dup** | | | | | | | | | | |
| Decane (C10) | 1.9 | 0.2 | mg/kg wet | 2.500 | | 77 | 40-140 | 4 | 25 | |
| Docosane (C22) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 96 | 40-140 | 3 | 25 | |
| Dodecane (C12) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 83 | 40-140 | 4 | 25 | |
| Eicosane (C20) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 93 | 40-140 | 3 | 25 | |
| Hexacosane (C26) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 97 | 40-140 | 2 | 25 | |
| Hexadecane (C16) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 89 | 40-140 | 3 | 25 | |
| Hexatriacontane (C36) | 2.8 | 0.2 | mg/kg wet | 2.500 | | 110 | 40-140 | 2 | 25 | |
| Nonadecane (C19) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 93 | 40-140 | 2 | 25 | |
| Nonane (C9) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 67 | 30-140 | 4 | 25 | |
| Octacosane (C28) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 92 | 40-140 | 2 | 25 | |
| Octadecane (C18) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 89 | 40-140 | 3 | 25 | |
| Tetracosane (C24) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 91 | 40-140 | 3 | 25 | |
| Tetradecane (C14) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 86 | 40-140 | 3 | 25 | |
| Total Petroleum Hydrocarbons (C9-C36) | 31.0 | 10.0 | mg/kg wet | 35.00 | | 89 | 40-140 | 3 | 25 | |
| Triacontane (C30) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | 2 | 25 | |
| *Surrogate: O-Terphenyl* | *4.43* | | mg/kg wet | *5.000* | | *89* | *40-140* | | | |
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DF40442 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Reactive Cyanide | ND | 2.0 | mg/kg | | | | | | | |
| Reactive Sulfide | ND | 2.0 | mg/kg | | | | | | | |
| **LCS** | | | | | | | | | | |
| Reactive Cyanide | 4.1 | 2.0 | mg/kg | 100.3 | | 4 | 0.68-5.41 | | | |
| Reactive Sulfide | 2.2 | 2.0 | mg/kg | 10.00 | | 22 | 0-44 | | | |
| **Batch DF40447 - General Preparation** | | | | | | | | | | |
| **Reference** | | | | | | | | | | |
| Flashpoint | 81 | | °F | 81.00 | | 100 | 97.9-102.1 | | | |
| **Batch DF40448 - General Preparation** | | | | | | | | | | |
| **Reference** | | | | | | | | | | |
| Flashpoint | 81 | | °F | 81.00 | | 100 | 97.9-102.1 | | | |
| **Batch DF40557 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Conductivity | ND | 5 | umhos/cm | | | | | | | |
| **LCS** | | | | | | | | | | |
| Conductivity | 1400 | | umhos/cm | 1410 | | 99 | 90-110 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DF40559 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Reactive Cyanide | ND | 2.0 | mg/kg | | | | | | | |
| Reactive Sulfide | ND | 2.0 | mg/kg | | | | | | | |
| **LCS** | | | | | | | | | | |
| Reactive Cyanide | 4.1 | 2.0 | mg/kg | 100.3 | | 4 | 0.68-5.41 | | | |
| Reactive Sulfide | 2.1 | 2.0 | mg/kg | 10.00 | | 21 | 0-44 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

**Notes and Definitions**

| | |
|---|---|
| WL | Results obtained from a deionized water leach of the sample. |
| U | Analyte included in the analysis, but not detected |
| S+ | Surrogate recovery(ies) above upper control limit (S+). |
| RRF | Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration |
| Q | Calibration required quadratic regression (Q). |
| EL | Elevated Method Reporting Limits due to sample matrix (EL). |
| D | Diluted. |
| CD- | Continuing Calibration %Diff/Drift is below control limit (CD-). |
| > | Greater than. |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0072

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24F0072
Date Received: 6/4/2024
Project Due Date: 6/11/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.5 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? (Yes) / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: 6/4/24 Time: 1013 By: TO

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted: Date: Time: By:

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 555965 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 555966 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 555971 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 2 | 555977 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 555978 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 556266 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 3 | 555967 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 555968 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 555972 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 4 | 555979 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 555980 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 556267 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 5 | 555969 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 5 | 555970 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 5 | 555973 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 6 | 555981 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 555982 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 556268 | Yes | N/A | Yes | 4 oz. Jar | NP | |

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

ESS Project ID: 24F0072
Date Received: 6/4/2024

**2nd Review**
**Were all containers scanned into storage/lab?** Initials: [illegible]
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: [illegible] Date & Time: 6/4/24 16:03
Reviewed By: [illegible] Date & Time: 6/4/24 1603

# ESS Laboratory

*Division of Thielsch Engineering, Inc.*
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

## CHAIN OF CUSTODY

ESS Lab # 24F0672

| | | |
|---|---|---|
| **Turn Time** | 5 | Days |
| **Regulatory State** | Massachusetts | |
| **Reporting Limits** | compare results to RCS-1, RCS-2, Lined and unlined landfills, TCLP, and 20X if needed. | |

**Is this project for any of the following?:** ○ CT RCP ◉ MA MCP ○ RGP

**Electonic Deliverables:** ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) EDD

| Company Name | Project # | Project Name |
|---|---|---|
| Civil and Environmental Consultants | 332-344 | MassCEC Phase III - Site #4 |

| Contact Person | Address |
|---|---|
| Cassia Dal Bello | 31 Bellows Road |

| City | State | Zip Code | PO # |
|---|---|---|---|
| Raynham | MA | 02767 | |

| Telephone Number | FAX Number | Email Address |
|---|---|---|
| 774-501-2176 | | cdalbello; jkitchen, dbarboza@cecinc.com |

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | Analysis: RCRA8 Metals | PCBs via 3540C | TPH | SVOC - incl pyr | Pest - incl Tox | Herbicides | Reactivity | Conductivity | pH | Free Liquid | Flashpoint | VOC - high | VOC - low | Grain Size Analysis (Sieve Only) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6/3/24 | 12:35 | Solid | Soil | CEC-4A 9'-11' | | | | | | | | | | | | X | X | | | |
| 2 | | 12:45 | | | CEC-4A ~~D-12'~~ D-12' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 3 | | 13:10 | | | CEC-4A 19'-21' | | | | | | | | | | | | X | X | | | |
| 4 | | 13:15 | | | CEC-4A 12'-24' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 5 | | 13:50 | | | CEC-4A 29'-31' | | | | | | | | | | | | X | X | | | |
| 6 | ↓ | 14:00 | ↓ | ↓ | CEC-4A 24'-36' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Container Type:** | AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial | | | | | | | | | | | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | V | V | J | J |
| **Container Volume:** | 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* | | | | | | | | | | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7 | 7 | 10 | 9 |
| **Preservation Code:** | 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* | | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 10 | 1 | 1 |
| | **Number of Containers per Sample:** | | | | | | | | | | | 1 | | | | | 1 | | | | | 1 | 1 | 2 | 1 | 1 |

**Laboratory Use Only**

Cooler Present: YES ○ Drop Off
Seals Intact: ○ Pickup
Cooler Temperature: 3.5 °C Ice

**Sampled by :** CI

**Comments:** Please specify "Other" preservative and containers types in this space

Run TCLP if fails 20x

| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
|---|---|---|---|
| 6/4/24 10:09 | 6/4/24 10:09 | 6/4/24 5:54 | 6/4/24 15:53 |
| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
| | | | |

ESS Laboratory
DIVISION OF THE RISE GROUP
BAL Laboratory Analytical Balance

*CERTIFICATE OF ANALYSIS*

Cassia DalBello
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

**RE: MassCEC Phase III - Site 4 (332-344)**
**ESS Laboratory Work Order Number: 24F0229**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

**REVIEWED**
**By ESS Laboratory at 5:08 pm, Jun 13, 2024**

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

## SAMPLE RECEIPT

The following samples were received on June 06, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

**Low Level VOA vials were frozen by ESS Laboratory on 6/06/24 at 17:23.**
**Tetrahydrofuran is reported above the MA CAM reporting limit of 0.010 mg/kg.**

**Question I: All samples for EPH and Metals were analyzed for a subset of the required MCP list per the client's request.**

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 24F0229-01 | CEC-5A 9-11ft | Soil | 8260D Low |
| 24F0229-02 | CEC-5A 0-12ft | Soil | 1010A, 2550B, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24F0229-03 | CEC-5A 19-21ft | Soil | 8260D Low |
| 24F0229-04 | CEC-5A 12-24ft | Soil | 1010A, 2550B, 6010D, 6020B, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |
| 24F0229-05 | CEC-5A 29-31ft | Soil | 8260D Low |
| 24F0229-06 | CEC-5A 24-36ft | Soil | 1010A, 2550B, 6010D, 6020B, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8100M, 8151A, 8270E, 9045, 9050A, 9095A |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

## PROJECT NARRATIVE

**8081B Organochlorine Pesticides**

D4F0167-CCV6 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
4,4´-DDE [2C] (21% @ 20%), 4,4´-DDT (32% @ 20%), 4,4´-DDT [2C] (38% @ 20%), alpha-Chlordane [2C] (22% @ 20%), Dieldrin [2C] (24% @ 20%), Endosulfan I [2C] (22% @ 20%), Endosulfan II [2C] (24% @ 20%), Endosulfan Sulfate (21% @ 20%), Endosulfan Sulfate [2C] (26% @ 20%), Endrin [2C] (26% @ 20%), Endrin Ketone (26% @ 20%), Endrin Ketone [2C] (28% @ 20%), gamma-Chlordane [2C] (21% @ 20%), Methoxychlor (31% @ 20%), Methoxychlor [2C] (34% @ 20%)

**8151A Chlorinated Herbicides**

D4F0215-CCV3 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Dinoseb [2C] (16% @ 15%)

**Semi-Volatile Organic Compounds**

D4F0179-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (106% @ 40-160%)

**Total Metals**

24F0229-04 **RSD of replicate analysis > 20%. Reanalysis produced similar results.**
Arsenic

24F0229-06 **Elevated Method Reporting Limits due to sample matrix (EL).**
Arsenic , Cadmium , Lead , Silver

DF40714-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Arsenic (70% @ 73-127%), Chromium (74% @ 74-126%), Lead (71% @ 72-128%), Selenium (68% @ 70-129%)

**Volatile Organics Low Level**

D4F0157-CCV1 **Calibration required quadratic regression (Q).**
Naphthalene (92% @ 40-160%)

D4F0157-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
1,4-Dioxane (30% @ 20%), Tetrahydrofuran (23% @ 20%)

DF40901-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
Acetone (24% @ 20%)

**No other observations noted.**

**End of Project Narrative.**

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

## MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24F0229-01 through 24F0229-06**

Matrices: ( ) Ground Water/Surface Water (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

**CAM Protocol** (check all that apply below):

| | | | | | |
|---|---|---|---|---|---|
| (X) 8260 VOC CAM II A | (X) 7470/7471 Hg CAM III B | ( ) MassDEP VPH (GC/PID/FID) CAM IV A | (X) 8082 PCB CAM V A | ( ) 9014 Total Cyanide/PAC CAM VI A | ( ) 6860 Perchlorate CAM VIII B |
| (X) 8270 SVOC CAM II B | ( ) 7010 Metals CAM III C | ( ) MassDEP VPH (GC/MS) CAM IV C | (X) 8081 Pesticides CAM V B | ( ) 7196 Hex Cr CAM VI B | ( ) MassDEP APH CAM IX A |
| (X) 6010 Metals CAM III A | (X) 6020 Metals CAM III D | (X) MassDEP EPH CAM IV B | (X) 8151 Herbicides CAM V C | ( ) Explosives CAM VIII A | ( ) TO-15 VOC CAM IX B |

***Affirmative responses to questions A through F are required for "Presumptive Certainty" status***

| | | |
|---|---|---|
| A | Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times? | Yes (X) No ( ) |
| B | Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed? | Yes (X) No ( ) |
| C | Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances? | Yes (X) No ( ) |
| D | Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? | Yes (X) No ( ) |
| E | VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). | Yes (X) No ( ) |
| | b. APH and TO-15 Methods only: Was the complete analyte list reported for each method? | Yes ( ) No ( ) |
| F | Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)? | Yes (X) No ( ) |

***Responses to Questions G, H and I below are required for '"Presumptive Certainty" status***

| | | |
|---|---|---|
| G | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? | Yes ( ) No (X)* |
| | ***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.** | |
| H | Were **all** QC performance standards specified in the CAM protocol(s) achieved? | Yes ( ) No (X)* |
| I | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes ( ) No (X)* |

***All negative responses must be addressed in an attached laboratory narrative.***

***I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.***

Signature: _____ Date: June 13, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 9-11ft
Date Sampled: 06/05/24 13:25
Percent Solids: 88
Initial Volume: 6.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/9/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,1,1-Trichloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,1,2,2-Tetrachloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,1,2-Trichloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,1-Dichloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,1-Dichloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,1-Dichloropropene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,2,3-Trichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,2,3-Trichloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,2,4-Trichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,2,4-Trimethylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,2-Dibromoethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,2-Dichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,2-Dichloroethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,2-Dichloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,3,5-Trimethylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,3-Dichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,3-Dichloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,4-Dichlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 1,4-Dioxane | ND (0.0888) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 2,2-Dichloropropane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 2-Butanone | ND (0.0444) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 2-Chlorotoluene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 2-Hexanone | ND (0.0444) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 4-Chlorotoluene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| 4-Isopropyltoluene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 9-11ft
Date Sampled: 06/05/24 13:25
Percent Solids: 88
Initial Volume: 6.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/9/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0444) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| **Acetone** | **0.202** (0.0444) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Benzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Bromobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Bromochloromethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Bromodichloromethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Bromoform | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Bromomethane | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Carbon Disulfide | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Carbon Tetrachloride | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Chlorobenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Chloroethane | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Chloroform | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Chloromethane | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| cis-1,2-Dichloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| cis-1,3-Dichloropropene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Dibromochloromethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Dibromomethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Dichlorodifluoromethane | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Diethyl Ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Di-isopropyl ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Ethyl tertiary-butyl ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Ethylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Hexachlorobutadiene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Isopropylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Methyl tert-Butyl Ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Methylene Chloride | ND (0.0222) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 9-11ft
Date Sampled: 06/05/24 13:25
Percent Solids: 88
Initial Volume: 6.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/9/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| n-Butylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| n-Propylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| sec-Butylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Styrene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| tert-Butylbenzene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Tertiary-amyl methyl ether | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Tetrachloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Tetrahydrofuran | ND (0.0178) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Toluene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| trans-1,2-Dichloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| trans-1,3-Dichloropropene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Trichloroethene | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Trichlorofluoromethane | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Vinyl Chloride | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Xylene O | ND (0.0044) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Xylene P,M | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |
| Xylenes (Total) | ND (0.0089) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:25 | D4F0157 | DF40901 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *107 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *97 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *104 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *105 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 0-12ft
Date Sampled: 06/05/24 13:35
Percent Solids: 88

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **2.97** (2.10) | --- | 6010D | --- | 1 | KJB | 06/07/24 20:11 | 2.7 100 | DF40714 |
| **Barium** | **23.2** (0.84) | --- | 6010D | --- | 1 | KJB | 06/07/24 20:11 | 2.7 100 | DF40714 |
| Cadmium | ND (0.42) | --- | 6010D | --- | 1 | KJB | 06/07/24 20:11 | 2.7 100 | DF40714 |
| **Chromium** | **13.2** (0.84) | --- | 6010D | --- | 1 | KJB | 06/07/24 20:11 | 2.7 100 | DF40714 |
| **Lead** | **14.0** (4.21) | --- | 6010D | --- | 1 | KJB | 06/07/24 20:11 | 2.7 100 | DF40714 |
| Mercury | ND (0.034) | --- | 7471B | --- | 1 | AFV | 06/07/24 18:35 | 0.66 40 | DF40717 |
| Selenium | ND (4.21) | --- | 6010D | --- | 1 | KJB | 06/07/24 20:11 | 2.7 100 | DF40714 |
| Silver | ND (0.42) | --- | 6010D | --- | 1 | KJB | 06/07/24 20:11 | 2.7 100 | DF40714 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 0-12ft
Date Sampled: 06/05/24 13:35
Percent Solids: 88
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/6/24 18:25

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 1,2,4-Trichlorobenzene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 1,2-Dichlorobenzene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 1,3-Dichlorobenzene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 1,4-Dichlorobenzene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 2,4,5-Trichlorophenol | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 2,4,6-Trichlorophenol | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 2,4-Dichlorophenol | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 2,4-Dimethylphenol | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 2,4-Dinitrophenol | ND (1.14) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 2,4-Dinitrotoluene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 2,6-Dinitrotoluene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 2-Chloronaphthalene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 2-Chlorophenol | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 2-Methylnaphthalene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 2-Methylphenol | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 2-Nitrophenol | ND (0.571) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 3,3´-Dichlorobenzidine | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 3+4-Methylphenol | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 4-Bromophenyl-phenylether | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 4-Chloroaniline | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| 4-Nitrophenol | ND (1.14) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Acenaphthene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Acenaphthylene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Acetophenone | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Aniline | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Anthracene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 0-12ft
Date Sampled: 06/05/24 13:35
Percent Solids: 88
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/6/24 18:25

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Benzo(a)anthracene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Benzo(a)pyrene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Benzo(b)fluoranthene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Benzo(g,h,i)perylene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Benzo(k)fluoranthene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| bis(2-Chloroethoxy)methane | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| bis(2-Chloroethyl)ether | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| bis(2-chloroisopropyl)Ether | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| bis(2-Ethylhexyl)phthalate | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Butylbenzylphthalate | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Chrysene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Dibenzo(a,h)Anthracene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Dibenzofuran | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Diethylphthalate | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Dimethylphthalate | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Di-n-butylphthalate | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Di-n-octylphthalate | ND (0.571) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Fluoranthene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Fluorene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Hexachlorobenzene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Hexachlorobutadiene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Hexachloroethane | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Indeno(1,2,3-cd)Pyrene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Isophorone | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Naphthalene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Nitrobenzene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 0-12ft
Date Sampled: 06/05/24 13:35
Percent Solids: 88
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/6/24 18:25

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Pentachlorophenol | ND (1.14) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Phenanthrene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Phenol | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Pyrene | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |
| Pyridine | ND (0.286) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:11 | D4F0179 | DF40602 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *96 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *100 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *105 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *92 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *98 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *84 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *107 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *109 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 0-12ft
Date Sampled: 06/05/24 13:35
Percent Solids: 88
Initial Volume: 19.9g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/7/24 11:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:29 | --- | DF40606 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:29 | --- | DF40606 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:29 | --- | DF40606 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:29 | --- | DF40606 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:29 | --- | DF40606 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:29 | --- | DF40606 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:29 | --- | DF40606 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:29 | --- | DF40606 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:29 | --- | DF40606 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *77 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *84 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 0-12ft
Date Sampled: 06/05/24 13:35
Percent Solids: 88
Initial Volume: 19.4g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/7/24 9:00

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| 4,4´-DDE | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| 4,4´-DDT | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Aldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| alpha-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| alpha-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| beta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Chlordane (Total) | ND (0.0234) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| delta-BHC | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Dieldrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Endosulfan I | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Endosulfan II | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Endosulfan Sulfate | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Endrin | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Endrin Ketone | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| gamma-BHC (Lindane) | ND (0.0018) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| gamma-Chlordane | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Heptachlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Heptachlor Epoxide | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Hexachlorobenzene | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Methoxychlor | ND (0.0029) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |
| Toxaphene | ND (0.146) | --- | 8081B | --- | 1 | 06/07/24 20:22 | D4F0141 | DF40709 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *66 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *64 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 0-12ft
Date Sampled: 06/05/24 13:35
Percent Solids: 88
Initial Volume: 10.4g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/10/24 18:10

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/12/24 9:50 | D4F0215 | DF41058 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/12/24 9:50 | D4F0215 | DF41058 |
| 2,4-D | ND (0.051) | --- | 8151A | --- | 1 | 06/12/24 9:50 | D4F0215 | DF41058 |
| 2,4-DB | ND (0.052) | --- | 8151A | --- | 1 | 06/12/24 9:50 | D4F0215 | DF41058 |
| Dalapon | ND (0.050) | --- | 8151A | --- | 1 | 06/12/24 9:50 | D4F0215 | DF41058 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/12/24 9:50 | D4F0215 | DF41058 |
| Dichlorprop | ND (0.051) | --- | 8151A | --- | 1 | 06/12/24 9:50 | D4F0215 | DF41058 |
| Dinoseb | ND (0.052) | --- | 8151A | --- | 1 | 06/12/24 9:50 | D4F0215 | DF41058 |
| MCPA | ND (2.54) | --- | 8151A | --- | 1 | 06/12/24 9:50 | D4F0215 | DF41058 |
| MCPP | ND (2.57) | --- | 8151A | --- | 1 | 06/12/24 9:50 | D4F0215 | DF41058 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *81 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 0-12ft
Date Sampled: 06/05/24 13:35
Percent Solids: 88
Initial Volume: 19.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/6/24 18:25

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **39.8** (11.8) | --- | 8100M | --- | 1 | 06/07/24 23:19 | --- | DF40664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 82 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 0-12ft
Date Sampled: 06/05/24 13:35
Percent Solids: 88

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-02
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 191** (5) | --- | 9050A | --- | 1 | JLK | 06/10/24 19:21 | umhos/cm | DF41062 |
| **Corrosivity (pH)** | **7.30** (N/A) | --- | 9045 | --- | 1 | EAM | 06/06/24 20:35 | S.U. | DF40670 |
| **Corrosivity (pH) Sample Temp** | **21.1** | --- | 2550B | --- | 1 | EAM | 06/06/24 20:35 | °C | DF40670 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | CCP | 06/10/24 17:15 | °F | DF41048 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/10/24 16:32 | ml/5 min | DF41047 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/10/24 16:15 | mg/kg | DF41050 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/10/24 16:15 | mg/kg | DF41050 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 19-21ft
Date Sampled: 06/05/24 14:20
Percent Solids: 86
Initial Volume: 6.8g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/9/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,1,1-Trichloroethane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,1,2,2-Tetrachloroethane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,1,2-Trichloroethane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,1-Dichloroethane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,1-Dichloroethene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,1-Dichloropropene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,2,3-Trichlorobenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,2,3-Trichloropropane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,2,4-Trichlorobenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,2,4-Trimethylbenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,2-Dibromoethane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,2-Dichlorobenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,2-Dichloroethane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,2-Dichloropropane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,3,5-Trimethylbenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,3-Dichlorobenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,3-Dichloropropane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,4-Dichlorobenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 1,4-Dioxane | ND (0.0852) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 2,2-Dichloropropane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 2-Butanone | ND (0.0426) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 2-Chlorotoluene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 2-Hexanone | ND (0.0426) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 4-Chlorotoluene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| 4-Isopropyltoluene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 19-21ft
Date Sampled: 06/05/24 14:20
Percent Solids: 86
Initial Volume: 6.8g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/9/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0426) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| **Acetone** | **0.137** (0.0426) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Benzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Bromobenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Bromochloromethane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Bromodichloromethane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Bromoform | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Bromomethane | ND (0.0085) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Carbon Disulfide | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Carbon Tetrachloride | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Chlorobenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Chloroethane | ND (0.0085) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Chloroform | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Chloromethane | ND (0.0085) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| cis-1,2-Dichloroethene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| cis-1,3-Dichloropropene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Dibromochloromethane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Dibromomethane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Dichlorodifluoromethane | ND (0.0085) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Diethyl Ether | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Di-isopropyl ether | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Ethyl tertiary-butyl ether | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Ethylbenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Hexachlorobutadiene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Isopropylbenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Methyl tert-Butyl Ether | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Methylene Chloride | ND (0.0213) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 19-21ft
Date Sampled: 06/05/24 14:20
Percent Solids: 86
Initial Volume: 6.8g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/9/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| n-Butylbenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| n-Propylbenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| sec-Butylbenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Styrene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| tert-Butylbenzene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Tertiary-amyl methyl ether | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Tetrachloroethene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Tetrahydrofuran | ND (0.0170) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Toluene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| trans-1,2-Dichloroethene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| trans-1,3-Dichloropropene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Trichloroethene | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Trichlorofluoromethane | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Vinyl Chloride | ND (0.0085) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Xylene O | ND (0.0043) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Xylene P,M | ND (0.0085) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |
| Xylenes (Total) | ND (0.0085) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 15:51 | D4F0157 | DF40901 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *108 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *100 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *106 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *105 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 12-24ft
Date Sampled: 06/05/24 14:30
Percent Solids: 86

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-04
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Arsenic** | **X* 2.91** (2.18) | --- | 6010D | --- | 1 | KJB | 06/12/24 17:23 | 2.66 100 | DF40714 |
| **Barium** | **27.2** (0.87) | --- | 6010D | --- | 1 | KJB | 06/07/24 20:13 | 2.66 100 | DF40714 |
| Cadmium | ND (0.44) | --- | 6010D | --- | 1 | KJB | 06/07/24 20:13 | 2.66 100 | DF40714 |
| **Chromium** | **17.2** (0.87) | --- | 6010D | --- | 1 | KJB | 06/07/24 20:13 | 2.66 100 | DF40714 |
| **Lead** | **13.2** (4.36) | --- | 6010D | --- | 1 | KJB | 06/07/24 20:13 | 2.66 100 | DF40714 |
| Mercury | ND (0.034) | --- | 7471B | --- | 1 | AFV | 06/07/24 18:37 | 0.67 40 | DF40717 |
| Selenium | ND (1.74) | --- | 6020B | --- | 20 | BJV | 06/11/24 1:04 | 2.66 100 | DF40714 |
| Silver | ND (0.44) | --- | 6010D | --- | 1 | KJB | 06/12/24 17:23 | 2.66 100 | DF40714 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 12-24ft
Date Sampled: 06/05/24 14:30
Percent Solids: 86
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/6/24 18:25

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.029) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 1,2,4-Trichlorobenzene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 1,2-Dichlorobenzene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 1,3-Dichlorobenzene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 1,4-Dichlorobenzene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 2,4,5-Trichlorophenol | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 2,4,6-Trichlorophenol | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 2,4-Dichlorophenol | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 2,4-Dimethylphenol | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 2,4-Dinitrophenol | ND (1.17) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 2,4-Dinitrotoluene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 2,6-Dinitrotoluene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 2-Chloronaphthalene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 2-Chlorophenol | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 2-Methylnaphthalene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 2-Methylphenol | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 2-Nitrophenol | ND (0.585) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 3,3´-Dichlorobenzidine | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 3+4-Methylphenol | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 4-Bromophenyl-phenylether | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 4-Chloroaniline | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| 4-Nitrophenol | ND (1.17) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Acenaphthene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Acenaphthylene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Acetophenone | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Aniline | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Anthracene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 12-24ft
Date Sampled: 06/05/24 14:30
Percent Solids: 86
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/6/24 18:25

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Benzo(a)anthracene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Benzo(a)pyrene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Benzo(b)fluoranthene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Benzo(g,h,i)perylene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Benzo(k)fluoranthene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| bis(2-Chloroethoxy)methane | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| bis(2-Chloroethyl)ether | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| bis(2-chloroisopropyl)Ether | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| bis(2-Ethylhexyl)phthalate | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Butylbenzylphthalate | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Chrysene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Dibenzo(a,h)Anthracene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Dibenzofuran | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Diethylphthalate | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Dimethylphthalate | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Di-n-butylphthalate | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Di-n-octylphthalate | ND (0.585) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Fluoranthene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Fluorene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Hexachlorobenzene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Hexachlorobutadiene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Hexachloroethane | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Indeno(1,2,3-cd)Pyrene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Isophorone | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Naphthalene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Nitrobenzene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 12-24ft
Date Sampled: 06/05/24 14:30
Percent Solids: 86
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/6/24 18:25

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Pentachlorophenol | ND (1.17) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Phenanthrene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Phenol | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Pyrene | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |
| Pyridine | ND (0.293) | --- | 8270E | --- | 1 | TJ | 06/11/24 1:41 | D4F0179 | DF40602 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *92 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *95 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *96 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *85 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *92 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *82 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *98 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *108 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 12-24ft
Date Sampled: 06/05/24 14:30
Percent Solids: 86
Initial Volume: 19.8g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/7/24 11:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:49 | --- | DF40606 |
| Aroclor 1221 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:49 | --- | DF40606 |
| Aroclor 1232 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:49 | --- | DF40606 |
| Aroclor 1242 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:49 | --- | DF40606 |
| Aroclor 1248 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:49 | --- | DF40606 |
| Aroclor 1254 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:49 | --- | DF40606 |
| Aroclor 1260 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:49 | --- | DF40606 |
| Aroclor 1262 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:49 | --- | DF40606 |
| Aroclor 1268 | ND (0.06) | --- | 8082A | --- | 1 | 06/10/24 12:49 | --- | DF40606 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *83 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *87 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 12-24ft
Date Sampled: 06/05/24 14:30
Percent Solids: 86
Initial Volume: 19.1g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/7/24 9:00

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| 4,4´-DDE | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| 4,4´-DDT | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Aldrin | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| alpha-BHC | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| alpha-Chlordane | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| beta-BHC | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Chlordane (Total) | ND (0.0243) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| delta-BHC | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Dieldrin | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Endosulfan I | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Endosulfan II | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Endosulfan Sulfate | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Endrin | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Endrin Ketone | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| gamma-BHC (Lindane) | ND (0.0018) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| gamma-Chlordane | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Heptachlor | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Heptachlor Epoxide | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Hexachlorobenzene | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Methoxychlor | ND (0.0030) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |
| Toxaphene | ND (0.152) | --- | 8081B | --- | 1 | 06/07/24 21:45 | D4F0141 | DF40709 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *80 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *76 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 12-24ft
Date Sampled: 06/05/24 14:30
Percent Solids: 86
Initial Volume: 10.1g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/10/24 18:10

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.011) | --- | 8151A | --- | 1 | 06/12/24 10:20 | D4F0215 | DF41058 |
| 2,4,5-TP (Silvex) | ND (0.011) | --- | 8151A | --- | 1 | 06/12/24 10:20 | D4F0215 | DF41058 |
| 2,4-D | ND (0.054) | --- | 8151A | --- | 1 | 06/12/24 10:20 | D4F0215 | DF41058 |
| 2,4-DB | ND (0.054) | --- | 8151A | --- | 1 | 06/12/24 10:20 | D4F0215 | DF41058 |
| Dalapon | ND (0.052) | --- | 8151A | --- | 1 | 06/12/24 10:20 | D4F0215 | DF41058 |
| Dicamba | ND (0.011) | --- | 8151A | --- | 1 | 06/12/24 10:20 | D4F0215 | DF41058 |
| Dichlorprop | ND (0.054) | --- | 8151A | --- | 1 | 06/12/24 10:20 | D4F0215 | DF41058 |
| Dinoseb | ND (0.054) | --- | 8151A | --- | 1 | 06/12/24 10:20 | D4F0215 | DF41058 |
| MCPA | ND (2.67) | --- | 8151A | --- | 1 | 06/12/24 10:20 | D4F0215 | DF41058 |
| MCPP | ND (2.70) | --- | 8151A | --- | 1 | 06/12/24 10:20 | D4F0215 | DF41058 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: DCAA* | *81 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 12-24ft
Date Sampled: 06/05/24 14:30
Percent Solids: 86
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/6/24 18:25

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **22.9** (11.9) | --- | 8100M | --- | 1 | 06/07/24 21:55 | --- | DF40664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 98 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 12-24ft
Date Sampled: 06/05/24 14:30
Percent Solids: 86

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-04
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 1580** (5) | --- | 9050A | --- | 1 | JLK | 06/10/24 19:21 | umhos/cm | DF41062 |
| **Corrosivity (pH)** | **7.24** (N/A) | --- | 9045 | --- | 1 | EAM | 06/06/24 20:35 | S.U. | DF40670 |
| **Corrosivity (pH) Sample Temp** | **21.1** | --- | 2550B | --- | 1 | EAM | 06/06/24 20:35 | °C | DF40670 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | CCP | 06/10/24 17:15 | °F | DF41048 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/10/24 16:32 | ml/5 min | DF41047 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/10/24 16:15 | mg/kg | DF41050 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/10/24 16:15 | mg/kg | DF41050 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 29-31ft
Date Sampled: 06/05/24 15:30
Percent Solids: 89
Initial Volume: 7.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/9/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,1,1-Trichloroethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,1,2,2-Tetrachloroethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,1,2-Trichloroethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,1-Dichloroethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,1-Dichloroethene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,1-Dichloropropene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,2,3-Trichlorobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,2,3-Trichloropropane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,2,4-Trichlorobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,2,4-Trimethylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,2-Dibromo-3-Chloropropane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,2-Dibromoethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,2-Dichlorobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,2-Dichloroethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,2-Dichloropropane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,3,5-Trimethylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,3-Dichlorobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,3-Dichloropropane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,4-Dichlorobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 1,4-Dioxane | ND (0.0792) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 2,2-Dichloropropane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 2-Butanone | ND (0.0396) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 2-Chlorotoluene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 2-Hexanone | ND (0.0396) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 4-Chlorotoluene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| 4-Isopropyltoluene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 29-31ft
Date Sampled: 06/05/24 15:30
Percent Solids: 89
Initial Volume: 7.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/9/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 4-Methyl-2-Pentanone | ND (0.0396) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Acetone | ND (0.0396) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Benzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Bromobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Bromochloromethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Bromodichloromethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Bromoform | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Bromomethane | ND (0.0079) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Carbon Disulfide | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Carbon Tetrachloride | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Chlorobenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Chloroethane | ND (0.0079) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Chloroform | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Chloromethane | ND (0.0079) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| cis-1,2-Dichloroethene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| cis-1,3-Dichloropropene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Dibromochloromethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Dibromomethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Dichlorodifluoromethane | ND (0.0079) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Diethyl Ether | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Di-isopropyl ether | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Ethyl tertiary-butyl ether | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Ethylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Hexachlorobutadiene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Isopropylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Methyl tert-Butyl Ether | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Methylene Chloride | ND (0.0198) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 29-31ft
Date Sampled: 06/05/24 15:30
Percent Solids: 89
Initial Volume: 7.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 6/9/24 8:00

## Volatile Organics Low Level

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| n-Butylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| n-Propylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| sec-Butylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Styrene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| tert-Butylbenzene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Tertiary-amyl methyl ether | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Tetrachloroethene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Tetrahydrofuran | ND (0.0158) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Toluene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| trans-1,2-Dichloroethene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| trans-1,3-Dichloropropene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Trichloroethene | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Trichlorofluoromethane | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Vinyl Chloride | ND (0.0079) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Xylene O | ND (0.0040) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Xylene P,M | ND (0.0079) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |
| Xylenes (Total) | ND (0.0079) | --- | 8260D Low | --- | 1 | MEK | 06/09/24 16:16 | D4F0157 | DF40901 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichloroethane-d4* | *110 %* | | *70-130* |
| *Surrogate: 4-Bromofluorobenzene* | *108 %* | | *70-130* |
| *Surrogate: Dibromofluoromethane* | *108 %* | | *70-130* |
| *Surrogate: Toluene-d8* | *103 %* | | *70-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 24-36ft
Date Sampled: 06/06/24 08:30
Percent Solids: 89

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-06
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

## Total Metals

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | IV / FV | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | **EL** ND (6.09) | --- | 6010D | --- | 3 | KJB | 06/10/24 21:31 | 2.77 100 | DF40714 |
| **Barium** | **74.6** (2.44) | --- | 6010D | --- | 3 | KJB | 06/10/24 21:31 | 2.77 100 | DF40714 |
| Cadmium | **EL** ND (1.22) | --- | 6010D | --- | 3 | KJB | 06/10/24 21:31 | 2.77 100 | DF40714 |
| **Chromium** | **13.0** (2.44) | --- | 6010D | --- | 3 | KJB | 06/10/24 21:31 | 2.77 100 | DF40714 |
| Lead | **EL** ND (12.2) | --- | 6010D | --- | 3 | KJB | 06/10/24 21:31 | 2.77 100 | DF40714 |
| Mercury | ND (0.035) | --- | 7471B | --- | 1 | AFV | 06/07/24 18:39 | 0.64 40 | DF40717 |
| Selenium | ND (1.62) | --- | 6020B | --- | 20 | BJV | 06/11/24 1:10 | 2.77 100 | DF40714 |
| Silver | **EL** ND (1.22) | --- | 6010D | --- | 3 | KJB | 06/10/24 21:31 | 2.77 100 | DF40714 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 24-36ft
Date Sampled: 06/06/24 08:30
Percent Solids: 89
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/6/24 18:25

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Biphenyl | ND (0.028) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 1,2,4-Trichlorobenzene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 1,2-Dichlorobenzene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 1,3-Dichlorobenzene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 1,4-Dichlorobenzene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 2,4,5-Trichlorophenol | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 2,4,6-Trichlorophenol | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 2,4-Dichlorophenol | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 2,4-Dimethylphenol | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 2,4-Dinitrophenol | ND (1.14) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 2,4-Dinitrotoluene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 2,6-Dinitrotoluene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 2-Chloronaphthalene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 2-Chlorophenol | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 2-Methylnaphthalene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 2-Methylphenol | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 2-Nitrophenol | ND (0.568) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 3,3´-Dichlorobenzidine | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 3+4-Methylphenol | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 4-Bromophenyl-phenylether | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 4-Chloroaniline | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| 4-Nitrophenol | ND (1.14) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Acenaphthene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Acenaphthylene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Acetophenone | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Aniline | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Anthracene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 24-36ft
Date Sampled: 06/06/24 08:30
Percent Solids: 89
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/6/24 18:25

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Azobenzene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Benzo(a)anthracene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Benzo(a)pyrene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Benzo(b)fluoranthene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Benzo(g,h,i)perylene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Benzo(k)fluoranthene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| bis(2-Chloroethoxy)methane | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| bis(2-Chloroethyl)ether | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| bis(2-chloroisopropyl)Ether | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| bis(2-Ethylhexyl)phthalate | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Butylbenzylphthalate | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Chrysene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Dibenzo(a,h)Anthracene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Dibenzofuran | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Diethylphthalate | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Dimethylphthalate | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Di-n-butylphthalate | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Di-n-octylphthalate | ND (0.568) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Fluoranthene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Fluorene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Hexachlorobenzene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Hexachlorobutadiene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Hexachloroethane | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Indeno(1,2,3-cd)Pyrene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Isophorone | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Naphthalene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Nitrobenzene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 24-36ft
Date Sampled: 06/06/24 08:30
Percent Solids: 89
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 6/6/24 18:25

## Semi-Volatile Organic Compounds

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|---|
| N-Nitrosodimethylamine | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Pentachlorophenol | ND (1.14) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Phenanthrene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Phenol | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Pyrene | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |
| Pyridine | ND (0.284) | --- | 8270E | --- | 1 | TJ | 06/11/24 2:12 | D4F0179 | DF40602 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: 1,2-Dichlorobenzene-d4* | *95 %* | | *30-130* |
| *Surrogate: 2,4,6-Tribromophenol* | *99 %* | | *30-130* |
| *Surrogate: 2-Chlorophenol-d4* | *99 %* | | *30-130* |
| *Surrogate: 2-Fluorobiphenyl* | *87 %* | | *30-130* |
| *Surrogate: 2-Fluorophenol* | *98 %* | | *30-130* |
| *Surrogate: Nitrobenzene-d5* | *83 %* | | *30-130* |
| *Surrogate: Phenol-d6* | *102 %* | | *30-130* |
| *Surrogate: p-Terphenyl-d14* | *107 %* | | *30-130* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 24-36ft
Date Sampled: 06/06/24 08:30
Percent Solids: 89
Initial Volume: 20.5g
Final Volume: 10ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/7/24 11:15

## 8082A Polychlorinated Biphenyls (PCB)

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | ND (0.05) | --- | 8082A | --- | 1 | 06/10/24 13:11 | --- | DF40606 |
| Aroclor 1221 | ND (0.05) | --- | 8082A | --- | 1 | 06/10/24 13:11 | --- | DF40606 |
| Aroclor 1232 | ND (0.05) | --- | 8082A | --- | 1 | 06/10/24 13:11 | --- | DF40606 |
| Aroclor 1242 | ND (0.05) | --- | 8082A | --- | 1 | 06/10/24 13:11 | --- | DF40606 |
| **Aroclor 1248** | **0.09** (0.05) | --- | 8082A | --- | 1 | 06/10/24 13:11 | --- | DF40606 |
| Aroclor 1254 | ND (0.05) | --- | 8082A | --- | 1 | 06/10/24 13:11 | --- | DF40606 |
| Aroclor 1260 | ND (0.05) | --- | 8082A | --- | 1 | 06/10/24 13:11 | --- | DF40606 |
| Aroclor 1262 | ND (0.05) | --- | 8082A | --- | 1 | 06/10/24 13:11 | --- | DF40606 |
| Aroclor 1268 | ND (0.05) | --- | 8082A | --- | 1 | 06/10/24 13:11 | --- | DF40606 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *76 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *83 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 24-36ft
Date Sampled: 06/06/24 08:30
Percent Solids: 89
Initial Volume: 19.8g
Final Volume: 5ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/7/24 9:00

## 8081B Organochlorine Pesticides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 4,4´-DDD | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| 4,4´-DDE | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| 4,4´-DDT | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Aldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| alpha-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| alpha-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| beta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Chlordane (Total) | ND (0.0227) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| delta-BHC | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Dieldrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Endosulfan I | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Endosulfan II | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Endosulfan Sulfate | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Endrin | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Endrin Ketone | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| gamma-BHC (Lindane) | ND (0.0017) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| gamma-Chlordane | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Heptachlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Heptachlor Epoxide | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Hexachlorobenzene | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Methoxychlor | ND (0.0028) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |
| Toxaphene | ND (0.142) | --- | 8081B | --- | 1 | 06/07/24 22:13 | D4F0141 | DF40709 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: Decachlorobiphenyl* | *67 %* | | *30-150* |
| *Surrogate: Tetrachloro-m-xylene* | *62 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 24-36ft
Date Sampled: 06/06/24 08:30
Percent Solids: 89
Initial Volume: 10.3g
Final Volume: 4ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 6/10/24 18:10

## 8151A Chlorinated Herbicides

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-T | ND (0.010) | --- | 8151A | --- | 1 | 06/12/24 10:50 | D4F0215 | DF41058 |
| 2,4,5-TP (Silvex) | ND (0.010) | --- | 8151A | --- | 1 | 06/12/24 10:50 | D4F0215 | DF41058 |
| 2,4-D | ND (0.051) | --- | 8151A | --- | 1 | 06/12/24 10:50 | D4F0215 | DF41058 |
| 2,4-DB | ND (0.052) | --- | 8151A | --- | 1 | 06/12/24 10:50 | D4F0215 | DF41058 |
| Dalapon | ND (0.050) | --- | 8151A | --- | 1 | 06/12/24 10:50 | D4F0215 | DF41058 |
| Dicamba | ND (0.010) | --- | 8151A | --- | 1 | 06/12/24 10:50 | D4F0215 | DF41058 |
| Dichlorprop | ND (0.051) | --- | 8151A | --- | 1 | 06/12/24 10:50 | D4F0215 | DF41058 |
| Dinoseb | ND (0.052) | --- | 8151A | --- | 1 | 06/12/24 10:50 | D4F0215 | DF41058 |
| MCPA | ND (2.54) | --- | 8151A | --- | 1 | 06/12/24 10:50 | D4F0215 | DF41058 |
| MCPP [2C] | ND (2.57) | --- | 8151A | --- | 1 | 06/12/24 10:50 | D4F0215 | DF41058 |

| | *%Recovery* | *Qualifier* | *Limits* |
|---|---|---|---|
| *Surrogate: DCAA* | *89 %* | | *30-150* |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 24-36ft
Date Sampled: 06/06/24 08:30
Percent Solids: 89
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: JDN
Prepared: 6/6/24 18:25

## 8100M Total Petroleum Hydrocarbons

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyzed | Sequence | Batch |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (C9-C36)** | **20.8** (11.5) | --- | 8100M | --- | 1 | 06/07/24 22:36 | --- | DF40664 |

| | %Recovery | Qualifier | Limits |
|---|---|---|---|
| *Surrogate: O-Terphenyl* | 97 % | | 40-140 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4
Client Sample ID: CEC-5A 24-36ft
Date Sampled: 06/06/24 08:30
Percent Solids: 89

ESS Laboratory Work Order: 24F0229
ESS Laboratory Sample ID: 24F0229-06
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Conductivity** | **WL 2470** (5) | --- | 9050A | --- | 1 | JLK | 06/10/24 19:21 | umhos/cm | DF41062 |
| **Corrosivity (pH)** | **8.10** (N/A) | --- | 9045 | --- | 1 | EAM | 06/06/24 20:35 | S.U. | DF40670 |
| **Corrosivity (pH) Sample Temp** | **21.1** | --- | 2550B | --- | 1 | EAM | 06/06/24 20:35 | °C | DF40670 |
| **Flashpoint** | **> 200** (N/A) | --- | 1010A | --- | 1 | CCP | 06/10/24 17:15 | °F | DF41048 |
| Free Liquid | ND (0.3) | --- | 9095A | --- | 1 | EAM | 06/10/24 16:43 | ml/5 min | DF41047 |
| Reactive Cyanide | ND (2.0) | --- | 7.3.3.2 | --- | 1 | EAM | 06/10/24 16:15 | mg/kg | DF41050 |
| Reactive Sulfide | ND (2.0) | --- | 7.3.4.1 | --- | 1 | EAM | 06/10/24 16:15 | mg/kg | DF41050 |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals** | | | | | | | | | | |
| **Batch DF40714 - 3050B** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Arsenic | ND | 2.50 | mg/kg wet | | | | | | | |
| Barium | ND | 1.00 | mg/kg wet | | | | | | | |
| Cadmium | ND | 0.50 | mg/kg wet | | | | | | | |
| Chromium | ND | 1.00 | mg/kg wet | | | | | | | |
| Lead | ND | 5.00 | mg/kg wet | | | | | | | |
| Selenium | ND | 5.00 | mg/kg wet | | | | | | | |
| Silver | ND | 0.50 | mg/kg wet | | | | | | | |
| **Blank** | | | | | | | | | | |
| Selenium | ND | 2.00 | mg/kg wet | | | | | | | , |
| **LCS** | | | | | | | | | | |
| Arsenic | 62.3 | 8.33 | mg/kg wet | 75.60 | | 82 | 73-127 | | | |
| Barium | 572 | 3.33 | mg/kg wet | 372.0 | | 154 | 40-297 | | | |
| Cadmium | 209 | 1.67 | mg/kg wet | 259.0 | | 81 | 69-131 | | | |
| Chromium | 135 | 3.33 | mg/kg wet | 156.0 | | 86 | 74-126 | | | |
| Lead | 187 | 16.7 | mg/kg wet | 225.0 | | 83 | 72-128 | | | |
| Selenium | 64.1 | 16.7 | mg/kg wet | 82.70 | | 77 | 70-129 | | | |
| Silver | 43.9 | 1.67 | mg/kg wet | 51.00 | | 86 | 57-143 | | | |
| **LCS** | | | | | | | | | | |
| Selenium | 82.8 | 33.3 | mg/kg wet | 82.70 | | 100 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Arsenic | 52.8 | 7.69 | mg/kg wet | 75.60 | | 70 | 73-127 | 17 | 30 | B- |
| Barium | 571 | 3.08 | mg/kg wet | 372.0 | | 154 | 40-297 | 0.2 | 30 | |
| Cadmium | 182 | 1.54 | mg/kg wet | 259.0 | | 70 | 69-131 | 14 | 30 | |
| Chromium | 115 | 3.08 | mg/kg wet | 156.0 | | 74 | 74-126 | 16 | 30 | B- |
| Lead | 160 | 15.4 | mg/kg wet | 225.0 | | 71 | 72-128 | 16 | 30 | B- |
| Selenium | 56.2 | 15.4 | mg/kg wet | 82.70 | | 68 | 70-129 | 13 | 30 | B- |
| Silver | 37.3 | 1.54 | mg/kg wet | 51.00 | | 73 | 57-143 | 16 | 30 | |
| **LCS Dup** | | | | | | | | | | |
| Selenium | 74.0 | 30.8 | mg/kg wet | 82.70 | | 90 | 80-120 | 11 | 30 | |
| **Batch DF40717 - 245.1/7470A** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Mercury | ND | 0.032 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Mercury | 22.5 | 3.30 | mg/kg wet | 25.50 | | 88 | 80-120 | | | |
| **LCS Dup** | | | | | | | | | | |
| Mercury | 22.2 | 2.83 | mg/kg wet | 25.50 | | 87 | 80-120 | 1 | 30 | |
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40901 - 5035** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,1-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40901 - 5035** | | | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1,2-Trichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,1-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,3-Trichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dibromoethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloroethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,3-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 1,4-Dioxane | ND | 0.100 | mg/kg wet | | | | | | | |
| 2,2-Dichloropropane | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Butanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 2-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 2-Hexanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| 4-Chlorotoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Isopropyltoluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| 4-Methyl-2-Pentanone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Acetone | ND | 0.0500 | mg/kg wet | | | | | | | |
| Benzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromodichloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromoform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Bromomethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Carbon Disulfide | ND | 0.0050 | mg/kg wet | | | | | | | |
| Carbon Tetrachloride | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chlorobenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloroethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Chloroform | ND | 0.0050 | mg/kg wet | | | | | | | |
| Chloromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| cis-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| cis-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromochloromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dibromomethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Dichlorodifluoromethane | ND | 0.0100 | mg/kg wet | | | | | | | |
| Diethyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40901 - 5035** | | | | | | | | | | |
| Di-isopropyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethyl tertiary-butyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Isopropylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methyl tert-Butyl Ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Methylene Chloride | ND | 0.0250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| n-Propylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| sec-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Styrene | ND | 0.0050 | mg/kg wet | | | | | | | |
| tert-Butylbenzene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tertiary-amyl methyl ether | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrachloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Tetrahydrofuran | ND | 0.0200 | mg/kg wet | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,2-Dichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| trans-1,3-Dichloropropene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichloroethene | ND | 0.0050 | mg/kg wet | | | | | | | |
| Trichlorofluoromethane | ND | 0.0050 | mg/kg wet | | | | | | | |
| Vinyl Chloride | ND | 0.0100 | mg/kg wet | | | | | | | |
| Xylene O | ND | 0.0050 | mg/kg wet | | | | | | | |
| Xylene P,M | ND | 0.0100 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0499* | | mg/kg wet | *0.05000* | | *100* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0480* | | mg/kg wet | *0.05000* | | *96* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0498* | | mg/kg wet | *0.05000* | | *100* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0527* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0521 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| 1,1,1-Trichloroethane | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| 1,1,2,2-Tetrachloroethane | 0.0526 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 40-160 | | | |
| 1,1,2-Trichloroethane | 0.0474 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| 1,1-Dichloroethane | 0.0473 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| 1,1-Dichloroethene | 0.0508 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| 1,1-Dichloropropene | 0.0482 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| 1,2,3-Trichlorobenzene | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | | | |
| 1,2,3-Trichloropropane | 0.0475 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 70-130 | | | |
| 1,2,4-Trichlorobenzene | 0.0581 | 0.0050 | mg/kg wet | 0.05000 | | 116 | 70-130 | | | |
| 1,2,4-Trimethylbenzene | 0.0567 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | | | |
| 1,2-Dibromo-3-Chloropropane | 0.0414 | 0.0050 | mg/kg wet | 0.05000 | | 83 | 70-130 | | | |
| 1,2-Dibromoethane | 0.0524 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| 1,2-Dichlorobenzene | 0.0539 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| 1,2-Dichloroethane | 0.0472 | 0.0050 | mg/kg wet | 0.05000 | | 94 | 70-130 | | | |
| 1,2-Dichloropropane | 0.0479 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40901 - 5035** | | | | | | | | | | |
| 1,3,5-Trimethylbenzene | 0.0569 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | | | |
| 1,3-Dichlorobenzene | 0.0545 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| 1,3-Dichloropropane | 0.0530 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| 1,4-Dichlorobenzene | 0.0549 | 0.0050 | mg/kg wet | 0.05000 | | 110 | 70-130 | | | |
| 1,4-Dioxane | 0.788 | 0.100 | mg/kg wet | 1.000 | | 79 | 70-130 | | | |
| 2,2-Dichloropropane | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| 2-Butanone | 0.227 | 0.0500 | mg/kg wet | 0.2500 | | 91 | 40-160 | | | |
| 2-Chlorotoluene | 0.0555 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | | | |
| 2-Hexanone | 0.203 | 0.0500 | mg/kg wet | 0.2500 | | 81 | 40-160 | | | |
| 4-Chlorotoluene | 0.0546 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | | | |
| 4-Isopropyltoluene | 0.0540 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| 4-Methyl-2-Pentanone | 0.199 | 0.0500 | mg/kg wet | 0.2500 | | 80 | 40-160 | | | |
| Acetone | 0.179 | 0.0500 | mg/kg wet | 0.2500 | | 72 | 40-160 | | | |
| Benzene | 0.0495 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| Bromobenzene | 0.0556 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 70-130 | | | |
| Bromochloromethane | 0.0495 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| Bromodichloromethane | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| Bromoform | 0.0474 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 40-160 | | | |
| Bromomethane | 0.0484 | 0.0100 | mg/kg wet | 0.05000 | | 97 | 40-160 | | | |
| Carbon Disulfide | 0.0509 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Carbon Tetrachloride | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| Chlorobenzene | 0.0525 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | | | |
| Chloroethane | 0.0549 | 0.0100 | mg/kg wet | 0.05000 | | 110 | 40-160 | | | |
| Chloroform | 0.0479 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| Chloromethane | 0.0454 | 0.0100 | mg/kg wet | 0.05000 | | 91 | 40-160 | | | |
| cis-1,2-Dichloroethene | 0.0502 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | | | |
| cis-1,3-Dichloropropene | 0.0516 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 40-160 | | | |
| Dibromochloromethane | 0.0561 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 40-160 | | | |
| Dibromomethane | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| Dichlorodifluoromethane | 0.0381 | 0.0100 | mg/kg wet | 0.05000 | | 76 | 40-160 | | | |
| Diethyl Ether | 0.0522 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | | | |
| Di-isopropyl ether | 0.0509 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | | | |
| Ethyl tertiary-butyl ether | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |
| Ethylbenzene | 0.0539 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | | | |
| Hexachlorobutadiene | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 40-160 | | | |
| Isopropylbenzene | 0.0611 | 0.0050 | mg/kg wet | 0.05000 | | 122 | 70-130 | | | |
| Methyl tert-Butyl Ether | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | | | |
| Methylene Chloride | 0.0480 | 0.0250 | mg/kg wet | 0.05000 | | 96 | 70-130 | | | |
| Naphthalene | 0.0516 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 40-160 | | | |
| n-Butylbenzene | 0.0562 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | | | |
| n-Propylbenzene | 0.0561 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | | | |
| sec-Butylbenzene | 0.0567 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | | | |
| Styrene | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 40-160 | | | |
| tert-Butylbenzene | 0.0565 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | | | |
| Tertiary-amyl methyl ether | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40901 - 5035** | | | | | | | | | | |
| Tetrachloroethene | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | | | |
| Tetrahydrofuran | 0.0431 | 0.0200 | mg/kg wet | 0.05000 | | 86 | 70-130 | | | |
| Toluene | 0.0495 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | | | |
| trans-1,2-Dichloroethene | 0.0507 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | | | |
| trans-1,3-Dichloropropene | 0.0491 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| Trichloroethene | 0.0490 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | | | |
| Trichlorofluoromethane | 0.0485 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 40-160 | | | |
| Vinyl Chloride | 0.0484 | 0.0100 | mg/kg wet | 0.05000 | | 97 | 70-130 | | | |
| Xylene O | 0.0565 | 0.0050 | mg/kg wet | 0.05000 | | 113 | 70-130 | | | |
| Xylene P,M | 0.115 | 0.0100 | mg/kg wet | 0.1000 | | 115 | 70-130 | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0478* | | mg/kg wet | *0.05000* | | *96* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0502* | | mg/kg wet | *0.05000* | | *100* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0494* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0525* | | mg/kg wet | *0.05000* | | *105* | *70-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0527 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 1 | 20 | |
| 1,1,1-Trichloroethane | 0.0503 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 3 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0475 | 0.0050 | mg/kg wet | 0.05000 | | 95 | 40-160 | 10 | 20 | |
| 1,1,2-Trichloroethane | 0.0485 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | 2 | 20 | |
| 1,1-Dichloroethane | 0.0485 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | 3 | 20 | |
| 1,1-Dichloroethene | 0.0524 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 3 | 20 | |
| 1,1-Dichloropropene | 0.0499 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 3 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 12 | 20 | |
| 1,2,3-Trichloropropane | 0.0428 | 0.0050 | mg/kg wet | 0.05000 | | 86 | 70-130 | 10 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0510 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 13 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0516 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 9 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0384 | 0.0050 | mg/kg wet | 0.05000 | | 77 | 70-130 | 7 | 20 | |
| 1,2-Dibromoethane | 0.0529 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 70-130 | 0.9 | 20 | |
| 1,2-Dichlorobenzene | 0.0487 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | 10 | 20 | |
| 1,2-Dichloroethane | 0.0484 | 0.0050 | mg/kg wet | 0.05000 | | 97 | 70-130 | 3 | 20 | |
| 1,2-Dichloropropane | 0.0489 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 2 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 9 | 20 | |
| 1,3-Dichlorobenzene | 0.0516 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 5 | 20 | |
| 1,3-Dichloropropane | 0.0538 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 1 | 20 | |
| 1,4-Dichlorobenzene | 0.0499 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 9 | 20 | |
| 1,4-Dioxane | 0.865 | 0.100 | mg/kg wet | 1.000 | | 86 | 70-130 | 9 | 20 | |
| 2,2-Dichloropropane | 0.0497 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 2 | 20 | |
| 2-Butanone | 0.245 | 0.0500 | mg/kg wet | 0.2500 | | 98 | 40-160 | 8 | 20 | |
| 2-Chlorotoluene | 0.0505 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 10 | 20 | |
| 2-Hexanone | 0.213 | 0.0500 | mg/kg wet | 0.2500 | | 85 | 40-160 | 5 | 20 | |
| 4-Chlorotoluene | 0.0499 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 9 | 20 | |
| 4-Isopropyltoluene | 0.0490 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 10 | 20 | |
| 4-Methyl-2-Pentanone | 0.206 | 0.0500 | mg/kg wet | 0.2500 | | 82 | 40-160 | 3 | 20 | |
| Acetone | 0.229 | 0.0500 | mg/kg wet | 0.2500 | | 92 | 40-160 | 24 | 20 | D+ |
| Benzene | 0.0508 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 3 | 20 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organics Low Level** | | | | | | | | | | |
| **Batch DF40901 - 5035** | | | | | | | | | | |
| Bromobenzene | 0.0508 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 9 | 20 | |
| Bromochloromethane | 0.0506 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 2 | 20 | |
| Bromodichloromethane | 0.0540 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 2 | 20 | |
| Bromoform | 0.0478 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 40-160 | 0.9 | 20 | |
| Bromomethane | 0.0506 | 0.0100 | mg/kg wet | 0.05000 | | 101 | 40-160 | 5 | 20 | |
| Carbon Disulfide | 0.0517 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 2 | 20 | |
| Carbon Tetrachloride | 0.0495 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 3 | 20 | |
| Chlorobenzene | 0.0536 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 2 | 20 | |
| Chloroethane | 0.0565 | 0.0100 | mg/kg wet | 0.05000 | | 113 | 40-160 | 3 | 20 | |
| Chloroform | 0.0490 | 0.0050 | mg/kg wet | 0.05000 | | 98 | 70-130 | 2 | 20 | |
| Chloromethane | 0.0474 | 0.0100 | mg/kg wet | 0.05000 | | 95 | 40-160 | 4 | 20 | |
| cis-1,2-Dichloroethene | 0.0516 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 3 | 20 | |
| cis-1,3-Dichloropropene | 0.0531 | 0.0050 | mg/kg wet | 0.05000 | | 106 | 40-160 | 3 | 20 | |
| Dibromochloromethane | 0.0571 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 40-160 | 2 | 20 | |
| Dibromomethane | 0.0493 | 0.0050 | mg/kg wet | 0.05000 | | 99 | 70-130 | 3 | 20 | |
| Dichlorodifluoromethane | 0.0386 | 0.0100 | mg/kg wet | 0.05000 | | 77 | 40-160 | 1 | 20 | |
| Diethyl Ether | 0.0541 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 4 | 20 | |
| Di-isopropyl ether | 0.0526 | 0.0050 | mg/kg wet | 0.05000 | | 105 | 70-130 | 3 | 20 | |
| Ethyl tertiary-butyl ether | 0.0542 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 2 | 20 | |
| Ethylbenzene | 0.0542 | 0.0050 | mg/kg wet | 0.05000 | | 108 | 70-130 | 0.6 | 20 | |
| Hexachlorobutadiene | 0.0481 | 0.0050 | mg/kg wet | 0.05000 | | 96 | 40-160 | 10 | 20 | |
| Isopropylbenzene | 0.0560 | 0.0050 | mg/kg wet | 0.05000 | | 112 | 70-130 | 9 | 20 | |
| Methyl tert-Butyl Ether | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 3 | 20 | |
| Methylene Chloride | 0.0496 | 0.0250 | mg/kg wet | 0.05000 | | 99 | 70-130 | 3 | 20 | |
| Naphthalene | 0.0464 | 0.0050 | mg/kg wet | 0.05000 | | 93 | 40-160 | 11 | 20 | |
| n-Butylbenzene | 0.0508 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 10 | 20 | |
| n-Propylbenzene | 0.0514 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 9 | 20 | |
| sec-Butylbenzene | 0.0516 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 9 | 20 | |
| Styrene | 0.0556 | 0.0050 | mg/kg wet | 0.05000 | | 111 | 40-160 | 2 | 20 | |
| tert-Butylbenzene | 0.0515 | 0.0050 | mg/kg wet | 0.05000 | | 103 | 70-130 | 9 | 20 | |
| Tertiary-amyl methyl ether | 0.0544 | 0.0050 | mg/kg wet | 0.05000 | | 109 | 70-130 | 2 | 20 | |
| Tetrachloroethene | 0.0534 | 0.0050 | mg/kg wet | 0.05000 | | 107 | 70-130 | 0 | 20 | |
| Tetrahydrofuran | 0.0445 | 0.0200 | mg/kg wet | 0.05000 | | 89 | 70-130 | 3 | 20 | |
| Toluene | 0.0509 | 0.0050 | mg/kg wet | 0.05000 | | 102 | 70-130 | 3 | 20 | |
| trans-1,2-Dichloroethene | 0.0518 | 0.0050 | mg/kg wet | 0.05000 | | 104 | 70-130 | 2 | 20 | |
| trans-1,3-Dichloropropene | 0.0504 | 0.0050 | mg/kg wet | 0.05000 | | 101 | 70-130 | 2 | 20 | |
| Trichloroethene | 0.0501 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 70-130 | 2 | 20 | |
| Trichlorofluoromethane | 0.0500 | 0.0050 | mg/kg wet | 0.05000 | | 100 | 40-160 | 3 | 20 | |
| Vinyl Chloride | 0.0495 | 0.0100 | mg/kg wet | 0.05000 | | 99 | 70-130 | 2 | 20 | |
| Xylene O | 0.0571 | 0.0050 | mg/kg wet | 0.05000 | | 114 | 70-130 | 1 | 20 | |
| Xylene P,M | 0.116 | 0.0100 | mg/kg wet | 0.1000 | | 116 | 70-130 | 1 | 20 | |
| *Surrogate: 1,2-Dichloroethane-d4* | *0.0479* | | mg/kg wet | *0.05000* | | *96* | *70-130* | | | |
| *Surrogate: 4-Bromofluorobenzene* | *0.0520* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *0.0494* | | mg/kg wet | *0.05000* | | *99* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *0.0520* | | mg/kg wet | *0.05000* | | *104* | *70-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40602 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 1,1-Biphenyl | ND | 0.025 | mg/kg wet | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| 2,4-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2,6-Dinitrotoluene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chloronaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Chlorophenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylnaphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 2-Nitrophenol | ND | 0.500 | mg/kg wet | | | | | | | |
| 3,3´-Dichlorobenzidine | ND | 0.250 | mg/kg wet | | | | | | | |
| 3+4-Methylphenol | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Bromophenyl-phenylether | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Chloroaniline | ND | 0.250 | mg/kg wet | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Acenaphthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Acetophenone | ND | 0.250 | mg/kg wet | | | | | | | |
| Aniline | ND | 0.250 | mg/kg wet | | | | | | | |
| Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Azobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(a)pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(b)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(g,h,i)perylene | ND | 0.250 | mg/kg wet | | | | | | | |
| Benzo(k)fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethoxy)methane | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Chloroethyl)ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-chloroisopropyl)Ether | ND | 0.250 | mg/kg wet | | | | | | | |
| bis(2-Ethylhexyl)phthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Butylbenzylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Chrysene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzo(a,h)Anthracene | ND | 0.250 | mg/kg wet | | | | | | | |
| Dibenzofuran | ND | 0.250 | mg/kg wet | | | | | | | |
| Diethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Dimethylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |
| Di-n-butylphthalate | ND | 0.250 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40602 - 3546** | | | | | | | | | | |
| Di-n-octylphthalate | ND | 0.500 | mg/kg wet | | | | | | | |
| Fluoranthene | ND | 0.250 | mg/kg wet | | | | | | | |
| Fluorene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachlorobutadiene | ND | 0.250 | mg/kg wet | | | | | | | |
| Hexachloroethane | ND | 0.250 | mg/kg wet | | | | | | | |
| Indeno(1,2,3-cd)Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Isophorone | ND | 0.250 | mg/kg wet | | | | | | | |
| Naphthalene | ND | 0.250 | mg/kg wet | | | | | | | |
| Nitrobenzene | ND | 0.250 | mg/kg wet | | | | | | | |
| N-Nitrosodimethylamine | ND | 0.250 | mg/kg wet | | | | | | | |
| Pentachlorophenol | ND | 1.00 | mg/kg wet | | | | | | | |
| Phenanthrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Phenol | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyrene | ND | 0.250 | mg/kg wet | | | | | | | |
| Pyridine | ND | 0.250 | mg/kg wet | | | | | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.31* | | mg/kg wet | *2.500* | | *92* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.70* | | mg/kg wet | *3.750* | | *99* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.48* | | mg/kg wet | *3.750* | | *93* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.10* | | mg/kg wet | *2.500* | | *84* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.47* | | mg/kg wet | *3.750* | | *93* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.17* | | mg/kg wet | *2.500* | | *87* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.55* | | mg/kg wet | *3.750* | | *95* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.28* | | mg/kg wet | *2.500* | | *91* | *30-130* | | | |
| **LCS** | | | | | | | | | | |
| 1,1-Biphenyl | 2.28 | 0.025 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| 1,2,4-Trichlorobenzene | 2.25 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| 1,2-Dichlorobenzene | 2.26 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | | | |
| 1,3-Dichlorobenzene | 2.20 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| 1,4-Dichlorobenzene | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| 2,4,5-Trichlorophenol | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 30-130 | | | |
| 2,4,6-Trichlorophenol | 2.29 | 0.250 | mg/kg wet | 2.500 | | 91 | 30-130 | | | |
| 2,4-Dichlorophenol | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 30-130 | | | |
| 2,4-Dimethylphenol | 1.62 | 0.250 | mg/kg wet | 2.500 | | 65 | 30-130 | | | |
| 2,4-Dinitrophenol | 2.16 | 1.00 | mg/kg wet | 2.500 | | 86 | 15-140 | | | |
| 2,4-Dinitrotoluene | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | | | |
| 2,6-Dinitrotoluene | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| 2-Chloronaphthalene | 2.16 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| 2-Chlorophenol | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 30-130 | | | |
| 2-Methylnaphthalene | 2.21 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| 2-Methylphenol | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 15-140 | | | |
| 2-Nitrophenol | 2.31 | 0.500 | mg/kg wet | 2.500 | | 92 | 30-130 | | | |
| 3,3´-Dichlorobenzidine | 2.03 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| 3+4-Methylphenol | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 15-140 | | | |
| 4-Bromophenyl-phenylether | 2.05 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40602 - 3546** | | | | | | | | | | |
| 4-Chloroaniline | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 15-140 | | | |
| 4-Nitrophenol | 2.41 | 1.00 | mg/kg wet | 2.500 | | 96 | 15-140 | | | |
| Acenaphthene | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Acenaphthylene | 2.08 | 0.250 | mg/kg wet | 2.500 | | 83 | 40-140 | | | |
| Acetophenone | 2.31 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Aniline | 1.88 | 0.250 | mg/kg wet | 2.500 | | 75 | 40-140 | | | |
| Anthracene | 2.16 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Azobenzene | 2.14 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Benzo(a)anthracene | 2.19 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| Benzo(a)pyrene | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Benzo(b)fluoranthene | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |
| Benzo(g,h,i)perylene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Benzo(k)fluoranthene | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| bis(2-Chloroethoxy)methane | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| bis(2-Chloroethyl)ether | 2.21 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| bis(2-chloroisopropyl)Ether | 2.09 | 0.250 | mg/kg wet | 2.500 | | 84 | 40-140 | | | |
| bis(2-Ethylhexyl)phthalate | 2.03 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Butylbenzylphthalate | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| Chrysene | 2.05 | 0.250 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Dibenzo(a,h)Anthracene | 2.23 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | | | |
| Dibenzofuran | 2.25 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Diethylphthalate | 2.25 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Dimethylphthalate | 2.08 | 0.250 | mg/kg wet | 2.500 | | 83 | 15-140 | | | |
| Di-n-butylphthalate | 2.35 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Di-n-octylphthalate | 2.14 | 0.500 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| Fluoranthene | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | | | |
| Fluorene | 2.24 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Hexachlorobenzene | 2.08 | 0.250 | mg/kg wet | 2.500 | | 83 | 40-140 | | | |
| Hexachlorobutadiene | 2.02 | 0.250 | mg/kg wet | 2.500 | | 81 | 40-140 | | | |
| Hexachloroethane | 2.20 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | | | |
| Indeno(1,2,3-cd)Pyrene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| Isophorone | 2.10 | 0.250 | mg/kg wet | 2.500 | | 84 | 40-140 | | | |
| Naphthalene | 2.12 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | | | |
| Nitrobenzene | 2.15 | 0.250 | mg/kg wet | 2.500 | | 86 | 40-140 | | | |
| N-Nitrosodimethylamine | 2.74 | 0.250 | mg/kg wet | 2.500 | | 110 | 40-140 | | | |
| Pentachlorophenol | 1.93 | 1.00 | mg/kg wet | 2.500 | | 77 | 15-140 | | | |
| Phenanthrene | 2.18 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Phenol | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 15-140 | | | |
| Pyrene | 2.17 | 0.250 | mg/kg wet | 2.500 | | 87 | 40-140 | | | |
| Pyridine | 1.84 | 0.250 | mg/kg wet | 2.500 | | 74 | 40-140 | | | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.36* | | mg/kg wet | *2.500* | | *94* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.51* | | mg/kg wet | *3.750* | | *94* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.84* | | mg/kg wet | *3.750* | | *102* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.27* | | mg/kg wet | *2.500* | | *91* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.65* | | mg/kg wet | *3.750* | | *97* | *30-130* | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40602 - 3546** | | | | | | | | | | |
| *Surrogate: Nitrobenzene-d5* | *2.25* | | mg/kg wet | *2.500* | | *90* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.83* | | mg/kg wet | *3.750* | | *102* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.32* | | mg/kg wet | *2.500* | | *93* | *30-130* | | | |
| **LCS Dup** | | | | | | | | | | |
| 1,1-Biphenyl | 2.40 | 0.025 | mg/kg wet | 2.500 | | 96 | 40-140 | 5 | 30 | |
| 1,2,4-Trichlorobenzene | 2.32 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 3 | 30 | |
| 1,2-Dichlorobenzene | 2.27 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | 0.2 | 30 | |
| 1,3-Dichlorobenzene | 2.26 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 3 | 30 | |
| 1,4-Dichlorobenzene | 2.26 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 2 | 30 | |
| 2,4,5-Trichlorophenol | 2.37 | 0.250 | mg/kg wet | 2.500 | | 95 | 30-130 | 3 | 30 | |
| 2,4,6-Trichlorophenol | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 30-130 | 3 | 30 | |
| 2,4-Dichlorophenol | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 30-130 | 2 | 30 | |
| 2,4-Dimethylphenol | 1.78 | 0.250 | mg/kg wet | 2.500 | | 71 | 30-130 | 9 | 30 | |
| 2,4-Dinitrophenol | 2.40 | 1.00 | mg/kg wet | 2.500 | | 96 | 15-140 | 11 | 30 | |
| 2,4-Dinitrotoluene | 2.49 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 5 | 30 | |
| 2,6-Dinitrotoluene | 2.36 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 2 | 30 | |
| 2-Chloronaphthalene | 2.21 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | 3 | 30 | |
| 2-Chlorophenol | 2.41 | 0.250 | mg/kg wet | 2.500 | | 96 | 30-130 | 0.4 | 30 | |
| 2-Methylnaphthalene | 2.39 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 8 | 30 | |
| 2-Methylphenol | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 15-140 | 2 | 30 | |
| 2-Nitrophenol | 2.46 | 0.500 | mg/kg wet | 2.500 | | 99 | 30-130 | 7 | 30 | |
| 3,3´-Dichlorobenzidine | 2.19 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | 8 | 30 | |
| 3+4-Methylphenol | 2.47 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | 3 | 30 | |
| 4-Bromophenyl-phenylether | 2.20 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | 7 | 30 | |
| 4-Chloroaniline | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 15-140 | 6 | 30 | |
| 4-Nitrophenol | 2.65 | 1.00 | mg/kg wet | 2.500 | | 106 | 15-140 | 9 | 30 | |
| Acenaphthene | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 5 | 30 | |
| Acenaphthylene | 2.20 | 0.250 | mg/kg wet | 2.500 | | 88 | 40-140 | 5 | 30 | |
| Acetophenone | 2.34 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 1 | 30 | |
| Aniline | 1.96 | 0.250 | mg/kg wet | 2.500 | | 78 | 40-140 | 4 | 30 | |
| Anthracene | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 8 | 30 | |
| Azobenzene | 2.42 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 12 | 30 | |
| Benzo(a)anthracene | 2.25 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 3 | 30 | |
| Benzo(a)pyrene | 2.28 | 0.250 | mg/kg wet | 2.500 | | 91 | 40-140 | 6 | 30 | |
| Benzo(b)fluoranthene | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 7 | 30 | |
| Benzo(g,h,i)perylene | 2.57 | 0.250 | mg/kg wet | 2.500 | | 103 | 40-140 | 9 | 30 | |
| Benzo(k)fluoranthene | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 6 | 30 | |
| bis(2-Chloroethoxy)methane | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 8 | 30 | |
| bis(2-Chloroethyl)ether | 2.31 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 4 | 30 | |
| bis(2-chloroisopropyl)Ether | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 40-140 | 2 | 30 | |
| bis(2-Ethylhexyl)phthalate | 2.24 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 10 | 30 | |
| Butylbenzylphthalate | 2.39 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 3 | 30 | |
| Chrysene | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 11 | 30 | |
| Dibenzo(a,h)Anthracene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 5 | 30 | |
| Dibenzofuran | 2.33 | 0.250 | mg/kg wet | 2.500 | | 93 | 40-140 | 4 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Volatile Organic Compounds** | | | | | | | | | | |
| **Batch DF40602 - 3546** | | | | | | | | | | |
| Diethylphthalate | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 2 | 30 | |
| Dimethylphthalate | 2.13 | 0.250 | mg/kg wet | 2.500 | | 85 | 15-140 | 2 | 30 | |
| Di-n-butylphthalate | 2.38 | 0.250 | mg/kg wet | 2.500 | | 95 | 40-140 | 1 | 30 | |
| Di-n-octylphthalate | 2.17 | 0.500 | mg/kg wet | 2.500 | | 87 | 40-140 | 2 | 30 | |
| Fluoranthene | 2.40 | 0.250 | mg/kg wet | 2.500 | | 96 | 40-140 | 4 | 30 | |
| Fluorene | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 2 | 30 | |
| Hexachlorobenzene | 2.24 | 0.250 | mg/kg wet | 2.500 | | 89 | 40-140 | 7 | 30 | |
| Hexachlorobutadiene | 2.10 | 0.250 | mg/kg wet | 2.500 | | 84 | 40-140 | 4 | 30 | |
| Hexachloroethane | 2.26 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 3 | 30 | |
| Indeno(1,2,3-cd)Pyrene | 2.48 | 0.250 | mg/kg wet | 2.500 | | 99 | 40-140 | 7 | 30 | |
| Isophorone | 2.29 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 9 | 30 | |
| Naphthalene | 2.26 | 0.250 | mg/kg wet | 2.500 | | 90 | 40-140 | 6 | 30 | |
| Nitrobenzene | 2.34 | 0.250 | mg/kg wet | 2.500 | | 94 | 40-140 | 8 | 30 | |
| N-Nitrosodimethylamine | 2.59 | 0.250 | mg/kg wet | 2.500 | | 104 | 40-140 | 6 | 30 | |
| Pentachlorophenol | 2.11 | 1.00 | mg/kg wet | 2.500 | | 84 | 15-140 | 9 | 30 | |
| Phenanthrene | 2.30 | 0.250 | mg/kg wet | 2.500 | | 92 | 40-140 | 6 | 30 | |
| Phenol | 2.46 | 0.250 | mg/kg wet | 2.500 | | 99 | 15-140 | 6 | 30 | |
| Pyrene | 2.43 | 0.250 | mg/kg wet | 2.500 | | 97 | 40-140 | 11 | 30 | |
| Pyridine | 1.82 | 0.250 | mg/kg wet | 2.500 | | 73 | 40-140 | 1 | 30 | |
| *Surrogate: 1,2-Dichlorobenzene-d4* | *2.28* | | mg/kg wet | *2.500* | | *91* | *30-130* | | | |
| *Surrogate: 2,4,6-Tribromophenol* | *3.55* | | mg/kg wet | *3.750* | | *95* | *30-130* | | | |
| *Surrogate: 2-Chlorophenol-d4* | *3.70* | | mg/kg wet | *3.750* | | *99* | *30-130* | | | |
| *Surrogate: 2-Fluorobiphenyl* | *2.29* | | mg/kg wet | *2.500* | | *92* | *30-130* | | | |
| *Surrogate: 2-Fluorophenol* | *3.68* | | mg/kg wet | *3.750* | | *98* | *30-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.38* | | mg/kg wet | *2.500* | | *95* | *30-130* | | | |
| *Surrogate: Phenol-d6* | *3.78* | | mg/kg wet | *3.750* | | *101* | *30-130* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.37* | | mg/kg wet | *2.500* | | *95* | *30-130* | | | |
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF40606 - 3540C** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Aroclor 1016 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1016 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1221 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1221 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1232 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1232 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1242 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1242 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1248 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1248 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1254 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1254 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1260 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1260 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8082A Polychlorinated Biphenyls (PCB)** | | | | | | | | | | |
| **Batch DF40606 - 3540C** | | | | | | | | | | |
| Aroclor 1262 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1262 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1268 | ND | 0.02 | mg/kg wet | | | | | | | |
| Aroclor 1268 [2C] | ND | 0.02 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0194* | | mg/kg wet | *0.02500* | | *78* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0191* | | mg/kg wet | *0.02500* | | *76* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0184* | | mg/kg wet | *0.02500* | | *74* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0192* | | mg/kg wet | *0.02500* | | *77* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 74 | 40-140 | | | |
| Aroclor 1016 [2C] | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 75 | 40-140 | | | |
| Aroclor 1260 | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 77 | 40-140 | | | |
| Aroclor 1260 [2C] | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 80 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0181* | | mg/kg wet | *0.02500* | | *72* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0176* | | mg/kg wet | *0.02500* | | *70* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0183* | | mg/kg wet | *0.02500* | | *73* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0182* | | mg/kg wet | *0.02500* | | *73* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| Aroclor 1016 | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 83 | 40-140 | 11 | 30 | |
| Aroclor 1016 [2C] | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 84 | 40-140 | 12 | 30 | |
| Aroclor 1260 | 0.4 | 0.02 | mg/kg wet | 0.5000 | | 87 | 40-140 | 13 | 30 | |
| Aroclor 1260 [2C] | 0.5 | 0.02 | mg/kg wet | 0.5000 | | 91 | 40-140 | 13 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0204* | | mg/kg wet | *0.02500* | | *82* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0202* | | mg/kg wet | *0.02500* | | *81* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0207* | | mg/kg wet | *0.02500* | | *83* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0207* | | mg/kg wet | *0.02500* | | *83* | *30-150* | | | |
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF40709 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 4,4´-DDD | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDD [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDE [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT | ND | 0.0025 | mg/kg wet | | | | | | | |
| 4,4´-DDT [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Aldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| alpha-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| beta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Chlordane (Total) | ND | 0.0200 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF40709 - 3546** | | | | | | | | | | |
| Chlordane (Total) [2C] | ND | 0.0200 | mg/kg wet | | | | | | | |
| delta-BHC | ND | 0.0025 | mg/kg wet | | | | | | | |
| delta-BHC [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Dieldrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan I [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan II [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endosulfan Sulfate [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone | ND | 0.0025 | mg/kg wet | | | | | | | |
| Endrin Ketone [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-BHC (Lindane) [2C] | ND | 0.0015 | mg/kg wet | | | | | | | |
| gamma-Chlordane | ND | 0.0025 | mg/kg wet | | | | | | | |
| gamma-Chlordane [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide | ND | 0.0025 | mg/kg wet | | | | | | | |
| Heptachlor Epoxide [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene | ND | 0.0025 | mg/kg wet | | | | | | | |
| Hexachlorobenzene [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor | ND | 0.0025 | mg/kg wet | | | | | | | |
| Methoxychlor [2C] | ND | 0.0025 | mg/kg wet | | | | | | | |
| Toxaphene | ND | 0.125 | mg/kg wet | | | | | | | |
| Toxaphene [2C] | ND | 0.125 | mg/kg wet | | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0127* | | mg/kg wet | *0.01250* | | *102* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0130* | | mg/kg wet | *0.01250* | | *104* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0119* | | mg/kg wet | *0.01250* | | *95* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0124* | | mg/kg wet | *0.01250* | | *99* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 4,4´-DDD | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| 4,4´-DDD [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| 4,4´-DDE | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | | | |
| 4,4´-DDE [2C] | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| 4,4´-DDT | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| 4,4´-DDT [2C] | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Aldrin | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Aldrin [2C] | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| alpha-BHC | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | | | |
| alpha-BHC [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| alpha-Chlordane | 0.0110 | 0.0025 | mg/kg wet | 0.01250 | | 88 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF40709 - 3546** | | | | | | | | | | |
| alpha-Chlordane [2C] | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | | | |
| beta-BHC | 0.0110 | 0.0025 | mg/kg wet | 0.01250 | | 88 | 40-140 | | | |
| beta-BHC [2C] | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| delta-BHC | 0.0099 | 0.0025 | mg/kg wet | 0.01250 | | 79 | 40-140 | | | |
| delta-BHC [2C] | 0.0107 | 0.0025 | mg/kg wet | 0.01250 | | 85 | 40-140 | | | |
| Dieldrin | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | | | |
| Dieldrin [2C] | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | | | |
| Endosulfan I | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| Endosulfan I [2C] | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Endosulfan II | 0.0116 | 0.0025 | mg/kg wet | 0.01250 | | 93 | 40-140 | | | |
| Endosulfan II [2C] | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |
| Endosulfan Sulfate | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Endosulfan Sulfate [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| Endrin | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |
| Endrin [2C] | 0.0117 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |
| Endrin Ketone | 0.0119 | 0.0025 | mg/kg wet | 0.01250 | | 95 | 40-140 | | | |
| Endrin Ketone [2C] | 0.0121 | 0.0025 | mg/kg wet | 0.01250 | | 97 | 40-140 | | | |
| gamma-BHC (Lindane) | 0.0114 | 0.0015 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| gamma-BHC (Lindane) [2C] | 0.0118 | 0.0015 | mg/kg wet | 0.01250 | | 94 | 40-140 | | | |
| gamma-Chlordane | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | | | |
| gamma-Chlordane [2C] | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | | | |
| Heptachlor | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| Heptachlor [2C] | 0.0120 | 0.0025 | mg/kg wet | 0.01250 | | 96 | 40-140 | | | |
| Heptachlor Epoxide | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| Heptachlor Epoxide [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| Hexachlorobenzene | 0.0112 | 0.0025 | mg/kg wet | 0.01250 | | 89 | 40-140 | | | |
| Hexachlorobenzene [2C] | 0.0113 | 0.0025 | mg/kg wet | 0.01250 | | 90 | 40-140 | | | |
| Methoxychlor | 0.0114 | 0.0025 | mg/kg wet | 0.01250 | | 91 | 40-140 | | | |
| Methoxychlor [2C] | 0.0115 | 0.0025 | mg/kg wet | 0.01250 | | 92 | 40-140 | | | |
| *Surrogate: Decachlorobiphenyl* | *0.0127* | | mg/kg wet | *0.01250* | | *101* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0128* | | mg/kg wet | *0.01250* | | *103* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0112* | | mg/kg wet | *0.01250* | | *90* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0119* | | mg/kg wet | *0.01250* | | *95* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 4,4´-DDD | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | 10 | 30 | |
| 4,4´-DDD [2C] | 0.0140 | 0.0025 | mg/kg wet | 0.01250 | | 112 | 40-140 | 9 | 30 | |
| 4,4´-DDE | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 10 | 30 | |
| 4,4´-DDE [2C] | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 9 | 30 | |
| 4,4´-DDT | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | 9 | 30 | |
| 4,4´-DDT [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 9 | 30 | |
| Aldrin | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 11 | 30 | |
| Aldrin [2C] | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 11 | 30 | |
| alpha-BHC | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 12 | 30 | |
| alpha-BHC [2C] | 0.0134 | 0.0025 | mg/kg wet | 0.01250 | | 107 | 40-140 | 10 | 30 | |
| alpha-Chlordane | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 11 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8081B Organochlorine Pesticides** | | | | | | | | | | |
| **Batch DF40709 - 3546** | | | | | | | | | | |
| alpha-Chlordane [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 11 | 30 | |
| beta-BHC | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 98 | 40-140 | 11 | 30 | |
| beta-BHC [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 10 | 30 | |
| delta-BHC | 0.0109 | 0.0025 | mg/kg wet | 0.01250 | | 87 | 40-140 | 10 | 30 | |
| delta-BHC [2C] | 0.0118 | 0.0025 | mg/kg wet | 0.01250 | | 94 | 40-140 | 10 | 30 | |
| Dieldrin | 0.0138 | 0.0025 | mg/kg wet | 0.01250 | | 111 | 40-140 | 11 | 30 | |
| Dieldrin [2C] | 0.0137 | 0.0025 | mg/kg wet | 0.01250 | | 110 | 40-140 | 11 | 30 | |
| Endosulfan I | 0.0124 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 11 | 30 | |
| Endosulfan I [2C] | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 10 | 30 | |
| Endosulfan II | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 12 | 30 | |
| Endosulfan II [2C] | 0.0130 | 0.0025 | mg/kg wet | 0.01250 | | 104 | 40-140 | 10 | 30 | |
| Endosulfan Sulfate | 0.0126 | 0.0025 | mg/kg wet | 0.01250 | | 101 | 40-140 | 10 | 30 | |
| Endosulfan Sulfate [2C] | 0.0127 | 0.0025 | mg/kg wet | 0.01250 | | 102 | 40-140 | 10 | 30 | |
| Endrin | 0.0133 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 12 | 30 | |
| Endrin [2C] | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 11 | 30 | |
| Endrin Ketone | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 9 | 30 | |
| Endrin Ketone [2C] | 0.0131 | 0.0025 | mg/kg wet | 0.01250 | | 105 | 40-140 | 8 | 30 | |
| gamma-BHC (Lindane) | 0.0126 | 0.0015 | mg/kg wet | 0.01250 | | 101 | 40-140 | 10 | 30 | |
| gamma-BHC (Lindane) [2C] | 0.0131 | 0.0015 | mg/kg wet | 0.01250 | | 105 | 40-140 | 11 | 30 | |
| gamma-Chlordane | 0.0143 | 0.0025 | mg/kg wet | 0.01250 | | 114 | 40-140 | 11 | 30 | |
| gamma-Chlordane [2C] | 0.0145 | 0.0025 | mg/kg wet | 0.01250 | | 116 | 40-140 | 11 | 30 | |
| Heptachlor | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 11 | 30 | |
| Heptachlor [2C] | 0.0132 | 0.0025 | mg/kg wet | 0.01250 | | 106 | 40-140 | 10 | 30 | |
| Heptachlor Epoxide | 0.0128 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 11 | 30 | |
| Heptachlor Epoxide [2C] | 0.0129 | 0.0025 | mg/kg wet | 0.01250 | | 103 | 40-140 | 11 | 30 | |
| Hexachlorobenzene | 0.0123 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 10 | 30 | |
| Hexachlorobenzene [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 10 | 30 | |
| Methoxychlor | 0.0124 | 0.0025 | mg/kg wet | 0.01250 | | 99 | 40-140 | 8 | 30 | |
| Methoxychlor [2C] | 0.0125 | 0.0025 | mg/kg wet | 0.01250 | | 100 | 40-140 | 8 | 30 | |
| *Surrogate: Decachlorobiphenyl* | *0.0130* | | mg/kg wet | *0.01250* | | *104* | *30-150* | | | |
| *Surrogate: Decachlorobiphenyl [2C]* | *0.0134* | | mg/kg wet | *0.01250* | | *107* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene* | *0.0118* | | mg/kg wet | *0.01250* | | *94* | *30-150* | | | |
| *Surrogate: Tetrachloro-m-xylene [2C]* | *0.0125* | | mg/kg wet | *0.01250* | | *100* | *30-150* | | | |
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41058 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| 2,4,5-T | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-T [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4,5-TP (Silvex) [2C] | ND | 0.010 | mg/kg wet | | | | | | | |
| 2,4-D | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-D [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| 2,4-DB | ND | 0.048 | mg/kg wet | | | | | | | |
| 2,4-DB [2C] | ND | 0.048 | mg/kg wet | | | | | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41058 - 3546** | | | | | | | | | | |
| Dalapon | ND | 0.046 | mg/kg wet | | | | | | | |
| Dalapon [2C] | ND | 0.046 | mg/kg wet | | | | | | | |
| Dicamba | ND | 0.009 | mg/kg wet | | | | | | | |
| Dicamba [2C] | ND | 0.009 | mg/kg wet | | | | | | | |
| Dichlorprop | ND | 0.047 | mg/kg wet | | | | | | | |
| Dichlorprop [2C] | ND | 0.047 | mg/kg wet | | | | | | | |
| Dinoseb | ND | 0.048 | mg/kg wet | | | | | | | |
| Dinoseb [2C] | ND | 0.048 | mg/kg wet | | | | | | | |
| MCPA | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPA [2C] | ND | 2.32 | mg/kg wet | | | | | | | |
| MCPP | ND | 2.35 | mg/kg wet | | | | | | | |
| MCPP [2C] | ND | 2.35 | mg/kg wet | | | | | | | |
| *Surrogate: DCAA* | *0.166* | | mg/kg wet | *0.2000* | | *83* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.157* | | mg/kg wet | *0.2000* | | *79* | *30-150* | | | |
| **LCS** | | | | | | | | | | |
| 2,4,5-T | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 66 | 40-140 | | | |
| 2,4,5-T [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 66 | 40-140 | | | |
| 2,4,5-TP (Silvex) | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | | | |
| 2,4,5-TP (Silvex) [2C] | 0.013 | 0.010 | mg/kg wet | 0.01900 | | 68 | 40-140 | | | |
| 2,4-D | 0.143 | 0.047 | mg/kg wet | 0.1880 | | 76 | 40-140 | | | |
| 2,4-D [2C] | 0.120 | 0.047 | mg/kg wet | 0.1880 | | 64 | 40-140 | | | |
| 2,4-DB | 0.159 | 0.048 | mg/kg wet | 0.1900 | | 84 | 40-140 | | | |
| 2,4-DB [2C] | 0.142 | 0.048 | mg/kg wet | 0.1900 | | 75 | 40-140 | | | |
| Dalapon | 0.309 | 0.046 | mg/kg wet | 0.4550 | | 68 | 40-140 | | | |
| Dalapon [2C] | 0.315 | 0.046 | mg/kg wet | 0.4550 | | 69 | 40-140 | | | |
| Dicamba | 0.012 | 0.009 | mg/kg wet | 0.01880 | | 62 | 40-140 | | | |
| Dicamba [2C] | 0.013 | 0.009 | mg/kg wet | 0.01880 | | 70 | 40-140 | | | |
| Dichlorprop | 0.157 | 0.047 | mg/kg wet | 0.1880 | | 84 | 40-140 | | | |
| Dichlorprop [2C] | 0.142 | 0.047 | mg/kg wet | 0.1880 | | 76 | 40-140 | | | |
| Dinoseb | 0.019 | 0.048 | mg/kg wet | 0.09500 | | 20 | 10-100 | | | |
| Dinoseb [2C] | 0.021 | 0.048 | mg/kg wet | 0.09500 | | 22 | 10-100 | | | |
| MCPA | 15.9 | 2.32 | mg/kg wet | 18.60 | | 85 | 40-140 | | | |
| MCPA [2C] | 14.7 | 2.32 | mg/kg wet | 18.60 | | 79 | 40-140 | | | |
| MCPP | 14.3 | 2.35 | mg/kg wet | 18.80 | | 76 | 40-140 | | | |
| MCPP [2C] | 14.7 | 2.35 | mg/kg wet | 18.80 | | 78 | 40-140 | | | |
| *Surrogate: DCAA* | *0.201* | | mg/kg wet | *0.2000* | | *100* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.193* | | mg/kg wet | *0.2000* | | *97* | *30-150* | | | |
| **LCS Dup** | | | | | | | | | | |
| 2,4,5-T | 0.011 | 0.010 | mg/kg wet | 0.01900 | | 56 | 40-140 | 16 | 30 | |
| 2,4,5-T [2C] | 0.010 | 0.010 | mg/kg wet | 0.01900 | | 52 | 40-140 | 24 | 30 | |
| 2,4,5-TP (Silvex) | 0.011 | 0.010 | mg/kg wet | 0.01900 | | 60 | 40-140 | 12 | 30 | |
| 2,4,5-TP (Silvex) [2C] | 0.011 | 0.010 | mg/kg wet | 0.01900 | | 56 | 40-140 | 19 | 30 | |
| 2,4-D | 0.123 | 0.047 | mg/kg wet | 0.1880 | | 65 | 40-140 | 16 | 30 | |
| 2,4-D [2C] | 0.104 | 0.047 | mg/kg wet | 0.1880 | | 55 | 40-140 | 14 | 30 | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8151A Chlorinated Herbicides** | | | | | | | | | | |
| **Batch DF41058 - 3546** | | | | | | | | | | |
| 2,4-DB | 0.133 | 0.048 | mg/kg wet | 0.1900 | | 70 | 40-140 | 18 | 30 | |
| 2,4-DB [2C] | 0.118 | 0.048 | mg/kg wet | 0.1900 | | 62 | 40-140 | 19 | 30 | |
| Dalapon | 0.286 | 0.046 | mg/kg wet | 0.4550 | | 63 | 40-140 | 8 | 30 | |
| Dalapon [2C] | 0.287 | 0.046 | mg/kg wet | 0.4550 | | 63 | 40-140 | 9 | 30 | |
| Dicamba | 0.011 | 0.009 | mg/kg wet | 0.01880 | | 56 | 40-140 | 10 | 30 | |
| Dicamba [2C] | 0.011 | 0.009 | mg/kg wet | 0.01880 | | 60 | 40-140 | 15 | 30 | |
| Dichlorprop | 0.137 | 0.047 | mg/kg wet | 0.1880 | | 73 | 40-140 | 14 | 30 | |
| Dichlorprop [2C] | 0.125 | 0.047 | mg/kg wet | 0.1880 | | 66 | 40-140 | 13 | 30 | |
| Dinoseb | 0.014 | 0.048 | mg/kg wet | 0.09500 | | 15 | 10-100 | 25 | 30 | |
| Dinoseb [2C] | 0.016 | 0.048 | mg/kg wet | 0.09500 | | 17 | 10-100 | 27 | 30 | |
| MCPA | 13.8 | 2.32 | mg/kg wet | 18.60 | | 74 | 40-140 | 14 | 30 | |
| MCPA [2C] | 12.9 | 2.32 | mg/kg wet | 18.60 | | 69 | 40-140 | 14 | 30 | |
| MCPP | 12.4 | 2.35 | mg/kg wet | 18.80 | | 66 | 40-140 | 14 | 30 | |
| MCPP [2C] | 12.4 | 2.35 | mg/kg wet | 18.80 | | 66 | 40-140 | 17 | 30 | |
| *Surrogate: DCAA* | *0.159* | | mg/kg wet | *0.2000* | | *79* | *30-150* | | | |
| *Surrogate: DCAA [2C]* | *0.150* | | mg/kg wet | *0.2000* | | *75* | *30-150* | | | |
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF40664 - 3546** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Decane (C10) | ND | 0.2 | mg/kg wet | | | | | | | |
| Docosane (C22) | ND | 0.2 | mg/kg wet | | | | | | | |
| Dodecane (C12) | ND | 0.2 | mg/kg wet | | | | | | | |
| Eicosane (C20) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexacosane (C26) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexadecane (C16) | ND | 0.2 | mg/kg wet | | | | | | | |
| Hexatriacontane (C36) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonadecane (C19) | ND | 0.2 | mg/kg wet | | | | | | | |
| Nonane (C9) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octacosane (C28) | ND | 0.2 | mg/kg wet | | | | | | | |
| Octadecane (C18) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetracosane (C24) | ND | 0.2 | mg/kg wet | | | | | | | |
| Tetradecane (C14) | ND | 0.2 | mg/kg wet | | | | | | | |
| Total Petroleum Hydrocarbons (C9-C36) | ND | 10.0 | mg/kg wet | | | | | | | |
| Triacontane (C30) | ND | 0.2 | mg/kg wet | | | | | | | |
| *Surrogate: O-Terphenyl* | *4.78* | | mg/kg wet | *5.000* | | *96* | *40-140* | | | |
| **LCS** | | | | | | | | | | |
| Decane (C10) | 2.1 | 0.2 | mg/kg wet | 2.500 | | 82 | 40-140 | | | |
| Docosane (C22) | 2.6 | 0.2 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Dodecane (C12) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | | | |
| Eicosane (C20) | 2.5 | 0.2 | mg/kg wet | 2.500 | | 101 | 40-140 | | | |
| Hexacosane (C26) | 2.6 | 0.2 | mg/kg wet | 2.500 | | 102 | 40-140 | | | |
| Hexadecane (C16) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Hexatriacontane (C36) | 2.8 | 0.2 | mg/kg wet | 2.500 | | 112 | 40-140 | | | |
| Nonadecane (C19) | 2.5 | 0.2 | mg/kg wet | 2.500 | | 100 | 40-140 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **8100M Total Petroleum Hydrocarbons** | | | | | | | | | | |
| **Batch DF40664 - 3546** | | | | | | | | | | |
| Nonane (C9) | 1.8 | 0.2 | mg/kg wet | 2.500 | | 71 | 30-140 | | | |
| Octacosane (C28) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Octadecane (C18) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 97 | 40-140 | | | |
| Tetracosane (C24) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 96 | 40-140 | | | |
| Tetradecane (C14) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 94 | 40-140 | | | |
| Total Petroleum Hydrocarbons (C9-C36) | 33.4 | 10.0 | mg/kg wet | 35.00 | | 95 | 40-140 | | | |
| Triacontane (C30) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 93 | 40-140 | | | |
| *Surrogate: O-Terphenyl* | *4.72* | | mg/kg wet | *5.000* | | *94* | *40-140* | | | |
| **LCS Dup** | | | | | | | | | | |
| Decane (C10) | 2.0 | 0.2 | mg/kg wet | 2.500 | | 80 | 40-140 | 3 | 25 | |
| Docosane (C22) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 97 | 40-140 | 6 | 25 | |
| Dodecane (C12) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 86 | 40-140 | 5 | 25 | |
| Eicosane (C20) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 95 | 40-140 | 5 | 25 | |
| Hexacosane (C26) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 96 | 40-140 | 6 | 25 | |
| Hexadecane (C16) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 92 | 40-140 | 5 | 25 | |
| Hexatriacontane (C36) | 2.6 | 0.2 | mg/kg wet | 2.500 | | 105 | 40-140 | 6 | 25 | |
| Nonadecane (C19) | 2.4 | 0.2 | mg/kg wet | 2.500 | | 95 | 40-140 | 5 | 25 | |
| Nonane (C9) | 1.7 | 0.2 | mg/kg wet | 2.500 | | 69 | 30-140 | 2 | 25 | |
| Octacosane (C28) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 91 | 40-140 | 6 | 25 | |
| Octadecane (C18) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 92 | 40-140 | 5 | 25 | |
| Tetracosane (C24) | 2.3 | 0.2 | mg/kg wet | 2.500 | | 91 | 40-140 | 6 | 25 | |
| Tetradecane (C14) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 90 | 40-140 | 5 | 25 | |
| Total Petroleum Hydrocarbons (C9-C36) | 31.7 | 10.0 | mg/kg wet | 35.00 | | 91 | 40-140 | 5 | 25 | |
| Triacontane (C30) | 2.2 | 0.2 | mg/kg wet | 2.500 | | 88 | 40-140 | 6 | 25 | |
| *Surrogate: O-Terphenyl* | *4.85* | | mg/kg wet | *5.000* | | *97* | *40-140* | | | |
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DF41048 - General Preparation** | | | | | | | | | | |
| **Reference** | | | | | | | | | | |
| Flashpoint | 82 | | °F | 81.00 | | 101 | 97.9-102.1 | | | |
| **Batch DF41050 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Reactive Cyanide | ND | 2.0 | mg/kg | | | | | | | |
| Reactive Sulfide | ND | 2.0 | mg/kg | | | | | | | |
| **LCS** | | | | | | | | | | |
| Reactive Cyanide | 4.1 | 2.0 | mg/kg | 100.3 | | 4 | 0.68-5.41 | | | |
| Reactive Sulfide | 2.1 | 2.0 | mg/kg | 10.00 | | 21 | 0-44 | | | |
| **Batch DF41062 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Conductivity | ND | 5 | umhos/cm | | | | | | | |
| **LCS** | | | | | | | | | | |
| Conductivity | 1390 | | umhos/cm | 1410 | | 99 | 90-110 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

**Notes and Definitions**

| | |
|---|---|
| X* | RSD of replicate analysis > 20%. Reanalysis produced similar results. |
| WL | Results obtained from a deionized water leach of the sample. |
| U | Analyte included in the analysis, but not detected |
| Q | Calibration required quadratic regression (Q). |
| EL | Elevated Method Reporting Limits due to sample matrix (EL). |
| D+ | Relative percent difference for duplicate is outside of criteria (D+). |
| D | Diluted. |
| CD+ | Continuing Calibration %Diff/Drift is above control limit (CD+). |
| CD- | Continuing Calibration %Diff/Drift is below control limit (CD-). |
| B- | Blank Spike recovery is below lower control limit (B-). |
| > | Greater than. |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Civil & Environmental Consultants, Inc.
Client Project ID: MassCEC Phase III - Site 4 ESS Laboratory Work Order: 24F0229

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24F0229
Date Received: 6/6/2024
Project Due Date: 6/13/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.7 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? (Yes) / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: _____ Time: _____ By/Acid Lot#: _____
    b. If dissolved metals are requested, are they: Yes / No Field Filtered
    c. Low Level VOA vials frozen: Date: 6/6/24 Yes / No To Be Lab Filtered Time: 1723 By: TD

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted: _____ Date: _____ Time: _____ By: _____

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 557434 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 557435 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 1 | 557440 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 2 | 557446 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 557447 | Yes | N/A | Yes | 8 oz jar | NP | |
| 2 | 557630 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 3 | 557436 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 557437 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 3 | 557441 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 4 | 557448 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 557449 | Yes | N/A | Yes | 8 oz jar | NP | |
| 4 | 557631 | Yes | N/A | Yes | 4 oz. Jar | NP | |
| 5 | 557438 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 5 | 557439 | Yes | N/A | Yes | VOA Vial | DI Water | |
| 5 | 557442 | Yes | N/A | Yes | VOA Vial | MeOH | |
| 6 | 557450 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 557451 | Yes | N/A | Yes | 8 oz jar | NP | |
| 6 | 557632 | Yes | N/A | Yes | 4 oz. Jar | NP | |

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: CEC - Civil & Envtal Consultants - TB

ESS Project ID: 24F0229

Date Received: 6/6/2024

**2nd Review**

**Were all containers scanned into storage/lab?** Initials RB

| | |
|---|---|
| Are barcode labels on correct containers? | Yes / No |
| Are all Flashpoint stickers attached/container ID # circled? | Yes / No / NA |
| Are all Hex Chrome stickers attached? | Yes / No / NA |
| Are all QC stickers attached? | Yes / No / NA |
| Are VOA stickers attached if bubbles noted? | Yes / No / NA |

Completed By: [signature] Date & Time: 6/6/24 17:20

Reviewed By: [signature] Date & Time: 06/06/24 1723.

# ESS Laboratory

*Division of Thielsch Engineering, Inc.*
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

## CHAIN OF CUSTODY

ESS Lab # 24F0229

| | | |
|---|---|---|
| **Turn Time** | 5 | Days |
| **Regulatory State** | Massachusetts | |

**Is this project for any of the following?:** ○ CT RCP ◉ MA MCP ○ RGP

**Reporting Limits:** compare results to RCS-1, RCS-2, Lined and unlined landfills, TCLP, and 20X if needed.

**Electonic Deliverables:** ☑ Data Checker ☑ Excel ☑ Other (Please Specify →) EDD

| Company Name | Project # | Project Name |
|---|---|---|
| Civil and Environmental Consultants | 332-344 | MassCEC Phase III - Site #4 |

| Contact Person | Address |
|---|---|
| Cassia Dal Bello | 31 Bellows Road |

| City | State | Zip Code | PO # |
|---|---|---|---|
| Raynham | MA | 02767 | |

| Telephone Number | FAX Number | Email Address |
|---|---|---|
| 774-501-2176 | | cdalbello; jkitchen, dbarboza@cecinc.com |

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | RCRA8 Metals | PCBs via 3540C | TPH | SVOC - incl pyr | Pest - incl Tox | Herbicides | Reactivity | Conductivity | pH | Free Liquid | Flashpoint | VOC - high | VOC - low | ~~Grain Size Analysis (Steve Only)~~ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6/5/24 | 13:25 | Solid | Soil | CEC-5A 9'-11' | | | | | | | | | | | | X | X | | | |
| 2 | 6/5/24 | 13:35 | ↓ | ↓ | CEC-5A 0'-12' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 3 | 6/5/24 | 14:20 | | | CEC-5A 19'-21' | | | | | | | | | | | | X | X | | | |
| 4 | 6/5/24 | 14:30 | | | CEC-5A 12'-24' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 5 | 6/5/24 | 15:30 | | | CEC-5A 29'-31' | | | | | | | | | | | | X | X | | | |
| 6 | 6/6/24 | 08:30 | | | CEC-5A 24'-36' | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Container Type:** | AC-Air Cassette | AG-Amber Glass | B-BOD Bottle | C-Cubitainer | J-Jar | O-Other | P-Poly | S-Sterile | V-Vial | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | AG | V | V | J | J | |
| **Container Volume:** | 1-100 mL | 2-2.5 gal | 3-250 mL | 4-300 mL | 5-500 mL | 6-1L | 7-VOA | 8-2 oz | 9-4 oz | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 7 | 7 | 10 | 9 | |
| **Preservation Code:** | 1-Non Preserved | 2-HCl | 3-H2SO4 | 4-HNO3 | 5-NaOH | 6-Methanol | 7-Na2S2O3 | 8-ZnAce, NaOH | 9-NH4Cl | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 10 | 1 | 1 | |
| **Number of Containers per Sample:** | | | | | | | | | | 1 | | | | | 1 | | | | | 1 | 1 | 2 | 1 | 1 | |

**Laboratory Use Only**

Cooler Present: yes ○ Drop Off
Seals Intact: ○ Pickup
Cooler Temperature: 3.7 °C / CQ

**Sampled by :** CI

**Comments:** Please specify "Other" preservative and containers types in this space

Run TCLP if fails 20x

| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
|---|---|---|---|
| 6/6/24 12:3 | 6/6 24 12:30 | 6/6/24 16:57 | 6/6/24 16:57 |
| Relinquished by: (Signature, Date & Time) | Received By: (Signature, Date & Time) | Relinquished By: (Signature, Date & Time) | Received By: (Signature, Date & Time) |
| | | | |

# SOIL GRADATION REPORTS

Thielsch
DIVISION OF THE RISE GROUP

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
cts.thielsch.com
*Let's Build a Solid Foundation*

| Client Information: | |
|---|---|
| Civil & Environmental Consultants, Inc | |
| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned By: | Tony Sousa |
| Collected By: | CEC |

| Project Information: | |
|---|---|
| **Shuster Bulkhead Improvements** | |
| **4 Wright St., New Bedford MA** | |
| Project Number: | 332-344 |
| Summary Page: | 1 of 1 |
| Report Date: | 7/5/2024 |

## LABORATORY TESTING DATA SHEET, Report No.: 7424-F-210

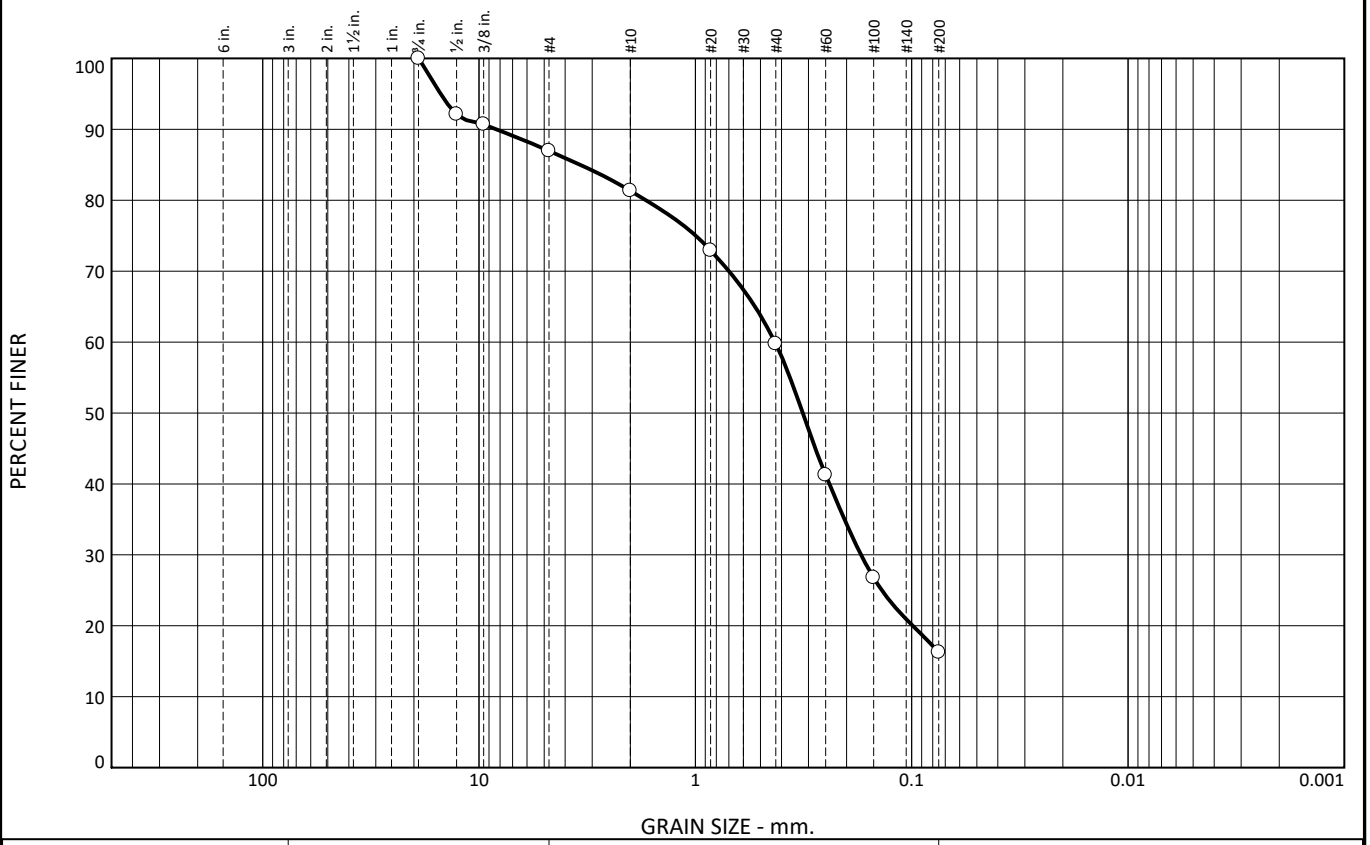
| Boring No. | Sample ID | Depth (ft) | Laboratory No. | Identification Tests | | | | | | | | | Proctor / CBR / Permeability Tests | | | | | | | | Laboratory Log and Soil Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | As Rcvd Moisture Content % | LL % | PL % | OD LL | Gravel % | Sand % | Fines % | Org. % | pH | $g_d$ MAX (pcf) $W_{opt}$ (%) | $g_d$ MAX (pcf) $W_{opt}$ (%) (Corr.) | Dry unit wt. (pcf) | Test Moisture Content % | Target Test Setup as % of Proctor | CBR @ 0.1" | CBR @ 0.2" | Permeability cm/sec | |
| | | | | D2216 | D4318 | | | D6913 | | | D2974 | D4792 | D1557 | | | | | | | | |
| CEC-4A | S-3 | 9-11 | 24-S-2476 | | | | | 13.0 | 70.8 | 16.2 | | | | | | | | | | | Brown silty sand |
| CEC-4A | S-4 | 14-16 | 24-S-2477 | | | | | 13.3 | 73.6 | 13.1 | | | | | | | | | | | Brown silty sand |
| CEC-4A | S-6 | 24-26 | 24-S-2478 | | | | | 32.3 | 62.1 | 5.6 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-5A | S-2 | 4-6 | 24-S-2479 | | | | | 10.5 | 75.8 | 13.7 | | | | | | | | | | | Brown silty sand |
| CEC-5A | S-4 | 14-16 | 24-S-2480 | | | | | 11.0 | 79.0 | 10.0 | | | | | | | | | | | Brown well-graded sand with silt |
| CEC-5A | S-6 | 24-26 | 24-S-2481 | | | | | 32.2 | 56.1 | 11.7 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-6A | S-2 | 4-6 | 24-S-2482 | | | | | 40.3 | 48.2 | 11.5 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-6A | S-5 | 19-21 | 24-S-2483 | | | | | 12.3 | 76.0 | 11.7 | | | | | | | | | | | Brown poorly graded sand with silt |
| CEC-6A | S-6 | 24-26 | 24-S-2484 | | | | | 27.1 | 69.0 | 3.9 | | | | | | | | | | | Brown poorly graded sand with gravel |
| CEC-6A | S-8 | 34-36 | 24-S-2485 | | | | | 19.9 | 63.4 | 16.7 | | | | | | | | | | | Brown silty sand with gravel |
| CEC-7A | S-2 | 4-6 | 24-S-2486 | | | | | 15.1 | 69.1 | 15.8 | | | | | | | | | | | Brown silty sand with gravel |
| CEC-7A | S-5 | 19-21 | 24-S-2487 | | | | | 22.7 | 66.3 | 11.0 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |

Date Received: **6/24/2024** Reviewed By: Date Reviewed: **7/5/2024**

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This report shall not be reproduced, except in full, without prior written approval from the Agency, as defined in ASTM E329.

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 13.0 | 5.7 | 21.5 | 43.6 | 16.2 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 92.1 | | |
| 3/8" | 90.7 | | |
| #4 | 87.0 | | |
| #10 | 81.3 | | |
| #20 | 72.9 | | |
| #40 | 59.8 | | |
| #60 | 41.3 | | |
| #100 | 26.8 | | |
| #200 | 16.2 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 8.3104 $D_{85}$= 3.4062 $D_{60}$= 0.4287
$D_{50}$= 0.3189 $D_{30}$= 0.1715 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 9-11'
Sample Number: CEC-4A / S-3

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2476

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 7.3 | 6.0 | 3.9 | 18.2 | 51.5 | 13.1 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 92.7 | | |
| 1/2" | 91.2 | | |
| 3/8" | 89.7 | | |
| #4 | 86.7 | | |
| #10 | 82.8 | | |
| #20 | 77.2 | | |
| #40 | 64.6 | | |
| #60 | 44.6 | | |
| #100 | 26.5 | | |
| #200 | 13.1 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 10.0828 $D_{85}$= 3.1897 $D_{60}$= 0.3692
$D_{50}$= 0.2872 $D_{30}$= 0.1682 $D_{15}$= 0.0830
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 14-16'
Sample Number: CEC-4A / S-4

Date: 7.2.24

Thielsch Engineering Inc.

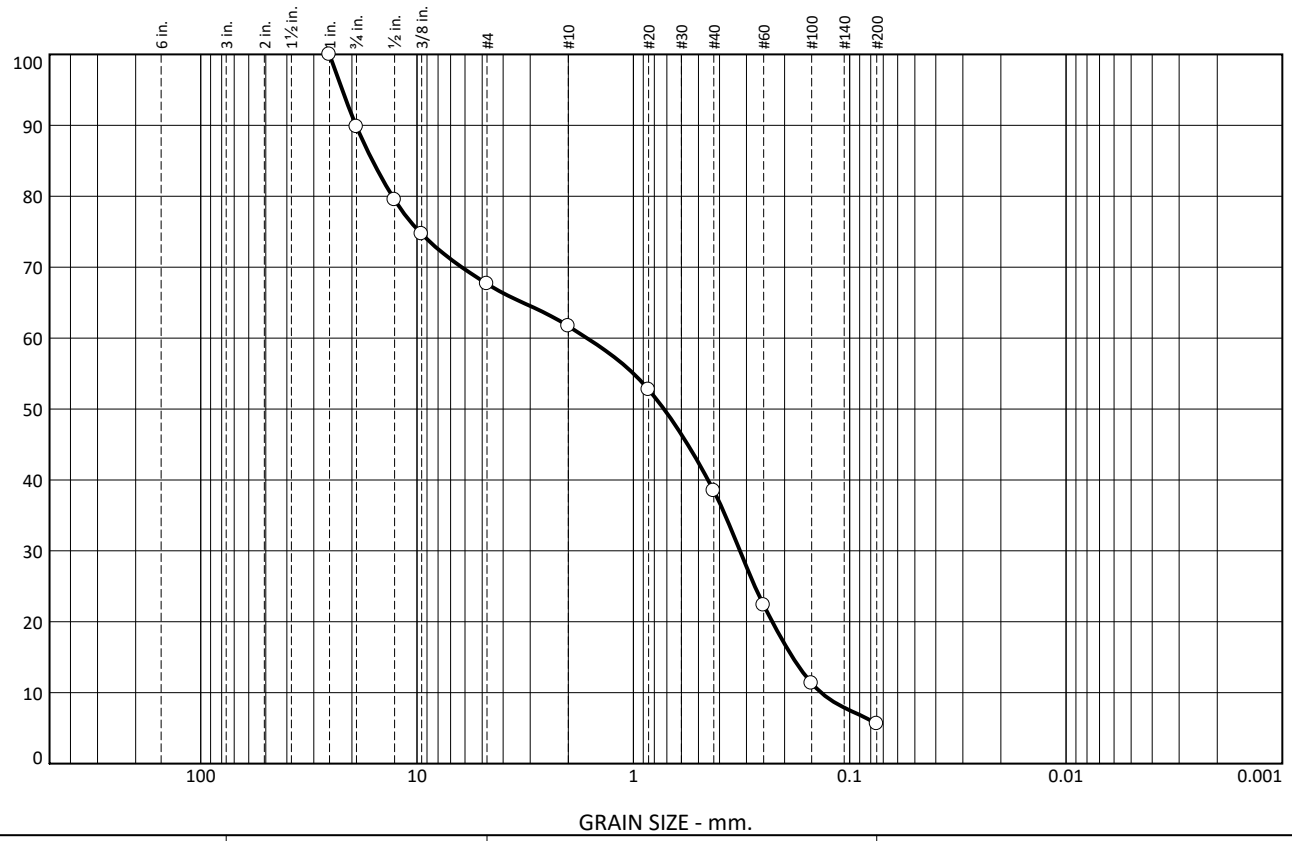
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2477

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 10.2 | 22.1 | 6.0 | 23.2 | 32.9 | 5.6 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 89.8 | | |
| 1/2" | 79.5 | | |
| 3/8" | 74.7 | | |
| #4 | 67.7 | | |
| #10 | 61.7 | | |
| #20 | 52.7 | | |
| #40 | 38.5 | | |
| #60 | 22.3 | | |
| #100 | 11.3 | | |
| #200 | 5.6 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 19.1731 $D_{85}$= 16.0597 $D_{60}$= 1.6406
$D_{50}$= 0.7224 $D_{30}$= 0.3216 $D_{15}$= 0.1837
$D_{10}$= 0.1356 $C_u$= 12.10 $C_c$= 0.47

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-4A / S-6

Date: 7.2.24

Thielsch Engineering Inc.

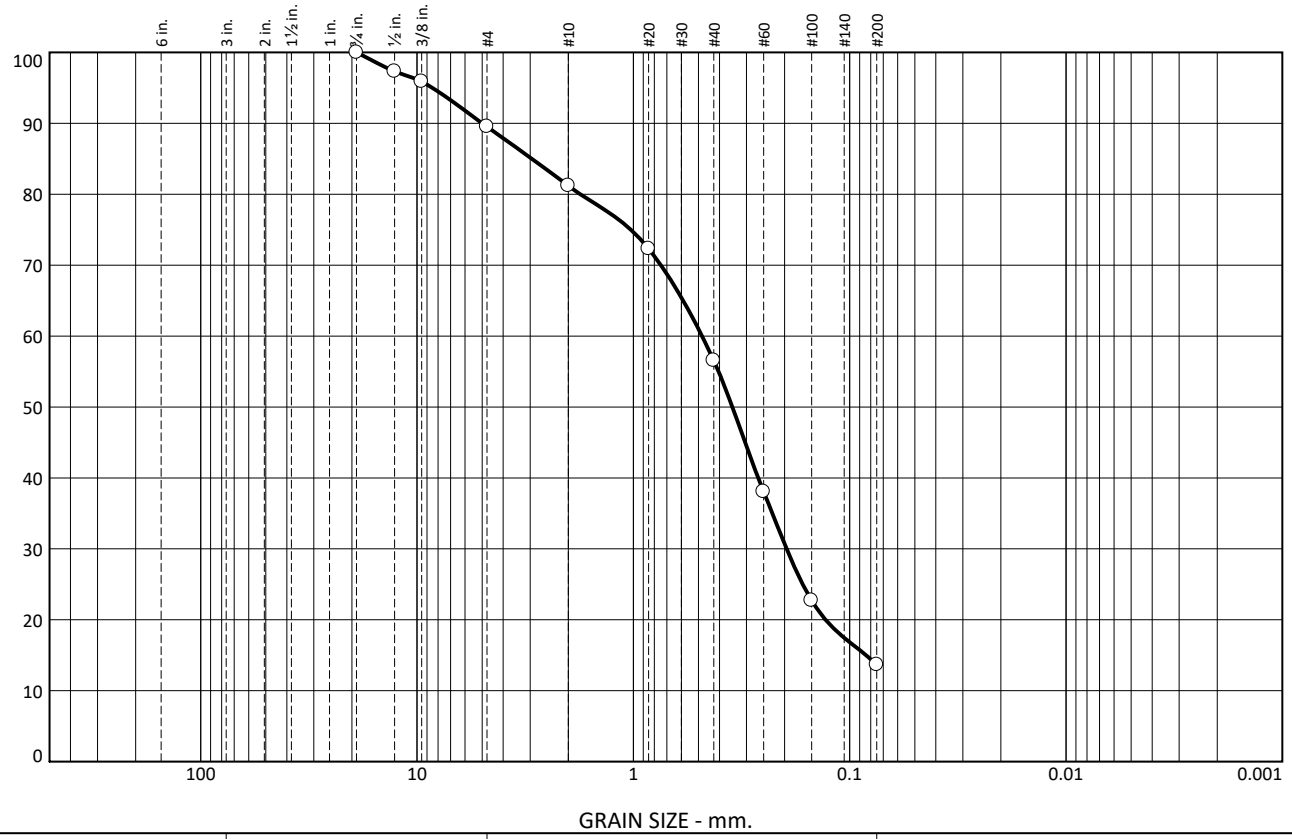
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2478

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 10.5 | 8.3 | 24.7 | 42.8 | 13.7 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 97.3 | | |
| 3/8" | 95.9 | | |
| #4 | 89.5 | | |
| #10 | 81.2 | | |
| #20 | 72.3 | | |
| #40 | 56.5 | | |
| #60 | 38.0 | | |
| #100 | 22.7 | | |
| #200 | 13.7 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 4.9938 $D_{85}$= 2.9460 $D_{60}$= 0.4815
$D_{50}$= 0.3487 $D_{30}$= 0.1956 $D_{15}$= 0.0840
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 4-6'
Sample Number: CEC-5A / S-2

Date: 7.2.24

Thielsch Engineering Inc.

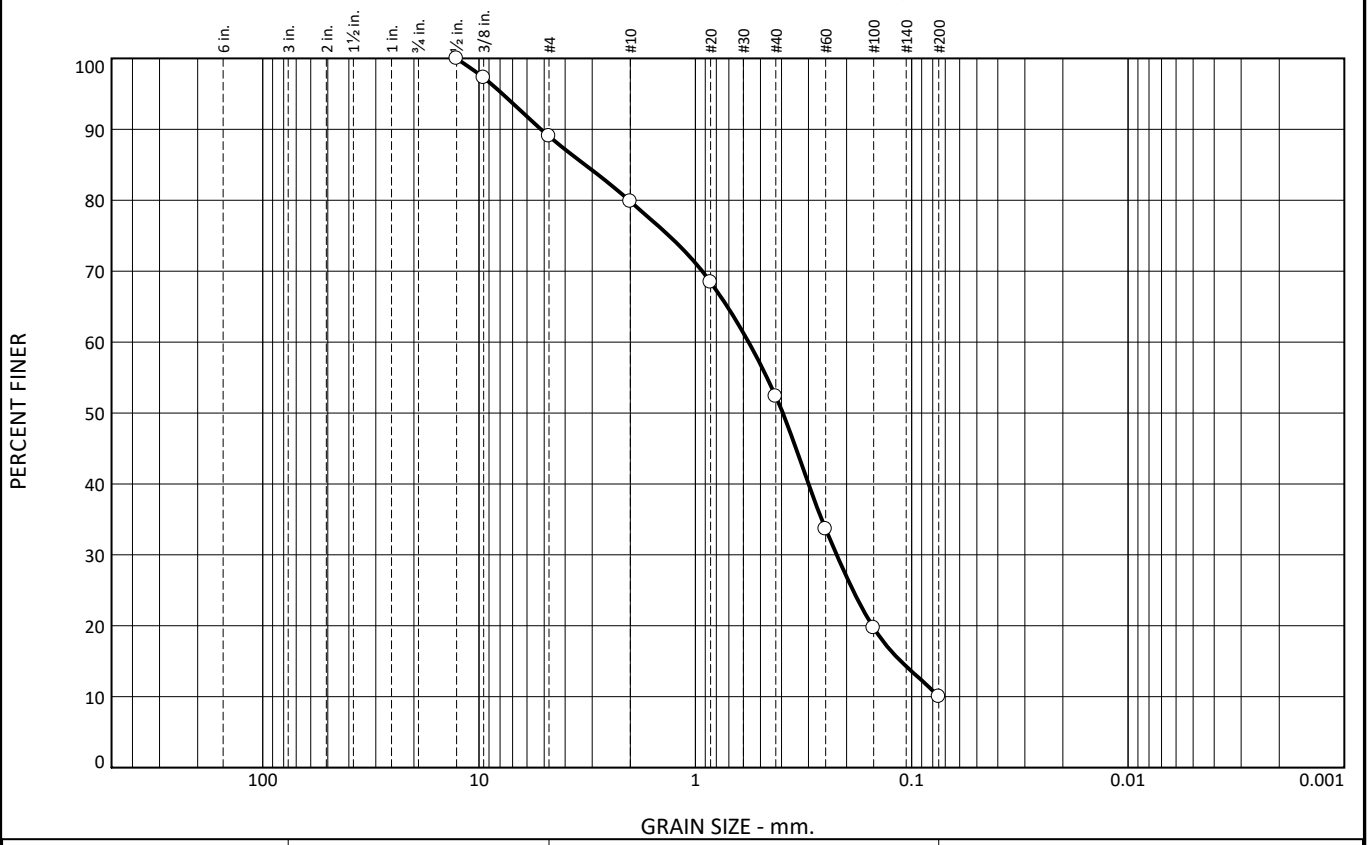
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2479

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 11.0 | 9.2 | 27.5 | 42.3 | 10.0 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1/2" | 100.0 | | |
| 3/8" | 97.3 | | |
| #4 | 89.0 | | |
| #10 | 79.8 | | |
| #20 | 68.4 | | |
| #40 | 52.3 | | |
| #60 | 33.6 | | |
| #100 | 19.7 | | |
| #200 | 10.0 | | |

* (no specification provided)

**Soil Description**

Brown well-graded sand with silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 5.1669 $D_{85}$= 3.2327 $D_{60}$= 0.5676
$D_{50}$= 0.3943 $D_{30}$= 0.2222 $D_{15}$= 0.1123
$D_{10}$= 0.0751 $C_u$= 7.56 $C_c$= 1.16

**Classification**

USCS= SW-SM AASHTO= A-3

**Remarks**

Source of Sample: Boring Depth: 14-16'
Sample Number: CEC-5A / S-4

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2480

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 24.6 | 7.6 | 6.4 | 20.1 | 29.6 | 11.7 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 75.4 | | |
| 1/2" | 75.4 | | |
| 3/8" | 74.8 | | |
| #4 | 67.8 | | |
| #10 | 61.4 | | |
| #20 | 52.9 | | |
| #40 | 41.3 | | |
| #60 | 29.3 | | |
| #100 | 19.4 | | |
| #200 | 11.7 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 23.0834 $D_{85}$= 22.0761 $D_{60}$= 1.7016
$D_{50}$= 0.6959 $D_{30}$= 0.2582 $D_{15}$= 0.1040
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-5A / S-6

Date: 7.2.24

Thielsch Engineering Inc.

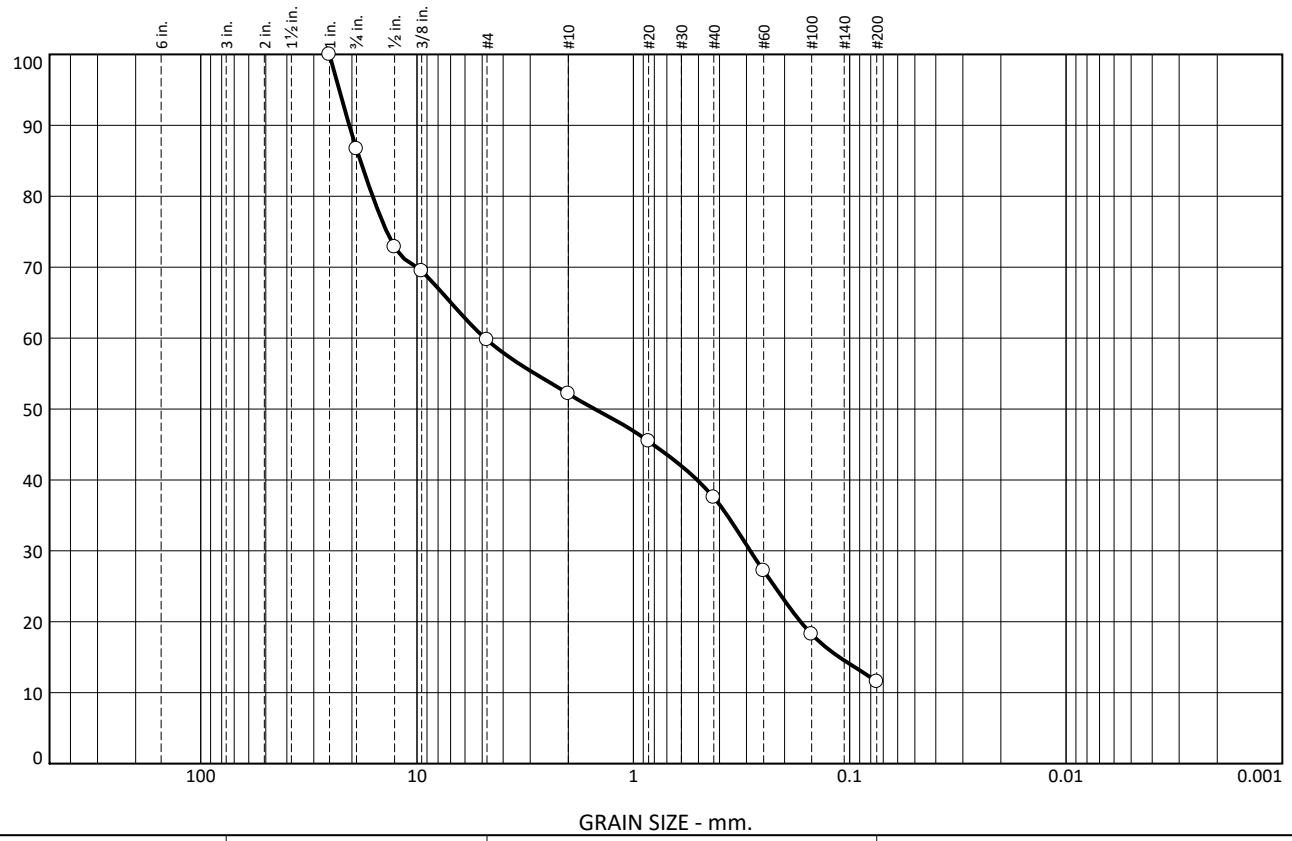
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2481

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 13.3 | 27.0 | 7.5 | 14.7 | 26.0 | 11.5 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 86.7 | | |
| 1/2" | 72.8 | | |
| 3/8" | 69.5 | | |
| #4 | 59.7 | | |
| #10 | 52.2 | | |
| #20 | 45.4 | | |
| #40 | 37.5 | | |
| #60 | 27.2 | | |
| #100 | 18.2 | | |
| #200 | 11.5 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 20.5835 $D_{85}$= 18.2740 $D_{60}$= 4.8553
$D_{50}$= 1.5089 $D_{30}$= 0.2884 $D_{15}$= 0.1116
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 4-6'
Sample Number: CEC-6A / S-2

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2482

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 12.3 | 7.4 | 28.2 | 40.4 | 11.7 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1/2" | 100.0 | | |
| 3/8" | 94.8 | | |
| #4 | 87.7 | | |
| #10 | 80.3 | | |
| #20 | 71.0 | | |
| #40 | 52.1 | | |
| #60 | 31.8 | | |
| #100 | 18.4 | | |
| #200 | 11.7 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 6.1470 $D_{85}$= 3.4646 $D_{60}$= 0.5470
$D_{50}$= 0.4004 $D_{30}$= 0.2361 $D_{15}$= 0.1153
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 19-21'
Sample Number: CEC-6A / S-5

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2483

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 27.1 | 12.2 | 25.2 | 31.6 | 3.9 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 86.5 | | |
| 3/8" | 83.1 | | |
| #4 | 72.9 | | |
| #10 | 60.7 | | |
| #20 | 49.2 | | |
| #40 | 35.5 | | |
| #60 | 22.2 | | |
| #100 | 11.8 | | |
| #200 | 3.9 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 14.3811 $D_{85}$= 11.6145 $D_{60}$= 1.8972
$D_{50}$= 0.8907 $D_{30}$= 0.3398 $D_{15}$= 0.1790
$D_{10}$= 0.1320 $C_u$= 14.37 $C_c$= 0.46

**Classification**

USCS= SP AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-6A / S-6

Date: 7.2.24

Thielsch Engineering Inc.

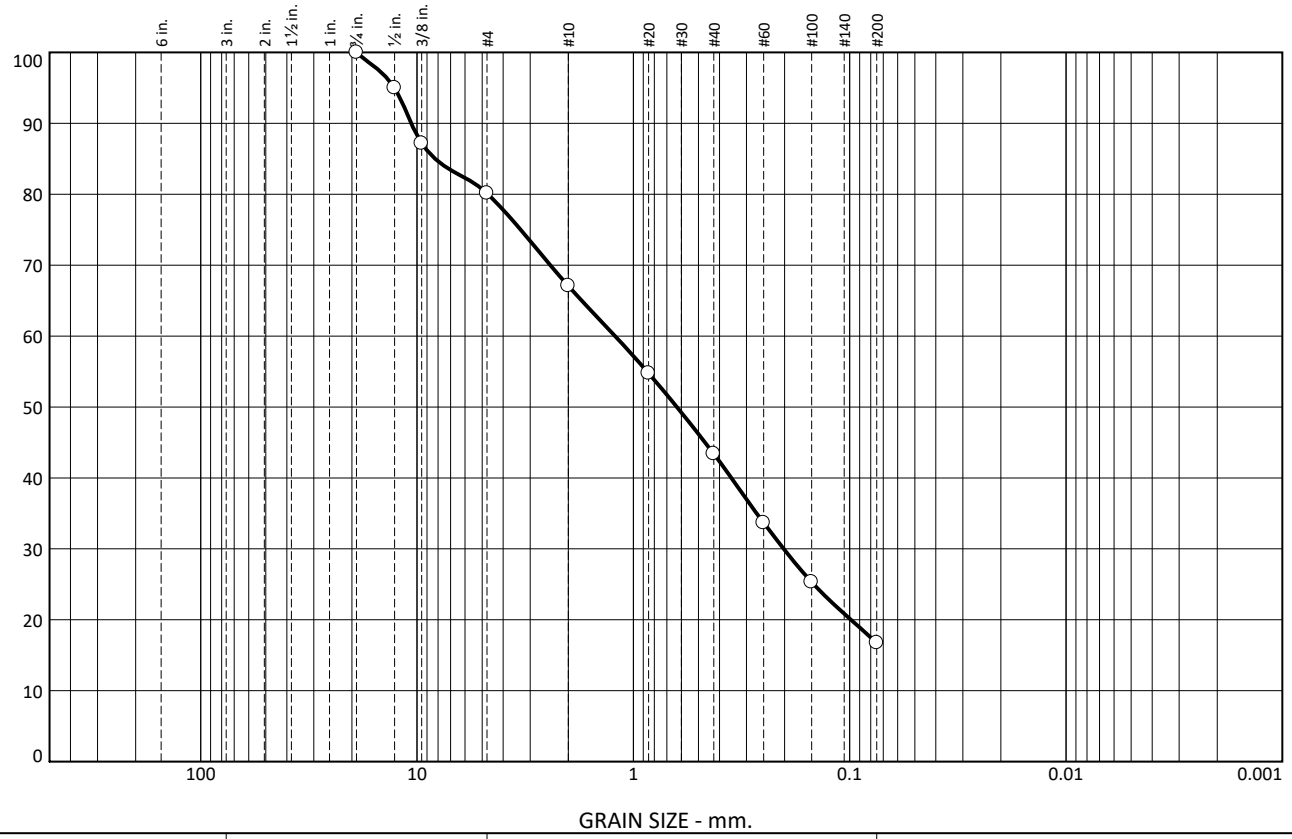
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2484

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 19.9 | 13.0 | 23.7 | 26.7 | 16.7 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 95.0 | | |
| 3/8" | 87.2 | | |
| #4 | 80.1 | | |
| #10 | 67.1 | | |
| #20 | 54.8 | | |
| #40 | 43.4 | | |
| #60 | 33.7 | | |
| #100 | 25.3 | | |
| #200 | 16.7 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 10.6329 $D_{85}$= 8.2491 $D_{60}$= 1.2155
$D_{50}$= 0.6294 $D_{30}$= 0.2019 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 34-36'
Sample Number: CEC-6A / S-8

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2485

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 8.8 | 6.3 | 6.5 | 22.7 | 39.9 | 15.8 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 91.2 | | |
| 1/2" | 91.2 | | |
| 3/8" | 91.2 | | |
| #4 | 84.9 | | |
| #10 | 78.4 | | |
| #20 | 69.7 | | |
| #40 | 55.7 | | |
| #60 | 39.0 | | |
| #100 | 25.5 | | |
| #200 | 15.8 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 7.5586 $D_{85}$= 4.7822 $D_{60}$= 0.5072
$D_{50}$= 0.3509 $D_{30}$= 0.1817 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 4-6'
Sample Number: CEC-7A / S-2

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2486

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 22.7 | 8.4 | 24.9 | 33.0 | 11.0 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 89.6 | | |
| 3/8" | 84.7 | | |
| #4 | 77.3 | | |
| #10 | 68.9 | | |
| #20 | 58.9 | | |
| #40 | 44.0 | | |
| #60 | 29.8 | | |
| #100 | 18.8 | | |
| #200 | 11.0 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 12.9414 $D_{85}$= 9.7343 $D_{60}$= 0.9106
$D_{50}$= 0.5482 $D_{30}$= 0.2520 $D_{15}$= 0.1117
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 19-21'
Sample Number: CEC-7A / S-5

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2487

Tested By: MCS Checked By: Kris Roland

Thielsch
DIVISION OF THE RISE GROUP

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
cts.thielsch.com
*Let's Build a Solid Foundation*

| Client Information: | |
|---|---|
| Civil & Environmental Consultants, Inc | |
| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned By: | Tony Sousa |
| Collected By: | CEC |

| Project Information: | |
|---|---|
| **Shuster Bulkhead Improvements** | |
| **4 Wright St., New Bedford MA** | |
| Project Number: | 332-344 |
| Summary Page: | 1 of 1 |
| Report Date: | 7/5/2024 |

## LABORATORY TESTING DATA SHEET, Report No.: 7424-F-211

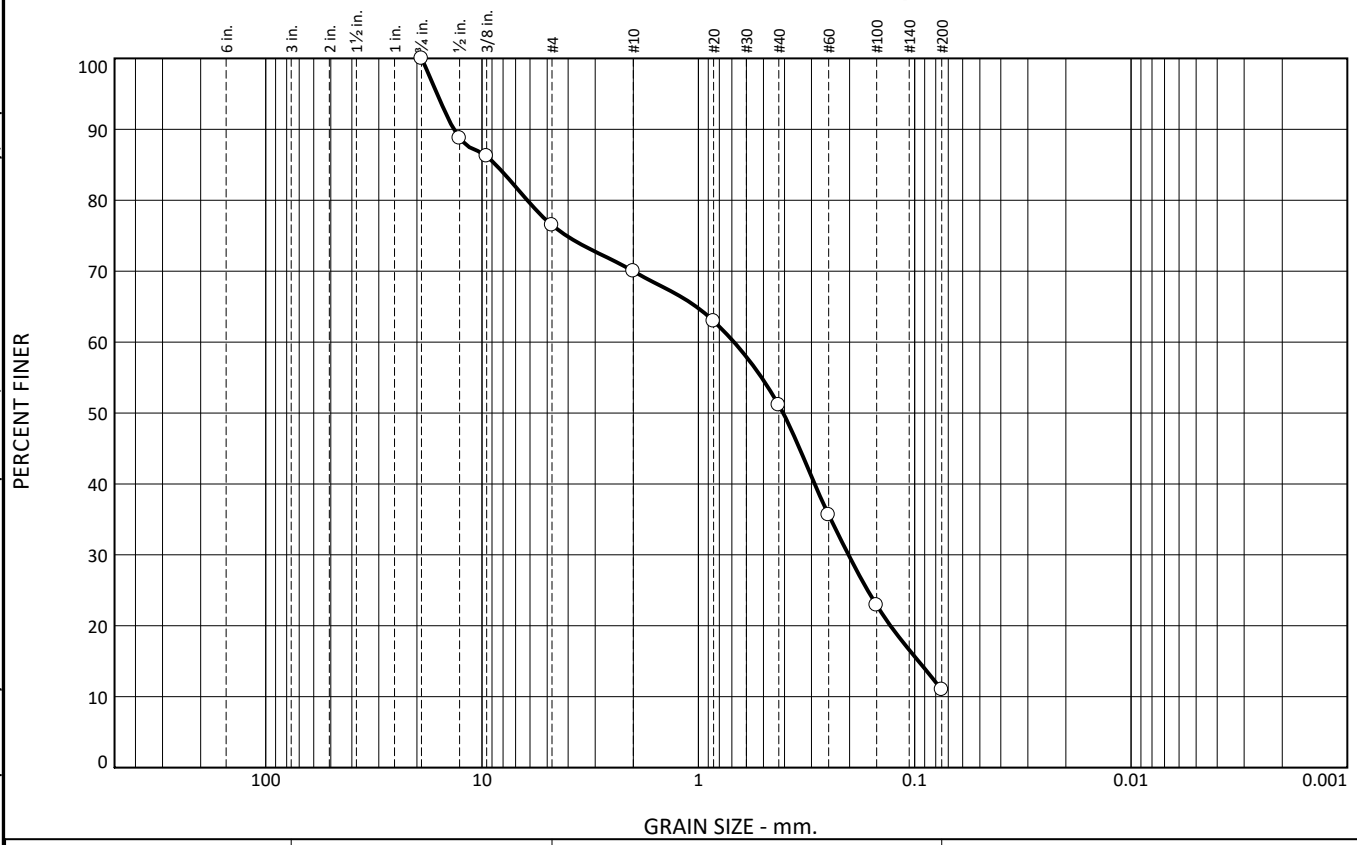
| Boring No. | Sample ID | Depth (ft) | Laboratory No. | Identification Tests | | | | | | | | | Proctor / CBR / Permeability Tests | | | | | | | | Laboratory Log and Soil Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | As Rcvd Moisture Content % | LL % | PL % | OD LL | Gravel % | Sand % | Fines % | Org. % | pH | $g_d$ MAX (pcf) $W_{opt}$ (%) | $g_d$ MAX (pcf) $W_{opt}$ (%) (Corr.) | Dry unit wt. (pcf) | Test Moisture Content % | Target Test Setup as % of Proctor | CBR @ 0.1" | CBR @ 0.2" | Permeability cm/sec | |
| | | | | D2216 | D4318 | | | D6913 | | | D2974 | D4792 | D1557 | | | | | | | | |
| CEC-7A | S-7 | 29-31 | 24-S-2488 | | | | | 23.5 | 65.5 | 11.0 | | | | | | | | | | | Dark Brown poorly graded sand with silt and gravel |
| CEC-8A | S-2 | 4-6 | 24-S-2489 | | | | | 10.3 | 72.5 | 17.2 | | | | | | | | | | | Brown silty sand |
| CEC-8A | S-4 | 14-16 | 24-S-2490 | | | | | 33.2 | 64.0 | 2.8 | | | | | | | | | | | Brown poorly graded sand with gravel |
| CEC-8A | S-7 | 29-31 | 24-S-2491 | | | | | 20.0 | 70.6 | 9.4 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-9A | S-1 | 0-2 | 24-S-2492 | | | | | 16.1 | 69.1 | 14.8 | | | | | | | | | | | Brown silty sand with gravel |
| CEC-9A | S-3 | 9-11 | 24-S-2493 | | | | | 26.7 | 68.5 | 4.8 | | | | | | | | | | | Brown poorly graded sand with gravel |
| CEC-10A | S-4 | 14-16 | 24-S-2494 | | | | | 8.2 | 70.2 | 21.6 | | | | | | | | | | | Brown silty sand |
| CEC-10A | S-7 | 29-31 | 24-S-2495 | | | | | 21.7 | 60.1 | 18.2 | | | | | | | | | | | Brown silty sand with gravel |
| CEC-11A | S-3 | 9-11 | 24-S-2496 | | | | | 21.1 | 57.8 | 21.1 | | | | | | | | | | | Brown silty sand with gravel |
| CEC-11A | S-6 | 24-26 | 24-S-2497 | | | | | 6.3 | 65.9 | 27.8 | | | | | | | | | | | Dark Brown silty sand |
| CEC-12A | S-1 | 0-2 | 24-S-2498 | | | | | 7.0 | 72.9 | 20.1 | | | | | | | | | | | Brown silty sand |
| CEC-12A | S-6 | 24-26 | 24-S-2499 | | | | | 0.0 | 86.7 | 13.3 | | | | | | | | | | | Dark Brown silty sand |

Date Received: **6/24/2024** Reviewed By: Date Reviewed: **7/5/2024**

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 23.5 | 6.5 | 18.9 | 40.1 | 11.0 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 88.7 | | |
| 3/8" | 86.2 | | |
| #4 | 76.5 | | |
| #10 | 70.0 | | |
| #20 | 63.0 | | |
| #40 | 51.1 | | |
| #60 | 35.6 | | |
| #100 | 22.9 | | |
| #200 | 11.0 | | |

* (no specification provided)

**Soil Description**

Dark Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 13.4889 $D_{85}$= 8.6372 $D_{60}$= 0.6845
$D_{50}$= 0.4058 $D_{30}$= 0.2023 $D_{15}$= 0.0960
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 29-31'
Sample Number: CEC-7A / S-7

Date: 7.2.24

Thielsch Engineering Inc.

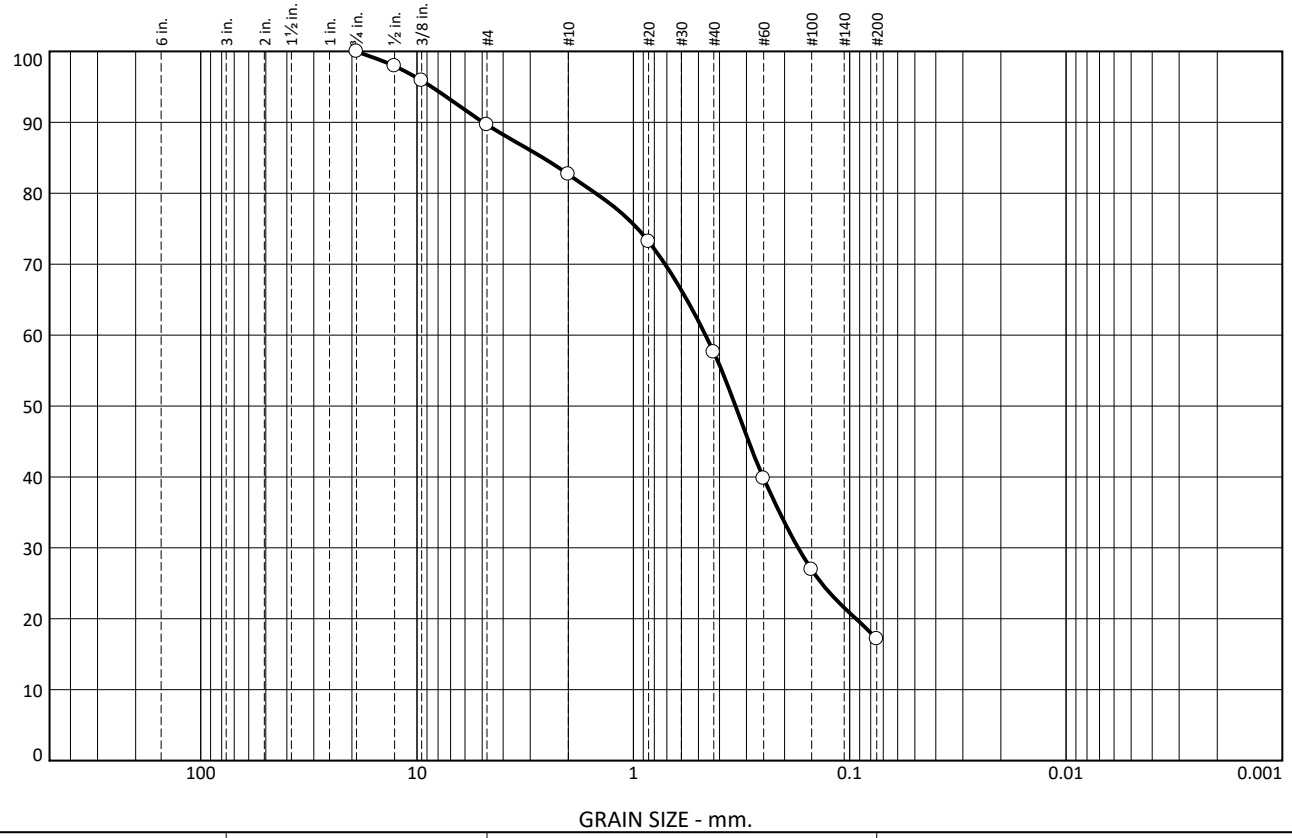
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2488

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 10.3 | 7.0 | 25.1 | 40.4 | 17.2 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 97.9 | | |
| 3/8" | 95.9 | | |
| #4 | 89.7 | | |
| #10 | 82.7 | | |
| #20 | 73.2 | | |
| #40 | 57.6 | | |
| #60 | 39.8 | | |
| #100 | 26.9 | | |
| #200 | 17.2 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 4.9391 $D_{85}$= 2.6132 $D_{60}$= 0.4641
$D_{50}$= 0.3372 $D_{30}$= 0.1731 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 4-6'
Sample Number: CEC-8A / S-2

Date: 7.2.24

Thielsch Engineering Inc.

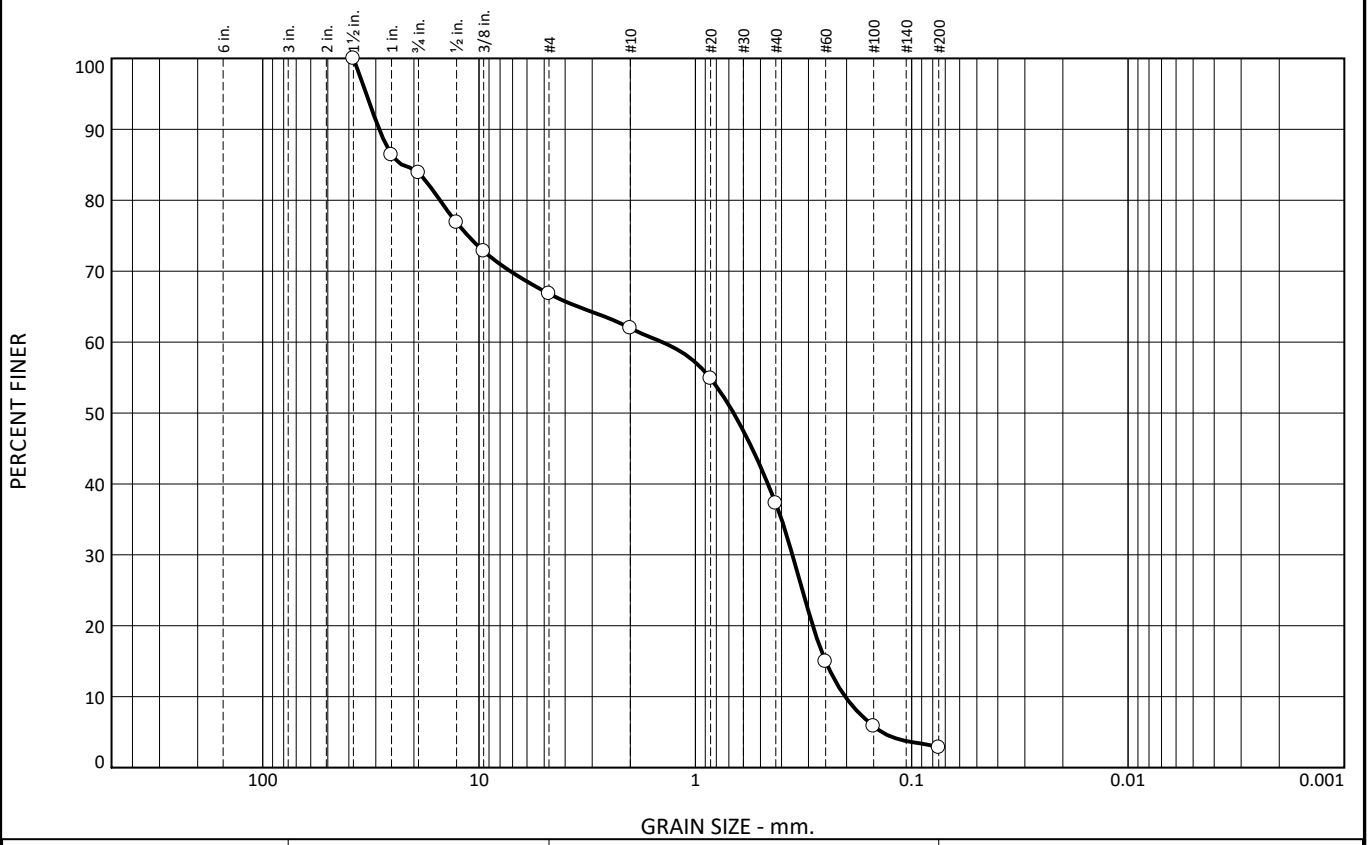
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2489

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 16.1 | 17.1 | 4.8 | 24.7 | 34.5 | 2.8 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 86.4 | | |
| 3/4" | 83.9 | | |
| 1/2" | 76.9 | | |
| 3/8" | 72.8 | | |
| #4 | 66.8 | | |
| #10 | 62.0 | | |
| #20 | 54.8 | | |
| #40 | 37.3 | | |
| #60 | 14.9 | | |
| #100 | 5.8 | | |
| #200 | 2.8 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 28.9135 $D_{85}$= 22.6654 $D_{60}$= 1.4222
$D_{50}$= 0.6660 $D_{30}$= 0.3560 $D_{15}$= 0.2504
$D_{10}$= 0.2029 $C_u$= 7.01 $C_c$= 0.44

**Classification**

USCS= SP AASHTO= A-1-b

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 14-16'
Sample Number: CEC-8A / S-4

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2490

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 20.0 | 9.0 | 23.7 | 37.9 | 9.4 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 95.1 | | |
| 3/8" | 88.3 | | |
| #4 | 80.0 | | |
| #10 | 71.0 | | |
| #20 | 60.3 | | |
| #40 | 47.3 | | |
| #60 | 34.3 | | |
| #100 | 18.3 | | |
| #200 | 9.4 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 10.3082 $D_{85}$= 7.6318 $D_{60}$= 0.8327
$D_{50}$= 0.4830 $D_{30}$= 0.2177 $D_{15}$= 0.1242
$D_{10}$= 0.0785 $C_u$= 10.60 $C_c$= 0.72

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 29-31'
Sample Number: CEC-8A / S-7

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2491

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 16.1 | 5.5 | 22.5 | 41.1 | 14.8 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 93.2 | | |
| 3/8" | 88.7 | | |
| #4 | 83.9 | | |
| #10 | 78.4 | | |
| #20 | 69.9 | | |
| #40 | 55.9 | | |
| #60 | 38.9 | | |
| #100 | 26.1 | | |
| #200 | 14.8 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 10.4751 $D_{85}$= 5.6900 $D_{60}$= 0.5019
$D_{50}$= 0.3499 $D_{30}$= 0.1787 $D_{15}$= 0.0760
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 0-2'
Sample Number: CEC-9A / S-1

Date: 7.2.24

Thielsch Engineering Inc.

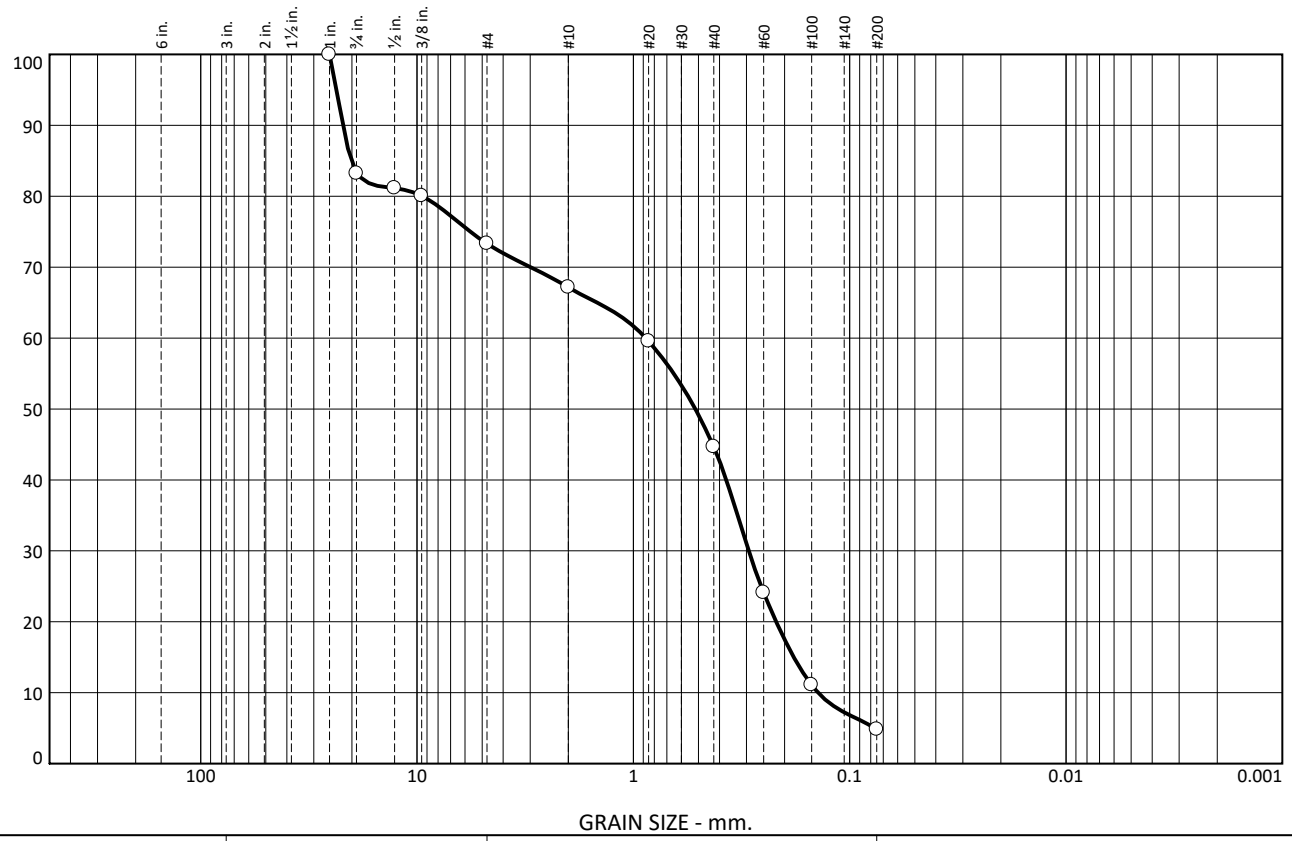
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2492

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 16.8 | 9.9 | 6.1 | 22.5 | 39.9 | 4.8 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 83.2 | | |
| 1/2" | 81.2 | | |
| 3/8" | 80.1 | | |
| #4 | 73.3 | | |
| #10 | 67.2 | | |
| #20 | 59.6 | | |
| #40 | 44.7 | | |
| #60 | 24.1 | | |
| #100 | 11.1 | | |
| #200 | 4.8 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 21.9788 $D_{85}$= 20.1845 $D_{60}$= 0.8760
$D_{50}$= 0.5172 $D_{30}$= 0.2928 $D_{15}$= 0.1813
$D_{10}$= 0.1401 $C_u$= 6.25 $C_c$= 0.70

**Classification**

USCS= SP AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 9-11'
Sample Number: CEC-9A / S-3

Date: 7.2.24

Thielsch Engineering Inc.

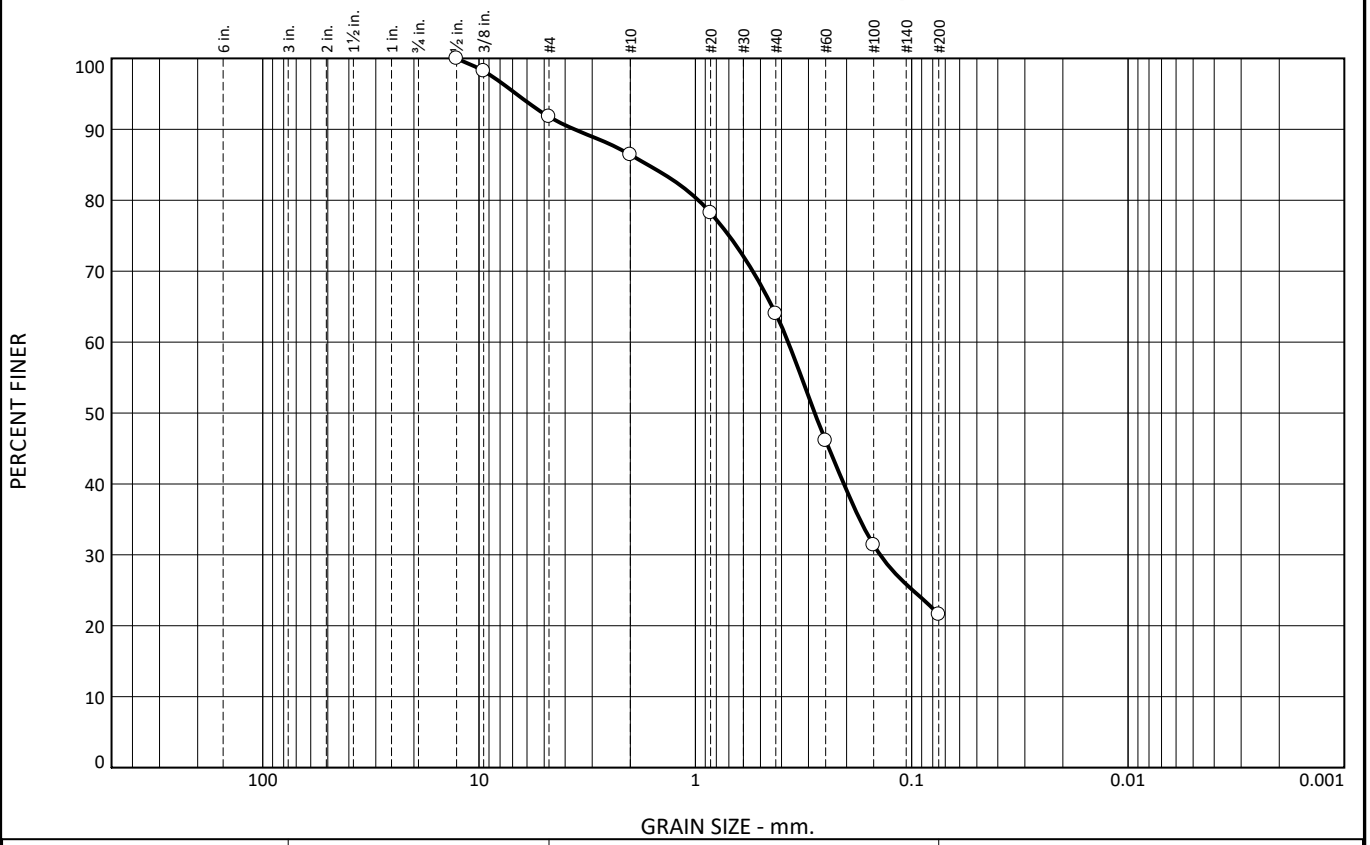
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2493

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 8.2 | 5.4 | 22.4 | 42.4 | 21.6 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1/2" | 100.0 | | |
| 3/8" | 98.2 | | |
| #4 | 91.8 | | |
| #10 | 86.4 | | |
| #20 | 78.2 | | |
| #40 | 64.0 | | |
| #60 | 46.1 | | |
| #100 | 31.4 | | |
| #200 | 21.6 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 3.6190 $D_{85}$= 1.6597 $D_{60}$= 0.3726
$D_{50}$= 0.2809 $D_{30}$= 0.1400 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 14-16'
Sample Number: CEC-10A / S-4

Date: 7.2.24

Thielsch Engineering Inc.

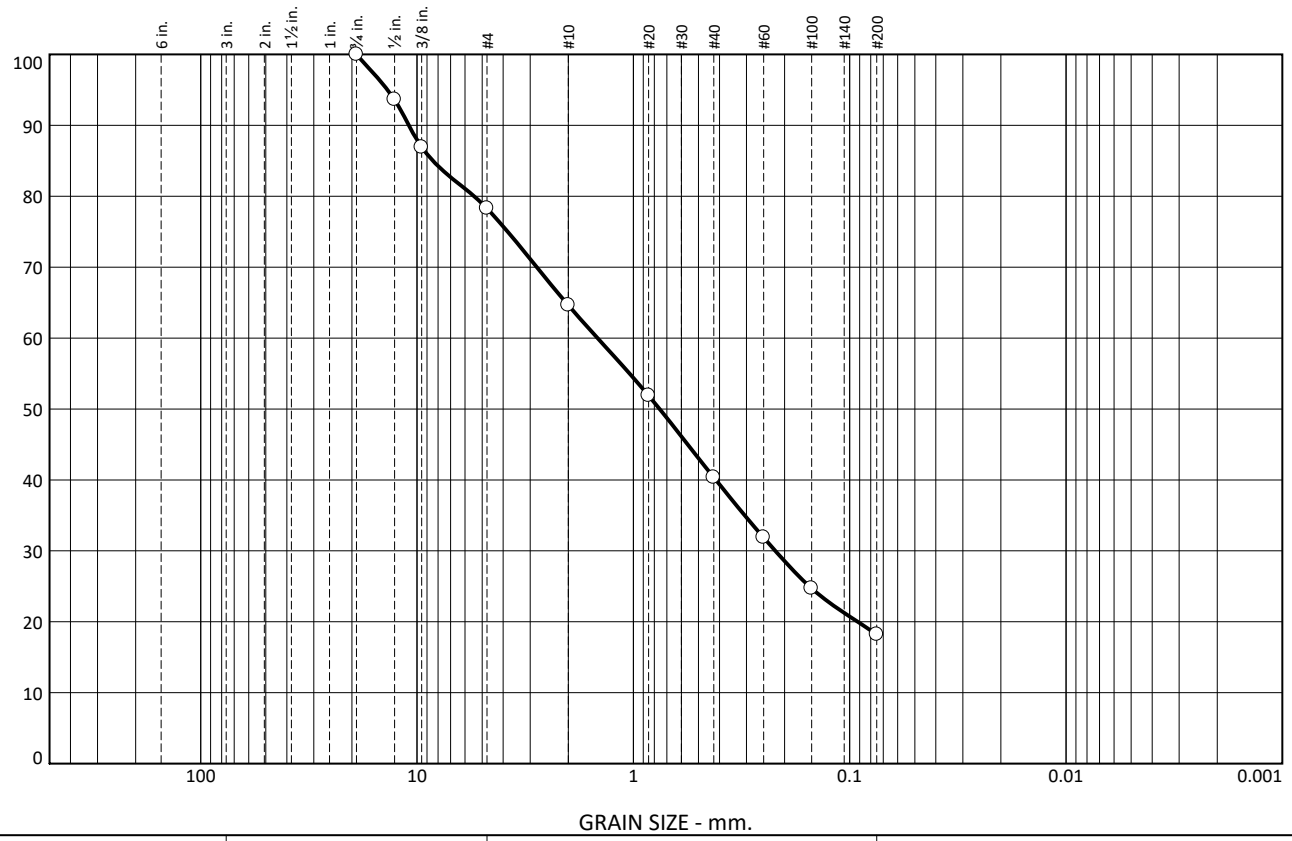
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2494

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 21.7 | 13.7 | 24.2 | 22.2 | 18.2 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 93.6 | | |
| 3/8" | 86.9 | | |
| #4 | 78.3 | | |
| #10 | 64.6 | | |
| #20 | 51.9 | | |
| #40 | 40.4 | | |
| #60 | 31.9 | | |
| #100 | 24.7 | | |
| #200 | 18.2 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 10.9057 $D_{85}$= 8.4458 $D_{60}$= 1.4639
$D_{50}$= 0.7560 $D_{30}$= 0.2207 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 29-31'
Sample Number: CEC-10A / S-7

Date: 7.2.24

Thielsch Engineering Inc.

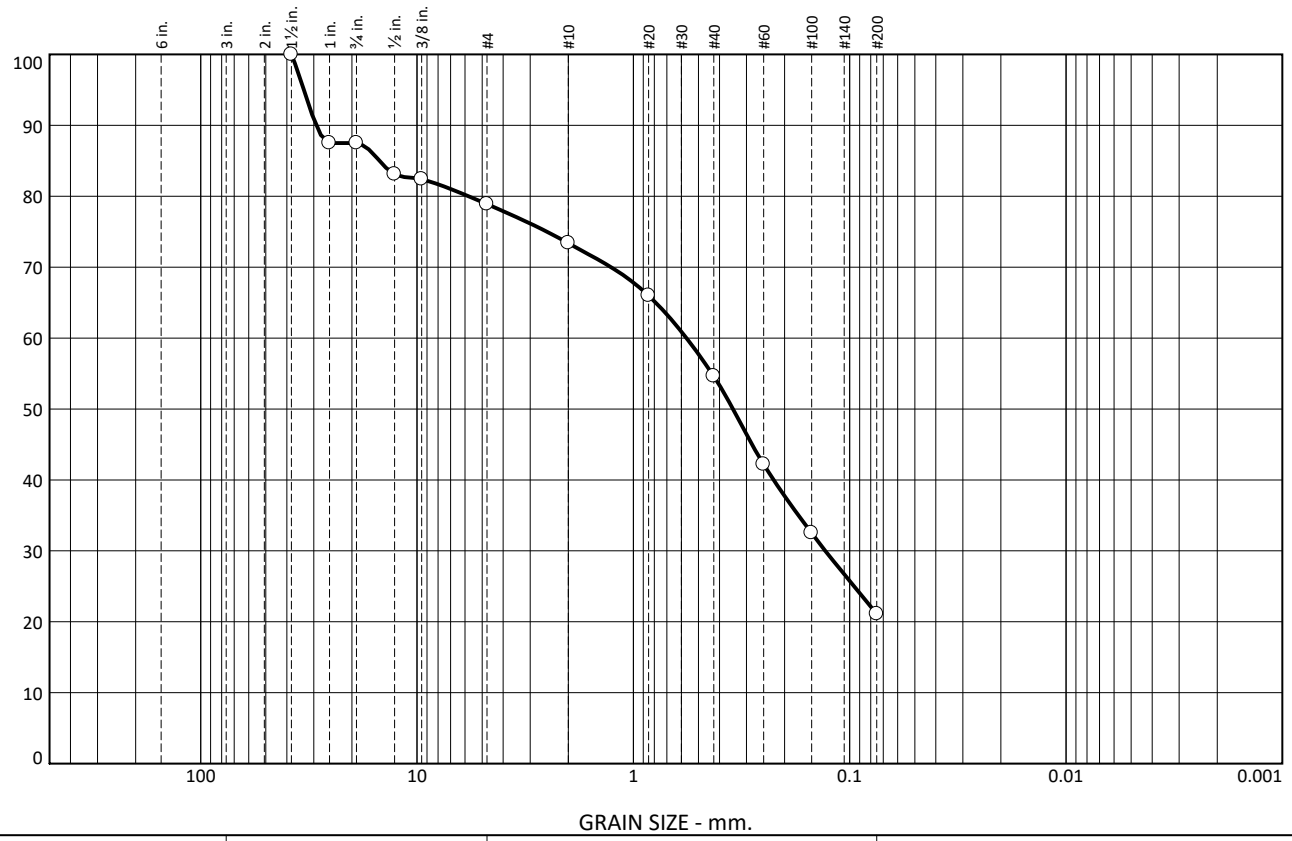
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2495

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 12.5 | 8.6 | 5.5 | 18.8 | 33.5 | 21.1 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 87.5 | | |
| 3/4" | 87.5 | | |
| 1/2" | 83.1 | | |
| 3/8" | 82.4 | | |
| #4 | 78.9 | | |
| #10 | 73.4 | | |
| #20 | 66.0 | | |
| #40 | 54.6 | | |
| #60 | 42.2 | | |
| #100 | 32.5 | | |
| #200 | 21.1 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 29.2429 $D_{85}$= 14.9037 $D_{60}$= 0.5682
$D_{50}$= 0.3465 $D_{30}$= 0.1296 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 9-11'
Sample Number: CEC-11A / S-3

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2496

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 6.3 | 2.4 | 3.4 | 60.1 | 27.8 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/8" | 100.0 | | |
| #4 | 93.7 | | |
| #10 | 91.3 | | |
| #20 | 89.8 | | |
| #40 | 87.9 | | |
| #60 | 77.3 | | |
| #100 | 54.5 | | |
| #200 | 27.8 | | |

* (no specification provided)

**Soil Description**

Dark Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 0.9878 $D_{85}$= 0.3388 $D_{60}$= 0.1695
$D_{50}$= 0.1344 $D_{30}$= 0.0795 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-11A / S-6

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2497

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 7.0 | 4.6 | 21.2 | 47.1 | 20.1 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 97.5 | | |
| 3/8" | 95.6 | | |
| #4 | 93.0 | | |
| #10 | 88.4 | | |
| #20 | 80.9 | | |
| #40 | 67.2 | | |
| #60 | 49.0 | | |
| #100 | 33.2 | | |
| #200 | 20.1 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 2.5587 $D_{85}$= 1.2349 $D_{60}$= 0.3400
$D_{50}$= 0.2578 $D_{30}$= 0.1303 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 0-2'
Sample Number: CEC-12A / S-1

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2498

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 0.0 | 0.2 | 2.8 | 83.7 | 13.3 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| #4 | 100.0 | | |
| #10 | 99.8 | | |
| #20 | 99.5 | | |
| #40 | 97.0 | | |
| #60 | 82.1 | | |
| #100 | 45.0 | | |
| #200 | 13.3 | | |

* (no specification provided)

**Soil Description**

Dark Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 0.3027 $D_{85}$= 0.2657 $D_{60}$= 0.1841
$D_{50}$= 0.1618 $D_{30}$= 0.1111 $D_{15}$= 0.0779
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-12A / S-6

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2499

Tested By: MCS Checked By: Kris Roland

Thielsch
DIVISION OF THE RISE GROUP

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Cranston RI, 02910
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Fax: (401)-467-2398
cts.thielsch.com
*Let's Build a Solid Foundation*

| Client Information: | |
|---|---|
| Civil & Environmental Consultants, Inc | |
| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned By: | Tony Sousa |
| Collected By: | CEC |

| Project Information: | |
|---|---|
| **Shuster Bulkhead Improvements** | |
| **4 Wright St, New Bedford MA** | |
| Project Number: | 332-344 |
| Summary Page: | 1 of 1 |
| Report Date: | 7/10/2024 |

# LABORATORY TESTING DATA SHEET, Report No.: 7424-F-212

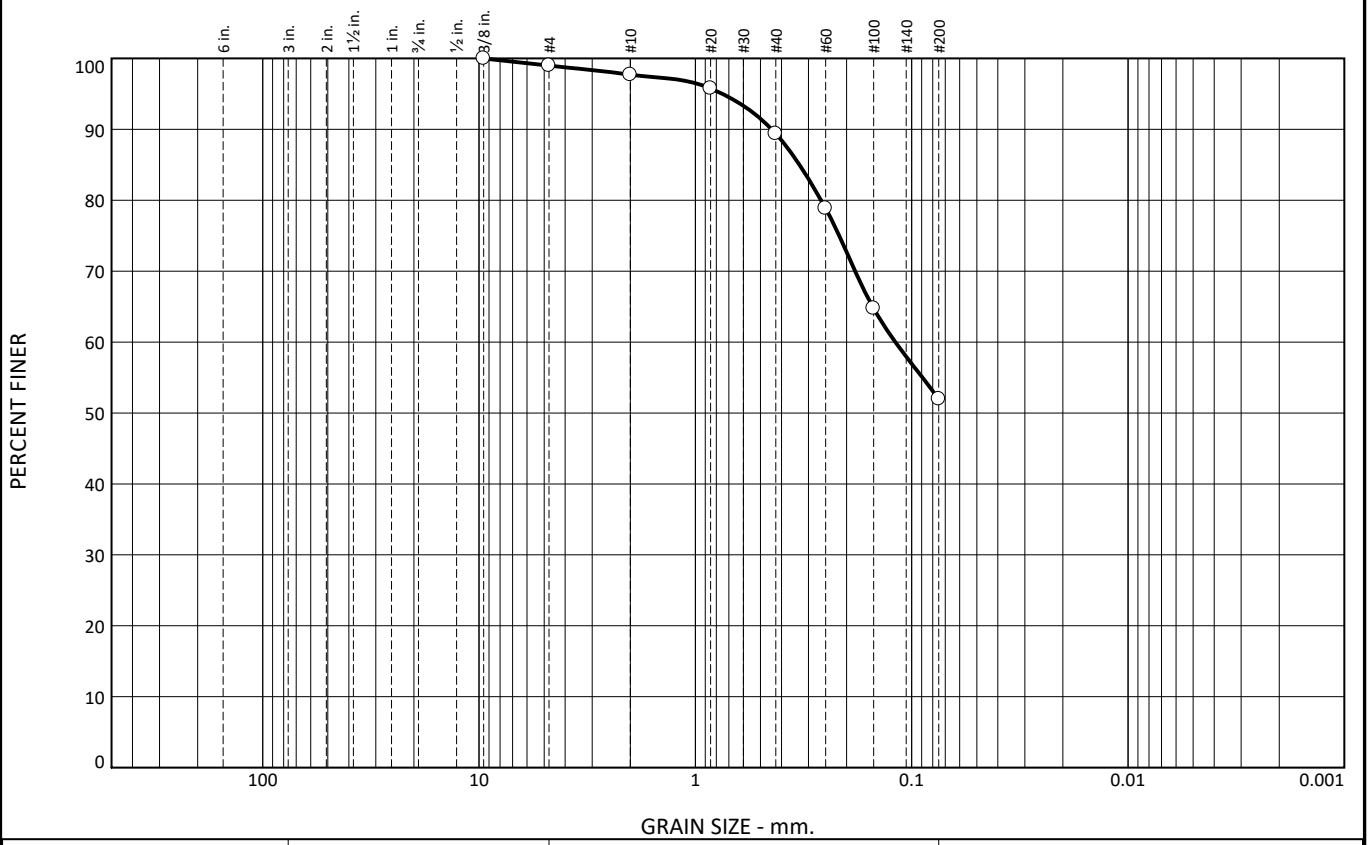
| Boring No. | Sample ID | Depth (ft) | Laboratory No. | Identification Tests | | | | | | Corrosivity Tests | | | | | | | | Laboratory Log and Soil Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | As Rcvd Moisture Content % | LL % | PL % | Gravel % | Sand % | Fines % | Resistivity (Mohms-cm) | Chloride (mg/kg) | Sulfate (mg/kg) | Sulfide (mg/kg) | Redox Potential (mv) | pH | Electrical Resist. As Rcvd Ohm-cm @ 60°F | Electrical Resist. Saturated Ohm-cm @ 60°F | |
| | | | | D2216 | D4318 | | D6913 | | | EPA | | | | | D4972 | G57 | | |
| CEC-13A | S-2 | 4-6 | 24-S-2500 | | | | 1.0 | 47.0 | 52.0 | 0.002 | 203 | ND | | | 6.7 | | | Brown sandy silt |
| CEC-13A | S-6 | 24-25 | 24-S-2501 | | | | 21.7 | 56.3 | 22.0 | | | | | | | | | Dark Brown silty sand with gravel |
| CEC-14A | S-8 | 14-16 | 24-S-2502 | | | | 12.7 | 60.7 | 26.6 | | | | | | | | | Dark Brown silty sand |
| CEC-15A | S-7 | 12-14 | 24-S-2503 | | | | 16.4 | 73.4 | 10.2 | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-15A | S-13 | 24-26 | 24-S-2504 | | | | 28.9 | 63.7 | 7.4 | | | | | | | | | Brown well-graded sand with silt and gravel |
| CEC-16A | S-5 | 8-10 | 24-S-2505 | | | | 22.8 | 52.1 | 25.1 | | | | | | | | | Brown silty sand with gravel |
| CEC-16A | S-12 | 22-24 | 24-S-2506 | | | | 17.3 | 74.7 | 8.0 | | | | | | | | | Dark Brown poorly graded sand with silt and gravel |
| CEC-17A | S-5 | 8-10 | 24-S-2507 | | | | 5.5 | 64.8 | 29.7 | | | | | | | | | Brown silty sand |
| CEC-17A | S-9 | 16-18 | 24-S-2508 | | | | 13.4 | 73.2 | 13.4 | | | | | | | | | Brown silty sand |
| CEC-17A | S-16 | 30-32 | 24-S-2509 | | | | 42.4 | 43.2 | 14.4 | | | | | | | | | Brown silty sand with gravel |
| CEC-18A | S-4 | 6-8 | 24-S-2510 | | | | 5.4 | 68.7 | 25.9 | 0.004 | 56 | ND | | | 6.7 | | | Brown silty sand |
| pH tested by RB 7-1-24. | | | | | | | | | | | | | | | | | | |

Date Received: **6/24/2024** Reviewed By: Date Reviewed: **7/10/2024**

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 1.0 | 1.3 | 8.3 | 37.4 | 52.0 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/8" | 100.0 | | |
| #4 | 99.0 | | |
| #10 | 97.7 | | |
| #20 | 95.8 | | |
| #40 | 89.4 | | |
| #60 | 78.9 | | |
| #100 | 64.7 | | |
| #200 | 52.0 | | |

* (no specification provided)

Source of Sample: Boring Depth: 4-6'
Sample Number: CEC-13A / S-2

Date: 7.3.24

**Soil Description**

Brown sandy silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 0.4436 $D_{85}$= 0.3303 $D_{60}$= 0.1190
$D_{50}$= $D_{30}$= $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= ML AASHTO= A-4(0)

**Remarks**

Sample visually classified as non-plastic. Sample received with standing water.

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2500

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 11.8 | 9.9 | 7.8 | 19.7 | 28.8 | 22.0 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 88.2 | | |
| 1/2" | 87.3 | | |
| 3/8" | 82.7 | | |
| #4 | 78.3 | | |
| #10 | 70.5 | | |
| #20 | 61.2 | | |
| #40 | 50.8 | | |
| #60 | 39.1 | | |
| #100 | 31.3 | | |
| #200 | 22.0 | | |

* (no specification provided)

**Soil Description**

Dark Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 20.6275 $D_{85}$= 10.8152 $D_{60}$= 0.7777
$D_{50}$= 0.4082 $D_{30}$= 0.1371 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 24-25'
Sample Number: CEC-13A / S-6

Date: 7.3.24

Thielsch Engineering Inc.

Cranston, RI

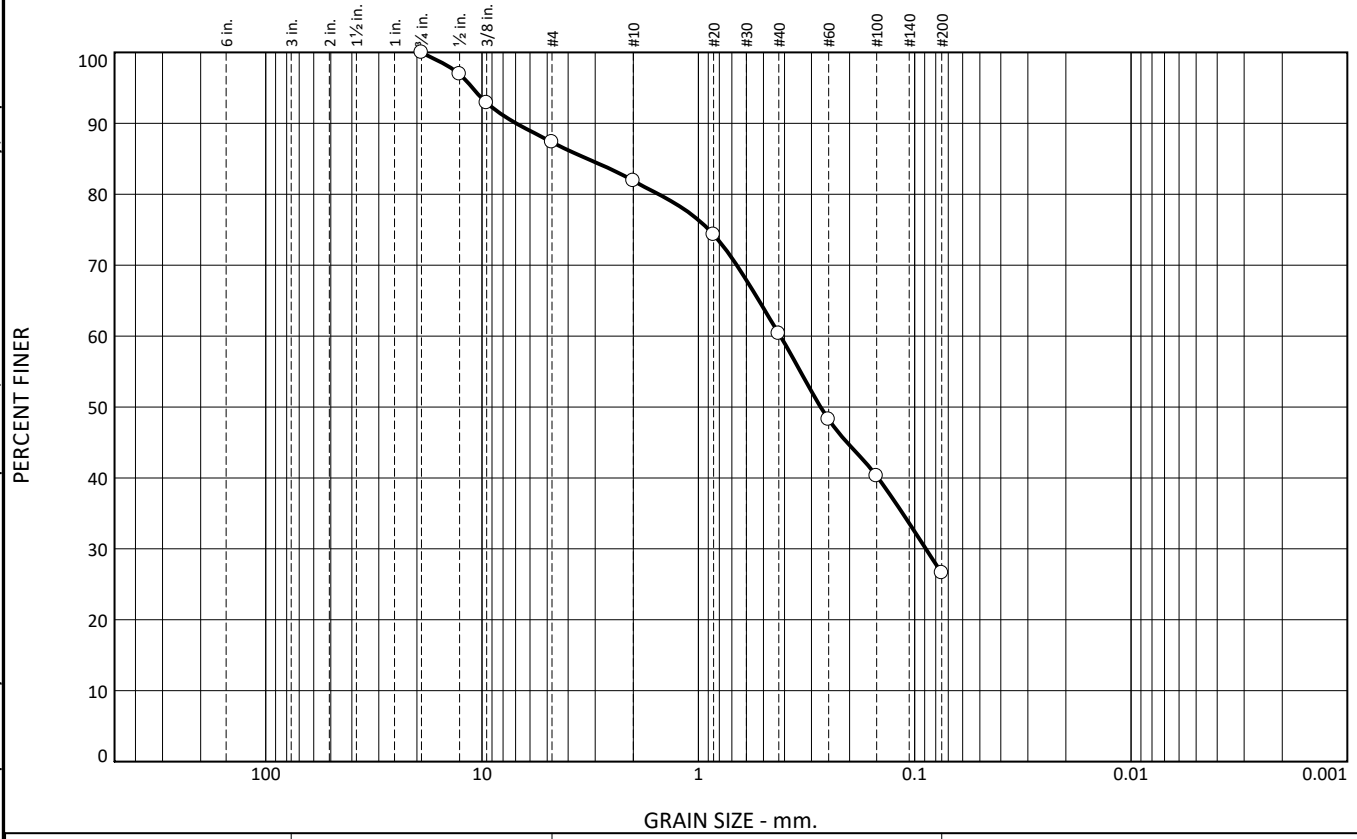
Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344

Fig. 24-S-2501

Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 12.7 | 5.4 | 21.5 | 33.8 | 26.6 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 97.0 | | |
| 3/8" | 92.9 | | |
| #4 | 87.3 | | |
| #10 | 81.9 | | |
| #20 | 74.3 | | |
| #40 | 60.4 | | |
| #60 | 48.2 | | |
| #100 | 40.3 | | |
| #200 | 26.6 | | |

* (no specification provided)

**Soil Description**

Dark Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 6.9456 $D_{85}$= 3.2596 $D_{60}$= 0.4179
$D_{50}$= 0.2724 $D_{30}$= 0.0888 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 14-16
Sample Number: CEC-14A / S-8

Date: 7.3.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2502

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 16.4 | 5.4 | 26.8 | 41.2 | 10.2 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 89.7 | | |
| 3/8" | 87.6 | | |
| #4 | 83.6 | | |
| #10 | 78.2 | | |
| #20 | 68.3 | | |
| #40 | 51.4 | | |
| #60 | 34.7 | | |
| #100 | 22.3 | | |
| #200 | 10.2 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 12.8933 $D_{85}$= 6.0467 $D_{60}$= 0.5849
$D_{50}$= 0.4049 $D_{30}$= 0.2092 $D_{15}$= 0.1001
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-3

**Remarks**

Source of Sample: Boring Depth: 12-14'
Sample Number: CEC-15A / S-7

Date: 7.3.24

Thielsch Engineering Inc.

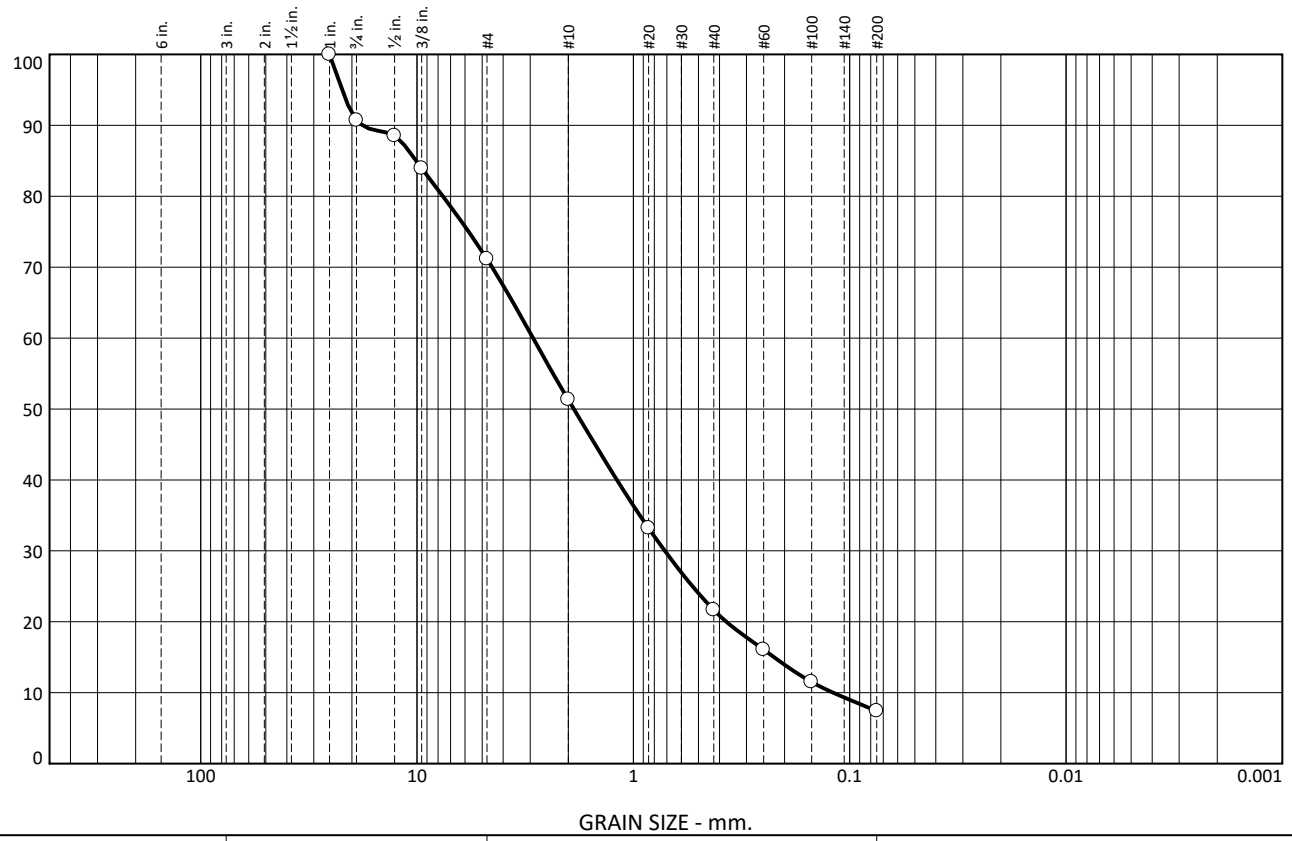
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2503

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 9.3 | 19.6 | 19.8 | 29.6 | 14.3 | 7.4 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 90.7 | | |
| 1/2" | 88.5 | | |
| 3/8" | 83.9 | | |
| #4 | 71.1 | | |
| #10 | 51.3 | | |
| #20 | 33.2 | | |
| #40 | 21.7 | | |
| #60 | 16.1 | | |
| #100 | 11.5 | | |
| #200 | 7.4 | | |

* (no specification provided)

**Soil Description**

Brown well-graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 17.9065 $D_{85}$= 10.1070 $D_{60}$= 2.9085
$D_{50}$= 1.8846 $D_{30}$= 0.7153 $D_{15}$= 0.2238
$D_{10}$= 0.1195 $C_u$= 24.34 $C_c$= 1.47

**Classification**

USCS= SW-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-15A / S-13

Date: 7.3.24

Thielsch Engineering Inc.

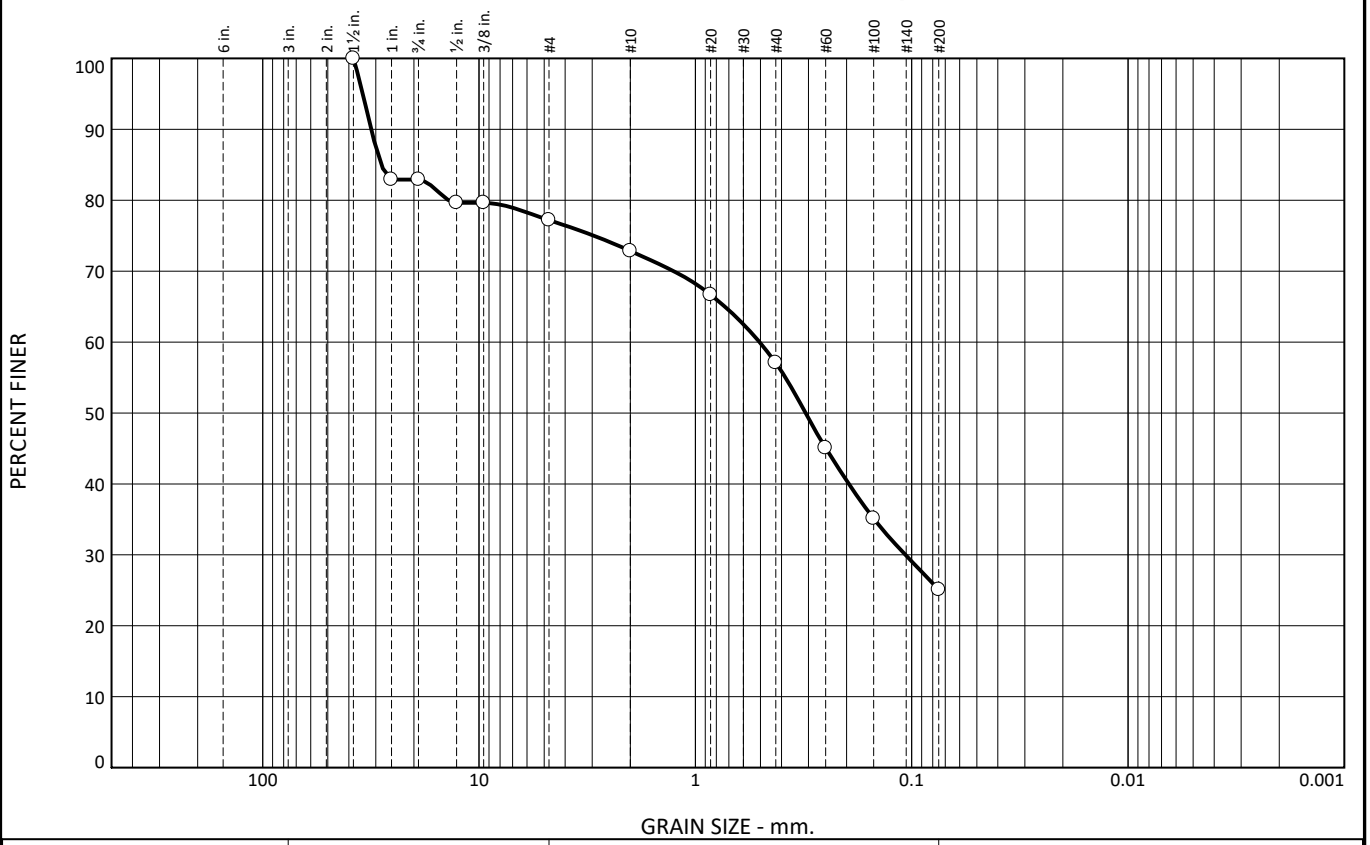
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2504

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 17.1 | 5.7 | 4.4 | 15.7 | 32.0 | 25.1 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 82.9 | | |
| 3/4" | 82.9 | | |
| 1/2" | 79.6 | | |
| 3/8" | 79.6 | | |
| #4 | 77.2 | | |
| #10 | 72.8 | | |
| #20 | 66.7 | | |
| #40 | 57.1 | | |
| #60 | 45.1 | | |
| #100 | 35.1 | | |
| #200 | 25.1 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 31.5033 $D_{85}$= 28.2766 $D_{60}$= 0.5052
$D_{50}$= 0.3095 $D_{30}$= 0.1070 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 8-10'
Sample Number: CEC-16A / S-5

Date: 7.3.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2505

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 17.3 | 8.7 | 22.0 | 44.0 | 8.0 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 92.8 | | |
| 3/8" | 89.4 | | |
| #4 | 82.7 | | |
| #10 | 74.0 | | |
| #20 | 64.6 | | |
| #40 | 52.0 | | |
| #60 | 33.7 | | |
| #100 | 16.9 | | |
| #200 | 8.0 | | |

* (no specification provided)

**Soil Description**

Dark Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 10.0972 $D_{85}$= 6.0609 $D_{60}$= 0.6263
$D_{50}$= 0.3965 $D_{30}$= 0.2249 $D_{15}$= 0.1369
$D_{10}$= 0.0901 $C_u$= 6.95 $C_c$= 0.90

**Classification**

USCS= SP-SM AASHTO= A-3

**Remarks**

Source of Sample: Boring Depth: 22-24'
Sample Number: CEC-16A / S-12

Date: 7.3.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344

Fig. 24-S-2506

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 5.5 | 3.8 | 12.8 | 48.2 | 29.7 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/8" | 100.0 | | |
| #4 | 94.5 | | |
| #10 | 90.7 | | |
| #20 | 85.8 | | |
| #40 | 77.9 | | |
| #60 | 67.0 | | |
| #100 | 53.5 | | |
| #200 | 29.7 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 1.7154 $D_{85}$= 0.7727 $D_{60}$= 0.1887
$D_{50}$= 0.1344 $D_{30}$= 0.0757 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 8-10'
Sample Number: CEC-17A / S-5

Date: 7.3.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2507

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 4.5 | 8.9 | 5.7 | 30.1 | 37.4 | 13.4 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 95.5 | | |
| 1/2" | 92.8 | | |
| 3/8" | 90.5 | | |
| #4 | 86.6 | | |
| #10 | 80.9 | | |
| #20 | 70.5 | | |
| #40 | 50.8 | | |
| #60 | 35.0 | | |
| #100 | 22.7 | | |
| #200 | 13.4 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 8.8663 $D_{85}$= 3.6027 $D_{60}$= 0.5739
$D_{50}$= 0.4136 $D_{30}$= 0.2070 $D_{15}$= 0.0850
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 16-18'
Sample Number: CEC-17A / S-9

Date: 7.3.24

Thielsch Engineering Inc.

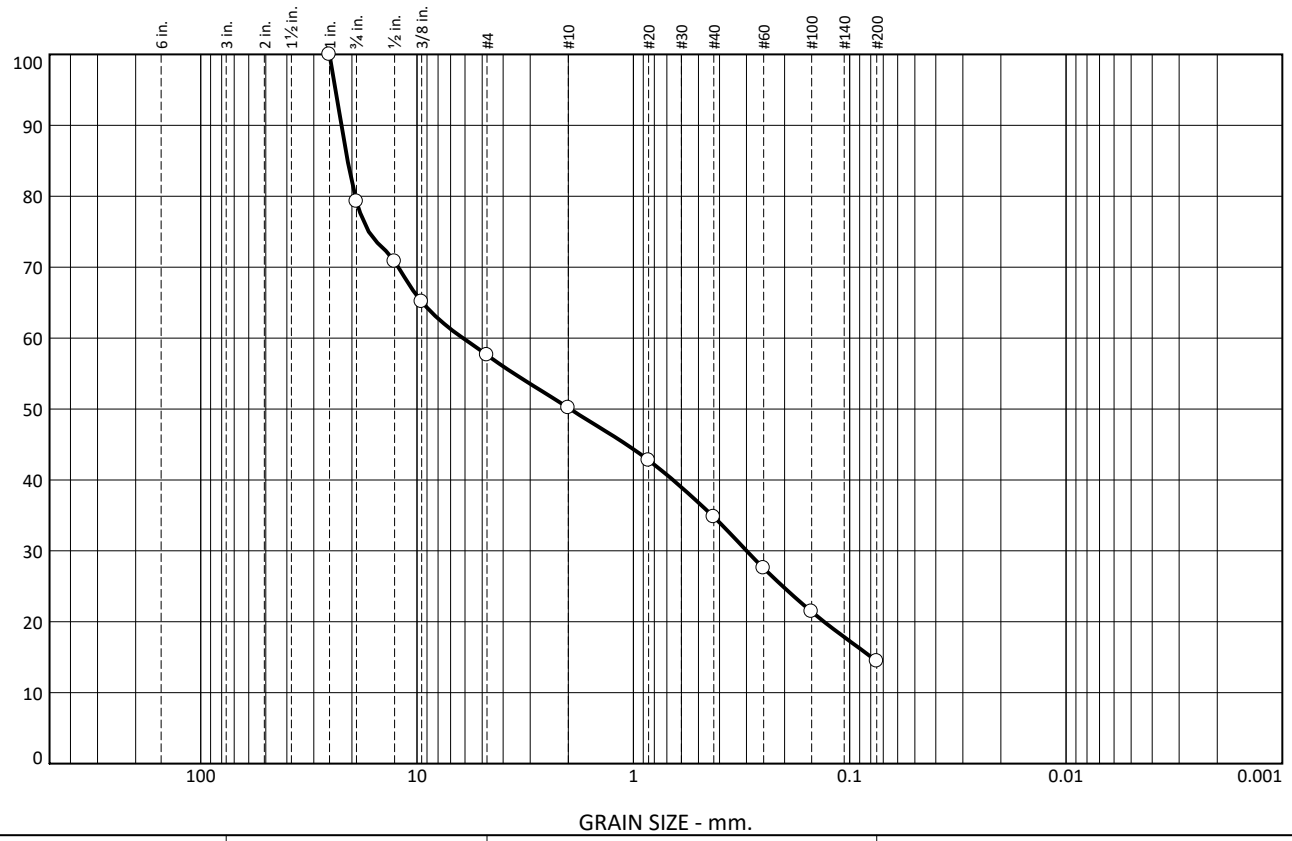
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2508

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 20.7 | 21.7 | 7.4 | 15.4 | 20.4 | 14.4 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 79.3 | | |
| 1/2" | 70.8 | | |
| 3/8" | 65.1 | | |
| #4 | 57.6 | | |
| #10 | 50.2 | | |
| #20 | 42.8 | | |
| #40 | 34.8 | | |
| #60 | 27.5 | | |
| #100 | 21.4 | | |
| #200 | 14.4 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 22.3593 $D_{85}$= 20.9442 $D_{60}$= 6.1347
$D_{50}$= 1.9610 $D_{30}$= 0.2998 $D_{15}$= 0.0793
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 30-32'
Sample Number: CEC-17A / S-16

Date: 7.3.24

Thielsch Engineering Inc.

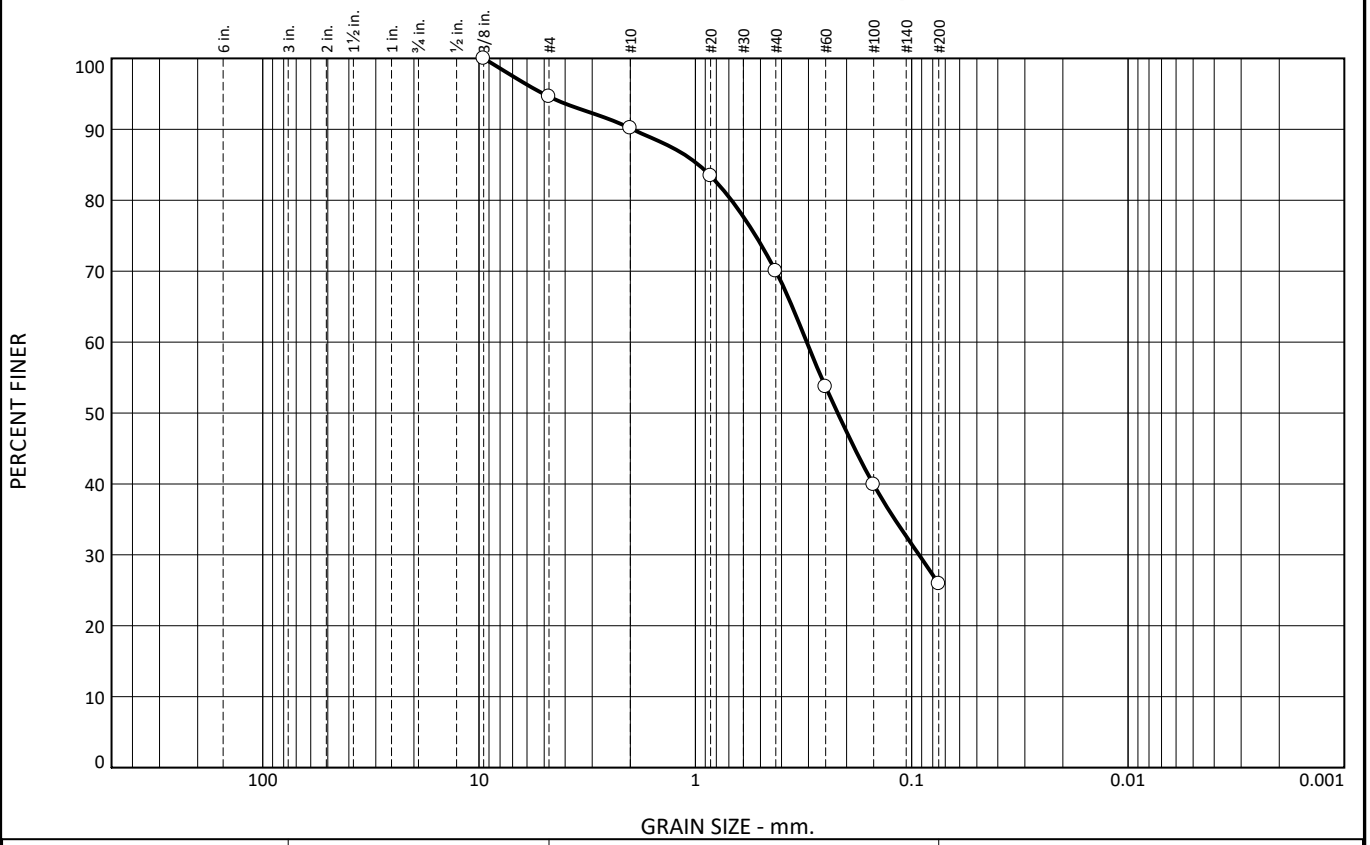
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2509

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 5.4 | 4.4 | 20.2 | 44.1 | 25.9 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/8" | 100.0 | | |
| #4 | 94.6 | | |
| #10 | 90.2 | | |
| #20 | 83.4 | | |
| #40 | 70.0 | | |
| #60 | 53.7 | | |
| #100 | 39.9 | | |
| #200 | 25.9 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 1.9499 $D_{85}$= 0.9666 $D_{60}$= 0.3058
$D_{50}$= 0.2199 $D_{30}$= 0.0925 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 6-8'
Sample Number: CEC-18A / S-4

Date: 7.3.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2510

Tested By: MCS Checked By: Kris Roland

ESS Laboratory
DIVISION OF THE RISE GROUP
BAL Laboratory Analytical Balance

*CERTIFICATE OF ANALYSIS*

Kris Roland
Thielsch Engineering, Inc.
CTS Cranston
Cranston, RI 02910

**RE: Shuster Bulkhead Improvements (332.344)**
**ESS Laboratory Work Order Number: 24F1174**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

**REVIEWED**
**By ESS Laboratory at 8:42 pm, Jul 08, 2024**

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements ESS Laboratory Work Order: 24F1174

## SAMPLE RECEIPT

The following samples were received on June 28, 2024 for the analyses specified on the enclosed Chain of Custody Record.

**The client did not deliver the samples in a cooler.**

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 24F1174-01 | CEC-13A S-2 | Soil | 9038, 9050A, 9250 |
| 24F1174-02 | CEC-18A S-4 | Soil | 9038, 9050A, 9250 |

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements ESS Laboratory Work Order: 24F1174

## PROJECT NARRATIVE

**No unusual observations noted.**

**End of Project Narrative.**

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements ESS Laboratory Work Order: 24F1174

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements
Client Sample ID: CEC-13A S-2
Date Sampled: 06/28/24 12:30
Percent Solids: 82

ESS Laboratory Work Order: 24F1174
ESS Laboratory Sample ID: 24F1174-01
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **WL 203** (37) | --- | 9250 | --- | 1 | LAB | 07/02/24 13:05 | mg/kg dry | DG40218 |
| **Resistivity** | **WL 0.002** (N/A) | --- | 9050A | --- | 1 | JLK | 07/03/24 21:10 | Mohms/cm | DG40347 |
| Sulfate | **WL** ND (61) | --- | 9038 | --- | 1 | JLK | 07/01/24 19:22 | mg/kg dry | DG40157 |

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements
Client Sample ID: CEC-18A S-4
Date Sampled: 06/28/24 12:30
Percent Solids: 87

ESS Laboratory Work Order: 24F1174
ESS Laboratory Sample ID: 24F1174-02
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **WL 56** (34) | --- | 9250 | --- | 1 | LAB | 07/02/24 13:10 | mg/kg dry | DG40218 |
| **Resistivity** | **WL 0.004** (N/A) | --- | 9050A | --- | 1 | JLK | 07/03/24 21:10 | Mohms/cm | DG40347 |
| Sulfate | **WL** ND (57) | --- | 9038 | --- | 1 | JLK | 07/01/24 19:22 | mg/kg dry | DG40157 |

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements ESS Laboratory Work Order: 24F1174

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DG40157 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Sulfate | ND | 5 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Sulfate | 10 | | mg/L | 9.988 | | 98 | 80-120 | | | |
| **Batch DG40218 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Chloride | ND | 30 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Chloride | 33 | | mg/L | 30.00 | | 109 | 90-110 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements ESS Laboratory Work Order: 24F1174

**Notes and Definitions**

| | |
|---|---|
| WL | Results obtained from a deionized water leach of the sample. |
| U | Analyte included in the analysis, but not detected |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements ESS Laboratory Work Order: 24F1174

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: Thielsch Engineering, Inc - ESS

Shipped/Delivered Via: Client

ESS Project ID: 24F1174
Date Received: 6/28/2024
Project Due Date: 7/8/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? No
   Temp: 24.2 Iced with: None
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered
    c. Low Level VOA vials frozen: Yes / No To Be Lab Filtered
       Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted: Date: Time: By:

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 567144 | Yes | N/A | Yes | Driller Jar | NP | |
| 2 | 567145 | Yes | N/A | Yes | Driller Jar | NP | |

**2nd Review**

Initials: BB

**Were all containers scanned into storage/lab?** Yes / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 6/28/24 1525
Reviewed By: Date & Time: 06/28/24 1342

ESS LABORATORY
185 Frances Avenue
Cranston, RI 02921
Phone: 401-461-7181
Fax: 401-461-4486
www.esslaboratory.com

# CHAIN OF CUSTODY

ESS Lab # 24F1174 | Page 1 of 1

**Turn Time** ☐ >5 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ Same Day

**Regulatory State:** NY **Criteria:**

**Is this project for any of the following?:**
☐ CT RCP ☐ MA MCP ☐ RGP ☐ Permit ☐ 401 WQ

**ELECTRONIC DELIVERABLES (Final Reports are PDF)**
☐ Limit Checker ☐ State Forms ☐ EQuIS
☐ Excel ☐ Hard Copy ☐ Enviro Data
☐ CLP-Like Package ☐ Other (Specify) →

## CLIENT INFORMATION

**Client:** Thielsch Engineering
**Address:** 195 Frances Avenue, Cranston, RI 02910
**Phone:** (401) 430-0365
**Email Distribution List:** Please send reports to kroland@thielsch.com, rleblanc@thielsch.com, rroth@thielsch.com, avanasse@thielsch.com

## PROJECT INFORMATION

**Project Name:** Shuster Bulkhead Improvements
**Project Location:** New Bedford, MA
**Project Number:** 332.344
**Project Manager:** Kris Roland
**Bill to:**
**PO#:**
**Quote#:**

Client acknowledges that sampling is compliant with all EPA / State regulatory programs

## REQUESTED ANALYSES

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | Sulfate (EPA) | Chloride (EPA) | Resistivity (EPA) | Total Number of Bottles |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.28.24 | 12:30 | Composite | Soil | CEC-13A, S-2 | X | X | X | 1 |
| 2 | 6.28.24 | 12:30 | Composite | Soil | CEC-18A, S-4 | X | X | X | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Container Type:** AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial — G G G
**Container Volume:** 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* — 10 10 10 — 1
**Preservation Code:** 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAcc, NaOH 9-NH4Cl 10-DI H2O 11-Other* — 1 1 1

**Sampled by :** Becca Blake

**Chain needs to be filled out neatly and completely for on time delivery.**

**Laboratory Use Only**
Cooler Temperature (°C): 24.2 none

**Comments:** * Please specify "Other" preservative and containers types in this space

All samples submitted are subject to ESS Laboratory's payment terms and conditions.

**Dissolved Filtration**
☐ Lab Filter

| Relinquished by (Signature) | Date | Time | Received by (Signature) | Relinquished by (Signature) | Date | Time | Received by (Signature) |
|---|---|---|---|---|---|---|---|
| [signature] | 6.28.24 | 12:46 | [signature] | | | | |
| | | | | | | | |

**ATTACHMENT 13: SOIL MANAGEMENT PLAN**
**(CIVIL & ENVIRONMENTAL CONSULTANTS, INC., MARCH 2025)**

# SOIL MANAGEMENT PLAN

## NEW BEDFORD MARINE COMMERCE TERMINAL
## MASSACHUSETTS CLEAN ENERGY CENTER
## 4 WRIGHT STREET
## NEW BEDFORD, MASSACHUSETTS

**Prepared for:**

**FOTH INFRASTRUCTURE & ENVIRONMENT, LLC**
**15 CREEK ROAD, MARION, MA 02738**

**Prepared By:**

**CIVIL & ENVIRONMENTAL CONSULTANTS, INC.**
**31 BELLOWS ROAD**
**RAYNHAM, MA 02767**

**CEC Project 332-344**

**MARCH 2025**

DRAFT

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**FIGURES**

Figure 1 – Site Locus Map
Figure 2 – NBMCT Parcel Overview Map
Figure 3 – NBMCT Terminal Expansion 'Site' Boundary Map

**EXHIBITS**

EXHIBIT A – Adequately Regulated Determination
EXHIBIT B – Figures and Tables by CEC and Others
EXHIBIT C – Activity and Use Limitations
EXHIBIT D – Boring Logs and Test Pits


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# 1.0 INTRODUCTION

Civil & Environmental Consultants, Inc. (CEC) has prepared this Soil Management Plan (SMP) to address earthwork activities related to the redevelopment of the properties associated with the New Bedford Marine Commerce Terminal (NBMCT) in New Bedford, Massachusetts (the Property). A Locus Map and a Site Overview map, and AUL Overview map are provided as Figures 1 through 3, respectively. This Soil Management Plan was prepared on behalf of the Massachusetts Clean Energy Technology Center of Boston, Massachusetts (MassCEC) and is intended to broadly apply to construction activities that are conducted by or on behalf of MassCEC on the Property.

## 1.1 PURPOSE

The purpose of this SMP is to present the planned procedures for the handling, managing, and relocation of soil during earthwork activities associated with the construction project. The specific objectives of the SMP are to:

- Describe general Site-wide excavation/earthwork activities and activities where the excavation extends into potentially OHM-impacted soils and/or fill material;
- Describe the on-Site re-use of soil/fill during the earthwork;
- Describe general site controls and soil erosion mitigation procedures.
- Describe the segregation of soil and stockpiling procedures;
- Describe the procedures for off-Site transport and disposal, reuse, or recycling of soils; and
- Describe the controls for dust, odor, and vapor mitigation and monitoring.

This SMP is applicable to two distinct types of soil; 1) General fill (dense grade aggregate, granular fill, etc..) that has been imported onto the Disposal Site(s) are part of the protective cap and/or as an improved surface and 2) Urban fill and native soils which may include ash, peat, sand, debris and may contain contaminants such as polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), or metals.

## 1.2 ROLES AND RESPONSIBILITIES

MassCEC is responsible for implementation of projects at the Property conducted under this SMP. the earthwork will be performed by a qualified contractor (the Contractor) and environmental services will be provided by a Licensed Site Professional (LSP). The following identifies the typical roles and responsibilities of each organization involved in the proposed earthwork. However, some responsibilities may vary based upon the specific project:

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- The Contractor will typically perform all earthwork activities, including excavation; soil management; off-Site transportation and appropriate disposal, re-use, or recycling of any materials not to be re-used on-Site; and, import/placement of fill/backfill required to achieve necessary grades for the project.

- The Contractor will typically be prepared and responsible for enacting mitigating measures of dust, odor, and vapor suppression as appropriate and in accordance with section 4.0 of this SMP.

- The LSP will prepare a Health and Safety Plan (HASP) for its employees, as required by 310 CMR 40.0871(e). The Contractor is typically responsible for their own employee's health and safety and for conformance with Occupational Health and Safety Administration (OSHA) standards and regulations.

- The LSP's firm will typically provide environmental consulting services including LSP services, as necessary, related to the earthwork activities.

- MassCEC or the Contractor will inform the LSP of any new (currently undetected), or significantly different circumstances relating to soil conditions and/or potential contamination discovered during the performance of the work.

With the existence of known reportable conditions within Disposal Site Boundaries and as defined in the Massachusetts Contingency Plan, 310 CMR 40.0000 (the MCP), handling of the soils located on the Property requires best management practices (BMPs) to ensure that a condition of significant risk is not created as a result of the earthwork activities. Reportable conditions existing on the Property include OHM-impacted materials at the expansion parcels and OHM-impacted materials underlying the existing imported protective cap within the NBMCT.

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## 2.0 SITE AND SURROUNDING AREA DESCRIPTION

The NBMCT is situated within an industrial area along the coast of New Bedford, Massachusetts. The NBMCT is comprised of a 30-acre facility between JFK Memorial Highway and the New Bedford Harbor and ~8 acres of recently acquired commercial property that is proposed to be a redeveloped as part of an expanded facility (expansion Sites); The 30-acre facility is predominately structurally undeveloped but includes an approximately 27,500 square foot single story building on 4 Wright Street. The existing main terminal portion of the NBMCT is subject to multiple Activity and Use Limitations (AULs. The Property includes the following sites with the associated Release Tracking Numbers (RTNs) listed if applicable:

**Shuster Property (former RIST, LLC)**
Address: Front Street
Parcel ID/Lot Size: 31- 288 / ~7.74 acres
Current Owner: MassCEC
RTN: 4-23736
Compliance Status/Date: Tier1D / 12/27/2012

**Shuster "Jog"**
Address: South of Wright Street
Parcel ID/Lot Size: 31- 289 / ~0.39 acres
Current Owner: MassCEC
It is unclear if this is part of any mapped Disposal Site, but CEC understands it will be covered by a pending Permanent Solution Statement (PSS) and AUL.

**New Bedford Radio, Inc., (Hall Comm)**
Address: South Front Street Lot 1 & 2
Parcel ID / Lot Size: 31-234 (~4.17 acres) / 31- 291 (~0.23 acres)
Current Owners: MassCEC / NB Radio, Inc.
RTN: 4-25350
Compliance Status/Date: Tier1D / 10/08/2015

**(Former) DMF Parcel 1**
Address: North of 16 Blackmer Street
Parcel ID/Lot Size: 25A-53 / ~1.2 acres
Current Owner: City of New Bedford
RTN: 4-24296
Compliance Status/Date: Tier1D / 12/03/2013

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**DMF Parcel 2**
Address: 16 Blackmer Street
Parcel ID/Lot Size: 25A-49 / ~2.2 acres
Current Owner: City of New Bedford
RTN: 4-15490
Compliance Status/Date: RAO (i.e. a Permanent Solution was achieved) / 3/27/2009

**New Bedford Redevelopment Authority**
Address: Southeast Blackmer Street
Parcel ID/Lot Size: 25A- 48 / ~9.23 acres
Current Owner: City of New Bedford
It is unclear if this is part of any mapped Disposal Site, but CEC understands it will be covered by a pending Permanent Solution Statement (PSS) and AUL.

**Former Dartmouth Finishing Site**
Address: 45 Cove Street
Parcel ID/Lot Size: 21- 45 / ~4.3 acres
Current Owner: City of New Bedford
RTN: 4-23616
Compliance Status/Date: Tier Classified / 10/03/2012

**Expansion Site 1**
Addresses: 54 Wright Street & 18 Wright Street
Parcel ID/Lot Size: 31-265 & 31-249 / ~2.1 acres
Current Owner: MassCEC
RTN 4-50261
Compliance Status/Date: 120-day notification / 5/24/2024 & 1/17/2025

**Expansion Site 2**
Addresses: 350 South Front Street /0 SS MacArthur Boulevard & 360-382 South Front Street
Parcel ID/Lot Size: 31-218 & 31-237 & 31-144 / ~2.15 acres
Current Owner: MassCEC
RTN 4-50261
Compliance Status/Date: 120-day notification / 5/24/2024 & 1/17/2025

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**Expansion Site 3**
Addresses: 4 Wright Street /portion of R ES South Front Street
Parcel ID/Lot Size: 31- 263 & 31-288 / ~2.2 acres
Current Owner: MassCEC
RTN 4-50261
Compliance Status/Date: 120-day notification / 5/24/2024 & 1/17/2025

The Property structures include the following:

| Property | Approximate Building Size (square feet) | Structure |
|---|---|---|
| 4 Wright Street | 27,500 | Single-story concrete building |
| 18 Wright Street | 10,000 | Single-story metal building |
| 54 Wright Street | 3,750 | Commercial warehouse |
| 350 South Front Street & 0 SS Macarthur Boulevard | 6,400 | Single-story metal building |
| 360-382 South Front Street | 21,500 | Single-story metal building |

Currently, greater than 21-acres of the NBMCT have been engineered and constructed to accommodate a heavy-lift capacity and consists of a surficial dense grade aggregate pavement. Adjacent properties primarily include seafood and seafood related commercial properties. Additionally, there are abutting commercial retailers to the 45 Cove Street property.

## 2.1 SITE HISTORY

Historically, situated within the footprint of Shuster and DMF parcels was the former Potomska Mills complex which operated from the late 1800s until it was demolished in 1936. Since the early 1940s, these parcels have been vacant of industrial activities and remain structurally undeveloped lots.

The Former Dartmouth Finishing Site was the location of a fabric finishing and dyeing business that discontinued operations after its bankruptcy in 1994. Prior to the Dartmouth Finishing companies' occupancy included The Hathaway Manufacturing Company (textiles) in the 1950s; and Dartmouth Mills (textiles) in the early 1900s. The property was structurally improved upon with a 120,000 square foot single-story building that was demolished between 1999 and 2001. Also on the property were two underground storage tanks (USTs). The USTs are associated with an RTN (4-23616) and were removed in 2004 as part of remedial actions.

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54 Wright Street (Site 1) was historically occupied by a boat builder and for the storage of fisherman's lockers between 1888 and 1950. The current building at the property was erected around 1978 for use as a shop for auto repairs and marine electronics.

18 Wright Street (Site 1) was undeveloped prior to 1950, then historically used for the storage of fisherman's lockers as of 1950. The current building at the property was erected around 1984 for use as a fish processing plant.

350 South Front Street (Site 2) was historically occupied by Potomska Mill beginning in 1888 through 1936 when it was demolished. A building was originally erected at the property around 1950 for use as a fish processing facility, followed by the re-development of the property in 1996 with the existing building for use by fish processing companies.

360-382 South Front Street (Site 2) was historically occupied by Potomska Mill beginning in 1888 through 1936 when it was demolished. The property remained undeveloped until approximately 2000 when the current building was erected for use as a fish processing facility.

Sites 1 through 3 and the surrounding area was located near or in the Acushnet River until it was filled in the 1960s and 1970s. The United States Environmental Protection Agency (USEPA) has been and continues to assess and remediate the Acushnet Estuary Superfund Site which encompasses the river and estuaries is impacted with PCBs and metals. The source of the fill material used to create the land at the Subject Property and surrounding area is unknown, nor if the sediment in the river was removed prior to emplacing the fill material.

## 2.2 RELEASE HISTORY

**Shuster Property (former RIST, LLC)**
**RTN: 4-23736**

In August 2011, a subsurface and groundwater investigation was conducted that included soil borings and monitoring well installation, test pit excavation, and soil and groundwater sampling. Contaminants were detected in soils above reportable concentrations (RCS-2) identified in the MCP (310 CMR 40.1600) that included:

- PCBs;
- total lead;
- total petroleum hydrocarbons (TPH);
- extractable petroleum hydrocarbons (EPH) fractions;
- polycyclic aromatic hydrocarbons (PAH); and
- volatile petroleum hydrocarbon (VPH) fractions and several target volatile organic compounds (VOC).

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Naphthalene was also detected in groundwater above the applicable MassDEP reportable concentration (RCGW-2).

An initial RAM Plan was submitted to MassDEP on July 3, 2013 that outlined RAM activities associated with the improvements to the main terminal on this parcel. Construction activities occurring under the RAM Plan included soils management and excavation. Excavated OHM-impacted soils were removed to off-site facilities if PCB concentrations were greater than 50 parts per million (ppm) and/or if EPH/TPH concentrations were greater than 10,000 ppm. A protective cap of clean dense grade aggregate was installed to a depth of three feet as an acceptable alternative to an asphalt cap. As discussed above, the status of this Disposal Site is currently on record with MassDEP as a Tier 1D, but it is CEC's understanding that the Disposal Site is considered adequately regulated (Exhibit A).

**New Bedford Radio, Inc., (Hall Comm)**
**RTN: 4-25350**

Extensive surficial soil sampling was completed on this parcel and involved over 1,000 surficial soil samples. Additionally, in January 2014 eight test pits were excavated and six soil borings were advanced. Test pits were advanced to a depth of 6 feet below grade surface (bgs) and soil borings were advanced to 11 feet bgs.

A release was reported to MassDEP on October 1, 2014, due to exceedances of MCP RCS-2 values for the following contaminants:

- PCB;
- lead;
- naphthalene; and
- cadmium.

A RAM Plan was filed on October 20, 2014, related to the New Bedford Marine Commerce Terminal (NBMCT) construction activities that required soils management within the Disposal Site for off-site disposal and onsite reuse. PCB-impacted soils with concentrations greater than 50 ppm were sent to off-site facilities for disposal. A protective cap of clean dense grade aggregate was installed to a depth of three feet as an acceptable alternative to an asphalt cap

A RAM Status Report was filed with MassDEP on May 17, 2016, and an AUL was filed for this Disposal Site on September 16, 2019. The AUL applies to both "Lot 1" and "Lot 2" of Map 31 parcels 234 and 291. The AUL conditions for each of these parcels vary. As discussed above, the status of this Disposal Site is currently on record with MassDEP as a Tier 1D, but it is CEC's understanding that the Disposal Site is considered adequately regulated (Exhibit A).

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**DMF Parcel 1**
**RTN: 4-24296**

A release was reported to MassDEP in November 2012 after Phase I investigations performed for the NBMCT identified PCB concentrations in soils greater than applicable RCS-2 standard.

The initial RAM Plan submitted to MassDEP on July 3, 2013, outlined RAM activities for the Shuster Property and three abutting RTNs, including DMF Parcels 1 and 2 and the Former Dartmouth Finishing Site. Construction activities occurring under the RAM plan included soils management and soils excavation. Excavated OHM-impacted soils were removed to offsite facilities if PCB concentrations were greater than 50 ppm and/or if EPH/TPH concentrations were greater than 10,000 ppm. A protective cap of clean dense grade aggregate was installed to a depth of three feet as an acceptable alternative to an asphalt cap. As discussed above, the status of this Disposal Site is currently on record with MassDEP as a Tier 1D, but it is CEC's understanding that the Disposal Site is considered adequately regulated (Exhibit A).

**DMF Parcel 2**
**RTN: 4-15490**

Phase I investigations in January 2000, were limited in scope to the perceived high-risk areas and the Disposal Site assessment included several test pits, discrete soil sampling locations, and installation and sampling of one groundwater monitoring well. There were observed exceedances within soils of MCP RCS-1/RCS-2 criteria for PAHs and lead.

Phase II investigations in May 2006 were performed to verify and delineate the presence of contaminants in soil and groundwater identified in the Phase I investigations. Soil samples were assessed from three borings and six test pits. Borings were advanced to a depth of 2.5 feet bgs and the test pits were sampled in intervals at 0-3 feet bgs and 3–6 feet bgs. Consistent with the results of the Phase I investigations, exceedances of the MCP RCS-1/RCS-2 criteria for PAHs and lead were observed in soil samples collected across the Disposal Site as part of the Phase II investigation.

In 2009, a Method 3 Risk Characterization was completed and a Class A-3 Response Action Outcome (RAO) Statement was submitted. The RAO concluded that an asphalt cap and an AUL would be necessary to ensure soil exposure pathways remained incomplete. The AUL was filed February 3, 2010.

RAM activities performed in 2013 included the removal of OHM-impacted soils and the installation of an acceptable protective cap in areas where the existing asphalt cap would be replaced. Three feet of dense grade aggregate was installed as an acceptable and protective

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alternative to the asphalt cap. A SMP was prepared as part of the prior RAM plan. This current SMP is intended as an alternative SMP that can be utilized on any portion of the Property.

A Permanent Solution has been achieved for this Disposal Site.

**Former Dartmouth Finishing Site**
**RTN: 4-23616**

A subsurface investigation in August 2004 included the removal of two 10,000-gallon Underground Storage Tanks (USTs) and approximately 80 cubic yards of petroleum-impacted soil. Petroleum odors and staining were reportedly confined to the northeast portion of each tank footprint.

In October 2011, Phase II investigations identified contaminant concentrations both in soil and groundwater that were greater than the applicable RCS-1/RCGW-2 concentrations. Contaminant concentrations that exceeded the RCS-1 standard included:

- EPH fractions;
- VPH fractions;
- PAHs;
- barium, cadmium, total chromium, and lead.

Dissolved silver was also detected in four monitoring wells greater than the RCGW-2 standard.

A Tier Classification was submitted on October 3, 2012 which classified the site as Tier II.

The initial RAM Plan submitted to MassDEP on July 3, 2013 outlined RAM activities for the Shuster Property and three abutting RTNs including the Former Dartmouth Finishing Site. Construction activities occurring under the RAM Plan included soils management and soils excavation. Excavated OHM-impacted soils were removed (76 tons) to offsite facilities if PCB concentrations were greater than 50 ppm and/or if EPH/TPH concentrations were greater than 10,000 ppm. A protective cap of clean dense grade aggregate (approximately one foot thick) and imported dredge materials (approximately two feet thick) were installed to a depth of three feet as an acceptable alternative to an asphalt cap.

A RAM Completion Report was filed in November of 2015 and an AUL was recorded on April 14, 2016 for this Disposal Site.

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**Expansion Sites 1, 2, & 3**
**RTN: 4-50261**

Beginning in November 2023, an initial subsurface investigation was conducted at these Sites after the completion of multiple ASTM Phase I Environmental Site Assessments (ESAs). The subsurface investigation included soil borings across all the Sites with hundreds of samples submitted for various parameters. A release was reported to MassDEP in May 2024 and again in January 2025 for contaminants that were detected in soils above reportable concentrations (RCS-1 and/or RCS-2 depending upon location) identified in the MCP (310 CMR 40.1600) which included:

- PCBs;
- total lead;
- semi-volatile organic compounds (SVOCs);
- volatile petroleum hydrocarbon (VPH) fractions; and
- extractable petroleum hydrocarbons (EPH) fractions.

Additionally, concentrations of PCBs were detected on the Property triggering the Toxic Substances Control Act (TSCA), the regulations for which are listed in Title 40 of the Code of Federal Regulations (CFR) Part 761 (40 CFR Part 761).

An initial RAM plan will be submitted in early 2025, concurrent with this SMP, and will outline RAM activities associated with the expansion of the main terminal at these Sites. The construction will occur in phases between 2025 and 2027, beginning with Site 1. Construction activities occurring under this RAM Plan will include site preparation and demolition, fencing installation, water and electric utility installation, drainage utility installation, installation of foundations for lighting, and any associated excavation of subgrade soils within the Property. Excavated OHM-impacted soils will be removed to off-site facilities if PCB concentrations are greater than 25 milligrams per kilogram (mg/kg). As part of the NBMCT Terminal Expansion, a heavy lift "cap" or surface, similar to the current engineered barrier, is proposed for portions of the Property. The proposed "cap" will consist of two layers of geogrid and select gravel fill, totaling a thickness of approximately 18".

## 2.3 SUBSURFACE CONDITIONS

Based on historical subsurface investigations, generally the top 6 feet of subsurface (prior to capping) consisted of fine to medium sandy fill. Ash, brick, and other debris defined by the MassDEP as "urban fill" have been observed throughout the existing NBMCT at different intervals in both test pits and borings (Exhibit D). A layer of organic soils or peat, likely the native ground surface, has been observed at approximately 3-4 feet bgs, underlying imported fill materials. Post-excavation activities across the existing NBMCT have involved importing dense grade aggregate

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and granular fill materials to create a protective cap that limits exposure to potentially OHM-impacted soils and provides an engineered surface for heavy lifting. The thickness of the cap is approximately three-feet across much of the NBMCT. The average groundwater elevation throughout the NBMCT is approximately 5-6 feet bgs, with groundwater elevations ranging from 7-8 feet bgs to as shallow as 3.5 feet bgs.

At the expansion Sites, and based on subsurface investigations completed at these Sites, the top 6 feet of subsurface soils consisted of fine to medium sandy fill. Ash, brick, and other debris defined by the MassDEP as "urban fill" have been observed throughout the parcels at different intervals in the soil borings. A layer of organic soils or peat, likely the native ground surface, has been observed at approximately 8-12 feet bgs, underlying the fill materials, primarily at Site 1. Groundwater was not investigated at this property; however, groundwater elevations are estimated to be similar to the existing NBMCT, ranging from 7-8 feet bgs to as shallow as 3.5 feet bgs.

## 2.4 TYPE OF HAZARD ANTICIPATED

Site workers could potentially be exposed to soils contaminated with volatile petroleum hydrocarbons (VPH), extractable petroleum hydrocarbons (EPH), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), lead, and other metals. The primary hazard will be exposure to soil via inhalation, direct/dermal contact, or incidental ingestion of dust generated during soil management activities.

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# 3.0 SOIL MANAGEMENT

## 3.1 OVERVIEW

Impacted soil and fill materials are present at the Property within the boundaries of various Disposal Sites (see Exhibit B). Individuals engaged in activities at the Property may be exposed to contaminants through incidental ingestion, dermal contact, or inhalation of soil particles if proper precautions are not taken. Due to the potential to encounter waste materials, CEC recommends the appropriate level of training per OSHA and industry standards.

Regardless of the soil type, the following procedures will be performed when soils are disturbed to minimize or eliminate the potential of exposure.

- During soil disturbance activity, dust suppression (i.e. watering, etc.) techniques must be employed as necessary.

- In the event that an unexpected observation or situation arises during work (i.e. encounter buried drums, metals/construction debris, contaminated soil, etc.), earthwork activities will immediately stop. Workers will not attempt to handle the situation themselves but will contact the appropriate supervisor/personnel for further direction.

- Soil that is exposed or excavated is anticipated to be re-used within the Disposal Site Boundary of origin.

- If soil is encountered that is not structurally suitable for reuse on the Property, it should be characterized through sampling and laboratory analysis to determine the appropriate management of the soil. Soil should not transfer between Disposal Site Boundaries or removed from the Property unless, based on additional characterization, an LSP deems it suitable for a specific on-site reuse or off-Site reuse, recycling or disposal at an appropriately permitted location.

- Significant volumes of groundwater are not expected to enter excavations and/or require management. The management of groundwater is outside of the scope of this document. If dewatering is required, a groundwater management plan should be developed.

- All regrading at the property shall be reviewed to ensure that it maintains the adequate thickness of the protective cap.

- All work shall conform with the attached AUL(s) (Exhibit C).

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## 3.2 EXCAVATED MATERIAL CATEGORIES

CEC has developed the following categories to distinguish the soils to be managed under this SMP.

Category A (General fill suitable for reuse): The soil/fill material that is located on the Property that is assumed to be ***suitable*** for reuse on the Property as part of the construction project. An example of this type of material would be dense grade aggregate originating from a depth of less than 3 feet below grade.

Category B (General fill not suitable for reuse): The soil/fill material that is located on the Property outside of a Disposal Site Boundary and that is assumed *unsuitable* for reuse on the Property as part of the construction project. This is typically soil that is unsuitable for reuse from a geotechnical perspective, but this soil may also contain contaminants and should be assumed to contain contaminants until laboratory testing proves otherwise. An example of this type of material would be organic soils from portion of 80 Wright Street outside of any Disposal Site area.

Category C: OHM-impacted soil that is located within a Disposal Site Boundary on the Property that has been analyzed and determined to be ***unsuitable*** for reuse on the Property as part of the construction project. This soil may be unsuitable for reuse either due to geotechnical characteristics or concentrations of OHM-related contaminants. This soil will require management under a RAM Plan.

## 3.3 TEMPORARY STOCKPILING OF SOIL

The Contractor should perform the excavation and soil management activities in a manner that minimizes the need to stockpile excavated soil on the Property, to the extent feasible.

In general, Category B and C excavated materials stockpiles should not exceed 500 cubic yards, shall be located at least 100 feet from any wetlands or other tributaries, and shall be surrounded by appropriate siltation controls to prevent potential run-off. Larger stockpiles may be approved after consultation with the LSP-of-record. The stockpile shall not be placed on or directly upgradient of any drainage catch-basins, manholes, drainage swales, or other potential discharge pathways. The siltation control measures shall be secured at all times and shall be adequately monitored until the soil is removed from the Site and transported to at an approved facility. Category B and C soil shall be stockpiled on a minimum of two (2) layers of 6-mil polyethylene sheeting and covered with a minimum of one (1) layer of 6-mil polyethylene sheeting at the end of the workday. No regulated soils will be stockpiled on-Site for greater than 120 days without prior approval from the LSP-of -Record.

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The following are the stockpiling procedures for each soil Category:

- Category A: This category broadly includes previously imported fill materials comprising the installed protective cap. This material should not be removed from the Property without consultation with an LSP. Stockpiles of this material may exceed 500 cubic yards and no polyethene sheeting is required to encapsulate the stockpile.

- Category B: This soil is not regulated under the MCP so long as it remains on-site but is intended for potential off-site disposal/reuse due to some other factor. This soil requires proper management to ensure that a reportable condition, as defined in the MCP, is not created. This soil may include urban fill, ash, peat, and sand. Any of this soil that is stockpiled shall be covered with 6-mil poly at the end of each day and remain covered until it has been properly characterized for disposal parameters. This material should not be removed from the Property without consultation with an LSP.

- Category C: This soil is regulated under the MCP and requires proper management. This is the soil that originates within a Disposal Site boundary and may be subject an AUL. This soil may not be reused at another Disposal Site on the Property without characterization and not within three feet of a final grade. Any of this soil that is stockpiled shall be covered with 6-mil poly at the end of each day and remain covered until it has been properly characterized for disposal parameters. This material should not be removed from the Property or reused without consultation with an LSP.

### 3.4 Field Screening

Soil being excavated from within a Disposal Site Boundary on the Property should be screened utilizing a photoionization detector (PID) for total organic vapors (TOVs). The PID should be calibrated to an isobutylene standard, and the frequency of screening should be no less than 1 sample for every 50 cubic yards of soil. Soil exhibiting PID readings of greater than or equal to 5 parts per million by volume (ppmv), and/or exhibiting visual or olfactory signs of contamination (staining/odors), should be segregated and should not be reused on the Property.

Soils will also be visually screened for other evidence of contamination (staining, sheens, free product).

In the event that excavated or sampled material has visible stains or unnatural odor, or if potentially contaminated and/or hazardous material is encountered, work will be stopped until the LSP and/or LSP representative has been notified.

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## 3.5 SOIL CHARACTERIZATION

Should it be determined that any soils from the Property (regardless of disposal category) are to be removed from the Property, the soil must be characterized for disposal by collecting representative soil samples. The soil will be sampled and analyzed under the direction of the LSP. The sampling procedures and analytical parameters will be based upon the requirements of the facility to which it will be transported to for reuse, recycling, treatment and/or disposed. The number of samples and analyses will depend on the facility. The soil samples will be placed in the appropriate glassware with preservative (if applicable) and then submitted to a laboratory, on ice and under a chain of custody for analyses. The selected facility shall be contacted prior to characterizing the soil to ensure the adequate number of samples are collected and the appropriate analyses are performed.

Soil characterization samples may be collected and screened from excavated stockpiles or in-situ. Sample depth intervals and location(s) will be included in the field notes. A minimum of five representative grab samples may be composited for appropriate analyses. However, volatile organic compounds (VOCs) will be grab samples and taken from biased-high soils exhibited from field screening results using a PID. Stockpile characterization samples will be typically collected for at least every 500 cubic yards of excavated materials designated for off-site disposal or Category B soil designated for reuse. However, the sampling frequency may be adjusted by the LSP, based upon professional judgement, regulatory guidance, and the requirements of the disposal facility.

Soil characterization methodology will require the samples will be a minimum 5-point composite and the top 12-inches of the sampling location will be removed prior to sampling. Waste characterization samples may be analyzed for total petroleum hydrocarbons (TPH), VOCs, semi-volatile VOCs (SVOCs), polycyclic aromatic hydrocarbons (PAHs), conductivity, flashpoint, pH, reactive sulfide, reactive cyanide, polychlorinated biphenyls (PCBs), and/or Resource Conservation and Recovery Act (RCRA) 8 metals with/without toxicity characteristic leaching procedure (TCLP) analysis to accommodate analytical disposal criteria of the utilized offsite facilities.

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## 4.0 DUST, ODOR, VAPOR CONTROLS

Significant odors, vapors, and/or dust are not anticipated. The Contractor will be responsible for evaluating conditions at the Property during soil management activity. The LSP may not be continuously present during soil management, but the LSP and/or his designee will conduct periodic inspections throughout the duration of the work.

During the construction activities, evaluation will be performed to identify conditions where dust becomes visible at the perimeter of the area of work. Throughout the duration of the work, dust control shall be performed as necessary to ensure that no visible or nuisance dust is allowed to migrate from the work area, areas of exposed soils, and/or stockpiles. Dust monitoring will consist of visual monitoring on an on-going basis. If dust is generated by the excavation activities and dust control is warranted, it will consist of spraying water, wetting the soils and/or the excavator bucket, or other feasible means. Spraying shall not introduce excessive moisture to the soils or produce runoff. Water supplied will be free of any contaminants. For excavation of soils with known concentrations of PCBs, the LSP should be consulted to determine if quantitative dust monitoring is required.

If these mitigating actions are inadequate to control airborne particulates, alternative control measure will be evaluated by the LSP and/or LSP's representative for implementation across the Property.

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## 5.0 DECONTAMINATION

Prior to exiting the Property, vehicles and equipment will be brushed of visible soils and tires will be adequately cleaned to prevent tracking materials offsite, where appropriate.

Additional decontamination efforts at the Property may be deemed necessary by the LSP and/or LSP representative if OHM-impacted soils are exposed during excavation activities. Decontamination procedures will vary based upon the location and nature of the activity and must comply with state and federal regulations.

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# FIGURES

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Civil & Environmental Consultants, Inc.

31 Bellows Road
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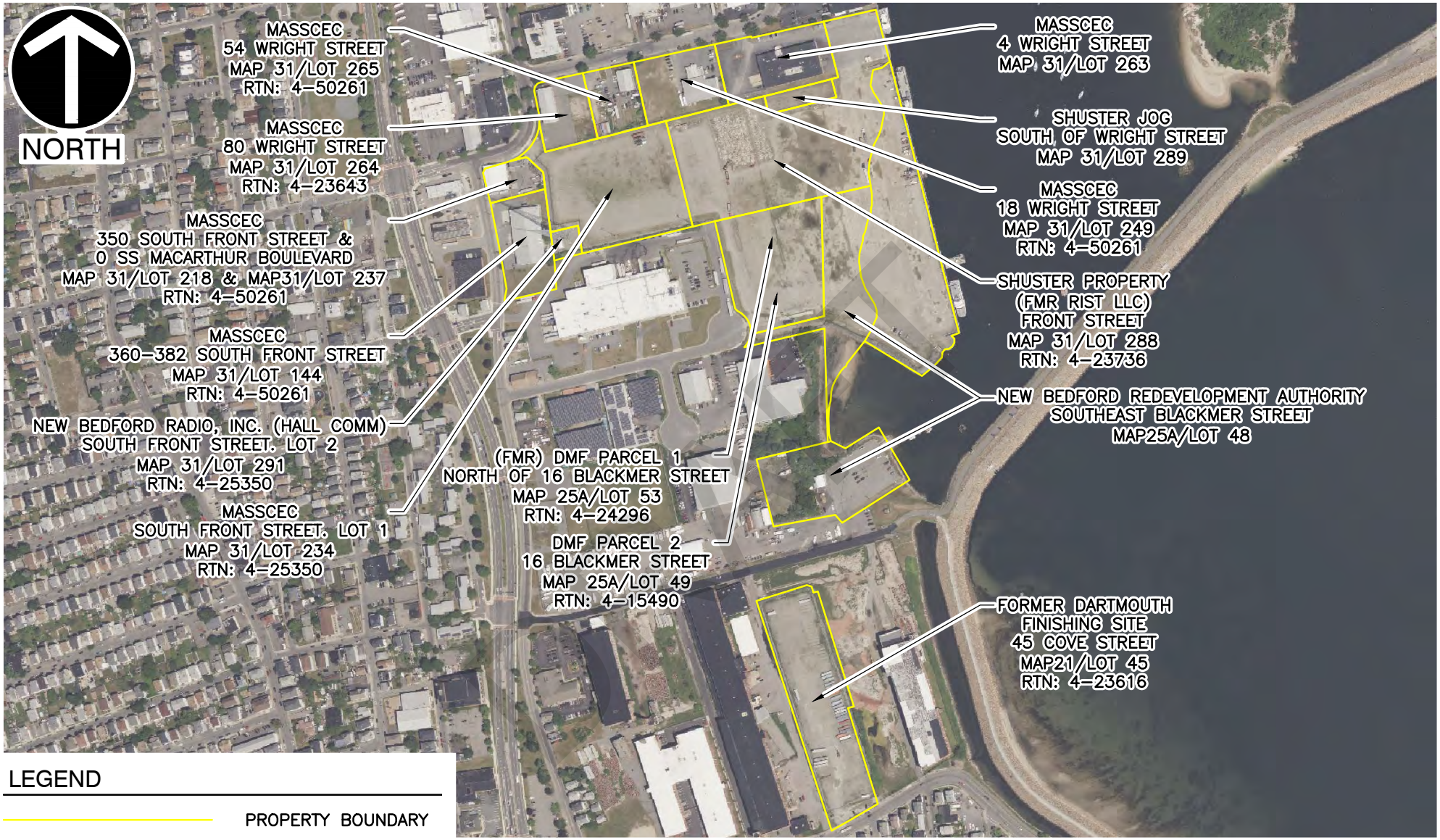
MASSACHUSETTS CLEAN ENERGY CENTER
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
NEW BEDFORD, MASSACHUSETTS

SITE LOCUS MAP

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | FIGURE NO.: | 1 |
| DATE: | MARCH 2025 | DWG SCALE: | 1"=4,000' | PROJECT NO: | 332-344 | | |

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Site Locus.dwg[FIGURE 1] LS:(3/6/2025 - abucco) - LP: 3/19/2025 4:06 PM

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Release Abatement.dwg{FIGURE 2} LS:(3/19/2025 - abucco) - LP: 3/31/2025 8:35 AM




LEGEND

PROPERTY BOUNDARY

SCALE IN FEET

0 500 1,000


Civil & Environmental Consultants, Inc.

31 Bellows Road
Raynham, MA 02767

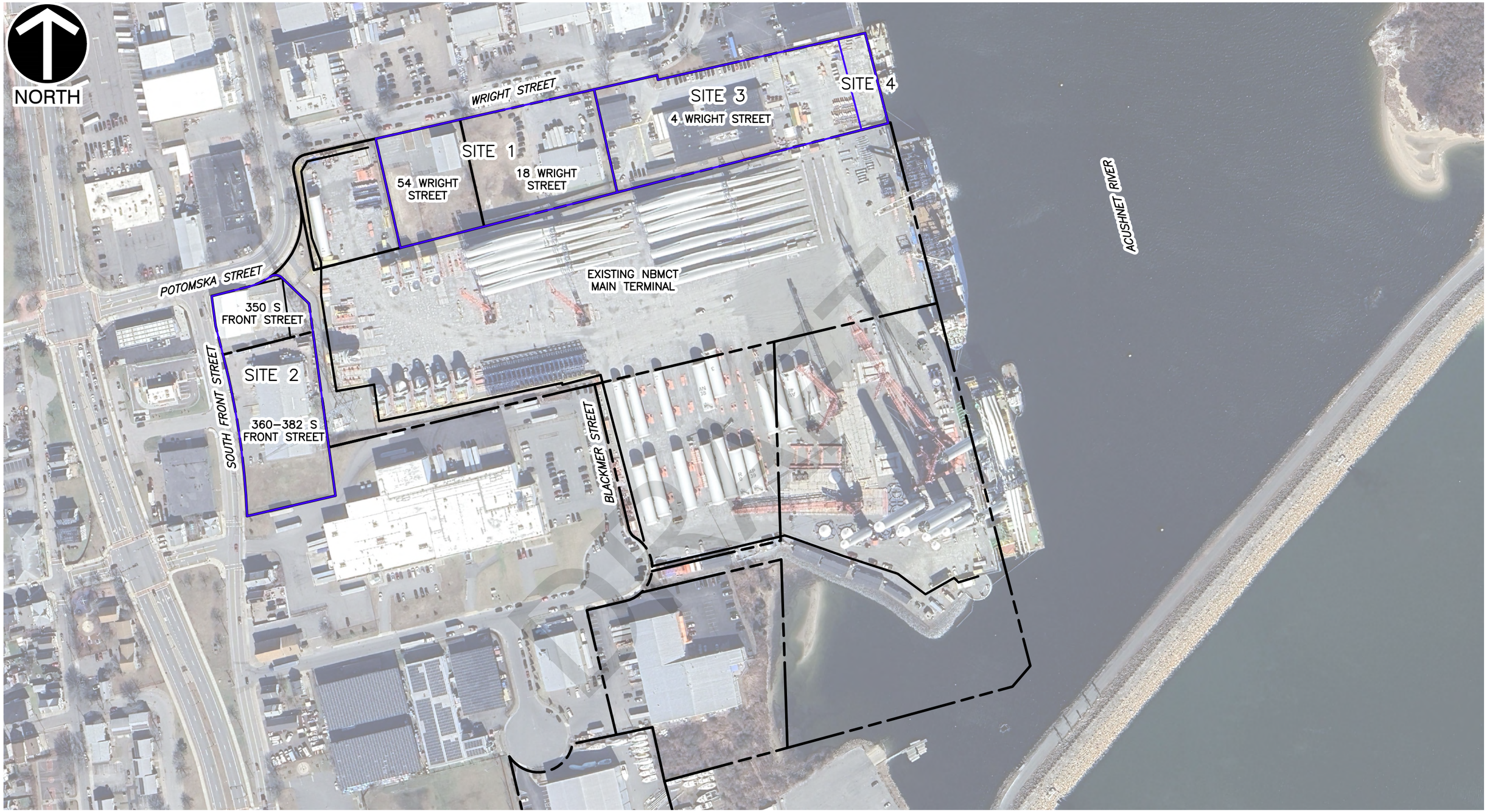
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NEW BEDFORD, MASSACHUSETTS

NBMCT PARCEL OVERVIEW MAP

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | FIGURE NO.: | 2 |
| DATE: | MARCH 2025 | DWG SCALE: | 1"=500' | PROJECT NO: | 332-344 | | |




LEGEND

PROPOSED EXPANSION AREA

PROPERTY LINE

SCALE IN FEET

0 200 400

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NBMCT TERMINAL EXPANSION
"SITE" BOUNDARY MAP

| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | FIGURE NO.: |
|---|---|---|---|---|---|---|
| DATE: | MARCH 2025 | DWG SCALE: | 1"=200' | PROJECT NO: | 332-344 | 3 |

P:\330-000\332-344\-CADD\Dwg\ENO4 - Soil Remediation\332344-ENO4-NBMCT Terminal Expansion Site Boundaries.dwg[FIGURE 3] LS:(3/12/2025 - abucco) - LP: 3/19/2025 4:09 PM

# EXHIBIT A
# ADEQUATELY REGULATED DETERMINATION

DRAFT

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
One Winter Street Boston, MA 02108 • 617-292-5500

DEVAL L. PATRICK
Governor

RICHARD K. SULLIVAN JR.
Secretary

KENNETH L. KIMMELL
Commissioner

DRAFT

July 1, 2013

Bill White
Director, Offshore Wind Sector Development
Massachusetts Clean Energy Center
55 Summer Street, 9th Floor
Boston, MA 02110

Re: Adequately Regulated Determination for New Bedford Marine Commerce Terminal

Dear Mr. White:

I write in response to your June 24, 2013 letter requesting that the Massachusetts Department of Environmental Protection (MassDEP) determine that certain aspects of the New Bedford Marine Commerce Terminal project, also called the South Terminal project (the Project), be deemed "adequately regulated" under the provisions set forth in 310 CMR 40.0110 of the Massachusetts Contingency Plan (MCP).

310 CMR 40.0111 states, in pertinent part:

> The Department shall deem response actions at a disposal site subject to CERCLA adequately regulated for purposes of compliance with [the MCP], provided:
> (a) the Department concurs with the ROD and/or other EPA decisions for remedial actions at such site in accordance with 40 CFR 300.515(e); or,
> (b) if the Department requests that EPA change or expand the EPA-selected remedial action, EPA agrees to integrate the Department's proposed changes or expansions into the planned CERCLA remedial action in accordance with 40 CFR 300.515(f) [the State Enhanced Remedy provisions]….

Upon request by MassDEP, in its November 16, 2012 "Final Determination for the South Terminal Project" (Final Determination), EPA expanded the State Enhanced Remedy (SER), which is incorporated into the 1998 Record of Decision for the Upper and Lower Harbor at the New Bedford Harbor Superfund Site ("1998 ROD") so that it includes the South Terminal Project. MassDEP concurred with the 1998 ROD, as amended, and with the Final Determination.

Therefore, MassDEP determines that the Project is "adequately regulated" pursuant to 310 CMR 40.0111(a) and (b).

Also noted in your June 24, 2013 letter is EPA's requirement that remediation of the upland portion of the Project be conducted in accordance with M.G.L. Chapter 21E and the MCP. MassDEP acknowledges that certain investigation, remediation, and public involvement activities, apart from MCP requirements, are also specified in the Final Determination. Therefore, in the case of the upland portion of the Project, the "adequately regulated" status will eliminate the need to comply with MCP requirements that are duplicative of work already being required by EPA. However, MassDEP believes that the following activities are necessary to meet the requirements of Chapter 21E and the MCP for the upland portion of the Project, and that these activities would not be duplicative of other requirements contained in EPA's Final Determination:

- Use of the Bill of Lading Process (when Hazardous Waste Manifests are not required) in accordance with 310 CMR 40.0034;
- Reporting of any new or additional release conditions to MassDEP under the guidelines and timetables under Subpart C of the MCP;
- Meeting the Response Action Performance Standard as outlined within 310 CMR 40.0191;
- Utilizing MCP cleanup standards and/or risk-based cleanup standards generated via a Method 3 risk assessment to determine compliance with MCP performance standards under Subpart I of the MCP;
- Submittal of Release Abatement Measure (RAM) Plan, status reports and completion report pursuant to 310 CMR 40.0440;
- Preparation of a risk assessment for the Site(s) under Subpart I of the MCP;
- Preparation of Activity and Use Limitations under Subpart J of the MCP; and
- Preparation of Class A or Class B Response Action Outcomes for outstanding Release Tracking Numbers (RTNs) under Subpart J of the MCP.

Please let me know if you have any questions about this. You may reach me at (617) 556-1121 or Benjamin.Ericson@state.ma.us.

Sincerely,

Benjamin J. Ericson
Assistant Commissioner for Waste Site Cleanup

Cc: Phil Weinberg, Regional Director of MassDEP SERO
Millie Garcia-Serrano, Deputy Regional Director, MassDEP SERO
Paul Craffey, BWSC, State Enhanced Remedy Oversight Coordinator

DRAFT

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June 24, 2013

Mr. Benjamin J. Ericson
Assistant Commissioner for Waste Site Cleanup
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

Re: Adequately Regulated Determination

Dear Assistant Commissioner Ericson,

I write this letter on behalf of the Massachusetts Clean Energy Center ("CEC"), the project proponent for the development of the New Bedford Marine Commerce Terminal ("Terminal"), requesting that the Massachusetts Department of Environmental Protection ("DEP") issue a determination that certain aspects of the environmental investigation, remediation, and public involvement activities associated with the Terminal project be deemed adequately regulated under the Adequately Regulated provisions set forth in the Massachusetts Contingency Plan ("MCP") at 310 CMR 40.0110. As you know, the Terminal project is being constructed under the direction of the USEPA, by virtue of the State Enhanced Remedy provision of the New Bedford Harbor Superfund Site Record of Decision, and the Final Determination for the South Terminal Project, dated November 16, 2012.[1] While crafting the Final Determination, EPA:

- reviewed historic data associated with previous uses of some of the properties involved in the project;
- reviewed historic environmental investigations conducted to date on some of the properties involved in the project;
- directed the Commonwealth to conduct environmental investigations on certain properties associated with the project;
- requested proposals for environmental remediation on certain properties associated with the project, and reviewed and accepted those proposals;
- requested commitments from the Commonwealth with regard to future maintenance of existing asphalt surfaces on certain properties associated with the project; and

[1] The Final Determination can be found on the Executive Office of Energy and Environmental Affairs website at http://www.mass.gov/eea/ocean-coastal-management/serth/.

DRAFT

- required the commitment of the Commonwealth to conduct a public involvement process to ensure communication with the public regarding EPA's decisions and actions, as well as the progress of work in association with the project.

According to the Adequately Regulated provisions set forth at 310 CMR 40.0110, DEP shall deem response actions at a disposal site subject to CERCLA adequately regulated for purposes of compliance with 310 CMR 40.0000, if DEP concurs with the ROD and/or other EPA decisions for remedial actions at such site in accordance with 40 CFR 300.515(e). CEC maintains that DEP's issuance of its Applicable or Relevant and Appropriate Requirements ("ARAR) in connection with the Terminal project constitutes the requisite concurrence of the Final Determination issued by EPA on November 12, 2012, so as to constitute "other EPA decision[] for remedial action" under 310 CMR 40.0111(1)(a).

Notwithstanding the foregoing, CEC recognizes that EPA has indicated that sampling and remediation are to take place as part of the 21E/MCP process. CEC also concedes that the Final Determination does not clearly identify a cleanup standard for the work proposed for the Terminal; and that, DEP's ARAR that it submitted in relation to the Final Determination contemplated that CEC would undertake a detailed site assessment and implement an appropriate response action under the MCP.

However, it is equally important to note that EPA has directly regulated environmental investigation and proposed remediation for this project to date. EPA has also taken an active role in regulating the investigation and proposed remediation for the project, and that some aspects of the 21E/MCP process have already been reviewed and regulated by EPA. More importantly, various elements of CEC's appropriate response actions are already contemplated in the Final Determination. In light of these considerations, CEC requests that MassDEP specifically deem the following actions taken to date (or specifically approved by EPA to date) as Adequately Regulated:

- Onsite investigation conducted to date (unless previously conducted under the MCP by others);

- Onsite investigations as outlined within the Commonwealth's Sampling and Analysis Plan submitted to EPA, dated March 21, 2013 (or the final revision of such plan);

- Remediation as currently outlined within the Commonwealth's January 18, 2012 submission to USEPA and approved by EPA within its Final Determination for the South Terminal Project, dated November 16, 2012 (which has been publicly available since July of 2012 on the EEA website);

- Mitigation measures as currently outlined within the USEPA Final Determination for the South Terminal Project, dated November 16, 2012;

- Intensive public engagement, including 9 public meetings and numerous meeting with local environmental groups, in association with the project; and

- Timetables for document submission MCP compliance.

DRAFT

Implementation of ARARs associated with 21E/MCP compliance would involve:

- Use of the Bill of Lading Process (when Hazardous Waste Manifests are not required) in accordance with 310 CMR 40.0034;
- Reporting of any new or additional release conditions to MassDEP under the guidelines and timetables under Subpart C of the MCP;
- Meeting the Response Action Performance Standard as outlined within 310 CMR 40.0191;
- Utilizing MCP cleanup standards and/or risk-based cleanup standards generated via a Method 3 risk assessment to determine compliance with MCP performance standards under Subpart I of the MCP;
- Submittal of Release Abatement Measure (RAM) Plan, status updates and completion report pursuant to 310 CMR 40.0440;
- Preparation of a risk assessment for the Site(s) under Subpart I of the MCP;
- Preparation of Activity and Use Limitations under Subpart J of the MCP; and
- Preparation of Class A or Class B Response Action Outcomes for outstanding RTNs under Subpart J of the MCP.

Finally, CEC commits to completing and submitting the associated paperwork for the above-referenced activities within 120 days of the completion of the construction of the Terminal.

MassCEC sincerely appreciates your consideration of this very important matter. If you have any questions, please do not hesitate to contact me at 617-315-9330.

Sincerely,

*Bill White*

Bill White
Director, Offshore Wind Sector Development

DRAFT

# EXHIBIT B
# FIGURES AND TABLES BY CEC AND OTHERS

DRAFT

# MassDEP - Bureau of Waste Site Cleanup

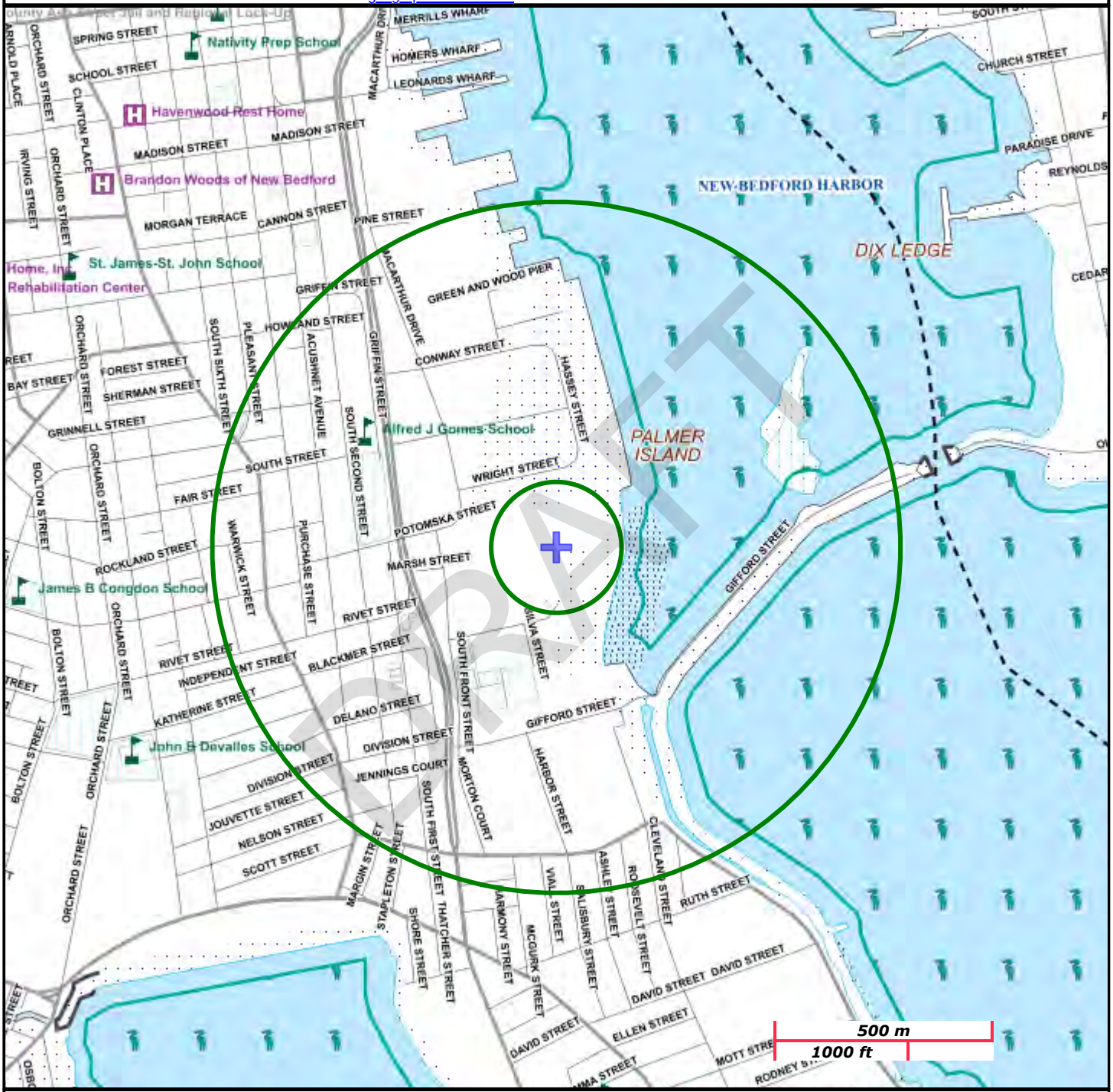
## Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

**Site Information:**
NBMCT
80 WRIGHT STREET NEW BEDFORD, MA

**NAD83 UTM Meters:**
4609654mN , 340334mE (Zone: 19)
September 28, 2022

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: https://www.mass.gov/orgs/massgis-bureau-of-geographic-information.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection




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Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source

Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A

Hydrography: Open Water, PWS Reservoir, Tidal Flat

Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100yr Floodplain; Protected Open Space; ACEC

NHESP Pri-Hab of Rare Species; Vernal Pool: Cert., Potential

Solid Waste Landfill; PWS: Com.GW,SW, Emerg., Non-Com.

**EXHIBIT B**
**FIGURES BY CEC**

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Raynham, MA 02767

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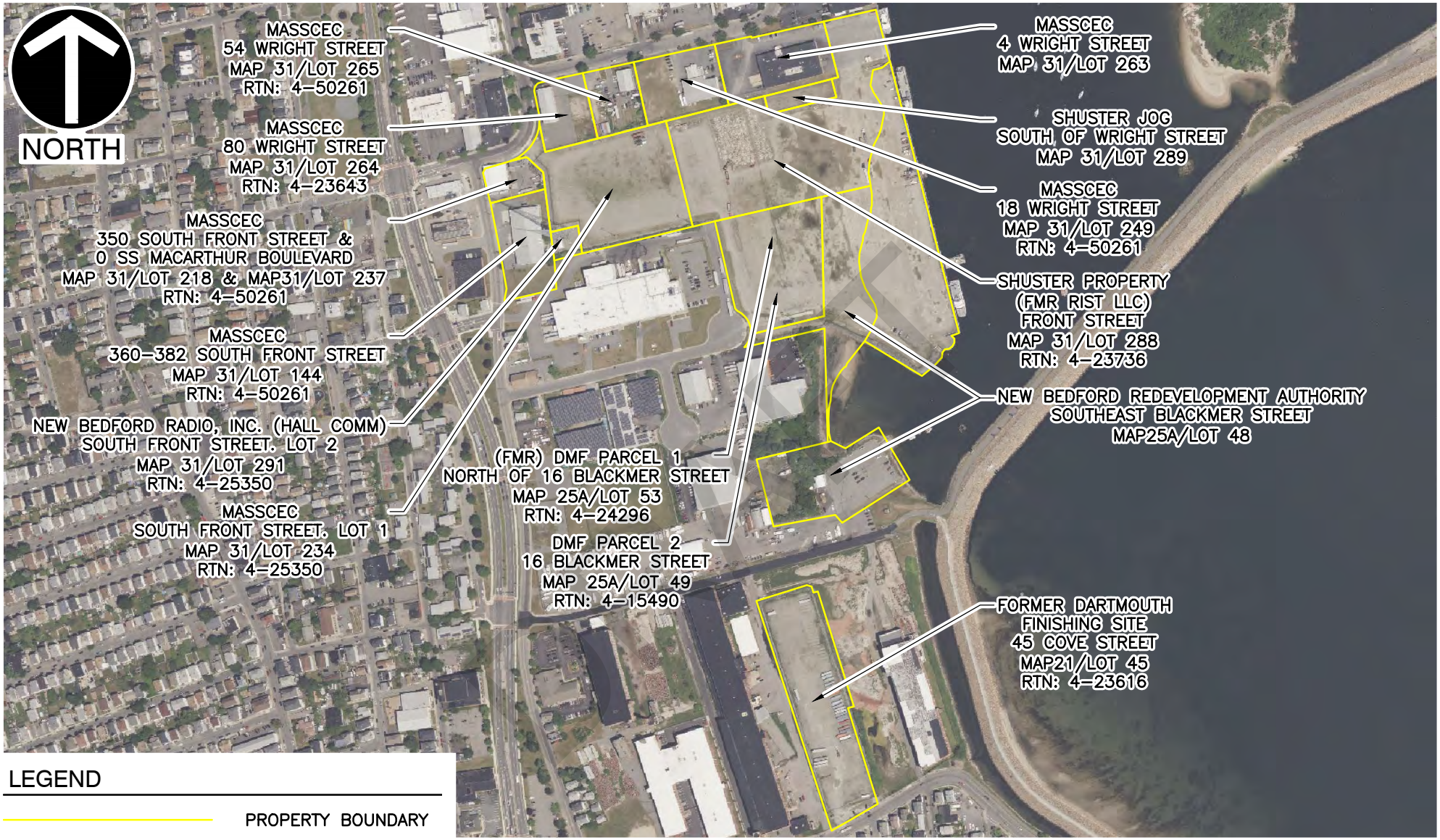
MASSACHUSETTS CLEAN ENERGY CENTER
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
NEW BEDFORD, MASSACHUSETTS

SITE LOCUS MAP

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | FIGURE NO.: | 1 |
| DATE: | MARCH 2025 | DWG SCALE: | 1"=4,000' | PROJECT NO: | 332-344 | | |

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Site Locus.dwg[FIGURE 1] LS:(3/6/2025 - abucco) - LP: 3/19/2025 4:06 PM

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Release Abatement.dwg{FIGURE 2} LS:(3/19/2025 - abucco) - LP: 3/31/2025 8:35 AM




LEGEND

PROPERTY BOUNDARY

SCALE IN FEET

0 500 1,000


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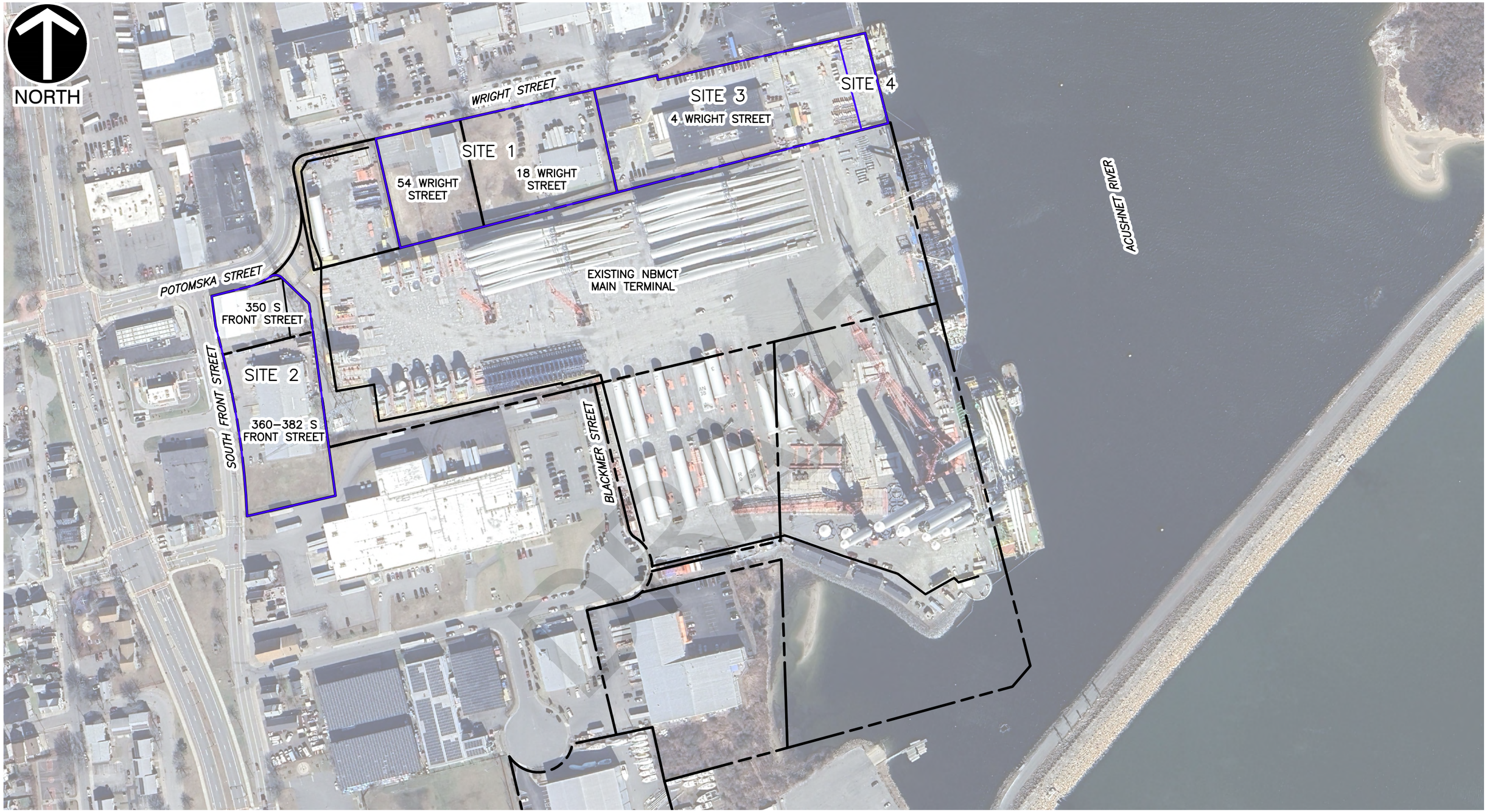
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NBMCT PARCEL OVERVIEW MAP

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | FIGURE NO.: | 2 |
| DATE: | MARCH 2025 | DWG SCALE: | 1"=500' | PROJECT NO: | 332-344 | | |




LEGEND

PROPOSED EXPANSION AREA

PROPERTY LINE

SCALE IN FEET

0 200 400

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NBMCT TERMINAL EXPANSION
"SITE" BOUNDARY MAP

| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | FIGURE NO.: |
|---|---|---|---|---|---|---|
| DATE: | MARCH 2025 | DWG SCALE: | 1"=200' | PROJECT NO: | 332-344 | 3 |

P:\330-000\332-344\-CADD\Dwg\ENO4 - Soil Remediation\332344-ENO4-NBMCT Terminal Expansion Site Boundaries.dwg[FIGURE 3] LS:(3/12/2025 - abucco) - LP: 3/19/2025 4:09 PM

NORTH

WRIGHT STREET

MM LL KK JJ II HH GG FF EE DD CC BB AA A B C D E F G H I J K L

-9 -8 -7 -6 -5 -4 -3 -2 -1 0 1

CEC-1-1 II-8.5 CEC-2-1 EE-8.5 AA-8.5 D-8.5 CEC 2-2 H-8.5 CEC 3-2

HH-7 FF-7 DD-7 BB-7 A-7 C-7 E-7 G-7 I-7

CEC-1-2

54 WRIGHT STREET

JJ/II-6 GATE BB-6 AA-6 A-6 B-6 C-6

HH-5 FF-5 DD-5 BB-5 AA-5 A-5 B-5 C-5 E-5 G-5 I-5

GATE CEC-5-1

80 WRIGHT STREET CEC-4-1

4 WRIGHT STREET

BB-4 AA-4 A-4 B-4 C-4 D-4

18 WRIGHT STREET

HH-3 FF-3 DD-3 BB-3 AA-3 A-3 B-3 C-3 D-3 E-3 G-3 I-3

JJ/II-2 GG-2 FF-2 EE-2 DD-2 CC-2 BB-2 AA-2 A-2 B-2 C-2 D-2 E-2 F-2 G-2

CEC 6-2

BB-1 A-1

HH-1 GG-1 FF-1 EE-1 DD-1 CC-1 AA-1 B-1 C-1 D-1 E-1 F-1 G-1 H-1 I-1

CEC-3-1 CEC-7-2 CEC-4-2 CEC-8-2

CEC 5-2

JJ0 II0 HH0 GG0 FF0 EE0 CC0 BB0 AA0 A0 B0 C0 D0 E0 F0 G0 H0 I0.5 J0

JJ0.5 II0.5 HH-0.5 EE0.5 DD0 AA0.5 A0.5 B0-10S C0.5 D0.5 E0.5 F0.5 G0.5 H0.5

NBMCT PROPERTY

HOT SPOT AREA (SEE FIGURE 6)

NBMCT PROPERTY

DRAFT

## LEGEND

| | |
|---|---|
| ⊕ AA-0 | SOIL BORING LOCATION – PCB ANALYSIS – DECEMBER 2023 THROUGH MAY 2024 |
| ⊕ AA-0 | SOIL BORING LOCATION – WASTE CHARACTERIZATION ANALYSIS – APRIL 2024 THROUGH MAY 2024 |
| ⊕ CEC-0-0 | SOIL BORING LOCATION PCB, MCP METALS, & SVOC ANALYSIS – NOVEMBER 2024 THROUGH DECEMBER 2024 |
| ——— | EXISTING PROPERTY LINE |
| ▲ | PROPOSED AIR/DUST MONITORING LOCATION |
| — — — | 50'x50' GRID SPACING |
| - - - - | 25'x25' GRID SPACING |

SCALE IN FEET

0 40 80

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NEW BEDFORD, MASSACHUSETTS

SITE 1 BORING LOCATION PLAN AND SAMPLING GRID

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | EXHIBIT: | 4 |
| DATE: | MARCH 2025 | DWG SCALE: | 1"=40' | PROJECT NO: | 332-344 | | |

P:\330-0001\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg[FIGURE 4] LS:(3/12/2025 - abucco) - LP: 3/19/2025 4:18 PM

WRIGHT STREET

NORTH

80 WRIGHT STREET

54 WRIGHT STREET

4 WRIGHT STREET

18 WRIGHT STREET

NBMCT PROPERTY

NBMCT PROPERTY

HOT SPOT AREA (SEE FIGURE 6)

DRAFT

## LEGEND

| | |
|---|---|
| AA–0 | SOIL BORING LOCATION – PCB ANALYSIS – DECEMBER 2023 THROUGH MAY 2024 |
| ⊕ AA–0 | SOIL BORING LOCATION – WASTE CHARACTERIZATION ANALYSIS – APRIL 2024 THROUGH MAY 2024 |
| CEC–0–0 | SOIL BORING LOCATION PCB, MCP METALS, & SVOC ANALYSIS – NOVEMBER 2024 THROUGH DECEMBER 2024 |
| | EXISTING PROPERTY LINE |
| | 50'x50' GRID SPACING |
| | 25'x25' GRID SPACING |

DISCRETE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

| | RESULT |
|---|---|
| 0–1 | PCB RESULT <1MG/KG |
| 1–2 | PCB RESULT 1 ≤ 25MG/KG |
| 2–3 | PCB RESULT >25MG/KG |
| 3–4 | NO SAMPLE ANALYZED |
| 4–5 | |
| 5–10 | |

COMPOSITE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

| | RESULT |
|---|---|
| 0–5 | PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE |
| 5–10 | PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE |

SCALE IN FEET

0 40 80

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SITE 1 SOIL RESULTS - PCBS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | EXHIBIT: | 5 |
| DATE: | MARCH 2025 | DWG SCALE: | 1"=40' | PROJECT NO: | 332-344 | | |

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg[FIGURE 5] LS:(3/12/2025 - abucco) - LP: 3/19/2025 4:18 PM

NORTH

A-1
B-1
C-1
25'
25'
5'
5'
A0-20N20W
A0-20N10W
CEC-7-2
CEC-4-2
B0-20N15W
B0-15N15W
CEC-8-2
B0-10N15W
B0-20N15E
B0-15N15E
B0-10N15E
B0-10N
B0-5N
B0-5S
B0-10S
AA0
A0-20W
A0-15W
A0-10W
A0-5W
A0
B0-20W
B0-15W
B0-10W
B0-5W
B0
B0-5E
B0-10E
B0-15E
B0-20E
C0
AA0.5
A0.5
B0-10S15W
B0-10S15E
C0.5

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## LEGEND

| | |
|---|---|
| AA-0 | SOIL BORING LOCATION – PCB ANALYSIS – DECEMBER 2023 THROUGH MAY 2024 |
| AA-0 | SOIL BORING LOCATION – WASTE CHARACTERIZATION ANALYSIS – APRIL 2024 THROUGH MAY 2024 |
| CEC-0-0 | SOIL BORING LOCATION PCB, MCP METALS, & SVOC ANALYSIS – NOVEMBER 2024 THROUGH DECEMBER 2024 |
| | EXISTING PROPERTY LINE |
| | 50'x50' GRID SPACING |
| | 25'x25' GRID SPACING |
| | 5'x5' GRID SPACING |

DISCRETE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

| | RESULT |
|---|---|
| 0-1 | PCB RESULT <1MG/KG |
| 1-2 | PCB RESULT 1 ≤ 25MG/KG |
| 2-3 | PCB RESULT >25MG/KG |
| 3-4 | NO SAMPLE ANALYZED |
| 4-5 | |
| 5-10 | |

COMPOSITE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

| | RESULT |
|---|---|
| 0-5 | PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE |
| 5-10 | PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE |

SCALE IN FEET
0 5 10

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NEW BEDFORD, MASSACHUSETTS

SITE 1 HOT SPOT SOIL RESULTS - PCBS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | EXHIBIT: | 6 |
| DATE: | MARCH 2025 | DWG SCALE: | 1"=5' | PROJECT NO: | 332-344 | | |

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg[FIGURE 6] LS:(3/12/2025 - abucco) - LP: 3/19/2025 5:04 PM

NORTH

WRIGHT STREET

MM LL KK JJ II HH GG FF EE DD CC BB AA A B C D E F G H I J K L

-9 -8 -7 -6 -5 -4 -3 -2 -1 0 1

CEC-1-1 II-8.5 | CEC-2-1 EE-8.5 | AA-8.5 | D-8.5 CEC 2-2 | H-8.5 CEC 3-2

HH-7 FF-7 DD-7 BB-7 A-7 C-7 E-7 G-7 I-7

CEC-1-2

54 WRIGHT STREET

JJ/II-6 GATE BB-6 AA-6 A-6 B-6 C-6

HH-5 FF-5 DD-5 BB-5 AA-5 A-5 B-5 C-5 E-5 G-5 I-5

GATE CEC-5-1

80 WRIGHT STREET

CEC-4-1

4 WRIGHT STREET

BB-4 AA-4 A-4 B-4 C-4 D-4

18 WRIGHT STREET

HH-3 FF-3 DD-3 BB-3 AA-3 A-3 B-3 C-3 D-3 E-3 G-3 I-3

JJ/II-2 GG-2 FF-2 EE-2 DD-2 CC-2 BB-2 AA-2 A-2 B-2 C-2 D-2 E-2 F-2 G-2

CEC 6-2

BB-1 A-1

HH-1 GG-1 FF-1 EE-1 DD-1 CC-1 AA-1 B-1 C-1 D-1 E-1 F-1 G-1 H-1 I-1

CEC-3-1 CEC-7-2 CEC-4-2 CEC-8-2

CEC 5-2

JJ0 II0 HH0 GG0 FF0 EE0 CC0 BB0 AA0 A0 B0 C0 D0 E0 F0 G0 H0 I0.5 J0

JJ0.5 II0.5 HH-0.5 EE0.5 DD0 AA0.5 A0.5 B0-10S C0.5 D0.5 E0.5 F0.5 G0.5 H0.5

NBMCT PROPERTY

NBMCT PROPERTY

DRAFT

## LEGEND

| | |
|---|---|
| AA-0 | SOIL BORING LOCATION – PCB ANALYSIS – DECEMBER 2023 THROUGH MAY 2024 |
| AA-0 | SOIL BORING LOCATION – WASTE CHARACTERIZATION ANALYSIS – APRIL 2024 THROUGH MAY 2024 |
| CEC-0-0 | SOIL BORING LOCATION PCB, MCP METALS, & SVOC ANALYSIS – NOVEMBER 2024 THROUGH DECEMBER 2024 |
| | EXISTING PROPERTY LINE |
| | 50'x50' GRID SPACING |
| | 25'x25' GRID SPACING |
| | APPROXIMATE AREA OF LEAD CONCENTRATIONS >200 MG/KG |

SCALE IN FEET

0 40 80

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NEW BEDFORD, MASSACHUSETTS

SITE 1 SOIL RESULTS - LEAD

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | EXHIBIT: | 7 |
| DATE: | MARCH 2025 | DWG SCALE: | 1"=40' | PROJECT NO: | 332-344 | | |

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg[FIGURE 7] LS:(3/12/2025 - abucco) - LP: 3/19/2025 4:21 PM

NORTH

WRIGHT STREET

EXISTING 30.00' DRAINAGE EASEMENT

EXISTING 30.00' DRAINAGE EASEMENT

Q–7 S–7 U–7 W–7 Y–7 C'–7 E'–7

A'–7

Y–5 A'–5 C'–5 E'–5

EXISTING BULKHEAD

K–4.5 L/M–4.5

K–3

18 WRIGHT STREET

4 WRIGHT STREET

Y–3 A'–3 C'–3 E'–3

Y–0.5

C'–1 E'–1

A'–1

K–1 L/M–1

O–0.5 Q–0.5 S–0.5 U–0.5 W–0.5

LO MO NO

NBMCT PROPERTY

DRAFT

SCALE IN FEET

0 50 100

## LEGEND

| | |
|---|---|
| AA–0 | SOIL BORING LOCATION – PCB ANALYSIS – JULY 2024 |
| – – – – – | 50'x50' GRID SPACING |
| - - - - - | 25'x25' GRID SPACING |


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SITE 3 BORING LOCATION PLAN AND SAMPLING GRID

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | EXHIBIT: | 8 |
| DATE: | MARCH 2025 | DWG SCALE: | 1"=50' | PROJECT NO: | 332-344 | | |

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg[FIG8 & LS:(3/19/2025 - abucco) - LP: 3/25/2025 1:13 PM

NORTH

WRIGHT STREET

EXISTING 30.00' DRAINAGE EASEMENT

EXISTING 30.00' DRAINAGE EASEMENT

Q–7 S–7 U–7 W–7 Y–7 C'–7 E'–7

A'–7

Y–5 A'–5 C'–5 E'–5

EXISTING BULKHEAD

K–4.5 L/M–4.5

K–3

18 WRIGHT STREET

4 WRIGHT STREET

Y–3 A'–3 C'–3 E'–3

Y–0.5

C'–1 E'–1

K–1 L/M–1

O–0.5 Q–0.5 S–0.5 U–0.5 W–0.5

A'–1

LO MO NO

NBMCT PROPERTY

DRAFT

## LEGEND

| | |
|---|---|
| AA–0 | SOIL BORING LOCATION – PCB ANALYSIS – JULY 2024 |
| — — — — — | 50'x50' GRID SPACING |
| - - - - - - | 25'x25' GRID SPACING |

DISCRETE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

| | RESULT |
|---|---|
| 0–1 | PCB RESULT <1MG/KG |
| 1–2 | PCB RESULT 1 ≤ 25MG/KG |
| 2–3 | PCB RESULT >25MG/KG |
| 3–4 | NO SAMPLE ANALYZED |
| 4–5 | |
| 5–10 | |

COMPOSITE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

| | RESULT |
|---|---|
| 0–5 | PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE |
| 5–10 | PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE |

SCALE IN FEET

0 50 100


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NEW BEDFORD, MASSACHUSETTS

SITE 3 SOIL RESULTS - PCBS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | EXHIBIT: | 9 |
| DATE: | MARCH 2025 | DWG SCALE: | 1"=50' | PROJECT NO: | 332-344 | | |

P:\330-0001\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg[FIGURE 9] LS:(3/19/2025 - abucco) - LP: 3/25/2025 1:14 PM

NORTH

SOUTH FRONT STREET

CEC 5–4
CEC 6–4
CEC–7–4
CEC 1–4
CEC 4–3
CEC–8–3
350 SOUTH FRONT STREET
CEC–14–4
CEC–8–4
POTOMSKA STREET
360 SOUTH FRONT STREET
CEC–5–3
CEC 2–3
CEC–9–4
CEC–6–3
CEC–15–4
CEC 2–4
CEC–7–3
CEC–3–3
CEC–10–4
NBMCT PROPERTY

DRAFT

LEGEND

CEC–11–4 — EXISTING SOIL BORING LOCATION – DECEMBER 2023 THROUGH SEPTEMBER 2024

50'x50' GRID SPACING

25'x25' GRID SPACING

SCALE IN FEET

0 40 80

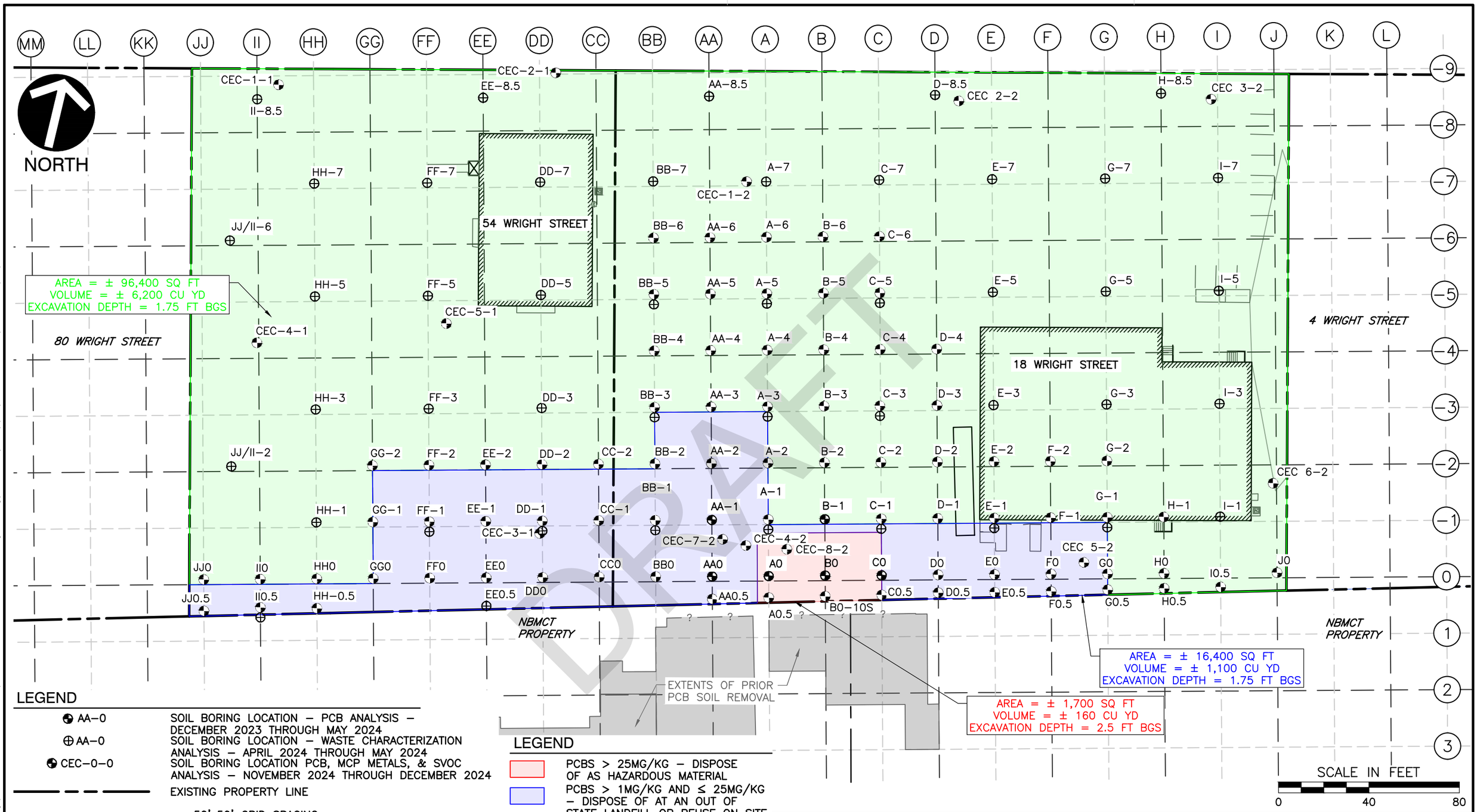
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767
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www.cecinc.com

FOTH INFRASTRUCTURE & ENVIRONMENT LLC
MASSACHUSETTS CLEAN ENERGY CENTER
NEW BEDFORD, MASSACHUSETTS

SITE 2 - BORING LOCATION PLAN AND SAMPLING GRID

| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | EXHIBIT: |
|---|---|---|---|---|---|---|
| DATE: | MARCH 2025 | DWG SCALE: | 1"=40' | PROJECT NO: | 332-344 | 10 |

P:\330-000\332-344\-CADD\Dwg\EN06 - Site 2\332344-EN06-Site 2-Boring Location Plan.dwg[FIGURE 10] LS:(3/6/2025 - abucco) - LP: 3/19/2025 5:05 PM




## LEGEND

- AA-0 — SOIL BORING LOCATION – PCB ANALYSIS – DECEMBER 2023 THROUGH MAY 2024
- ⊕ AA-0 — SOIL BORING LOCATION – WASTE CHARACTERIZATION ANALYSIS – APRIL 2024 THROUGH MAY 2024
- CEC-0-0 — SOIL BORING LOCATION PCB, MCP METALS, & SVOC ANALYSIS – NOVEMBER 2024 THROUGH DECEMBER 2024
- EXISTING PROPERTY LINE
- 50'x50' GRID SPACING
- 25'x25' GRID SPACING

DISCRETE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

| | RESULT |
|---|---|
| 0-1 | PCB RESULT <1MG/KG |
| 1-2 | PCB RESULT 1 ≤ 25MG/KG |
| 2-3 | PCB RESULT >25MG/KG |
| 3-4 | NO SAMPLE ANALYZED |
| 4-5 | |
| 5-10 | |

## LEGEND

- PCBS > 25MG/KG – DISPOSE OF AS HAZARDOUS MATERIAL
- PCBS > 1MG/KG AND ≤ 25MG/KG – DISPOSE OF AT AN OUT OF STATE LANDFILL OR REUSE ON SITE
- PCBS < 1MG/KG – DISPOSE OF AT A COMM-97 LANDFILL OR REUSE ON SITE

COMPOSITE SAMPLE DEPTH (FEET BELOW GROUND SURFACE)

| | RESULT |
|---|---|
| 0-5 | PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE |
| 5-10 | PCB COMPOSITE SAMPLE WITHIN THIS DEPTH RANGE |

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FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
NEW BEDFORD, MASSACHUSETTS

SITE 1 SOIL EXCAVATION CHARACTERIZATION AREAS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | CDB | APPROVED BY: | JDK | EXHIBIT: | 11 |
| DATE: | MARCH 2025 | DWG SCALE: | 1"=40' | PROJECT NO: | 332-344 | | |

P:\330-000\332-344\-CADD\Dwg\EN04 - Soil Remediation\332344-EN04-Soil Remediation Figures.dwg{FIGURE 11} LS:(3/12/2025 - abucco) - LP: 3/19/2025 4:44 PM

# EXHIBIT B
# TABLES BY CEC

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Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **A-1** | **A-3** | **A-5** | **A-7** | **AA-8.5** | **B-1** | **B-2** | **B0** | **BB-1** | **BB-3** | **BB-5** | **BB-7** | **C-1** | **MCP Concentrations** | |
| Sample ID | A-1 | A-3 | A-5 | A-7 | **AA-8.5** | B-1 4-5 | B-2 2-3 | B0 3-4 | BB-1 | BB-3 | BB-5 | BB-7 | C-1 | | |
| Sample Depth (feet) | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 4-5 | 2-3 | 3-4 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | | |
| Sample Date | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 4/30/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 5/2/2024 | RCS-1 | RCS-2 |
| Laboratory Sample ID | 24E0050-03 | 24E0050-02 | 24E0050-01 | 24E0050-05 | 24E0026-09 | 24E0051-15 | 24F0473-01 | 24E0814-06 | 24E0026-08 | 24E0026-07 | 24E0026-06 | 24E0026-05 | 24E0124-01 | | |
| **VOCs (mg/kg)** | | | | | | | | | | | | | | | |
| Acetone | < 0.043 | < 0.048 | < 0.048 | < 0.060 | < 0.046 | -- | -- | -- | < 0.056 | < 0.049 | < 0.050 | < 0.047 | < 0.054 | 6 | 50 |
| Naphthalene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | -- | -- | -- | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 4 | 20 |
| **SVOCs (mg/kg)** | | | | | | | | | | | | | | | |
| 1,1-Biphenyl | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | -- | -- | -- | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | 0.05 | 6 |
| 2-Methylnaphthalene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | -- | -- | -- | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 80 |
| Acenaphthylene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.48 | -- | -- | -- | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 2 | 10 |
| Anthracene | < 0.29 | 1.41 | < 0.28 | < 0.28 | 0.67 | -- | -- | -- | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 1000 | 3000 |
| Benzo(A)anthracene | 0.33 | 7.33 | 0.51 | < 0.28 | 2.38 | -- | -- | -- | 0.45 | 0.32 | 0.28 | < 0.28 | < 0.28 | 20 | 300 |
| Benzo(A)pyrene | 0.35 | 7.30 | 0.52 | < 0.28 | 2.33 | -- | -- | -- | 0.49 | 0.32 | 0.30 | < 0.28 | < 0.28 | 2 | 30 |
| Benzo(B)fluoranthene | < 0.29 | 6.25 | 0.39 | < 0.28 | 2.53 | -- | -- | -- | 0.52 | 0.35 | 0.29 | < 0.28 | < 0.28 | 20 | 300 |
| Benzo(g,h,i)Perylene | 0.45 | 4.44 | 0.37 | < 0.28 | 1.52 | -- | -- | -- | 0.36 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 1000 | 3000 |
| Benzo(K)fluoranthene | < 0.29 | 4.84 | 0.32 | < 0.28 | 0.97 | -- | -- | -- | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 1000 | 3000 |
| Bis (2-ethylhexyl) phthalate | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | -- | -- | -- | < 0.28 | < 0.29 | < 0.28 | < 0.28 | 0.40 | 100 | 700 |
| Butylbenzylphthalate | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | -- | -- | -- | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 100 | 1000 |
| Chrysene | 0.31 | 6.28 | 0.48 | < 0.28 | 2.27 | -- | -- | -- | 0.44 | 0.34 | 0.31 | < 0.28 | < 0.28 | 200 | 3000 |
| Di-n-octyl phthalate | < 0.57 | < 0.55 | < 0.56 | < 0.56 | < 0.55 | -- | -- | -- | < 0.56 | < 0.58 | < 0.55 | < 0.56 | < 0.55 | 1000 | 10000 |
| Dibenzo(A,H)anthracene | < 0.29 | 1.28 | < 0.28 | < 0.28 | 0.35 | -- | -- | -- | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 2 | 30 |
| Dibenzofuran | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | -- | -- | -- | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 100 | 1000 |
| Fluoranthene | 0.69 | 10.00 | 0.92 | < 0.28 | 5.39 | -- | -- | -- | 0.87 | 0.60 | 0.50 | 0.42 | < 0.28 | 1000 | 3000 |
| Fluorene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | -- | -- | -- | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 1000 | 3000 |
| Indeno (1,2,3-cd) pyrene | < 0.29 | 5.31 | 0.34 | < 0.28 | 1.46 | -- | -- | -- | 0.35 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 20 | 300 |
| Naphthalene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | -- | -- | -- | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 4 | 20 |
| Phenanthrene | 0.37 | 3.82 | 0.58 | < 0.28 | 2.83 | -- | -- | -- | 0.47 | 0.34 | 0.29 | < 0.28 | < 0.28 | 10 | 1000 |
| Pyrene | 0.64 | 9.49 | 1.07 | < 0.28 | 4.59 | -- | -- | -- | 0.74 | 0.54 | 0.51 | 0.40 | < 0.28 | 1000 | 3000 |
| **Total SVOCs** | 3.15 | 67.75 | 5.51 | 0 | 27.32 | -- | -- | -- | 4.70 | 2.82 | 2.48 | 0.82 | 0.40 | | -- |
| **Petroleum Hydrocarbons (mg/kg)** | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | 31.30 | 36.2 | 39.1 | 14 | 66.4 | -- | -- | -- | 42.5 D | 21.9 | 16.4 | 18.8 | < 11 | 1000 | 3000 |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | | | | |
| 4,4'-DDD | < 0.003 | < 0.003 | < 0.003 | 0.008 | < 0.003 | -- | -- | -- | < 0.003 | < 0.0027 | < 0.0028 | < 0.0028 | < 0.0027 | 10 | 40 |
| BHC-alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | < 0.003 | < 0.0027 | < 0.0028 | < 0.0028 | < 0.0027 | 50 | 500 |
| Dieldrin | < 0.003 | 0.003 | 0.007 | < 0.003 | 0.003 | -- | -- | -- | < 0.003 | < 0.0027 | < 0.0028 | < 0.0028 | < 0.0027 | 0.09 | 0.6 |
| Endosulfan, beta | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | < 0.003 | < 0.0027 | < 0.0028 | < 0.0028 | < 0.0027 | 0.5 | 1 |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | | |
| Arsenic | 2.52 | 4.04 | 2.93 | 4.2 | 3.2 | -- | -- | -- | 2.36 | 2.84 | 2.75 | 2.74 | 3.84 | 20 | 20 |
| Barium | 10.6 | 63.4 | 21.0 | 37.5 | 21.8 | -- | -- | -- | 17.5 | 20.7 | 11.7 | 24 | 15.4 | 1000 | 3000 |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 100 | 200 |
| Cadmium | < 0.41 | 0.52 | < 0.38 | < 0.42 | < 0.4 | -- | -- | -- | < 0.39 | < 0.44 | < 0.42 | < 0.44 | < 0.41 | 80 | 80 |
| Chromium | 7.77 | 24.2 | 8.58 | 7.62 | 5.85 | -- | -- | -- | 10.6 | 10.1 | 8.38 | 4.85 | 13.2 | 100 | 200 |
| Lead | 15.8 | 164 | 72.7 | 105 | 125 | 46.3 | 57.3 | 64.5 | 34 | 39.3 | 20.6 | 96 | 53.3 | 200 | 600 |
| Mercury | 0.06 | 0.12 | 0.15 | 0.44 | 0.20 | -- | -- | -- | 0.08 | 0.13 | 0.08 | < 0.04 | < 0.04 | 20 | 40 |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 700 | 1000 |
| Silver | < 0.41 | < 0.41 | < 0.38 | < 0.42 | < 0.4 | -- | -- | -- | < 0.39 | < 0.44 | < 0.42 | < 0.44 | < 0.41 | 100 | 200 |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 500 | 800 |
| Zinc | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 | 3000 |

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **C-1** | **C-3** | **C-5** | **C-7** | **C0** | **CEC-1-1** | **CEC-1-1** | **CEC-1-2** | **CEC-2-1** | **CEC-2-1** | **CEC-2-2** | **CEC-3-1** | **CEC-3-2** | **MCP Concentrations** | |
| Sample ID | C-1 3-4 | C-3 | C-5 | C-7 | C0 4-5 | CEC-1-1 0-4 | CEC-1-1 8-9.5 | CEC-1-2 0-4 | CEC-2-1 0-4 | CEC-2-1 8.8-10 | CEC-2-2 0-4 | CEC-3-1 0-4 | CEC-3-2 0.3-4 | | |
| Sample Depth (feet) | 3-4 | 0-5 | 0-5 | 0-5 | 4-5 | 0-4 | 8-9.5 | 0-4 | 0-4 | 8.8-10 | 0-4 | 0-4 | 0.3-4 | | |
| Sample Date | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/1/2024 | 11/9/2023 | 11/9/2023 | 12/5/2023 | 11/9/2023 | 11/9/2023 | 12/6/2023 | 11/10/2023 | 12/6/2023 | RCS-1 | RCS-2 |
| Laboratory Sample ID | 24F0155-01 | 24E0124-02 | 24E0124-03 | 24E0124-04 | 24E0050-09 | 23K0414-01 | 23K0414-02 | 23L0197-04 | 23K0414-05 | 23K0414-06 | 23L0197-12 | 23K0414-09 | 23L0197-11 | | |
| **VOCs (mg/kg)** | | | | | | | | | | | | | | | |
| Acetone | -- | < 0.054 | < 0.049 | < 0.065 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6 | 50 |
| Naphthalene | -- | < 0.005 | < 0.005 | < 0.007 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4 | 20 |
| **SVOCs (mg/kg)** | | | | | | | | | | | | | | | |
| 1,1-Biphenyl | -- | < 0.03 | < 0.026 | < 0.026 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.05 | 6 |
| 2-Methylnaphthalene | -- | < 0.26 | < 0.26 | < 0.264 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.7 | 80 |
| Acenaphthylene | -- | < 0.26 | < 0.26 | < 0.264 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | 10 |
| Anthracene | -- | < 0.26 | < 0.26 | < 0.264 | -- | < 0.32 | < 1.33 | < 0.267 | < 0.32 | < 0.41 | < 0.26 | < 0.30 | < 0.27 | 1000 | 3000 |
| Benzo(A)anthracene | -- | < 0.26 | < 0.26 | < 0.264 | -- | < 0.32 | < 1.33 | < 0.267 | < 0.32 | < 0.41 | < 0.26 | < 0.30 | < 0.27 | 20 | 300 |
| Benzo(A)pyrene | -- | < 0.26 | < 0.26 | < 0.264 | -- | 0.37 | < 1.33 | < 0.267 | < 0.32 | < 0.41 | < 0.26 | < 0.30 | < 0.27 | 2 | 30 |
| Benzo(B)fluoranthene | -- | < 0.26 | < 0.26 | < 0.264 | -- | 0.32 | < 1.33 | < 0.267 | < 0.32 | < 0.41 | < 0.26 | < 0.30 | < 0.27 | 20 | 300 |
| Benzo(g,h,i)Perylene | -- | < 0.26 | < 0.26 | < 0.264 | -- | < 0.32 | < 1.33 | < 0.267 | < 0.32 | < 0.41 | < 0.26 | < 0.30 | < 0.27 | 1000 | 3000 |
| Benzo(K)fluoranthene | -- | < 0.26 | < 0.26 | < 0.264 | -- | < 0.32 | < 1.33 | < 0.267 | < 0.32 | < 0.41 | < 0.26 | < 0.30 | < 0.27 | 1000 | 3000 |
| Bis (2-ethylhexyl) phthalate | -- | < 0.26 | < 0.26 | < 0.264 | -- | < 0.32 | < 1.33 | < 0.267 | < 0.32 | < 0.41 | < 0.26 | < 0.30 | < 0.27 | 100 | 700 |
| Butylbenzylphthalate | -- | < 0.26 | < 0.26 | < 0.264 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 100 | 1000 |
| Chrysene | -- | < 0.26 | < 0.26 | < 0.264 | -- | 0.34 | < 1.33 | < 0.267 | < 0.32 | < 0.41 | < 0.26 | < 0.30 | < 0.27 | 200 | 3000 |
| Di-n-octyl phthalate | -- | < 0.52 | < 0.52 | < 0.528 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 | 10000 |
| Dibenzo(A,H)anthracene | -- | < 0.26 | < 0.26 | < 0.264 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | 30 |
| Dibenzofuran | -- | < 0.26 | < 0.26 | < 0.264 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 100 | 1000 |
| Fluoranthene | -- | < 0.26 | < 0.26 | < 0.264 | -- | 0.61 | < 1.33 | < 0.267 | < 0.32 | 0.43 | < 0.26 | < 0.30 | < 0.27 | 1000 | 3000 |
| Fluorene | -- | < 0.26 | < 0.26 | < 0.264 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 | 3000 |
| Indeno (1,2,3-cd) pyrene | -- | < 0.26 | < 0.26 | < 0.264 | -- | < 0.32 | < 1.33 | < 0.267 | < 0.32 | < 0.41 | < 0.26 | < 0.30 | < 0.27 | 20 | 300 |
| Naphthalene | -- | < 0.26 | < 0.26 | < 0.264 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4 | 20 |
| Phenanthrene | -- | < 0.26 | < 0.26 | < 0.264 | -- | < 0.32 | < 1.33 | < 0.267 | < 0.32 | < 0.41 | < 0.26 | < 0.30 | < 0.27 | 10 | 1000 |
| Pyrene | -- | < 0.26 | < 0.26 | 0.319 | -- | 0.61 | < 1.33 | < 0.267 | < 0.32 | 0.50 | < 0.26 | 0.33 | < 0.27 | 1000 | 3000 |
| **Total SVOCs** | -- | 0 | 0 | 0.319 | -- | 2.25 | 0 | 0 | 0 | 0.92 | 0 | 1.134 | 0 | | -- |
| **Petroleum Hydrocarbons (mg/kg)** | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | -- | < 10.8 | 19.1 | < 10.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 | 3000 |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | | | | |
| 4,4'-DDD | -- | < 0.0027 | < 0.0027 | < 0.0026 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10 | 40 |
| BHC-alpha | -- | < 0.0027 | < 0.0027 | < 0.0026 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 50 | 500 |
| Dieldrin | -- | < 0.0027 | < 0.0027 | < 0.0026 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.09 | 0.6 |
| Endosulfan, beta | -- | < 0.0027 | < 0.0027 | < 0.0026 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.5 | 1 |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | | |
| Arsenic | -- | 4.05 | 2.96 | 1.71 | -- | 4.51 | < 4.57 | < 2 | 2.59 | 3.26 | < 2.02 | < 1.9 | < 2.01 | 20 | 20 |
| Barium | -- | 14.1 | 15 | 9.04 | -- | 74.7 | 22.8 | 12 | 44.3 | 44.2 | 18.1 | 23.1 | 9.51 | 1000 | 3000 |
| Beryllium | -- | -- | -- | -- | -- | 0.25 | 0.28 | 0.21 | 0.24 | 0.42 | 0.22 | 0.17 | 0.29 | 100 | 200 |
| Cadmium | -- | < 0.36 | < 0.39 | < 0.4 | -- | < 0.46 | < 0.91 | < 0.4 | < 0.46 | 0.84 | < 0.4 | < 0.38 | < 0.4 | 80 | 80 |
| Chromium | -- | 6.84 | 5.88 | 4.11 | -- | 8.63 | 13.2 | 6.44 | 21.2 | 17.8 | 7.15 | 12.9 | 6.65 | 100 | 200 |
| Lead | 54.6 | 24.6 | 169 | 10.9 | 4210 D | 307 | 13.8 | 11.5 | 310 | 136 | 32 | 28.6 | 8.6 | 200 | 600 |
| Mercury | -- | < 0.04 | 0.035 | < 0.035 | -- | 1.9 D | < 0.16 | < 0.04 | < 0.04 | 1.17 D | 0.05 | 0.07 | 0.05 | 20 | 40 |
| Nickel | -- | -- | -- | -- | -- | 5.44 | 11 | 5.56 | 6.15 | 8.28 | 5.44 | 5.82 | 4.59 | 700 | 1000 |
| Silver | -- | < 0.36 | < 0.39 | < 0.4 | -- | < 0.46 | < 0.91 | < 0.4 | < 0.46 | < 0.62 | < 0.4 | < 0.38 | < 0.4 | 100 | 200 |
| Vanadium | -- | -- | -- | -- | -- | 10.6 | 28.1 | 9.65 | 14.4 | 17.9 | 9.97 | 9.31 | 7.4 | 500 | 800 |
| Zinc | -- | -- | -- | -- | -- | 101 | 17.2 | 23.1 | 76 | 68.6 | 26.2 | 41 | 18 | 1000 | 3000 |

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

DRAFT

Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

| **Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **CEC-4-1** | **CEC-4-1** | **CEC-4-2** | **CEC-5-1** | **CEC-5-1** | **CEC-5-2** | **CEC-6-2** | **CEC-7-2** | **CEC-8-2** | **D-4** | **D-8.5** | **DD-1** | **DD-3** | **MCP Concentrations** | |
| Sample ID | CEC-4-1 0-4 | CEC-4-1 8-10 | CEC-4-2 0-4 | CEC-5-1 0-4 | CEC-5-1 8-10 | CEC-5-2 0-4 | CEC-6-2 0-4 | CEC-7-2 0-4 | CEC-8-2 2-4 | D-4 4-5 | D-8.5 | DD-1 | DD-3 | | |
| Sample Depth (feet) | 0-4 | 8-10 | 0-4 | 0-4 | 8-10 | 0-4 | 0-4 | 0-4 | 2-4 | 4-5 | 0-5 | 0-5 | 0-5 | | |
| Sample Date | 11/9/2023 | 11/9/2023 | 12/5/2023 | 11/10/2023 | 11/10/2023 | 12/6/2023 | 12/6/2023 | 12/5/2023 | 12/5/2023 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/30/2024 | RCS-1 | RCS-2 |
| Laboratory Sample ID | 23K0414-03 | 23K0414-04 | 23L0197-05 | 23K0414-08 | 23K0414-07 | 23L0197-09 | 23L0197-10 | 23L0197-07 | 23L0197-02 | 24E0125-09 | 24E0124-05 | 24D1044-18 | 24E0026-03 | | |
| **VOCs (mg/kg)** | | | | | | | | | | | | | | | |
| Acetone | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.063 | < 0.047 | < 0.045 | 6 | 50 |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.006 | < 0.005 | < 0.005 | 4 | 20 |
| **SVOCs (mg/kg)** | | | | | | | | | | | | | | | |
| 1,1-Biphenyl | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.03 | 0.03 | < 0.03 | 0.05 | 6 |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.27 | < 0.29 | < 0.27 | 0.7 | 80 |
| Acenaphthylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.27 | < 0.29 | < 0.27 | 2 | 10 |
| Anthracene | < 0.27 | < 0.34 | < 0.28 | < 0.26 | < 0.33 | 0.34 | < 0.28 | < 0.28 | < 0.28 | -- | < 0.27 | 0.53 | < 0.27 | 1000 | 3000 |
| Benzo(A)anthracene | < 0.27 | < 0.34 | < 0.28 | < 0.26 | < 0.33 | 0.69 | < 0.28 | < 0.28 | 0.51 | -- | < 0.27 | 0.76 | < 0.27 | 20 | 300 |
| Benzo(A)pyrene | < 0.27 | < 0.34 | < 0.28 | < 0.26 | < 0.33 | 0.60 | < 0.28 | < 0.28 | 0.49 | -- | < 0.27 | 0.69 | < 0.27 | 2 | 30 |
| Benzo(B)fluoranthene | < 0.27 | < 0.34 | < 0.28 | < 0.26 | < 0.33 | 0.55 | < 0.28 | < 0.28 | 0.42 | -- | < 0.27 | 0.72 | < 0.27 | 20 | 300 |
| Benzo(g,h,i)Perylene | < 0.27 | < 0.34 | < 0.28 | < 0.26 | < 0.33 | 0.34 | < 0.28 | < 0.28 | 0.34 | -- | < 0.27 | 0.41 | < 0.27 | 1000 | 3000 |
| Benzo(K)fluoranthene | < 0.27 | < 0.34 | < 0.28 | < 0.26 | < 0.33 | 0.44 | < 0.28 | < 0.28 | 0.37 | -- | < 0.27 | 0.29 | < 0.27 | 1000 | 3000 |
| Bis (2-ethylhexyl) phthalate | < 0.27 | 0.35 | < 0.28 | < 0.26 | < 0.33 | < 0.27 | < 0.28 | < 0.28 | < 0.28 | -- | < 0.27 | < 0.29 | < 0.27 | 100 | 700 |
| Butylbenzylphthalate | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.27 | < 0.29 | < 0.27 | 100 | 1000 |
| Chrysene | < 0.27 | < 0.34 | < 0.28 | < 0.26 | < 0.33 | 0.63 | < 0.28 | < 0.28 | 0.45 | -- | < 0.27 | 0.72 | < 0.27 | 200 | 3000 |
| Di-n-octyl phthalate | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.54 | < 0.58 | < 0.54 | 1000 | 10000 |
| Dibenzo(A,H)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.27 | < 0.29 | < 0.27 | 2 | 30 |
| Dibenzofuran | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.27 | < 0.29 | < 0.27 | 100 | 1000 |
| Fluoranthene | < 0.27 | < 0.34 | < 0.28 | < 0.26 | < 0.33 | 1.38 | < 0.28 | < 0.28 | 1.01 | -- | < 0.27 | 1.85 | < 0.27 | 1000 | 3000 |
| Fluorene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.27 | < 0.29 | < 0.27 | 1000 | 3000 |
| Indeno (1,2,3-cd) pyrene | < 0.27 | < 0.34 | < 0.28 | < 0.26 | < 0.33 | 0.37 | < 0.28 | < 0.28 | 0.33 | -- | < 0.27 | 0.40 | < 0.27 | 20 | 300 |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.27 | < 0.29 | < 0.27 | 4 | 20 |
| Phenanthrene | < 0.27 | < 0.34 | < 0.28 | < 0.26 | < 0.33 | 1.27 | < 0.28 | < 0.28 | 0.52 | -- | < 0.27 | 1.97 | < 0.27 | 10 | 1000 |
| Pyrene | < 0.27 | < 0.34 | < 0.28 | < 0.26 | < 0.33 | 1.26 | < 0.28 | < 0.28 | 0.89 | -- | < 0.27 | 1.51 | 0.27 | 1000 | 3000 |
| **Total SVOCs** | 0 | 0.35 | 0 | 0 | 0 | 7.86 | 0 | 0 | 5.34 | -- | 0 | 9.88 | 0.27 | | -- |
| **Petroleum Hydrocarbons (mg/kg)** | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 11.6 | 19.8 | 146 D | 1000 | 3000 |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | | | | |
| 4,4'-DDD | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.0027 | < 0.0029 | < 0.0026 | 10 | 40 |
| BHC-alpha | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.0027 | < 0.0029 | < 0.0026 | 50 | 500 |
| Dieldrin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.0027 | < 0.0029 | < 0.0026 | 0.09 | 0.6 |
| Endosulfan, beta | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | < 0.0027 | < 0.0029 | < 0.0026 | 0.5 | 1 |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | | |
| Arsenic | < 2.02 | < 1.08 | < 2.08 | < 1.9 | 2.58 | < 1.91 | < 1.92 | < 2.13 | < 1.88 | -- | 1.77 | 7.09 | 2.35 | 20 | 20 |
| Barium | 11.9 | 5.87 | 8.36 | 17.7 | 60.4 | 19 | 15.9 | 9.95 | 20.5 | -- | 22.1 | 37.8 | 15.2 | 1000 | 3000 |
| Beryllium | 0.16 | 0.31 | 0.17 | 0.15 | 0.24 | 0.18 | 0.16 | 0.16 | 0.23 | -- | -- | -- | -- | 100 | 200 |
| Cadmium | < 0.4 | < 0.22 | < 0.42 | < 0.38 | < 0.49 | < 0.38 | < 0.38 | < 0.43 | < 0.38 | -- | < 0.43 | < 0.39 | < 0.37 | 80 | 80 |
| Chromium | 4.55 | 6.97 | 4.05 | 7.65 | 7.81 | 7.68 | 8.49 | 6.12 | 11.5 | -- | 4.17 | 23.3 | 10.8 | 100 | 200 |
| Lead | 16.3 | 4.16 | 7.64 | 5.94 | 15.4 | 52.6 | 30.9 | 15.2 | 49.7 | 411 | 73.8 | 76.2 | 19.5 | 200 | 600 |
| Mercury | < 0.03 | < 0.04 | < 0.03 | < 0.03 | 0.07 | < 0.03 | 0.11 | 0.03 | 0.09 | -- | 0.09 | 0.08 | 0.06 | 20 | 40 |
| Nickel | 4.11 | 3.62 | 3.7 | 5.66 | 4.18 | 4.81 | 5.04 | 4.02 | 7.02 | -- | -- | -- | -- | 700 | 1000 |
| Silver | < 0.4 | 0.43 | < 0.42 | < 0.38 | < 0.49 | < 0.38 | < 0.38 | < 0.43 | < 0.38 | -- | < 0.43 | < 0.39 | < 0.37 | 100 | 200 |
| Vanadium | 6.01 | 13.9 | 7.7 | 6.02 | 14.4 | 9.95 | 9.47 | 9.18 | 13 | -- | -- | -- | -- | 500 | 800 |
| Zinc | 73.1 | 55.2 | 14.9 | 15.2 | 18.9 | 36.9 | 24.4 | 21.9 | 47.3 | -- | -- | -- | -- | 1000 | 3000 |

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **DD-5** | **DD-7** | **E-1** | **E-1** | **E-1** | **E-1** | **E-1** | **E-2** | **E-3** | **E-3** | **E-5** | **E-7** | **E0** | **MCP Concentrations** | |
| Sample ID | DD-5 | DD-7 | E-1 | E-1 1-2 | E-1 2-3 | E-1 4-5 | E-1 9-10 | E-2 4-5 | E-3 0-3 | E-3 3-7 | E-5 | E-7 | **E-0 9-10** | | |
| Sample Depth (feet) | 0-5 | 0-5 | 0-5 | 1-2 | 2-3 | 4-5 | 9-10 | 4-5 | 0-3 | 3-7 | 0-5 | 0-5 | 9-10 | | |
| Sample Date | 4/30/2024 | 4/30/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 6/21/2024 | 5/3/2024 | 5/3/2024 | 5/3/2024 | 5/2/2024 | 5/2/2024 | 6/21/2024 | RCS-1 | RCS-2 |
| Laboratory Sample ID | 24E0026-02 | 24E0026-01 | 24E0124-08 | 24E0125-10 | 24E1060-01 | 24E0125-15 | 24F0929-08 | 24E0126-02 | 24E0124-16 | 24E0124-17 | 24E0124-07 | 24E0124-06 | 24F0927-01 | | |
| **VOCs (mg/kg)** | | | | | | | | | | | | | | | |
| Acetone | < 0.051 | < 1.52 | < 0.053 | -- | -- | -- | -- | -- | < 0.066 | < 0.058 | < 0.060 | < 0.068 | -- | 6 | 50 |
| Naphthalene | < 0.005 | 0.857 | < 0.005 | -- | -- | -- | -- | -- | < 0.007 | < 0.006 | < 0.006 | < 0.007 | -- | 4 | 20 |
| **SVOCs (mg/kg)** | | | | | | | | | | | | | | | |
| 1,1-Biphenyl | < 0.03 | 0.08 | < 0.03 | -- | -- | -- | -- | -- | < 0.03 | < 0.03 | < 0.03 | < 0.03 | -- | 0.05 | 6 |
| 2-Methylnaphthalene | < 0.28 | 0.31 | < 0.29 | -- | -- | -- | -- | -- | < 0.27 | < 0.25 | < 0.28 | < 0.30 | -- | 0.7 | 80 |
| Acenaphthylene | < 0.28 | 0.75 | < 0.29 | -- | -- | -- | -- | -- | < 0.27 | < 0.25 | < 0.28 | < 0.30 | -- | 2 | 10 |
| Anthracene | < 0.28 | 0.60 | < 0.29 | -- | -- | -- | -- | -- | < 0.27 | < 0.25 | 0.44 | < 0.30 | -- | 1000 | 3000 |
| Benzo(A)anthracene | < 0.28 | 1.02 | 1.00 | -- | -- | -- | -- | -- | 0.29 | 0.33 | 1.29 | < 0.30 | -- | 20 | 300 |
| Benzo(A)pyrene | < 0.28 | 0.93 | 1.17 | -- | -- | -- | -- | -- | 0.32 | 0.36 | 1.21 | < 0.30 | -- | 2 | 30 |
| Benzo(B)fluoranthene | < 0.28 | 1.04 | 0.93 | -- | -- | -- | -- | -- | 0.36 | 0.37 | 0.92 | < 0.30 | -- | 20 | 300 |
| Benzo(g,h,i)Perylene | < 0.28 | 0.51 | 0.84 | -- | -- | -- | -- | -- | < 0.27 | < 0.25 | 0.75 | < 0.30 | -- | 1000 | 3000 |
| Benzo(K)fluoranthene | < 0.28 | 0.41 | 0.85 | -- | -- | -- | -- | -- | < 0.27 | < 0.25 | 0.90 | < 0.30 | -- | 1000 | 3000 |
| Bis (2-ethylhexyl) phthalate | < 0.28 | < 0.27 | < 0.29 | -- | -- | -- | -- | -- | < 0.27 | < 0.25 | < 0.28 | < 0.30 | -- | 100 | 700 |
| Butylbenzylphthalate | < 0.28 | < 0.27 | 0.39 | -- | -- | -- | -- | -- | < 0.27 | < 0.25 | < 0.28 | < 0.30 | -- | 100 | 1000 |
| Chrysene | < 0.28 | 1.02 | 0.93 | -- | -- | -- | -- | -- | 0.32 | 0.32 | 1.20 | < 0.30 | -- | 200 | 3000 |
| Di-n-octyl phthalate | < 0.56 | < 0.54 | < 0.57 | -- | -- | -- | -- | -- | < 0.53 | < 0.50 | < 0.57 | < 0.60 | -- | 1000 | 10000 |
| Dibenzo(A,H)anthracene | < 0.28 | < 0.27 | < 0.29 | -- | -- | -- | -- | -- | < 0.27 | < 0.25 | < 0.28 | < 0.30 | -- | 2 | 30 |
| Dibenzofuran | < 0.28 | 0.43 | < 0.29 | -- | -- | -- | -- | -- | < 0.27 | < 0.25 | < 0.28 | < 0.30 | -- | 100 | 1000 |
| Fluoranthene | < 0.28 | 3.07 | 1.48 | -- | -- | -- | -- | -- | 0.53 | 0.51 | 2.28 | < 0.30 | -- | 1000 | 3000 |
| Fluorene | < 0.28 | 0.59 | < 0.29 | -- | -- | -- | -- | -- | < 0.27 | < 0.25 | < 0.28 | < 0.30 | -- | 1000 | 3000 |
| Indeno (1,2,3-cd) pyrene | < 0.28 | 0.55 | 0.92 | -- | -- | -- | -- | -- | < 0.27 | < 0.25 | 0.80 | < 0.30 | -- | 20 | 300 |
| Naphthalene | < 0.28 | 0.79 | < 0.29 | -- | -- | -- | -- | -- | < 0.27 | < 0.25 | < 0.28 | < 0.30 | -- | 4 | 20 |
| Phenanthrene | < 0.28 | 3.23 | 0.56 | -- | -- | -- | -- | -- | 0.27 | < 0.25 | 1.78 | < 0.30 | -- | 10 | 1000 |
| Pyrene | < 0.28 | 2.20 | 1.48 | -- | -- | -- | -- | -- | 0.52 | 0.60 | 2.54 | < 0.30 | -- | 1000 | 3000 |
| **Total SVOCs** | -- | 17.53 | 10.55 | -- | -- | -- | -- | -- | 2.59 | 2.47 | 14.1 | 0 | -- | | -- |
| **Petroleum Hydrocarbons (mg/kg)** | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | < 10.5 | 53.2 | 72.3 D | -- | -- | -- | -- | -- | 36.8 | 20.6 | 70.3 | 19.6 | -- | 1000 | 3000 |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | | | | |
| 4,4'-DDD | < 0.0027 | < 0.0027 | < 0.0027 | -- | -- | -- | -- | -- | < 0.0027 | < 0.0026 | < 0.0028 | < 0.0029 | -- | 10 | 40 |
| BHC-alpha | < 0.0027 | < 0.0027 | < 0.0027 | -- | -- | -- | -- | -- | < 0.0027 | < 0.0026 | < 0.0028 | < 0.0029 | -- | 50 | 500 |
| Dieldrin | < 0.0027 | < 0.0027 | < 0.0027 | -- | -- | -- | -- | -- | < 0.0027 | < 0.0026 | < 0.0028 | < 0.0029 | -- | 0.09 | 0.6 |
| Endosulfan, beta | < 0.0027 | < 0.0027 | < 0.0027 | -- | -- | -- | -- | -- | < 0.0027 | < 0.0026 | < 0.0028 | < 0.0029 | -- | 0.5 | 1 |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | | |
| Arsenic | 1.31 | 2.86 | 6.72 | -- | -- | -- | -- | -- | 5.39 | 2.99 | 8.09 | 6.38 | -- | 20 | 20 |
| Barium | 5.93 | 8.73 | 216 | -- | -- | -- | -- | -- | 31.9 | 14.9 | 104 | 58 | -- | 1000 | 3000 |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 100 | 200 |
| Cadmium | < 0.4 | < 0.39 | < 0.39 | -- | -- | -- | -- | -- | < 0.36 | < 0.39 | < 0.38 | < 0.44 | -- | 80 | 80 |
| Chromium | 4.29 | 4.36 | 26.7 | -- | -- | -- | -- | -- | 11.1 | 5.89 | 12.5 | 11.8 | -- | 100 | 200 |
| Lead | 9.18 | 5.02 | 676 | 340 | 183 | 1890 | 413 | 1230 | 188 | 53.5 | 368 | 171 | 235 | 200 | 600 |
| Mercury | 0.04 | < 0.03 | 0.24 | -- | -- | -- | -- | -- | 0.15 | 0.36 | 0.99 D | 0.33 | -- | 20 | 40 |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 700 | 1000 |
| Silver | < 0.4 | < 0.39 | 0.53 | -- | -- | -- | -- | -- | < 0.36 | < 0.39 | < 0.38 | < 0.44 | -- | 100 | 200 |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 500 | 800 |
| Zinc | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 | 3000 |

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

DRAFT

Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

| **Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **EE-8.5** | **EE-0.5** | **FF-1** | **FF-3** | **FF-5** | **FF-7** | **G-1** | **G-1** | **G-1** | **G-2** | **G-3** | **G-3** | **G-5** | **MCP Concentrations** | |
| Sample ID | EE-8.5 | EE-0.5 | FF-1 | **FF-3** | **FF-5** | **FF-7** | G-1 | G-1 4-5 | G-1 9-10 | G-2 4-5 | G-3 0-4 | G-3 4-8 | G-5 | | |
| Sample Depth (feet) | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 4-5 | 9-10 | 4-5 | 0-4 | 4-8 | 0-5 | | |
| Sample Date | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 5/2/2024 | 5/2/2024 | 6/21/2024 | 5/3/2024 | 5/1/2024 | 5/1/2024 | 5/2/2024 | RCS-1 | RCS-2 |
| Laboratory Sample ID | 24D1044-13 | 24D1044-14 | 24D1044-12 | 24D1044-11 | 24D1044-10 | 24D1044-09 | 24E0124-11 | 24E0125-16 | 24F0929-07 | 24E0126-07 | 24E0050-06 | 24E0050-07 | 24E0124-10 | | |
| **VOCs (mg/kg)** | | | | | | | | | | | | | | | |
| Acetone | < 0.048 | < 0.068 | < 0.045 | < 0.045 | < 0.046 | < 0.047 | < 0.055 | -- | -- | -- | < 0.049 | < 0.051 | < 0.050 | 6 | 50 |
| Naphthalene | < 0.005 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | < 0.005 | < 0.005 | < 0.005 | 4 | 20 |
| **SVOCs (mg/kg)** | | | | | | | | | | | | | | | |
| 1,1-Biphenyl | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | -- | -- | -- | < 0.03 | 0.03 | < 0.03 | 0.05 | 6 |
| 2-Methylnaphthalene | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | < 0.28 | < 0.27 | 0.7 | 80 |
| Acenaphthylene | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | < 0.28 | < 0.27 | 2 | 10 |
| Anthracene | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | 0.40 | < 0.27 | 1000 | 3000 |
| Benzo(A)anthracene | < 0.29 | < 0.29 | 0.42 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | 0.78 | < 0.27 | 20 | 300 |
| Benzo(A)pyrene | < 0.29 | < 0.29 | 0.42 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | 0.80 | < 0.27 | 2 | 30 |
| Benzo(B)fluoranthene | < 0.29 | < 0.29 | 0.44 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | 0.55 | < 0.27 | 20 | 300 |
| Benzo(g,h,i)Perylene | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | 0.52 | < 0.27 | 1000 | 3000 |
| Benzo(K)fluoranthene | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | 0.47 | < 0.27 | 1000 | 3000 |
| Bis (2-ethylhexyl) phthalate | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | < 0.28 | < 0.27 | 100 | 700 |
| Butylbenzylphthalate | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | < 0.28 | < 0.27 | 100 | 1000 |
| Chrysene | < 0.29 | < 0.29 | 0.41 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | 0.77 | < 0.27 | 200 | 3000 |
| Di-n-octyl phthalate | < 0.57 | < 0.58 | < 0.54 | < 0.54 | < 0.54 | < 0.57 | < 0.56 | -- | -- | -- | < 0.55 | < 0.56 | < 0.54 | 1000 | 10000 |
| Dibenzo(A,H)anthracene | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | < 0.28 | < 0.27 | 2 | 30 |
| Dibenzofuran | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | < 0.28 | < 0.27 | 100 | 1000 |
| Fluoranthene | < 0.29 | < 0.29 | 0.88 | < 0.27 | < 0.27 | < 0.29 | 0.31 | -- | -- | 0.58 | 1.39 | 0.35 | 1000 | 3000 |
| Fluorene | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | < 0.28 | < 0.27 | 1000 | 3000 |
| Indeno (1,2,3-cd) pyrene | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | 0.48 | < 0.27 | 20 | 300 |
| Naphthalene | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | < 0.27 | < 0.28 | < 0.27 | 4 | 20 |
| Phenanthrene | < 0.29 | < 0.29 | 0.45 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | 0.56 | 1.51 | < 0.27 | 10 | 1000 |
| Pyrene | < 0.29 | < 0.29 | 0.76 | < 0.27 | < 0.27 | < 0.29 | 0.29 | -- | -- | -- | 0.56 | 1.67 | 0.44 | 1000 | 3000 |
| **Total SVOCs** | 0 | 0 | 3.77 | 0 | 0 | 0 | 0.60 | -- | -- | -- | 1.70 | 9.38 | 0.78 | | -- |
| **Petroleum Hydrocarbons (mg/kg)** | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | < 11.1 | 72.8 D | 42 | < 11.4 | < 10.5 | 16.2 | 27.5 | -- | -- | -- | 19.6 | 44.7 | 20.7 | 1000 | 3000 |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | | | | |
| 4,4'-DDD | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | < 0.003 | < 0.003 | < 0.003 | 10 | 40 |
| BHC-alpha | < 0.003 | < 0.003 | 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | < 0.003 | < 0.003 | < 0.003 | 50 | 500 |
| Dieldrin | < 0.003 | < 0.003 | 0.025 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | < 0.003 | < 0.003 | < 0.003 | 0.09 | 0.6 |
| Endosulfan, beta | < 0.003 | < 0.003 | 0.006 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | < 0.003 | < 0.003 | < 0.003 | 0.5 | 1 |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | | |
| Arsenic | 6.02 | 4.39 | 1.47 | 4.08 | 3.12 | 4.41 | 4.4 | -- | -- | -- | 4.93 | 4.95 | 3.38 | 20 | 20 |
| Barium | 66.6 | 28.6 | 16.6 | 16.4 | 16.4 | 20.7 | 50 | -- | -- | -- | 21.5 | 24.9 | 18.1 | 1000 | 3000 |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 100 | 200 |
| Cadmium | < 0.37 | < 0.41 | < 0.38 | < 0.42 | < 0.4 | < 0.43 | < 0.42 | -- | -- | -- | < 0.37 | < 0.42 | < 0.36 | 80 | 80 |
| Chromium | 12 | 10.7 | 5.23 | 9.93 | 7.16 | 9.44 | 12.3 | -- | -- | -- | 10.2 | 13 | 6.3 | 100 | 200 |
| Lead | 134 | 37.6 | 22.1 | 13.9 | 6.21 | 61.3 | 441 | 5420 D | 31.6 | 863 | 24.2 | 59.7 | 51.1 | 200 | 600 |
| Mercury | 0.14 | < 0.03 | 0.13 | < 0.036 | < 0.033 | 0.048 | 0.138 | -- | -- | -- | < 0.03 | 0.05 | 0.18 | 20 | 40 |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 700 | 1000 |
| Silver | < 0.37 | < 0.41 | < 0.38 | < 0.42 | < 0.4 | < 0.43 | < 0.42 | -- | -- | -- | < 0.37 | < 0.42 | < 0.36 | 100 | 200 |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 500 | 800 |
| Zinc | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 | 3000 |

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

| **Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **G-5** | **G-5** | **G-7** | **H-1** | **H-8.5** | **HH-1** | **HH-3** | **HH-5** | **HH-7** | **I-1** | **I-3** | **I-3** | **I-5** | **MCP Concentrations** | |
| Sample ID | G-5 5-6 | G-5 9-10 | G-7 | H-1 4-5 | H-8.5 | HH-1 | HH-3 | HH-5 | HH-7 | I-1 | I-3 | I-3 4-8 | I-5 | | |
| Sample Depth (feet) | 5-6 | 9-10 | 0-5 | 4-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-4 | 4-8 | 0-5 | | |
| Sample Date | 6/21/2024 | 6/21/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/30/2024 | 4/29/2024 | 4/29/2024 | 5/2/2024 | 5/1/2024 | 6/21/2024 | 5/2/2024 | RCS-1 | RCS-2 |
| Laboratory Sample ID | 24F0928-19 | 24F0929-11 | 24E0124-09 | 24E0125-17 | 24E0124-12 | 24D1044-08 | 24E0026-04 | 24D1044-06 | 24D1044-05 | 24E0124-15 | 24E0050-04 | 24F0927-02 | 24E0124-14 | | |
| **VOCs (mg/kg)** | | | | | | | | | | | | | | | |
| Acetone | -- | -- | < 0.055 | -- | < 0.054 | < 0.044 | < 0.046 | < 0.043 | < 0.063 | < 0.047 | < 0.046 | < 0.049 | < 0.048 | 6 | 50 |
| Naphthalene | -- | -- | < 0.006 | -- | < 0.005 | < 0.004 | 0.013 | < 0.004 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 4 | 20 |
| **SVOCs (mg/kg)** | | | | | | | | | | | | | | | |
| 1,1-Biphenyl | -- | -- | < 0.03 | -- | < 0.03 | < 0.03 | 0.04 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | 0.04 | 0.05 | 6 |
| 2-Methylnaphthalene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.27 | < 0.28 | < 0.27 | 0.7 | 80 |
| Acenaphthylene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.27 | < 0.28 | 1.05 | 2 | 10 |
| Anthracene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | 0.47 | < 0.28 | < 0.29 | < 0.28 | < 0.27 | < 0.28 | 0.82 | 1000 | 3000 |
| Benzo(A)anthracene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | 0.48 | < 0.28 | < 0.29 | 0.38 | < 0.27 | < 0.28 | 3.22 | 20 | 300 |
| Benzo(A)pyrene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | 0.40 | < 0.28 | < 0.29 | 0.40 | < 0.27 | < 0.28 | 2.23 | 2 | 30 |
| Benzo(B)fluoranthene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | 0.41 | < 0.28 | < 0.29 | 0.46 | < 0.27 | < 0.28 | 2.20 | 20 | 300 |
| Benzo(g,h,i)Perylene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.27 | < 0.28 | 1.19 | 1000 | 3000 |
| Benzo(K)fluoranthene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.27 | < 0.28 | 0.71 | 1000 | 3000 |
| Bis (2-ethylhexyl) phthalate | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | < 0.27 | < 0.28 | 0.53 | < 0.28 | < 0.27 | < 0.28 | < 0.27 | 100 | 700 |
| Butylbenzylphthalate | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | < 0.27 | < 0.28 | 1.32 | < 0.28 | < 0.27 | < 0.28 | < 0.27 | 100 | 1000 |
| Chrysene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | 0.42 | < 0.28 | < 0.29 | 0.43 | < 0.27 | < 0.28 | 4.09 | 200 | 3000 |
| Di-n-octyl phthalate | -- | -- | < 0.55 | -- | < 0.51 | < 0.56 | < 0.55 | < 0.55 | 1.03 | < 0.56 | < 0.54 | < 0.55 | < 0.54 | 1000 | 10000 |
| Dibenzo(A,H)anthracene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.27 | < 0.28 | 0.38 | 2 | 30 |
| Dibenzofuran | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.27 | < 0.28 | < 0.27 | 100 | 1000 |
| Fluoranthene | -- | -- | 0.28 | -- | < 0.26 | 0.39 | 1.28 | < 0.28 | < 0.29 | 0.73 | 0.41 | 0.33 | 3.58 | 1000 | 3000 |
| Fluorene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.27 | < 0.28 | < 0.27 | 1000 | 3000 |
| Indeno (1,2,3-cd) pyrene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.27 | < 0.28 | 1.00 | 20 | 300 |
| Naphthalene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | 0.35 | < 0.28 | < 0.29 | < 0.28 | < 0.27 | < 0.28 | < 0.27 | 4 | 20 |
| Phenanthrene | -- | -- | < 0.28 | -- | < 0.26 | < 0.28 | 1.56 | < 0.28 | < 0.29 | 0.38 | < 0.27 | < 0.28 | 2.48 | 10 | 1000 |
| Pyrene | -- | -- | 0.37 | -- | < 0.26 | 0.33 | 0.97 | < 0.28 | < 0.29 | 0.69 | 0.44 | 0.41 | 5.88 | 1000 | 3000 |
| **Total SVOCs** | -- | -- | 0.64 | -- | 0 | 0.71 | 6.37 | 0 | 2.80 | 3.48 | 0.86 | 0.74 | 28.87 | | -- |
| **Petroleum Hydrocarbons (mg/kg)** | | | | | | | | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | -- | -- | 63.4 | -- | 17.9 | 298 | < 11.2 | < 10.6 | 15.5 | 28.1 | 73.8 | 73.2 | 16 | 1000 | 3000 |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | | | | |
| 4,4'-DDD | -- | -- | < 0.003 | -- | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 10 | 40 |
| BHC-alpha | -- | -- | < 0.003 | -- | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 50 | 500 |
| Dieldrin | -- | -- | < 0.003 | -- | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.09 | 0.6 |
| Endosulfan, beta | -- | -- | < 0.003 | -- | < 0.003 | 0.004 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.5 | 1 |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | | |
| Arsenic | -- | -- | < 0.86 | -- | 2.79 | 4.83 | 2.67 | 1.8 | 3.24 | 6.3 | 2.58 | < 0.99 | 3.94 | 20 | 20 |
| Barium | -- | -- | < 0.86 | -- | 21.6 | 21.9 | 12.9 | 8.93 | 19.4 | 44.7 | 35.2 | 13 | 14.2 | 1000 | 3000 |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 100 | 200 |
| Cadmium | -- | -- | < 0.43 | -- | < 0.4 | < 0.38 | < 0.4 | < 0.41 | < 0.42 | < 0.41 | < 0.36 | < 0.49 | < 0.39 | 80 | 80 |
| Chromium | -- | -- | < 0.86 | -- | 10.1 | 7.16 | 4.97 | 3.9 | 5.41 | 15.4 | 7.1 | 5.09 | 9.6 | 100 | 200 |
| Lead | 46.5 | 101 | < 4.3 | 89.4 D | 17.6 | 86.2 | 18.8 | < 4.12 | 53.6 | 107 | 34 | 35.2 | 19.4 | 200 | 600 |
| Mercury | -- | -- | 0.13 | -- | 0.07 | 0.05 | < 0.03 | < 0.03 | 0.13 | 0.26 | 0.08 | < 0.03 | 0.13 | 20 | 40 |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 700 | 1000 |
| Silver | -- | -- | < 0.43 | -- | < 0.4 | < 0.38 | < 0.4 | < 0.41 | < 0.42 | < 0.41 | < 0.36 | -- | < 0.39 | 100 | 200 |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 500 | 800 |
| Zinc | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 | 3000 |

Notes:
Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 1
Site 1 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

| **Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Location | **I-7** | **II-8.5** | **II-8.5** | **II0.5** | **JJ/II-2** | **JJ/II-6** | **MCP Concentrations** | |
| Sample ID | I-7 | **II-8.5** | II-8.5 5-6 | **II-0.5** | **JJ/II-2** | **JJ/II-6** | | |
| Sample Depth (feet) | 0-5 | 0-5 | 5-6 | 0-5 | 0-5 | 0-5 | RCS-1 | RCS-2 |
| Sample Date | 5/2/2024 | 4/29/2024 | 5/3/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | | |
| Laboratory Sample ID | 24E0124-13 | 24D1044-03 | 24E0124-18 | 24D1044-04 | 24D1044-02 | 24D1044-01 | | |
| **VOCs (mg/kg)** | | | | | | | | |
| Acetone | 0.091 | 0.071 | 0.246 | < 0.047 | < 0.047 | < 0.048 | 6 | 50 |
| Naphthalene | < 0.006 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | < 0.005 | 4 | 20 |
| **SVOCs (mg/kg)** | | | | | | | | |
| 1,1-Biphenyl | < 0.03 | < 0.03 | < 0.10 | < 0.03 | < 0.027 | < 0.028 | 0.05 | 6 |
| 2-Methylnaphthalene | < 0.27 | < 0.31 | < 0.99 | < 0.26 | < 0.271 | < 0.28 | 0.7 | 80 |
| Acenaphthylene | < 0.27 | < 0.31 | < 0.99 | < 0.26 | < 0.271 | < 0.28 | 2 | 10 |
| Anthracene | < 0.27 | < 0.31 | < 0.99 | < 0.26 | < 0.271 | < 0.28 | 1000 | 3000 |
| Benzo(A)anthracene | < 0.27 | < 0.31 | < 0.99 | 0.65 | < 0.271 | < 0.28 | 20 | 300 |
| Benzo(A)pyrene | < 0.27 | < 0.31 | < 0.99 | 0.62 | < 0.271 | < 0.28 | 2 | 30 |
| Benzo(B)fluoranthene | < 0.27 | < 0.31 | < 0.99 | 0.67 | < 0.271 | < 0.28 | 20 | 300 |
| Benzo(g,h,i)Perylene | < 0.27 | < 0.31 | < 0.99 | 0.38 | < 0.271 | < 0.28 | 1000 | 3000 |
| Benzo(K)fluoranthene | < 0.27 | < 0.31 | < 0.99 | < 0.26 | < 0.271 | < 0.28 | 1000 | 3000 |
| Bis (2-ethylhexyl) phthalate | < 0.27 | < 0.31 | < 0.99 | < 0.26 | < 0.271 | < 0.28 | 100 | 700 |
| Butylbenzylphthalate | < 0.27 | < 0.31 | < 0.99 | < 0.26 | < 0.271 | < 0.28 | 100 | 1000 |
| Chrysene | < 0.27 | < 0.31 | < 0.99 | 0.66 | < 0.271 | < 0.28 | 200 | 3000 |
| Di-n-octyl phthalate | < 0.55 | < 0.61 | < 1.98 | < 0.53 | < 0.542 | < 0.561 | 1000 | 10000 |
| Dibenzo(A,H)anthracene | < 0.27 | < 0.31 | < 0.99 | < 0.26 | < 0.271 | < 0.28 | 2 | 30 |
| Dibenzofuran | < 0.27 | < 0.31 | < 0.99 | < 0.26 | < 0.271 | < 0.28 | 100 | 1000 |
| Fluoranthene | < 0.27 | 0.42 | 0.99 | 1.44 | < 0.271 | < 0.28 | 1000 | 3000 |
| Fluorene | < 0.27 | < 0.31 | < 0.99 | < 0.26 | < 0.271 | < 0.28 | 1000 | 3000 |
| Indeno (1,2,3-cd) pyrene | < 0.27 | < 0.31 | < 0.99 | 0.37 | < 0.271 | < 0.28 | 20 | 300 |
| Naphthalene | < 0.27 | < 0.31 | < 0.99 | < 0.26 | < 0.271 | < 0.28 | 4 | 20 |
| Phenanthrene | < 0.27 | < 0.31 | < 0.99 | 0.98 | < 0.271 | < 0.28 | 10 | 1000 |
| Pyrene | < 0.27 | 0.40 | 0.99 | 1.24 | < 0.271 | < 0.28 | 1000 | 3000 |
| **Total SVOCs** | 0 | 0.82 | 1.98 | 6.63 | 0 | 0 | | -- |
| **Petroleum Hydrocarbons (mg/kg)** | | | | | | | | |
| Hydrocarbon, Oil, Petroleum | < 11.9 | 36.2 | 273 | 32 | < 10.6 | < 11 | 1000 | 3000 |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | |
| 4,4'-DDD | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | < 0.003 | 10 | 40 |
| BHC-alpha | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | < 0.003 | 50 | 500 |
| Dieldrin | < 0.003 | < 0.003 | < 0.005 | 0.037 | < 0.003 | < 0.003 | 0.09 | 0.6 |
| Endosulfan, beta | < 0.003 | < 0.003 | < 0.005 | 0.009 | < 0.003 | < 0.003 | 0.5 | 1 |
| **Total Metals (mg/kg)** | | | | | | | | |
| Arsenic | 5.81 | 6.55 | 6.92 | 1.83 | 2.62 | 3.29 | 20 | 20 |
| Barium | 24.1 | 86.3 | 55.4 | 18.4 | 11.3 | 13 | 1000 | 3000 |
| Beryllium | -- | -- | -- | -- | -- | -- | 100 | 200 |
| Cadmium | < 0.46 | < 0.45 | < 0.7 | < 0.37 | < 0.39 | < 0.38 | 80 | 80 |
| Chromium | 19.8 | 12.1 | 9.25 | 3.76 | 5.07 | 6.43 | 100 | 200 |
| Lead | 27.3 | 347 | 21.4 | 39.4 | 6.81 | 12.8 | 200 | 600 |
| Mercury | 0.09 | 0.58 | < 0.06 | 0.07 | < 0.035 | < 0.031 | 20 | 40 |
| Nickel | -- | -- | -- | -- | -- | -- | 700 | 1000 |
| Silver | < 0.46 | < 0.45 | < 0.7 | < 0.37 | < 0.39 | < 0.38 | 100 | 200 |
| Vanadium | -- | -- | -- | -- | -- | -- | 500 | 800 |
| Zinc | -- | -- | -- | -- | -- | -- | 1000 | 3000 |

Notes:

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.

SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls

D = identified in an analysis that has been diluted

< = not detected above laboratory reporting limit

-- = Not Tested

NS = No Standard

Exceeds MassDEP MCP RCS-1

Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **A-1** | **A-1** | **A-1** | **A-1** | **A-2** | **A-2** | **A-2** | **A-2** | **A-3** | **A-3** | **A-3** | **A-3** | | |
| Sample ID | A-1 | A-1 0-1 | A-1 1-2 | A-1 3-4 | A-2 0-1 | A-2 1-2 | A-2 2-3 | A-2 3-4 | A-3 | A-3 1-2 | A-3 2-3 | A-3 4-5 | | |
| Sample Depth (feet) | 0-5 | 0-1 | 1-2 | 4-5 | 0-1 | 1-2 | 2-3 | 3-4 | 0-5 | 1-2 | 2-3 | 4-5 | | |
| Sample Date | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 6/20/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | | |
| Laboratory Sample ID | 24E0050-03 | 24G0454-03 | 24E0051-02 | 24E0051-11 | 23L0931-01 | 23L0931-02 | 23L0931-03 | 24F0928-16 | 24E0050-02 | 24E0051-03 | 24E0814-07 | 24E0051-12 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | 0.3 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1254 | 0.1 | 0.3 | < 0.05 | 0.2 | < 0.06 | < 0.06 | 0.6 | 0.2 | 0.3 | 0.4 | 1.1 | 0.2 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| Total PCBs | 0.1 | 0.3 | -- | 0.2 | -- | -- | 0.9 | 0.2 | 0.3 | 0.4 | 1.1 | 0.2 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **A-4** | **A-4** | **A-4** | **A-4** | **A-5** | **A-5** | **A-5** | **A-5** | **A-6** | **A-6 DUP** | **A-6** | **A-7** | | |
| Sample ID | A-4 0-1 | A-4 1-2 | A-4 2-3 | A-4 3-4 | A-5 | A-5 1-2 | A-5 2-3 | A-5 4-5 | A-6 1-2 | A-6 DUP 1-2 | A-6 4-5 | A-7 | | |
| Sample Depth (feet) | 0-1 | 1-2 | 2-3 | 3-4 | 0-5 | 1-2 | 2-3 | 4-5 | 1-2 | 1-2 | 4-5 | 0-5 | | |
| Sample Date | 12/29/2023 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | | |
| Laboratory Sample ID | 23L0931-07 | 23L0931-08 | 23L0931-09 | 23L0931-10 | 24E0050-01 | 24E0051-04 | 24E0814-09 | 24E0051-13 | 24E0051-05 | 24E0051-18 | 24E0051-14 | 24E0050-05 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.07 | < 0.06 | -- | -- |
| PCB Aroclor 1221 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.07 | < 0.06 | -- | -- |
| PCB Aroclor 1232 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.07 | < 0.06 | -- | -- |
| PCB Aroclor 1242 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.07 | < 0.06 | -- | -- |
| PCB Aroclor 1248 | < 0.06 | < 0.06 | 0.3 | 0.08 | < 0.05 | < 0.05 | < 0.06 | 0.1 | < 0.05 | < 0.05 | < 0.07 | 0.1 | -- | -- |
| PCB Aroclor 1254 | < 0.06 | 0.5 | 1.3 D | 0.6 | 0.1 | 0.3 | 0.09 | 0.2 | < 0.05 | < 0.05 | 0.09 | 0.3 | -- | -- |
| PCB Aroclor 1260 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.07 | < 0.06 | -- | -- |
| PCB Aroclor 1262 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.07 | < 0.06 | -- | -- |
| PCB Aroclor 1268 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.07 | < 0.06 | -- | -- |
| Total PCBs | -- | 0.5 | 1.6 | 0.68 | 0.1 | 0.3 | 0.09 | 0.3 | -- | -- | 0.09 | 0.4 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **A0** | **A0** | **A0-5W** | **A0-10W** | **A0-10W** | **A0-20N10W** | **A0-20N10W** | **A0.5** | **AA-1** | **AA-1** | **AA-1** | | |
| Sample ID | A0 0-1 | A-0 1-2 | A0-5W 0-1 | A0-10W 0-1 | A0-10W 2-3 | A0-20N10W 0-1 | A0-20N10W 1-2 | A0.5 0-1 | AA-1 0-1 | AA-1 1-2 | AA-1 2-3 | | |
| Sample Depth (feet) | 0-1 | 1-2 | 0-1 | 0-1 | 2-3 | 0-1 | 1-2 | 0-1 | 0-1 | 1-2 | 2-3 | | |
| Sample Date | 5/1/2024 | 5/1/2024 | 7/17/2024 | 7/17/2024 | 7/17/2024 | 7/17/2024 | 7/17/2024 | 7/17/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | | |
| Laboratory Sample ID | 24G0151-02 | 24E0051-01 | 24G1155-03 | 24G0737-01 | 24G0737-02 | 24G0737-03 | 24G0737-04 | 24G0736-01 | 24G0454-02 | 24E0029-07 | 24E0814-03 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 10.4 | < 0.05 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 0.05 | < 6.6 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1221 | < 10.4 | < 0.05 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 0.05 | < 6.6 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1232 | < 10.4 | < 0.05 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 0.05 | < 6.6 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1242 | < 10.4 | < 0.05 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 0.05 | < 6.6 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1248 | < 10.4 | < 0.05 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 0.05 | < 6.6 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1254 | 125 D | 0.4 | 4.5 D | 15.7 D | 0.4 | 0.3 | < 0.05 | 68 D | < 0.05 | < 0.05 | 0.2 | -- | -- |
| PCB Aroclor 1260 | < 10.4 | < 0.05 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 0.05 | < 6.6 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1262 | < 10.4 | < 0.05 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 0.05 | < 6.6 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1268 | < 10.4 | < 0.05 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 0.05 | < 6.6 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| Total PCBs | 125 | 0.4 | 4.5 | 15.7 | 0.4 | 0.3 | -- | 68 | -- | -- | 0.2 | 1 | 4 |

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **AA-1** | **AA-2** | **AA-2** | **AA-2** | **AA-3** | **AA-3** | **AA-3** | **AA-3** | **AA-4** | **AA-4 DUP** | **AA-4** | **AA-4** | | |
| Sample ID | AA-1 4-5 | AA-2 1-2 | AA-2 DUP 1-2 | AA-2 4-5 | AA-3 0-1 | AA-3 1-2 | AA-3 2-3 | AA-3 3-4 | AA-4 1-2 | AA-4 DUP 1-2 | AA-4 2-3 | AA-4 4-5 | | |
| Sample Depth (feet) | 4-5 | 1-2 | 1-2 | 4-5 | 0-1 | 1-2 | 2-3 | 3-4 | 1-2 | 1-2 | 2-3 | 4-5 | | |
| Sample Date | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 6/20/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | | |
| Laboratory Sample ID | 24E0027-06 | 24E0029-08 | 24E0029-09 | 24E0027-07 | 23L0931-04 | 23L0931-05 | 23L0931-06 | 24F0928-15 | 24E0029-10 | 24E0027-09 | 24E0814-08 | 24E0027-08 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | 0.1 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1254 | 0.6 | 1.4 D | 0.6 | 0.6 | 0.1 | 0.7 | 0.2 | 0.4 | 0.6 | 0.4 | 0.5 | 0.2 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| Total PCBs | 0.6 | 1.4 | 0.6 | 0.6 | 0.1 | 0.8 | 0.2 | 0.4 | 0.6 | 0.4 | 0.5 | 0.2 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **AA-5** | **AA-5** | **AA-6** | **AA-6** | **AA-8.5** | **AA0** | **AA0** | **AA0 DUP** | **AA0** | **AA0.5** | **B-1** | **B-1** | | |
| Sample ID | AA-5 1-2 | AA-5 4-5 | AA-6 1-2 | AA-6 4-5 | **AA-8.5** | AA0 0-1 | AA-0 1-2 | AA-0 DUP 1-2 | AA-0 4-5 | AA0.5 0-1 | B-1 0-1 | B-1 1-2 | | |
| Sample Depth (feet) | 1-2 | 4-5 | 1-2 | 4-5 | 0-5 | 0-1 | 1-2 | 1-2 | 4-5 | 0-1 | 0-1 | 1-2 | | |
| Sample Date | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 7/17/2024 | 5/1/2024 | 5/1/2024 | | |
| Laboratory Sample ID | 24E0027-10 | 24E0027-11 | 24E0027-12 | 24E0027-13 | 24E0026-09 | 24G0454-01 | 24E0029-05 | 24E0029-06 | 24E0027-05 | 24G0736-02 | 24G0151-03 | 24E0051-07 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1254 | 0.06 | 0.2 | < 0.05 | 0.08 | 0.2 | 2 D | 0.2 | 0.2 | 0.2 | 7.1 D | 2.5 D | < 0.05 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | 0.2 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| Total PCBs | 0.06 | 0.2 | -- | 0.08 | 0.2 | 2 | 0.2 | 0.2 | 0.4 | 7.1 | 2.5 | -- | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **B-1** | **B-2** | **B-2** | **B-2** | **B-3** | **B-3** | **B-3** | **B-3** | **B-4** | **B-5** | **B-5** | **B-5** | | |
| Sample ID | B-1 4-5 | B-2 0-1 | B-2 1-2 | B-2 4-5 | B-3 0-1 | B-3 1-2 | B-3 2-3 | B-3 2-3 | B-4 2-3 | B-5 1-2 | B-5 2-3 | B-5 4-5 | | |
| Sample Depth (feet) | 4-5 | 0-1 | 1-2 | 4-5 | 0-1 | 1-2 | 2-3 | 2-3 | 2-3 | 1-2 | 2-3 | 4-5 | | |
| Sample Date | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 6/20/2024 | 6/20/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | | |
| Laboratory Sample ID | 24E0051-15 | 24G0453-07 | 24E0051-08 | 24E0051-16 | 23L0931-11 | 23L0931-12 | 23L0932-01 | 24F0928-13 | 24F0928-13 | 24E0051-09 | 24E0814-10 | 24E0051-17 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1248 | 0.3 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1254 | 0.4 | < 0.06 | < 0.05 | 0.2 | < 0.05 | 0.09 | 0.09 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | 0.2 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| Total PCBs | 0.7 | -- | -- | 0.2 | -- | 0.09 | 0.09 | -- | -- | -- | -- | 0.2 | 1 | 4 |

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **B-6** | **B0** | **B0** | **B0** | **B0** | **B0-10E** | **B0-10E** | **B0-10N** | **B0-10N15E** | **B0-10N15W** | **B0-10N15E** | **B0-10N15W** | | |
| Sample ID | B-6 1-2 | B0 0-1 | B-0 1-2 | B0 2-3 | B0 3-4 | B0-10E 0-1 | B0-10E 2-3 | B0-10N 0-1 | B0-10N15E 2-3 | B0-10N15W 2-3 | B0-10N15E 0-1 | B0-10N15W 0-1 | | |
| Sample Depth (feet) | 1-2 | 0-1 | 1-2 | 2-3 | 3-4 | 0-1 | 2-3 | 0-1 | 2-3 | 2-3 | 0-1 | 0-1 | | |
| Sample Date | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 6/21/2024 | 6/21/2024 | 6/21/2024 | 7/2/2024 | 7/2/2024 | 7/2/2024 | 7/2/2024 | | |
| Laboratory Sample ID | 24E0051-10 | 24E0814-04 | 24E0051-06 | 24E0814-05 | 24E0814-06 | 24F0929-09 | 24G0151-05 | 24F0929-05 | 24G0453-04 | 24G0453-01 | 24G0152-05 | 24G0152-01 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 23.1 | < 5.8 | < 0.05 | < 0.05 | < 270 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 5.3 | < 10.9 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 23.1 | < 5.8 | < 0.05 | < 0.05 | < 270 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 5.3 | < 10.9 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 23.1 | < 5.8 | < 0.05 | < 0.05 | < 270 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 5.3 | < 10.9 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 23.1 | < 5.8 | < 0.05 | < 0.05 | < 270 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 5.3 | < 10.9 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 23.1 | < 5.8 | < 0.05 | < 0.05 | < 270 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 5.3 | < 10.9 | -- | -- |
| PCB Aroclor 1254 | < 0.05 | 240 D | 102 D | 0.07 | 0.1 | 3040 D | 0.8 | 12.8 D | 0.07 | 0.2 | 83.1 D | 174 D | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 23.1 | < 5.8 | < 0.05 | < 0.05 | < 270 | < 0.05 | < 1 | < 0.05 | 0.06 | < 5.3 | < 10.9 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 23.1 | < 5.8 | < 0.05 | < 0.05 | < 270 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 5.3 | < 10.9 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 23.1 | < 5.8 | < 0.05 | < 0.05 | < 270 | < 0.05 | < 1 | < 0.05 | < 0.05 | < 5.3 | < 10.9 | -- | -- |
| Total PCBs | -- | 240 | 102 | 0.07 | 0.1 | 3040 | 0.8 | 12.8 | 0.07 | 0.26 | 83.1 | 174 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **B0-10S** | **B0-10S** | **B0-10S15E** | **B0-10S15W** | **B0-10S15E** | **B0-10S15W** | **B0-10W** | **B0-10W** | **B0-15E** | **B0-15N15E** | **B0-15N15W** | **B0-15W** | | |
| Sample ID | B0-10S 0-1 | B0-10S 2-3 | B0-10S15E 2-3 | B0-10S15W 2-3 | B0-10S15E 0-1 | BO-10S15W 0-1 | B0-10W 0-1 | B0-10W 2-3 | B0-15E 0-1 | B0-15N15E 0-1 | B0-15N15W 0-1 | B0-15W 0-1 | | |
| Sample Depth (feet) | 0-1 | 2-3 | 2-3 | 2-3 | 0-1 | 0-1 | 0-1 | 2-3 | 0-1 | 0-1 | 0-1 | 0-1 | | |
| Sample Date | 6/21/2024 | 6/21/2024 | 7/2/2024 | 7/2/2024 | 7/2/2024 | 7/2/2024 | 6/21/2024 | 6/21/2024 | 7/2/2024 | 7/17/2024 | 7/17/2024 | 7/2/2024 | | |
| Laboratory Sample ID | 24F0928-20 | 24G0151-06 | 24G0453-06 | 24G0453-03 | 24G0152-08 | 24G0152-04 | 24F0929-02 | 24G0151-07 | 24G0152-06 | 24G1155-02 | 24G1155-01 | 24G0152-02 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 21.2 | < 0.05 | < 0.06 | < 0.06 | < 2.8 | < 21.3 | < 10.2 | < 0.05 | < 10.4 | < 5.1 | < 5.1 | < 26.5 | -- | -- |
| PCB Aroclor 1221 | < 21.2 | < 0.05 | < 0.06 | < 0.06 | < 2.8 | < 21.3 | < 10.2 | < 0.05 | < 10.4 | < 5.1 | < 5.1 | < 26.5 | -- | -- |
| PCB Aroclor 1232 | < 21.2 | < 0.05 | < 0.06 | < 0.06 | < 2.8 | < 21.3 | < 10.2 | < 0.05 | < 10.4 | < 5.1 | < 5.1 | < 26.5 | -- | -- |
| PCB Aroclor 1242 | < 21.2 | < 0.05 | < 0.06 | < 0.06 | < 2.8 | < 21.3 | < 10.2 | < 0.05 | < 10.4 | < 5.1 | < 5.1 | < 26.5 | -- | -- |
| PCB Aroclor 1248 | < 21.2 | < 0.05 | < 0.06 | < 0.06 | < 2.8 | < 21.3 | < 10.2 | < 0.05 | < 10.4 | < 5.1 | < 5.1 | < 26.5 | -- | -- |
| PCB Aroclor 1254 | 317 D | 0.4 | 6.3 D | 0.08 | 54.3 D | 257 D | 139 D | 0.5 | 136 D | 49.9 D | 72.2 D | 456 D | -- | -- |
| PCB Aroclor 1260 | < 21.2 | < 0.05 | < 0.06 | < 0.06 | < 2.8 | < 21.3 | < 10.2 | < 0.05 | < 10.4 | < 5.1 | < 5.1 | < 26.5 | -- | -- |
| PCB Aroclor 1262 | < 21.2 | < 0.05 | < 0.06 | < 0.06 | < 2.8 | < 21.3 | < 10.2 | < 0.05 | < 10.4 | < 5.1 | < 5.1 | < 26.5 | -- | -- |
| PCB Aroclor 1268 | < 21.2 | < 0.05 | < 0.06 | < 0.06 | < 2.8 | < 21.3 | < 10.2 | < 0.05 | < 10.4 | < 5.1 | < 5.1 | < 26.5 | -- | -- |
| Total PCBs | 317 | 0.4 | 6.3 | 0.08 | 54.3 | 257 | 139 | 0.5 | 136 | 49.9 | 72.2 | 456 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **B0-20E** | **B0-20E** | **B0-20N15E** | **B0-20N15W** | **B0-20N15W** | **B0-20W** | **B0-20W** | **B0-5E** | **B0-5N** | **B0-5S** | **B0-5W** | **BB-0** | | |
| Sample ID | B0-20E 0-1 | B0-20E 2-3 | B0-20N15E 0-1 | B0-20N15W 0-1 | B0-20N15W 1-2 | B0-20W 0-1 | B0-20W 2-3 | B0-5E 0-1 | B0-5N 0-1 | B0-5S 0-1 | B0-5W 0-1 | BB-0 0-1 | | |
| Sample Depth (feet) | 0-1 | 2-3 | 0-1 | 0-1 | 1-2 | 0-1 | 2-3 | 0-1 | 0-1 | 0-1 | 0-1 | 0-1 | | |
| Sample Date | 7/2/2024 | 7/2/2024 | 7/17/2024 | 7/17/2024 | 7/17/2024 | 7/2/2024 | 7/2/2024 | 6/21/2024 | 6/21/2024 | 6/21/2024 | 6/21/2024 | 12/29/2023 | | |
| Laboratory Sample ID | 24G0152-07 | 24G0453-05 | 24G0736-07 | 24G0736-08 | 24G0736-09 | 24G0152-03 | 24G0453-02 | 24F0929-04 | 24F0929-06 | 24F0929-03 | 24F0929-01 | 23L0932-02 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 5.4 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 5.6 | < 0.05 | < 5.1 | < 2.6 | < 10.2 | < 10.1 | < 0.05 | -- | -- |
| PCB Aroclor 1221 | < 5.4 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 5.6 | < 0.05 | < 5.1 | < 2.6 | < 10.2 | < 10.1 | < 0.05 | -- | -- |
| PCB Aroclor 1232 | < 5.4 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 5.6 | < 0.05 | < 5.1 | < 2.6 | < 10.2 | < 10.1 | < 0.05 | -- | -- |
| PCB Aroclor 1242 | < 5.4 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 5.6 | < 0.05 | < 5.1 | < 2.6 | < 10.2 | < 10.1 | < 0.05 | -- | -- |
| PCB Aroclor 1248 | < 5.4 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 5.6 | < 0.05 | < 5.1 | < 2.6 | < 10.2 | < 10.1 | < 0.05 | -- | -- |
| PCB Aroclor 1254 | 67.6 D | 0.2 | 3.1 D | 0.5 | 0.1 | 81.8 D | 0.3 | 93.7 D | 35.3 D | 180 D | 167 D | 0.8 | -- | -- |
| PCB Aroclor 1260 | < 5.4 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 5.6 | < 0.05 | < 5.1 | < 2.6 | < 10.2 | < 10.1 | < 0.05 | -- | -- |
| PCB Aroclor 1262 | < 5.4 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 5.6 | < 0.05 | < 5.1 | < 2.6 | < 10.2 | < 10.1 | < 0.05 | -- | -- |
| PCB Aroclor 1268 | < 5.4 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 5.6 | < 0.05 | < 5.1 | < 2.6 | < 10.2 | < 10.1 | < 0.05 | -- | -- |
| Total PCBs | 67.6 | 0.2 | 3.1 | 0.5 | 0.1 | 81.8 | 0.3 | 93.7 | 35.3 | 180 | 167 | 0.8 | 1 | 4 |

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **BB-0** | **BB-0** | **BB-0** | **BB-1** | **BB-1** | **BB-1** | **BB-1** | **BB-1** | **BB-1** | **BB-2** | **BB-2** | **BB-2** | | |
| Sample ID | BB-0 1-2 | BB-0 2-3 | BB-0 3-4 | BB-1 0-1 | BB-1 1-2 | BB-1 2-3 | BB-1 | BB-1 3-4 | BB-1 4-5 | BB-2 1-2 | BB-2 2-3 | BB-2 3-4 | | |
| Sample Depth (feet) | 1-2 | 2-3 | 3-4 | 0-1 | 1-2 | 2-3 | 0-5 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | | |
| Sample Date | 12/29/2023 | 12/29/2023 | 6/20/2024 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 4/30/2024 | 6/20/2024 | 6/20/2024 | 12/29/2023 | 12/29/2023 | 12/29/2023 | | |
| Laboratory Sample ID | 23L0932-03 | 23L0932-04 | 24F0928-18 | 23L0932-05 | 23L0932-06 | 23L0932-07 | 24E0026-08 | 24F0928-17 | 24F0927-10 | 23L0932-08 | 23L0932-09 | 23L0932-10 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1221 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1232 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1242 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1248 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | 0.1 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | 0.09 | -- | -- |
| PCB Aroclor 1254 | < 0.06 | 1.5 D | 0.2 | < 0.06 | 0.3 | 0.7 | 0.6 | 0.7 | 0.5 | < 0.06 | 0.5 | 0.4 | -- | -- |
| PCB Aroclor 1260 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | 0.1 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1262 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1268 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- |
| Total PCBs | 0 | 1.5 | 0.2 | 0 | 0.3 | 0.8 | 0.7 | 0.7 | 0.5 | -- | 0.5 | 0.49 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **BB-3** | **BB-3** | **BB-3** | **BB-4** | **BB-4** | **BB-5** | **BB-5** | **BB-5** | **BB-6** | **BB-6** | **BB-7** | **C-1** | | |
| Sample ID | BB-3 | BB-3 1-2 | BB-3 4-5 | BB-4 1-2 | BB-4 4-5 | BB-5 | BB-5 1-2 | BB-5 4-5 | BB-6 1-2 | BB-6 4-5 | BB-7 | C-1 | | |
| Sample Depth (feet) | 0-5 | 1-2 | 4-5 | 1-2 | 4-5 | 0-5 | 1-2 | 4-5 | 1-2 | 4-5 | 0-5 | 0-5 | | |
| Sample Date | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 5/2/2024 | | |
| Laboratory Sample ID | 24E0026-07 | 24E0029-04 | 24E0027-04 | 24E0029-03 | 24E0027-03 | 24E0026-06 | 24E0029-02 | 24E0027-02 | 24E0029-01 | 24E0027-01 | 24E0026-05 | 24E0124-01 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1221 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1232 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1242 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | 0.08 | < 0.06 | -- | -- |
| PCB Aroclor 1248 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1254 | 0.2 | 0.4 | 0.3 | 0.08 | 0.09 | 0.07 | 0.2 | 0.08 | < 0.06 | 0.09 | 0.06 | 0.2 | -- | -- |
| PCB Aroclor 1260 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1262 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1268 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| Total PCBs | 0.2 | 0.4 | 0.3 | 0.08 | 0.09 | 0.07 | 0.2 | 0.08 | -- | 0.09 | 0.14 | 0.2 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **C-1** | **C-1** | **C-2** | **C-2** | **C-2** | **C-2** | **C-3** | **C-3** | **C-3** | **C-4** | **C-4** | **C-4** | | |
| Sample ID | C-1 0-1 | C-1 1-2 | C-2 0-1 | C-2 1-2 | C-2 2-3 | C-2 3-4 | C-3 | C-3 1-2 | C-3 4-5 | C-4 0-1 | C-4 1-2 | C-4 2-3 | | |
| Sample Depth (feet) | 0-1 | 1-2 | 0-1 | 1-2 | 2-3 | 3-4 | 0-5 | 1-2 | 4-5 | 0-1 | 1-2 | 2-3 | | |
| Sample Date | 5/2/2024 | 5/2/2024 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 12/29/2023 | 12/29/2023 | 12/29/2023 | | |
| Laboratory Sample ID | 24G0151-04 | 24E0125-05 | 23L0932-11 | 23L0932-12 | 23L0932-13 | 23L0932-14 | 24E0124-02 | 24E0125-04 | 24E0125-06 | 23L0932-15 | 23L0932-16 | 23L0932-17 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1221 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1232 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1242 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1248 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | 0.1 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1254 | 0.2 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | 0.3 | 0.08 | < 0.05 | < 0.06 | < 0.05 | 0.1 | 0.1 | -- | -- |
| PCB Aroclor 1260 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1262 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1268 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| Total PCBs | 0.2 | -- | -- | -- | -- | 0.4 | 0.08 | -- | -- | -- | 0.1 | 0.1 | 1 | 4 |

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **C-5** | **C-5** | **C-5** | **C-6** | **C-7** | **C0** | **C0** | **C0 DUP** | **C0** | **C0.5** | **CC-1** | **CC-1** | | |
| Sample ID | C-5 | C-5 1-2 | C-5 4-5 | C-6 1-2 | C-7 | C0 0-1 | C0 1-2 | C0 DUP 1-2 | C0 4-5 | C0.5 0-1 | CC-1 3-4 | CC-1 1-2 | | |
| Sample Depth (feet) | 0-5 | 1-2 | 4-5 | 1-2 | 0-5 | 0-1 | 1-2 | 1-2 | 4-5 | 0-1 | 3-4 | 1-2 | | |
| Sample Date | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/17/2024 | 4/25/2024 | 4/29/2024 | | |
| Laboratory Sample ID | 24E0124-03 | 24E0125-03 | 24E0125-01 | 24E0125-02 | 24E0124-04 | 24G0151-01 | 24E0050-08 | 24E0050-10 | 24E0050-09 | 24G0736-03 | 24E0814-01 | 24D1045-10 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | 0.1 | -- | -- |
| PCB Aroclor 1254 | 0.1 | < 0.05 | 0.2 | 0.1 | < 0.05 | 3.4 D | < 0.05 | < 0.05 | 0.3 | 9.3 D | 8.2 D | 0.5 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | 0.1 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| Total PCBs | 0.1 | -- | 0.2 | 0.1 | -- | 3.4 | -- | -- | 0.4 | 9.3 | 8.2 | 0.6 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **CC-1** | **CC-2** | **CC-2 DUP** | **CC-2** | **CC0** | **CC0** | **CC0** | **CEC-1-1** | **CEC-1-1** | **CEC-1-2** | **CEC-2-1** | **CEC-2-1** | | |
| Sample ID | CC-1 5-6 | CC-2 1-2 | CC-2 DUP 1-2 | CC-2 4-5 | CC-0 3-4 | CC-0 1-2 | CC-0 5-6 | CEC-1-1 0-4 | CEC-1-1 8-9.5 | CEC-1-2 0-4 | CEC-2-1 0-4 | CEC-2-1 8.8-10 | | |
| Sample Depth (feet) | 5-6 | 1-2 | 1-2 | 4-5 | 3-4 | 1-2 | 5-6 | 0-4 | 8-9.5 | 0-4 | 0-4 | 8.8-10 | | |
| Sample Date | 6/20/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/25/2024 | 4/29/2024 | 6/20/2024 | 11/9/2023 | 11/9/2023 | 12/5/2023 | 11/9/2023 | 11/9/2023 | | |
| Laboratory Sample ID | 24F0928-10 | 24D1045-10 | 24D1045-19 | 24D1045-16 | 24E0814-02 | 24D1045-08 | 24F0928-09 | 23K0414-01 | 23K0414-02 | 23L0197-04 | 23K0414-05 | 23K0414-06 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.3 | < 0.05 | < 0.06 | < 0.08 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.3 | < 0.05 | < 0.06 | < 0.08 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.3 | < 0.05 | < 0.06 | < 0.08 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.3 | < 0.05 | < 0.06 | < 0.08 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.3 | < 0.05 | < 0.06 | < 0.08 | -- | -- |
| PCB Aroclor 1254 | 0.6 | 0.2 | < 0.05 | 0.6 | 2.5 D | 0.08 | 0.2 | 0.1 | < 0.3 | 0.4 | < 0.06 | < 0.08 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.3 | < 0.05 | < 0.06 | < 0.08 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.3 | < 0.05 | < 0.06 | < 0.08 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.3 | < 0.05 | < 0.06 | < 0.08 | -- | -- |
| Total PCBs | 0.6 | 0.2 | -- | 0.6 | 2.5 | 0.08 | 0.2 | 0.1 | -- | 0.4 | -- | -- | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **CEC-2-2** | **CEC-3-1** | **CEC-3-2** | **CEC-4-1** | **CEC-4-1** | **CEC-4-2** | **CEC-4-2** | **CEC-5-1** | **CEC-5-1** | **CEC-5-2** | **CEC-6-2** | **CEC-7-2** | | |
| Sample ID | CEC-2-2 0-4 | CEC-3-1 0-4 | CEC-3-2 0.3-4 | CEC-4-1 0-4 | CEC-4-1 8-10 | CEC-4-2 0-4 | CEC-4-2 4.5-7.5 | CEC-5-1 0-4 | CEC-5-1 8-10 | CEC-5-2 0-4 | CEC-6-2 0-4 | CEC-7-2 0-4 | | |
| Sample Depth (feet) | 0-4 | 0-4 | 0.3-4 | 0-4 | 8-10 | 0-4 | 4.5-5.75 | 0-4 | 8-10 | 0-4 | 0-4 | 0-4 | | |
| Sample Date | 12/6/2023 | 11/10/2023 | 12/6/2023 | 11/9/2023 | 11/9/2023 | 12/5/2023 | 12/5/2023 | 11/10/2023 | 11/10/2023 | 12/6/2023 | 12/6/2023 | 12/5/2023 | | |
| Laboratory Sample ID | 23L0197-12 | 23K0414-09 | 23L0197-11 | 23K0414-03 | 23K0414-04 | 23L0197-05 | 23L0197-06 | 23K0414-08 | 23K0414-07 | 23L0197-09 | 23L0197-10 | 23L0197-07 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 1.1 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 1.1 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 1.1 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 1.1 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | 0.2 | < 0.05 | < 0.05 | < 0.06 | < 1.1 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1254 | 0.1 | 0.6 | < 0.05 | < 0.05 | < 0.06 | 11.2 D | < 0.05 | < 0.05 | < 0.06 | 0.06 | 0.09 | 0.4 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 1.1 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 1.1 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 1.1 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | -- | -- |
| Total PCBs | 0.1 | 0.8 | -- | -- | -- | 11.2 | -- | -- | -- | 0.06 | 0.09 | 0.4 | 1 | 4 |

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **CEC-7-2** | **CEC-7-2** | **CEC-8-2** | **CEC-8-2** | **D-0** | **D-0** | **D-0** | **D-1** | **D-1** | **D-1** | **D-2** | **D-3** | | |
| Sample ID | CEC-7-2 4-8 | CEC-7-2 8-10 | CEC-8-2 2-4 | CEC-8-2 4-8 | D-0 0-1 | D-0 1-2 | D-0 2-3 | D-1 0-1 | D-1 1-2 | D-1 2-3 | D-2 1-2 | D-3 0-1 | | |
| Sample Depth (feet) | 4-8 | 8-10 | 2-4 | 4-8 | 0-1 | 1-2 | 2-3 | 0-1 | 1-2 | 2-3 | 1-2 | 0-1 | | |
| Sample Date | 12/5/2024 | 12/5/2024 | 12/5/2023 | 12/5/2024 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 5/2/2024 | 12/29/2023 | | |
| Laboratory Sample ID | 23L0197-08 | 23L0197-01 | 23L0197-02 | 23L0197-03 | 23L0933-01 | 23L0933-02 | 23L0933-03 | 23L0933-04 | 23L0933-05 | 23L0933-06 | 24E0125-08 | 23L0933-07 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1221 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1232 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1242 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1248 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1254 | 0.3 | 0.3 | 6.9 D | 3.5 D | 0.3 | < 0.05 | < 0.05 | 0.2 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1260 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1262 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1268 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| Total PCBs | 0.3 | 0.3 | 6.9 | 3.5 | 0.3 | -- | -- | 0.2 | -- | -- | -- | -- | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **D-3** | **D-3** | **D-4** | **D-4** | **D-8.5** | **D0.5** | **DD-1** | **DD-1** | **DD-1** | **DD-2** | **DD-3** | **DD-5** | | |
| Sample ID | D-3 1-2 | D-3 2-3 | D-4 1-2 | D-4 4-5 | D-8.5 | D0.5 0-1 | DD-1 | DD-1 1-2 | DD-1 4-5 | DD-2 3-4 | DD-3 | DD-5 | | |
| Sample Depth (feet) | 1-2 | 2-3 | 1-2 | 4-5 | 0-5 | 0-1 | 0-5 | 1-2 | 4-5 | 3-4 | 0-5 | 0-5 | | |
| Sample Date | 12/29/2023 | 12/29/2023 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 7/17/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 6/20/2024 | 4/30/2024 | 4/30/2024 | | |
| Laboratory Sample ID | 23L0933-08 | 23L0933-09 | 24E0125-07 | 24E0125-09 | 24E0124-05 | 24G0736-04 | 24D1044-18 | 24D1045-09 | 24D1045-14 | 24F0928-12 | 24E0026-03 | 24E0026-02 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | 0.1 | 0.08 | 0.1 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1254 | < 0.05 | 0.2 | 0.09 | 0.1 | 0.1 | 0.8 | 0.6 | 0.4 | 0.4 | < 0.05 | 0.09 | 0.08 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| Total PCBs | -- | 0.2 | 0.09 | 0.1 | 0.1 | 0.8 | 0.7 | 0.48 | 0.5 | -- | 0.09 | 0.08 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **DD-7** | **DD0** | **DD0** | **E-1** | **E-1** | **E-1** | **E-1** | **E-2** | **E-2** | **E-2** | **E-3** | **E-3** | | |
| Sample ID | DD-7 | DD-0 1-2 | DD-0 4-5 | E-1 | E-1 0-1 | E-1 1-2 | E-1 4-5 | E-2 1-2 | E-2 DUP 1-2 | E-2 4-5 | E-3 0-3 | E-3 3-7 | | |
| Sample Depth (feet) | 0-5 | 1-2 | 4-5 | 0-5 | 0-1 | 1-2 | 4-5 | 1-2 | 1-2 | 4-5 | 0-3 | 3-7 | | |
| Sample Date | 4/30/2024 | 4/29/2024 | 4/29/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/3/2024 | 5/3/2024 | 5/3/2024 | 5/3/2024 | 5/3/2024 | | |
| Laboratory Sample ID | 24E0026-01 | 24D1045-07 | 24D1045-13 | 24E0124-08 | 24E0814-11 | 24E0125-10 | 24E0125-15 | 24E0126-01 | 24E0126-03 | 24E0126-02 | 24E0124-16 | 24E0124-17 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.05 | 0.4 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1254 | < 0.05 | 0.06 | 0.8 | 0.1 | 0.3 | 0.09 | 0.3 | 0.07 | 0.07 | 0.2 | 0.1 | 0.2 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | 0.1 | < 0.05 | < 0.05 | 0.07 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| Total PCBs | -- | 0.06 | 1.2 | 0.1 | 0.3 | 0.09 | 0.4 | 0.07 | 0.07 | 0.27 | 0.1 | 0.2 | 1 | 4 |

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **E-5** | **E-7** | **E0** | **E0** | **E0** | **E0.5** | **E0.5 DUP** | **EE-1** | **EE-2** | **EE-8.5** | **EE0** | **EE0.5** | | |
| Sample ID | E-5 | E-7 | E-0 0-1 | E-0 1-2 | E-0 2-3 | E0.5 0-1 | E0.5 Dup | EE-1 3-4 | EE-2 3-4 | EE-8.5 | EE-0 1-2 | EE-0.5 | | |
| Sample Depth (feet) | 0-5 | 0-5 | 0-1 | 1-2 | 2-3 | 0-1 | 0-1 | 3-4 | 3-4 | 0-5 | 1-2 | 0-5 | | |
| Sample Date | 5/2/2024 | 5/2/2024 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 7/17/2024 | 7/17/2024 | 6/20/2024 | 6/20/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | | |
| Laboratory Sample ID | 24E0124-07 | 24E0124-06 | 23L0933-10 | 23L0933-11 | 23L0933-12 | 24G0736-05 | 24G0736-06 | 24F0928-08 | 24F0928-11 | 24D1044-13 | 24D1045-06 | 24D1044-14 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 1.1 | < 1.1 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 1.1 | < 1.1 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 1.1 | < 1.1 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 1.1 | < 1.1 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 1.1 | < 1.1 | < 0.06 | < 0.05 | 0.1 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1254 | 0.09 | < 0.06 | 0.1 | < 0.05 | < 0.05 | 19.9 D | 12.4 D | 0.1 | 0.2 | 0.2 | 0.3 | 0.08 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 1.1 | < 1.1 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 1.1 | < 1.1 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 1.1 | < 1.1 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| Total PCBs | 0.09 | -- | 0.1 | -- | -- | 19.9 | 12.4 | 0.1 | 0.2 | 0.3 | 0.3 | 0.08 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **F-0** | **F-0** | **F-0** | **F-0** | **F-1** | **F-1** | **F-2** | **F-2** | **F0.5** | **FF-1** | **FF-1** | **FF-1** | | |
| Sample ID | F-0 0-1 | F-0 1-2 | F-0 2-3 | F-0 3-4 | F-1 0-1 | F-1 1-2 | F-2 1-2 | F-2 4-5 | F-0.5 0-1 | FF-1 | FF-1 0-1 | FF-1 1-2 | | |
| Sample Depth (feet) | 0-1 | 1-2 | 2-3 | 3-4 | 0-1 | 1-2 | 1-2 | 4-5 | 0-1 | 0-5 | 0-1 | 1-2 | | |
| Sample Date | 12/29/2023 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 5/2/2024 | 5/2/2024 | 5/3/2024 | 5/3/2024 | 8/26/2024 | 4/29/2024 | 6/20/2024 | 6/20/2024 | | |
| Laboratory Sample ID | 23L0933-19 | 23L0933-13 | 23L0933-14 | 23L0933-15 | 24E0814-12 | 24E0125-12 | 24E0126-04 | 24E0126-05 | 24I0015-01 | 24D1044-12 | 24G0455-01 | 24F0928-06 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1221 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1232 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1242 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1248 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1254 | 2.2 D | < 0.05 | < 0.05 | < 0.05 | 0.2 | 0.2 | 0.1 | 0.2 | 1 | 2.3 D | < 0.05 | 0.3 | -- | -- |
| PCB Aroclor 1260 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1262 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| PCB Aroclor 1268 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- |
| Total PCBs | 2.2 | -- | -- | -- | 0.2 | 0.2 | 0.1 | 0.2 | 1 | 2.3 | -- | 0.3 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **FF-1** | **FF-1** | **FF-1** | **FF-2** | **FF-2** | **FF-3** | **FF-5** | **FF-7** | **FF0** | **FF0 DUP** | **FF0** | **G-1** | | |
| Sample ID | FF-1 2-3 | FF-1 3-4 | FF-1 4-5 | FF-2 1-2 | FF-2 4-5 | FF-3 | FF-5 | FF-7 | FF-0 1-2 | FF-0 DUP 1-2 | FF-0 4-5 | G-1 | | |
| Sample Depth (feet) | 2-3 | 3-4 | 4-5 | 1-2 | 4-5 | 0-5 | 0-5 | 0-5 | 1-2 | 1-2 | 4-5 | 0-5 | | |
| Sample Date | 6/20/2024 | 6/20/2024 | 6/20/2024 | 6/20/2024 | 6/20/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 5/2/2024 | | |
| Laboratory Sample ID | 24G0455-02 | 24G0455-03 | 24F0927-08 | 24F0928-07 | 24F0927-09 | 24D1044-11 | 24D1044-10 | 24D1044-09 | 24D1045-05 | 24D1045-18 | 24D1045-12 | 24E0124-11 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | 0.08 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1254 | 0.09 | 9.1 D | < 0.06 | 0.08 | < 0.06 | < 0.05 | < 0.05 | 0.07 | < 0.05 | < 0.05 | < 0.05 | 0.2 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | 0.1 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| Total PCBs | 0.09 | 9.1 | -- | 0.08 | -- | -- | -- | 0.15 | -- | -- | -- | 0.3 | 1 | 4 |

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **G-1** | **G-1** | **G-1** | **G-2** | **G-2** | **G-3** | **G-3** | **G-5** | **G-7** | **G0** | **G0.5** | **GG-1** | | |
| Sample ID | G-1 0-1 | G-1 1-2 | G-1 4-5 | G-2 1-2 | G-2 4-5 | G-3 0-4 | G-3 4-8 | G-5 | G-7 | G0 0-1 | G-0.5 0-1 | GG-1 1-2 | | |
| Sample Depth (feet) | 0-1 | 1-2 | 4-5 | 1-2 | 4-5 | 0-4 | 4-8 | 0-5 | 0-5 | 0-1 | 0-1 | 1-2 | | |
| Sample Date | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/3/2024 | 5/3/2024 | 5/1/2024 | 5/1/2024 | 5/2/2024 | 5/2/2024 | 6/21/2024 | 8/26/2024 | 6/20/2024 | | |
| Laboratory Sample ID | 24E0814-13 | 24E0125-13 | 24E0125-16 | 24E0126-06 | 24E0126-07 | 24E0050-06 | 24E0050-07 | 24E0124-10 | 24E0124-09 | 24F0929-10 | 24I0015-02 | 24F0928-05 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | 0.1 | < 0.05 | 0.2 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1254 | 0.1 | 0.2 | 0.8 | 0.1 | 0.3 | < 0.05 | 0.1 | 0.1 | 0.2 | 0.4 | 0.9 | < 0.05 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.06 | 0.2 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | -- | -- |
| Total PCBs | 0.1 | 0.2 | 1 | 0.1 | 0.3 | -- | 0.2 | 0.1 | 0.4 | 0.4 | 0.9 | -- | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **GG-1** | **GG-2** | **GG-2** | **GG0** | **H-0** | **H-0** | **H-0** | **H-1** | **H-1 DUP** | **H-1** | **H-8.5** | **H0.5** | | |
| Sample ID | GG-1 4-5 | GG-2 1-2 | GG-2 4-5 | GG-0 1-2 | H-0 0-1 | H-0 1-2 | H-0 2-3 | H-1 1-2 | H-1 DUP 1-2 | H-1 4-5 | H-8.5 | H-0.5 0-1 | | |
| Sample Depth (feet) | 4-5 | 1-2 | 4-5 | 1-2 | 0-1 | 1-2 | 2-3 | 1-2 | 1-2 | 4-5 | 0-5 | 0-1 | | |
| Sample Date | 6/20/2024 | 6/20/2024 | 6/20/2024 | 4/29/2024 | 12/29/2023 | 12/29/2023 | 12/29/2023 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 8/29/2024 | | |
| Laboratory Sample ID | 24F0927-07 | 24F0928-04 | 24F0927-06 | 24D1045-04 | 23L0933-16 | 23L0933-17 | 23L0933-18 | 24E0125-14 | 24E0125-11 | 24E0125-17 | 24E0124-12 | 24I0015-03 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1221 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1232 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1242 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1248 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | 0.2 | < 0.06 | < 0.06 | 0.07 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1254 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | 0.08 | 0.06 | 0.3 | 0.07 | 0.1 | 0.2 | 0.1 | 0.5 | -- | -- |
| PCB Aroclor 1260 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1262 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1268 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.05 | < 0.06 | -- | -- |
| Total PCBs | -- | -- | -- | -- | 0.08 | 0.06 | 0.5 | 0.07 | 0.1 | 0.27 | 0.1 | 0.5 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **HH-1** | **HH-3** | **HH-5** | **HH-7** | **HH0** | **HH0 DUP** | **HH0** | **HH0.5** | **HH-0.5** | **I-1** | **I-3** | **I-3** | | |
| Sample ID | HH-1 | HH-3 | HH-5 | HH-7 | HH-0 1-2 | HH-0 DUP 1-2 | HH-0 4-5 | HH-0.5 1-2 | HH-0.5 4-5 | I-1 | I-3 | **I-3 4-8** | | |
| Sample Depth (feet) | 0-5 | 0-5 | 0-5 | 0-5 | 1-2 | 1-2 | 4-5 | 1-2 | 4-5 | 0-5 | 0-4 | 4-8 | | |
| Sample Date | 4/29/2024 | 4/30/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 6/20/2024 | 6/20/2024 | 5/2/2024 | 5/1/2024 | 6/21/2024 | | |
| Laboratory Sample ID | 24D1044-08 | 24E0026-04 | 24D1044-06 | 24D1044-05 | 24D1045-03 | 24D1045-17 | 24D1045-11 | 24F0928-03 | 24F0927-05 | 24E0124-15 | 24E0050-04 | 24F0927-02 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.05 | < 0.06 | 0.07 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1254 | 0.5 | 0.2 | < 0.06 | 0.09 | < 0.05 | < 0.05 | < 0.05 | 1.3 D | < 0.06 | < 0.05 | 0.1 | 0.3 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| Total PCBs | 0.5 | 0.2 | -- | 0.16 | -- | -- | -- | 1.3 | -- | -- | 0.1 | 0.3 | 1 | 4 |

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 2
Site 1 - Soil PCBs
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | **I-5** | **I-7** | **I0.5** | **II-8.5** | **II-8.5** | **II0** | **II0.5** | **II0.5** | **II-0.5** | **J-0** | **J-0** | **J-0** | | |
| Sample ID | I-5 | I-7 | I-0.5 0-1 | II-8.5 | II-8.5 5-6 | II-0 1-2 | II-0.5 | II-0.5 1-2 | II-0.5 4-5 | J-0 0-1 | J-0 1-2 | J-0 2-3 | | |
| Sample Depth (feet) | 0-5 | 0-5 | 0-1 | 0-5 | 5-6 | 1-2 | 0-5 | 1-2 | 4-5 | 0-1 | 1-2 | 2-3 | | |
| Sample Date | 5/2/2024 | 5/2/2024 | 8/29/2024 | 4/29/2024 | 5/3/2024 | 4/29/2024 | 4/29/2024 | 6/20/2024 | 6/20/2024 | 12/29/2023 | 12/29/2023 | 12/29/2023 | | |
| Laboratory Sample ID | 24E0124-14 | 24E0124-13 | 24I0015-04 | 24D1044-03 | 24E0124-18 | 24D1045-01 | 24D1044-04 | 24F0928-02 | 24F0927-04 | 23L0931-13 | 23L0931-14 | 23L0931-15 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1248 | < 0.05 | 0.2 | < 0.06 | 0.1 | < 0.1 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1254 | 0.1 | 0.3 | 0.8 | 0.08 | < 0.1 | < 0.05 | 1.2 D | 0.4 | 0.09 | < 0.05 | < 0.06 | 0.2 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.06 | -- | -- |
| Total PCBs | 0.1 | 0.5 | 0.8 | 0.18 | -- | -- | 1.2 | 0.4 | 0.09 | -- | -- | 0.2 | 1 | 4 |

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | MCP Concentrations | |
|---|---|---|---|---|---|---|---|---|
| Location | **J-0** | **JJ/II-2** | **JJ/II-6** | **JJ0** | **JJ0.5** | **JJ0.5** | | |
| Sample ID | J-0 3-4 | JJ/II-2 | JJ/II-6 | JJ-0 1-2 | JJ-0.5 1-2 | JJ-0.5 4-5 | | |
| Sample Depth (feet) | 3-4 | 0-5 | 0-5 | 1-2 | 1-2 | 4-5 | | |
| Sample Date | 12/29/2023 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 6/20/2024 | 6/20/2024 | | |
| Laboratory Sample ID | 23L0931-16 | 24D1044-02 | 24D1044-01 | 24D1045-02 | 24F0928-01 | 24F0927-03 | RCS-1 | RCS-2 |
| **PCBs (mg/kg)** | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1248 | 0.2 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1254 | 0.3 | < 0.05 | < 0.05 | < 0.05 | 0.1 | 0.6 | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1262 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | -- | -- |
| Total PCBs | 0.5 | -- | -- | -- | 0.1 | 0.6 | 1 | 4 |

Laboratory analytical results compared to RCS-1 and RCS-2 Massachusetts Contingency Plan Standards.
PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1
Exceeds MassDEP MCP RCS-1 and RCS-2

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Table 3
Site 2 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 2 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | | | MCP Concentrations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | CEC-1-4 | CEC-10-4 | CEC-14-4 | CEC-15-4 | CEC-2-3 | CEC-2-4 | CEC-3-3 | CEC-4-3 | CEC-5-3 | CEC-5-4 | CEC-6-3 | CEC-6-3 | CEC-6-4 | |
| Sample ID | CEC-1-4 | CEC-10-4 | CEC-14-4 | CEC-15-4 | CEC-2-3 | CEC-2-4 | CEC-3-3 | CEC-4-3 | CEC-5-3 | CEC-5-4 | CEC-6-3 | CEC-6-3 | CEC-6-4 | |
| Sample Depth (feet) | 0-4 | 0-5 | 0.6-4.6 | 0.6-4.6 | 0-6 | 0-4 | 0-4 | 0-4 | 0-4 | 0-4 | 0-4 | 5-7 | 0-4 | |
| Sample Date | 11/13/2023 | 9/19/2024 | 9/18/2024 | 9/18/2024 | 11/13/2023 | 11/13/2023 | 11/10/2023 | 11/10/2023 | 11/10/2023 | 11/13/2023 | 9/19/2024 | 9/19/2024 | 11/13/2023 | RCS-1 |
| Laboratory Sample ID | 23K0441-01 | 24I0766-07 | 24I0766-02 | 24I0766-01 | 23K0440-04 | 23K0441-02 | 23K0440-01 | 23K0440-02 | 23K0440-03 | 23K0441-04 | 24I0766-10 | 24I0766-11 | 23K0441-03 | |
| **SVOCs (mg/kg)** | | | | | | | | | | | | | | |
| 1,1-Biphenyl | 0.05 | 0.03 | < 0.03 | < 0.03 | 0.08 D | < 0.05 | < 0.03 | 0.08 D | 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.05 | 0.05 |
| 2,4-Dinitrotoluene | < 0.28 | < 0.27 | < 0.27 | < 0.28 | < 0.55 | < 0.52 | < 0.28 | < 0.55 | < 0.28 | < 0.25 | < 0.28 | < 0.28 | < 0.54 | 0.7 |
| 2-Methylnaphthalene | < 0.28 | < 0.27 | < 0.27 | < 0.28 | < 0.55 | < 0.52 | < 0.28 | < 0.55 | < 0.28 | < 0.25 | < 0.28 | < 0.28 | < 0.54 | 0.7 |
| Acenaphthene | 0.55 | < 0.27 | < 0.27 | < 0.28 | 0.62 D | < 0.52 | < 0.28 | < 0.55 | < 0.28 | < 0.25 | < 0.28 | < 0.28 | < 0.54 | 4 |
| Acenaphthylene | < 0.28 | 0.65 | < 0.27 | 0.38 | < 0.55 | < 0.52 | < 0.28 | 2.60 D | 0.39 | < 0.25 | 0.59 | < 0.28 | < 0.54 | 2 |
| Anthracene | 0.97 | 0.95 | < 0.27 | 0.38 | 1.69 D | < 0.52 | < 0.28 | 4.89 D | 0.98 | < 0.25 | 0.41 | < 0.28 | < 0.54 | 1000 |
| Benzo(A)anthracene | 2.50 | 3.65 | 0.66 | 2.20 | 5.96 D | 0.70 D | < 0.28 | 13.50 D | 4.43 | 0.31 | 3.20 | < 0.28 | < 0.54 | 20 |
| Benzo(A)pyrene | 2.60 | 3.33 | 0.63 | 2.45 | 6.63 D | 0.81 D | < 0.28 | 13.20 D | 5.13 | 0.31 | 3.62 | < 0.28 | < 0.54 | 2 |
| Benzo(B)fluoranthene | 1.86 | 3.66 | 0.54 | 2.14 | 5.74 D | 0.64 D | < 0.28 | 10.00 D | 4.05 | 0.28 | 4.02 | < 0.28 | < 0.54 | 20 |
| Benzo(g,h,i)Perylene | 1.50 | 2.31 | 0.38 | 1.68 | 4.14 D | < 0.52 | < 0.28 | 6.80 D | 3.54 | < 0.25 | 2.47 | < 0.28 | < 0.54 | 1000 |
| Benzo(K)fluoranthene | 1.94 | 1.47 | 0.53 | 1.91 | 4.55 D | 0.62 D | < 0.28 | 10.50 D | 3.59 | < 0.25 | 1.56 | < 0.28 | < 0.54 | 200 |
| Chrysene | 2.51 | 3.70 | 0.64 | 2.00 | 5.63 D | 0.65 D | < 0.28 | 11.60 D | 4.21 | 0.30 | 3.02 | < 0.28 | < 0.54 | 200 |
| Dibenzo(A,H)anthracene | 0.38 | 0.41 | < 0.27 | 0.33 | 0.93 D | < 0.52 | < 0.28 | 1.81 D | 0.75 | < 0.25 | 0.44 | < 0.28 | < 0.54 | 2 |
| Dibenzofuran | 0.39 | < 0.27 | < 0.27 | < 0.28 | < 0.55 | < 0.52 | < 0.28 | 0.84 D | < 0.28 | < 0.25 | < 0.28 | < 0.28 | < 0.54 | -- |
| Fluoranthene | 4.32 | 5.97 | 1.71 | 4.88 | 10.10 D | 1.16 D | < 0.28 | 25.80 D | 8.45 | 0.63 | 5.24 | < 0.28 | < 0.54 | 1000 |
| Fluorene | 0.45 | 0.42 | < 0.27 | < 0.28 | 0.65 D | < 0.52 | < 0.28 | 0.88 D | 0.34 | < 0.25 | < 0.28 | < 0.28 | < 0.54 | 1000 |
| Indeno (1,2,3-cd) pyrene | 1.54 | 2.13 | 0.41 | 1.67 | 4.50 D | < 0.52 | < 0.28 | 7.93 D | 3.78 | < 0.25 | 2.51 | < 0.28 | < 0.54 | 20 |
| Naphthalene | < 0.28 | < 0.27 | < 0.27 | < 0.28 | 0.70 D | < 0.52 | < 0.28 | < 0.55 | < 0.28 | < 0.25 | < 0.28 | < 0.28 | < 0.54 | 4 |
| Phenanthrene | 4.37 | 3.71 | 0.92 | 1.11 | 6.32 D | 0.71 D | < 0.28 | 19.60 D | 3.20 | 0.43 | 0.87 | < 0.28 | < 0.54 | 10 |
| Pyrene | 5.24 | 7.21 | 1.12 | 3.33 | 11.60 D | 1.21 D | < 0.28 | 24.80 D | 9.13 | 0.59 | 5.25 | < 0.28 | < 0.54 | 1000 |
| **VPH (mg/kg)** | | | | | | | | | | | | | | |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.7 |
| Aliphatic Petroleum Hydrocarbons C19-C36 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Aliphatic Petroleum Hydrocarbons C5-C8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Aliphatic Petroleum Hydrocarbons C9-C12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Aliphatic Petroleum Hydrocarbons C9-C18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Aromatic Petroleum Hydrocarbons C11-C22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Aromatic Petroleum Hydrocarbons C9-C10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Fluorene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 |
| o-Xylenes | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Phenanthrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10 |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1254 | < 0.06 | -- | -- | -- | < 0.05 | < 0.05 | < 0.06 | < 0.05 | 0.3 | < 0.05 | -- | -- | < 0.06 | -- |
| PCB Aroclor 1260 | < 0.06 | -- | -- | -- | < 0.05 | < 0.05 | < 0.06 | < 0.05 | 0.1 | < 0.05 | -- | -- | < 0.06 | -- |
| PCB Aroclor 1262 | < 0.06 | -- | -- | -- | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- | < 0.06 | -- |
| PCB Aroclor 1268 | < 0.06 | -- | -- | -- | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | -- | -- | < 0.06 | -- |
| Total PCBs | 0 | -- | -- | -- | 0 | 0 | 0 | 0 | 0.4 | 0 | -- | -- | 0 | 1 |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | |
| Arsenic | 2.64 | -- | -- | -- | 3.42 | < 2.11 | < 2.31 | < 2.3 | < 2.13 | < 1.84 | -- | -- | < 1.83 | 20 |
| Barium | 39.2 | -- | -- | -- | 252 | 55.8 | 20.9 | 58 | 50.6 | 28.6 | -- | -- | 31.8 | 1000 |
| Beryllium | 0.32 | -- | -- | -- | 0.22 | 0.28 | 0.18 | 0.19 | 0.16 | 0.21 | -- | -- | 0.16 | 100 |
| Chromium | 13.8 | -- | -- | -- | 9.85 | 17 | 5.51 | 9.05 | 17.1 | 7.76 | -- | -- | 11 | 100 |
| Lead | 85.3 | -- | -- | -- | 113 | 43.2 | 7 | 101 | 86.5 | 113 | -- | -- | 27.2 | 200 |
| Mercury | 0.067 | -- | -- | -- | 0.096 | 0.055 | < 0.034 | 0.294 | 0.065 | 0.069 | -- | -- | 0.075 | 20 |
| Nickel | 8.95 | -- | -- | -- | 7.09 | 10 | 3.27 | 5.83 | 10.2 | 5.14 | -- | -- | 6.35 | 700 |
| Vanadium | 14.1 | -- | -- | -- | 15.4 | 26.6 | 10.3 | 11.1 | 15.7 | 13.3 | -- | -- | 12 | 500 |
| Zinc | 58.4 | -- | -- | -- | 181 | 51.2 | 15.3 | 75.7 | 43.3 | 34.1 | -- | -- | 26 | 1000 |

Notes:
Laboratory analytical results compared to RCS-1 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls; VPH = Volatile Petroleum Hydrocarbons
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1

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Table 3
Site 2 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 2 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | MCP Concentrations |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | **CEC-7-3** | **CEC-7-4** | **CEC-7-4** | **CEC-8-3** | **CEC-8-3** | **CEC-8-3** | **CEC-8-4** | **CEC-9-4** | **CEC-9-4** | |
| Sample ID | CEC-7-3 | CEC-7-4 | CEC-7-4 | CEC-8-3 | CEC-8-3 | CEC-8-3 | CEC-8-4 | CEC-9-4 | CEC-9-4 | |
| Sample Depth (feet) | 0-4 | 0-4 | 5-10 | 2-4 | 7-8 | 12-14.5 | 0-4 | 2-6 | 6-8 | |
| Sample Date | 9/19/2024 | 9/19/2024 | 9/19/2024 | 9/23/2024 | 9/23/2024 | 9/23/2024 | 9/19/2024 | 9/19/2024 | 9/19/2024 | RCS-1 |
| Laboratory Sample ID | 24I0766-09 | 24I0766-05 | 24I0766-06 | 24I0819-01 | 24I0819-02 | 24I0819-03 | 24I0766-08 | 24I0766-03 | 24I0766-04 | |
| **SVOCs (mg/kg)** | | | | | | | | | | |
| 1,1-Biphenyl | 0.06 | 0.04 | < 0.03 | < 0.03 | < 0.06 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | 0.05 |
| 2,4-Dinitrotoluene | < 0.27 | < 0.28 | < 0.27 | < 0.29 | 1.13 | < 0.27 | < 0.27 | < 0.33 | < 0.28 | 0.7 |
| 2-Methylnaphthalene | < 0.27 | < 0.28 | < 0.27 | 4.47 | < 0.58 | < 0.27 | < 0.27 | < 0.33 | < 0.28 | 0.7 |
| Acenaphthene | 0.90 | 1.00 | < 0.27 | 0.54 | 1.31 | < 0.27 | < 0.27 | < 0.33 | < 0.28 | 4 |
| Acenaphthylene | 0.47 | 0.62 | < 0.27 | < 0.29 | < 0.58 | < 0.27 | < 0.27 | < 0.33 | < 0.28 | 2 |
| Anthracene | 1.96 | 2.63 | < 0.27 | < 0.29 | < 0.58 | < 0.27 | 0.29 | < 0.33 | < 0.28 | 1000 |
| Benzo(A)anthracene | 6.17 | 9.24 | < 0.27 | < 0.29 | < 0.58 | < 0.27 | 0.86 | 0.34 | < 0.28 | 20 |
| Benzo(A)pyrene | 5.83 | 7.84 | < 0.27 | < 0.29 | < 0.58 | < 0.27 | 0.95 | < 0.33 | < 0.28 | 2 |
| Benzo(B)fluoranthene | 6.72 | 7.96 | < 0.27 | < 0.29 | < 0.58 | < 0.27 | 1.07 | 1.38 | < 0.28 | 20 |
| Benzo(g,h,i)Perylene | 3.39 | 4.38 | < 0.27 | < 0.29 | < 0.58 | < 0.27 | 0.68 | 1.05 | < 0.28 | 1000 |
| Benzo(K)fluoranthene | 2.75 | 6.27 | < 0.27 | < 0.29 | < 0.58 | < 0.27 | 0.40 | 0.60 | < 0.28 | 200 |
| Chrysene | 6.30 | 8.60 | < 0.27 | < 0.29 | < 0.58 | < 0.27 | 0.86 | 0.52 | < 0.28 | 200 |
| Dibenzo(A,H)anthracene | 0.71 | 1.23 | < 0.27 | < 0.29 | < 0.58 | < 0.27 | < 0.27 | < 0.33 | < 0.28 | 2 |
| Dibenzofuran | 0.51 | 0.43 | < 0.27 | < 0.29 | 0.63 | < 0.27 | < 0.27 | < 0.33 | < 0.28 | -- |
| Fluoranthene | 13.50 | 17.30 D | < 0.27 | < 0.29 | < 0.58 | < 0.27 | 1.75 | 0.54 | < 0.28 | 1000 |
| Fluorene | 0.80 | 0.93 | < 0.27 | 0.57 | 1.55 | < 0.27 | < 0.27 | < 0.33 | < 0.28 | 1000 |
| Indeno (1,2,3-cd) pyrene | 3.35 | 4.75 | < 0.27 | < 0.29 | < 0.58 | < 0.27 | 0.65 | 0.97 | < 0.28 | 20 |
| Naphthalene | 0.39 | 0.29 | < 0.27 | < 0.29 | < 0.58 | < 0.27 | < 0.27 | < 0.33 | < 0.28 | 4 |
| Phenanthrene | 9.12 | 10.40 | < 0.27 | 1.21 | 3.06 | < 0.27 | 1.02 | 0.40 | < 0.28 | 10 |
| Pyrene | 12.00 | 16.90 D | < 0.27 | 0.33 | < 0.58 | < 0.27 | 1.62 | 0.38 | < 0.28 | 1000 |
| **VPH (mg/kg)** | | | | | | | | | | |
| 2-Methylnaphthalene | -- | -- | -- | -- | < 0.24 | 3.62 | -- | -- | -- | 0.7 |
| Aliphatic Petroleum Hydrocarbons C19-C36 | -- | -- | -- | -- | 85.6 | 39.7 | -- | -- | -- | -- |
| Aliphatic Petroleum Hydrocarbons C5-C8 | -- | -- | -- | -- | < 13.2 | 12.7 | -- | -- | -- | -- |
| Aliphatic Petroleum Hydrocarbons C9-C12 | -- | -- | -- | -- | 140 D | 42.8 D | -- | -- | -- | -- |
| Aliphatic Petroleum Hydrocarbons C9-C18 | -- | -- | -- | -- | 649 | 262 | -- | -- | -- | -- |
| Aromatic Petroleum Hydrocarbons C11-C22 | -- | -- | -- | -- | 344 | 158 | -- | -- | -- | -- |
| Aromatic Petroleum Hydrocarbons C9-C10 | -- | -- | -- | -- | 155 | 48 | -- | -- | -- | -- |
| Fluorene | -- | -- | -- | -- | 0.84 | < 0.43 | -- | -- | -- | 1000 |
| o-Xylenes | -- | -- | -- | -- | 1.17 | 0.31 | -- | -- | -- | -- |
| Phenanthrene | -- | -- | -- | -- | 1.71 | 0.94 | -- | -- | -- | 10 |
| **PCBs (mg/kg)** | | | | | | | | | | |
| PCB Aroclor 1254 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| PCB Aroclor 1260 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| PCB Aroclor 1262 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| PCB Aroclor 1268 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total PCBs | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 |
| **Total Metals (mg/kg)** | | | | | | | | | | |
| Arsenic | -- | -- | -- | -- | -- | -- | -- | -- | -- | 20 |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | 100 |
| Chromium | -- | -- | -- | -- | -- | -- | -- | -- | -- | 100 |
| Lead | -- | -- | -- | -- | -- | -- | -- | -- | -- | 200 |
| Mercury | -- | -- | -- | -- | -- | -- | -- | -- | -- | 20 |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | 700 |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | -- | -- | 500 |
| Zinc | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 |

Notes:
Laboratory analytical results compared to RCS-1 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls; VPH = Volatile Petroleum Hydrocarbons
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceeds MassDEP MCP RCS-1

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Table 4
Site 3 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 3 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | MCP Concentrations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | A'-1 | A'-3 | A'-5 | A'-7 | C'-1 | C'-3 | C'-5 | C'-7 | E'-1 | E'-3 | E'-5 | |
| Sample ID | A'-1 | A'-3 | A'-5 | A'-7 | C'-1 | C'-3 | C'-5 | C'-7 | E'-1 | E'-3 | E'-5 | |
| Sample Depth (feet) | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | |
| Sample Date | 7/1/2024 | 7/1/2024 | 7/1/2024 | 7/1/2024 | 7/1/2024 | 7/1/2024 | 7/1/2024 | 7/1/2024 | 7/1/2024 | 7/1/2024 | 7/1/2024 | |
| Laboratory Sample ID | 24G0131-07<br>24G0131-08 | 24G0131-09<br>24G0131-10 | 24G0131-11<br>24G0131-12 | 24G0131-13<br>24G0131-14 | 24G0132-05<br>24G0132-06 | 24G0132-03<br>24G0132-04 | 24G0132-01<br>24G0132-02 | 24G0132-19<br>24G0132-20 | 24G0132-11<br>24G0132-12 | 24G0132-13<br>24G0132-14 | 24G0132-15<br>24G0132-16 | RCS-2 |
| **SVOCs (mg/kg)** | | | | | | | | | | | | |
| 1,1-Biphenyl | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | 6 |
| 2-Methylnaphthalene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 80 |
| Acenaphthene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 3000 |
| Acenaphthylene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 10 |
| Anthracene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 3000 |
| Benzo(A)anthracene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 300 |
| Benzo(A)pyrene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 30 |
| Benzo(B)fluoranthene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 300 |
| Benzo(g,h,i)Perylene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 3000 |
| Benzo(K)fluoranthene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 3000 |
| Chrysene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 3000 |
| Dibenzo(A,H)anthracene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 30 |
| Dibenzofuran | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | NS |
| Fluoranthene | 0.29 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 3000 |
| Fluorene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 3000 |
| Hydrocarbon, Oil, Petroleum | 41.4 | < 10.4 | 20 | 13.2 | < 10.5 | < 11.2 | 17.0 | 15.7 | < 11.1 | < 10.7 | < 11 | NS |
| Indeno (1,2,3-cd) pyrene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 300 |
| Naphthalene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 20 |
| Phenanthrene | < 0.27 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 1000 |
| Pyrene | 0.34 | < 0.26 | < 0.27 | < 0.26 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | 3000 |
| **Total SVOCs** | 42.02 | 0 | 20 | 13.2 | 0 | 0 | 17 | 15.7 | 0 | 0 | 0 | NS |
| **Total Metals (mg/kg)** | | | | | | | | | | | | |
| Arsenic | 2.35 | 2.27 | 2.45 | 2.18 | 2.33 | 2.51 | 2.21 | 2.52 | 2.37 | 2.40 | 2.67 | 20 |
| Barium | 9.00 | 11.7 | 10.5 | 10.6 | 22.8 | 9.16 | 30.8 | 10.0 | 11.1 | 8.78 | 8.01 | 3000 |
| Cadmium | < 0.47 | < 0.45 | < 0.49 | < 0.44 | < 0.47 | < 0.5 | < 0.44 | < 0.5 | < 0.47 | < 0.48 | < 0.53 | 80 |
| Chromium | 8.09 | 8.95 | 6.43 | 6.81 | 7.6 | 7.21 | 7.13 | 8.76 | 6.12 | 6.58 | 5.72 | 200 |
| Lead | 12.4 | 12.2 | 10 | 12.1 | 32.8 | 12.2 | 73.7 | 11.2 | 10.7 | 7.44 | 6.12 | 600 |
| Mercury | 0.05 | < 0.03 | < 0.03 | < 0.04 | 0.06 | < 0.04 | 0.05 | < 0.03 | < 0.03 | < 0.03 | < 0.04 | 40 |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | |
| 4,4'-DDT | < 0.003 | < 0.003 | 0.010 | 0.007 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 30 |
| Dieldrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.6 |
| **PCBs (mg/kg)** | | | | | | | | | | | | |
| PCB Aroclor 1248 | < 0.06 | < 0.05 | 0.10 | 0.10 | < 0.05 | < 0.06 | < 0.05 | 0.08 | < 0.05 | < 0.05 | < 0.05 | -- |
| PCB Aroclor 1254 | < 0.06 | 0.10 | 0.20 | 0.20 | < 0.05 | 0.10 | 0.20 | 0.30 | < 0.05 | < 0.05 | 0.10 | -- |
| **Total PCBs** | 0 | 0.10 | 0.31 | 0.31 | 0 | 0.10 | 0.20 | 0.38 | 0 | 0 | 0.10 | 4 |

Notes:
Laboratory analytical results compared to RCS-2 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
Exceeds MassDEP MCP RCS-2

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Table 4
Site 3 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 3 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | MCP Concentrations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | E'-7 | K-1 | K-3 | K-4.5 | L/M-1 | L/M-4.5 | L0 | M0 | N0 | O-0.5 | Q-0.5 | |
| Sample ID | E'-7 | K-1 | K-3 | K-4.5 | L/M-1 | L/M-4.5 | L0 0-1 | M0 0-1 | N0 0-1 | O-0.5 | Q-0.5 | |
| Sample Depth (feet) | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-1 | 0-1 | 0-1 | 0-5 | 0-5 | |
| Sample Date | 7/1/2024 | 7/2/2024 | | 7/2/2024 | 7/2/2024 | 7/2/2024 | 7/17/2024 | 7/17/2024 | 7/17/2024 | 7/2/2024 | 7/1/2024 | |
| Laboratory Sample ID | 24G0132-17<br>24G0132-18 | 24G0130-03<br>24G0130-04 | 24G0130-07<br>24G0130-08 | 24G0130-09<br>24G0130-10 | 24G0130-05<br>24G0130-06 | 24G0130-11<br>24G0130-12 | 24G0738-01 | 24G0738-02 | 24G0738-03 | 24G0130-01<br>24G0130-02 | 24G0131-09<br>24G0131-10 | RCS-2 |
| **SVOCs (mg/kg)** | | | | | | | | | | | | |
| 1,1-Biphenyl | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | -- | -- | -- | 0.24 | < 0.03 | 6 |
| 2-Methylnaphthalene | < 0.27 | < 0.29 | < 0.27 | < 0.26 | < 0.28 | < 0.28 | -- | -- | -- | 0.87 | < 0.26 | 80 |
| Acenaphthene | < 0.27 | < 0.29 | < 0.27 | < 0.26 | < 0.28 | < 0.28 | -- | -- | -- | 2.09 | < 0.26 | 3000 |
| Acenaphthylene | < 0.27 | < 0.29 | < 0.27 | < 0.26 | < 0.28 | < 0.28 | -- | -- | -- | 0.71 | < 0.26 | 10 |
| Anthracene | < 0.27 | < 0.29 | < 0.27 | < 0.26 | < 0.28 | < 0.28 | -- | -- | -- | 7.84 | < 0.26 | 3000 |
| Benzo(A)anthracene | < 0.27 | 0.33 | < 0.27 | < 0.26 | 0.37 | 0.50 | -- | -- | -- | 15.1 D | < 0.26 | 300 |
| Benzo(A)pyrene | < 0.27 | 0.39 | < 0.27 | < 0.26 | 0.43 | 0.41 | -- | -- | -- | 13.2 | < 0.26 | 30 |
| Benzo(B)fluoranthene | < 0.27 | 0.33 | < 0.27 | < 0.26 | 0.35 | 0.34 | -- | -- | -- | 12.3 | < 0.26 | 300 |
| Benzo(g,h,i)Perylene | < 0.27 | < 0.29 | < 0.27 | < 0.26 | 0.37 | < 0.281 | -- | -- | -- | 7.43 | < 0.26 | 3000 |
| Benzo(K)fluoranthene | < 0.27 | < 0.29 | < 0.27 | < 0.26 | 0.35 | 0.39 | -- | -- | -- | 9.13 | < 0.26 | 3000 |
| Chrysene | < 0.27 | 0.33 | < 0.27 | < 0.26 | 0.38 | 0.51 | -- | -- | -- | 13.6 D | < 0.26 | 3000 |
| Dibenzo(A,H)anthracene | < 0.27 | < 0.29 | < 0.27 | < 0.26 | < 0.28 | < 0.28 | -- | -- | -- | 1.89 | < 0.26 | 30 |
| Dibenzofuran | < 0.27 | < 0.29 | < 0.27 | < 0.26 | < 0.28 | < 0.28 | -- | -- | -- | 2.32 | < 0.26 | NS |
| Fluoranthene | < 0.27 | 0.48 | < 0.27 | 0.29 | 0.62 | 0.98 | -- | -- | -- | 32 D | < 0.26 | 3000 |
| Fluorene | < 0.27 | < 0.29 | < 0.27 | < 0.26 | < 0.28 | < 0.28 | -- | -- | -- | 3.26 | < 0.26 | 3000 |
| Hydrocarbon, Oil, Petroleum | < 10.30 | 55.7 | 64.5 | 45.9 | 29.8 | 64.2 | -- | -- | -- | 72.2 | 15.90 | NS |
| Indeno (1,2,3-cd) pyrene | < 0.27 | < 0.29 | < 0.27 | < 0.26 | 0.33 | < 0.28 | -- | -- | -- | 8.47 | < 0.26 | 300 |
| Naphthalene | < 0.27 | < 0.29 | < 0.27 | < 0.26 | < 0.28 | < 0.28 | -- | -- | -- | 2.47 | < 0.26 | 20 |
| Phenanthrene | < 0.27 | < 0.29 | < 0.27 | < 0.26 | < 0.28 | < 0.28 | -- | -- | -- | 26.3 D | < 0.26 | 1000 |
| Pyrene | < 0.27 | 0.44 | < 0.27 | 0.28 | 0.59 | 0.80 | -- | -- | -- | 25.1 D | < 0.26 | 3000 |
| **Total SVOCs** | 0 | 58.0 | 64.5 | 46.47 | 34.96 | 69.53 | -- | -- | -- | 256.52 | 15.90 | NS |
| **Total Metals (mg/kg)** | | | | | | | | | | | | |
| Arsenic | 2.26 | 2.38 | 2.59 | 2.51 | 2.18 | 2.33 | -- | -- | -- | 2.59 | 2.23 | 20 |
| Barium | 10.6 | 77.3 | 28.4 | 32.9 | 104 | 16.8 | -- | -- | -- | 15.1 | 12.9 | 3000 |
| Cadmium | < 0.45 | < 0.48 | < 0.52 | < 0.5 | < 0.44 | < 0.47 | -- | -- | -- | < 0.52 | < 0.45 | 80 |
| Chromium | 7.58 | 10.3 | 9.71 | 10.2 | 10.5 | 7.29 | -- | -- | -- | 8.7 | 7.93 | 200 |
| Lead | 6.95 | 167 | 55.1 | 53.2 | 455 | 24.3 | -- | -- | -- | 48.3 | 31.4 | 600 |
| Mercury | < 0.03 | 0.06 | 0.07 | 0.06 | 0.07 | 0.05 | -- | -- | -- | 0.06 | 0.03 | 40 |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | |
| 4,4'-DDT | < 0.003 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | -- | -- | -- | 0.02 | 0.01 | 30 |
| Dieldrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | 0.003 | < 0.003 | 0.6 |
| **PCBs (mg/kg)** | | | | | | | | | | | | |
| PCB Aroclor 1248 | < 0.05 | 0.08 | 0.10 | 0.07 | < 0.05 | 0.10 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | -- |
| PCB Aroclor 1254 | 0.07 | 0.20 | 0.10 | 0.20 | 0.10 | 0.10 | 2.9 D | 0.10 | 0.09 | 0.20 | 0.20 | -- |
| **Total PCBs** | 0.07 | 0.29 | 0.20 | 0.27 | 0.10 | 0.20 | 2.9 | 0.10 | 0.09 | 0.20 | 0.20 | 4 |

Notes:
Laboratory analytical results compared to RCS-2, S3 GW-2, and S3 GW-3 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
Exceeds MassDEP MCP RCS-2

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Table 4
Site 3 - Soil All Parameters
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 3 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | | MCP Concentrations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Q-7 | S-0.5 | S-7 | U-0.5 | U-7 | W-0.5 | W-7 | Y-0.5 | Y-3 | Y-5 | Y-7 | |
| Sample ID | Q-7 | S-0.5 | S-7 | U-0.5 | U-7 | W-0.5 | W-7 | Y-0.5 | Y-3 | Y-5 | Y-7 | |
| Sample Depth (feet) | 0-10 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | |
| Sample Date | 7/2/2024 | 7/1/2024 | 7/2/2024 | 7/1/2024 | 7/2/2024 | 7/1/2024 | 7/2/2024 | 7/1/2024 | 7/1/2024 | 7/1/2024 | 7/1/2024 | |
| Laboratory Sample ID | 24G0130-13<br>24G0130-14 | 24G0131-07<br>24G0131-08 | 24G0130-15<br>24G0130-16 | 24G0131-05<br>24G0131-06 | 24G0130-17<br>24G0130-18 | 24G0131-03<br>24G0131-04 | 24G0130-19<br>24G0130-20 | 24G0131-01<br>24G0131-02 | 24G0131-19<br>24G0131-20 | 24G0131-15<br>24G0131-16 | 24G0131-17<br>24G0131-18 | RCS-2 |
| **SVOCs (mg/kg)** | | | | | | | | | | | | |
| 1,1-Biphenyl | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | 6 |
| 2-Methylnaphthalene | < 0.27 | < 0.28 | < 0.28 | < 0.27 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 80 |
| Acenaphthene | < 0.27 | < 0.28 | < 0.28 | < 0.27 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 3000 |
| Acenaphthylene | < 0.27 | < 0.28 | < 0.28 | < 0.27 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 10 |
| Anthracene | < 0.27 | 0.46 | < 0.28 | < 0.27 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 3000 |
| Benzo(A)anthracene | < 0.27 | 0.97 | < 0.28 | < 0.27 | < 0.25 | 0.41 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 300 |
| Benzo(A)pyrene | < 0.27 | 0.90 | < 0.28 | < 0.27 | < 0.25 | 0.51 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 30 |
| Benzo(B)fluoranthene | < 0.27 | 0.84 | < 0.28 | < 0.27 | < 0.25 | 0.34 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 300 |
| Benzo(g,h,i)Perylene | < 0.27 | 0.64 | < 0.28 | < 0.27 | < 0.25 | 0.45 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 3000 |
| Benzo(K)fluoranthene | < 0.27 | 0.75 | < 0.28 | < 0.27 | < 0.25 | 0.37 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 3000 |
| Chrysene | < 0.27 | 1.00 | < 0.28 | < 0.27 | < 0.25 | 0.44 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 3000 |
| Dibenzo(A,H)anthracene | < 0.27 | < 0.28 | < 0.28 | < 0.27 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 30 |
| Dibenzofuran | < 0.27 | < 0.28 | < 0.28 | < 0.27 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | NS |
| Fluoranthene | < 0.27 | 2.51 | < 0.28 | 0.52 | < 0.25 | 0.56 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 3000 |
| Fluorene | < 0.27 | < 0.28 | < 0.28 | < 0.27 | < 0.25 | < 0.254 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 3000 |
| Hydrocarbon, Oil, Petroleum | 30.9 | 18.8 | 11.4 | 26.1 | < 10.5 | 56.9 | < 10.6 | 46.1 | 25.2 | < 10.6 | 10.8 | NS |
| Indeno (1,2,3-cd) pyrene | < 0.27 | 0.62 | < 0.28 | < 0.27 | < 0.25 | 0.33 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 300 |
| Naphthalene | < 0.27 | < 0.28 | < 0.28 | < 0.27 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 20 |
| Phenanthrene | < 0.27 | 2.16 | < 0.28 | < 0.27 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 1000 |
| Pyrene | < 0.27 | 1.81 | < 0.28 | 0.45 | < 0.25 | 0.81 | < 0.25 | < 0.25 | < 0.26 | < 0.27 | < 0.26 | 3000 |
| **Total SVOCs** | 30.9 | 31.44 | 11.4 | 26.82 | 0 | 4.62 | 0 | 46.1 | 25.2 | 0 | 10.8 | NS |
| **Total Metals (mg/kg)** | | | | | | | | | | | | |
| Arsenic | 2.56 | 2.71 | 2.22 | 2.15 | 2.53 | 2.37 | 2.22 | 2.26 | 2.13 | 2.17 | 2.47 | 20 |
| Barium | 13 | 20.9 | 11.7 | 19.3 | 10.1 | 24 | 6.88 | 11 | 8.96 | 7.84 | 8.04 | 3000 |
| Cadmium | < 0.51 | < 0.54 | < 0.44 | < 0.43 | < 0.51 | < 0.47 | < 0.44 | < 0.45 | < 0.43 | < 0.43 | < 0.49 | 80 |
| Chromium | 8.35 | 15.3 | 11 | 14 | 5.74 | 21.5 | 6.42 | 6.65 | 5.41 | 5.38 | 6.87 | 200 |
| Lead | 17 | 47.6 | 14.1 | 43.3 | 7.9 | 36.2 | 9.57 | 11 | 14.4 | 7.24 | 7.14 | 600 |
| Mercury | 0.10 | 0.131 | < 0.03 | 0.11 | < 0.03 | 0.04 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | 40 |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | |
| 4,4'-DDT | 0.010 | 0.024 | 0.009 | 0.01 | 0.003 | 0.01 | 0.003 | 0.005 | < 0.003 | < 0.003 | 0.004 | 30 |
| Dieldrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.6 |
| **PCBs (mg/kg)** | | | | | | | | | | | | |
| PCB Aroclor 1248 | 0.09 | 0.20 | 0.06 | < 0.05 | < 0.05 | 0.10 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | -- |
| PCB Aroclor 1254 | 0.20 | 0.60 | 0.10 | 0.20 | < 0.05 | 0.30 | < 0.05 | < 0.05 | < 0.05 | 0.07 | < 0.05 | -- |
| **Total PCBs** | 0.29 | 0.80 | 0.16 | 0.20 | 0.00 | 0.41 | 0 | 0 | 0 | 0.07 | 0 | 4 |

Notes:
Laboratory analytical results compared to RCS-2, S3 GW-2, and S3 GW-3 Massachusetts Contingency Plan Standards.
SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
All data reported in mg/kg = milligrams per kilogram.
D = identified in an analysis that has been diluted
< = not detected above laboratory reporting limit
-- = Not Tested
Exceeds MassDEP MCP RCS-2

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | A-1 | A-3 | A-5 | A-7 | AA-8.5 | BB-1 | BB-3 | BB-5 | BB-7 | C-1 | | | | |
| Sample ID | A-1 | A-3 | A-5 | A-7 | AA-8.5 | BB-1 | BB-3 | BB-5 | BB-7 | C-1 | | | | |
| Sample Depth (feet) | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-4 | 0-4 | | | | |
| Sample Date | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 5/2/2024 | | | | |
| Laboratory Sample ID | 24E0050-03 | 24E0050-02 | 24E0050-01 | 24E0050-05 | 24E0026-09 | 24E0026-08 | 24E0026-07 | 24E0026-06 | 24E0026-05 | 24E0124-01 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| **VOCs (mg/kg)** | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.1 | 0.1 | -- | -- |
| 1,1,1-Trichloroethane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 30 | 600 | -- | -- |
| 1,1,2,2-Tetrachloroethane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.005 | 0.02 | -- | -- |
| 1,1,2-Trichloroethane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.1 | 2 | -- | -- |
| 1,1-Dichloroethane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.4 | 9 | -- | -- |
| 1,1-Dichloroethylene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 3 | 40 | -- | -- |
| 1,1-Dichloropropene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,2,3-Trichlorobenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,2,3-Trichloropropane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,2,4-Trichlorobenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 2 | 6 | -- | -- |
| 1,2-Dibromo-3-chloropropane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,2-Dibromoethane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.1 | 0.1 | -- | -- |
| 1,2-Dichlorobenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 9 | 100 | -- | -- |
| 1,2-Dichloroethane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.1 | 0.1 | -- | -- |
| 1,2-Dichloropropane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.1 | 0.1 | -- | -- |
| 1,3,4-Trimethylbenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,3,5-Trimethylbenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,3-Dichlorobenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 3 | 200 | -- | -- |
| 1,3-Dichloropropane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,4-Dioxane | < 0.086 | < 0.096 | < 0.095 | < 0.12 | < 0.092 | < 0.111 | < 0.098 | < 0.101 | < 0.094 | < 0.108 | 0.2 | 5 | -- | -- |
| 2,2-Dichloropropane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 4-Isopropyltoluene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Acetone | < 0.043 | < 0.048 | < 0.048 | < 0.0599 | < 0.046 | < 0.056 | < 0.049 | < 0.050 | < 0.047 | < 0.054 | 6 | 50 | -- | -- |
| Benzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 2 | 200 | -- | -- |
| Bromobenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Bromochloromethane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Bromodichloromethane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.1 | 0.1 | -- | -- |
| Bromoform | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.1 | 1 | -- | -- |
| Bromomethane | < 0.009 | < 0.010 | < 0.010 | < 0.012 | < 0.009 | < 0.011 | < 0.010 | < 0.010 | < 0.009 | < 0.011 | 0.5 | 0.5 | -- | -- |
| Carbon Disulfide | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Carbon Tetrachloride | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 5 | 5 | -- | -- |
| Chlorobenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 1 | 3 | -- | -- |
| Chlorodibromomethane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.005 | 0.03 | -- | -- |
| Chloroethane | < 0.009 | < 0.010 | < 0.010 | < 0.012 | < 0.009 | < 0.011 | < 0.010 | < 0.010 | < 0.009 | < 0.011 | -- | -- | -- | -- |
| Chloroform | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.2 | 0.2 | -- | -- |
| Cis-1,2-dichloroethylene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.1 | 0.1 | -- | -- |
| cis-1,3-Dichloropropene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Dibromomethane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Dichlorodifluoromethane | < 0.009 | < 0.010 | < 0.010 | < 0.012 | < 0.009 | < 0.011 | < 0.010 | < 0.010 | < 0.009 | < 0.011 | -- | -- | -- | -- |
| Dichloromethane | < 0.022 | < 0.024 | < 0.024 | < 0.03 | < 0.023 | < 0.028 | < 0.025 | < 0.025 | < 0.024 | < 0.027 | 0.1 | 3 | -- | -- |
| Diisopropyl Ether | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Ethyl benzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 40 | 1000 | -- | -- |
| Ethyl ether | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Ethyl tert-butyl ether | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Fluorotrichloromethane | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Hexachlorobutadiene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 30 | 100 | -- | -- |
| Hexachloroethane | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.7 | 3 | -- | -- |
| Isopropyl benzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| m,p-Xylenes | < 0.009 | < 0.010 | < 0.010 | < 0.012 | < 0.009 | < 0.011 | < 0.010 | < 0.010 | < 0.009 | < 0.011 | -- | -- | -- | -- |
| Methyl Chloride | < 0.009 | < 0.010 | < 0.010 | < 0.012 | < 0.009 | < 0.011 | < 0.010 | < 0.010 | < 0.009 | < 0.011 | -- | -- | -- | -- |
| Methyl ethyl ketone | < 0.043 | < 0.048 | < 0.048 | < 0.060 | < 0.046 | < 0.056 | < 0.049 | < 0.050 | < 0.047 | < 0.054 | 4 | 50 | -- | -- |
| Methyl isobutyl ketone | < 0.043 | < 0.048 | < 0.048 | < 0.060 | < 0.046 | < 0.056 | < 0.049 | < 0.050 | < 0.047 | < 0.054 | 0.4 | 50 | -- | -- |
| Methyl n-butyl ketone | < 0.043 | < 0.048 | < 0.048 | < 0.060 | < 0.046 | < 0.056 | < 0.049 | < 0.050 | < 0.047 | < 0.054 | -- | -- | -- | -- |
| Methyl-tert-butyl ether | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.1 | 100 | -- | -- |
| n-Butylbenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| n-Propylbenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Naphthalene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 4 | 20 | -- | -- |
| O-chlorotoluene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| o-Xylenes | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| p-Chlorotoluene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| P-dichlorobenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.7 | 1 | -- | -- |
| sec-Butylbenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Styrene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 3 | 4 | -- | -- |
| Tert-amyl-methyl ether | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| tert-Butylbenzene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Tetrachloroethylene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 1 | 4 | -- | -- |
| Tetrahydrofuran | < 0.017 | < 0.019 | < 0.019 | < 0.024 | < 0.018 | < 0.022 | < 0.020 | < 0.020 | < 0.019 | < 0.022 | -- | -- | -- | -- |
| Toluene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 30 | 1000 | -- | -- |
| Trans-1,2-dichloroethylene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 1 | 1 | -- | -- |
| trans-1,3-Dichloropropene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Trichloroethylene | < 0.004 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.3 | 0.3 | -- | -- |
| Vinyl Chloride | < 0.009 | < 0.010 | < 0.010 | < 0.012 | < 0.009 | < 0.011 | < 0.010 | < 0.010 | < 0.009 | < 0.011 | 0.3 | 0.7 | -- | -- |
| Xylene | < 0.009 | < 0.010 | < 0.010 | < 0.012 | < 0.009 | < 0.011 | < 0.010 | < 0.010 | < 0.009 | < 0.011 | 100 | 100 | -- | -- |
| Total VOCs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -- | -- | 10 | 4 |

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | A-1 | A-3 | A-5 | A-7 | AA-8.5 | BB-1 | BB-3 | BB-5 | BB-7 | C-1 | | | | |
| Sample ID | A-1 | A-3 | A-5 | A-7 | AA-8.5 | BB-1 | BB-3 | BB-5 | BB-7 | C-1 | | | | |
| Sample Depth (feet) | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-4 | 0-4 | | | | |
| Sample Date | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 5/2/2024 | | | | |
| Laboratory Sample ID | 24E0050-03 | 24E0050-02 | 24E0050-01 | 24E0050-05 | 24E0026-09 | 24E0026-08 | 24E0026-07 | 24E0026-06 | 24E0026-05 | 24E0124-01 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| **SVOCs (mg/kg)** | | | | | | | | | | | | | | |
| 1,1-Biphenyl | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | 0.05 | 6 | -- | -- |
| 1,2,4-Trichlorobenzene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 2 | 6 | -- | -- |
| 1,2-Dichlorobenzene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 9 | 100 | -- | -- |
| 1,3-Dichlorobenzene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 3 | 200 | -- | -- |
| 2,4,5-Trichlorophenol | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 4 | 600 | -- | -- |
| 2,4,6-Trichlorophenol | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 20 | -- | -- |
| 2,4-Dichlorophenol | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 40 | -- | -- |
| 2,4-Dimethylphenol | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 100 | -- | -- |
| 2,4-Dinitrophenol | < 1.15 | < 1.11 | < 1.12 | < 1.12 | < 1.10 | < 1.11 | < 1.15 | < 1.10 | < 1.11 | < 1.11 | 3 | 50 | -- | -- |
| 2,4-Dinitrotoluene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 10 | -- | -- |
| 2,6-Dinitrotoluene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| 2-Chloronaphthalene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| 2-Chlorophenol | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 100 | -- | -- |
| 2-Methylnaphthalene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 80 | -- | -- |
| 2-Methylphenol | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| 2-Nitrophenol | < 0.57 | < 0.55 | < 0.56 | < 0.56 | < 0.55 | < 0.56 | < 0.58 | < 0.55 | < 0.56 | < 0.55 | -- | -- | -- | -- |
| 3 & 4 Methylphenol | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| 3,3'-Dichlorobenzidine | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 3 | 20 | -- | -- |
| 4-Bromophenyl phenyl ether | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| 4-Nitrophenol | < 1.15 | < 1.11 | < 1.12 | < 1.12 | < 1.10 | < 1.11 | < 1.15 | < 1.1 | < 1.11 | < 1.11 | -- | -- | -- | -- |
| Acenaphthene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 4 | 3000 | -- | -- |
| Acenaphthylene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.48 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 2 | 10 | -- | -- |
| Acetophenone | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| Aniline | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| Anthracene | < 0.29 | 1.41 | < 0.28 | < 0.28 | 0.67 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 1000 | 3000 | -- | -- |
| Azobenzene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| Benzo(A)anthracene | 0.33 | 7.33 | 0.51 | < 0.28 | 2.38 | 0.45 | 0.32 | 0.28 | < 0.28 | < 0.28 | 20 | 300 | -- | -- |
| Benzo(A)pyrene | 0.35 | 7.30 | 0.52 | < 0.28 | 2.33 | 0.49 | 0.32 | 0.30 | < 0.28 | < 0.28 | 2 | 30 | -- | -- |
| Benzo(B)fluoranthene | < 0.29 | 6.25 | 0.39 | < 0.28 | 2.53 | 0.52 | 0.35 | 0.29 | < 0.28 | < 0.28 | 20 | 300 | -- | -- |
| Benzo(g,h,i)Perylene | 0.45 | 4.44 | 0.37 | < 0.28 | 1.52 | 0.36 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 1000 | 3000 | -- | -- |
| Benzo(K)fluoranthene | < 0.29 | 4.84 | 0.32 | < 0.28 | 0.97 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 200 | 3000 | -- | -- |
| bis (2-chloroethoxy) Methane | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| bis (2-chloroethyl) Ether | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 0.7 | -- | -- |
| bis (2-chloroisopropyl) Ether | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 0.7 | -- | -- |
| Bis (2-ethylhexyl) phthalate | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | 0.40 | 100 | 700 | -- | -- |
| Butylbenzylphthalate | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| Chrysene | 0.31 | 6.28 | 0.48 | < 0.28 | 2.27 | 0.44 | 0.34 | 0.31 | < 0.28 | < 0.28 | 200 | 3000 | -- | -- |
| Di-n-octyl phthalate | < 0.57 | < 0.55 | < 0.56 | < 0.56 | < 0.55 | < 0.56 | < 0.58 | < 0.55 | < 0.56 | < 0.55 | -- | -- | -- | -- |
| Dibenzo(A,H)anthracene | < 0.29 | 1.28 | < 0.28 | < 0.28 | 0.35 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 2 | 30 | -- | -- |
| Dibenzofuran | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| Diethyl phthalate | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 10 | 200 | -- | -- |
| Dimethyl phthalate | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 50 | -- | -- |
| Fluoranthene | 0.69 | 10.00 | 0.92 | < 0.28 | 5.39 | 0.87 | 0.60 | 0.50 | 0.42 | < 0.28 | 1000 | 3000 | -- | -- |
| Fluorene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 1000 | 3000 | -- | -- |
| Hexachlorobenzene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 0.9 | -- | -- |
| Hexachlorobutadiene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 30 | 100 | -- | -- |
| Hexachloroethane | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 3 | -- | -- |
| Indeno (1,2,3-cd) pyrene | < 0.29 | 5.31 | 0.34 | < 0.28 | 1.46 | 0.35 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 20 | 300 | -- | -- |
| Isophorone | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| N-dibutyl phthalate | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| n-Nitrosodimethylamine | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| Naphthalene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 4 | 20 | -- | -- |
| Nitrobenzene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| P-chloroaniline | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 1 | 3 | -- | -- |
| P-dichlorobenzene | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.7 | 1 | -- | -- |
| Pentachlorophenol | < 1.15 | < 1.11 | < 1.12 | < 1.12 | < 1.1 | < 1.11 | < 1.15 | < 1.1 | < 1.11 | < 1.11 | 3 | 10 | -- | -- |
| Phenanthrene | 0.37 | 3.82 | 0.58 | < 0.28 | 2.83 | 0.47 | 0.34 | 0.29 | < 0.28 | < 0.28 | 10 | 1000 | -- | -- |
| Phenols | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | 0.9 | 20 | -- | -- |
| Pyrene | 0.64 | 9.49 | 1.07 | < 0.28 | 4.59 | 0.74 | 0.54 | 0.51 | 0.40 | < 0.28 | 1000 | 3000 | -- | -- |
| Pyridine | < 0.29 | < 0.28 | < 0.28 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | < 0.28 | < 0.28 | -- | -- | -- | -- |
| **Total SVOCs** | 3.15 | 67.75 | 5.51 | 0 | 27.77 | 4.70 | 2.82 | 2.48 | 0.81 | 0.40 | -- | -- | 100 | 100 |
| **Petroleum Hydrocarbons (mg/kg)** | | | | | | | | | | | | | | |
| C9-C36 | 31.3 | 36.2 | 39.1 | 14 | 66.4 | 42.5 D | 21.9 | 16.4 | 18.8 | < 11 | -- | -- | -- | -- |

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Terminal, New Bedford, Massachusetts | | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | A-1 | A-3 | A-5 | A-7 | AA-8.5 | BB-1 | BB-3 | BB-5 | BB-7 | C-1 | | | | |
| Sample ID | A-1 | A-3 | A-5 | A-7 | AA-8.5 | BB-1 | BB-3 | BB-5 | BB-7 | C-1 | | | | |
| Sample Depth (feet) | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-5 | 0-4 | 0-4 | | | | |
| Sample Date | 5/1/2024 | 5/1/2024 | 5/1/2024 | 5/1/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 5/2/2024 | | | | |
| Laboratory Sample ID | 24E0050-03 | 24E0050-02 | 24E0050-01 | 24E0050-05 | 24E0026-09 | 24E0026-08 | 24E0026-07 | 24E0026-06 | 24E0026-05 | 24E0124-01 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | | | |
| 2,2-Dichloropropionic acid | < 0.049 | < 0.048 | < 0.048 | < 0.051 | < 0.048 | < 0.049 | < 0.049 | < 0.05 | < 0.049 | < 0.05 | -- | -- | -- | -- |
| 2,4,5-Trichlorophenoxyacetic acid | < 0.01 | < 0.01 | < 0.01 | < 0.011 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | -- | -- | -- | -- |
| 2,4,5-Trichlorophenoxypropionic acid | < 0.01 | < 0.01 | < 0.01 | < 0.011 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | -- | -- | -- | -- |
| 2,4-Dichlorophenoxyacetic acid | < 0.05 | < 0.05 | < 0.05 | < 0.052 | < 0.049 | < 0.05 | < 0.051 | < 0.052 | < 0.051 | < 0.051 | -- | -- | -- | -- |
| 2-(2-Methyl-1,4-chlorophenoxy) propionic acid | < 2.51 | 2.48 | 2.48 | 2.62 | < 2.47 | < 2.52 | < 2.56 | < 2.58 | < 2.54 | < 2.56 | -- | -- | -- | -- |
| 4,4'-DDD | < 0.003 | < 0.003 | < 0.003 | 0.01 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 10 | 40 | -- | -- |
| 4,4'-DDE | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 7 | 30 | -- | -- |
| 4,4'-DDT | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 7 | 30 | -- | -- |
| 4-(2,4-dichlorophenoxy)-Butanoic acid | < 0.051 | < 0.050 | < 0.050 | < 0.053 | < 0.050 | < 0.051 | < 0.052 | < 0.052 | < 0.051 | < 0.052 | -- | -- | -- | -- |
| Aldrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.09 | 0.5 | -- | -- |
| beta-BHC | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-delta | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-gamma | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | 0.003 | 0.5 | -- | -- |
| Chlordane (mixture of isomers) | < 0.022 | < 0.022 | < 0.022 | < 0.022 | < 0.021 | < 0.023 | < 0.021 | < 0.023 | < 0.022 | < 0.021 | -- | -- | -- | -- |
| Chlordane, alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Dicamba | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | -- | -- | -- | -- |
| chloroprop (2-(2,4-dichlorophenoxy) propanoic acid) | < 0.050 | < 0.050 | < 0.050 | < 0.052 | < 0.049 | < 0.050 | < 0.051 | < 0.052 | < 0.051 | < 0.051 | -- | -- | -- | -- |
| Dieldrin | < 0.003 | 0.003 | 0.007 | < 0.003 | 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.09 | 0.6 | -- | -- |
| Dinoseb | < 0.051 | < 0.050 | < 0.050 | < 0.053 | < 0.050 | < 0.051 | < 0.052 | < 0.052 | < 0.051 | < 0.052 | -- | -- | -- | -- |
| Endosulfan sulfate | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endosulfan, alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endosulfan, beta | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 20 | 30 | -- | -- |
| Endrin ketone | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Heptachlor | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.3 | 2 | -- | -- |
| Heptachlor Epoxide | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.2 | 1 | -- | -- |
| Hexachlorobenzene | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.7 | 0.9 | -- | -- |
| Methoxychlor | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 300 | 400 | -- | -- |
| Methylchlorophenoxyacetic acid | < 2.480 | < 2.450 | < 2.450 | < 2.590 | < 2.450 | < 2.490 | < 2.530 | < 2.550 | < 2.510 | < 2.540 | -- | -- | -- | -- |
| Toxaphene | < 0.139 | < 0.136 | < 0.137 | < 0.140 | < 0.130 | < 0.144 | < 0.134 | < 0.141 | < 0.138 | < 0.133 | -- | -- | -- | -- |
| trans-Chlordane | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | 0.08 | < 0.06 | -- | -- | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.06 | < 0.05 | 0.1 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- | -- | -- |
| PCB Aroclor 1254 | 0.1 | 0.3 | 0.1 | 0.3 | 0.2 | 0.6 | 0.2 | 0.07 | 0.06 | 0.2 | -- | -- | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | 0.1 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | | | | |
| PCB Aroclor 1262 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | -- | -- | -- | -- |
| **Total PCBs** | 0.1 | 0.3 | 0.1 | 0.4 | 0.2 | 0.7 | 0.2 | 0.07 | 0.14 | 0.2 | 1 | 4 | < 2 | < 2 |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | |
| Arsenic | 2.52 | 4.04 | 2.93 | 4.2 | 3.2 | 2.36 | 2.84 | 2.75 | 2.74 | 3.84 | 20 | 20 | 40 | 40 |
| Barium | 10.6 | 63.4 | 21 | 37.5 | 21.8 | 17.5 | 20.7 | 11.7 | 24 | 15.4 | 1000 | 3000 | -- | -- |
| Cadmium | < 0.41 | 0.52 | < 0.38 | < 0.42 | < 0.4 | < 0.39 | < 0.44 | < 0.42 | < 0.44 | < 0.41 | 80 | 80 | 80 | 30 |
| Chromium | 7.77 | 24.2 | 8.58 | 7.62 | 5.85 | 10.6 | 10.1 | 8.38 | 4.85 | 13.2 | 100 | 200 | 1000 | 1000 |
| Lead | 15.8 | 164 | 72.7 | 105 | 125 | 34 | 39.3 | 20.6 | 96 | 53.3 | 200 | 600 | 2000 | 1000 |
| Mercury | 0.06 | 0.118 | 0.15 | 0.44 | 0.20 | 0.08 | 0.13 | 0.08 | < 0.04 | < 0.04 | 20 | 40 | 10 | 10 |
| Selenium | < 4.09 | < 4.12 | < 3.79 | < 4.17 | < 4.02 | < 3.92 | < 4.43 | < 4.17 | < 4.44 | < 4.08 | 400 | 800 | -- | -- |
| Silver | < 0.41 | < 0.41 | < 0.38 | < 0.42 | < 0.4 | < 0.39 | < 0.44 | < 0.42 | < 0.44 | < 0.41 | 100 | 200 | -- | -- |
| **TCLP (mg/L)** | | | | | | | | | | | | | | |
| Lead TCLP (mg/L) | -- | 0.94 | -- | 1.12 | 1.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **General Chemistry** | | | | | | | | | | | | | | |
| Corrosivity (pH) | 7.9 | 8.08 | 8.34 | 8.48 | 6.91 | 7.79 | 8.31 | 7.7 | 6.72 | 8.02 | -- | -- | -- | -- |
| **Physical Conditions** | | | | | | | | | | | | | | |
| Flashpoint ($^{o}$F) | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | -- | -- | -- | -- |
| Reactivity - Cyanide (mg/kg) | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | -- | -- | -- | -- |
| Reactivity - Sulfide (mg/kg) | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | -- | -- | -- | -- |
| Specific Conductance @ 25$^{o}$C (µmhos/cm) | 50 | 134 | 141 | 51 | 8 | 255 | 89 | 49 | 9 | 123 | -- | -- | 8000 | 4000 |

Notes:
Laboratory analytical results compared to RCS-1, RCS-2, Massachusetts Contingency Plan Standards and Massachusetts COMM-97 Landfill standards.
VOCs = Volatile Organic Carbons; SVOCs = Semi-Volatile Organic Carbons; PCBs = Polychlorinated Biphenyls
D = identified in an analysis that has been diluted
P = pesticide target analyte had a % difference > 25% between 2 GC columns
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceedance of MassDEP MCP RCS-1
Exceedance of MassDEP MCP RCS-1 & RCS-2
Exceedance of COMM-97 - Lined Landfill criteria
Exceedance of COMM-97 - Unlined Landfill criteria

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | C-3 | C-5 | C-7 | D-8.5 | DD-1 | DD-3 | DD-5 | DD-7 | E-1 | E-3 | | | | |
| Sample ID | C-3 | C-5 | C-7 | D-8.5 | DD-1 | DD-3 | DD-5 | DD-7 | E-1 | E-3 0-3 | | | | |
| Sample Depth (feet) | 0-4.8 | 0-5 | 0-4.3 | 0-4 | 0-5 | 0-5 | 0-4.5 | 0-3 | 0-5 | 0-3 | | | | |
| Sample Date | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 5/2/2024 | 5/3/2024 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| Laboratory Sample ID | 24E0124-02 | 24E0124-03 | 24E0124-04 | 24E0124-05 | 24D1044-18 | 24E0026-03 | 24E0026-02 | 24E0026-01 | 24E0124-08 | 24E0124-16 | | | | |
| **VOCs (mg/kg)** | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.1 | 0.1 | -- | -- |
| 1,1,1-Trichloroethane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 30 | 600 | -- | -- |
| 1,1,2,2-Tetrachloroethane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.005 | 0.02 | -- | -- |
| 1,1,2-Trichloroethane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.1 | 2 | -- | -- |
| 1,1-Dichloroethane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.4 | 9 | -- | -- |
| 1,1-Dichloroethylene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 3 | 40 | -- | -- |
| 1,1-Dichloropropene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.608 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| 1,2,3-Trichlorobenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| 1,2,3-Trichloropropane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| 1,2,4-Trichlorobenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 2 | 6 | -- | -- |
| 1,2-Dibromo-3-chloropropane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 1.52 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| 1,2-Dibromoethane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.1 | 0.1 | -- | -- |
| 1,2-Dichlorobenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 9 | 100 | -- | -- |
| 1,2-Dichloroethane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.1 | 0.1 | -- | -- |
| 1,2-Dichloropropane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.1 | 0.1 | -- | -- |
| 1,3,4-Trimethylbenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| 1,3,5-Trimethylbenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| 1,3-Dichlorobenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 3 | 200 | -- | -- |
| 1,3-Dichloropropane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| 1,4-Dioxane | < 0.107 | < 0.098 | < 0.131 | < 0.126 | < 0.093 | < 0.091 | < 0.101 | < 30.4 | < 0.106 | < 0.131 | 0.2 | 5 | -- | -- |
| 2,2-Dichloropropane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| 4-Isopropyltoluene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Acetone | < 0.054 | < 0.049 | < 0.065 | < 0.063 | < 0.047 | < 0.045 | < 0.051 | < 1.52 | < 0.053 | < 0.066 | 6 | 50 | -- | -- |
| Benzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 2 | 200 | -- | -- |
| Bromobenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Bromochloromethane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Bromodichloromethane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.1 | 0.1 | -- | -- |
| Bromoform | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.1 | 1 | -- | -- |
| Bromomethane | < 0.011 | < 0.010 | < 0.013 | < 0.013 | < 0.009 | < 0.009 | < 0.010 | < 0.304 | < 0.011 | < 0.013 | 0.5 | 0.5 | -- | -- |
| Carbon Disulfide | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Carbon Tetrachloride | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 5 | 5 | -- | -- |
| Chlorobenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 1 | 3 | -- | -- |
| Chlorodibromomethane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.005 | 0.03 | -- | -- |
| Chloroethane | < 0.011 | < 0.010 | < 0.013 | < 0.013 | < 0.009 | < 0.009 | < 0.010 | < 0.304 | < 0.011 | < 0.013 | -- | -- | -- | -- |
| Chloroform | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.2 | 0.2 | -- | -- |
| Cis-1,2-dichloroethylene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.1 | 0.1 | -- | -- |
| cis-1,3-Dichloropropene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Dibromomethane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Dichlorodifluoromethane | < 0.011 | < 0.010 | < 0.013 | < 0.013 | < 0.009 | < 0.009 | < 0.010 | < 0.304 | < 0.011 | < 0.013 | -- | -- | -- | -- |
| Dichloromethane | < 0.027 | < 0.025 | < 0.033 | < 0.032 | < 0.023 | < 0.023 | < 0.025 | < 0.608 | < 0.027 | < 0.033 | 0.1 | 3 | -- | -- |
| Diisopropyl Ether | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Ethyl benzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 40 | 1000 | -- | -- |
| Ethyl ether | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Ethyl tert-butyl ether | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Fluorotrichloromethane | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Hexachlorobutadiene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 30 | 100 | -- | -- |
| Hexachloroethane | -- | -- | -- | -- | -- | -- | -- | < 0.304 | -- | -- | 0.7 | 3 | -- | -- |
| Isopropyl benzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| m,p-Xylenes | < 0.011 | < 0.010 | < 0.013 | < 0.013 | < 0.009 | < 0.009 | < 0.010 | < 0.608 | < 0.011 | < 0.013 | -- | -- | -- | -- |
| Methyl Chloride | < 0.011 | < 0.010 | < 0.013 | < 0.013 | < 0.009 | < 0.009 | < 0.010 | < 0.304 | < 0.011 | < 0.013 | -- | -- | -- | -- |
| Methyl ethyl ketone | < 0.054 | < 0.049 | < 0.065 | < 0.063 | < 0.047 | < 0.045 | < 0.051 | < 1.52 | < 0.053 | < 0.066 | 4 | 50 | -- | -- |
| Methyl isobutyl ketone | < 0.054 | < 0.049 | < 0.065 | < 0.063 | < 0.047 | < 0.045 | < 0.051 | < 1.52 | < 0.053 | < 0.066 | 0.4 | 50 | -- | -- |
| Methyl n-butyl ketone | < 0.054 | < 0.049 | < 0.065 | < 0.063 | < 0.047 | < 0.045 | < 0.051 | < 1.52 | < 0.053 | < 0.066 | -- | -- | -- | -- |
| Methyl-tert-butyl ether | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.1 | 100 | -- | -- |
| n-Butylbenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| n-Propylbenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Naphthalene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | 0.857 | < 0.005 | < 0.007 | 4 | 20 | -- | -- |
| O-chlorotoluene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| o-Xylenes | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| p-Chlorotoluene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| P-dichlorobenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.7 | 1 | -- | -- |
| sec-Butylbenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Styrene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 3 | 4 | -- | -- |
| Tert-amyl-methyl ether | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| tert-Butylbenzene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Tetrachloroethylene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 1 | 4 | -- | -- |
| Tetrahydrofuran | < 0.022 | < 0.020 | < 0.026 | < 0.025 | < 0.019 | < 0.018 | < 0.020 | < 1.52 | < 0.021 | < 0.026 | -- | -- | -- | -- |
| Toluene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 30 | 1000 | -- | -- |
| Trans-1,2-dichloroethylene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 1 | 1 | -- | -- |
| trans-1,3-Dichloropropene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | -- | -- | -- | -- |
| Trichloroethylene | < 0.005 | < 0.005 | < 0.007 | < 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.304 | < 0.005 | < 0.007 | 0.3 | 0.3 | -- | -- |
| Vinyl Chloride | < 0.011 | < 0.010 | < 0.013 | < 0.013 | < 0.009 | < 0.009 | < 0.010 | < 0.304 | < 0.011 | < 0.013 | 0.3 | 0.7 | -- | -- |
| Xylene | < 0.011 | < 0.010 | < 0.013 | < 0.013 | < 0.009 | < 0.009 | < 0.010 | < 0.608 | < 0.011 | < 0.013 | 100 | 100 | -- | -- |
| Total VOCs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.857 | 0 | 0 | -- | -- | 10 | 4 |

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | C-3 | C-5 | C-7 | D-8.5 | DD-1 | DD-3 | DD-5 | DD-7 | E-1 | E-3 | | | | |
| Sample ID | C-3 | C-5 | C-7 | D-8.5 | DD-1 | DD-3 | DD-5 | DD-7 | E-1 | E-3 0-3 | | | | |
| Sample Depth (feet) | 0-4.8 | 0-5 | 0-4.3 | 0-4 | 0-5 | 0-5 | 0-4.5 | 0-3 | 0-5 | 0-3 | | | | |
| Sample Date | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 5/2/2024 | 5/3/2024 | | | | |
| Laboratory Sample ID | 24E0124-02 | 24E0124-03 | 24E0124-04 | 24E0124-05 | 24D1044-18 | 24E0026-03 | 24E0026-02 | 24E0026-01 | 24E0124-08 | 24E0124-16 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| **SVOCs (mg/kg)** | | | | | | | | | | | | | | |
| 1,1-Biphenyl | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | 0.08 | < 0.03 | < 0.03 | 0.05 | 6 | -- | -- |
| 1,2,4-Trichlorobenzene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 2 | 6 | -- | -- |
| 1,2-Dichlorobenzene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 9 | 100 | -- | -- |
| 1,3-Dichlorobenzene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 3 | 200 | -- | -- |
| 2,4,5-Trichlorophenol | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 4 | 600 | -- | -- |
| 2,4,6-Trichlorophenol | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 0.7 | 20 | -- | -- |
| 2,4-Dichlorophenol | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 0.7 | 40 | -- | -- |
| 2,4-Dimethylphenol | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 0.7 | 100 | -- | -- |
| 2,4-Dinitrophenol | < 1.05 | < 1.04 | < 1.06 | < 1.08 | < 1.16 | < 1.08 | < 1.11 | < 1.08 | < 1.15 | < 1.06 | 3 | 50 | -- | -- |
| 2,4-Dinitrotoluene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 0.7 | 10 | -- | -- |
| 2,6-Dinitrotoluene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| 2-Chloronaphthalene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| 2-Chlorophenol | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 0.7 | 100 | -- | -- |
| 2-Methylnaphthalene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | 0.31 | < 0.29 | < 0.27 | 0.7 | 80 | -- | -- |
| 2-Methylphenol | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| 2-Nitrophenol | < 0.52 | < 0.52 | < 0.53 | < 0.54 | < 0.58 | < 0.54 | < 0.56 | < 0.54 | < 0.57 | < 0.53 | -- | -- | -- | -- |
| 3 & 4 Methylphenol | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| 3,3'-Dichlorobenzidine | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 3 | 20 | -- | -- |
| 4-Bromophenyl phenyl ether | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| 4-Nitrophenol | < 1.05 | < 1.04 | < 1.06 | < 1.08 | < 1.16 | < 1.08 | < 1.11 | < 1.08 | < 1.15 | < 1.06 | -- | -- | -- | -- |
| Acenaphthene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 4 | 3000 | -- | -- |
| Acenaphthylene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | 0.75 | < 0.29 | < 0.27 | 2 | 10 | -- | -- |
| Acetophenone | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| Aniline | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| Anthracene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | 0.53 | < 0.27 | < 0.28 | 0.60 | < 0.29 | < 0.27 | 1000 | 3000 | -- | -- |
| Azobenzene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| Benzo(A)anthracene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | 0.76 | < 0.27 | < 0.28 | 1.02 | 1.00 | 0.29 | 20 | 300 | -- | -- |
| Benzo(A)pyrene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | 0.69 | < 0.27 | < 0.28 | 0.93 | 1.17 | 0.32 | 2 | 30 | -- | -- |
| Benzo(B)fluoranthene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | 0.72 | < 0.27 | < 0.28 | 1.04 | 0.93 | 0.36 | 20 | 300 | -- | -- |
| Benzo(g,h,i)Perylene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | 0.41 | < 0.27 | < 0.28 | 0.51 | 0.84 | < 0.27 | 1000 | 3000 | -- | -- |
| Benzo(K)fluoranthene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | 0.29 | < 0.27 | < 0.28 | 0.41 | 0.85 | < 0.27 | 200 | 3000 | -- | -- |
| bis (2-chloroethoxy) Methane | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| bis (2-chloroethyl) Ether | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 0.7 | 0.7 | -- | -- |
| bis (2-chloroisopropyl) Ether | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 0.7 | 0.7 | -- | -- |
| Bis (2-ethylhexyl) phthalate | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 100 | 700 | -- | -- |
| Butylbenzylphthalate | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | 0.39 | < 0.27 | -- | -- | -- | -- |
| Chrysene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | 0.72 | < 0.27 | < 0.28 | 1.02 | 0.93 | 0.32 | 200 | 3000 | -- | -- |
| Di-n-octyl phthalate | < 0.52 | < 0.52 | < 0.53 | < 0.54 | < 0.58 | < 0.54 | < 0.56 | < 0.54 | < 0.57 | < 0.53 | -- | -- | -- | -- |
| Dibenzo(A,H)anthracene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 2 | 30 | -- | -- |
| Dibenzofuran | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | 0.43 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| Diethyl phthalate | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 10 | 200 | -- | -- |
| Dimethyl phthalate | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 0.7 | 50 | -- | -- |
| Fluoranthene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | 1.85 | < 0.27 | < 0.28 | 3.07 | 1.48 | 0.53 | 1000 | 3000 | -- | -- |
| Fluorene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | 0.59 | < 0.29 | < 0.27 | 1000 | 3000 | -- | -- |
| Hexachlorobenzene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 0.7 | 0.9 | -- | -- |
| Hexachlorobutadiene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 30 | 100 | -- | -- |
| Hexachloroethane | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 0.7 | 3 | -- | -- |
| Indeno (1,2,3-cd) pyrene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | 0.40 | < 0.27 | < 0.28 | 0.55 | 0.92 | < 0.27 | 20 | 300 | -- | -- |
| Isophorone | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| N-dibutyl phthalate | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| n-Nitrosodimethylamine | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| Naphthalene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | 0.79 | < 0.29 | < 0.27 | 4 | 20 | -- | -- |
| Nitrobenzene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| P-chloroaniline | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 1 | 3 | -- | -- |
| P-dichlorobenzene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 0.7 | 1 | -- | -- |
| Pentachlorophenol | < 1.05 | < 1.04 | < 1.06 | < 1.08 | < 1.16 | < 1.08 | < 1.11 | < 1.08 | < 1.15 | < 1.06 | 3 | 10 | -- | -- |
| Phenanthrene | < 0.26 | < 0.26 | < 0.26 | < 0.27 | 1.97 | < 0.27 | < 0.28 | 3.23 | 0.56 | 0.27 | 10 | 1000 | -- | -- |
| Phenols | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | 0.9 | 20 | -- | -- |
| Pyrene | < 0.26 | < 0.26 | 0.32 | < 0.27 | 1.51 | 0.27 | < 0.28 | 2.20 | 1.48 | 0.52 | 1000 | 3000 | -- | -- |
| Pyridine | < 0.26 | < 0.26 | < 0.26 | < 0.27 | < 0.29 | < 0.27 | < 0.28 | < 0.27 | < 0.29 | < 0.27 | -- | -- | -- | -- |
| **Total SVOCs** | 0 | 0 | 0.58 | 0 | 9.85 | 0.27 | 0 | 17.53 | 10.55 | 2.59 | -- | -- | 100 | 100 |
| **Petroleum Hydrocarbons (mg/kg)** | | | | | | | | | | | | | | |
| C9-C36 | < 10.8 | 19.1 | < 10.8 | < 11.6 | 19.8 | 146 D | < 10.5 | 53.2 | 72.3 D | 36.8 | -- | -- | -- | -- |

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | C-3 | C-5 | C-7 | D-8.5 | DD-1 | DD-3 | DD-5 | DD-7 | E-1 | E-3 | | | | |
| Sample ID | C-3 | C-5 | C-7 | D-8.5 | DD-1 | DD-3 | DD-5 | DD-7 | E-1 | E-3 0-3 | | | | |
| Sample Depth (feet) | 0-4.8 | 0-5 | 0-4.3 | 0-4 | 0-5 | 0-5 | 0-4.5 | 0-3 | 0-5 | 0-3 | | | | |
| Sample Date | 5/2/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/30/2024 | 4/30/2024 | 4/30/2024 | 5/2/2024 | 5/3/2024 | | | | |
| Laboratory Sample ID | 24E0124-02 | 24E0124-03 | 24E0124-04 | 24E0124-05 | 24D1044-18 | 24E0026-03 | 24E0026-02 | 24E0026-01 | 24E0124-08 | 24E0124-16 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | | | |
| 2,2-Dichloropropionic acid | < 0.047 | < 0.047 | < 0.047 | < 0.049 | < 0.049 | < 0.048 | < 0.048 | < 0.048 | < 0.050 | < 0.047 | -- | -- | -- | -- |
| 2,4,5-Trichlorophenoxyacetic acid | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | -- | -- | -- | -- |
| 2,4,5-Trichlorophenoxypropionic acid | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | -- | -- | -- | -- |
| 2,4-Dichlorophenoxyacetic acid | < 0.049 | < 0.049 | < 0.049 | < 0.051 | < 0.05 | < 0.049 | < 0.050 | < 0.050 | < 0.052 | < 0.048 | -- | -- | -- | -- |
| 2-(2-Methyl-1,4-chlorophenoxy) propionic acid | < 2.45 | < 2.44 | < 2.44 | < 2.54 | < 2.53 | < 2.49 | < 2.470 | < 2.490 | < 2.590 | < 2.410 | -- | -- | -- | -- |
| 4,4'-DDD | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 10 | 40 | -- | -- |
| 4,4'-DDE | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 7 | 30 | -- | -- |
| 4,4'-DDT | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 7 | 30 | -- | -- |
| 4-(2,4-dichlorophenoxy)-Butanoic acid | < 0.050 | < 0.049 | < 0.049 | < 0.051 | < 0.051 | < 0.050 | < 0.050 | < 0.050 | < 0.052 | < 0.049 | -- | -- | -- | -- |
| Aldrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.09 | 0.5 | -- | -- |
| beta-BHC | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-delta | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-gamma | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | 0.003 | 0.5 | -- | -- |
| Chlordane (mixture of isomers) | < 0.022 | < 0.022 | < 0.021 | < 0.022 | < 0.023 | < 0.021 | < 0.021 | < 0.022 | < 0.021 | < 0.021 | -- | -- | -- | -- |
| Chlordane, alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Dicamba | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | -- | -- | -- | -- |
| chloroprop (2-(2,4-dichlorophenoxy) propanoic acid) | < 0.049 | < 0.049 | < 0.049 | < 0.051 | < 0.051 | < 0.050 | < 0.049 | < 0.050 | < 0.052 | < 0.048 | -- | -- | -- | -- |
| Dieldrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.09 | 0.6 | -- | -- |
| Dinoseb | < 0.050 | < 0.049 | < 0.049 | < 0.051 | < 0.051 | < 0.050 | < 0.050 | < 0.050 | < 0.052 | < 0.049 | -- | -- | -- | -- |
| Endosulfan sulfate | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endosulfan, alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endosulfan, beta | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 20 | 30 | -- | -- |
| Endrin ketone | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Heptachlor | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.3 | 2 | -- | -- |
| Heptachlor Epoxide | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.2 | 1 | -- | -- |
| Hexachlorobenzene | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.7 | 0.9 | -- | -- |
| Methoxychlor | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 300 | 400 | -- | -- |
| Methylchlorophenoxyacetic acid | < 2.420 | < 2.420 | < 2.420 | < 2.510 | < 2.500 | < 2.470 | < 2.450 | < 2.470 | < 2.560 | < 2.390 | -- | -- | -- | -- |
| Toxaphene | < 0.136 | < 0.135 | < 0.128 | < 0.136 | < 0.143 | < 0.128 | < 0.133 | < 0.136 | < 0.134 | < 0.134 | -- | -- | -- | -- |
| trans-Chlordane | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.0026 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | 0.1 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1254 | 0.08 | 0.1 | < 0.05 | 0.1 | 0.6 | 0.09 | 0.08 | < 0.05 | 0.1 | 0.1 | -- | -- | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | | | | |
| PCB Aroclor 1262 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | -- | -- | -- | -- |
| **Total PCBs** | 0.08 | 0.1 | 0 | 0.1 | 0.7 | 0.09 | 0.08 | 0 | 0.1 | 0.1 | 1 | 4 | < 2 | < 2 |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | |
| Arsenic | 4.05 | 2.96 | 1.71 | 1.77 | 7.09 | 2.35 | 1.31 | 2.86 | 6.72 | 5.39 | 20 | 20 | 40 | 40 |
| Barium | 14.1 | 15 | 9.04 | 22.1 | 37.8 | 15.2 | 5.93 | 8.73 | 216 | 31.9 | 1000 | 3000 | -- | -- |
| Cadmium | < 0.36 | < 0.39 | < 0.4 | < 0.43 | < 0.39 | < 0.37 | < 0.4 | < 0.39 | < 0.39 | < 0.36 | 80 | 80 | 80 | 30 |
| Chromium | 6.84 | 5.88 | 4.11 | 4.17 | 23.3 | 10.8 | 4.29 | 4.36 | 26.7 | 11.1 | 100 | 200 | 1000 | 1000 |
| Lead | 24.6 | 169 | 10.9 | 73.8 | 76.2 | 19.5 | 9.18 | 5.02 | 676 | 188 | 200 | 600 | 2000 | 1000 |
| Mercury | < 0.04 | 0.04 | < 0.04 | 0.09 | 0.08 | 0.06 | 0.04 | < 0.03 | 0.24 | 0.15 | 20 | 40 | 10 | 10 |
| Selenium | < 3.6 | < 3.93 | < 4.03 | < 4.29 | < 3.92 | < 3.68 | < 3.96 | < 3.85 | < 3.92 | < 3.64 | 400 | 800 | -- | -- |
| Silver | < 0.36 | < 0.39 | < 0.4 | < 0.43 | < 0.39 | < 0.37 | < 0.4 | < 0.39 | 0.53 | < 0.36 | 100 | 200 | -- | -- |
| **TCLP (mg/L)** | | | | | | | | | | | | | | |
| Lead TCLP (mg/L) | -- | 0.58 | -- | 0.54 | -- | -- | -- | -- | 2.63 | 0.17 | -- | -- | -- | -- |
| **General Chemistry** | | | | | | | | | | | | | | |
| Corrosivity (pH) | 7.75 | 7.68 | 7.46 | 7.11 | 6.62 | 8.06 | 8.95 | 7.95 | 8.5 | 7.96 | -- | -- | -- | -- |
| **Physical Conditions** | | | | | | | | | | | | | | |
| Flashpoint ($^{o}$F) | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | -- | -- | -- | -- |
| Reactivity - Cyanide (mg/kg) | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | -- | -- | -- | -- |
| Reactivity - Sulfide (mg/kg) | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | -- | -- | -- | -- |
| Specific Conductance @ 25$^{o}$C (µmhos/cm) | 59 | 186 | 36 | 35 | 30 | 57 | 59 | 72 | 145 | 124 | -- | -- | 8000 | 4000 |

Notes:
Laboratory analytical results compared to RCS-1, RCS-2,
VOCs = Volatile Organic Carbons; SVOCs = Semi-Volat
D = identified in an analysis that has been diluted
P = pesticide target analyte had a % difference > 25% bet
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceedance of MassDEP MCP RCS-1
Exceedance of MassDEP MCP RCS-1 & RCS-2
Exceedance of COMM-97 - Lined Landfill criteria
Exceedance of COMM-97 - Unlined Landfill criteria

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | E-3 | E-5 | E-7 | EE-0.5 | EE-8.5 | FF-1 | FF-3 | FF-5 | FF-7 | G-1 | MCP Concentrations | | | |
| Sample ID | E-3 3-7 | E-5 | E-7 | EE-0.5 | EE-8.5 | FF-1 | FF-3 | FF-5 | FF-7 | G-1 | | | | |
| Sample Depth (feet) | 3-7 | 0-4.3 | 0-4.5 | 0-3.5 | 0-4.5 | 0-5 | 0-4 | 0-4 | 0-3.5 | 0-5 | | | | |
| Sample Date | 5/3/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 5/2/2024 | | | | |
| Laboratory Sample ID | 24E0124-17 | 24E0124-07 | 24E0124-06 | 24D1044-14 | 24D1044-13 | 24D1044-12 | 24D1044-11 | 24D1044-10 | 24D1044-09 | 24E0124-11 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| **VOCs (mg/kg)** | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 0.1 | 0.1 | -- | -- |
| 1,1,1-Trichloroethane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 30 | 600 | -- | -- |
| 1,1,2,2-Tetrachloroethane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 0.005 | 0.02 | -- | -- |
| 1,1,2-Trichloroethane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 0.1 | 2 | -- | -- |
| 1,1-Dichloroethane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 0.4 | 9 | -- | -- |
| 1,1-Dichloroethylene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 3 | 40 | -- | -- |
| 1,1-Dichloropropene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| 1,2,3-Trichlorobenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| 1,2,3-Trichloropropane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| 1,2,4-Trichlorobenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 2 | 6 | -- | -- |
| 1,2-Dibromo-3-chloropropane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| 1,2-Dibromoethane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 0.1 | 0.1 | -- | -- |
| 1,2-Dichlorobenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 9 | 100 | -- | -- |
| 1,2-Dichloroethane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 0.1 | 0.1 | -- | -- |
| 1,2-Dichloropropane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 0.1 | 0.1 | -- | -- |
| 1,3,4-Trimethylbenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| 1,3,5-Trimethylbenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| 1,3-Dichlorobenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 3 | 200 | -- | -- |
| 1,3-Dichloropropane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| 1,4-Dioxane | < 0.116 | < 0.121 | < 0.135 | < 0.136 | < 0.096 | < 0.090 | < 0.090 | < 0.092 | < 0.095 | < 0.111 | 0.2 | 5 | -- | -- |
| 2,2-Dichloropropane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| 4-Isopropyltoluene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Acetone | < 0.058 | < 0.060 | < 0.068 | < 0.068 | < 0.048 | < 0.045 | < 0.045 | < 0.046 | < 0.047 | < 0.055 | 6 | 50 | -- | -- |
| Benzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 2 | 200 | -- | -- |
| Bromobenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Bromochloromethane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Bromodichloromethane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 0.1 | 0.1 | -- | -- |
| Bromoform | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 0.1 | 1 | -- | -- |
| Bromomethane | < 0.012 | < 0.012 | < 0.014 | < 0.014 | < 0.010 | < 0.009 | < 0.009 | < 0.009 | < 0.010 | < 0.011 | 0.5 | 0.5 | -- | -- |
| Carbon Disulfide | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Carbon Tetrachloride | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 5 | 5 | -- | -- |
| Chlorobenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 1 | 3 | -- | -- |
| Chlorodibromomethane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 0.005 | 0.03 | -- | -- |
| Chloroethane | < 0.012 | < 0.012 | < 0.014 | < 0.014 | < 0.010 | < 0.009 | < 0.009 | < 0.009 | < 0.010 | < 0.011 | -- | -- | -- | -- |
| Chloroform | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 0.2 | 0.2 | -- | -- |
| Cis-1,2-dichloroethylene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 0.1 | 0.1 | -- | -- |
| cis-1,3-Dichloropropene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Dibromomethane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Dichlorodifluoromethane | < 0.012 | < 0.012 | < 0.014 | < 0.014 | < 0.010 | < 0.009 | < 0.009 | < 0.009 | < 0.010 | < 0.011 | -- | -- | -- | -- |
| Dichloromethane | < 0.029 | < 0.030 | < 0.034 | < 0.034 | < 0.024 | < 0.023 | < 0.023 | < 0.023 | < 0.024 | < 0.028 | 0.1 | 3 | -- | -- |
| Diisopropyl Ether | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Ethyl benzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 40 | 1000 | -- | -- |
| Ethyl ether | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Ethyl tert-butyl ether | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Fluorotrichloromethane | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Hexachlorobutadiene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | 30 | 100 | -- | -- |
| Hexachloroethane | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.7 | 3 | -- | -- |
| Isopropyl benzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| m,p-Xylenes | < 0.012 | < 0.012 | < 0.014 | < 0.014 | < 0.010 | < 0.009 | < 0.009 | < 0.009 | < 0.010 | < 0.011 | -- | -- | -- | -- |
| Methyl Chloride | < 0.012 | < 0.012 | < 0.014 | < 0.014 | < 0.010 | < 0.009 | < 0.009 | < 0.009 | < 0.010 | < 0.011 | -- | -- | -- | -- |
| Methyl ethyl ketone | < 0.058 | < 0.060 | < 0.068 | < 0.068 | < 0.048 | < 0.045 | < 0.0452 | < 0.046 | < 0.047 | < 0.055 | 4 | 50 | -- | -- |
| Methyl isobutyl ketone | < 0.058 | < 0.060 | < 0.068 | < 0.068 | < 0.048 | < 0.045 | < 0.0452 | < 0.046 | < 0.047 | < 0.055 | 0.4 | 50 | -- | -- |
| Methyl n-butyl ketone | < 0.058 | < 0.060 | < 0.068 | < 0.068 | < 0.048 | < 0.045 | < 0.0452 | < 0.046 | < 0.047 | < 0.055 | -- | -- | -- | -- |
| Methyl-tert-butyl ether | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | 0.1 | 100 | -- | -- |
| n-Butylbenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| n-Propylbenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Naphthalene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | 4 | 20 | -- | -- |
| O-chlorotoluene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| o-Xylenes | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| p-Chlorotoluene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| P-dichlorobenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | 0.7 | 1 | -- | -- |
| sec-Butylbenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Styrene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | 3 | 4 | -- | -- |
| Tert-amyl-methyl ether | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| tert-Butylbenzene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Tetrachloroethylene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | 1 | 4 | -- | -- |
| Tetrahydrofuran | < 0.023 | < 0.024 | < 0.027 | < 0.027 | < 0.019 | < 0.018 | < 0.0181 | < 0.018 | < 0.019 | < 0.022 | -- | -- | -- | -- |
| Toluene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | 30 | 1000 | -- | -- |
| Trans-1,2-dichloroethylene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | 1 | 1 | -- | -- |
| trans-1,3-Dichloropropene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | -- | -- | -- | -- |
| Trichloroethylene | < 0.006 | < 0.006 | < 0.007 | < 0.007 | < 0.005 | < 0.005 | < 0.0045 | < 0.005 | < 0.005 | < 0.006 | 0.3 | 0.3 | -- | -- |
| Vinyl Chloride | < 0.012 | < 0.012 | < 0.014 | < 0.014 | < 0.010 | < 0.009 | < 0.009 | < 0.009 | < 0.010 | < 0.011 | 0.3 | 0.7 | -- | -- |
| Xylene | < 0.012 | < 0.012 | < 0.014 | < 0.014 | < 0.010 | < 0.009 | < 0.009 | < 0.009 | < 0.010 | < 0.011 | 100 | 100 | -- | -- |
| Total VOCs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -- | -- | 10 | 4 |

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | E-3 | E-5 | E-7 | EE-0.5 | EE-8.5 | FF-1 | FF-3 | FF-5 | FF-7 | G-1 | | | | |
| Sample ID | E-3 3-7 | E-5 | E-7 | EE-0.5 | EE-8.5 | FF-1 | FF-3 | FF-5 | FF-7 | G-1 | | | | |
| Sample Depth (feet) | 3-7 | 0-4.3 | 0-4.5 | 0-3.5 | 0-4.5 | 0-5 | 0-4 | 0-4 | 0-3.5 | 0-5 | | | | |
| Sample Date | 5/3/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 5/2/2024 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| Laboratory Sample ID | 24E0124-17 | 24E0124-07 | 24E0124-06 | 24D1044-14 | 24D1044-13 | 24D1044-12 | 24D1044-11 | 24D1044-10 | 24D1044-09 | 24E0124-11 | | | | |
| **SVOCs (mg/kg)** | | | | | | | | | | | | | | |
| 1,1-Biphenyl | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | 0.05 | 6 | -- | -- |
| 1,2,4-Trichlorobenzene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 2 | 6 | -- | -- |
| 1,2-Dichlorobenzene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 9 | 100 | -- | -- |
| 1,3-Dichlorobenzene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 3 | 200 | -- | -- |
| 2,4,5-Trichlorophenol | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 4 | 600 | -- | -- |
| 2,4,6-Trichlorophenol | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.7 | 20 | -- | -- |
| 2,4-Dichlorophenol | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.7 | 40 | -- | -- |
| 2,4-Dimethylphenol | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.7 | 100 | -- | -- |
| 2,4-Dinitrophenol | < 1.00 | < 1.13 | < 1.19 | < 1.17 | < 1.14 | < 1.09 | < 1.07 | < 1.08 | < 1.14 | < 1.13 | 3 | 50 | -- | -- |
| 2,4-Dinitrotoluene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.7 | 10 | -- | -- |
| 2,6-Dinitrotoluene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| 2-Chloronaphthalene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| 2-Chlorophenol | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.7 | 100 | -- | -- |
| 2-Methylnaphthalene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.7 | 80 | -- | -- |
| 2-Methylphenol | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| 2-Nitrophenol | < 0.50 | < 0.57 | < 0.60 | < 0.58 | < 0.57 | < 0.54 | < 0.54 | < 0.54 | < 0.57 | < 0.56 | -- | -- | -- | -- |
| 3 & 4 Methylphenol | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| 3,3'-Dichlorobenzidine | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 3 | 20 | -- | -- |
| 4-Bromophenyl phenyl ether | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| 4-Nitrophenol | < 1.00 | < 1.13 | < 1.19 | < 1.17 | < 1.14 | < 1.09 | < 1.07 | < 1.08 | < 1.14 | < 1.13 | -- | -- | -- | -- |
| Acenaphthene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 4 | 3000 | -- | -- |
| Acenaphthylene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 2 | 10 | -- | -- |
| Acetophenone | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| Aniline | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| Anthracene | < 0.25 | 0.44 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 1000 | 3000 | -- | -- |
| Azobenzene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| Benzo(A)anthracene | 0.33 | 1.29 | < 0.30 | < 0.29 | < 0.29 | 0.42 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 20 | 300 | -- | -- |
| Benzo(A)pyrene | 0.36 | 1.21 | < 0.30 | < 0.29 | < 0.29 | 0.42 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 2 | 30 | -- | -- |
| Benzo(B)fluoranthene | 0.37 | 0.92 | < 0.30 | < 0.29 | < 0.29 | 0.44 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 20 | 300 | -- | -- |
| Benzo(g,h,i)Perylene | < 0.25 | 0.75 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 1000 | 3000 | -- | -- |
| Benzo(K)fluoranthene | < 0.25 | 0.90 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 200 | 3000 | -- | -- |
| bis (2-chloroethoxy) Methane | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| bis (2-chloroethyl) Ether | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.7 | 0.7 | -- | -- |
| bis (2-chloroisopropyl) Ether | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.7 | 0.7 | -- | -- |
| Bis (2-ethylhexyl) phthalate | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 100 | 700 | -- | -- |
| Butylbenzylphthalate | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| Chrysene | 0.32 | 1.20 | < 0.30 | < 0.29 | < 0.29 | 0.41 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 200 | 3000 | -- | -- |
| Di-n-octyl phthalate | < 0.50 | < 0.57 | < 0.60 | < 0.58 | < 0.57 | < 0.54 | < 0.54 | < 0.54 | < 0.57 | < 0.56 | -- | -- | -- | -- |
| Dibenzo(A,H)anthracene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 2 | 30 | -- | -- |
| Dibenzofuran | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| Diethyl phthalate | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 10 | 200 | -- | -- |
| Dimethyl phthalate | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.7 | 50 | -- | -- |
| Fluoranthene | 0.51 | 2.28 | < 0.30 | < 0.29 | < 0.29 | 0.88 | < 0.27 | < 0.27 | < 0.29 | 0.31 | 1000 | 3000 | -- | -- |
| Fluorene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 1000 | 3000 | -- | -- |
| Hexachlorobenzene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.7 | 0.9 | -- | -- |
| Hexachlorobutadiene | < 0.25 | < 0.283 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 30 | 100 | -- | -- |
| Hexachloroethane | < 0.25 | < 0.283 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.7 | 3 | -- | -- |
| Indeno (1,2,3-cd) pyrene | < 0.25 | 0.80 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 20 | 300 | -- | -- |
| Isophorone | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| N-dibutyl phthalate | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| n-Nitrosodimethylamine | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| Naphthalene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 4 | 20 | -- | -- |
| Nitrobenzene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| P-chloroaniline | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 1 | 3 | -- | -- |
| P-dichlorobenzene | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.7 | 1 | -- | -- |
| Pentachlorophenol | < 1.00 | < 1.13 | < 1.19 | < 1.17 | < 1.14 | < 1.09 | < 1.07 | < 1.08 | < 1.14 | < 1.13 | 3 | 10 | -- | -- |
| Phenanthrene | < 0.25 | 1.78 | < 0.30 | < 0.29 | < 0.29 | 0.45 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 10 | 1000 | -- | -- |
| Phenols | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | 0.9 | 20 | -- | -- |
| Pyrene | 0.60 | 2.54 | < 0.30 | < 0.29 | < 0.29 | 0.76 | < 0.27 | < 0.27 | < 0.29 | 0.29 | 1000 | 3000 | -- | -- |
| Pyridine | < 0.25 | < 0.28 | < 0.30 | < 0.29 | < 0.29 | < 0.27 | < 0.27 | < 0.27 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| **Total SVOCs** | 2.47 | 14.10 | 0 | 0 | 0 | 3.77 | 0 | 0 | 0 | 0.60 | -- | -- | 100 | 100 |
| **Petroleum Hydrocarbons (mg/kg)** | | | | | | | | | | | | | | |
| C9-C36 | 20.6 | 70.3 | 19.60 | 72.80 D | < 11.10 | 42.00 | < 11.40 | < 10.50 | 16.20 | 27.50 | -- | -- | -- | -- |

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | E-3 | E-5 | E-7 | EE-0.5 | EE-8.5 | FF-1 | FF-3 | FF-5 | FF-7 | G-1 | | | | |
| Sample ID | E-3 3-7 | E-5 | E-7 | EE-0.5 | EE-8.5 | FF-1 | FF-3 | FF-5 | FF-7 | G-1 | | | | |
| Sample Depth (feet) | 3-7 | 0-4.3 | 0-4.5 | 0-3.5 | 0-4.5 | 0-5 | 0-4 | 0-4 | 0-3.5 | 0-5 | | | | |
| Sample Date | 5/3/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 4/29/2024 | 5/2/2024 | | | | |
| Laboratory Sample ID | 24E0124-17 | 24E0124-07 | 24E0124-06 | 24D1044-14 | 24D1044-13 | 24D1044-12 | 24D1044-11 | 24D1044-10 | 24D1044-09 | 24E0124-11 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | | | |
| 2,2-Dichloropropionic acid | < 0.047 | < 0.048 | < 0.054 | < 0.049 | < 0.049 | < 0.048 | < 0.047 | < 0.049 | < 0.051 | < 0.049 | -- | -- | -- | -- |
| 2,4,5-Trichlorophenoxyacetic acid | < 0.010 | < 0.010 | < 0.011 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.011 | < 0.010 | -- | -- | -- | -- |
| 2,4,5-Trichlorophenoxypropionic acid | < 0.010 | < 0.010 | < 0.011 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.011 | < 0.010 | -- | -- | -- | -- |
| 2,4-Dichlorophenoxyacetic acid | < 0.048 | < 0.050 | < 0.056 | < 0.051 | < 0.050 | < 0.050 | < 0.049 | < 0.051 | < 0.053 | < 0.051 | -- | -- | -- | -- |
| 2-(2-Methyl-1,4-chlorophenoxy) propionic acid | < 2.410 | < 2.480 | < 2.810 | < 2.540 | < 2.520 | < 2.500 | < 2.430 | < 2.540 | < 2.660 | < 2.530 | -- | -- | -- | -- |
| 4,4'-DDD | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 10 | 40 | -- | -- |
| 4,4'-DDE | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 7 | 30 | -- | -- |
| 4,4'-DDT | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 7 | 30 | -- | -- |
| 4-(2,4-dichlorophenoxy)-Butanoic acid | < 0.049 | < 0.050 | < 0.057 | < 0.051 | < 0.051 | < 0.051 | < 0.049 | < 0.051 | < 0.054 | < 0.051 | -- | -- | -- | -- |
| Aldrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.09 | 0.5 | -- | -- |
| beta-BHC | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-delta | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-gamma | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | 0.003 | 0.5 | -- | -- |
| Chlordane (mixture of isomers) | < 0.021 | < 0.022 | < 0.023 | < 0.022 | < 0.022 | < 0.021 | < 0.022 | < 0.022 | < 0.023 | < 0.023 | -- | -- | -- | -- |
| Chlordane, alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Dicamba | < 0.010 | < 0.010 | < 0.011 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.011 | < 0.010 | -- | -- | -- | -- |
| chloroprop (2-(2,4-dichlorophenoxy) propanoic acid) | < 0.048 | < 0.050 | < 0.056 | < 0.051 | < 0.050 | < 0.050 | < 0.049 | < 0.051 | < 0.053 | < 0.051 | -- | -- | -- | -- |
| Dieldrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.025 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.09 | 0.6 | -- | -- |
| Dinoseb | < 0.049 | < 0.050 | < 0.057 | < 0.051 | < 0.051 | < 0.051 | < 0.049 | < 0.051 | < 0.054 | < 0.051 | -- | -- | -- | -- |
| Endosulfan sulfate | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endosulfan, alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endosulfan, beta | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.006 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 20 | 30 | -- | -- |
| Endrin ketone | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Heptachlor | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.3 | 2 | -- | -- |
| Heptachlor Epoxide | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.2 | 1 | -- | -- |
| Hexachlorobenzene | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.7 | 0.9 | -- | -- |
| Methoxychlor | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 300 | 400 | -- | -- |
| Methylchlorophenoxyacetic acid | < 2.380 | < 2.450 | < 2.780 | < 2.510 | < 2.490 | < 2.480 | < 2.400 | < 2.510 | < 2.630 | < 2.500 | -- | -- | -- | -- |
| Toxaphene | < 0.129 | < 0.139 | < 0.146 | < 0.138 | < 0.136 | < 0.134 | < 0.140 | < 0.136 | < 0.146 | < 0.145 | -- | -- | -- | -- |
| trans-Chlordane | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | -- | -- | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | -- | -- | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | -- | -- | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | -- | -- | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | 0.1 | < 0.05 | < 0.05 | < 0.05 | 0.08 | < 0.06 | -- | -- | -- | -- |
| PCB Aroclor 1254 | 0.2 | 0.09 | < 0.06 | 0.08 | 0.2 | 2.3 D | < 0.05 | < 0.05 | 0.07 | 0.2 | -- | -- | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.1 | | | | |
| PCB Aroclor 1262 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | -- | -- | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | -- | -- | -- | -- |
| **Total PCBs** | 0.2 | 0.09 | 0 | 0.08 | 0.3 | 2.33 | 0 | 0 | 0.15 | 0.2 | 1 | 4 | < 2 | < 2 |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | |
| Arsenic | 2.99 | 8.09 | 6.38 | 4.39 | 6.02 | 1.47 | 4.08 | 3.12 | 4.41 | 4.4 | 20 | 20 | 40 | 40 |
| Barium | 14.9 | 104 | 58 | 28.6 | 66.6 | 16.6 | 16.4 | 16.4 | 20.7 | 50 | 1000 | 3000 | -- | -- |
| Cadmium | < 0.39 | < 0.38 | < 0.44 | < 0.41 | < 0.37 | < 0.38 | < 0.42 | < 0.4 | < 0.43 | < 0.42 | 80 | 80 | 80 | 30 |
| Chromium | 5.89 | 12.5 | 11.8 | 10.7 | 12 | 5.23 | 9.93 | 7.16 | 9.44 | 12.3 | 100 | 200 | 1000 | 1000 |
| Lead | 53.5 | 368 | 171 | 37.6 | 134 | 22.1 | 13.9 | 6.21 | 61.3 | 441 | 200 | 600 | 2000 | 1000 |
| Mercury | 0.36 | 0.99 D | 0.33 | < 0.03 | 0.14 | 0.13 | < 0.04 | < 0.03 | 0.05 | 0.14 | 20 | 40 | 10 | 10 |
| Selenium | < 3.87 | < 3.84 | < 4.4 | < 4.13 | < 3.73 | < 3.78 | < 4.17 | < 3.98 | < 4.27 | < 4.16 | 400 | 800 | -- | -- |
| Silver | < 0.39 | < 0.38 | < 0.44 | < 0.41 | < 0.37 | < 0.38 | < 0.42 | < 0.4 | < 0.43 | < 0.42 | 100 | 200 | -- | -- |
| **TCLP (mg/L)** | | | | | | | | | | | | | | |
| Lead TCLP (mg/L) | -- | 1.38 | 0.4 | -- | 0.71 | -- | -- | -- | -- | 3.25 | -- | -- | -- | -- |
| **General Chemistry** | | | | | | | | | | | | | | |
| Corrosivity (pH) | 8.7 | 8.57 | 7.76 | 6.45 | 8.15 | 7.1 | 8.19 | 6.48 | 6.67 | 8.45 | -- | -- | -- | -- |
| **Physical Conditions** | | | | | | | | | | | | | | |
| Flashpoint (°F) | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | -- | -- | -- | -- |
| Reactivity - Cyanide (mg/kg) | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | -- | -- | -- | -- |
| Reactivity - Sulfide (mg/kg) | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | -- | -- | -- | -- |
| Specific Conductance @ 25°C (µmhos/cm) | 206 | 213 | 129 | 53 | 136 | 46 | 119 | 9 | 56 | 202 | -- | -- | 8000 | 4000 |

Notes:
Laboratory analytical results compared to RCS-1, RCS-2,
VOCs = Volatile Organic Carbons; SVOCs = Semi-Volat
D = identified in an analysis that has been diluted
P = pesticide target analyte had a % difference > 25% bet
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceedance of MassDEP MCP RCS-1
Exceedance of MassDEP MCP RCS-1 & RCS-2
Exceedance of COMM-97 - Lined Landfill criteria
Exceedance of COMM-97 - Unlined Landfill criteria

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | G-3 | G-3 | G-5 | G-7 | H-8.5 | HH-1 | HH-3 | HH-5 | HH-7 | I-1 | | | | |
| Sample ID | G-3 0-4 | G-3 4-8 | G-5 | G-7 | H-8.5 | HH-1 | HH-3 | HH-5 | HH-7 | I-1 | | | | |
| Sample Depth (feet) | 0-4 | 4-8 | 0-5 | 0-4.5 | 0-4.5 | 0-4 | 0-5 | 0-4 | 0-4 | 0-4 | | | | |
| Sample Date | 5/1/2024 | 5/1/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/30/2024 | 4/29/2024 | 4/29/2024 | 5/2/2024 | | | | |
| Laboratory Sample ID | 24E0050-06 | 24E0050-07 | 24E0124-10 | 24E0124-09 | 24E0124-12 | 24D1044-08 | 24E0026-04 | 24D1044-06 | 24D1044-05 | 24E0124-15 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| **VOCs (mg/kg)** | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.1 | 0.1 | -- | -- |
| 1,1,1-Trichloroethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 30 | 600 | -- | -- |
| 1,1,2,2-Tetrachloroethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.005 | 0.02 | -- | -- |
| 1,1,2-Trichloroethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.1 | 2 | -- | -- |
| 1,1-Dichloroethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.4 | 9 | -- | -- |
| 1,1-Dichloroethylene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 3 | 40 | -- | -- |
| 1,1-Dichloropropene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| 1,2,3-Trichlorobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| 1,2,3-Trichloropropane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| 1,2,4-Trichlorobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 2 | 6 | -- | -- |
| 1,2-Dibromo-3-chloropropane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| 1,2-Dibromoethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.1 | 0.1 | -- | -- |
| 1,2-Dichlorobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 9 | 100 | -- | -- |
| 1,2-Dichloroethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.1 | 0.1 | -- | -- |
| 1,2-Dichloropropane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.1 | 0.1 | -- | -- |
| 1,3,4-Trimethylbenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| 1,3,5-Trimethylbenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| 1,3-Dichlorobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 3 | 200 | -- | -- |
| 1,3-Dichloropropane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| 1,4-Dioxane | < 0.097 | < 0.102 | < 0.101 | < 0.110 | < 0.107 | < 0.087 | < 0.093 | < 0.086 | < 0.125 | < 0.094 | 0.2 | 5 | -- | -- |
| 2,2-Dichloropropane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| 4-Isopropyltoluene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Acetone | < 0.049 | < 0.051 | < 0.050 | < 0.055 | < 0.054 | < 0.044 | < 0.046 | < 0.043 | < 0.063 | < 0.047 | 6 | 50 | -- | -- |
| Benzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 2 | 200 | -- | -- |
| Bromobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Bromochloromethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Bromodichloromethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.1 | 0.1 | -- | -- |
| Bromoform | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.1 | 1 | -- | -- |
| Bromomethane | < 0.010 | < 0.010 | < 0.010 | < 0.011 | < 0.011 | < 0.009 | < 0.009 | < 0.009 | < 0.013 | < 0.009 | 0.5 | 0.5 | -- | -- |
| Carbon Disulfide | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Carbon Tetrachloride | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 5 | 5 | -- | -- |
| Chlorobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 1 | 3 | -- | -- |
| Chlorodibromomethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.005 | 0.03 | -- | -- |
| Chloroethane | < 0.010 | < 0.010 | < 0.010 | < 0.011 | < 0.011 | < 0.009 | < 0.009 | < 0.009 | < 0.013 | < 0.009 | -- | -- | -- | -- |
| Chloroform | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.2 | 0.2 | -- | -- |
| Cis-1,2-dichloroethylene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.1 | 0.1 | -- | -- |
| cis-1,3-Dichloropropene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Dibromomethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Dichlorodifluoromethane | < 0.010 | < 0.010 | < 0.010 | < 0.011 | < 0.011 | < 0.009 | < 0.009 | < 0.009 | < 0.013 | < 0.009 | -- | -- | -- | -- |
| Dichloromethane | < 0.024 | < 0.026 | < 0.025 | < 0.028 | < 0.027 | < 0.022 | < 0.023 | < 0.021 | < 0.031 | < 0.024 | 0.1 | 3 | -- | -- |
| Diisopropyl Ether | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Ethyl benzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 40 | 1000 | -- | -- |
| Ethyl ether | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Ethyl tert-butyl ether | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Fluorotrichloromethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Hexachlorobutadiene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 30 | 100 | -- | -- |
| Hexachloroethane | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.7 | 3 | -- | -- |
| Isopropyl benzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| m,p-Xylenes | < 0.010 | < 0.010 | < 0.010 | < 0.011 | < 0.011 | < 0.009 | < 0.009 | < 0.009 | < 0.013 | < 0.009 | -- | -- | -- | -- |
| Methyl Chloride | < 0.010 | < 0.010 | < 0.010 | < 0.011 | < 0.011 | < 0.009 | < 0.009 | < 0.009 | < 0.013 | < 0.009 | -- | -- | -- | -- |
| Methyl ethyl ketone | < 0.049 | < 0.051 | < 0.050 | < 0.055 | < 0.054 | < 0.044 | < 0.046 | < 0.043 | < 0.063 | < 0.047 | 4 | 50 | -- | -- |
| Methyl isobutyl ketone | < 0.049 | < 0.051 | < 0.050 | < 0.055 | < 0.054 | < 0.044 | < 0.046 | < 0.043 | < 0.063 | < 0.047 | 0.4 | 50 | -- | -- |
| Methyl n-butyl ketone | < 0.049 | < 0.051 | < 0.050 | < 0.055 | < 0.054 | < 0.044 | < 0.046 | < 0.043 | < 0.063 | < 0.047 | -- | -- | -- | -- |
| Methyl-tert-butyl ether | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.1 | 100 | -- | -- |
| n-Butylbenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| n-Propylbenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Naphthalene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | 0.013 | < 0.004 | < 0.006 | < 0.005 | 4 | 20 | -- | -- |
| O-chlorotoluene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| o-Xylenes | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| p-Chlorotoluene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| P-dichlorobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.7 | 1 | -- | -- |
| sec-Butylbenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Styrene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 3 | 4 | -- | -- |
| Tert-amyl-methyl ether | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| tert-Butylbenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Tetrachloroethylene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 1 | 4 | -- | -- |
| Tetrahydrofuran | < 0.019 | < 0.020 | < 0.020 | < 0.022 | < 0.021 | < 0.018 | < 0.019 | < 0.017 | < 0.025 | < 0.019 | -- | -- | -- | -- |
| Toluene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 30 | 1000 | -- | -- |
| Trans-1,2-dichloroethylene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 1 | 1 | -- | -- |
| trans-1,3-Dichloropropene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | -- | -- | -- | -- |
| Trichloroethylene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.004 | < 0.005 | < 0.004 | < 0.006 | < 0.005 | 0.3 | 0.3 | -- | -- |
| Vinyl Chloride | < 0.010 | < 0.010 | < 0.010 | < 0.011 | < 0.011 | < 0.009 | < 0.009 | < 0.009 | < 0.013 | < 0.009 | 0.3 | 0.7 | -- | -- |
| Xylene | < 0.010 | < 0.010 | < 0.010 | < 0.011 | < 0.011 | < 0.009 | < 0.009 | < 0.009 | < 0.013 | < 0.009 | 100 | 100 | -- | -- |
| Total VOCs | 0 | 0 | 0 | 0 | 0 | 0 | 0.013 | 0 | 0 | 0 | -- | -- | 10 | 4 |

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | G-3 | G-3 | G-5 | G-7 | H-8.5 | HH-1 | HH-3 | HH-5 | HH-7 | I-1 | | | | |
| Sample ID | G-3 0-4 | G-3 4-8 | G-5 | G-7 | H-8.5 | HH-1 | HH-3 | HH-5 | HH-7 | I-1 | | | | |
| Sample Depth (feet) | 0-4 | 4-8 | 0-5 | 0-4.5 | 0-4.5 | 0-4 | 0-5 | 0-4 | 0-4 | 0-4 | | | | |
| Sample Date | 5/1/2024 | 5/1/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/30/2024 | 4/29/2024 | 4/29/2024 | 5/2/2024 | | | | |
| Laboratory Sample ID | 24E0050-06 | 24E0050-07 | 24E0124-10 | 24E0124-09 | 24E0124-12 | 24D1044-08 | 24E0026-04 | 24D1044-06 | 24D1044-05 | 24E0124-15 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| **SVOCs (mg/kg)** | | | | | | | | | | | | | | |
| 1,1-Biphenyl | < 0.03 | 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | 0.04 | < 0.03 | < 0.03 | < 0.03 | 0.05 | 6 | -- | -- |
| 1,2,4-Trichlorobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 2 | 6 | -- | -- |
| 1,2-Dichlorobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 9 | 100 | -- | -- |
| 1,3-Dichlorobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 3 | 200 | -- | -- |
| 2,4,5-Trichlorophenol | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 4 | 600 | -- | -- |
| 2,4,6-Trichlorophenol | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.7 | 20 | -- | -- |
| 2,4-Dichlorophenol | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.7 | 40 | -- | -- |
| 2,4-Dimethylphenol | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.7 | 100 | -- | -- |
| 2,4-Dinitrophenol | < 1.09 | < 1.12 | < 1.08 | < 1.11 | < 1.03 | < 1.11 | < 1.09 | < 1.11 | < 1.14 | < 1.11 | 3 | 50 | -- | -- |
| 2,4-Dinitrotoluene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.7 | 10 | -- | -- |
| 2,6-Dinitrotoluene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| 2-Chloronaphthalene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| 2-Chlorophenol | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.7 | 100 | -- | -- |
| 2-Methylnaphthalene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.7 | 80 | -- | -- |
| 2-Methylphenol | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| 2-Nitrophenol | < 0.55 | < 0.56 | < 0.54 | < 0.55 | < 0.51 | < 0.56 | < 0.55 | < 0.55 | < 0.57 | < 0.56 | -- | -- | -- | -- |
| 3 & 4 Methylphenol | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| 3,3'-Dichlorobenzidine | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 3 | 20 | -- | -- |
| 4-Bromophenyl phenyl ether | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| 4-Nitrophenol | < 1.09 | < 1.12 | < 1.08 | < 1.11 | < 1.03 | < 1.11 | < 1.09 | < 1.11 | < 1.14 | < 1.11 | -- | -- | -- | -- |
| Acenaphthene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 4 | 3000 | -- | -- |
| Acenaphthylene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 2 | 10 | -- | -- |
| Acetophenone | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| Aniline | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| Anthracene | < 0.27 | 0.40 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | 0.47 | < 0.28 | < 0.29 | < 0.28 | 1000 | 3000 | -- | -- |
| Azobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| Benzo(A)anthracene | < 0.27 | 0.78 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | 0.48 | < 0.28 | < 0.29 | 0.38 | 20 | 300 | -- | -- |
| Benzo(A)pyrene | < 0.27 | 0.80 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | 0.40 | < 0.28 | < 0.29 | 0.40 | 2 | 30 | -- | -- |
| Benzo(B)fluoranthene | < 0.27 | 0.55 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | 0.41 | < 0.28 | < 0.29 | 0.46 | 20 | 300 | -- | -- |
| Benzo(g,h,i)Perylene | < 0.27 | 0.52 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 1000 | 3000 | -- | -- |
| Benzo(K)fluoranthene | < 0.27 | 0.47 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 200 | 3000 | -- | -- |
| bis (2-chloroethoxy) Methane | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| bis (2-chloroethyl) Ether | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.7 | 0.7 | -- | -- |
| bis (2-chloroisopropyl) Ether | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.7 | 0.7 | -- | -- |
| Bis (2-ethylhexyl) phthalate | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | 0.53 | < 0.28 | 100 | 700 | -- | -- |
| Butylbenzylphthalate | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | 1.32 | < 0.28 | -- | -- | -- | -- |
| Chrysene | < 0.27 | 0.77 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | 0.42 | < 0.28 | < 0.29 | 0.43 | 200 | 3000 | -- | -- |
| Di-n-octyl phthalate | < 0.55 | < 0.56 | < 0.54 | < 0.55 | < 0.51 | < 0.56 | < 0.55 | < 0.55 | 1.03 | < 0.56 | -- | -- | -- | -- |
| Dibenzo(A,H)anthracene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 2 | 30 | -- | -- |
| Dibenzofuran | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| Diethyl phthalate | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 10 | 200 | -- | -- |
| Dimethyl phthalate | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.7 | 50 | -- | -- |
| Fluoranthene | 0.58 | 1.39 | 0.35 | 0.28 | < 0.26 | 0.39 | 1.28 | < 0.28 | < 0.29 | 0.73 | 1000 | 3000 | -- | -- |
| Fluorene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 1000 | 3000 | -- | -- |
| Hexachlorobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.7 | 0.9 | -- | -- |
| Hexachlorobutadiene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 30 | 100 | -- | -- |
| Hexachloroethane | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.7 | 3 | -- | -- |
| Indeno (1,2,3-cd) pyrene | < 0.27 | 0.48 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 20 | 300 | -- | -- |
| Isophorone | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| N-dibutyl phthalate | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| n-Nitrosodimethylamine | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| Naphthalene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | 0.35 | < 0.28 | < 0.29 | < 0.28 | 4 | 20 | -- | -- |
| Nitrobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| P-chloroaniline | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 1 | 3 | -- | -- |
| P-dichlorobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.7 | 1 | -- | -- |
| Pentachlorophenol | < 1.09 | < 1.12 | < 1.08 | < 1.11 | < 1.03 | < 1.11 | < 1.09 | < 1.11 | < 1.14 | < 1.11 | 3 | 10 | -- | -- |
| Phenanthrene | 0.56 | 1.51 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | 1.56 | < 0.28 | < 0.29 | 0.38 | 10 | 1000 | -- | -- |
| Phenols | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | 0.9 | 20 | -- | -- |
| Pyrene | 0.56 | 1.67 | 0.44 | 0.37 | < 0.26 | 0.33 | 0.97 | < 0.28 | < 0.29 | 0.69 | 1000 | 3000 | -- | -- |
| Pyridine | < 0.27 | < 0.28 | < 0.27 | < 0.28 | < 0.26 | < 0.28 | < 0.27 | < 0.28 | < 0.29 | < 0.28 | -- | -- | -- | -- |
| **Total SVOCs** | 1.70 | 9.38 | 0.78 | 0.64 | 0 | 0.71 | 6.37 | 0 | 2.88 | 3.48 | -- | -- | 100 | 100 |
| **Petroleum Hydrocarbons (mg/kg)** | | | | | | | | | | | | | | |
| C9-C36 | 19.60 | 44.70 | 20.70 | 63.40 | 17.90 | 298 | < 11.20 | < 10.60 | 15.50 | 28.10 | -- | -- | -- | -- |

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | G-3 | G-3 | G-5 | G-7 | H-8.5 | HH-1 | HH-3 | HH-5 | HH-7 | I-1 | | | | |
| Sample ID | G-3 0-4 | G-3 4-8 | G-5 | G-7 | H-8.5 | HH-1 | HH-3 | HH-5 | HH-7 | I-1 | | | | |
| Sample Depth (feet) | 0-4 | 4-8 | 0-5 | 0-4.5 | 0-4.5 | 0-4 | 0-5 | 0-4 | 0-4 | 0-4 | | | | |
| Sample Date | 5/1/2024 | 5/1/2024 | 5/2/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/30/2024 | 4/29/2024 | 4/29/2024 | 5/2/2024 | | | | |
| Laboratory Sample ID | 24E0050-06 | 24E0050-07 | 24E0124-10 | 24E0124-09 | 24E0124-12 | 24D1044-08 | 24E0026-04 | 24D1044-06 | 24D1044-05 | 24E0124-15 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | | | |
| 2,2-Dichloropropionic acid | < 0.047 | < 0.051 | < 0.049 | < 0.049 | < 0.047 | < 0.048 | < 0.048 | < 0.049 | < 0.049 | < 0.048 | -- | -- | -- | -- |
| 2,4,5-Trichlorophenoxyacetic acid | < 0.010 | < 0.011 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | -- | -- | -- | -- |
| 2,4,5-Trichlorophenoxypropionic acid | < 0.010 | < 0.011 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | -- | -- | -- | -- |
| 2,4-Dichlorophenoxyacetic acid | < 0.049 | < 0.053 | < 0.051 | < 0.051 | < 0.049 | < 0.049 | < 0.049 | < 0.051 | < 0.051 | < 0.050 | -- | -- | -- | -- |
| 2-(2-Methyl-1,4-chlorophenoxy) propionic acid | < 2.430 | 2.640 | < 2.530 | < 2.540 | < 2.450 | < 2.460 | < 2.470 | < 2.540 | < 2.530 | < 2.490 | -- | -- | -- | -- |
| 4,4'-DDD | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 10 | 40 | -- | -- |
| 4,4'-DDE | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 7 | 30 | -- | -- |
| 4,4'-DDT | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.008 | 7 | 30 | -- | -- |
| 4-(2,4-dichlorophenoxy)-Butanoic acid | < 0.049 | < 0.053 | < 0.051 | < 0.051 | < 0.049 | < 0.050 | < 0.050 | < 0.051 | < 0.051 | < 0.050 | -- | -- | -- | -- |
| Aldrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.09 | 0.5 | -- | -- |
| beta-BHC | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-delta | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-gamma | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | 0.003 | 0.5 | -- | -- |
| Chlordane (mixture of isomers) | < 0.022 | < 0.023 | < 0.021 | < 0.023 | < 0.022 | < 0.022 | < 0.023 | < 0.022 | < 0.022 | < 0.023 | -- | -- | -- | -- |
| Chlordane, alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Dicamba | < 0.010 | < 0.011 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | -- | -- | -- | -- |
| chloroprop (2-(2,4-dichlorophenoxy) propanoic acid) | < 0.049 | < 0.053 | < 0.051 | < 0.051 | < 0.049 | < 0.049 | < 0.049 | < 0.051 | < 0.051 | < 0.050 | -- | -- | -- | -- |
| Dieldrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.09 | 0.6 | -- | -- |
| Dinoseb | < 0.049 | < 0.053 | < 0.051 | < 0.051 | < 0.049 | < 0.050 | < 0.050 | < 0.051 | < 0.051 | < 0.050 | -- | -- | -- | -- |
| Endosulfan sulfate | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endosulfan, alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endosulfan, beta | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.004 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 20 | 30 | -- | -- |
| Endrin ketone | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Heptachlor | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.3 | 2 | -- | -- |
| Heptachlor Epoxide | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.2 | 1 | -- | -- |
| Hexachlorobenzene | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.7 | 0.9 | -- | -- |
| Methoxychlor | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 300 | 400 | -- | -- |
| Methylchlorophenoxyacetic acid | < 2.410 | < 2.610 | < 2.500 | < 2.510 | < 2.420 | < 2.440 | < 2.450 | < 2.510 | < 2.510 | < 2.460 | -- | -- | -- | -- |
| Toxaphene | < 0.140 | < 0.146 | < 0.133 | < 0.143 | < 0.137 | < 0.137 | < 0.141 | < 0.139 | < 0.134 | < 0.146 | -- | -- | -- | -- |
| trans-Chlordane | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| **PCBs (mg/kg)** | | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1248 | < 0.05 | 0.1 | < 0.05 | 0.2 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | 0.07 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1254 | < 0.05 | 0.1 | 0.1 | 0.2 | 0.1 | 0.5 | 0.2 | < 0.06 | 0.09 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | | | | |
| PCB Aroclor 1262 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| **Total PCBs** | 0 | 0.2 | 0.1 | 0.4 | 0.1 | 0.5 | 0.2 | 0 | 0.16 | 0 | 1 | 4 | < 2 | < 2 |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | | |
| Arsenic | 4.93 | 4.95 | 3.38 | < 0.86 | 2.79 | 4.83 | 2.67 | 1.8 | 3.24 | 6.3 | 20 | 20 | 40 | 40 |
| Barium | 21.5 | 24.9 | 18.1 | < 0.86 | 21.6 | 21.9 | 12.9 | 8.93 | 19.4 | 44.7 | 1000 | 3000 | -- | -- |
| Cadmium | < 0.37 | < 0.42 | < 0.36 | < 0.43 | < 0.4 | < 0.38 | < 0.4 | < 0.41 | < 0.42 | < 0.41 | 80 | 80 | 80 | 30 |
| Chromium | 10.2 | 13 | 6.3 | < 0.86 | 10.1 | 7.16 | 4.97 | 3.9 | 5.41 | 15.4 | 100 | 200 | 1000 | 1000 |
| Lead | 24.2 | 59.7 | 51.1 | < 4.3 | 17.6 | 86.2 | 18.8 | < 4.12 | 53.6 | 107 | 200 | 600 | 2000 | 1000 |
| Mercury | < 0.03 | 0.05 | 0.18 | 0.13 | 0.07 | 0.05 | < 0.03 | < 0.03 | 0.13 | 0.26 | 20 | 40 | 10 | 10 |
| Selenium | < 3.75 | < 4.16 | < 3.65 | < 4.3 | < 4 | < 3.84 | < 4.05 | < 4.12 | < 4.23 | < 4.12 | 400 | 800 | -- | -- |
| Silver | < 0.37 | < 0.42 | < 0.36 | < 0.43 | < 0.4 | < 0.38 | < 0.4 | < 0.41 | < 0.42 | < 0.41 | 100 | 200 | -- | -- |
| **TCLP (mg/L)** | | | | | | | | | | | | | | |
| Lead TCLP (mg/L) | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.29 | -- | -- | -- | -- |
| **General Chemistry** | | | | | | | | | | | | | | |
| Corrosivity (pH) | 8.8 | 8.44 | 8.38 | 7.52 | 8.22 | 5.8 | 7.12 | 6.42 | 7 | 6.92 | -- | -- | -- | -- |
| **Physical Conditions** | | | | | | | | | | | | | | |
| Flashpoint ($^{o}$F) | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | -- | -- | -- | -- |
| Reactivity - Cyanide (mg/kg) | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | -- | -- | -- | -- |
| Reactivity - Sulfide (mg/kg) | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | -- | -- | -- | -- |
| Specific Conductance @ 25$^{o}$C (µmhos/cm) | 92 | 156 | 269 | 730 | 306 | 50 | 7 | 9 | 68 | 39 | -- | -- | 8000 | 4000 |

Notes:
Laboratory analytical results compared to RCS-1, RCS-2,
VOCs = Volatile Organic Carbons; SVOCs = Semi-Volat
D = identified in an analysis that has been diluted
P = pesticide target analyte had a % difference > 25% bet
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard

Exceedance of MassDEP MCP RCS-1
Exceedance of MassDEP MCP RCS-1 & RCS-2
Exceedance of COMM-97 - Lined Landfill criteria
Exceedance of COMM-97 - Unlined Landfill criteria

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | I-3 | I-3 | I-5 | I-7 | II-0.5 | II-8.5 | II-8.5 | JJ II-2 | JJ II-6 | | | | |
| Sample ID | I-3 | I-3 4-8 | I-5 | I-7 | II-0.5 | II-8.5 | II-8.5 5-6 | JJ II-2 | JJ II-6 | | | | |
| Sample Depth (feet) | 0-5 | 4-8 | 0-4.3 | 0-4.3 | 5-6 | 0-5 | 5-6 | 0-3.5 | 0-4.5 | | | | |
| Sample Date | 5/1/2024 | 6/21/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/29/2024 | 5/3/2024 | 4/29/224 | 4/29/2024 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| Laboratory Sample ID | 24E0050-04 | 24F0927-02 | 24E0124-14 | 24E0124-13 | 24D1044-04 | 24D1044-03 | 24E0124-18 | 24D1044-02 | 24D1044-01 | | | | |
| **VOCs (mg/kg)** | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.1 | 0.1 | -- | -- |
| 1,1,1-Trichloroethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 30 | 600 | -- | -- |
| 1,1,2,2-Tetrachloroethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.005 | 0.02 | -- | -- |
| 1,1,2-Trichloroethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.1 | 2 | -- | -- |
| 1,1-Dichloroethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.4 | 9 | -- | -- |
| 1,1-Dichloroethylene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 3 | 40 | -- | -- |
| 1,1-Dichloropropene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,2,3-Trichlorobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,2,3-Trichloropropane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,2,4-Trichlorobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 2 | 6 | -- | -- |
| 1,2-Dibromo-3-chloropropane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,2-Dibromoethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.1 | 0.1 | -- | -- |
| 1,2-Dichlorobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 9 | 100 | -- | -- |
| 1,2-Dichloroethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.1 | 0.1 | -- | -- |
| 1,2-Dichloropropane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.1 | 0.1 | -- | -- |
| 1,3,4-Trimethylbenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,3,5-Trimethylbenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,3-Dichlorobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 3 | 200 | -- | -- |
| 1,3-Dichloropropane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 1,4-Dioxane | < 0.093 | < 0.098 | < 0.095 | < 0.110 | < 0.093 | < 0.112 | < 0.296 | < 0.093 | < 0.095 | 0.2 | 5 | -- | -- |
| 2,2-Dichloropropane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| 4-Isopropyltoluene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Acetone | < 0.046 | < 0.049 | < 0.048 | 0.091 | < 0.047 | 0.071 | 0.246 | < 0.047 | < 0.048 | 6 | 50 | -- | -- |
| Benzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 2 | 200 | -- | -- |
| Bromobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Bromochloromethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Bromodichloromethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.1 | 0.1 | -- | -- |
| Bromoform | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.1 | 1 | -- | -- |
| Bromomethane | < 0.009 | < 0.010 | < 0.010 | < 0.011 | < 0.009 | < 0.011 | < 0.030 | < 0.009 | < 0.010 | 0.5 | 0.5 | -- | -- |
| Carbon Disulfide | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Carbon Tetrachloride | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 5 | 5 | -- | -- |
| Chlorobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 1 | 3 | -- | -- |
| Chlorodibromomethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.005 | 0.03 | -- | -- |
| Chloroethane | < 0.009 | < 0.010 | < 0.010 | < 0.011 | < 0.009 | < 0.011 | < 0.030 | < 0.009 | < 0.010 | -- | -- | -- | -- |
| Chloroform | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.2 | 0.2 | -- | -- |
| Cis-1,2-dichloroethylene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.1 | 0.1 | -- | -- |
| cis-1,3-Dichloropropene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Dibromomethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Dichlorodifluoromethane | < 0.009 | < 0.010 | < 0.010 | < 0.011 | < 0.009 | < 0.011 | < 0.030 | < 0.009 | < 0.010 | -- | -- | -- | -- |
| Dichloromethane | < 0.023 | < 0.024 | < 0.024 | < 0.028 | < 0.023 | < 0.028 | < 0.074 | < 0.023 | < 0.024 | 0.1 | 3 | -- | -- |
| Diisopropyl Ether | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Ethyl benzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 40 | 1000 | -- | -- |
| Ethyl ether | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Ethyl tert-butyl ether | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Fluorotrichloromethane | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Hexachlorobutadiene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 30 | 100 | -- | -- |
| Hexachloroethane | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.7 | 3 | -- | -- |
| Isopropyl benzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| m,p-Xylenes | < 0.009 | < 0.010 | < 0.010 | < 0.011 | < 0.009 | < 0.011 | < 0.030 | < 0.009 | < 0.010 | -- | -- | -- | -- |
| Methyl Chloride | < 0.009 | < 0.010 | < 0.010 | < 0.011 | < 0.009 | < 0.011 | < 0.030 | < 0.009 | < 0.010 | -- | -- | -- | -- |
| Methyl ethyl ketone | < 0.046 | < 0.049 | < 0.048 | < 0.055 | < 0.047 | < 0.056 | < 0.148 | < 0.047 | < 0.048 | 4 | 50 | -- | -- |
| Methyl isobutyl ketone | < 0.046 | < 0.049 | < 0.048 | < 0.055 | < 0.047 | < 0.056 | < 0.148 | < 0.047 | < 0.048 | 0.4 | 50 | -- | -- |
| Methyl n-butyl ketone | < 0.046 | < 0.049 | < 0.048 | < 0.055 | < 0.047 | < 0.056 | < 0.148 | < 0.047 | < 0.048 | -- | -- | -- | -- |
| Methyl-tert-butyl ether | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.1 | 100 | -- | -- |
| n-Butylbenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| n-Propylbenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Naphthalene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 4 | 20 | -- | -- |
| O-chlorotoluene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| o-Xylenes | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| p-Chlorotoluene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| P-dichlorobenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.7 | 1 | -- | -- |
| sec-Butylbenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Styrene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 3 | 4 | -- | -- |
| Tert-amyl-methyl ether | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| tert-Butylbenzene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Tetrachloroethylene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 1 | 4 | -- | -- |
| Tetrahydrofuran | < 0.019 | < 0.020 | < 0.019 | < 0.022 | < 0.019 | < 0.022 | < 0.059 | < 0.019 | < 0.019 | -- | -- | -- | -- |
| Toluene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 30 | 1000 | -- | -- |
| Trans-1,2-dichloroethylene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 1 | 1 | -- | -- |
| trans-1,3-Dichloropropene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | -- | -- | -- | -- |
| Trichloroethylene | < 0.005 | < 0.005 | < 0.005 | < 0.006 | < 0.005 | < 0.006 | < 0.015 | < 0.005 | < 0.005 | 0.3 | 0.3 | -- | -- |
| Vinyl Chloride | < 0.009 | < 0.010 | < 0.010 | < 0.011 | < 0.009 | < 0.011 | < 0.030 | < 0.009 | < 0.010 | 0.3 | 0.7 | -- | -- |
| Xylene | < 0.009 | < 0.010 | < 0.010 | < 0.011 | < 0.009 | < 0.011 | < 0.030 | < 0.009 | < 0.010 | 100 | 100 | -- | -- |
| Total VOCs | 0 | 0 | 0 | 0.091 | 0 | 0.071 | 0.246 | 0 | 0 | -- | -- | 10 | 4 |

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | I-3 | I-3 | I-5 | I-7 | II-0.5 | II-8.5 | II-8.5 | JJ II-2 | JJ II-6 | | | | |
| Sample ID | I-3 | I-3 4-8 | I-5 | I-7 | II-0.5 | II-8.5 | II-8.5 5-6 | JJ II-2 | JJ II-6 | | | | |
| Sample Depth (feet) | 0-5 | 4-8 | 0-4.3 | 0-4.3 | 5-6 | 0-5 | 5-6 | 0-3.5 | 0-4.5 | | | | |
| Sample Date | 5/1/2024 | 6/21/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/29/2024 | 5/3/2024 | 4/29/224 | 4/29/2024 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| Laboratory Sample ID | 24E0050-04 | 24F0927-02 | 24E0124-14 | 24E0124-13 | 24D1044-04 | 24D1044-03 | 24E0124-18 | 24D1044-02 | 24D1044-01 | | | | |
| **SVOCs (mg/kg)** | | | | | | | | | | | | | |
| 1,1-Biphenyl | < 0.03 | < 0.03 | 0.04 | < 0.03 | < 0.03 | < 0.03 | < 0.10 | < 0.03 | < 0.03 | 0.05 | 6 | -- | -- |
| 1,2,4-Trichlorobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.98 | < 0.27 | < 0.28 | 2 | 6 | -- | -- |
| 1,2-Dichlorobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.98 | < 0.27 | < 0.28 | 9 | 100 | -- | -- |
| 1,3-Dichlorobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.98 | < 0.27 | < 0.28 | 3 | 200 | -- | -- |
| 2,4,5-Trichlorophenol | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.98 | < 0.27 | < 0.28 | 4 | 600 | -- | -- |
| 2,4,6-Trichlorophenol | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.98 | < 0.27 | < 0.28 | 0.7 | 20 | -- | -- |
| 2,4-Dichlorophenol | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.98 | < 0.27 | < 0.28 | 0.7 | 40 | -- | -- |
| 2,4-Dimethylphenol | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.98 | < 0.27 | < 0.28 | 0.7 | 100 | -- | -- |
| 2,4-Dinitrophenol | < 1.08 | < 1.11 | < 1.07 | < 1.10 | < 1.06 | < 1.23 | < 3.95 | < 1.08 | < 1.12 | 3 | 50 | -- | -- |
| 2,4-Dinitrotoluene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 0.7 | 10 | -- | -- |
| 2,6-Dinitrotoluene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| 2-Chloronaphthalene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| 2-Chlorophenol | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 0.7 | 100 | -- | -- |
| 2-Methylnaphthalene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 0.7 | 80 | -- | -- |
| 2-Methylphenol | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| 2-Nitrophenol | < 0.54 | < 0.55 | < 0.54 | < 0.55 | < 0.53 | < 0.61 | < 1.98 | < 0.54 | < 0.56 | -- | -- | -- | -- |
| 3 & 4 Methylphenol | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| 3,3'-Dichlorobenzidine | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 3 | 20 | -- | -- |
| 4-Bromophenyl phenyl ether | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| 4-Nitrophenol | < 1.08 | < 1.11 | < 1.07 | < 1.10 | < 1.06 | < 1.23 | < 3.95 | < 1.08 | < 1.12 | -- | -- | -- | -- |
| Acenaphthene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 4 | 3000 | -- | -- |
| Acenaphthylene | < 0.27 | < 0.28 | 1.05 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 2 | 10 | -- | -- |
| Acetophenone | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| Aniline | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| Anthracene | < 0.27 | < 0.28 | 0.82 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 1000 | 3000 | -- | -- |
| Azobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| Benzo(A)anthracene | < 0.27 | < 0.28 | 3.22 | < 0.27 | 0.65 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 20 | 300 | -- | -- |
| Benzo(A)pyrene | < 0.27 | < 0.28 | 2.23 | < 0.27 | 0.62 | < 0.31 | < 0.99 | < 0.271 | < 0.28 | 2 | 30 | -- | -- |
| Benzo(B)fluoranthene | < 0.27 | < 0.28 | 2.20 | < 0.27 | 0.67 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 20 | 300 | -- | -- |
| Benzo(g,h,i)Perylene | < 0.27 | < 0.28 | 1.19 | < 0.27 | 0.38 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 1000 | 3000 | -- | -- |
| Benzo(K)fluoranthene | < 0.27 | < 0.28 | 0.71 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 200 | 3000 | -- | -- |
| bis (2-chloroethoxy) Methane | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| bis (2-chloroethyl) Ether | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 0.7 | 0.7 | -- | -- |
| bis (2-chloroisopropyl) Ether | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 0.7 | 0.7 | -- | -- |
| Bis (2-ethylhexyl) phthalate | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 100 | 700 | -- | -- |
| Butylbenzylphthalate | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| Chrysene | < 0.27 | < 0.28 | 4.09 | < 0.27 | 0.66 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 200 | 3000 | -- | -- |
| Di-n-octyl phthalate | < 0.54 | < 0.55 | < 0.54 | < 0.55 | < 0.53 | < 0.61 | < 1.98 | < 0.54 | < 0.561 | -- | -- | -- | -- |
| Dibenzo(A,H)anthracene | < 0.27 | < 0.28 | 0.38 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 2 | 30 | -- | -- |
| Dibenzofuran | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| Diethyl phthalate | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 10 | 200 | -- | -- |
| Dimethyl phthalate | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 0.7 | 50 | -- | -- |
| Fluoranthene | 0.41 | 0.33 | 3.58 | < 0.27 | 1.44 | 0.42 | < 0.99 | < 0.27 | < 0.28 | 1000 | 3000 | -- | -- |
| Fluorene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 1000 | 3000 | -- | -- |
| Hexachlorobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 0.7 | 0.9 | -- | -- |
| Hexachlorobutadiene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 30 | 100 | -- | -- |
| Hexachloroethane | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 0.7 | 3 | -- | -- |
| Indeno (1,2,3-cd) pyrene | < 0.27 | < 0.28 | 1.00 | < 0.27 | 0.37 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 20 | 300 | -- | -- |
| Isophorone | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| N-dibutyl phthalate | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| n-Nitrosodimethylamine | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| Naphthalene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 4 | 20 | -- | -- |
| Nitrobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| P-chloroaniline | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 1 | 3 | -- | -- |
| P-dichlorobenzene | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 0.7 | 1 | -- | -- |
| Pentachlorophenol | < 1.08 | < 1.11 | < 1.07 | < 1.10 | < 1.06 | < 1.23 | < 3.95 | < 1.08 | < 1.12 | 3 | 10 | -- | -- |
| Phenanthrene | < 0.27 | < 0.28 | 2.48 | < 0.27 | 0.98 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 10 | 1000 | -- | -- |
| Phenols | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | 0.9 | 20 | -- | -- |
| Pyrene | 0.44 | 0.41 | 5.88 | < 0.27 | 1.24 | 0.40 | < 0.99 | < 0.27 | < 0.28 | 1000 | 3000 | -- | -- |
| Pyridine | < 0.27 | < 0.28 | < 0.27 | < 0.27 | < 0.26 | < 0.31 | < 0.99 | < 0.27 | < 0.28 | -- | -- | -- | -- |
| **Total SVOCs** | 0.86 | 0.74 | 28.87 | 0.00 | 7.00 | 0.83 | 0 | 0 | 0 | -- | -- | 100 | 100 |
| **Petroleum Hydrocarbons (mg/kg)** | | | | | | | | | | | | | |
| C9-C36 | 73.80 | 73.20 | 16.00 | < 11.90 | 32.00 | 36.20 | 273.00 | < 10.60 | < 11 | -- | -- | -- | -- |

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Table 5
Site 1 - Soil Waste Characterization
New Bedford Marine Commerce Terminal
New Bedford, MA

| Site 1 - New Bedford Marine Commerce Termin | | | | | | | | | | MCP Concentrations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | I-3 | I-3 | I-5 | I-7 | II-0.5 | II-8.5 | II-8.5 | JJ II-2 | JJ II-6 | | | | |
| Sample ID | I-3 | I-3 4-8 | I-5 | I-7 | II-0.5 | II-8.5 | II-8.5 5-6 | JJ II-2 | JJ II-6 | | | | |
| Sample Depth (feet) | 0-5 | 4-8 | 0-4.3 | 0-4.3 | 5-6 | 0-5 | 5-6 | 0-3.5 | 0-4.5 | | | | |
| Sample Date | 5/1/2024 | 6/21/2024 | 5/2/2024 | 5/2/2024 | 4/29/2024 | 4/29/2024 | 5/3/2024 | 4/29/224 | 4/29/2024 | RCS-1 | RCS-2 | Landfills Lined | Landfills Unlined |
| Laboratory Sample ID | 24E0050-04 | 24F0927-02 | 24E0124-14 | 24E0124-13 | 24D1044-04 | 24D1044-03 | 24E0124-18 | 24D1044-02 | 24D1044-01 | | | | |
| **Pesticides/Herbicides (mg/kg)** | | | | | | | | | | | | | |
| 2,2-Dichloropropionic acid | < 0.049 | < 0.051 | < 0.048 | < 0.051 | < 0.046 | < 0.055 | < 0.088 | < 0.049 | < 0.048 | -- | -- | -- | -- |
| 2,4,5-Trichlorophenoxyacetic acid | < 0.010 | < 0.011 | < 0.010 | < 0.011 | < 0.010 | < 0.011 | < 0.018 | < 0.010 | < 0.010 | -- | -- | -- | -- |
| 2,4,5-Trichlorophenoxypropionic acid | < 0.010 | < 0.011 | < 0.010 | < 0.011 | < 0.010 | < 0.011 | < 0.018 | < 0.010 | < 0.010 | -- | -- | -- | -- |
| 2,4-Dichlorophenoxyacetic acid | < 0.050 | < 0.053 | < 0.050 | < 0.052 | < 0.047 | 0.107 | < 0.091 | < 0.050 | < 0.049 | -- | -- | -- | -- |
| 2-(2-Methyl-1,4-chlorophenoxy) propionic acid | < 2.520 | < 2.640 | < 2.480 | < 2.610 | < 2.370 | < 2.830 | < 4.550 | < 2.520 | < 2.460 | -- | -- | -- | -- |
| 4,4'-DDD | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | 10 | 40 | -- | -- |
| 4,4'-DDE | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | 7 | 30 | -- | -- |
| 4,4'-DDT | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | 7 | 30 | -- | -- |
| 4-(2,4-dichlorophenoxy)-Butanoic acid | < 0.051 | < 0.053 | < 0.050 | < 0.053 | < 0.048 | < 0.057 | < 0.092 | < 0.051 | < 0.050 | -- | -- | -- | -- |
| Aldrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | 0.09 | 0.5 | -- | -- |
| beta-BHC | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-delta | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| BHC-gamma | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.003 | < 0.002 | < 0.002 | 0.003 | 0.5 | -- | -- |
| Chlordane (mixture of isomers) | < 0.021 | < 0.022 | < 0.023 | < 0.023 | < 0.021 | < 0.025 | < 0.041 | < 0.022 | < 0.022 | -- | -- | -- | -- |
| Chlordane, alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Dicamba | < 0.010 | < 0.011 | < 0.010 | < 0.010 | < 0.009 | < 0.011 | < 0.018 | < 0.010 | < 0.010 | -- | -- | -- | -- |
| hloroprop (2-(2,4-dichlorophenoxy) propanoic acid) | < 0.050 | < 0.053 | < 0.050 | < 0.052 | < 0.047 | < 0.057 | < 0.091 | < 0.050 | < 0.049 | -- | -- | -- | -- |
| Dieldrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.037 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | 0.09 | 0.6 | -- | -- |
| Dinoseb | < 0.051 | < 0.053 | < 0.050 | < 0.053 | < 0.048 | < 0.057 | < 0.092 | < 0.051 | < 0.050 | -- | -- | -- | -- |
| Endosulfan sulfate | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endosulfan, alpha | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endosulfan, beta | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.009 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Endrin | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | 20 | 30 | -- | -- |
| Endrin ketone | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| Heptachlor | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | 0.3 | 2 | -- | -- |
| Heptachlor Epoxide | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | 0.2 | 1 | -- | -- |
| Hexachlorobenzene | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | 0.7 | 0.9 | -- | -- |
| Methoxychlor | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.005 | < 0.003 | < 0.003 | 300 | 400 | -- | -- |
| Methylchlorophenoxyacetic acid | < 2.500 | < 2.610 | < 2.450 | < 2.580 | < 2.350 | < 2.800 | < 4.500 | < 2.490 | < 2.430 | -- | -- | -- | -- |
| Toxaphene | < 0.132 | < 0.139 | < 0.143 | < 0.146 | < 0.131 | < 0.153 | < 0.257 | < 0.136 | < 0.135 | -- | -- | -- | -- |
| trans-Chlordane | < 0.003 | 0.004 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | 0.005 | < 0.003 | < 0.003 | -- | -- | -- | -- |
| **PCBs (mg/kg)** | | | | | | | | | | | | | |
| PCB Aroclor 1016 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1221 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1232 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1242 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1248 | < 0.05 | < 0.06 | < 0.05 | 0.2 | < 0.05 | 0.1 | < 0.1 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1254 | 0.1 | 0.3 | 0.1 | 0.3 | 1.2 D | 0.08 | < 0.1 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1260 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | | | | |
| PCB Aroclor 1262 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| PCB Aroclor 1268 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.05 | < 0.06 | < 0.1 | < 0.05 | < 0.05 | -- | -- | -- | -- |
| **Total PCBs** | 0.1 | 0.3 | 0.1 | 0.5 | 1.2 | 0.18 | 0 | 0 | 0 | 1 | 4 | < 2 | < 2 |
| **Total Metals (mg/kg)** | | | | | | | | | | | | | |
| Arsenic | 2.58 | < 0.99 | 3.94 | 5.81 | 1.83 | 6.55 | 6.92 | 2.62 | 3.29 | 20 | 20 | 40 | 40 |
| Barium | 35.2 | 13 | 14.2 | 24.1 | 18.4 | 86.3 | 55.4 | 11.3 | 13 | 1000 | 3000 | -- | -- |
| Cadmium | < 0.36 | < 0.49 | < 0.39 | < 0.46 | < 0.37 | < 0.45 | < 0.7 | < 0.39 | < 0.38 | 80 | 80 | 80 | 30 |
| Chromium | 7.1 | 5.09 | 9.6 | 19.8 | 3.76 | 12.1 | 9.25 | 5.07 | 6.43 | 100 | 200 | 1000 | 1000 |
| Lead | 34 | 35.2 | 19.4 | 27.3 | 39.4 | 347 | 21.4 | 6.81 | 12.8 | 200 | 600 | 2000 | 1000 |
| Mercury | 0.08 | < 0.03 | 0.13 | 0.093 | 0.069 | 0.575 | < 0.063 | < 0.035 | < 0.031 | 20 | 40 | 10 | 10 |
| Selenium | < 3.59 | 4.95 | < 3.92 | < 4.58 | < 3.66 | < 4.54 | < 6.98 | < 3.9 | < 3.76 | 400 | 800 | -- | -- |
| Silver | < 0.36 | < 0.49 | < 0.39 | < 0.46 | < 0.37 | < 0.45 | < 0.7 | < 0.39 | < 0.38 | 100 | 200 | -- | -- |
| **TCLP (mg/L)** | | | | | | | | | | | | | |
| Lead TCLP (mg/L) | -- | -- | -- | -- | -- | 0.72 | -- | -- | -- | -- | -- | -- | -- |
| **General Chemistry** | | | | | | | | | | | | | |
| Corrosivity (pH) | 7.96 | 7.35 | 7.58 | 6.9 | 7.1 | 6.7 | 7.28 | 6.78 | 6.53 | -- | -- | -- | -- |
| **Physical Conditions** | | | | | | | | | | | | | |
| Flashpoint (°F) | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 | -- | -- | -- | -- |
| Reactivity - Cyanide (mg/kg) | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 3.7 | < 2 | < 2 | -- | -- | -- | -- |
| Reactivity - Sulfide (mg/kg) | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | -- | -- | -- | -- |
| Specific Conductance @ 25°C (µmhos/cm) | 473 | 71 | 104 | 177 | 30 | 562 | 328 | 9 | 35 | -- | -- | 8000 | 4000 |

Notes:
Laboratory analytical results compared to RCS-1, RCS-2,
VOCs = Volatile Organic Carbons; SVOCs = Semi-Volat
D = identified in an analysis that has been diluted
P = pesticide target analyte had a % difference > 25% bet
< = not detected above laboratory reporting limit
-- = Not Tested
NS = No Standard
Exceedance of MassDEP MCP RCS-1
Exceedance of MassDEP MCP RCS-1 & RCS-2
Exceedance of COMM-97 - Lined Landfill criteria
Exceedance of COMM-97 - Unlined Landfill criteria

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# EXHIBIT B
# HISTORICAL FIGURES BY OTHERS

DRAFT

**SHUSTER PROPERTY (FMR RIST LLC)**

**RTN: 4-23736**

DRAFT





Apex Companies, LLC.

184 HIGH STREET
SUITE 502
BOSTON MA 02110
(617) 728-0070


REVISIONS

| # | DATE | DESCRIPTION |
|---|---|---|
| 1 | 7/11/11 | LAND BORINGS |


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B9/MW-6 BORING/MONITORING WELL LOCATION

OVER WATER GEOTECHNICAL BORING

TP6 LARGE TEST PIT BOUNDARIES

SMALL TEST PIT LOCATION

PROPOSED EXCAVATION
PCB CONCENTRATION > 50 PPM

PROPOSED EXCAVATION
EPH/TPH CONCENTRATION > 10,000 PPM

**PREPARED FOR:**

MASSACHUSETTS
CLEAN ENERGY
CENTER

**DRAWING TITLE:**

# SAMPLE LOCATION PLAN – UPLAND INVESTIGATION AT SHUSTER PROPERTY AND UNOCCUPIED SHUSTER PROPERTY

Scale: 1"=50'

0 25 50 100 150 FEET

| | |
|---|---|
| Date | 10/28/10 |
| Proj. Mgr. | |
| Design | CWM |
| Check | JAB |
| Drawn | GCD |
| Job. No. | 6690 |
| Last Rev. | 11/22/10 |

Drawing No.

FIG. 2

P:\Jobs\6690 NBH_ Phase IV\PLANS\SHUSTER_UPLAND_9-26-11.dwg, 9/26/2011 3:20:04 PM, DWG To PDF.pc3




Apex Companies, LLC.

184 HIGH STREET
SUITE 502
BOSTON MA 02110
(617) 728-0070

REVISIONS

| # | DATE | DESCRIPTION |
|---|---|---|
| 1 | 7/11/11 | LAND BORINGS |

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B9/MW-6 BORING/MONITORING WELL LOCATION

OVER WATER GEOTECHNICAL BORING

TP6 LARGE TEST PIT BOUNDARIES

SMALL TEST PIT LOCATION

PROPOSED EXCAVATION
PCB CONCENTRATION > 50 PPM

PROPOSED EXCAVATION
EPH/TPH CONCENTRATION > 10,000 PPM

**PREPARED FOR:**

MASSACHUSETTS
CLEAN ENERGY
CENTER

**DRAWING TITLE:**

# NEW BEDFORD MARINE COMMERCE TERMINAL PCB SAMPLE RESULTS

Scale: 1"=50'

0 25 50 100 150 FEET

| | |
|---|---|
| Date | 10/28/10 |
| Proj. Mgr. | |
| Design | CWM |
| Check | JAB |
| Drawn | GCD |
| Job. No. | 6690 |
| Last Rev. | 11/22/10 |

Drawing No.

FIG. 3

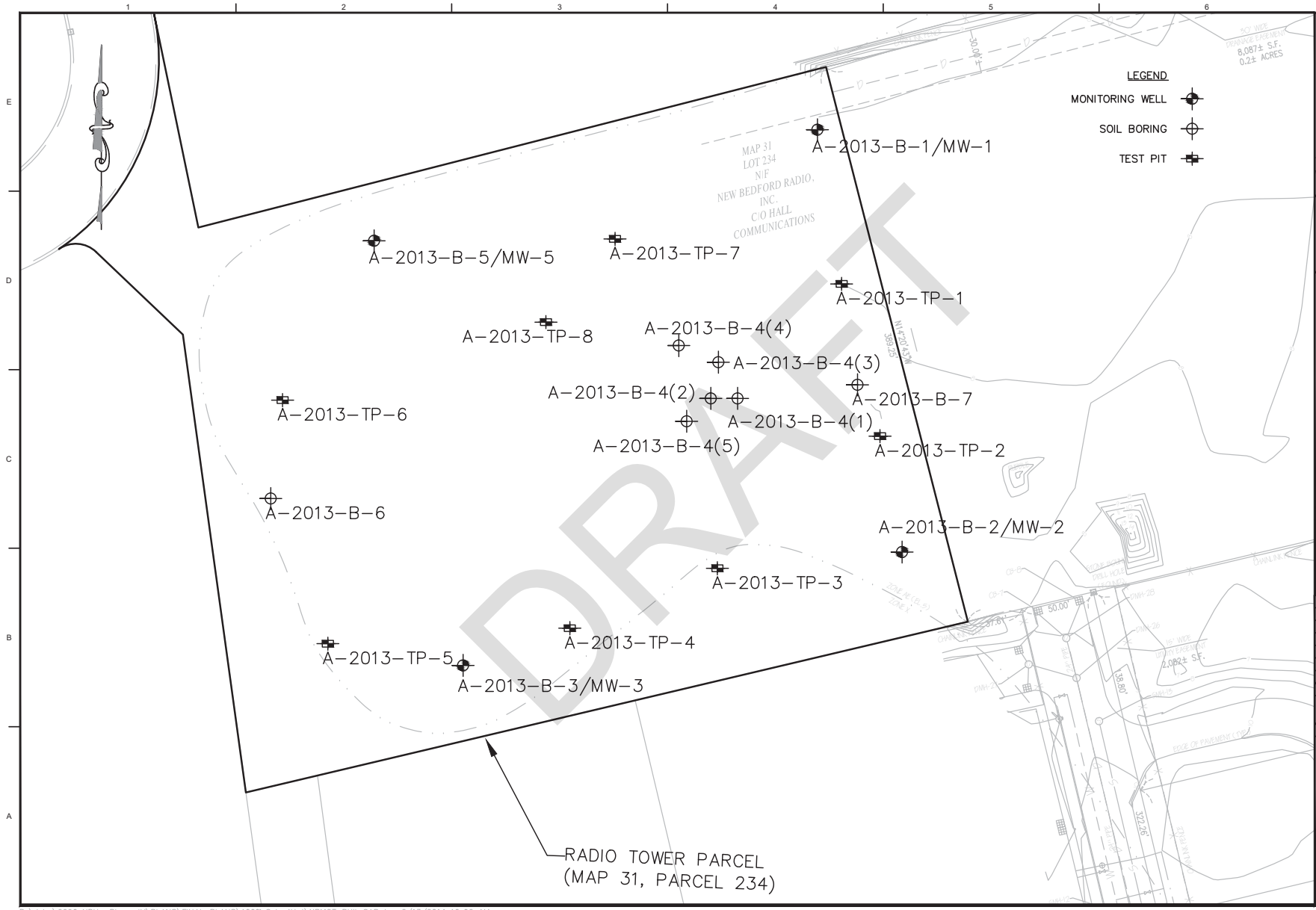
DRAFT

P:\Jobs\6690 NBH_ Phase IV\PLANS\SHUSTER_UPLAND_9-26-11.dwg, 9/26/2011 3:23:56 PM, DWG To PDF.pc3

**NEW BEDFORD RADIO (HALL COMM)**

**RTN: 4-25350**

DRAFT




APEX
ROCKVILLE, MD
SOUTH WINDSOR, CT - BOSTON, MA - NEW BEDFORD, MA - HOLYOKE, MA

184 HIGH STREET, SUITE 502
BOSTON, MA 02210

5801 CONNECTICUT AVENUE
SOUTH WINDSOR, CT

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PROJECT
NEW BEDFORD
MARINE COMMERCE
TERMINAL

OWNER
MASSACHUSETTS CLEAN ENERGY CENTER
55 SUMMER STREET, 9TH FLOOR
BOSTON, MA 02110

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|

| | |
|---|---|
| PROJECT NO. | 6690 |
| CADD FILE | NBMCT_PHII_SAP |
| DESIGNED BY | |
| DRAWN BY | |
| CHECKED BY | |
| DATE | 2/11/14 |
| DRAWING SCALE | 1"=60' |

GRAPHIC SCALE
SCALE: 1" = 60'
0 30 60

SHEET TITLE

BORING, TEST PIT, & GROUNDWATER MONITORING WELL LOCATION PLAN

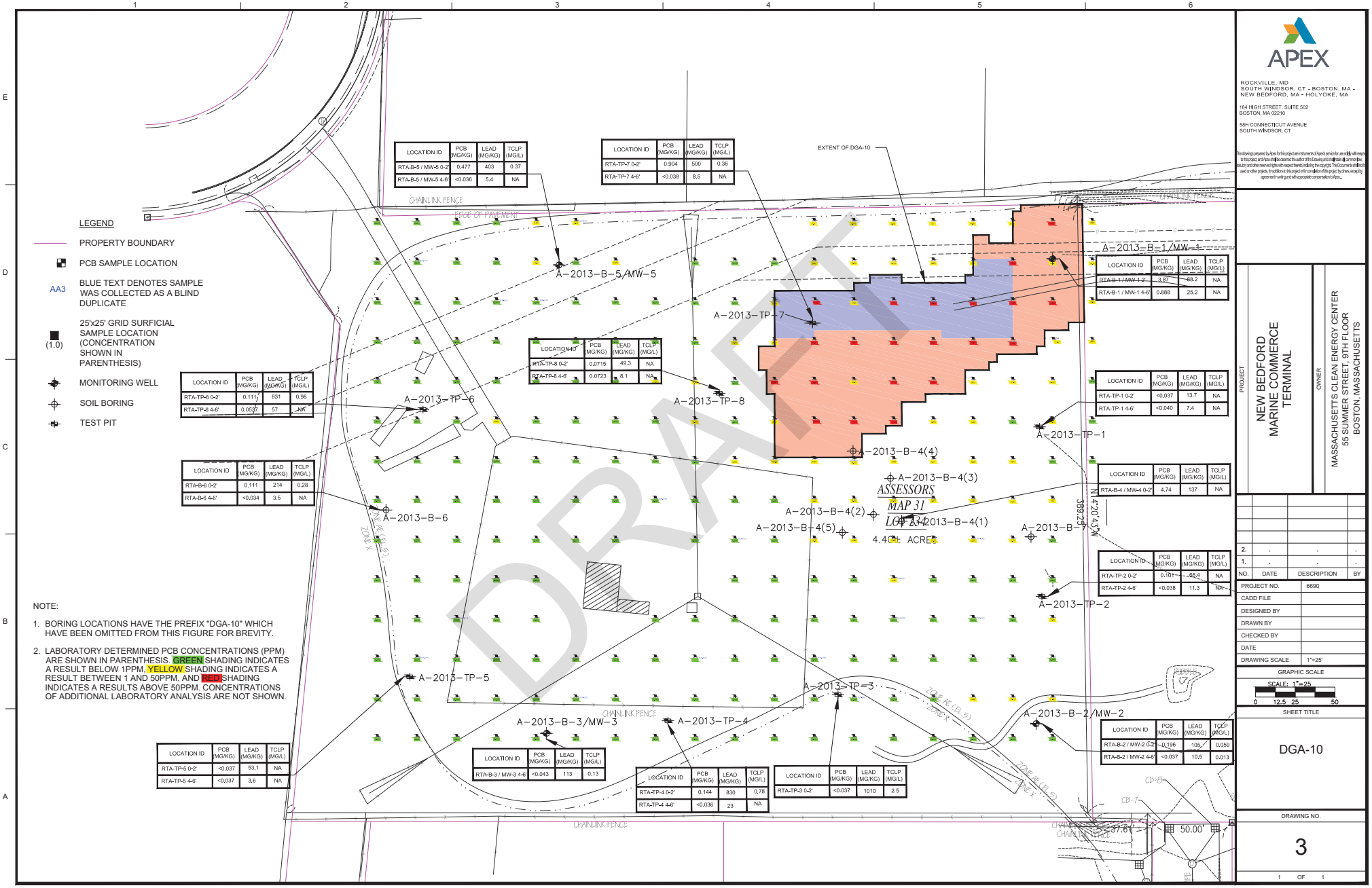
DRAWING NO.

FIG. 2

2 OF 2

P:\Jobs\6690 NBH_ Phase IV\PLANS\FINAL_PLANS\100% Submittal\NBMCT_PHII_SAP.dwg 2/13/2014 10:06 AM

PLOT SCALE




| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-B-5 / MW-5 0-2' | 0.477 | 403 | 0.37 |
| RTA-B-5 / MW-5 4-6' | <0.036 | 5.4 | NA |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-TP-7 0-2' | 0.904 | 500 | 0.36 |
| RTA-TP-7 4-6' | <0.038 | 8.5 | NA |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-B-1 / MW-1 2' | 3.87 | 88.2 | NA |
| RTA-B-1 / MW-1 4-6' | 0.888 | 25.2 | NA |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-TP-8 0-2' | 0.0715 | 49.3 | NA |
| RTA-TP-8 4-6' | 0.0723 | 8.1 | NA |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-TP-6 0-2' | 0.111 | 831 | 0.98 |
| RTA-TP-6 4-6' | 0.0527 | 57 | NA |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-TP-1 0-2' | <0.037 | 13.7 | NA |
| RTA-TP-1 4-6' | <0.040 | 7.4 | NA |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-B-6 0-2' | 0.111 | 214 | 0.28 |
| RTA-B-6 4-6' | <0.034 | 3.5 | NA |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-B-4 / MW-4 0-2' | 4.74 | 137 | NA |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-TP-2 0-2' | 0.101 | 66.4 | NA |
| RTA-TP-2 4-6' | <0.038 | 11.3 | NA |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-B-2 / MW-2 0-2' | 0.196 | 105 | 0.059 |
| RTA-B-2 / MW-2 4-6' | <0.037 | 10.5 | 0.013 |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-TP-5 0-2' | <0.037 | 53.1 | NA |
| RTA-TP-5 4-8' | <0.037 | 3.6 | NA |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-B-3 / MW-3 4-6' | <0.043 | 113 | 0.13 |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-TP-4 0-2' | 0.144 | 830 | 0.78 |
| RTA-TP-4 4-6' | <0.036 | 23 | NA |

| LOCATION ID | PCB (MG/KG) | LEAD (MG/KG) | TCLP (MG/L) |
|---|---|---|---|
| RTA-TP-3 0-2' | <0.037 | 1010 | 2.5 |

DRAFT

APEX
ROCKVILLE, MD
SOUTH WINDSOR, CT - BOSTON, MA - NEW BEDFORD, MA - HOLYOKE, MA
184 HIGH STREET, SUITE 502
BOSTON, MA 02210
58H CONNECTICUT AVENUE
SOUTH WINDSOR, CT

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PROJECT
NEW BEDFORD MARINE COMMERCE TERMINAL

OWNER
MASSACHUSETTS CLEAN ENERGY CENTER
55 SUMMER STREET, 9TH FLOOR
BOSTON, MASSACHUSETTS

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2. | . | . | . |
| 1. | . | . | . |

| | |
|---|---|
| PROJECT NO. | 6690 |
| CADD FILE | |
| DESIGNED BY | |
| DRAWN BY | |
| CHECKED BY | |
| DATE | |
| DRAWING SCALE | 1"=25' |

GRAPHIC SCALE
SCALE: 1"=25'
0 12.5 25 50

SHEET TITLE
DGA-10

DRAWING NO.
3

1 OF 1

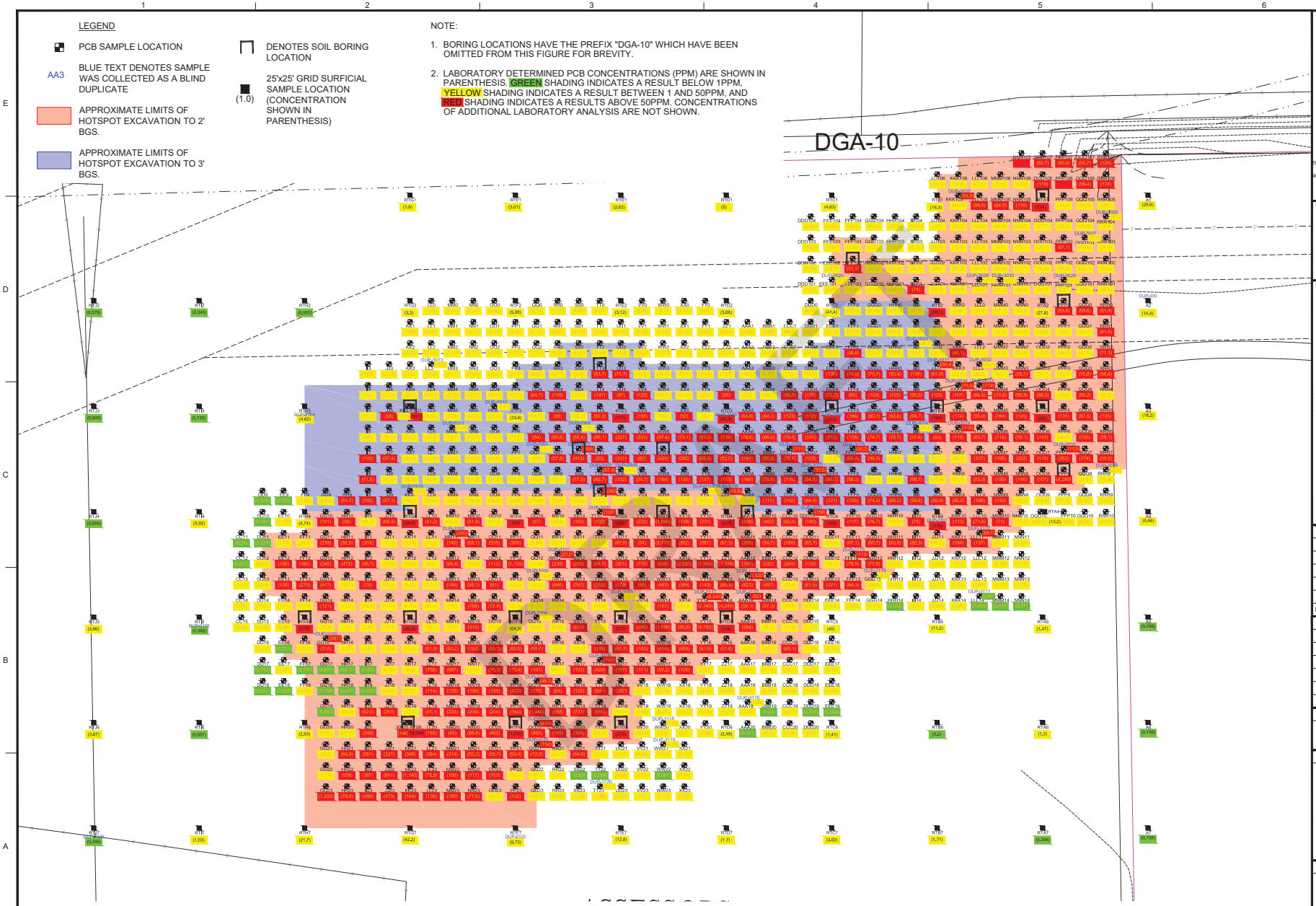
P:\Jobs\6690 NBH_ Phase IV\PLANS\FINAL_PLANS\CONSTRUCTION\P-1.2_PCB_CONFIRM_SAMPLE_PLAN_RadioTower_Dec2013.dwg 6/26/2014 10:52 AM

LEGEND

- PCB SAMPLE LOCATION
- AA3 — BLUE TEXT DENOTES SAMPLE WAS COLLECTED AS A BLIND DUPLICATE
- APPROXIMATE LIMITS OF HOTSPOT EXCAVATION TO 2' BGS.
- APPROXIMATE LIMITS OF HOTSPOT EXCAVATION TO 3' BGS.
- DENOTES SOIL BORING LOCATION
- (1.0) — 25'x25' GRID SURFICIAL SAMPLE LOCATION (CONCENTRATION SHOWN IN PARENTHESIS)

NOTE:

1. BORING LOCATIONS HAVE THE PREFIX "DGA-10" WHICH HAVE BEEN OMITTED FROM THIS FIGURE FOR BREVITY.
2. LABORATORY DETERMINED PCB CONCENTRATIONS (PPM) ARE SHOWN IN PARENTHESIS. GREEN SHADING INDICATES A RESULT BELOW 1PPM, YELLOW SHADING INDICATES A RESULT BETWEEN 1 AND 50PPM, AND RED SHADING INDICATES A RESULTS ABOVE 50PPM. CONCENTRATIONS OF ADDITIONAL LABORATORY ANALYSIS ARE NOT SHOWN.




APEX
ROCKVILLE, MD
SOUTH WINDSOR, CT - BOSTON, MA -
NEW BEDFORD, MA - HOLYOKE, MA
184 HIGH STREET, SUITE 502
BOSTON, MA 02210
58H CONNECTICUT AVENUE
SOUTH WINDSOR, CT

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PROJECT
NEW BEDFORD
MARINE COMMERCE
TERMINAL

OWNER
MASSACHUSETTS CLEAN ENERGY CENTER
55 SUMMER STREET, 9TH FLOOR
BOSTON, MASSACHUSETTS

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 2. | . | . | . |
| 1. | . | . | . |

| | |
|---|---|
| PROJECT NO. | 6690 |
| CADD FILE | |
| DESIGNED BY | |
| DRAWN BY | |
| CHECKED BY | |
| DATE | |
| DRAWING SCALE | 1"=10' |

GRAPHIC SCALE
SCALE: 1"=10'
0 5 10 20

SHEET TITLE
DGA-10

DRAWING NO.
1

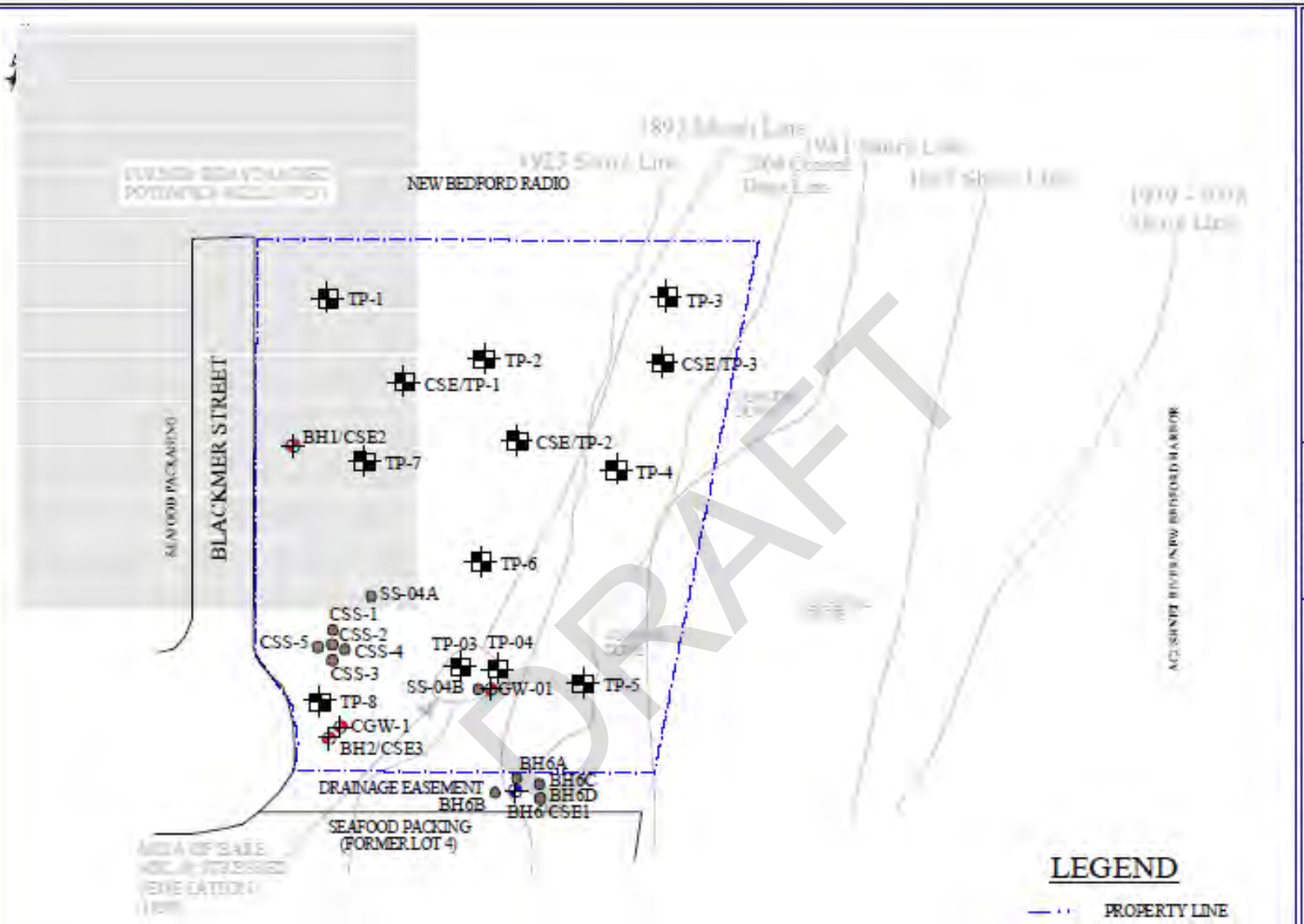
1 OF 1

P:\Jobs\6690 NBH_ Phase IV\PLANS\FINAL_PLANS\CONSTRUCTION\P-1.2_PCB_CONFIRM_SAMPLE_PLAN_RadioTower_Dec2013.dwg 6/26/2014 10:53 AM

**DMF PARCEL 1 / DMF PARCEL 2**

**RTNS: 4-24296, 4-15490**

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NOTES:
1) SITE FEATURES, BOUNDARIES AND SAMPLE LOCATIONS DERIVED FROM FIELD MEASUREMENTS AND OBSERVATIONS.
2) BASE MAP GENERATED FROM HISTORIC REFERENCES AND HISTORIC ASSESSMENT REPORTS PREPARED BY M&E AND CYGNUS.
3) ALL LOCATIONS AND SCALES ARE APPROXIMATE.

GRAPHICAL SCALE
50 0 25 50

COMMON SENSE ENVIRONMENTAL, INC.
[illegible]
DARTMOUTH, MASSACHUSETTS 02748
PHONE: 508-991-3491

DRAWN BY: KJB
PROJ. MGR: KJB
PROJECT NO: W024
SCALE: NOTED
DATE: 9/24/08

# MASTER SAMPLING PLAN

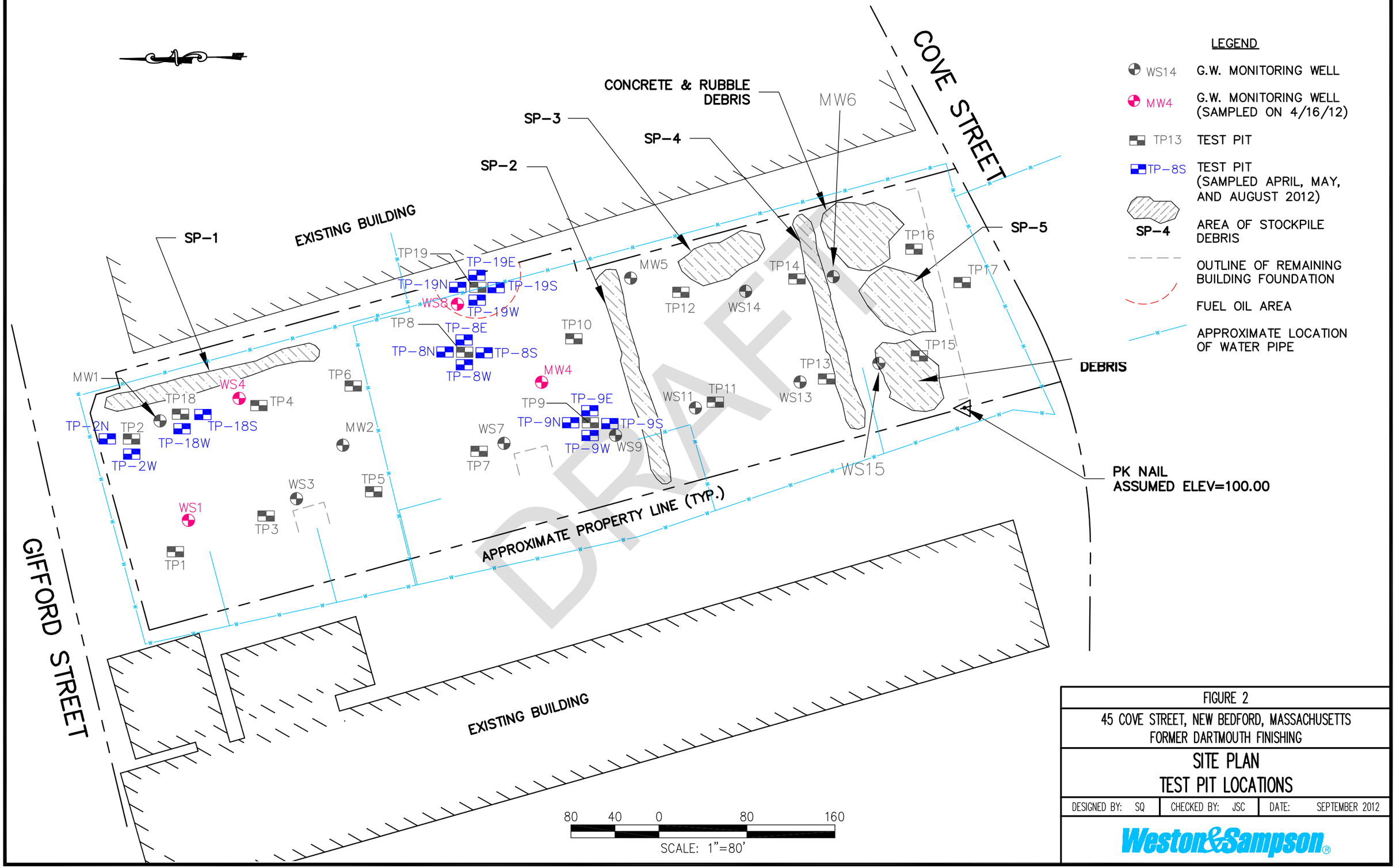
FORMER LOT 3
16 BLACKMER STREET
NEW BEDFORD, MASSACHUSETTS

FIGURE NUMBER:
8

**FORMER DARTMOUTH FINISHING SITE**

**RTN: 4-23616**

DRAFT




LEGEND

- WS14 — G.W. MONITORING WELL
- MW4 — G.W. MONITORING WELL (SAMPLED ON 4/16/12)
- TP13 — TEST PIT
- TP-8S — TEST PIT (SAMPLED APRIL, MAY, AND AUGUST 2012)
- SP-4 — AREA OF STOCKPILE DEBRIS
- OUTLINE OF REMAINING BUILDING FOUNDATION
- FUEL OIL AREA
- APPROXIMATE LOCATION OF WATER PIPE

DRAFT

FIGURE 2

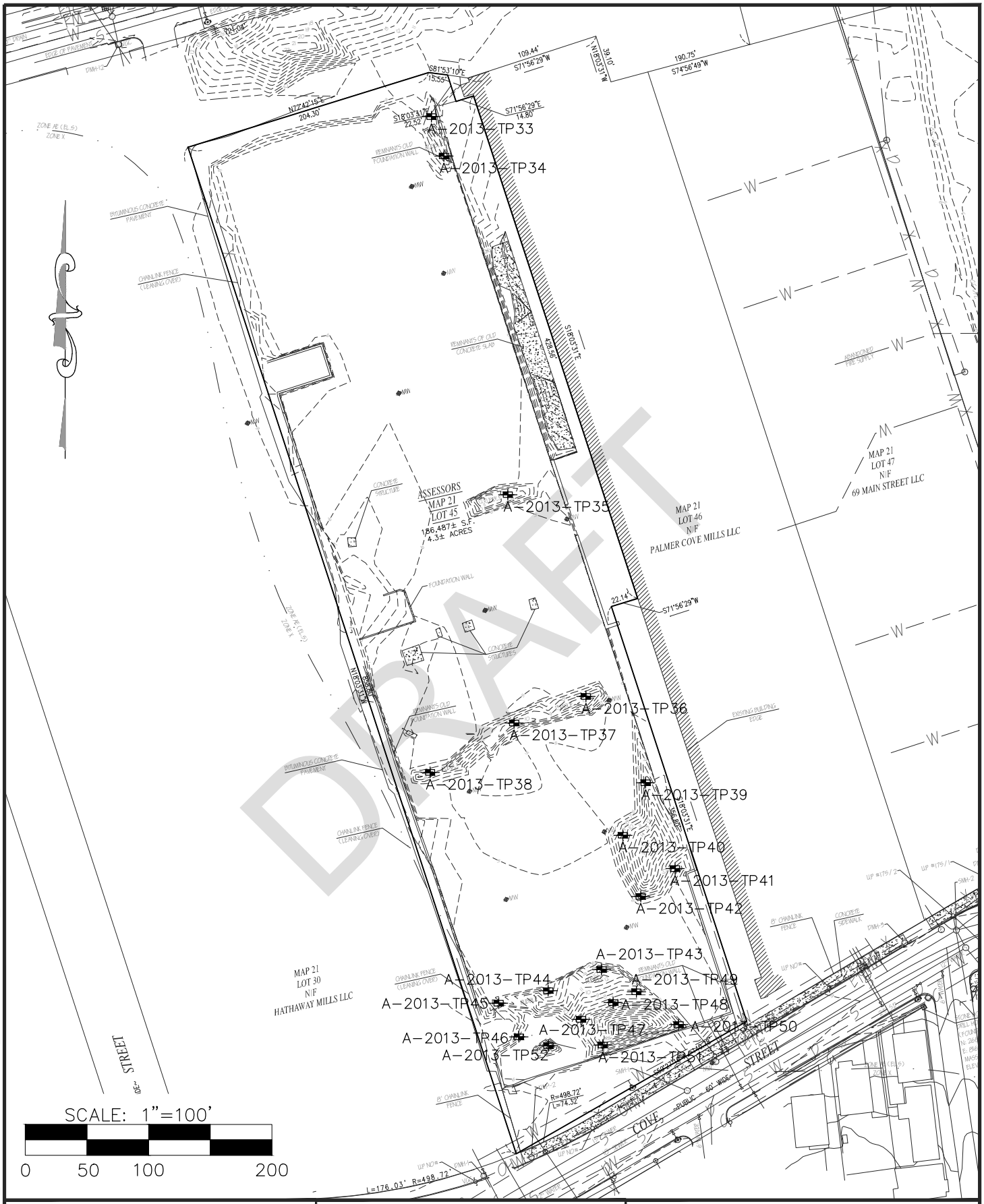
45 COVE STREET, NEW BEDFORD, MASSACHUSETTS
FORMER DARTMOUTH FINISHING

SITE PLAN
TEST PIT LOCATIONS

| DESIGNED BY: SQ | CHECKED BY: JSC | DATE: SEPTEMBER 2012 |
|---|---|---|

Weston&Sampson®

O:\New Bedford - Cove St\Cove St\Reports\Phase II Documents\Supplemental Phase II\CADD\cove street 09212012.dwg

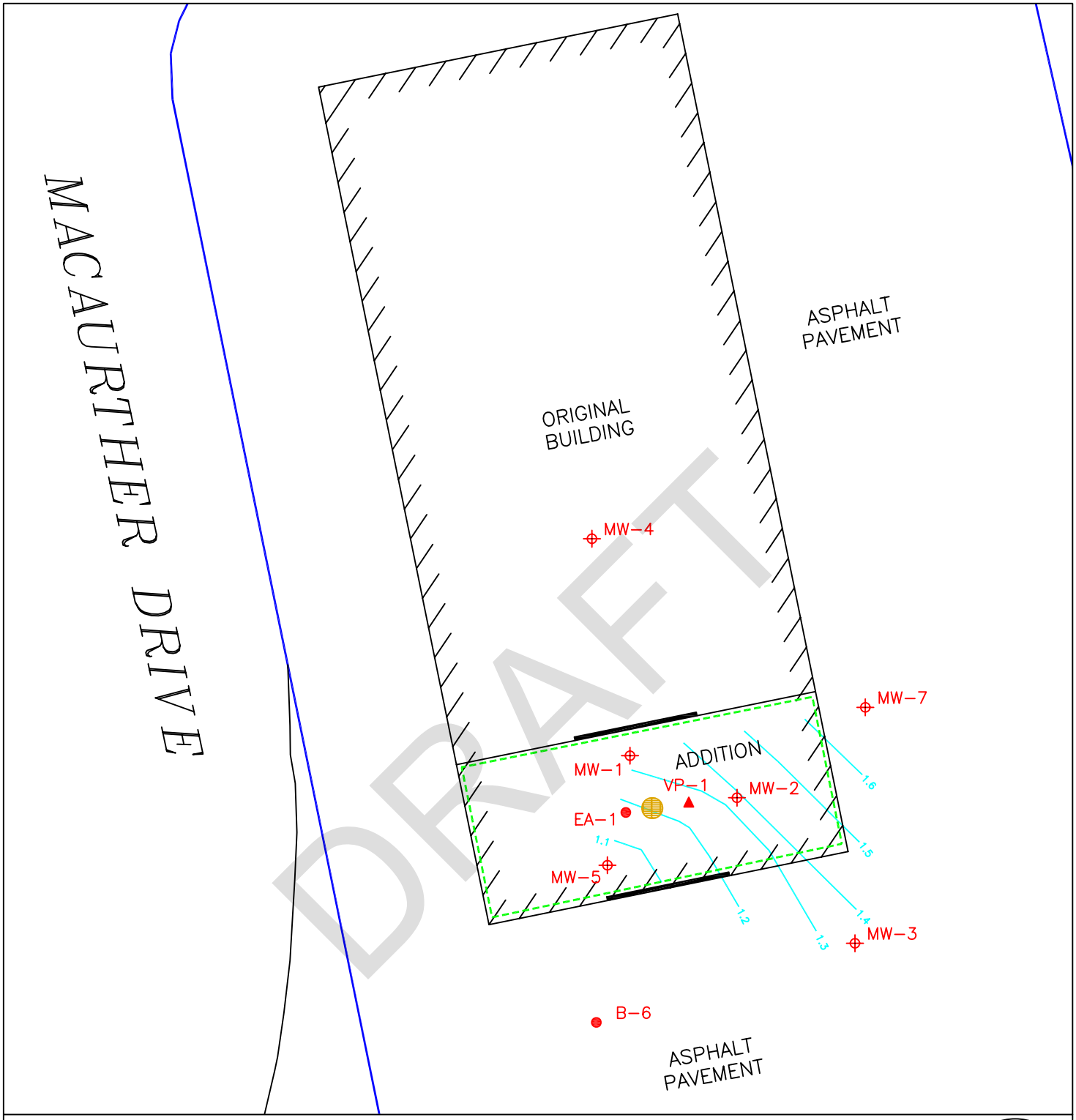



| | | |
|---|---|---|
| Figure 5:<br>STOCKPILE SAMPLING LOCATION MAP<br>DARTMOUTH FINISHING | New Bedford<br>Marine Commerce Terminal | APEX<br>125 Broad Street<br>Boston, Massachusetts<br>Phone: (617) 728-0070 |

**CP BRODEUR, INC.**

**RTN: 4-23643**

DRAFT




LEGEND

- APPX. PROPERTY LINES
- MW-1 GROUNDWATER MONITORING WELL
- B-1 SOIL BORING ONLY
- VP-1 SOIL VAPOR PROBE
- OIL/WATER SEPERATOR
- INFERRED SITE/RAO BOUNDRY
- OVERHEAD DOOR
- 1.1 INFERRED GROUNDWATER CONTOUR AND ELEVATION

NOTES: ALL LOCATIONS ARE CONSIDERED APPROXIMATE

FIGURE 2

PROPERTY/SITE SKETCH

*appx. scale:*
1"=20'
0 10 20

CP BRODEUR, INC.
80 WRIGHT STREET
NEW BEDFORD, MASSACHUSETTS

SITEC ENVIRONMENTAL
769 Plain Street, Unit C
Marshfield, MA 02050
Tel. (781) 319-0100 FAX (781) 834-4783

# EXHIBIT B
# HISTORICAL TABLES BY OTHERS

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**SHUSTER PROPERTY (FMR RIST LLC)**

**RTN: 4-23736**

DRAFT

**Table 1**
**Analytical Testing Summary: Soil**
**New Bedford Marine Commerce Terminal**
**New Bedford, Massachusetts**

| Sample ID | PCBs | VOCs | SVOCs | Metals | TPH | MA VPH | MA EPH | TCLP-Pb |
|---|---|---|---|---|---|---|---|---|
| TP-1 | x | | | x | x | | | |
| TP-2 | x | | | x | x | | | x |
| TP-3 | x | x | x | x | x | x | x | |
| TP-4 | x | | | x | x | | | x |
| TP-5 | x | | | x | x | | | x |
| TP-6 | x | x | x | x | x | x | x | |
| TP-8 | x | | | x | x | | | |
| TP-9 | x | | | x | x | | | |
| TP-10 | x | | | x | x | | | |
| TP-11 | x | | | x | x | | | |
| TP-12 | x | | | x | x | | | x |
| TP-14 | x | | | x | x | | | |
| TP-16 | x | | | x | x | | | |
| DUPLICATE 1 | x | x | x | x | x | x | x | |
| DUPLICATE 2 | x | x | x | x | x | x | x | |
| TP6-1-N-H | x | x | x | | | | x | |
| TP6-2-N-M | x | x | x | | | | x | |
| TP6-3-N-A | x | x | x | | | | x | |
| TP6-3-N-B | x | x | x | | | | x | |
| TP6-2-W-A | x | x | x | | | | x | |
| TP6-2-W-M | x | x | x | | | | x | |
| TP6-2-W-B | x | x | x | | | | x | |
| TP6-1-NW-A | x | | | | | | x | |
| TP6-1-NW-M | x | | | | | | x | |
| TP6-1-NW-B | x | | | | | | x | |
| TP6-2-NW-A | x | | | | | | x | |
| TP6-2-NW-M | x | | | | | | x | |
| TP6-2-NW-B | x | | | | | | x | |
| TP6-1-NE-A | x | | | | | | x | |
| TP6-1-NE-M | x | | | | | | x | |
| TP6-1-NE-B | x | | | | | | x | |
| TP6-3-NE-A | x | | | | | | x | |
| TP6-3-NE-M | x | | | | | | x | |
| TP6-3-NE-B | x | | | | | | x | |
| TP6-5-NE-A | x | | x | | | | x | |
| TP6-5-NE-M | x | | x | | | | x | |
| TP6-5-NE-B | x | | x | | | | x | |

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**Table 1**
**Analytical Testing Summary: Soil**
**New Bedford Marine Commerce Terminal**
**New Bedford, Massachusetts**

| Sample ID | PCBs | VOCs | SVOCs | Metals | TPH | MA VPH | MA EPH | TCLP-Pb |
|---|---|---|---|---|---|---|---|---|
| TP6-7-NW-A | x | | x | | | | x | |
| TP6-7-NW-M | x | | x | | | | x | |
| TP6-7-NW-B | x | | x | | | | x | |
| TP2-1-W-H | x | x | x | | | | x | |
| TP2-2-W-M | x | x | x | | | | x | |
| TP2-4-W-A | x | x | x | | | | x | |
| TP2-4-W-B | x | x | x | | | | x | |
| TP3-1-S | x | | x | | | | x | |
| TP3-2-S-A | x | | x | | | | x | |
| TP3-2-S-M | x | | x | | | | x | |
| TP3-2-S-B | x | x | x | | | | x | |
| TP4-1-E | x | x | x | | | | x | |
| TP4-1-S-A | x | | x | | | | x | |
| TP4-1-S-M | x | | x | | | | x | |
| TP4-1-S-B | x | | x | | | | x | |
| TP4-1-W-A | x | | x | | | | x | |
| TP4-1-W-M | x | | x | | | | x | |
| TP4-1-W-B | x | | x | | | | x | |
| TP4-2-W | x | | x | | | | x | |
| TP-9-1-E | x | | | | | | | |
| TP-9-1-W | x | | | | | | | |
| TP-9-1-N | x | | | | | | | |
| TP-9-1-S | x | | | | | | | |
| B-5/MW-3 | x | | | x | | | | |
| B-6/MW-4 | x | | | x | | | | |
| B-7 | x | | | x | | | | |
| B-8/MW-5 | x | | | x | | | | x |
| B-9/MW-6 | x | | | x | | | | |
| B-11/MW-7 | x | x | | x | | x | x | |
| B-12/MW-8A | x | x | | x | | x | x | |
| B-12/MW-8B | x | x | | x | | x | x | |
| TP4-2NW-A | x | | | | | | | |
| TP4-2NW-M | x | | | | | | | |
| TP4-2NW-B | x | | | | | | | |
| TP4-1N-A | x | | | | | | | |
| TP4-1N-M | x | | | | | | | |
| TP4-1N-B | x | | | | | | | |

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**Table 1**
**Analytical Testing Summary: Soil**
**New Bedford Marine Commerce Terminal**
**New Bedford, Massachusetts**

| Sample ID | PCBs | VOCs | SVOCs | Metals | TPH | MA VPH | MA EPH | TCLP-Pb |
|---|---|---|---|---|---|---|---|---|
| TP4-2N-A | x | | | | | | | |
| TP4-2N-M | x | | | | | | | |
| TP4-2N-B | x | | | | | | | |
| TP4-1NE-A | x | | | | | | | |
| TP4-1NE-M | x | | | | | | | |
| TP4-1NE-B | x | | | | | | | |
| TP4-3W-A | x | | | | | | | |
| TP4-3W-M | x | | | | | | | |
| TP4-3W-B | x | | | | | | | |
| TP4-4W-A | x | | | | | | | |
| TP4-4W-M | x | | | | | | | |
| TP4-4W-B | x | | | | | | | |
| TP4-5W-A | x | | | | | | | |
| TP4-5W-M | x | | | | | | | |
| TP4-5W-B | x | | | | | | | |
| TP4-1NW-A | x | | | | | | | |
| TP4-1NW-M | x | | | | | | | |
| TP4-1NW-B | x | | | | | | | |
| TP2-1E-A | x | | | | | | | |
| TP2-1E-M | x | | | | | | | |
| TP2-1E-B | x | | | | | | | |
| TP6-1S | | | | | | | x | |
| TP63W | | | | | | | x | |
| TP6-8NW | | | | | | | x | |
| TP6-4N | | | | | | | x | |
| TP6-6NE | | | | | | | x | |
| TP2-1E | | | | | | | x | |
| TP2-2E | | | | | | | x | |
| TP4-1NE | | | | | | | x | |

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**Table 2**
**Analytical Testing Summary: Groundwater**
**New Bedford Marine Commerce Terminal**
**New Bedford, Massachusetts**

| Sample ID | PCBs | VOCs | SVOCs | Metals | TPH | VPH | EPH |
|---|---|---|---|---|---|---|---|
| MW-3 | x | x | x | x | x | | |
| MW-4 | x | x | x | x | x | | |
| MW-5 | x | x | x | x | x | | |
| MW-6 | x | x | x | x | x | | |
| MW-7 | x | x | x | x | x | x | x |
| MW-8 | x | x | x | x | x | x | x |

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# Table 3
# PCBs (Aroclors) -
# Test Pit Soil Analytical Data
# New Bedford Marine Commerce Terminal
# New Bedford, Massachusetts

| Sample Name | Collection Date | Aroclor 1016/1242 | Aroclor 1221 | Aroclor 1232 | Aroclor 1248 | Aroclor 1254 | Aroclor 1260 | Estimate of Total PCBs (Summation of reported Aroclors) (mg/kg) |
|---|---|---|---|---|---|---|---|---|
| TP-1 | 4/25/2011 | 0.06U | 0.06U | 0.06U | 0.06U | 0.086 | 0.06U | 0.086 |
| TP-2 | 4/25/2011 | 1.1U | 1.1U | 1.1U | 1.1U | 75 | 1.1U | 75 |
| TP-5 | 4/25/2011 | 0.31U | 0.31U | 0.31U | 0.31U | 0.31U | 0.31U | ND |
| TP-4 | 4/25/2011 | 6.2U | 6.2U | 6.2U | 6.2U | 610 | 6.2U | 610 |
| TP-3 | 4/25/2011 | 0.53J | 0.17U | 0.17U | 0.52J | 12.0 | 0.17U | 13.1 |
| TP-6 | 4/26/2011 | 0.0067U | 0.0067U | 0.0067U | 0.0067U | 0.11 | 0.0067U | 0.11 |
| TP-8 | 4/26/2011 | 0.0058U | 0.0058U | 0.0058U | 0.0058U | 0.014 | 0.0058U | 0.014 |
| TP-9 | 4/26/2011 | 0.77U | 0.77U | 0.77U | 0.77U | 4.6 | 0.77U | 4.6 |
| TP-11 | 4/26/2011 | 0.0054U | 0.0054U | 0.0054U | 0.0054U | 0.032 | 0.0054U | 0.032 |
| TP-10 | 4/27/2011 | 0.0058U | 0.0058U | 0.0058U | 0.0058U | 0.22 | 0.0058U | 0.22 |
| TP-12 | 4/27/2011 | 0.0062U | 0.0062U | 0.0062U | 0.0062U | 0.11 | 0.0062U | 0.11 |
| TP-14 | 4/27/2011 | 0.0059 | 0.0059 | 0.0059 | 0.0059 | 0.1 | 0.0059 | 0.1 |
| TP-16 | 4/27/2011 | 0.0061U | 0.0061U | 0.0061U | 0.0061U | 0.03 | 0.0061U | 0.03 |
| DUPLICATE 1* | 4/25/2011 | 0.57U | 0.57U | 0.57U | 0.57U | 3.1 | 0.57U | 3.1 |
| DUPLICATE 2** | 4/26/2011 | 0.0067U | 0.0067U | 0.0067U | 0.0067U | 0.1 | 0.0067U | 0.1 |
| TP6-1-N-H | 7/18/2011 | 0.0099U | 0.0099U | 0.0099U | 0.0099U | 0.019 | 0.0099U | 0.019 |
| TP6-2-N-M | 7/18/2011 | 0.0068U | 0.0068U | 0.0068U | 0.0068U | 0.0068U | 0.0068U | ND |
| TP6-3-N-A | 7/18/2011 | 0.0059U | 0.0059U | 0.0059U | 0.0059U | 0.540 | 0.019 | 0.559 |
| TP6-3-N-B | 7/18/2011 | 0.0062U | 0.0062U | 0.0062U | 0.0062U | 0.0062U | 0.0062U | ND |
| TP6-2-W-A | 7/19/2011 | 0.0058U | 0.0058U | 0.0058U | 0.0058U | 1.7 | 0.0058U | 1.7 |
| TP6-2-W-M | 7/19/2011 | 0.019U | 0.019U | 0.019U | 0.019U | 0.019U | 0.019U | ND |
| TP6-2-W-B | 7/19/2011 | 0.0056U | 0.0056U | 0.0056U | 0.0056U | 0.0056U | 0.0056U | ND |
| TP6-1-NW-A | 7/22/2011 | 0.0059U | 0.0059U | 0.0059U | 0.0059U | 1.7 | 0.0059U | 1.7 |
| TP6-1-NW-M | 7/22/2011 | 0.0052U | 0.0052U | 0.0052U | 0.0052U | 0.28 | 0.140 | 0.42 |
| TP6-1-NW-B | 7/22/2011 | 0.006U | 0.006U | 0.006U | 0.006U | 0.047 | 0.006U | 0.047 |
| TP6-2-NW-A | 7/22/2011 | 0.015U | 0.015U | 0.015U | 0.015U | 2.3 | 0.094 | 2.394 |
| TP6-2-NW-M | 7/22/2011 | 0.0054U | 0.0054U | 0.0054U | 0.0054U | 0.0054U | 0.0054U | ND |
| TP6-2-NW-B | 7/22/2011 | 0.006U | 0.006U | 0.006U | 0.006U | 0.006U | 0.006U | ND |
| TP6-1-NE-A | 7/22/2011 | 0.0051U | 0.0051U | 0.0051U | 0.0051U | 0.25 | 0.0096 | 0.2596 |
| TP6-1-NE-M | 7/22/2011 | 0.0062U | 0.0062U | 0.0062U | 0.0062U | 0.35 | 0.0062U | 0.35 |
| TP6-1-NE-B | 7/22/2011 | 0.0051U | 0.0051U | 0.0051U | 0.0051U | 0.028 | 0.0051U | 0.028 |
| TP6-3-NE-A | 7/22/2011 | 0.0055U | 0.0055U | 0.0055U | 0.0055U | 0.025 | 0.0055U | 0.025 |
| TP6-3-NE-M | 7/22/2011 | 0.0055U | 0.0055U | 0.0055U | 0.0055U | 0.0055U | 0.0055U | ND |
| TP6-3-NE-B | 7/22/2011 | 0.0058U | 0.0058U | 0.0058U | 0.0058U | 0.019 | 0.0058U | 0.019 |
| TP6-5-NE-A | 7/25/2011 | 0.0051U | 0.0051U | 0.0051U | 0.0051U | 0.0051U | 0.0051U | ND |
| TP6-5-NE-M | 7/25/2011 | 0.0059U | 0.0059U | 0.0059U | 0.0059U | 0.042 | 0.0059U | 0.042 |
| TP6-5-NE-B | 7/25/2011 | 0.0066U | 0.0066U | 0.0066U | 0.0066U | 0.0066U | 0.0066U | ND |
| TP6-7-NW-A | 7/25/2011 | 0.0056U | 0.0056U | 0.0056U | 0.0056U | 0.11 | 0.0056U | 0.11 |
| TP6-7-NW-M | 7/25/2011 | 0.0059U | 0.0059U | 0.0059U | 0.0059U | 0.0059U | 0.0059U | ND |
| TP6-7-NW-B | 7/25/2011 | 0.0066U | 0.0066U | 0.0066U | 0.0066U | 0.0066U | 0.0066U | ND |
| TP2-2-W-H | 7/19/2011 | 0.0058U | 0.0058U | 0.0058U | 0.0058U | 0.0058U | 0.0058U | ND |
| TP2-2-W-M | 7/19/2011 | 0.0056U | 0.0056U | 0.0056U | 0.0056U | 0.0056U | 0.0056U | ND |
| TP2-4-W-A | 7/19/2011 | 0.0077 | 0.0055U | 0.0055U | 0.0055U | 0.170 | 0.012 | 0.0077 |
| TP2-4-W-B | 7/19/2011 | 0.0057U | 0.0057U | 0.0057U | 0.0057U | 0.087 | 0.0059 | 0.093 |
| TP3-1-S | 7/19/2011 | 0.0069U | 0.0069U | 0.0069U | 0.0069U | 0.0069U | 0.0069U | ND |
| TP3-2-S-A | 7/19/2011 | 0.0058U | 0.0058U | 0.0058U | 0.0058U | 1.3 | 0.06 | 1.36 |
| TP3-2-S-M | 7/19/2011 | 0.0056U | 0.0056U | 0.0056U | 0.0056U | 0.42 | 0.019 | 0.439 |
| TP3-2-S-B | 7/19/2011 | 0.0059U | 0.0059U | 0.0059U | 0.0059U | 0.0059U | 0.0059U | ND |
| TP4-1-E | 7/19/2011 | 0.0067U | 0.0067U | 0.0067U | 0.0067U | 0.57 | 0.0067U | 0.57 |
| TP4-1-S-A | 7/20/2011 | 0.0058U | 0.0058U | 0.0058U | 0.0058U | 0.360 | 0.041 | 0.401 |
| TP4-1-S-M | 7/20/2011 | 0.0056U | 0.0056U | 0.0056U | 0.0056U | 0.0059 | 0.0056U | 0.0059 |
| TP4-1-S-B | 7/20/2011 | 0.0059U | 0.0059U | 0.0059U | 0.0059U | 0.0059U | 0.0059U | ND |
| TP4-1-W-A | 7/20/2011 | 3.1U | 3.1U | 3.1U | 3.1U | 630 | 11 | 641 |
| TP4-1-W-M | 7/20/2011 | 2.9U | 2.9U | 2.9U | 2.9U | 970 | 19 | 989 |
| TP4-1-W-B | 7/20/2011 | 0.006U | 0.006U | 0.006U | 0.023 | 0.170 | 0.006U | 0.193 |
| TP4-2-W | 7/20/2011 | 12U | 12U | 12U | 12U | 480 | 12U | 480 |
| TP-9-1-E | 7/20/2011 | 0.0092U | 0.0092U | 0.0092U | 0.0092U | 0.014 | 0.0092U | 0.014 |
| TP-9-1-W | 7/20/2011 | 0.0075U | 0.0075U | 0.0075U | 0.017 | 0.069 | 0.0075U | 0.086 |
| TP-9-1-N | 7/20/2011 | 0.0097U | 0.0097U | 0.0097U | 0.0097U | 0.0097U | 0.0097U | ND |

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# Table 3
# PCBs (Aroclors) -
# Test Pit Soil Analytical Data
# New Bedford Marine Commerce Terminal
# New Bedford, Massachusetts

| Sample Name | Collection Date | Aroclor 1016/1242 | Aroclor 1221 | Aroclor 1232 | Aroclor 1248 | Aroclor 1254 | Aroclor 1260 | Estimate of Total PCBs (Summation of reported Aroclors) (mg/kg) |
|---|---|---|---|---|---|---|---|---|
| TP-9-1-S | 7/20/2011 | 0.0096U | 0.0096U | 0.0096U | 0.0096U | 0.0096U | 0.0096U | ND |
| B-5/MW-3 | 5/4/2011 | 0.0057U | 0.0057U | 0.0057U | 0.0057U | 0.0057U | 0.0057U | ND |
| B-6/MW-4 | 5/5/2011 | 0.0057U | 0.0057U | 0.0057U | 0.0057U | 0.040 | 0.0057U | 0.04 |
| B-7 | 5/6/2011 | 0.0053U | 0.0053U | 0.0053U | 0.0053U | 0.060 | 0.0053U | 0.06 |
| B-8/MW-5 | 5/6/2011 | 0.0057U | 0.0057U | 0.0057U | 0.0057U | 0.020 | 0.0057U | 0.02 |
| B-9/MW-6 | 5/9/2011 | 0.0053U | 0.0053U | 0.0053U | 0.0053U | 0.020 | 0.0053U | 0.02 |
| B-11/MW-7 | 5/12/2011 | 0.0057U | 0.0057U | 0.0057U | 0.0057U | 0.0057U | 0.0057U | ND |
| B-12/MW-8A | 5/13/2011 | 0.011U | 0.011U | 0.011U | 0.011U | 0.011U | 0.011U | ND |
| B-12/MW-8B | 5/13/2011 | 0.0059U | 0.0059U | 0.0059U | 0.0059U | 0.0059U | 0.0059U | ND |
| TP4-2NW-A | 8/11/2011 | 0.0054U | 0.0054U | 0.0054U | 0.0054U | 1.10 | 0.039 | 1.14 |
| TP4-2NW-M | 8/11/2011 | 0.019U | 0.019U | 0.019U | 0.019U | 0.02 | 0.019U | 0.02 |
| TP4-2NW-B | 8/11/2011 | 0.006U | 0.006U | 0.006U | 0.006U | 0.006U | 0.006U | ND |
| TP4-1N-A | 8/11/2011 | 0.0055U | 0.0055U | 0.0055U | 0.0055U | 0.93 | 0.041 | 0.971 |
| TP4-1N-M | 8/11/2011 | 0.12U | 0.12U | 0.12U | 0.12U | 0.12U | 0.12U | ND |
| TP4-1N-B | 8/11/2011 | 0.0063U | 0.0063U | 0.0063U | 0.0063U | 0.0063U | 0.0063U | ND |
| TP4-2N-A | 8/11/2011 | 0.0053U | 0.0053U | 0.0053U | 0.0053U | 0.01 | 0.0053U | 0.01 |
| TP4-2N-M | 8/11/2011 | 0.0056U | 0.0056U | 0.0056U | 0.0056U | 0.01 | 0.0056U | 0.01 |
| TP4-2N-B | 8/11/2011 | 0.017U | 0.017U | 0.017U | 0.017U | 0.017U | 0.017U | ND |
| TP4-1NE-A | 8/11/2011 | 0.0056U | 0.0056U | 0.0056U | 0.0056U | 0.09 | 0.0056U | 0.09 |
| TP4-1NE-M | 8/11/2011 | 0.19U | 0.19U | 0.19U | 0.19U | 0.19U | 0.19U | ND |
| TP4-1NE-B | 8/11/2011 | 0.066U | 0.066U | 0.066U | 0.066U | 0.066U | 0.066U | ND |
| TP4-3W-A | 8/11/2011 | 0.055U | 0.055U | 0.055U | 0.055U | 4.10 | 0.16 | 4.26 |
| TP4-3W-M | 8/11/2011 | 0.0057U | 0.0057U | 0.0057U | 0.0057U | 0.47 | 0.024 | 0.494 |
| TP4-3W-B | 8/11/2011 | 0.0056U | 0.0056U | 0.0056U | 0.0056U | 0.01 | 0.0056U | 0.01 |
| TP4-4W-A | 8/11/2011 | 0.0058U | 0.0058U | 0.0058U | 0.0058U | 0.03 | 0.0058U | 0.03 |
| TP4-4W-M | 8/11/2011 | 0.059U | 0.059U | 0.059U | 0.059U | 0.059U | 0.059U | ND |
| TP4-4W-B | 8/11/2011 | 0.011U | 0.011U | 0.011U | 0.011U | 0.011U | 0.011U | ND |
| TP4-5W-A | 8/11/2011 | 0.0056U | 0.0056U | 0.0056U | 0.0056U | 0.33 | 0.0056U | 0.33 |
| TP4-5W-M | 8/11/2011 | 0.07U | 0.07U | 0.07U | 0.07U | 0.38 | 0.07U | 0.38 |
| TP4-5W-B | 8/11/2011 | 0.01U | 0.01U | 0.01U | 0.01U | 0.01U | 0.01U | ND |
| TP4-1NW-A | 8/11/2011 | 0.0058U | 0.0058U | 0.0058U | 0.0058U | 110.00 | 0.0058U | 110 |
| TP4-1NW-M | 8/11/2011 | 0.095U | 0.095U | 0.095U | 0.095U | 0.15 | 0.095U | 0.15 |
| TP4-1NW-B | 8/11/2011 | 0.0055U | 0.0055U | 0.0055U | 0.0055U | 1.30 | 0.067 | 1.367 |
| TP2-1E-A | 8/11/2011 | 0.0052U | 0.0052U | 0.0052U | 0.0052U | 0.01 | 0.0052U | 0.01 |
| TP2-1E-M | 8/11/2011 | 0.0054U | 0.0054U | 0.0054U | 0.0054U | 0.01 | 0.0054U | 0.01 |
| TP2-1E-B | 8/11/2011 | 0.0056U | 0.0056U | 0.0056U | 0.0056U | 0.01 | 0.0056U | 0.01 |
| | | | | | | | | |
| MCP Upper Concentration Limits ( | | NP | NP | NP | NP | NP | NP | 100 |
| MCP S-3/GW-2 | | NP | NP | NP | NP | NP | NP | 3 |
| MCP S-3/GW-3 | | NP | NP | NP | NP | NP | NP | 3 |
| Reporting Category - RCS-2 | | NP | NP | NP | NP | NP | NP | 3 |

**Notes:**

U = Concentration is below the laboratory's method detection limit. One half of the method detection limit is utilized in the summation.

*Duplicate 1 is a duplicate sample of sample TP-3.

**Duplicate 2 is a duplicate sample of sample TP-6.

NP = Not Promulgated

ND = Analyzed Aroclors were non-detected.

J = Estimated value.

Exceedance of MCP Reporting Category and/or Standard, which also exceeds EPA's unrestricted use standard of 1 ppm.

Exceedance of EPA's unrestricted use Standard in High Occupancy Use Areas (e.g., residential) of 1 ppm, but not its respective MCP Reporting Category and/or Standard.

NOTE: EPA Standard for Low Occupancy Use Areas (e.g., commercial) is less than or equal to 25 ppm (and greater than 1 ppm).

A = Shallow Sample

M = Middle Sample

B = Bottom

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# Table 4
# Volatile Organic Compounds
# Soil Analytical Data
# South Terminal CDF, New Bedford, Massachusetts
# concentration in ppm (mg/kg)

| Sample Name | Collection Date | **Volatile Organics** (mg/kg) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Tetrachloroethene | Benzene | Toluene | Ethylbenzene | p/m-Xylene | o-Xylene | n-Butylbenzene | sec-Butylbenzene | Isopropylbenzene | p-Isopropyltoluene | Naphthalene | n-Propylbenzene | 1,3,5-Trimethylbenzene | 1,2,4-Trimethylbenzene |
| B-11/MW-7 | 5/12/2011 | 0.1U | 0.1U | 0.16U | 1.1 | 0.76 | 0.32 | 0.1U | 0.1U | 0.1U | 0.1U | 12.0 | 0.1U | 0.41U | 0.440 |
| B-12/MW-8 (A) | 5/13/2011 | 0.5U | 6.6 | 0.74U | 7.6 | 10 | 7.2 | 0.5U | 0.5U | 3.2 | 1.8 | 36.0 | 0.5U | 2U | 3.2 |
| B-12/MW-8 (B) | 5/13/2011 | 0.083U | 0.52 | 0.12U | 0.78 | 0.8 | 0.58 | 0.083U | 0.083U | 0.42 | 0.22 | 4.6 | 0.083U | 0.33U | 0.350 |
| TP-3 | 4/25/2011 | 0.089U | 0.089U | 0.130U | 0.089U | 0.180U | 0.180U | 0.089U | 0.089U | 0.089U | 0.089U | 1.5 | 0.089U | 0.350U | 0.350U |
| Duplicate 1* | 4/25/2011 | 0.082U | 0.082U | 0.120U | 0.082U | 0.160U | 0.160U | 0.082U | 0.082U | 0.082U | 0.089 | 1.5 | 0.082U | 0.330U | 0.330U |
| TP-6 | 4/26/2011 | 4.0U | 4.0U | 10 | 2.2 | 20 | 8.1 | 4.0U | 4.0U | 5.9 | 4.2 | 180 | 4.0U | 16.0U | 16.0U |
| Duplicate 2** | 4/26/2011 | 0.820U | 0.820U | 2.2 | 5.8 | 5.4 | 2.2 | 0.820U | 0.820U | 1.8 | 1.4 | 64 | 0.820U | 3.3U | 3.3U |
| TP6-1-N-H | 7/18/2011 | 6.6U | 6.6U | 9.9U | 39 | 15 | 18 | 6.6U | 6.6U | 38 | 43 | 470 | 6.6U | 26.0U | 40 |
| TP6-2-N-M | 7/18/2011 | 0.13U | 0.13U | 0.19U | 0.13U | 0.25U | 0.25U | 0.13U | 0.13U | 0.13U | 0.13U | 0.51U | 0.13U | 0.51U | 0.51U |
| TP6-3-N-A | 7/18/2011 | 0.13U | 0.0013U | 0.002U | 0.0013U | 0.0026U | 0.0026U | 0.0013U | 0.0013U | 0.0013U | 0.0013U | 0.0053U | 0.0013U | 0.0053U | 0.0053U |
| TP6-3-N-B | 7/18/2011 | 0.00095U | 0.00095U | 0.0014U | 0.00095U | 0.0019U | 0.0019U | 0.00095U | 0.00095U | 0.00095U | 0.00095U | 0.0038U | 0.00095U | 0.0038U | 0.0038U |
| TP6-2-W-A | 7/19/2011 | 0.0025U | 0.0025U | 0.0038U | 0.0025U | 0.005U | 0.005U | 0.0025U | 0.0025U | 0.0025U | 0.0025U | 0.01U | 0.0025U | 0.01U | 0.01U |
| TP6-2-W-M | 7/19/2011 | .720U | 2.1 | 1.1U | 5.6 | 4.3 | 2.0 | 0.720U | 0.720U | 0.720U | 0.720U | 2.9U | 0.720U | 2.9U | 2.9U |
| TP6-2-W-B | 7/19/2011 | 0.087U | 0.087U | 0.130U | 0.087U | 0.170U | 0.170U | 0.087U | 0.087U | 0.087U | 0.087U | 0.45 | 0.087U | 0.35U | 0.35U |
| TP2-1-W-H | 7/19/2011 | 0.30 | 0.38 | 0.32 | 4.6 | 5.4 | 2.8 | 1.3 | 0.1 | 1.50 | 1.30 | 340 | 0.77 | 4.70 | 8.80 |
| TP2-2-W-M | 7/19/2011 | 1.8U | 1.8U | 2.8U | 2.9 | 3.7U | 3.7U | 1.8U | 1.8U | 1.8U | 1.8U | 92 | 1.8U | 7.4U | 7.4U |
| TP2-4-W-A | 7/19/2011 | 0.0018U | 0.0016U | 0.0023U | 0.0016U | 0.0031U | 0.0031U | 0.0016U | 0.0016U | 0.0016U | 0.0016U | 0.0062U | 0.160U | 0.0062U | 0.0062U |
| TP2-4-W-B | 7/19/2011 | 0.0019U | 0.0019U | 0.0028U | 0.0019U | 0.0037U | 0.0037U | 0.0019U | 0.0019U | 0.0019U | 0.0019U | 0.0075U | 0.160U | 0.0075U | 0.0075U |
| TP4-1-E | 7/19/2011 | 0.160U | 3.3 | 0.36 | 0.160U | 0.320U | 0.320U | 0.160U | 0.160U | 0.160U | 0.160U | 0.630U | 0.160U | 0.630U | 0.630U |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MCP Upper Concentration Limit (UCL): | 10000 | 9,000 | 10,000 | 10,000 | 10,000 | NP | NP | NP | NP | 10,000 | NP | NP | NP |
| MCP S-1/GW-3 | 30 | 30 | 500 | 500 | 500 | NP | NP | NP | NP | 500 | NP | NP | NP |
| MCP S-3/GW-3 | 1000 | 900 | 3,000 | 3,000 | 3,000 | NP | NP | NP | NP | 3,000 | NP | NP | NP |
| Reporting Category - RCS-2 | 10 | 200 | 1,000 | 1,000 | 300 | NP | NP | 10,000 | NP | 40 | NP | 100 | 10,000 |

**Notes:**
Only detected compounds are reported in the table. Please refer to Appendix _ for a complete listing of analytes.
U = Concentration is below the laboratory's method detection limit.
NP = Not Promulgated
*Duplicate 1 is a duplicate sample of sample TP-3.
**Duplicate 2 is a duplicate sample of sample TP-6.
- Exceedance of Reporting Category and/or Standard
Testing results for trip blanks analyzed during the testing program were all non-detect (ND).
Acetone and Carbon disulfide detected in TP6-N-B at low ppb levels considered an artifact of laboratory.

**Table 5**
**13 Priority Pollutant Metals Soil**
**Analytical Data**
**New Bedford Marine Commerce Terminal**
**New Bedford, Massachusetts**

| Sample Name | Collection Date | 13 Priority Pollutant Metals (mg/kg) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Antimony | Arsenic | Beryllium | Cadmium | Chromium | Copper | Lead | Mercury | Nickel | Selenium | Silver | Thallium | Zinc | TCLP lead (mg/l) |
| B-5/MW-3 | 5/4/2011 | 0.0900 | 4.11 | 0.298 | 0.079 | 6.48 | 13.0 | 77.2 | 0.061 | 5.25 | 0.434 | 0.094 | 0.104 | 37.3 | N/A |
| B-6/MW-4 | 5/5/2011 | 0.2840 | 1.25 | 0.166 | 0.071 | 7.72 | 14.0 | 95.2 | 0.027 | 5.36 | 0.318 | 0.033 | 0.056 | 55.7 | N/A |
| B-7 | 5/6/2011 | 0.035U | 0.68 | 0.196 | 0.047 | 6.60 | 6.8 | 15.2 | 0.012U | 4.61 | 0.203 | 0.035U | 0.078U | 19.0 | N/A |
| B-8/MW-5 | 5/6/2011 | 0.0400 | 1.32 | 0.270 | 0.409 | 6.19 | 10.1 | 161.0 | 0.028 | 4.07 | 0.334 | 0.039 | 0.086U | 126.0 | 0.6 |
| B-9/MW-6 | 5/9/2011 | 0.034U | 1.01 | 0.143 | 0.056 | 13.60 | 12.1 | 4.8 | 0.013U | 10.40 | 0.117 | 0.034U | 0.032U | 18.8 | N/A |
| B-11/MW-7 | 5/12/2011 | 0.037U | 1.00 | 0.194 | 0.040 | 6.04 | 3.4 | 3.3 | 0.014U | 3.38 | 0.279 | 0.037U | 0.082 | 10.1 | N/A |
| B-12/MW-8 (A) | 5/13/2011 | 0.1060 | 3.95 | 0.317 | 0.257 | 8.20 | 3.6 | 4.0 | 0.025U | 4.37 | 2.530 | 0.065U | 0.219 | 8.0 | N/A |
| B-12/MW-8 (B) | 5/13/2011 | 0.0560 | 1.78 | 0.251 | 0.037U | 9.02 | 2.9 | 4.6 | 0.013 | 4.99 | 0.481 | 0.038U | 0.045 | 13.0 | N/A |
| TP-1 | 4/25/2011 | 0.039U | 1.66 | 0.124 | 0.066 | 4.08 | 13.8 | 11.7 | 0.073 | 2.92 | 0.273 | 0.074 | 0.085 | 17.4 | NA |
| TP-2 | 4/25/2011 | 0.126 | 1.67 | 0.138 | 0.269 | 4.87 | 12.5 | 126 | 0.151 | 6.01 | 0.253 | 0.078 | 0.053 | 132 | 0.56 |
| TP-5 | 4/25/2011 | 0.472 | 6.37 | 0.202 | 0.570 | 5.80 | 21.9 | 580 | 0.134 | 5.95 | 0.549 | 0.149 | 0.127 | 200 | 18 |
| TP-4 | 4/25/2011 | 0.857 | 5.35 | 0.672 | 3.68 | 11.3 | 110 | 252 | 0.084 | 11.0 | 0.936 | 0.166 | 0.201 | 240 | 0.5U |
| TP-3 | 4/25/2011 | 0.037U | 1.20 | 0.230 | 0.034U | 8.92 | 6.04 | 4.41 | 0.013U | 5.84 | 0.249 | 0.038 | 0.037 | 15.9 | NA |
| TP-6 | 4/26/2011 | 0.195 | 5.10 | 0.232 | 0.186 | 3.96 | 44.0 | 74.5 | 0.050 | 7.29 | 0.800 | 0.087 | 0.206 | 27.8 | NA |
| TP-8 | 4/26/2011 | 0.033U | 0.484 | 0.061 | 0.031U | 2.04 | 3.55 | 1.96 | 0.014U | 1.34 | 0.129 | 0.033U | 0.031U | 4.39 | NA |
| TP-9 | 4/26/2011 | 0.354 | 5.53 | 0.236 | 0.218 | 6.45 | 71.8 | 30.2 | 0.021 | 5.79 | 2.44 | 0.120 | 0.138 | 78.8 | NA |
| TP-11 | 4/26/2011 | 0.162 | 0.641 | 0.090 | 0.072 | 2.90 | 5.03 | 16.2 | 0.012U | 2.08 | 0.248 | 0.033U | 0.039 | 12.8 | NA |
| TP-10 | 4/27/2011 | 0.164 | 1.57 | 0.221 | 0.101 | 8.12 | 17.6 | 60.4 | 0.022 | 3.29 | 0.574 | 0.081 | 0.047 | 31.0 | NA |
| TP-12 | 4/27/2011 | 0.186 | 7.46 | 0.451 | 0.237 | 5.92 | 37.7 | 164 | 0.290 | 7.92 | 1.42 | 0.122 | 0.297 | 85.5 | 0.5U |
| TP-14 | 4/27/2011 | 0.103 | 2.68 | 0.204 | 0.064 | 5.15 | 19.2 | 26.9 | 0.067 | 7.99 | 0.528 | 0.045 | 0.076 | 21.1 | NA |
| TP-16 | 4/27/2011 | 0.110 | 1.58 | 0.217 | 0.055 | 5.72 | 6.53 | 10.2 | 0.016 | 3.82 | 0.517 | 0.049 | 0.060 | 28.0 | NA |
| DUPLICATE-1 | 4/25/2011 | 0.032U | 1.04 | 0.211 | 0.046 | 8.3 | 6.40 | 7.63 | 0.013U | 5.5 | 0.256 | 0.032U | 0.047 | 17.8 | NA |
| DUPLICATE-2 | 4/26/2011 | 0.133 | 4.06 | 0.176 | 0.105 | 4.57 | 40.2 | 68.1 | 0.045 | 4.76 | 0.907 | 0.071 | 0.120 | 38.7 | N/A |
| MCP Upper Concentration Limit (UCL) | | 300 | 200 | 2000 | 300 | 2000 | NP | 3000 | 300 | 7000 | 8000 | 2000 | 800 | 10000 | NP |
| MCP S-3/GW-2 | | 30 | 20 | 200 | 30 | 200 | NP | 300 | 30 | 700 | 800 | 200 | 80 | 5000 | NP |
| MCP S-3/GW-3 | | 30 | 20 | 200 | 30 | 200 | NP | 300 | 30 | 700 | 800 | 200 | 80 | 5000 | NP |
| Reporting Category - RCS-2 | | 30 | 20 | 200 | 30 | 200 | 10000 | 300 | 30 | 700 | 800 | 200 | 60 | 3000 | NP |

**Notes:**
U = below quntitation limit
N/A = Not Analyzed
NP = Not Promulgated
Exceedance of MCP Reporting Category and/or Standard
A = Shallow Sample
M = Middle Sample
B = Bottom

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**Table 6**
**Total Petroleum Hydrocarbons, MA VPH and MA EPH**
**Soil Analytical Data**
**New Bedford Marine Commerce Terminal**
**New Bedford, Massachusetts**

| Sample Name | Collection Date | Total Petroleum Hydrocarbons | C5-C8 Aliphatics | C9-C12 Aliphatics | C9-C10 Aromatics | C5-C8 Aliphatics, Adjusted | C9-C12 Aliphatics, Adjusted | C9-C18 Aliphatics | C19-C36 Aliphatics | C11-C22 Aromatics | C11-C22 Aromatics, Adjusted | Naphthalene | 2-Methylnaphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(1,2,3-cd)Pyrene | Dibenzo(a,h)anthracene | Benzo(ghi)perylene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-5/MW-3 | 5/4/2011 | 510 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| B-6/MW-4 | 5/5/2011 | 208 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| B-7 | 5/6/2011 | 36.3U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| B-8/MW-5 | 5/6/2011 | 791 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| B-9/MW-6 | 5/9/2011 | 180 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| B-11/MW-7 | 5/12/2011 | 38.4U | 4.34U | 13 | 7 | 4.34U | 4.34U | 8.17U | 8.17U | 17 | 9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| B-12/MW-8 (A) | 5/13/2011 | 562 | 14.4U | 66 | 31 | 14.4U | 19 | 14.4U | 16 | 127 | 81 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| B-12/MW-8 (B) | 5/13/2011 | 117 | 4.97U | 10 | 6 | 4.97U | 4.97U | 8.09U | 8.09U | 50 | 32 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-1 | 4/25/2011 | 48.4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-2 | 4/25/2011 | 2180 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-5 | 4/25/2011 | 253 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-4 | 4/25/2011 | 524 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-3 | 4/25/2011 | 449 | 21.8U | 85.4 | 55.2 | 21.8U | 30.2 | 37.9 | 15.4 | 244 | 195 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-6 | 4/26/2011 | 5900 | 153U | 342 | 239 | 153U | 153U | 76.0 | 47.3U | 2490 | 1750 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-8 | 4/26/2011 | 36.5U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-9 | 4/26/2011 | 52.9U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-11 | 4/26/2011 | 134 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-10 | 4/27/2011 | 59.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-12 | 4/27/2011 | 124 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-14 | 4/27/2011 | 37.2U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP-16 | 4/27/2011 | 38.8U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| DUPLICATE 1 | 4/25/2011 | 650 | 34.8 | 205 | 67.9 | 29.4 | 103 | 86.5 | 28.6 | 630 | 493 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| DUPLICATE 2 | 4/26/2011 | 613 | 46.2U | 131 | 90.7 | 46.2U | 46.2U | 643 | 432U | 19300 | 12600 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TP6-1-N-H | 7/18/2011 | NA | NA | NA | NA | NA | NA | 643U | 643U | 20600 | 17800 | 343 | 152 | 32.2U | 410 | 528 | 850 | 154 | 73.6 | 157 | 50.6 | 60.1 | 32.2U | 32.2U | 34.3 | 32.2U | 32.2U | 32.2U |
| TP6-2-N-M | 7/18/2011 | NA | NA | NA | NA | NA | NA | 1070 | 970 | 1100 | 1100 | 0.428U | 1.28 | 0.648 | 0.428U | 0.428U | 2.04 | 0.428U | 0.561 | 0.428U | 0.428U | 0.428U | 0.428U | 0.428U | 0.428U | 0.428U | 0.428U | 0.428U |
| TP6-3-N-A | 7/18/2011 | NA | NA | NA | NA | NA | NA | 7.54U | 7.54U | 30 | 22.2 | 0.377U | 0.377U | 0.377U | 0.377U | 0.377U | 1.2 | 0.377U | 1.2 | 1.31 | 0.535 | 0.829 | 0.544 | 0.5 | 0.576 | 0.432 | 0.377U | 0.669 |
| TP6-3-N-B | 7/18/2011 | NA | NA | NA | NA | NA | NA | 7.42U | 7.42U | 7.42U | 7.42U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U | 0.371U |
| TP6-2-W-A | 7/19/2011 | NA | NA | NA | NA | NA | NA | 36.9U | 54.8 | 322 | 253 | 1.85U | 1.85U | 1.85U | 1.85U | 1.85U | 3.11 | 1.85U | 10.6 | 13.5 | 7.26 | 8.3 | 5.68 | 4.62 | 7.38 | 4.15 | 1.85U | 4.81 |
| TP6-2-W-M | 7/19/2011 | NA | NA | NA | NA | NA | NA | 25.4U | 29.4 | 112 | 90.8 | 1.27U | 1.27U | 1.27U | 1.27U | 1.27U | 2.33 | 1.27U | 1.94 | 4.06 | 1.71 | 1.8 | 1.4 | 1.4 | 2.16 | 1.27U | 1.27U | 4.15 |
| TP6-2-W-B | 7/19/2011 | NA | NA | NA | NA | NA | NA | 7.18U | 7.18U | 56.1 | 38.9 | 0.359U | 0.411 | 0.359U | 1.13 | 0.757 | 4.57 | 1 | 1.54 | 2.99 | 0.908 | 0.867 | 0.515 | 0.468 | 0.978 | 0.424 | 0.359U | 0.644 |
| TP2-1-W-H | 7/19/2011 | NA | NA | NA | NA | NA | NA | 130 | 286 | 2840 | 1870 | 75.4 | 65.7 | 9.58 | 68.9 | 36.4 | 166 | 40.2 | 70.5 | 147 | 48.1 | 48.3 | 29.6 | 31.2 | 62.7 | 26.7 | 5.76U | 38.7 |
| TP2-1-W-M | 7/19/2011 | NA | NA | NA | NA | NA | NA | 84.6 | 44 | 837 | 558 | 35.1 | 29.6 | 2.35 | 15.6 | 10.9 | 49.8 | 11.8 | 18 | 37 | 10.3 | 10.6 | 7.18 | 8.06 | 13.8 | 7.29 | 2.25 | 9.78 |
| TP2-4-W-A | 7/19/2011 | NA | NA | NA | NA | NA | NA | 7.57U | 65.9 | 47.9 | 47 | 0.378U | 0.378U | 0.378U | 0.378U | 0.378U | 0.378U | 0.378U | 0.454 | 0.43 | 0.378U | 0.378U | 0.378U | 0.378U | 0.378U | 0.378U | 0.378U | 0.378U |
| TP2-4-W-B | 7/19/2011 | NA | NA | NA | NA | NA | NA | 7.8U | 12.4 | 88.9 | 66.3 | 0.39U | 0.39U | 0.39U | 0.39U | 0.39U | 1.79 | 0.39U | 3.09 | 3.85 | 1.79 | 2.17 | 1.79 | 1.5 | 2.21 | 1.75 | 0.39U | 2.65 |
| TP4-1-E | 7/19/2011 | NA | NA | NA | NA | NA | NA | 15.5 | 10.3 | 63.9 | 61.6 | 0.466 | 0.424U | 0.424U | 0.424U | 0.424U | 0.574 | 0.424U | 0.424U | 0.452 | 0.424U | 0.784 | 0.424U | 0.424U | 0.424U | 0.424U | 0.424U | 0.424U |
| TP3-1-S | 7/19/2011 | NA | NA | NA | NA | NA | NA | 9.24U | 9.24U | 42.5 | 25.8 | 0.462U | 0.462U | 0.462U | 0.462U | 0.462U | 2.42 | 0.462U | 3.17 | 3 | 1.27 | 1.52 | 1.23 | 1.02 | 1.3 | 0.914 | 0.462U | 0.907 |
| TP3-2-S-A | 7/19/2011 | NA | NA | NA | NA | NA | NA | 38.3U | 135 | 558 | 392 | 1.91U | 1.91U | 1.91U | 1.91U | 1.91U | 19.8 | 3.96 | 31 | 26.7 | 13 | 14.7 | 12.8 | 11.2 | 14.4 | 9.28 | 1.91U | 9.61 |

**Table 6**
**Total Petroleum Hydrocarbons, MA VPH and MA EPH**
**Soil Analytical Data**
**New Bedford Marine Commerce Terminal**
**New Bedford, Massachusetts**

| Sample Name | Collection Date | Total Petroleum Hydrocarbons | C5-C8 Aliphatics | C9-C12 Aliphatics | C9-C10 Aromatics | C5-C8 Aliphatics, Adjusted | C9-C12 Aliphatics, Adjusted | C9-C18 Aliphatics | C19-C36 Aliphatics | C11-C22 Aromatics | C11-C22 Aromatics, Adjusted | Naphthalene | 2-Methylnaphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(1,2,3-cd)Pyrene | Dibenzo(a,h)anthracene | Benzo(ghi)perylene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TP3-2-S-M | 7/19/2011 | NA | NA | NA | NA | NA | NA | 6.83U | 7.8 | 34.8 | 25.5 | 0.341U | 0.341U | 0.341U | 0.341U | 0.341U | 0.981 | 0.341U | 1.93 | 1.71 | 0.833 | 0.902 | 0.583 | 0.341U | 0.921 | 0.681 | 0.341U | 0.751 |
| TP3-2-S-B | 7/19/2011 | NA | NA | NA | NA | NA | NA | 6.98U | 6.98U | 6.98U | 6.98U | 0.626 | 0.349U | 0.349U | 0.349U | 0.349U | 0.349U | 0.349U | 0.349U | 0.349U | 0.349U | 0.349U | 0.349U | 0.349U | 0.349U | 0.349U | 0.349U | 0.349U |
| TP4-1-S-A | 7/20/2011 | NA | NA | NA | NA | NA | NA | 7.32U | 7.32U | 34.9 | 24.2 | 0.366U | 0.366U | 0.366U | 0.366U | 0.366U | 0.775 | 0.366U | 1.5 | 1.86 | 0.886 | 1.07 | 0.912 | 0.781 | 1 | 0.726 | 0.366U | 1.16 |
| TP4-1-S-M | 7/20/2011 | NA | NA | NA | NA | NA | NA | 14.3U | 14.3U | 252 | 163 | 0.715U | 0.715U | 0.715U | 0.715U | 0.715U | 5.71 | 0.959 | 11.7 | 19.6 | 7.44 | 8.75 | 7.14 | 6.79 | 7.95 | 5.22 | 1.58 | 6.41 |
| TP4-1-S-B | 7/20/2011 | NA | NA | NA | NA | NA | NA | 7.22U | 7.22U | 7.43 | 7.43 | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U | 0.361U |
| TP4-1-W-A | 7/20/2011 | NA | NA | NA | NA | NA | NA | 38U | 38U | 321 | 216 | 1.9U | 1.9U | 1.9U | 1.9U | 1.9U | 11.5 | 2.09 | 16.8 | 18.2 | 8.08 | 9.02 | 8.23 | 7.92 | 9.24 | 6.4 | 1.9U | 6.95 |
| TP4-1-W-M | 7/20/2011 | NA | NA | NA | NA | NA | NA | 20.6 | 25.4 | 310 | 217 | 1.84 | 0.997 | 1.16 | 0.751U | 0.751U | 5.2 | 1.15 | 9.21 | 17.5 | 7.03 | 8.67 | 7.15 | 7.38 | 10.2 | 6.21 | 1.95 | 7.96 |
| TP4-1-W-B | 7/20/2011 | NA | NA | NA | NA | NA | NA | 7.32U | 7.32U | 48.7 | 37.1 | 0.366U | 0.366U | 0.366U | 0.366U | 0.366U | 1.01 | 0.366U | 1.65 | 1.71 | 0.814 | 1.03 | 1.01 | 0.657 | 1.21 | 1.01 | 0.366U | 1.45 |
| TP4-2-W | 7/20/2011 | NA | NA | NA | NA | NA | NA | 12.6 | 18 | 175 | 147 | 0.386U | 0.386U | 1.09 | 0.386U | 0.386U | 0.721 | 0.386U | 2.41 | 2.74 | 1.26 | 2.21 | 2.46 | 1.81 | 3.07 | 3.92 | 0.705 | 6.32 |
| TP6-1-NW-A | 7/22/2011 | NA | NA | NA | NA | NA | NA | 6.58U | 6.58U | 9.53 | 7.64 | 0.329U | 0.329U | 0.329U | 0.329U | 0.329U | 0.329U | 0.329U | 0.463 | 0.589 | 0.329U | 0.337 | 0.329U | 0.329U | 0.493 | 0.329U | 0.329U | 0.329U |
| TP6-1-NW-M | 7/22/2011 | NA | NA | NA | NA | NA | NA | 7.29U | 7.29U | 7.29U | 7.29U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U | 0.365U |
| TP6-1-NW-B | 7/22/2011 | NA | NA | NA | NA | NA | NA | 18.3U | 36 | 46.1 | 44.7 | 1.4 | 0.916U | 0.916U | 0.916U | 0.916U | 0.916U | 0.916U | 0.916U | 0.916U | 0.916U | 0.916U | 0.916U | 0.916U | 0.916U | 0.916U | 0.916U | 0.916U |
| TP6-2-NW-A | 7/22/2011 | NA | NA | NA | NA | NA | NA | 7.09U | 10.5 | 15.3 | 12.8 | 0.354U | 0.354U | 0.354U | 0.354U | 0.354U | 0.354U | 0.354U | 0.633 | 0.607 | 0.354U | 0.375 | 0.354U | 0.354U | 0.884 | 0.354U | 0.354U | 0.354U |
| TP6-2-NW-M | 7/22/2011 | NA | NA | NA | NA | NA | NA | 7.38U | 7.38U | 7.38U | 7.38U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U |
| TP6-2-NW-B | 7/22/2011 | NA | NA | NA | NA | NA | NA | 7.37U | 7.37U | 9.1 | 9.1 | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U | 0.369U |
| TP6-A-NE-A | 7/22/2011 | NA | NA | NA | NA | NA | NA | 6.32U | 6.32U | 6.32U | 6.32U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U | 0.316U |
| TP6-1-NE-M | 7/22/2011 | NA | NA | NA | NA | NA | NA | 1230U | 1230U | 19700 | 12300 | 142 | 98.5 | 61.7U | 218 | 212 | 1620 | 311 | 1420 | 1340 | 484 | 490 | 257 | 290 | 318 | 149 | 61.7U | 118 |
| TP6-1-NE-B | 7/22/2011 | NA | NA | NA | NA | NA | NA | 6.26U | 6.26U | 94 | 59.8 | 0.313U | 0.313U | 0.313U | 0.574 | 0.528 | 5.02 | 0.932 | 5.74 | 5.84 | 2.48 | 3.11 | 2.07 | 2.32 | 2.47 | 1.44 | 0.407 | 1.23 |
| TP6-3-NW-A | 7/22/2011 | NA | NA | NA | NA | NA | NA | 6.47U | 6.47U | 6.47U | 6.47U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U | 0.324U |
| TP6-3-NE-M | 7/22/2011 | NA | NA | NA | NA | NA | NA | 33.5U | 33.5U | 375 | 210 | 1.89 | 1.68U | 1.68U | 3.9 | 4.26 | 29.4 | 7.32 | 32.8 | 25.9 | 11.8 | 11.8 | 8.55 | 7.91 | 9.67 | 5.53 | 1.68U | 4.46 |
| TP6-3-NE-B | 7/22/2011 | NA | NA | NA | NA | NA | NA | 6.94U | 6.94U | 10.2 | 6.94U | 0.347U | 0.347U | 0.347U | 0.347U | 0.347U | 0.545 | 0.347U | 0.865 | 0.72 | 0.375 | 0.393 | 0.347U | 0.347U | 0.364 | 0.347U | 0.347U | 0.347U |
| TP6-5-NE-A | 7/25/2011 | NA | NA | NA | NA | NA | NA | 6.44U | 6.44U | 6.44U | 6.44U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U | 0.322U |
| TP6-5-NE-M | 7/25/2011 | NA | NA | NA | NA | NA | NA | 14.4U | 14.4U | 205 | 107 | 0.722U | 0.722U | 0.722U | 2.05 | 2.39 | 17.4 | 4.19 | 19.3 | 14.8 | 6.92 | 7.29 | 5.44 | 4.8 | 5.84 | 3.73 | 0.758 | 3.02 |
| TP6-5-NE-B | 7/25/2011 | NA | NA | NA | NA | NA | NA | 9.18U | 69 | 40.9 | 38.5 | 0.459U | 0.459U | 0.459U | 0.459U | 0.459U | 0.459U | 0.459U | 0.682 | 0.808 | 0.459U | 0.467 | 0.459U | 0.459U | 0.469 | 0.459U | 0.459U | 0.459U |
| TP6-7-NW-A | 7/25/2011 | NA | NA | NA | NA | NA | NA | 286U | 472 | 1690 | 913 | 18.6 | 14.3U | 14.3U | 20.1 | 20.5 | 153 | 35.7 | 151 | 118 | 51.1 | 50.6 | 37.8 | 35.6 | 41 | 27.3 | 14.3U | 21.7 |
| TP6-7-NW-M | 7/25/2011 | NA | NA | NA | NA | NA | NA | 8.86U | 8.86U | 12.6 | 9.34 | 0.443U | 0.443U | 0.443U | 0.443U | 0.443U | 0.475 | 0.443U | 0.869 | 0.837 | 0.443U | 0.443U | 0.443U | 0.443U | 0.469 | 0.443U | 0.443U | 0.635 |
| TP6-7-NW-B | 7/25/2011 | NA | NA | NA | NA | NA | NA | 7.13U | 7.13U | 7.22 | 7.22 | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U | 0.357U |
| TP6-1S | 8/11/2011 | NA | NA | NA | NA | NA | NA | 283U | 283U | 13300 | 10800 | 555 | 489 | 107 | 230 | 243 | 504 | 85.7 | 62.9 | 118 | 36.8 | 39.5 | 14.2U | 14.2U | 26.7 | 14.2U | 14.2U | 14.2U |
| TP6-3W | 8/11/2011 | NA | NA | NA | NA | NA | NA | 130U | 130U | 2930 | 2240 | 212 | 130 | 31.3 | 58.4 | 55.1 | 127 | 23.8 | 13.7 | 25.1 | 7.96 | 8.80 | 6.49U | 6.49U | 6.49U | 6.49U | 6.49U | 6.49U |
| TP6-8NW | 8/11/2011 | NA | NA | NA | NA | NA | NA | 7.99U | 7.99U | 7.99U | 7.99U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U | 0.399U |
| TP6-4N | 8/11/2011 | NA | NA | NA | NA | NA | NA | 8.07U | 8.07U | 152 | 96.4 | 0.404U | 0.404U | 0.404U | 0.799 | 0.893 | 7.25 | 1.85 | 11.6 | 8.87 | 4.7 | 4.84 | 3.38 | 2.75 | 3.99 | 2.65 | 0.404U | 2.09 |
| TP6-6NE | 8/11/2011 | NA | NA | NA | NA | NA | NA | 347U | 347U | 5240 | 2860 | 71.1 | 19.8 | 17.3U | 61.4 | 78.8 | 491 | 126 | 451 | 333 | 162 | 159 | 111 | 94 | 120 | 62.2 | 17.3U | 48.9 |
| TP2-1E | 8/11/2011 | NA | NA | NA | NA | NA | NA | 153 | 142U | 3710 | 2480 | 219 | 61.6 | 8.15 | 102 | 64.8 | 259 | 56.4 | 76.7 | 149 | 47 | 45.4 | 21.8 | 24.6 | 50.9 | 18.6 | 7.10U | 24.4 |
| TP2-2E | 8/11/2011 | NA | NA | NA | NA | NA | NA | 26.1 | 17.4U | 252 | 194 | 0.871U | 2.43 | 0.871U | 4.75 | 4.52 | 20.9 | 4.6 | 5.09 | 8.72 | 1.6 | 1.78 | 0.907 | 0.871U | 1.51 | 0.871U | 0.871U | 1.31 |
| TP4-1NE | 8/11/2011 | NA | NA | NA | NA | NA | NA | 8.05U | 8.05U | 32.4 | 25.8 | 0.403U | 0.403U | 0.403U | 0.403U | 0.403U | 1.12 | 0.403U | 1.5 | 1.57 | 0.65 | 0.709 | 0.483 | 0.403U | 0.544 | 0.403U | 0.403U | 0.403U |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MCP Upper Concentration Limit (UCL): | | 10000 | 5000 | 20000 | 5000 | 5000 | 20000 | 20000 | 20000 | 10000 | 10000 | 10000 | 5000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 3000 | 10000 | 3000 | 10000 | 300 | 3000 | 300 | 10000 |

**Table 6**
**Total Petroleum Hydrocarbons, MA VPH and MA EPH**
**Soil Analytical Data**
**New Bedford Marine Commerce Terminal**
**New Bedford, Massachusetts**

| Sample Name | Collection Date | Total Petroleum Hydrocarbons | C5-C8 Aliphatics | C9-C12 Aliphatics | C9-C10 Aromatics | C5-C8 Aliphatics, Adjusted | C9-C12 Aliphatics, Adjusted | C9-C18 Aliphatics | C19-C36 Aliphatics | C11-C22 Aromatics | C11-C22 Aromatics, Adjusted | Naphthalene | 2-Methylnaphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(1,2,3-cd)Pyrene | Dibenzo(a,h)anthracene | Benzo(ghi)perylene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MCP S-3/GW-2 | | 5000 | 500 | 5000 | 500 | 500 | 5000 | 5000 | 5000 | 5000 | 5000 | 40 | 80 | 600 | 5000 | 5000 | 3000 | 5000 | 5000 | 5000 | 300 | 3000 | 300 | 3000 | 30 | 300 | 30 | 5000 |
| MCP S-3/GW-3 | | 5000 | 500 | 5000 | 500 | 500 | 5000 | 5000 | 5000 | 5000 | 5000 | 3000 | 500 | 10 | 5000 | 5000 | 3000 | 5000 | 5000 | 5000 | 300 | 3000 | 300 | 3000 | 30 | 300 | 30 | 5000 |
| Reporting Category - RCS-2 | | 3000 | 500 | 3000 | 500 | 500 | 3000 | 3000 | 5000 | 3000 | 3000 | 40 | 80 | 10 | 3000 | 3000 | 1000 | 3000 | 3000 | 3000 | 40 | 400 | 40 | 400 | 4 | 40 | 4 | 3000 |

**Notes:**
U = below quntitation limit
NA = Not Analyzed
Exceedance of MCP Reporting Category and/or Standard.
NP = Not Promulgated
A = Shallow Sample
M = Middle Sample
B = Bottom

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# Table 7:
# Semi-Volatile Organics
# Soil Analytical Data
# New Bedford Marine Commerce Terminal, New Bedford, Massachusetts

| Sample Name | Collection Date | acenaphthene | fluoranthene | naphthalene | benzo(a)anthracene | benzo(a)pyrene | benzo(b)fluoranthene | benzo(k)fluoranthene | chrysene | acenaphthylene | anthracene | benzo(g,h,i)perylene | fluorene | phenanthrene | dibenz(a.h)anthracene | indeno(1,2,3-cd)pyrene | pyrene | 4-chloroaniline | dibenzofuran | 2-methylnaphthalene | 2,6-dichlorophenol | carbazole |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-5/MW-3 | 5/4/2011 | 0.96 | 8.9 | 0.56 | 4.6 | 4.0 | 5.3 | 1.9 | 4.4 | 0.36U | 1.8 | 2.5 | 0.72 | 7.9 | 0.72 | 2.7 | 7.4 | 0.36U | 0.66 | 0.36U | NA | NA |
| B-6/MW-4 | 5/5/2011 | 1.7U | 16 | 1.7U | 7.4 | 7.2 | 9.2 | 3.4 | 6.7 | 1.7U | 3.1 | 4.3 | 1.7U | 12 | 1 | 4.9 | 13 | 1.7U | 1.7U | 1.7U | NA | NA |
| B-7 | 5/6/2011 | 0.37U | 0.37U | 0.37U | 0.37U | 0.37U | 0.37U | 0.37U | 0.37U | 0.37U | 0.37U | 0.37U | 0.37U | 0.37U | 0.22U | 0.37U | 0.37U | 0.37U | 0.37U | 0.37U | NA | NA |
| B-8/MW-5 | 5/6/2011 | 1.7U | 37 | 1.7U | 18 | 18 | 22 | 8.9 | 15 | 3.6 | 6.5 | 12 | 1.7 | 21 | 2.4 | 13 | 31 | 1.7U | 1.7U | 1.7U | NA | NA |
| B-9/MW-6 | 5/9/2011 | 2U | 2.6 | 2U | 2U | 2U | 2U | 2U | 2U | 2U | 2U | 2U | 2U | 5.3 | 1.2U | 2U | 2U | 2U | 2U | 2U | NA | NA |
| B-11/MW-7 | 5/12/2011 | 0.66 | 0.41U | 6.6 | 0.41U | 0.41U | 0.41U | 0.41U | 0.41U | 0.41U | 0.41U | 0.41U | 0.41U | 0.41U | 0.24U | 0.41U | 0.41U | 0.41U | 0.41U | 2.1 | NA | NA |
| B-12/MW-8 (A) | 5/13/2011 | 2.6 | 3.4 | 18 | 1.4U | 1.4U | 1.4 | 1.4U | 1.4 | 1.4U | 1.4U | 1.4U | 1.4U | 5.3 | 0.84U | 1.4U | 3.3 | 1.4U | 1.4U | 3 | NA | NA |
| B-12/MW-8 (B) | 5/13/2011 | 0.6 | 2.1 | 1.8 | 0.88 | 0.78 | 0.97 | 0.4U | 0.96 | 0.4U | 0.51 | 0.43 | 0.43 | 2.9 | 0.24U | 0.43 | 2.1 | 0.4U | 0.4U | 0.4U | NA | NA |
| TP-1 | 4/25/2011 | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.24U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | NA | NA |
| TP-2 | 4/25/2011 | 2U | 38 | 2U | 19 | 18 | 21 | 9.2 | 17 | 2U | 6.7 | 11 | 2.2 | 26 | 2.5 | 12 | 33 | 2U | 2U | 2U | NA | NA |
| TP-3 | 4/25/2011 | 1.6 | 3 | 0.88 | 1.6 | 1.6 | 1.2 | 0.4 | 1.6 | 0.39U | 1.9 | 0.92 | 1.6 | 8.9 | 0.23U | 0.67 | 6 | 0.39U | 0.39U | 6.1 | NA | NA |
| TP-4 | 4/25/2011 | 2.2U | 5.2 | 2.2U | 3.2 | 3.5 | 4.2 | 3.2 | 2.2U | 2.2U | 2.2U | 2.6 | 2.2U | 2.7 | 2.2U | 2.3 | 6.3 | 2.2U | 2.2U | 2.2U | NA | NA |
| TP-5 | 4/25/2011 | 2U | 16 | 2U | 6.9 | 6.5 | 7.6 | 2.7 | 6.7 | 2U | 3.8 | 4.1 | 2U | 18 | 1.2U | 4 | 14 | 2U | 2U | 2U | NA | NA |
| TP-6 | 4/26/2011 | 110 | 4.9U | 500 | 60 | 64 | 44 | 14 | 54 | 4.9U | 83 | 35 | 76 | 390 | 7 | 25 | 150 | 4.9U | 4.9U | 300 | NA | NA |
| TP-8 | 4/26/2011 | 0.38U | 0.38U | 0.38U | 0.38U | 0.38U | 0.38U | 0.38U | 0.38U | 0.38U | 0.38U | 0.38U | 0.38U | 0.38U | 0.23U | 0.38U | 0.38U | 0.38U | 0.38U | 0.38U | NA | NA |
| TP-9 | 4/26/2011 | 0.58U | 1.1 | 0.58U | 0.58U | 0.58U | 0.58U | 0.58U | 0.58U | 0.58U | 0.58U | 0.58U | 0.58U | 0.58U | 0.35U | 0.58U | 0.58U | 0.58U | 0.58U | 0.58U | NA | NA |
| TP-10 | 4/27/2011 | 0.38U | 0.74 | 0.38U | 0.42 | 0.38U | 0.38U | 0.38U | 0.52 | 0.38U | 0.38U | 0.38U | 0.38U | 0.81 | 0.22U | 0.38U | 1 | 0.38U | 0.38U | 0.38U | NA | NA |
| TP-11 | 4/26/2011 | 0.38U | 0.38U | 0.38U | 0.5 | 0.53 | 0.61 | 0.38U | 0.49 | 0.38U | 0.38U | 0.4 | 0.38U | 0.38U | 0.23U | 0.38U | 1.1 | 0.38U | 0.38U | 0.38U | NA | NA |
| TP-12 | 4/27/2011 | 0.43U | 0.96 | 0.43U | 0.43 | 0.47 | 0.72 | 0.43U | 0.62 | 0.43U | 0.43U | 0.43U | 0.43U | 0.43U | 0.26U | 0..43 | 0.88 | 0.43U | 0.43U | 0.43U | NA | NA |
| TP-14 | 4/27/2011 | 0.37U | 0.72 | 0.37U | 0.37U | 0.37U | 0.37 | 0.37U | 0.37U | 0.37U | 0.37U | 0.37U | 0.37U | 0.43 | 0.22U | 0.37U | 0.7 | 0.37U | 0.37U | 0.37U | NA | NA |
| TP-16 | 4/27/2011 | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | 0.24U | 0.4U | 0.4U | 0.4U | 0.4U | 0.4U | NA | NA |
| DUPLICATE 1 | 4/25/2011 | 3.6 | 5.2 | 2 | 3.3 | 3.1 | 2.6 | 0.73 | 3 | 0.36U | 3.6 | 1.8 | 3.2 | 14 | 0.39 | 1.3 | 9.5 | 0.36U | 0.36U | 6.8 | NA | NA |
| DUPLICATE 2 | 4/25/2011 | 0.87 | 0.98 | 3.9 | 0.69 | 0.77 | 0.68 | 0.41U | 0.7 | 0.41 | 0.56 | 0.58 | 0.52 | 3.2 | 0.25U | 0.41U | 1.9 | 0.41U | 0.41U | 1.9 | NA | NA |
| TP2-1-W-H | 7/19/2011 | 110 | 150 | 410 | 120 | 140 | 58 | 72 | 120 | 24 | 60 | 100 | 54 | 290 | 23 | 92 | 320 | 3U | 3U | 150 | 120 | 3U |
| TP2-2-W-M | 7/19/2011 | 22 | 20 | 65 | 15 | 21 | 8.7 | 6.7 | 15 | 3.1 | 13 | 17 | 8.3 | 47 | 1U | 13 | 43 | 1U | 1U | 43 | 31 | 1U |
| TP2-4-W-A | 7/19/2011 | 0.06U | 0.6 | 0.06U | 0.3 | 0.3 | 0.2 | 0.3 | 0.4 | 0.06U | 0.06U | 0.3 | 0.06U | 0.3 | 0.06U | 0.2 | 0.6 | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U |
| TP2-4-W-B | 7/19/2011 | 0.1 | 3 | 0.3 | 1.8 | 2 | 1.4 | 1.2 | 1.9 | 0.3 | 0.4 | 2.1 | 0.1 | 1.7 | 0.3 | 1.8 | 3.4 | 0.03U | 0.07 | 0.06 | 0.07 | 0.1 |
| TP3-1-S | 7/19/2011 | 0.07U | 0.3 | 0.07U | 0.2 | 0.1 | 0.07U | 0.09 | 0.2 | 0.07U | 0.07U | 0.07U | 0.07U | 0.1 | 0.07U | 0.07U | 0.3 | 0.07U | 0.07U | 0.07U | 0.07U | 0.07U |
| TP3-2-S-A | 7/19/2011 | 0.7 | 19 | 0.6 | 9.8 | 9.4 | 8.5 | 4.7 | 8.7 | 0.8 | 2.4 | 4.5 | 0.8 | 10 | 1.4 | 4.1 | 17 | 0.06U | 0.5 | 0.2 | 0.2 | 1 |
| TP3-2-S-B | 7/19/2011 | 0.03U | 0.03U | 0.7 | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.2 | 0.03U |
| TP3-2-S-M | 7/19/2011 | 0.1U | 1.2 | 0.1U | 0.5 | 0.6 | 0.4 | 0.5 | 0.6 | 0.1U | 0.1 | 0.5 | 0.1U | 0.6 | 0.2 | 0.4 | 1 | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U |
| TP4-1-E | 7/19/2011 | 1U | 1U | 2 | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 2.2 | 1U | 1U | 1U | 1U | 1U |
| TP4-1-S-A | 7/20/2011 | 0.08 | 1.8 | 0.09 | 1.1 | 1.2 | 0.9 | 0.8 | 1.1 | 0.1 | 0.2 | 0.7 | 0.1 | 1.1 | 0.2 | 0.7 | 1.8 | 0.04U | 0.04U | 0.04U | 0.04U | 0.1 |
| TP4-1-S-B | 7/20/2011 | 0.1U | 0.4 | 0.1U | 0.2 | 0.4 | 0.1U | 0.1U | 0.3 | 0.1U | 0.1U | 0.4 | 0.1U | 0.1U | 0.1U | 0.3 | 0.5 | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U |
| TP4-1-S-M | 7/20/2011 | 0.3 | 9 | 0.7 | 7 | 7.2 | 5.7 | 4.4 | 7.4 | 0.9 | 1.1 | 5.6 | 0.4 | 5.4 | 1.4 | 5.1 | 13 | 0.06U | 0.2 | 0.2 | 0.2 | 0.3 |
| TP4-1-W-A | 7/20/2011 | 2.7 | 26 | 1.3 | 14 | 10 | 6.5 | 9 | 8.8 | 0.7 | 5.9 | 4.5 | 2.5 | 23 | 1.6 | 4.2 | 22 | 0.06U | 1.9 | 0.6 | 0.6 | 3 |
| TP4-1-W-B | 7/20/2011 | 0.2U | 1 | 0.2U | 0.7 | 1.7 | 1 | 0.6 | 0.9 | 0.3 | 0.2U | 2.7 | 0.2U | 0.6 | 0.3 | 2.5 | 1.3 | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U |
| TP4-1-W-M | 7/20/2011 | 0.2 | 6.8 | 1.4 | 5.3 | 5.9 | 4.9 | 2.8 | 5.4 | 1 | 1.1 | 3.6 | 0.3 | 4.3 | 1.1 | 3.2 | 11 | 0.06U | 0.1 | 0.4 | 0.2 | 0.2 |
| TP4-2-W | 7/20/2011 | 0.2U | 1.9 | 0.2U | 1.7 | 4.7 | 2.6 | 1.3 | 2.1 | 1 | 0.5 | 9.2 | 0.2U | 1 | 0.9 | 7.8 | 3.9 | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U |
| TP6-1-NE-A | 7/22/2011 | 0.06U | 0.2 | 0.06U | 0.08 | 0.09 | 0.07 | 0.07 | 0.09 | 0.06U | 0.06U | 0.06 | 0.06U | 0.07 | 0.06U | 0.06U | 0.1 | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U |
| TP6-1-NE-B | 7/22/2011 | 0.4 | 3.6 | 0.2 | 1.7 | 1.9 | 1 | 1.4 | 2 | 0.2U | 0.8 | 1.1 | 0.5 | 4.2 | 0.4 | 0.9 | 4 | 0.2U | 0.2U | 0.2 | 0.3 | 0.2U |
| TP6-1-NE-M | 7/22/2011 | 200 | 1800 | 130 | 910 | 720 | 670 | 380 | 850 | 33 | 390 | 420 | 230 | 1600 | 120 | 380 | 1700 | 7U | 110 | 83 | 73 | 150 |
| TP6-1-N-H | 7/18/2011 | 320 | 86 | 230 | 60 | 18 | 7.7 | 17 | 62 | 22 | 120 | 13 | 79 | 650 | 11 | 7.7 | 180 | 3U | 3U | 39 | 3U | 3U |
| TP6-1-NW-A | 7/22/2011 | 0.06U | 0.3 | 0.06U | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.06U | 0.06U | 0.2 | 0.06U | 0.1 | 0.07 | 0.1 | 0.3 | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U |
| TP6-1-NW-B | 7/22/2011 | 0.2U | 0.2U | 0.4 | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 1.4 | 0.2U |
| TP6-1-NW-M | 7/22/2011 | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U | 0.2 | 0.06U | 0.06U | 0.07 | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U |
| TP6-2-N-M | 7/18/2011 | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U |
| TP6-2-N-M | 7/18/2011 | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U | 0.8U |
| TP6-2-NW-A | 7/22/2011 | 0.1U | 1.6 | 0.1U | 0.8 | 0.9 | 0.6 | 0.8 | 0.9 | 0.1U | 0.2 | 0.5 | 0.1U | 1.1 | 0.1U | 0.4 | 1.5 | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U |
| TP6-2-NW-A | 7/22/2011 | 0.1U | 1.6 | 0.1U | 0.8 | 0.9 | 0.6 | 0.8 | 0.9 | 0.1U | 0.2 | 0.5 | 0.1U | 1.1 | 0.1U | 0.4 | 1.5 | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U |
| TP6-2-NW-B | 7/22/2011 | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |
| TP6-2-NW-M | 7/22/2011 | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U |
| TP6-2-W-A | 7/19/2011 | 0.06U | 2.5 | 0.06U | 2.8 | 5.1 | 2 | 2.9 | 3.2 | 0.3 | 0.2 | 4.4 | 0.06U | 0.4 | 0.8 | 4 | 6 | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U |
| TP6-2-W-B | 7/19/2011 | 1.2 | 0.6U | 0.6U | 0.6U | 0.6U | 0.6U | 0.6U | 0.6U | 0.6U | 0.6U | 0.6U | 0.6U | 3.6 | 0.6U | 0.6U | 2.3 | 0.6U | 0.6U | 0.6U | 0.6U | 0.6U |
| TP6-2-W-M | 7/19/2011 | 6U | 6U | 6U | 6U | 6U | 6U | 6U | 13 | 6U | 16 | 6U | 6U | 6U | 6U | 6U | 6U | 6U | 6U | 6U | 6U | 6U |
| TP6-3-N-A | 7/18/2011 | 0.03U | 0.3 | 0.03U | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.03U | 0.03U | 0.2 | 0.03U | 0.2 | 0.03U | 0.2 | 0.3 | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U |
| TP6-3-N-B | 7/18/2011 | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U | 0.03U |
| TP6-3-NE-A | 7/22/2011 | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U |
| TP6-3-NE-B | 7/22/2011 | 12 | 140 | 5U | 52 | 59 | 40 | 42 | 53 | 5U | 37 | 26 | 16 | 100 | 5U | 30 | 100 | 5U | 9.5 | 5U | 5U | 5U |
| TP6-3-NE-M | 7/22/2011 | 0.06U | 0.4 | 0.06U | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.06U | 0.06U | 0.06U | 0.06U | 0.3 | 0.06U | 0.06U | 0.3 | 0.06U | 0.06U | 0.06U | 0.06U | 0.06U |
| TP6-5-NE-A | 7/25/2011 | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U |
| TP6-5-NE-B | 7/25/2011 | 0.1U | 0.3 | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.4 | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U |

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# Table 7:
# Semi-Volatile Organics
# Soil Analytical Data
# New Bedford Marine Commerce Terminal, New Bedford, Massachusetts

| Sample Name | Collection Date | acenaphthene | fluoranthene | naphthalene | benzo(a)anthracene | benzo(a)pyrene | benzo(b)fluoranthene | benzo(k)fluoranthene | chrysene | acenaphthylene | anthracene | benzo(g,h,i)perylene | fluorene | phenanthrene | dibenz(a.h)anthracene | indeno(1,2,3-cd)pyrene | pyrene | 4-chloroaniline | dibenzofuran | 2-methylnaphthalene | 2,6-dichlorophenol | carbazole |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TP6-5-NE-M | 7/25/2011 | 6.9 | 60 | 3U | 26 | 22 | 16 | 16 | 24 | 3U | 13 | 12 | 7.4 | 57 | 3U | 11 | 49 | 3U | 3U | 3U | 3U | 8.8 |
| TP6-7-NW-A | 7/25/2011 | 1.9 | 38 | 1.2 | 23 | 16 | 17 | 6.3 | 14 | 2 | 5.5 | 5.5 | 2.2 | 22 | 2 | 5.4 | 35 | 0.06U | 1 | 0.6 | 0.5 | 2.2 |
| TP6-7-NW-B | 7/25/2011 | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U | 0.1U |
| TP6-7-NW-M | 7/25/2011 | 0.4 | 3.3 | 0.2 | 1.5 | 1.4 | 1.1 | 1 | 1.7 | 0.07U | 0.6 | 0.7 | 0.3 | 3.6 | 0.2 | 0.6 | 3.2 | 0.07U | 0.07U | 0.1 | 0.2 | 0.3 |
| MCP Upper Concentration Limit (UCL): | | 10000 | 10000 | 10000 | 3000 | 300 | 3000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 | 300 | 3000 | 10000 | NP | NP | 5000 | NP | NP |
| MCP S-3/GW-2 | | 5000 | 5000 | 40 | 300 | 30 | 300 | 3000 | 3000 | 600 | 5000 | 5000 | 5000 | 3000 | 30 | 300 | 5000 | NP | NP | 80 | NP | NP |
| MCP S-3/GW-3 | | 5000 | 5000 | 3000 | 300 | 30 | 300 | 3000 | 3000 | 10 | 5000 | 5000 | 5000 | 3000 | 30 | 300 | 5000 | NP | NP | 500 | NP | NP |
| Reporting Category - RCS-2 | | 3000 | 3000 | 40 | 40 | 4 | 40 | 400 | 400 | 10 | 3000 | 3000 | 3000 | 1000 | 4 | 40 | 3000 | NP | NP | 80 | NP | NP |

**Notes:**
U = below quntitation limit
NA = Not Analyzed
- Exceedance of Reporting Category and/or Standard
NP = Not Promulgated
A = Shallow Sample
M = Middle Sample
B = Bottom

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# Table 8
# PCBs (Aroclors) - Groundwater Analytical Data
# New Bedford Marine Commerce Terminal
# New Bedford, Massachusetts

| | | Concentration of PCBs (µg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| Sample Name | Collection Date | Aroclor 1016/1242 | Aroclor 1221 | Aroclor 1232 | Aroclor 1248 | Aroclor 1254 | Aroclor 1260 |
| MW-3 | 6/30/2011 | 0.05U | 0.05U | 0.05U | 0.05U | 0.05U | 0.05U |
| MW-4 | 6/30/2011 | 0.05U | 0.05U | 0.05U | 0.05U | 0.05U | 0.05U |
| MW-5 | 6/30/2011 | 0.05U | 0.05U | 0.05U | 0.05U | 0.05U | 0.05U |
| MW-6 | 6/29/2011 | 0.05U | 0.05U | 0.05U | 0.05U | 0.05U | 0.05U |
| MW-7 | 6/29/2011 | 0.05U | 0.05U | 0.05U | 0.05U | 0.05U | 0.05U |
| MW-8 | 6/28/2011 | 0.05U | 0.05U | 0.05U | 0.05U | 0.05U | 0.05U |
| MCP Upper Concentration Limits (UCL): | | NP | NP | NP | NP | NP | NP |
| MCP GW-3 | | NP | NP | NP | NP | NP | NP |
| Reporting Category - RCGW-2 | | NP | NP | NP | NP | NP | NP |

Notes:
U = Concentration is below the laboratory's method detection limit.
NP = Not Promulgated
ND = Analyzed Aroclors were non-detected.

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# Table 9
# Total Petroleum Hydrocarbons Groundwater Analytical Data
# New Bedford Marine Commerce Terminal
# New Bedford, Massachusetts

| Total Petroleum Hydrocarbons, MA VPH and MA EPH (µg/L) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Name | Collection Date | Total Petroleum Hydrocarbons | C9-C10 Aromatics | C5-C8 Aliphatics, Adjusted | C9-C12 Aliphatics, Adjusted | C9-C18 Aliphatics | C19-C36 Aliphatics | C11-C22 Aromatics, Adjusted |
| MW-3 | 6/30/2011 | 500U | NA | NA | NA | NA | NA | NA |
| MW-4 | 6/30/2011 | 500U | NA | NA | NA | NA | NA | NA |
| MW-5 | 6/30/2011 | 500U | NA | NA | NA | NA | NA | NA |
| MW-6 | 6/30/2011 | 3350 | NA | NA | NA | NA | NA | NA |
| MW-7 | 6/29/2011 | 500U | 3730 | 1250U | 2370 | 100U | 100U | 2710 |
| MW-8 | 6/28/2011 | 500U | 50U | 50U | 50U | 100U | 100U | 148 |
| MCP Upper Concentration Limit (UCL): | | 50000 | 100000 | 100000 | 100000 | 100000 | 100000 | 100000 |
| MCP Method 1 GW-3 | | 5000 | 50000 | 50000 | 50000 | 50000 | 50000 | 5000 |
| Reporting Category - RCGW-2 | | 5000 | 7000 | 3000 | 5000 | 5000 | 50000 | 5000 |

U = Concentration is below the laboratory's method detection limit.

Notes:
U = below quntitation limit
NA = Not Analyzed
NP = Not Promulgated

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# Table 10
# Semi-Volatile Organics Groundwater Analytical Data
# New Bedford Marine Commerce Terminal
# New Bedford, Massachusetts

| | | **Volatile Organics** (µg/L) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Name | Collection Date | Benzene | Toluene | Ethylbenzene | p/m-Xylene | o-Xylene | Naphthalene | 1,3,5-Trimethylbenzene |
| MW-3 | 6/30/2011 | 0.5U | 1U | 1U | 2U | 1U | 2U | 2U |
| MW-4 | 6/30/2011 | 0.5U | 1U | 1U | 2U | 1U | 2U | 2U |
| MW-5 | 6/30/2011 | 0.5U | 1U | 1U | 2U | 1U | 2U | 2U |
| MW-6 | 6/29/2011 | 0.5U | 1U | 1U | 2U | 1U | 2U | 2U |
| MW-7 | 6/29/2011 | 370 | 110 | 940 | 560 | 280 | 3900 | 300 |
| MW-8 | 6/28/2011 | 0.5U | 1U | 1U | 2U | 1U | 42 | 2U |
| MCP Upper Concentration Limit (UCL): | | 100000 | 100000 | 100000 | 100000 | | 100000 | NP |
| MCP Method 1 GW-3 | | 10000 | 40000 | 5000 | 5000 | | 20000 | NP |
| Reporting Category - RCGW-2 | | 2000 | 40000 | 5000 | 5000 | | 1000 | 1000 |

Notes:
U = Concentration is below the laboratory's method detection limit.
NP = Not Promulgated
Constituent concentration exceeds MCP Reportable Concentration.

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# Table 11
# Semi-Volatile Organics Groundwater Analytical Data
# New Bedford Marine Commerce Terminal
# New Bedford, Massachusetts

| | | Semivolatile Organics (µg/L) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Name | Collection Dat | acenaphthene | fluoranthene | naphthalene | fluorene | phenanthrene | pyrene | 2-methylnaphthalene |
| MW-3 | 6/30/2011 | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U |
| MW-4 | 6/30/2011 | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U |
| MW-5 | 6/30/2011 | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U |
| MW-6 | 6/29/2011 | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U | 0.2U |
| MW-7 | 6/29/2011 | 68 | 10U | 700 | 20 | 19 | 10U | 150 |
| MW-8 | 6/28/2011 | 2.1 | 3.8 | 0.2U | 0.28 | 0.28 | 3.2 | 0.2U |
| MCP Upper Concentration Limit (UCL): | | 60000 | 2000 | 100000 | 400 | 100000 | 800 | 100000 |
| MCP Method 1 GW-3 | | 6000 | 200 | 20000 | 40 | 10000 | 20 | 20000 |
| Reporting Category - RCGW-2 | | 6000 | 200 | 1000 | 40 | 10000 | 20 | 2000 |

Notes:
U = Concentration is below the labora U = Concentration is below the laboratory's method detection limit.
NP = Not Promulgated
Note: Other analyzed compounds not detected.

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# Table 12
# 13 Priority Pollutant Metals Groundwater Analytical Data
# New Bedford Marine Commerce Terminal
# New Bedford, Massachusetts

| | | 13 Priority Pollutant Metals (mg/L) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | Collection Date | Antimony | Arsenic | Beryllium | Cadmium | Chromium | Copper | Lead | Mercury | Nickel | Selenium | Silver | Thallium | Zinc |
| MW-3 | 6/30/2011 | 0.0036 | 0.0006 | 0.0005U | 0.0005U | 0.0005U | 0.0018 | 0.0005U | 0.0002U | 0.0008 | 0.001 | 0.0005U | 0.0005U | 0.0118 |
| MW-4 | 6/30/2011 | 0.01U | 0.0055 | 0.005U | 0.005U | 0.005U | 0.0124 | 0.005U | 0.0002U | 0.0064 | 0.024 | 0.005U | 0.005U | 0.005U |
| MW-5 | 6/30/2011 | 0.001U | 0.0005U | 0.0005U | 0.0005U | 0.0005U | 0.0024 | 0.0005U | 0.0002U | 0.0021 | 0.002 | 0.0005U | 0.0005U | 0.0116 |
| MW-6 | 6/29/2011 | 0.001U | 0.0046 | 0.0005U | 0.0005U | 0.0005U | 0.0009 | 0.0005U | 0.0002U | 0.0021 | 0.002 | 0.0005U | 0.0005U | 0.0130 |
| MW-7 | 6/29/2011 | 0.001U | 0.0013 | 0.0005U | 0.0005U | 0.0005U | 0.0008 | 0.0005U | 0.0002U | 0.0011 | 0.001 | 0.0005U | 0.0005U | 0.0127 |
| MW-8 | 6/28/2011 | 0.001U | 0.0008 | 0.0005U | 0.0005U | 0.0008 | 0.0005U | 0.0005U | 0.0002U | 0.0008 | 0.001 | 0.0005U | 0.0005U | 0.0090 |
| MCP Upper Concentration Limit (UCL) | | 80 | 9 | 2 | 0.05 | 3 | NP | 0.15 | 0.2 | 2 | 1 | 1 | 30 | 50 |
| MCP Method 1 GW-3 | | 8 | 0.9 | 0.2 | 0.004 | 0.3 | NP | 0.01 | 0.02 | 0.2 | 0.1 | 0.007 | 3 | 0.9 |
| Reporting Category - RCGW-2 | | 8 | 0.9 | 0.2 | 0.004 | 0.3 | 100 | 0.01 | 0.02 | 0.2 | 0.1 | 0.007 | 3 | 0.9 |

Notes:
U = below laboratory's method detection limit
N/A = Not Analyzed
NP = Not Promulgated

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**TABLE 13**
**SOIL HANDLING AND DISPOSAL ESTIMATE**
**South Terminal CDF, New Bedford, Massachusetts**

| TEST PIT/EXCAVATION AREA | MAIN CONTAMINANT | AREA (SF) | EXCAVATION THICKNESS (ft) | VOLUME (CY) | TONS | DISPOSAL PER TON | MA TRANSPORT FEE | TOTAL DISPOSAL COST PER TON | DISPOSAL COST PER AREA | EXCAVATION COST PER TON | EXCAVATION COST | HANDLING & DISPOSAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TP-4 | PCBs | 4,000 | 4 | 593 | 948 | $258.8 | $63.9 | $322.7 | $305,958 | $13.3 | $12,610 | $318,568 |
| TP-2 | PCBs | 3,100 | 4 | 459 | 735 | $258.8 | $63.9 | $322.7 | $237,117 | $13.3 | $9,773 | $246,890 |
| ***PCBs - Estimated Cost Range*** | | | | | | | | | | | | ***$565,459*** |
| TP-6 | Petroleum | 4,500 | 3 | 500 | 800 | $77.6 | NA | $78 | $62,080 | $13.3 | $10,640 | $72,720 |
| ***Petroleum-Related Estimated Cost*** | | | | | | | | | | | | ***$72,720*** |
| ***Total Estimated Costs - PCBs & Petroleum Related*** | | | | | | | | | | | | ***$638,179*** |

Notes:

***PCB Soils: Includes 15% markup.***

1. $225.00 / ton Transportation and Disposal plus Massachusetts Transport Fee of $55.60. Transport Fee is cost to transfer soils from Site to railcars for transport to disposal facility.
2. Soils are proposed for a Subtitle C landfill and EPA must approve the facility under the "Mega Rule" (approval is not an issue but must be stated in soil management plan to EPA).
3. Assumptions:

(a) Disposal at Heritage Environmental's Subtitle C landfill in Indiana
(b) <10% debris and should not contain debris larger than 3 ft x 1 ft x 1 ft.
(c) Facility can accept larger debris but special arrangements will need to be made prior to shipping.
(d) Waste must pass paint filter as received at the landfill.
(e) Waste must be the minimum of 1000 lbs / sq ft shear strength or 2000 lbs / sq ft unconfined compressive strength.
(f) Samples, profile and EPA approval letter required

***Petroleum Soils: Includes 15% markup.***

1. $67.50 / ton Transportation and Disposal. (Massachusetts Transport Fee does not apply)
2. Soils are proposed for asphalt batch in Massachusetts.
3. Assumptions

(a) Disposal at Aggregate Industries in Stoughton MA.
(b) <15% debris and cannot contain large quantities of clay.
(c) Waste must pass paint filter test.
(d) Data, profile, site map and LSP opinion Letter required.

***REGULATORY COSTS***

| | |
|---|---|
| Preparation (field and office) | $7,500.00 |
| RAM Related | $10,000.00 |
| TSCA Related | $20,000.00 |
| LSP Services (disposal) | $5,000.00 |
| Verification Sampling | $12,500.00 |
| Apex Oversight/Documentation & Equipment | $17,250.00 |
| Closure Reports (RAM/TSCA) | $20,000.00 |
| Response Action Outcome | $30,000.00 |
| includes M3 Risk Characterization | |
| Deed Restrictions** | $20,500.00 |
| Project Mgt (10%) | $13,775.00 |
| ***Estimated Regulatory Costs*** | ***$156,525.00*** |
| ***Estimated Cleanup Costs (Total)*** | ***$794,704*** |

**Survey (metes & Bounds added to cost)

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**NEW BEDFORD RADIO (HALL COMM)**

**RTN: 4-25350**

DRAFT

| Accutest Labs of New England, Inc. | | | | | | | 1/31/2014 8:39 |
|---|---|---|---|---|---|---|---|
| **Job Number:** | MC27613 | | | | | | |
| **Account:** | Apex Companies, LLC | | | | | | |
| **Project:** | NBMCT, Blackmer, New Bedford, MA | | | | | | |
| **Project Number:** | 6690.027 | | | | | | |
| | | | | | | Legend: | Hit |

| Client Sample ID: | | A-2013-B-1/MW-1 0-2' | A-2013-B-1/MW-1 4-6' | A-2013-B-2/MW-2 0-2' | A-2013-B-2/MW-2 4-6' | A-2013-B-3/MW-3 4-6' | A-2013-B-4/MW-4 0-2' |
|---|---|---|---|---|---|---|---|
| **Lab Sample ID:** | | MC27613-1 | MC27613-2 | MC27613-3 | MC27613-4 | MC27613-5 | MC27613-6 |
| **Date Sampled:** | | 1/9/2014 | 1/10/2014 | 1/9/2014 | 1/9/2014 | 1/10/2014 | 1/10/2014 |
| **Matrix:** | | Soil | Soil | Soil | Soil | Soil | Soil |
| **GC/MS Semi-volatiles (SW846 8270D)** | | | | | | | |
| Benzoic acid | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| 2-Chlorophenol | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| 4-Chloro-3-methyl phenol | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| 2,4-Dichlorophenol | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| 2,4-Dimethylphenol | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| 2,4-Dinitrophenol | mg/kg | 1.1 U | 1.2 U | 1.2 U | 1.1 U | 1.3 U | 5.8 U |
| 2-Methylphenol | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| 3&4-Methylphenol | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| 2-Nitrophenol | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| 4-Nitrophenol | mg/kg | 1.1 U | 1.2 U | 1.2 U | 1.1 U | 1.3 U | 5.8 U |
| Pentachlorophenol | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| Phenol | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| 2,4,5-Trichlorophenol | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| 2,4,6-Trichlorophenol | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| Acenaphthene | mg/kg | 0.11 U | 0.12 U | 0.12 U | 0.11 U | 0.13 U | 0.892 |
| Acenaphthylene | mg/kg | 0.11 U | 0.12 U | 0.12 U | 0.11 U | 0.13 U | 0.58 U |
| Acetophenone | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| Aniline | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| Anthracene | mg/kg | 0.165 | 0.12 U | 0.328 | 0.11 U | 0.284 | 2.61 |
| Benzo(a)anthracene | mg/kg | 0.472 | 0.12 U | 1.46 | 0.11 U | 0.881 | 6.03 |
| Benzo(a)pyrene | mg/kg | 0.354 | 0.12 U | 1.34 | 0.11 U | 0.795 | 4.78 |
| Benzo(b)fluoranthene | mg/kg | 0.375 | 0.12 U | 1.52 | 0.11 U | 0.693 | 4.2 |
| Benzo(g,h,i)perylene | mg/kg | 0.2 | 0.12 U | 0.86 | 0.11 U | 0.444 | 2.55 |
| Benzo(k)fluoranthene | mg/kg | 0.369 | 0.12 U | 0.941 | 0.11 U | 0.577 | 3.93 |
| 4-Bromophenyl phenyl ether | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| Butyl benzyl phthalate | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| 2-Chloronaphthalene | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| 4-Chloroaniline | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| Chrysene | mg/kg | 0.497 | 0.12 U | 1.51 | 0.11 U | 0.828 | 6.08 |
| bis(2-Chloroethoxy)methane | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| bis(2-Chloroethyl)ether | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| bis(2-Chloroisopropyl)ether | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| 1,2-Dichlorobenzene | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| 1,2-Diphenylhydrazine | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| 1,3-Dichlorobenzene | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| 1,4-Dichlorobenzene | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| 2,4-Dinitrotoluene | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| 2,6-Dinitrotoluene | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| 3,3'-Dichlorobenzidine | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| Dibenzo(a,h)anthracene | mg/kg | 0.11 U | 0.12 U | 0.257 | 0.11 U | 0.13 U | 1.06 |
| Dibenzofuran | mg/kg | 0.11 U | 0.12 U | 0.12 U | 0.11 U | 0.13 U | 0.787 |
| Di-n-butyl phthalate | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| Di-n-octyl phthalate | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| Diethyl phthalate | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| Dimethyl phthalate | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| bis(2-Ethylhexyl)phthalate | mg/kg | 0.28 U | 0.359 | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| Fluoranthene | mg/kg | 1.06 | 0.12 U | 2.94 | 0.11 U | 2.13 | 12.8 |
| Fluorene | mg/kg | 0.11 U | 0.12 U | 0.12 U | 0.11 U | 0.13 U | 1.14 |
| Hexachlorobenzene | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| Hexachlorobutadiene | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| Hexachlorocyclopentadiene | mg/kg | 0.56 U | 0.60 U | 0.59 U | 0.56 U | 0.65 U | 2.9 U |
| Hexachloroethane | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.206 | 0.12 U | 0.816 | 0.11 U | 0.445 | 2.32 |
| Isophorone | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| 2-Methylnaphthalene | mg/kg | 0.11 U | 0.12 U | 0.12 U | 0.11 U | 0.13 U | 0.58 U |
| Naphthalene | mg/kg | 0.118 | 0.12 U | 0.12 U | 0.11 U | 0.13 U | 0.803 |
| Nitrobenzene | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| N-Nitroso-di-n-propylamine | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| N-Nitrosodiphenylamine | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| Phenanthrene | mg/kg | 0.851 | 0.12 U | 1.4 | 0.11 U | 1.22 | 11.9 |
| Pyrene | mg/kg | 1.02 | 0.12 U | 2.88 | 0.11 U | 2.12 | 11.4 |
| 1,2,4-Trichlorobenzene | mg/kg | 0.28 U | 0.30 U | 0.30 U | 0.28 U | 0.32 U | 1.4 U |
| **GC Volatiles (SW846 8015)** | | | | | | | |
| TPH-GRO (VOA) | mg/kg | 6.3 U | 7.1 U | 6.6 U | 4.9 U | 8.2 U | 6.8 U |
| **GC Semi-volatiles (SW846 8082)** | | | | | | | |
| Aroclor 1016 | mg/kg | 0.038 U | 0.041 U | 0.038 U | 0.037 U | 0.043 U | 0.039 U |
| Aroclor 1221 | mg/kg | 0.038 U | 0.041 U | 0.038 U | 0.037 U | 0.043 U | 0.039 U |
| Aroclor 1232 | mg/kg | 0.038 U | 0.041 U | 0.038 U | 0.037 U | 0.043 U | 0.039 U |
| Aroclor 1242 | mg/kg | 0.038 U | 0.041 U | 0.038 U | 0.037 U | 0.043 U | 0.039 U |
| Aroclor 1248 | mg/kg | 0.038 U | 0.041 U | 0.038 U | 0.037 U | 0.043 U | 0.039 U |
| Aroclor 1254 | mg/kg | 3.87 | 0.888 | 0.196 | 0.037 U | 0.043 U | 4.74 |
| Aroclor 1260 | mg/kg | 0.038 U | 0.041 U | 0.038 U | 0.037 U | 0.043 U | 0.039 U |
| **GC Semi-volatiles (SW846-8015)** | | | | | | | |
| TPH-DRO (Semi-VOA) | mg/kg | 26.3 | 20 U | 46.8 | 19 U | 52.4 | 309 |
| **Metals Analysis** | | | | | | | |
| Antimony | mg/kg | 0.90 U | 0.98 U | 0.95 U | 0.89 U | 0.78 U | 0.98 U |
| Arsenic | mg/kg | 3 | 5.2 | 3.8 | 2 | 4.3 | 2.7 |
| Beryllium | mg/kg | 0.36 U | 0.39 U | 0.4 | 0.36 U | 0.31 U | 0.39 U |
| Cadmium | mg/kg | 0.36 U | 0.39 U | 0.38 U | 0.36 U | 0.31 U | 0.39 U |
| Chromium | mg/kg | 8 | 6.4 | 9.4 | 17.9 | 5 | 15.1 |
| Copper | mg/kg | 17.8 | 14.7 | 20.1 | 10.9 | 21 | 19.3 |
| Lead | mg/kg | 88.2 | 25.2 | 105 | 10.5 | 113 | 137 |
| TCLP Lead | mg/L | NA | NA | 0.059 | 0.013 | 0.13 | NA |
| Mercury | mg/kg | 0.037 | 0.040 U | 0.067 | 0.038 U | 0.036 | 0.11 |
| Nickel | mg/kg | 7.6 | 9 | 6.7 | 9.2 | 4.8 | 7.1 |
| Selenium | mg/kg | 0.90 U | 3.2 | 0.95 U | 0.89 U | 0.78 U | 0.98 U |
| Silver | mg/kg | 0.45 U | 0.49 U | 0.48 U | 0.44 U | 0.39 U | 0.49 U |
| Thallium | mg/kg | 0.90 U | 0.98 U | 0.95 U | 0.89 U | 0.78 U | 0.98 U |
| Zinc | mg/kg | 49.3 | 33.7 | 62.8 | 31.5 | 43.4 | 61.5 |
| **General Chemistry** | | | | | | | |
| Solids, Percent | % | 88.4 | 81.1 | 84 | 86 | 74.8 | 83.9 |

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| Client Sample ID: | | A-2013-B-5/MW-5 0-2' | A-2013-B-5/MW-5 4-6' | A-2013-B-6 0-2' | A-2013-B-6 4-6' | A-2013-TP-1 0-2' | A-2013-TP-1 4-6' |
|---|---|---|---|---|---|---|---|
| Lab Sample ID: | | MC27613-7 | MC27613-8 | MC27613-9 | MC27613-10 | MC27613-11 | MC27613-12 |
| Date Sampled: | | 1/9/2014 | 1/9/2014 | 1/9/2014 | 1/9/2014 | 1/10/2014 | 1/10/2014 |
| Matrix: | | Soil | Soil | Soil | Soil | Soil | Soil |
| **GC/MS Semi-volatiles (SW846 8270D)** | | | | | | | |
| Benzoic acid | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| 2-Chlorophenol | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| 4-Chloro-3-methyl phenol | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| 2,4-Dichlorophenol | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| 2,4-Dimethylphenol | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| 2,4-Dinitrophenol | mg/kg | 6.0 U | 1.1 U | 5.5 U | 1.1 U | 1.1 U | 1.2 U |
| 2-Methylphenol | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| 3&4-Methylphenol | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| 2-Nitrophenol | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| 4-Nitrophenol | mg/kg | 6.0 U | 1.1 U | 5.5 U | 1.1 U | 1.1 U | 1.2 U |
| Pentachlorophenol | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| Phenol | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| 2,4,5-Trichlorophenol | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| 2,4,6-Trichlorophenol | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| Acenaphthene | mg/kg | 2.7 | 0.11 U | 0.55 U | 0.11 U | 0.11 U | 0.12 U |
| Acenaphthylene | mg/kg | 0.818 | 0.11 U | 0.55 U | 0.11 U | 0.11 U | 0.12 U |
| Acetophenone | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| Aniline | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| Anthracene | mg/kg | 5.64 | 0.11 U | 0.802 | 0.11 U | 0.11 U | 0.12 U |
| Benzo(a)anthracene | mg/kg | 15.7 | 0.11 U | 2.74 | 0.11 U | 0.11 U | 0.12 U |
| Benzo(a)pyrene | mg/kg | 14 | 0.11 U | 2.65 | 0.11 U | 0.11 U | 0.12 U |
| Benzo(b)fluoranthene | mg/kg | 11.7 | 0.11 U | 2.36 | 0.11 U | 0.11 U | 0.12 U |
| Benzo(g,h,i)perylene | mg/kg | 7.52 | 0.11 U | 1.55 | 0.11 U | 0.11 U | 0.12 U |
| Benzo(k)fluoranthene | mg/kg | 11.4 | 0.11 U | 1.94 | 0.11 U | 0.11 U | 0.12 U |
| 4-Bromophenyl phenyl ether | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| Butyl benzyl phthalate | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| 2-Chloronaphthalene | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| 4-Chloroaniline | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| Chrysene | mg/kg | 15.8 | 0.11 U | 2.83 | 0.11 U | 0.11 U | 0.12 U |
| bis(2-Chloroethoxy)methane | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| bis(2-Chloroethyl)ether | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| bis(2-Chloroisopropyl)ether | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| 1,2-Dichlorobenzene | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| 1,2-Diphenylhydrazine | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| 1,3-Dichlorobenzene | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| 1,4-Dichlorobenzene | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| 2,4-Dinitrotoluene | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| 2,6-Dinitrotoluene | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| 3,3'-Dichlorobenzidine | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| Dibenzo(a,h)anthracene | mg/kg | 2.99 | 0.11 U | 0.55 U | 0.11 U | 0.11 U | 0.12 U |
| Dibenzofuran | mg/kg | 1.82 | 0.11 U | 0.55 U | 0.11 U | 0.11 U | 0.12 U |
| Di-n-butyl phthalate | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| Di-n-octyl phthalate | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| Diethyl phthalate | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| Dimethyl phthalate | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| bis(2-Ethylhexyl)phthalate | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| Fluoranthene | mg/kg | 34.5 | 0.11 U | 5.24 | 0.11 U | 0.11 U | 0.12 U |
| Fluorene | mg/kg | 2.25 | 0.11 U | 0.55 U | 0.11 U | 0.11 U | 0.12 U |
| Hexachlorobenzene | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| Hexachlorobutadiene | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| Hexachlorocyclopentadiene | mg/kg | 3.0 U | 0.57 U | 2.8 U | 0.53 U | 0.55 U | 0.60 U |
| Hexachloroethane | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| Indeno(1,2,3-cd)pyrene | mg/kg | 7.44 | 0.11 U | 1.52 | 0.11 U | 0.11 U | 0.12 U |
| Isophorone | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| 2-Methylnaphthalene | mg/kg | 0.77 | 0.11 U | 0.55 U | 0.11 U | 0.11 U | 0.12 U |
| Naphthalene | mg/kg | 1.66 | 0.11 U | 0.55 U | 0.11 U | 0.11 U | 0.12 U |
| Nitrobenzene | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| N-Nitroso-di-n-propylamine | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| N-Nitrosodiphenylamine | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| Phenanthrene | mg/kg | 27.4 | 0.11 U | 3.75 | 0.11 U | 0.11 U | 0.12 U |
| Pyrene | mg/kg | 33.3 | 0.11 U | 5.37 | 0.11 U | 0.11 U | 0.12 U |
| 1,2,4-Trichlorobenzene | mg/kg | 1.5 U | 0.28 U | 1.4 U | 0.26 U | 0.27 U | 0.30 U |
| **GC Volatiles (SW846 8015)** | | | | | | | |
| TPH-GRO (VOA) | mg/kg | 6.6 U | 6.1 U | 5.7 U | 5.4 U | 5.7 U | 7.1 U |
| **GC Semi-volatiles (SW846 8082)** | | | | | | | |
| Aroclor 1016 | mg/kg | 0.039 U | 0.036 U | 0.036 U | 0.034 U | 0.037 U | 0.040 U |
| Aroclor 1221 | mg/kg | 0.039 U | 0.036 U | 0.036 U | 0.034 U | 0.037 U | 0.040 U |
| Aroclor 1232 | mg/kg | 0.039 U | 0.036 U | 0.036 U | 0.034 U | 0.037 U | 0.040 U |
| Aroclor 1242 | mg/kg | 0.039 U | 0.036 U | 0.036 U | 0.034 U | 0.037 U | 0.040 U |
| Aroclor 1248 | mg/kg | 0.039 U | 0.036 U | 0.036 U | 0.034 U | 0.037 U | 0.040 U |
| Aroclor 1254 | mg/kg | 0.477 [a] | 0.036 U | 0.111 | 0.034 U | 0.037 U | 0.040 U |
| Aroclor 1260 | mg/kg | 0.039 U | 0.036 U | 0.036 U | 0.034 U | 0.037 U | 0.040 U |
| **GC Semi-volatiles (SW846-8015)** | | | | | | | |
| TPH-DRO (Semi-VOA) | mg/kg | 428 | 18 U | 101 | 18 U | 29.8 | 20 U |
| **Metals Analysis** | | | | | | | |
| Antimony | mg/kg | 0.83 U | 0.94 U | 0.90 U | 0.87 U | 0.91 U | 0.98 U |
| Arsenic | mg/kg | 11.6 | 3 | 2.9 | 2 | 2.3 | 2.1 |
| Beryllium | mg/kg | 0.49 | 0.38 U | 0.36 U | 0.35 U | 0.37 U | 0.39 U |
| Cadmium | mg/kg | 0.33 | 0.38 U | 0.36 U | 0.35 U | 0.37 U | 0.39 U |
| Chromium | mg/kg | 12.6 | 8.3 | 6.5 | 11.5 | 6.6 | 5.6 |
| Copper | mg/kg | 32.4 | 5.3 | 17.8 | 6.2 | 5.2 | 5.6 |
| Lead | mg/kg | 403 | 5.4 | 214 | 3.5 | 13.7 | 7.4 |
| TCLP Lead | mg/L | 0.37 | NA | 0.28 | NA | NA | NA |
| Mercury | mg/kg | 0.087 | 0.038 U | 0.25 | 0.035 U | 0.037 U | 0.039 U |
| Nickel | mg/kg | 9.6 | 5.6 | 4.9 | 8.1 | 3.7 U | 3.9 U |
| Selenium | mg/kg | 3.3 | 0.94 U | 0.90 U | 0.87 U | 0.91 U | 0.98 U |
| Silver | mg/kg | 0.42 U | 0.47 U | 0.45 U | 0.43 U | 0.46 U | 0.49 U |
| Thallium | mg/kg | 0.83 U | 0.94 U | 0.90 U | 0.87 U | 0.91 U | 0.98 U |
| Zinc | mg/kg | 253 | 14.3 | 71.2 | 18.4 | 14.5 | 15.4 |
| **General Chemistry** | | | | | | | |
| Solids, Percent | % | 82.6 | 86.5 | 90.3 | 93.2 | 89 | 82 |

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| Client Sample ID: | | A-2013-TP-2 0-2' | A-2013-TP-2 4-6' | A-2013-TP-3 0-2' | A-2013-TP-4 0-2' | A-2013-TP-4 4-6' | A-2013-TP-5 0-2' |
|---|---|---|---|---|---|---|---|
| Lab Sample ID: | | MC27613-13 | MC27613-14 | MC27613-15 | MC27613-16 | MC27613-17 | MC27613-18 |
| Date Sampled: | | 1/10/2014 | 1/10/2014 | 1/10/2014 | 1/10/2014 | 1/10/2014 | 1/10/2014 |
| Matrix: | | Soil | Soil | Soil | Soil | Soil | Soil |
| **GC/MS Semi-volatiles (SW846 8270D)** | | | | | | | |
| Benzoic acid | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| 2-Chlorophenol | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| 4-Chloro-3-methyl phenol | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| 2,4-Dichlorophenol | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| 2,4-Dimethylphenol | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| 2,4-Dinitrophenol | mg/kg | 1.1 U | 1.2 U | 5.8 U | 5.9 U | 1.1 U | 1.1 U |
| 2-Methylphenol | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| 3&4-Methylphenol | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| 2-Nitrophenol | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| 4-Nitrophenol | mg/kg | 1.1 U | 1.2 U | 5.8 U | 5.9 U | 1.1 U | 1.1 U |
| Pentachlorophenol | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| Phenol | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| 2,4,5-Trichlorophenol | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| 2,4,6-Trichlorophenol | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| Acenaphthene | mg/kg | 0.229 | 0.465 | 0.743 | 0.914 | 0.11 U | 0.11 U |
| Acenaphthylene | mg/kg | 0.154 | 0.12 U | 0.58 U | 2.06 | 0.11 U | 0.11 U |
| Acetophenone | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| Aniline | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| Anthracene | mg/kg | 0.639 | 0.339 | 1.83 | 5.24 | 0.11 U | 0.149 |
| Benzo(a)anthracene | mg/kg | 1.87 | 1.21 | 5.83 | 19.9 | 0.193 | 0.778 |
| Benzo(a)pyrene | mg/kg | 1.71 | 1.09 | 4.89 | 18.4 | 0.181 | 0.802 |
| Benzo(b)fluoranthene | mg/kg | 1.68 | 0.952 | 4.56 | 16.3 | 0.168 | 0.705 |
| Benzo(g,h,i)perylene | mg/kg | 1.08 | 0.626 | 2.8 | 10 | 0.111 | 0.528 |
| Benzo(k)fluoranthene | mg/kg | 1.17 | 0.854 | 4.01 | 13.6 | 0.133 | 0.636 |
| 4-Bromophenyl phenyl ether | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| Butyl benzyl phthalate | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| 2-Chloronaphthalene | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| 4-Chloroaniline | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| Chrysene | mg/kg | 1.84 | 1.18 | 5.8 | 18.2 | 0.181 | 0.849 |
| bis(2-Chloroethoxy)methane | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| bis(2-Chloroethyl)ether | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| bis(2-Chloroisopropyl)ether | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| 1,2-Dichlorobenzene | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| 1,2-Diphenylhydrazine | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| 1,3-Dichlorobenzene | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| 1,4-Dichlorobenzene | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| 2,4-Dinitrotoluene | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| 2,6-Dinitrotoluene | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| 3,3'-Dichlorobenzidine | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| Dibenzo(a,h)anthracene | mg/kg | 0.267 | 0.219 | 0.905 | 3.7 | 0.11 U | 0.174 |
| Dibenzofuran | mg/kg | 0.179 | 0.315 | 0.58 U | 1.07 | 0.11 U | 0.11 U |
| Di-n-butyl phthalate | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| Di-n-octyl phthalate | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| Diethyl phthalate | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| Dimethyl phthalate | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| bis(2-Ethylhexyl)phthalate | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| Fluoranthene | mg/kg | 3.84 | 2.56 | 11.6 | 45.1 | 0.397 | 1.4 |
| Fluorene | mg/kg | 0.208 | 0.309 | 0.767 | 1.45 | 0.11 U | 0.11 U |
| Hexachlorobenzene | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| Hexachlorobutadiene | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| Hexachlorocyclopentadiene | mg/kg | 0.55 U | 0.58 U | 2.9 U | 3.0 U | 0.56 U | 0.55 U |
| Hexachloroethane | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.983 | 0.566 | 2.77 | 9.82 | 0.11 U | 0.471 |
| Isophorone | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| 2-Methylnaphthalene | mg/kg | 0.11 U | 0.164 | 0.58 U | 0.59 U | 0.11 U | 0.11 U |
| Naphthalene | mg/kg | 0.129 | 0.492 | 0.58 U | 0.688 | 0.11 U | 0.11 U |
| Nitrobenzene | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| N-Nitroso-di-n-propylamine | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| N-Nitrosodiphenylamine | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| Phenanthrene | mg/kg | 2.79 | 2.55 | 9.04 | 25.8 | 0.244 | 0.814 |
| Pyrene | mg/kg | 3.76 | 2.45 | 10.7 | 41.1 | 0.376 | 1.57 |
| 1,2,4-Trichlorobenzene | mg/kg | 0.28 U | 0.29 U | 1.4 U | 1.5 U | 0.28 U | 0.27 U |
| **GC Volatiles (SW846 8015)** | | | | | | | |
| TPH-GRO (VOA) | mg/kg | 5.8 U | 6.7 U | 6.5 U | 6.6 U | 5.9 U | 6.1 U |
| **GC Semi-volatiles (SW846 8082)** | | | | | | | |
| Aroclor 1016 | mg/kg | 0.038 U | 0.038 U | 0.037 U | 0.039 U | 0.036 U | 0.037 U |
| Aroclor 1221 | mg/kg | 0.038 U | 0.038 U | 0.037 U | 0.039 U | 0.036 U | 0.037 U |
| Aroclor 1232 | mg/kg | 0.038 U | 0.038 U | 0.037 U | 0.039 U | 0.036 U | 0.037 U |
| Aroclor 1242 | mg/kg | 0.038 U | 0.038 U | 0.037 U | 0.039 U | 0.036 U | 0.037 U |
| Aroclor 1248 | mg/kg | 0.038 U | 0.038 U | 0.037 U | 0.039 U | 0.036 U | 0.037 U |
| Aroclor 1254 | mg/kg | 0.101 [a] | 0.038 U | 0.037 U | 0.144 | 0.036 U | 0.037 U |
| Aroclor 1260 | mg/kg | 0.038 U | 0.038 U | 0.037 U | 0.039 U | 0.036 U | 0.037 U |
| **GC Semi-volatiles (SW846-8015)** | | | | | | | |
| TPH-DRO (Semi-VOA) | mg/kg | 72.6 | 19 U | 214 | 737 | 18 U | 18 U |
| **Metals Analysis** | | | | | | | |
| Antimony | mg/kg | 0.90 U | 0.94 U | 0.94 U | 0.99 U | 0.91 U | 0.89 U |
| Arsenic | mg/kg | 2 | 5.2 | 7.1 | 5.3 | 2.2 | 3 |
| Beryllium | mg/kg | 0.36 U | 0.53 | 0.37 | 0.40 U | 0.36 U | 0.36 U |
| Cadmium | mg/kg | 0.36 U | 0.38 U | 0.37 U | 0.40 U | 0.36 U | 0.36 U |
| Chromium | mg/kg | 7 | 10.7 | 9.9 | 6.4 | 6.6 | 5.5 |
| Copper | mg/kg | 92.4 | 28.7 | 16.4 | 30.2 | 6.6 | 9.7 |
| Lead | mg/kg | 66.4 | 11.3 | 1010 | 830 | 23 | 53.1 |
| TCLP Lead | mg/L | NA | NA | 2.5 | 0.78 | NA | NA |
| Mercury | mg/kg | 0.047 | 0.037 U | 0.099 | 0.21 | 0.037 U | 0.12 |
| Nickel | mg/kg | 5.6 | 4.9 | 6.2 | 7.6 | 5.4 | 4.2 |
| Selenium | mg/kg | 0.90 U | 0.94 U | 0.94 U | 0.99 U | 0.91 U | 0.89 U |
| Silver | mg/kg | 0.45 U | 0.47 U | 0.47 U | 0.50 U | 0.45 U | 0.45 U |
| Thallium | mg/kg | 0.90 U | 0.94 U | 0.94 U | 0.99 U | 0.91 U | 0.89 U |
| Zinc | mg/kg | 34.8 | 46.2 | 373 | 297 | 22 | 53 |
| **General Chemistry** | | | | | | | |
| Solids, Percent | % | 88.5 | 85.3 | 86.1 | 82.7 | 88.3 | 88.8 |

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| Client Sample ID: | | A-2013-TP-5 4'-6' | A-2013-TP-6 0-2' | A-2013-TP-6 4-6' | A-2013-TP-7 0-2' | A-2013-TP-7 4-6' | A-2013-TP-8-0-2' |
|---|---|---|---|---|---|---|---|
| Lab Sample ID: | | MC27613-19 | MC27613-20 | MC27613-21 | MC27613-22 | MC27613-23 | MC27613-24 |
| Date Sampled: | | 1/10/2014 | 1/10/2014 | 1/10/2014 | 1/10/2014 | 1/10/2014 | 1/10/2014 |
| Matrix: | | Soil | Soil | Soil | Soil | Soil | Soil |
| **GC/MS Semi-volatiles (SW846 8270D)** | | | | | | | |
| Benzoic acid | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| 2-Chlorophenol | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| 4-Chloro-3-methyl phenol | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| 2,4-Dichlorophenol | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| 2,4-Dimethylphenol | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| 2,4-Dinitrophenol | mg/kg | 1.1 U | 5.4 U | 1.1 U | 11 U | 1.1 U | 1.3 U |
| 2-Methylphenol | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| 3&4-Methylphenol | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| 2-Nitrophenol | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| 4-Nitrophenol | mg/kg | 1.1 U | 5.4 U | 1.1 U | 11 U | 1.1 U | 1.3 U |
| Pentachlorophenol | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| Phenol | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| 2,4,5-Trichlorophenol | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| 2,4,6-Trichlorophenol | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| Acenaphthene | mg/kg | 0.11 U | 0.54 U | 0.11 U | 26.1 | 0.11 U | 0.13 U |
| Acenaphthylene | mg/kg | 0.11 U | 0.54 U | 0.123 | 7.28 | 0.11 U | 0.13 U |
| Acetophenone | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| Aniline | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| Anthracene | mg/kg | 0.11 U | 0.754 | 0.262 | 44.7 | 0.11 U | 0.13 U |
| Benzo(a)anthracene | mg/kg | 0.11 U | 4.36 | 1.3 | 92.6 | 0.11 U | 0.164 |
| Benzo(a)pyrene | mg/kg | 0.11 U | 4.4 | 1.35 | 83.2 | 0.11 U | 0.174 |
| Benzo(b)fluoranthene | mg/kg | 0.11 U | 3.85 | 1.22 | 70.3 | 0.11 U | 0.154 |
| Benzo(g,h,i)perylene | mg/kg | 0.11 U | 2.88 | 0.863 | 46.9 | 0.11 U | 0.13 U |
| Benzo(k)fluoranthene | mg/kg | 0.11 U | 3.29 | 1.02 | 51.8 | 0.11 U | 0.13 U |
| 4-Bromophenyl phenyl ether | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| Butyl benzyl phthalate | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| 2-Chloronaphthalene | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| 4-Chloroaniline | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| Chrysene | mg/kg | 0.11 U | 4.05 | 1.3 | 90.8 | 0.11 U | 0.145 |
| bis(2-Chloroethoxy)methane | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| bis(2-Chloroethyl)ether | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| bis(2-Chloroisopropyl)ether | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| 1,2-Dichlorobenzene | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| 1,2-Diphenylhydrazine | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| 1,3-Dichlorobenzene | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| 1,4-Dichlorobenzene | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| 2,4-Dinitrotoluene | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| 2,6-Dinitrotoluene | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| 3,3'-Dichlorobenzidine | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| Dibenzo(a,h)anthracene | mg/kg | 0.11 U | 0.673 | 0.266 | 16 | 0.11 U | 0.13 U |
| Dibenzofuran | mg/kg | 0.11 U | 0.54 U | 0.11 U | 18.9 | 0.11 U | 0.13 U |
| Di-n-butyl phthalate | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| Di-n-octyl phthalate | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| Diethyl phthalate | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| Dimethyl phthalate | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| bis(2-Ethylhexyl)phthalate | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| Fluoranthene | mg/kg | 0.11 U | 7.41 | 2.42 | 224 | 0.211 | 0.314 |
| Fluorene | mg/kg | 0.11 U | 0.54 U | 0.11 U | 22.2 | 0.11 U | 0.13 U |
| Hexachlorobenzene | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| Hexachlorobutadiene | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| Hexachlorocyclopentadiene | mg/kg | 0.57 U | 2.7 U | 0.54 U | 5.5 U | 0.57 U | 0.63 U |
| Hexachloroethane | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.11 U | 2.65 | 0.81 | 43.4 | 0.11 U | 0.13 U |
| Isophorone | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| 2-Methylnaphthalene | mg/kg | 0.11 U | 0.54 U | 0.11 U | 6.83 | 0.11 U | 0.13 U |
| Naphthalene | mg/kg | 0.11 U | 0.54 U | 0.11 U | 12.9 | 0.11 U | 0.13 U |
| Nitrobenzene | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| N-Nitroso-di-n-propylamine | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| N-Nitrosodiphenylamine | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| Phenanthrene | mg/kg | 0.11 U | 2.88 | 1.22 | 235 | 0.201 | 0.13 |
| Pyrene | mg/kg | 0.11 U | 7.78 | 2.42 | 200 | 0.196 | 0.311 |
| 1,2,4-Trichlorobenzene | mg/kg | 0.28 U | 1.4 U | 0.27 U | 2.8 U | 0.28 U | 0.31 U |
| **GC Volatiles (SW846 8015)** | | | | | | | |
| TPH-GRO (VOA) | mg/kg | 6.3 U | 5.7 U | 5.8 U | 5.8 U | 6.4 U | 7.6 U |
| **GC Semi-volatiles (SW846 8082)** | | | | | | | |
| Aroclor 1016 | mg/kg | 0.037 U | 0.036 U | 0.037 U | 0.036 U | 0.038 U | 0.042 U |
| Aroclor 1221 | mg/kg | 0.037 U | 0.036 U | 0.037 U | 0.036 U | 0.038 U | 0.042 U |
| Aroclor 1232 | mg/kg | 0.037 U | 0.036 U | 0.037 U | 0.036 U | 0.038 U | 0.042 U |
| Aroclor 1242 | mg/kg | 0.037 U | 0.036 U | 0.037 U | 0.036 U | 0.038 U | 0.042 U |
| Aroclor 1248 | mg/kg | 0.037 U | 0.036 U | 0.037 U | 0.036 U | 0.038 U | 0.042 U |
| Aroclor 1254 | mg/kg | 0.037 U | 0.111 | 0.0537 a | 0.904 | 0.038 U | 0.0715 |
| Aroclor 1260 | mg/kg | 0.037 U | 0.036 U | 0.037 U | 0.036 U | 0.038 U | 0.042 U |
| **GC Semi-volatiles (SW846-8015)** | | | | | | | |
| TPH-DRO (Semi-VOA) | mg/kg | 19 U | 105 | 48.4 | 3310 | 19 U | 20 U |
| **Metals Analysis** | | | | | | | |
| Antimony | mg/kg | 0.92 U | 0.89 U | 0.90 U | 0.88 U | 0.96 U | 1.0 U |
| Arsenic | mg/kg | 1.9 | 5.2 | 2 | 6.9 | 3.7 | 3.6 |
| Beryllium | mg/kg | 0.37 U | 0.36 U | 0.36 U | 0.35 U | 0.38 U | 0.41 U |
| Cadmium | mg/kg | 0.37 U | 0.36 U | 0.36 U | 0.35 U | 0.38 U | 0.41 U |
| Chromium | mg/kg | 4.5 | 7.6 | 6.1 | 6.6 | 6.9 | 8 |
| Copper | mg/kg | 4.1 | 47.6 | 8.2 | 36.1 | 4.2 | 17.4 |
| Lead | mg/kg | 3.6 | 831 | 57 | 500 | 8.5 | 49.3 |
| TCLP Lead | mg/L | NA | 0.98 | NA | 0.36 | NA | NA |
| Mercury | mg/kg | 0.038 U | 0.46 | 0.036 U | 0.34 | 0.038 U | 0.077 |
| Nickel | mg/kg | 4.2 | 7.9 | 4.5 | 4.9 | 4.5 | 4.1 U |
| Selenium | mg/kg | 0.92 U | 0.89 U | 0.90 U | 0.88 U | 0.96 U | 1.0 U |
| Silver | mg/kg | 0.46 U | 0.44 U | 0.45 U | 0.44 U | 0.48 U | 0.51 U |
| Thallium | mg/kg | 0.92 U | 0.89 U | 0.90 U | 0.88 U | 0.96 U | 1.0 U |
| Zinc | mg/kg | 15.5 | 359 | 46.2 | 182 | 19.5 | 24.2 |
| **General Chemistry** | | | | | | | |
| Solids, Percent | % | 85.5 | 89.3 | 90.5 | 90.7 | 84.4 | 79.3 |

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| Client Sample ID: | | A-2013-TP-8-4-6' | DUP-2320 | DUP-2321 | | | |
|---|---|---|---|---|---|---|---|
| Lab Sample ID: | | MC27613-25 | MC27613-26 | MC27613-27 | | | |
| Date Sampled: | | 1/10/2014 | 1/10/2014 | 1/10/2014 | | | |
| Matrix: | | Soil | Soil | Soil | | | |
| **GC/MS Semi-volatiles (SW846 8270D)** | | | | | | | |
| Benzoic acid | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| 2-Chlorophenol | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| 4-Chloro-3-methyl phenol | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| 2,4-Dichlorophenol | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| 2,4-Dimethylphenol | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| 2,4-Dinitrophenol | mg/kg | 1.1 U | 1.1 U | 1.1 U | | | |
| 2-Methylphenol | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| 3&4-Methylphenol | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| 2-Nitrophenol | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| 4-Nitrophenol | mg/kg | 1.1 U | 1.1 U | 1.1 U | | | |
| Pentachlorophenol | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| Phenol | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| 2,4,5-Trichlorophenol | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| 2,4,6-Trichlorophenol | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| Acenaphthene | mg/kg | 0.11 U | 0.11 U | 0.138 | | | |
| Acenaphthylene | mg/kg | 0.11 U | 0.11 U | 0.11 U | | | |
| Acetophenone | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| Aniline | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| Anthracene | mg/kg | 0.11 U | 0.11 U | 0.303 | | | |
| Benzo(a)anthracene | mg/kg | 0.126 | 0.11 U | 1.22 | | | |
| Benzo(a)pyrene | mg/kg | 0.132 | 0.11 U | 1.29 | | | |
| Benzo(b)fluoranthene | mg/kg | 0.125 | 0.11 U | 1.22 | | | |
| Benzo(g,h,i)perylene | mg/kg | 0.11 U | 0.11 U | 0.831 | | | |
| Benzo(k)fluoranthene | mg/kg | 0.11 U | 0.11 U | 0.925 | | | |
| 4-Bromophenyl phenyl ether | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| Butyl benzyl phthalate | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| 2-Chloronaphthalene | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| 4-Chloroaniline | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| Chrysene | mg/kg | 0.11 U | 0.11 U | 1.21 | | | |
| bis(2-Chloroethoxy)methane | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| bis(2-Chloroethyl)ether | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| bis(2-Chloroisopropyl)ether | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| 1,2-Dichlorobenzene | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| 1,2-Diphenylhydrazine | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| 1,3-Dichlorobenzene | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| 1,4-Dichlorobenzene | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| 2,4-Dinitrotoluene | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| 2,6-Dinitrotoluene | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| 3,3'-Dichlorobenzidine | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| Dibenzo(a,h)anthracene | mg/kg | 0.11 U | 0.11 U | 0.268 | | | |
| Dibenzofuran | mg/kg | 0.11 U | 0.11 U | 0.11 U | | | |
| Di-n-butyl phthalate | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| Di-n-octyl phthalate | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| Diethyl phthalate | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| Dimethyl phthalate | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| bis(2-Ethylhexyl)phthalate | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| Fluoranthene | mg/kg | 0.256 | 0.11 U | 2.43 | | | |
| Fluorene | mg/kg | 0.11 U | 0.11 U | 0.156 | | | |
| Hexachlorobenzene | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| Hexachlorobutadiene | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| Hexachlorocyclopentadiene | mg/kg | 0.57 U | 0.56 U | 0.54 U | | | |
| Hexachloroethane | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.11 U | 0.11 U | 0.78 | | | |
| Isophorone | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| 2-Methylnaphthalene | mg/kg | 0.11 U | 0.11 U | 0.11 U | | | |
| Naphthalene | mg/kg | 0.11 U | 0.11 U | 0.11 U | | | |
| Nitrobenzene | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| N-Nitroso-di-n-propylamine | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| N-Nitrosodiphenylamine | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| Phenanthrene | mg/kg | 0.11 U | 0.11 U | 1.55 | | | |
| Pyrene | mg/kg | 0.244 | 0.111 | 2.35 | | | |
| 1,2,4-Trichlorobenzene | mg/kg | 0.28 U | 0.28 U | 0.27 U | | | |
| **GC Volatiles (SW846 8015)** | | | | | | | |
| TPH-GRO (VOA) | mg/kg | 6.4 U | 6.3 U | 5.8 U | | | |
| **GC Semi-volatiles (SW846 8082)** | | | | | | | |
| Aroclor 1016 | mg/kg | 0.038 U | 0.038 U | 0.037 U | | | |
| Aroclor 1221 | mg/kg | 0.038 U | 0.038 U | 0.037 U | | | |
| Aroclor 1232 | mg/kg | 0.038 U | 0.038 U | 0.037 U | | | |
| Aroclor 1242 | mg/kg | 0.038 U | 0.038 U | 0.037 U | | | |
| Aroclor 1248 | mg/kg | 0.038 U | 0.038 U | 0.037 U | | | |
| Aroclor 1254 | mg/kg | 0.0723 | 0.038 U | 0.0418 [a] | | | |
| Aroclor 1260 | mg/kg | 0.038 U | 0.038 U | 0.037 U | | | |
| **GC Semi-volatiles (SW846-8015)** | | | | | | | |
| TPH-DRO (Semi-VOA) | mg/kg | 18 U | 19 U | 121 | | | |
| **Metals Analysis** | | | | | | | |
| Antimony | mg/kg | 0.92 U | 0.91 U | 0.90 U | | | |
| Arsenic | mg/kg | 2.1 | 2 | 2.1 | | | |
| Beryllium | mg/kg | 0.37 U | 0.36 U | 0.36 U | | | |
| Cadmium | mg/kg | 0.37 U | 0.36 U | 0.36 U | | | |
| Chromium | mg/kg | 10.7 | 5 | 6.1 | | | |
| Copper | mg/kg | 6.8 | 4.1 | 7.2 | | | |
| Lead | mg/kg | 8.1 | 9.9 | 44.5 | | | |
| TCLP Lead | mg/L | NA | NA | NA | | | |
| Mercury | mg/kg | 0.036 U | 0.037 U | 0.045 | | | |
| Nickel | mg/kg | 6.2 | 3.6 U | 3.8 | | | |
| Selenium | mg/kg | 0.92 U | 0.91 U | 0.90 U | | | |
| Silver | mg/kg | 0.46 U | 0.46 U | 0.45 U | | | |
| Thallium | mg/kg | 0.92 U | 0.91 U | 0.90 U | | | |
| Zinc | mg/kg | 16.2 | 10.2 | 41.5 | | | |
| **General Chemistry** | | | | | | | |
| Solids, Percent | % | 87.2 | 87.8 | 89.6 | | | |

**Footnotes:**

[a] Due to Matrix Interference less than five GC peaks characteristic for reported Aroclors are used for quantization.

NA - Not Analyzed

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| Accutest Labs of New England, Inc. | | | | | | | 8/22/2014 12:10 |
|---|---|---|---|---|---|---|---|
| Job Number: | MC27810 | | | | | | |
| Account: | Apex Companies, LLC | | | | | | |
| Project: | NBMCT, Blackmer, New Bedford, MA | | | | | | |
| Project Number: | 6690.027 | | | | | | |
| | | | | | Legend: | Hit | Exceed |

| Client Sample ID: | | MA MCP Method 1: GW-3 Standard (310 CMR 6/14) | MW-1 | MW-1 | MW-2 | MW-2 | MW-3 |
|---|---|---|---|---|---|---|---|
| Lab Sample ID: | | | MC27810-1 | MC27810-1F | MC27810-2 | MC27810-2F | MC27810-3 |
| Date Sampled: | | | 1/21/2014 | 1/21/2014 | 1/21/2014 | 1/21/2014 | 1/21/2014 |
| Matrix: | | | Ground Water | Ground Water | Ground Water | Ground Water | Ground Water |
| **GC/MS Semi-volatiles (SW846 8270D)** | | | | | | | |
| Benzoic Acid | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2-Chlorophenol | mg/l | 7 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 4-Chloro-3-methyl phenol | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2,4-Dichlorophenol | mg/l | 2 | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2,4-Dimethylphenol | mg/l | 50 | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2,4-Dinitrophenol | mg/l | 20 | 0.020 U | - | 0.020 U | - | 0.020 U |
| 2-Methylphenol | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| 3&4-Methylphenol | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2-Nitrophenol | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| 4-Nitrophenol | mg/l | - | 0.020 U | - | 0.020 U | - | 0.020 U |
| Pentachlorophenol | mg/l | 0.2 | 0.010 U | - | 0.010 U | - | 0.010 U |
| Phenol | mg/l | 2 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 2,4,5-Trichlorophenol | mg/l | 3 | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2,4,6-Trichlorophenol | mg/l | 0.5 | 0.010 U | - | 0.010 U | - | 0.010 U |
| Acenaphthene | mg/l | 10 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Acenaphthylene | mg/l | 0.04 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Acetophenone | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| Aniline | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| Anthracene | mg/l | 0.03 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Benzo(a)anthracene | mg/l | 1 | 0.0020 U | - | 0.0020 U | - | 0.0045 |
| Benzo(a)pyrene | mg/l | 0.5 | 0.0020 U | - | 0.0020 U | - | 0.0043 |
| Benzo(b)fluoranthene | mg/l | 0.4 | 0.0020 U | - | 0.0020 U | - | 0.0036 |
| Benzo(g,h,i)perylene | mg/l | 0.02 | 0.0020 U | - | 0.0020 U | - | 0.0027 |
| Benzo(k)fluoranthene | mg/l | 0.1 | 0.0020 U | - | 0.0020 U | - | 0.0035 |
| 4-Bromophenyl phenyl ether | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Butyl benzyl phthalate | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 2-Chloronaphthalene | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 4-Chloroaniline | mg/l | 0.3 | 0.010 U | - | 0.010 U | - | 0.010 U |
| Chrysene | mg/l | 0.07 | 0.0020 U | - | 0.0020 U | - | 0.004 |
| bis(2-Chloroethoxy)methane | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| bis(2-Chloroethyl)ether | mg/l | 50 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| bis(2-Chloroisopropyl)ether | mg/l | 50 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 1,2-Dichlorobenzene | mg/l | 2 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 1,2-Diphenylhydrazine | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 1,3-Dichlorobenzene | mg/l | 50 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 1,4-Dichlorobenzene | mg/l | 8 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 2,4-Dinitrotoluene | mg/l | 50 | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2,6-Dinitrotoluene | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| 3,3'-Dichlorobenzidine | mg/l | 2 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Dibenzo(a,h)anthracene | mg/l | 0.04 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Dibenzofuran | mg/l | - | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Di-n-butyl phthalate | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Di-n-octyl phthalate | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Diethyl phthalate | mg/l | 9 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Dimethyl phthalate | mg/l | 50 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| bis(2-Ethylhexyl)phthalate | mg/l | 50 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Fluoranthene | mg/l | 0.2 | 0.0020 U | - | 0.0020 U | - | 0.0099 |
| Fluorene | mg/l | 0.04 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Hexachlorobenzene | mg/l | 6 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Hexachlorobutadiene | mg/l | 3 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Hexachlorocyclopentadiene | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| Hexachloroethane | mg/l | 50 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Indeno(1,2,3-cd)pyrene | mg/l | 0.1 | 0.0020 U | - | 0.0020 U | - | 0.0025 |
| Isophorone | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 2-Methylnaphthalene | mg/l | 20 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Naphthalene | mg/l | 20 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Nitrobenzene | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| N-Nitroso-di-n-propylamine | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| N-Nitrosodiphenylamine | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Phenanthrene | mg/l | 10 | 0.0020 U | - | 0.0020 U | - | 0.0042 |
| Pyrene | mg/l | 0.02 | 0.0020 U | - | 0.0020 U | - | 0.0092 |
| 1,2,4-Trichlorobenzene | mg/l | 50 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| **GC Semi-volatiles (SW846 8082)** | | | | | | | |
| Aroclor 1016 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1221 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1232 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1242 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1248 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1254 | mg/l | 0.01 | 0.0022 | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1260 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1262 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1268 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| **GC Semi-volatiles (SW846-8015)** | | | | | | | |
| TPH-DRO (Semi-VOA) | mg/l | - | 0.24 U | - | 0.24 U | - | 0.26 U |
| **Metals Analysis** | | | | | | | |
| Antimony | mg/l | 8 | - | 0.0060 U | - | 0.0060 U | - |
| Arsenic | mg/l | 0.9 | - | 0.0040 U | - | 0.0040 U | - |
| Beryllium | mg/l | 0.2 | - | 0.0040 U | - | 0.0040 U | - |
| Cadmium | mg/l | 0.004 | - | 0.0040 U | - | 0.0040 U | - |
| Chromium | mg/l | 0.3 | - | 0.010 U | - | 0.010 U | - |
| Copper | mg/l | - | - | 0.025 U | - | 0.025 U | - |
| Lead | mg/l | 0.01 | - | 0.0050 U | - | 0.0050 U | - |
| Mercury | mg/l | 0.02 | - | 0.00020 U | - | 0.00020 U | - |
| Nickel | mg/l | 0.2 | - | 0.040 U | - | 0.040 U | - |
| Selenium | mg/l | 0.1 | - | 0.010 U | - | 0.010 U | - |
| Silver | mg/l | 0.007 | - | 0.0050 U | - | 0.0050 U | - |
| Thallium | mg/l | 3 | - | 0.0050 U | - | 0.0050 U | - |
| Zinc | mg/l | 0.9 | - | 0.020 U | - | 0.020 U | - |

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| Client Sample ID: | | MA MCP Method | MW-3 | MW-5 | MW-5 | DUP-C-W-100 | DUP-C-W-100 |
|---|---|---|---|---|---|---|---|
| Lab Sample ID: | | 1: GW-3 | MC27810-3F | MC27810-4 | MC27810-4F | MC27810-5 | MC27810-5F |
| Date Sampled: | | Standard (310 | 1/21/2014 | 1/21/2014 | 1/21/2014 | 1/21/2014 | 1/21/2014 |
| Matrix: | | CMR 6/14) | Ground Water | Ground Water | Ground Water | Ground Water | Ground Water |
| **GC/MS Semi-volatiles (SW846 8270D)** | | | | | | | |
| Benzoic Acid | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| 2-Chlorophenol | mg/l | 7 | - | 0.0050 U | - | 0.0050 U | - |
| 4-Chloro-3-methyl phenol | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| 2,4-Dichlorophenol | mg/l | 2 | - | 0.010 U | - | 0.010 U | - |
| 2,4-Dimethylphenol | mg/l | 50 | - | 0.010 U | - | 0.010 U | - |
| 2,4-Dinitrophenol | mg/l | 20 | - | 0.020 U | - | 0.020 U | - |
| 2-Methylphenol | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| 3&4-Methylphenol | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| 2-Nitrophenol | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| 4-Nitrophenol | mg/l | - | - | 0.020 U | - | 0.020 U | - |
| Pentachlorophenol | mg/l | 0.2 | - | 0.010 U | - | 0.010 U | - |
| Phenol | mg/l | 2 | - | 0.0050 U | - | 0.0050 U | - |
| 2,4,5-Trichlorophenol | mg/l | 3 | - | 0.010 U | - | 0.010 U | - |
| 2,4,6-Trichlorophenol | mg/l | 0.5 | - | 0.010 U | - | 0.010 U | - |
| Acenaphthene | mg/l | 10 | - | 0.0020 U | - | 0.0020 U | - |
| Acenaphthylene | mg/l | 0.04 | - | 0.0020 U | - | 0.0020 U | - |
| Acetophenone | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| Aniline | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| Anthracene | mg/l | 0.03 | - | 0.0020 U | - | 0.0020 U | - |
| Benzo(a)anthracene | mg/l | 1 | - | 0.0020 U | - | 0.0020 U | - |
| Benzo(a)pyrene | mg/l | 0.5 | - | 0.0020 U | - | 0.0020 U | - |
| Benzo(b)fluoranthene | mg/l | 0.4 | - | 0.0020 U | - | 0.0020 U | - |
| Benzo(g,h,i)perylene | mg/l | 0.02 | - | 0.0020 U | - | 0.0020 U | - |
| Benzo(k)fluoranthene | mg/l | 0.1 | - | 0.0020 U | - | 0.0020 U | - |
| 4-Bromophenyl phenyl ether | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| Butyl benzyl phthalate | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| 2-Chloronaphthalene | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| 4-Chloroaniline | mg/l | 0.3 | - | 0.010 U | - | 0.010 U | - |
| Chrysene | mg/l | 0.07 | - | 0.0020 U | - | 0.0020 U | - |
| bis(2-Chloroethoxy)methane | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| bis(2-Chloroethyl)ether | mg/l | 50 | - | 0.0050 U | - | 0.0050 U | - |
| bis(2-Chloroisopropyl)ether | mg/l | 50 | - | 0.0050 U | - | 0.0050 U | - |
| 1,2-Dichlorobenzene | mg/l | 2 | - | 0.0050 U | - | 0.0050 U | - |
| 1,2-Diphenylhydrazine | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| 1,3-Dichlorobenzene | mg/l | 50 | - | 0.0050 U | - | 0.0050 U | - |
| 1,4-Dichlorobenzene | mg/l | 8 | - | 0.0050 U | - | 0.0050 U | - |
| 2,4-Dinitrotoluene | mg/l | 50 | - | 0.010 U | - | 0.010 U | - |
| 2,6-Dinitrotoluene | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| 3,3'-Dichlorobenzidine | mg/l | 2 | - | 0.0050 U | - | 0.0050 U | - |
| Dibenzo(a,h)anthracene | mg/l | 0.04 | - | 0.0020 U | - | 0.0020 U | - |
| Dibenzofuran | mg/l | - | - | 0.0020 U | - | 0.0020 U | - |
| Di-n-butyl phthalate | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| Di-n-octyl phthalate | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| Diethyl phthalate | mg/l | 9 | - | 0.0050 U | - | 0.0050 U | - |
| Dimethyl phthalate | mg/l | 50 | - | 0.0050 U | - | 0.0050 U | - |
| bis(2-Ethylhexyl)phthalate | mg/l | 50 | - | 0.0020 U | - | 0.0020 U | - |
| Fluoranthene | mg/l | 0.2 | - | 0.0020 U | - | 0.0020 U | - |
| Fluorene | mg/l | 0.04 | - | 0.0020 U | - | 0.0020 U | - |
| Hexachlorobenzene | mg/l | 6 | - | 0.0050 U | - | 0.0050 U | - |
| Hexachlorobutadiene | mg/l | 3 | - | 0.0050 U | - | 0.0050 U | - |
| Hexachlorocyclopentadiene | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| Hexachloroethane | mg/l | 50 | - | 0.0050 U | - | 0.0050 U | - |
| Indeno(1,2,3-cd)pyrene | mg/l | 0.1 | - | 0.0020 U | - | 0.0020 U | - |
| Isophorone | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| 2-Methylnaphthalene | mg/l | 20 | - | 0.0020 U | - | 0.0020 U | - |
| Naphthalene | mg/l | 20 | - | 0.0020 U | - | 0.0020 U | - |
| Nitrobenzene | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| N-Nitroso-di-n-propylamine | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| N-Nitrosodiphenylamine | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| Phenanthrene | mg/l | 10 | - | 0.0020 U | - | 0.0020 U | - |
| Pyrene | mg/l | 0.02 | - | 0.0020 U | - | 0.0020 U | - |
| 1,2,4-Trichlorobenzene | mg/l | 50 | - | 0.0050 U | - | 0.0050 U | - |
| **GC Semi-volatiles (SW846 8082)** | | | | | | | |
| Aroclor 1016 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1221 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1232 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1242 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1248 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1254 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1260 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1262 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1268 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| **GC Semi-volatiles (SW846-8015)** | | | | | | | |
| TPH-DRO (Semi-VOA) | mg/l | - | - | 0.25 U | - | 0.22 U | - |
| **Metals Analysis** | | | | | | | |
| Antimony | mg/l | 8 | 0.0060 U | - | 0.0060 U | - | 0.0060 U |
| Arsenic | mg/l | 0.9 | 0.0040 U | - | 0.0040 U | - | 0.0040 U |
| Beryllium | mg/l | 0.2 | 0.0040 U | - | 0.0040 U | - | 0.0040 U |
| Cadmium | mg/l | 0.004 | 0.0040 U | - | 0.0040 U | - | 0.0040 U |
| Chromium | mg/l | 0.3 | 0.010 U | - | 0.010 U | - | 0.010 U |
| Copper | mg/l | - | 0.025 U | - | 0.025 U | - | 0.025 U |
| Lead | mg/l | 0.01 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Mercury | mg/l | 0.02 | 0.00020 U | - | 0.00020 U | - | 0.00020 U |
| Nickel | mg/l | 0.2 | 0.040 U | - | 0.040 U | - | 0.040 U |
| Selenium | mg/l | 0.1 | 0.010 U | - | 0.010 U | - | 0.010 U |
| Silver | mg/l | 0.007 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Thallium | mg/l | 3 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Zinc | mg/l | 0.9 | 0.0348 | - | 0.0955 | - | 0.098 |

**Regulatory limits listed in this document have been obtained from the latest version of the regulations cited and are used for advisory purposes only. Accutest assumes no responsibility for errors in regulatory documents or changes to criteria detailed in later versions of the referenced regulation. It is the responsibility of the user to verify these limits before using or reporting any data.**

**No results exceeded regulatory criteria.**

DRAFT

| Accutest Labs of New England, Inc. | | | | | | | 8/22/2014 12:10 |
|---|---|---|---|---|---|---|---|
| Job Number: | MC27810 | | | | | | |
| Account: | Apex Companies, LLC | | | | | | |
| Project: | NBMCT, Blackmer, New Bedford, MA | | | | | | |
| Project Number: | 6690.027 | | | | | | |
| | | | | | Legend: | Hit | Exceed |

| Client Sample ID: | | MA MCP Method 1: GW-3 Standard (310 CMR 6/14) | MW-1 | MW-1 | MW-2 | MW-2 | MW-3 |
|---|---|---|---|---|---|---|---|
| Lab Sample ID: | | | MC27810-1 | MC27810-1F | MC27810-2 | MC27810-2F | MC27810-3 |
| Date Sampled: | | | 1/21/2014 | 1/21/2014 | 1/21/2014 | 1/21/2014 | 1/21/2014 |
| Matrix: | | | Ground Water | Ground Water | Ground Water | Ground Water | Ground Water |
| **GC/MS Semi-volatiles (SW846 8270D)** | | | | | | | |
| Benzoic Acid | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2-Chlorophenol | mg/l | 7 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 4-Chloro-3-methyl phenol | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2,4-Dichlorophenol | mg/l | 2 | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2,4-Dimethylphenol | mg/l | 50 | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2,4-Dinitrophenol | mg/l | 20 | 0.020 U | - | 0.020 U | - | 0.020 U |
| 2-Methylphenol | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| 3&4-Methylphenol | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2-Nitrophenol | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| 4-Nitrophenol | mg/l | - | 0.020 U | - | 0.020 U | - | 0.020 U |
| Pentachlorophenol | mg/l | 0.2 | 0.010 U | - | 0.010 U | - | 0.010 U |
| Phenol | mg/l | 2 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 2,4,5-Trichlorophenol | mg/l | 3 | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2,4,6-Trichlorophenol | mg/l | 0.5 | 0.010 U | - | 0.010 U | - | 0.010 U |
| Acenaphthene | mg/l | 10 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Acenaphthylene | mg/l | 0.04 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Acetophenone | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| Aniline | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| Anthracene | mg/l | 0.03 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Benzo(a)anthracene | mg/l | 1 | 0.0020 U | - | 0.0020 U | - | 0.0045 |
| Benzo(a)pyrene | mg/l | 0.5 | 0.0020 U | - | 0.0020 U | - | 0.0043 |
| Benzo(b)fluoranthene | mg/l | 0.4 | 0.0020 U | - | 0.0020 U | - | 0.0036 |
| Benzo(g,h,i)perylene | mg/l | 0.02 | 0.0020 U | - | 0.0020 U | - | 0.0027 |
| Benzo(k)fluoranthene | mg/l | 0.1 | 0.0020 U | - | 0.0020 U | - | 0.0035 |
| 4-Bromophenyl phenyl ether | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Butyl benzyl phthalate | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 2-Chloronaphthalene | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 4-Chloroaniline | mg/l | 0.3 | 0.010 U | - | 0.010 U | - | 0.010 U |
| Chrysene | mg/l | 0.07 | 0.0020 U | - | 0.0020 U | - | 0.004 |
| bis(2-Chloroethoxy)methane | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| bis(2-Chloroethyl)ether | mg/l | 50 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| bis(2-Chloroisopropyl)ether | mg/l | 50 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 1,2-Dichlorobenzene | mg/l | 2 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 1,2-Diphenylhydrazine | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 1,3-Dichlorobenzene | mg/l | 50 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 1,4-Dichlorobenzene | mg/l | 8 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 2,4-Dinitrotoluene | mg/l | 50 | 0.010 U | - | 0.010 U | - | 0.010 U |
| 2,6-Dinitrotoluene | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| 3,3'-Dichlorobenzidine | mg/l | 2 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Dibenzo(a,h)anthracene | mg/l | 0.04 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Dibenzofuran | mg/l | - | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Di-n-butyl phthalate | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Di-n-octyl phthalate | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Diethyl phthalate | mg/l | 9 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Dimethyl phthalate | mg/l | 50 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| bis(2-Ethylhexyl)phthalate | mg/l | 50 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Fluoranthene | mg/l | 0.2 | 0.0020 U | - | 0.0020 U | - | 0.0099 |
| Fluorene | mg/l | 0.04 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Hexachlorobenzene | mg/l | 6 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Hexachlorobutadiene | mg/l | 3 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Hexachlorocyclopentadiene | mg/l | - | 0.010 U | - | 0.010 U | - | 0.010 U |
| Hexachloroethane | mg/l | 50 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Indeno(1,2,3-cd)pyrene | mg/l | 0.1 | 0.0020 U | - | 0.0020 U | - | 0.0025 |
| Isophorone | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| 2-Methylnaphthalene | mg/l | 20 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Naphthalene | mg/l | 20 | 0.0020 U | - | 0.0020 U | - | 0.0020 U |
| Nitrobenzene | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| N-Nitroso-di-n-propylamine | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| N-Nitrosodiphenylamine | mg/l | - | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Phenanthrene | mg/l | 10 | 0.0020 U | - | 0.0020 U | - | 0.0042 |
| Pyrene | mg/l | 0.02 | 0.0020 U | - | 0.0020 U | - | 0.0092 |
| 1,2,4-Trichlorobenzene | mg/l | 50 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| **GC Semi-volatiles (SW846 8082)** | | | | | | | |
| Aroclor 1016 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1221 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1232 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1242 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1248 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1254 | mg/l | 0.01 | 0.0022 | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1260 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1262 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| Aroclor 1268 | mg/l | 0.01 | 0.00027 U | - | 0.00031 U | - | 0.00030 U |
| **GC Semi-volatiles (SW846-8015)** | | | | | | | |
| TPH-DRO (Semi-VOA) | mg/l | - | 0.24 U | - | 0.24 U | - | 0.26 U |
| **Metals Analysis** | | | | | | | |
| Antimony | mg/l | 8 | - | 0.0060 U | - | 0.0060 U | - |
| Arsenic | mg/l | 0.9 | - | 0.0040 U | - | 0.0040 U | - |
| Beryllium | mg/l | 0.2 | - | 0.0040 U | - | 0.0040 U | - |
| Cadmium | mg/l | 0.004 | - | 0.0040 U | - | 0.0040 U | - |
| Chromium | mg/l | 0.3 | - | 0.010 U | - | 0.010 U | - |
| Copper | mg/l | - | - | 0.025 U | - | 0.025 U | - |
| Lead | mg/l | 0.01 | - | 0.0050 U | - | 0.0050 U | - |
| Mercury | mg/l | 0.02 | - | 0.00020 U | - | 0.00020 U | - |
| Nickel | mg/l | 0.2 | - | 0.040 U | - | 0.040 U | - |
| Selenium | mg/l | 0.1 | - | 0.010 U | - | 0.010 U | - |
| Silver | mg/l | 0.007 | - | 0.0050 U | - | 0.0050 U | - |
| Thallium | mg/l | 3 | - | 0.0050 U | - | 0.0050 U | - |
| Zinc | mg/l | 0.9 | - | 0.020 U | - | 0.020 U | - |

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| Client Sample ID: | | MA MCP Method 1: GW-3 Standard (310 CMR 6/14) | MW-3 | MW-5 | MW-5 | DUP-C-W-100 | DUP-C-W-100 |
|---|---|---|---|---|---|---|---|
| Lab Sample ID: | | | MC27810-3F | MC27810-4 | MC27810-4F | MC27810-5 | MC27810-5F |
| Date Sampled: | | | 1/21/2014 | 1/21/2014 | 1/21/2014 | 1/21/2014 | 1/21/2014 |
| Matrix: | | | Ground Water | Ground Water | Ground Water | Ground Water | Ground Water |
| **GC/MS Semi-volatiles (SW846 8270D)** | | | | | | | |
| Benzoic Acid | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| 2-Chlorophenol | mg/l | 7 | - | 0.0050 U | - | 0.0050 U | - |
| 4-Chloro-3-methyl phenol | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| 2,4-Dichlorophenol | mg/l | 2 | - | 0.010 U | - | 0.010 U | - |
| 2,4-Dimethylphenol | mg/l | 50 | - | 0.010 U | - | 0.010 U | - |
| 2,4-Dinitrophenol | mg/l | 20 | - | 0.020 U | - | 0.020 U | - |
| 2-Methylphenol | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| 3&4-Methylphenol | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| 2-Nitrophenol | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| 4-Nitrophenol | mg/l | - | - | 0.020 U | - | 0.020 U | - |
| Pentachlorophenol | mg/l | 0.2 | - | 0.010 U | - | 0.010 U | - |
| Phenol | mg/l | 2 | - | 0.0050 U | - | 0.0050 U | - |
| 2,4,5-Trichlorophenol | mg/l | 3 | - | 0.010 U | - | 0.010 U | - |
| 2,4,6-Trichlorophenol | mg/l | 0.5 | - | 0.010 U | - | 0.010 U | - |
| Acenaphthene | mg/l | 10 | - | 0.0020 U | - | 0.0020 U | - |
| Acenaphthylene | mg/l | 0.04 | - | 0.0020 U | - | 0.0020 U | - |
| Acetophenone | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| Aniline | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| Anthracene | mg/l | 0.03 | - | 0.0020 U | - | 0.0020 U | - |
| Benzo(a)anthracene | mg/l | 1 | - | 0.0020 U | - | 0.0020 U | - |
| Benzo(a)pyrene | mg/l | 0.5 | - | 0.0020 U | - | 0.0020 U | - |
| Benzo(b)fluoranthene | mg/l | 0.4 | - | 0.0020 U | - | 0.0020 U | - |
| Benzo(g,h,i)perylene | mg/l | 0.02 | - | 0.0020 U | - | 0.0020 U | - |
| Benzo(k)fluoranthene | mg/l | 0.1 | - | 0.0020 U | - | 0.0020 U | - |
| 4-Bromophenyl phenyl ether | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| Butyl benzyl phthalate | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| 2-Chloronaphthalene | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| 4-Chloroaniline | mg/l | 0.3 | - | 0.010 U | - | 0.010 U | - |
| Chrysene | mg/l | 0.07 | - | 0.0020 U | - | 0.0020 U | - |
| bis(2-Chloroethoxy)methane | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| bis(2-Chloroethyl)ether | mg/l | 50 | - | 0.0050 U | - | 0.0050 U | - |
| bis(2-Chloroisopropyl)ether | mg/l | 50 | - | 0.0050 U | - | 0.0050 U | - |
| 1,2-Dichlorobenzene | mg/l | 2 | - | 0.0050 U | - | 0.0050 U | - |
| 1,2-Diphenylhydrazine | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| 1,3-Dichlorobenzene | mg/l | 50 | - | 0.0050 U | - | 0.0050 U | - |
| 1,4-Dichlorobenzene | mg/l | 8 | - | 0.0050 U | - | 0.0050 U | - |
| 2,4-Dinitrotoluene | mg/l | 50 | - | 0.010 U | - | 0.010 U | - |
| 2,6-Dinitrotoluene | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| 3,3'-Dichlorobenzidine | mg/l | 2 | - | 0.0050 U | - | 0.0050 U | - |
| Dibenzo(a,h)anthracene | mg/l | 0.04 | - | 0.0020 U | - | 0.0020 U | - |
| Dibenzofuran | mg/l | - | - | 0.0020 U | - | 0.0020 U | - |
| Di-n-butyl phthalate | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| Di-n-octyl phthalate | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| Diethyl phthalate | mg/l | 9 | - | 0.0050 U | - | 0.0050 U | - |
| Dimethyl phthalate | mg/l | 50 | - | 0.0050 U | - | 0.0050 U | - |
| bis(2-Ethylhexyl)phthalate | mg/l | 50 | - | 0.0020 U | - | 0.0020 U | - |
| Fluoranthene | mg/l | 0.2 | - | 0.0020 U | - | 0.0020 U | - |
| Fluorene | mg/l | 0.04 | - | 0.0020 U | - | 0.0020 U | - |
| Hexachlorobenzene | mg/l | 6 | - | 0.0050 U | - | 0.0050 U | - |
| Hexachlorobutadiene | mg/l | 3 | - | 0.0050 U | - | 0.0050 U | - |
| Hexachlorocyclopentadiene | mg/l | - | - | 0.010 U | - | 0.010 U | - |
| Hexachloroethane | mg/l | 50 | - | 0.0050 U | - | 0.0050 U | - |
| Indeno(1,2,3-cd)pyrene | mg/l | 0.1 | - | 0.0020 U | - | 0.0020 U | - |
| Isophorone | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| 2-Methylnaphthalene | mg/l | 20 | - | 0.0020 U | - | 0.0020 U | - |
| Naphthalene | mg/l | 20 | - | 0.0020 U | - | 0.0020 U | - |
| Nitrobenzene | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| N-Nitroso-di-n-propylamine | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| N-Nitrosodiphenylamine | mg/l | - | - | 0.0050 U | - | 0.0050 U | - |
| Phenanthrene | mg/l | 10 | - | 0.0020 U | - | 0.0020 U | - |
| Pyrene | mg/l | 0.02 | - | 0.0020 U | - | 0.0020 U | - |
| 1,2,4-Trichlorobenzene | mg/l | 50 | - | 0.0050 U | - | 0.0050 U | - |
| **GC Semi-volatiles (SW846 8082)** | | | | | | | |
| Aroclor 1016 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1221 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1232 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1242 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1248 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1254 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1260 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1262 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| Aroclor 1268 | mg/l | 0.01 | - | 0.00033 U | - | 0.00032 U | - |
| **GC Semi-volatiles (SW846-8015)** | | | | | | | |
| TPH-DRO (Semi-VOA) | mg/l | - | - | 0.25 U | - | 0.22 U | - |
| **Metals Analysis** | | | | | | | |
| Antimony | mg/l | 8 | 0.0060 U | - | 0.0060 U | - | 0.0060 U |
| Arsenic | mg/l | 0.9 | 0.0040 U | - | 0.0040 U | - | 0.0040 U |
| Beryllium | mg/l | 0.2 | 0.0040 U | - | 0.0040 U | - | 0.0040 U |
| Cadmium | mg/l | 0.004 | 0.0040 U | - | 0.0040 U | - | 0.0040 U |
| Chromium | mg/l | 0.3 | 0.010 U | - | 0.010 U | - | 0.010 U |
| Copper | mg/l | - | 0.025 U | - | 0.025 U | - | 0.025 U |
| Lead | mg/l | 0.01 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Mercury | mg/l | 0.02 | 0.00020 U | - | 0.00020 U | - | 0.00020 U |
| Nickel | mg/l | 0.2 | 0.040 U | - | 0.040 U | - | 0.040 U |
| Selenium | mg/l | 0.1 | 0.010 U | - | 0.010 U | - | 0.010 U |
| Silver | mg/l | 0.007 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Thallium | mg/l | 3 | 0.0050 U | - | 0.0050 U | - | 0.0050 U |
| Zinc | mg/l | 0.9 | 0.0348 | - | 0.0955 | - | 0.098 |

**Regulatory limits listed in this document have been obtained from the latest version of the regulations cited and are used for advisory purposes only. Accutest assumes no responsibility for errors in regulatory documents or changes to criteria detailed in later versions of the referenced regulation. It is the responsibility of the user to verify these limits before using or reporting any data.**

**No results exceeded regulatory criteria.**

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# TABLE 2

**Summary of Analytical Soil Data from DGA-10**
**Soil Analytical - PCBs**
**5x5 Grids**
2/4/2014

Legend: Red = Exceeds 50 ppm | Green = Above MCP S1/GW-1 Criteria.

| LOCATION | | | DGA-10 SB-G3 1' | | DGA-10 SB-G3 2' | | DGA-10 SB-G3 3' | | DGA-10 SB-G3 4' | | DGA-10 SB-G3 5' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402874-01 | | L1402874-02 | | L1402874-03 | | L1402874-04 | | L1402874-05 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 3.93 | U | 7.41 | U | 0.0423 | U | 0.0375 | U | 0.0354 | U |
| Aroclor 1221 | 2 | mg/kg | 3.93 | U | 7.41 | U | 0.0423 | U | 0.0375 | U | 0.0354 | U |
| Aroclor 1232 | 2 | mg/kg | 3.93 | U | 7.41 | U | 0.0423 | U | 0.0375 | U | 0.0354 | U |
| Aroclor 1242 | 2 | mg/kg | 3.93 | U | 7.41 | U | 0.0423 | U | 0.0375 | U | 0.0354 | U |
| Aroclor 1248 | 2 | mg/kg | 3.93 | U | 7.41 | U | 0.0423 | U | 0.0375 | U | 0.0354 | U |
| Aroclor 1254 | 2 | mg/kg | 38 | | 83.8 | | 0.0423 | U | 0.0375 | U | 0.0354 | U |
| Aroclor 1260 | 2 | mg/kg | 3.93 | U | 7.41 | U | 0.0423 | U | 0.0375 | U | 0.0354 | U |
| Aroclor 1262 | 2 | mg/kg | 3.93 | U | 7.41 | U | 0.0423 | U | 0.0375 | U | 0.0354 | U |
| Aroclor 1268 | 2 | mg/kg | 3.93 | U | 7.41 | U | 0.0423 | U | 0.0375 | U | 0.0354 | U |

| LOCATION | | | DGA-10 SB-G4 1' | | DGA-10 SB-G4 2' | | DGA-10 SB-G4 3' | | DGA-10 SB-G4 4' | | DGA-10 SB-G4 5' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402874-11 | | L1402874-12 | | L1402874-13 | | L1402874-14 | | L1402874-15 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 0.706 | U | 3.67 | U | 0.364 | U | 0.189 | U | 0.038 | U |
| Aroclor 1221 | 2 | mg/kg | 0.706 | U | 3.67 | U | 0.364 | U | 0.189 | U | 0.038 | U |
| Aroclor 1232 | 2 | mg/kg | 0.706 | U | 3.67 | U | 0.364 | U | 0.189 | U | 0.038 | U |
| Aroclor 1242 | 2 | mg/kg | 0.706 | U | 3.67 | U | 0.364 | U | 0.189 | U | 0.038 | U |
| Aroclor 1248 | 2 | mg/kg | 0.706 | U | 3.67 | U | 0.364 | U | 0.189 | U | 0.038 | U |
| Aroclor 1254 | 2 | mg/kg | 3.91 | | 7.13 | | 3.36 | | 0.74 | | 0.3 | |
| Aroclor 1260 | 2 | mg/kg | 0.706 | U | 3.67 | U | 0.364 | U | 0.189 | U | 0.038 | U |
| Aroclor 1262 | 2 | mg/kg | 0.706 | U | 3.67 | U | 0.364 | U | 0.189 | U | 0.038 | U |
| Aroclor 1268 | 2 | mg/kg | 0.706 | U | 3.67 | U | 0.364 | U | 0.189 | U | 0.038 | U |

| LOCATION | | | DGA-10SB-H5 1' | | DGA-10SB-H5 2' | | DGA-10SB-H5 3' | | DGA-10SB-H5 4' | | DGA-10SB-H5 5' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402874-17 | | L1402874-18 | | L1402874-19 | | L1402874-20 | | L1402874-21 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 21.1 | U | 3.92 | U | 1.77 | U | 0.199 | U | 0.0844 | U |
| Aroclor 1221 | 2 | mg/kg | 21.1 | U | 3.92 | U | 1.77 | U | 0.199 | U | 0.0844 | U |
| Aroclor 1232 | 2 | mg/kg | 21.1 | U | 3.92 | U | 1.77 | U | 0.199 | U | 0.0844 | U |
| Aroclor 1242 | 2 | mg/kg | 21.1 | U | 3.92 | U | 1.77 | U | 0.199 | U | 0.0844 | U |
| Aroclor 1248 | 2 | mg/kg | 21.1 | U | 3.92 | U | 1.77 | U | 0.199 | U | 0.0844 | U |
| Aroclor 1254 | 2 | mg/kg | 184 | | 11 | | 7.72 | | 1.11 | | 0.7 | |
| Aroclor 1260 | 2 | mg/kg | 21.1 | U | 3.92 | U | 1.77 | U | 0.199 | U | 0.0844 | U |
| Aroclor 1262 | 2 | mg/kg | 21.1 | U | 3.92 | U | 1.77 | U | 0.199 | U | 0.0844 | U |
| Aroclor 1268 | 2 | mg/kg | 21.1 | U | 3.92 | U | 1.77 | U | 0.199 | U | 0.0844 | U |

| LOCATION | | | DGA-10 SB-G6 1' | | DGA-10 SB-G6 2' | | DGA-10 SB-G6 3' | | DGA-10 SB-G6 4' | | DGA-10 SB-G6 5' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402874-23 | | L1402874-24 | | L1402874-25 | | L1402874-26 | | L1402874-27 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 18.1 | U | 3.66 | U | 0.187 | U | 0.0363 | U | 0.0413 | U |
| Aroclor 1221 | 2 | mg/kg | 18.1 | U | 3.66 | U | 0.187 | U | 0.0363 | U | 0.0413 | U |
| Aroclor 1232 | 2 | mg/kg | 18.1 | U | 3.66 | U | 0.187 | U | 0.0363 | U | 0.0413 | U |
| Aroclor 1242 | 2 | mg/kg | 18.1 | U | 3.66 | U | 0.187 | U | 0.0363 | U | 0.0413 | U |
| Aroclor 1248 | 2 | mg/kg | 18.1 | U | 3.66 | U | 0.187 | U | 0.0363 | U | 0.0413 | U |
| Aroclor 1254 | 2 | mg/kg | 188 | | 33.4 | | 1.56 | | 0.0752 | | 0.12 | |
| Aroclor 1260 | 2 | mg/kg | 18.1 | U | 3.66 | U | 0.187 | U | 0.0363 | U | 0.0413 | U |
| Aroclor 1262 | 2 | mg/kg | 18.1 | U | 3.66 | U | 0.187 | U | 0.0363 | U | 0.0413 | U |
| Aroclor 1268 | 2 | mg/kg | 18.1 | U | 3.66 | U | 0.187 | U | 0.0363 | U | 0.0413 | U |

| LOCATION | | | DGA-10 SB-G5 1' | | DGA-10 SB-G5 2' | | DGA-10 SB-G5 3' | | DGA-10 SB-G5 4' | | DGA-10 SB-G5 5' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402875-01 | | L1402875-02 | | L1402875-03 | | L1402875-04 | | L1402875-05 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 4.57 | U | 3.57 | U | 0.716 | U | 0.0746 | U | 0.0385 | U |
| Aroclor 1221 | 2 | mg/kg | 4.57 | U | 3.57 | U | 0.716 | U | 0.0746 | U | 0.0385 | U |
| Aroclor 1232 | 2 | mg/kg | 4.57 | U | 3.57 | U | 0.716 | U | 0.0746 | U | 0.0385 | U |
| Aroclor 1242 | 2 | mg/kg | 4.57 | U | 3.57 | U | 0.716 | U | 0.0746 | U | 0.0385 | U |
| Aroclor 1248 | 2 | mg/kg | 4.57 | U | 3.57 | U | 0.716 | U | 0.0746 | U | 0.0385 | U |
| Aroclor 1254 | 2 | mg/kg | 13.5 | | 36 | | 4.19 | | 0.239 | | 0.0638 | |
| Aroclor 1260 | 2 | mg/kg | 4.57 | U | 3.57 | U | 0.716 | U | 0.0746 | U | 0.0385 | U |
| Aroclor 1262 | 2 | mg/kg | 4.57 | U | 3.57 | U | 0.716 | U | 0.0746 | U | 0.0385 | U |
| Aroclor 1268 | 2 | mg/kg | 4.57 | U | 3.57 | U | 0.716 | U | 0.0746 | U | 0.0385 | U |

| LOCATION | | | DGA-10 SB-F5 1' | | DGA-10 SB-F5 2' | | DGA-10 SB-F5 3' | | DGA-10 SB-F5 4' | | DGA-10 SB-F6 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402875-07 | | L1402875-08 | | L1402875-09 | | L1402875-10 | | L1402875-11 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 0.0726 | U | 0.0385 | U | 0.0354 | U | 0.0334 | U | 0.0358 | U |
| Aroclor 1221 | 2 | mg/kg | 0.0726 | U | 0.0385 | U | 0.0354 | U | 0.0334 | U | 0.0358 | U |
| Aroclor 1232 | 2 | mg/kg | 0.0726 | U | 0.0385 | U | 0.0354 | U | 0.0334 | U | 0.0358 | U |
| Aroclor 1242 | 2 | mg/kg | 0.0726 | U | 0.0385 | U | 0.0354 | U | 0.0334 | U | 0.0358 | U |
| Aroclor 1248 | 2 | mg/kg | 0.0726 | U | 0.0385 | U | 0.0354 | U | 0.0334 | U | 0.0358 | U |
| Aroclor 1254 | 2 | mg/kg | 0.749 | | 0.0385 | U | 0.0354 | U | 0.0334 | U | 0.128 | |
| Aroclor 1260 | 2 | mg/kg | 0.0726 | U | 0.0385 | U | 0.0354 | U | 0.0334 | U | 0.0358 | U |
| Aroclor 1262 | 2 | mg/kg | 0.0726 | U | 0.0385 | U | 0.0354 | U | 0.0334 | U | 0.0358 | U |
| Aroclor 1268 | 2 | mg/kg | 0.0726 | U | 0.0385 | U | 0.0354 | U | 0.0334 | U | 0.0358 | U |

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| LOCATION | | | DGA-10 SB-F6 2' | | DGA-10 SB-F6 3' | | DGA-10 SB-F6 4' | | DGA-10 SB-F6 5' | | DGA-10 SB-E5 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402875-12 | | L1402875-13 | | L1402875-14 | | L1402875-15 | | L1402875-19 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 0.039 | U | 0.0355 | U | 0.033 | U | 0.0337 | U | 4.44 | U |
| Aroclor 1221 | 2 | mg/kg | 0.039 | U | 0.0355 | U | 0.033 | U | 0.0337 | U | 4.44 | U |
| Aroclor 1232 | 2 | mg/kg | 0.039 | U | 0.0355 | U | 0.033 | U | 0.0337 | U | 4.44 | U |
| Aroclor 1242 | 2 | mg/kg | 0.039 | U | 0.0355 | U | 0.033 | U | 0.0337 | U | 4.44 | U |
| Aroclor 1248 | 2 | mg/kg | 0.039 | U | 0.0355 | U | 0.033 | U | 0.0337 | U | 4.44 | U |
| Aroclor 1254 | 2 | mg/kg | 0.0551 | | 0.0835 | | 0.0424 | | 0.104 | | 46.7 | |
| Aroclor 1260 | 2 | mg/kg | 0.039 | U | 0.0355 | U | 0.033 | U | 0.0337 | U | 4.44 | U |
| Aroclor 1262 | 2 | mg/kg | 0.039 | U | 0.0355 | U | 0.033 | U | 0.0337 | U | 4.44 | U |
| Aroclor 1268 | 2 | mg/kg | 0.039 | U | 0.0355 | U | 0.033 | U | 0.0337 | U | 4.44 | U |

| LOCATION | | | DGA-10 SB-E5 2' | | DGA-10 SB-E5 3' | | DGA-10 SB-E5 4' | | DGA-10 SB-E5 5' | | DGA-10 SB-E6 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402875-20 | | L1402875-21 | | L1402875-22 | | L1402875-23 | | L1402876-01 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 0.363 | U | 0.0348 | U | 0.0367 | U | 0.0349 | U | 0.728 | U |
| Aroclor 1221 | 2 | mg/kg | 0.363 | U | 0.0348 | U | 0.0367 | U | 0.0349 | U | 0.728 | U |
| Aroclor 1232 | 2 | mg/kg | 0.363 | U | 0.0348 | U | 0.0367 | U | 0.0349 | U | 0.728 | U |
| Aroclor 1242 | 2 | mg/kg | 0.363 | U | 0.0348 | U | 0.0367 | U | 0.0349 | U | 0.728 | U |
| Aroclor 1248 | 2 | mg/kg | 0.363 | U | 0.0348 | U | 0.0367 | U | 0.0349 | U | 0.728 | U |
| Aroclor 1254 | 2 | mg/kg | 1.57 | | 0.0455 | | 0.0367 | U | 0.0349 | U | 4.08 | |
| Aroclor 1260 | 2 | mg/kg | 0.363 | U | 0.0348 | U | 0.0367 | U | 0.0349 | U | 0.728 | U |
| Aroclor 1262 | 2 | mg/kg | 0.363 | U | 0.0348 | U | 0.0367 | U | 0.0349 | U | 0.728 | U |
| Aroclor 1268 | 2 | mg/kg | 0.363 | U | 0.0348 | U | 0.0367 | U | 0.0349 | U | 0.728 | U |

| LOCATION | | | DGA-10 SB-E6 2' | | DGA-10 SB-E6 3' | | DGA-10 SB-E6 4' | | DGA-10 SB-E6 5' | | DGA-10 SB-D5 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402876-02 | | L1402876-03 | | L1402876-04 | | L1402876-05 | | L1402876-09 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 0.0386 | U | 0.0382 | U | 0.0376 | U | 0.0355 | U | 1330 | U |
| Aroclor 1221 | 2 | mg/kg | 0.0386 | U | 0.0382 | U | 0.0376 | U | 0.0355 | U | 1330 | U |
| Aroclor 1232 | 2 | mg/kg | 0.0386 | U | 0.0382 | U | 0.0376 | U | 0.0355 | U | 1330 | U |
| Aroclor 1242 | 2 | mg/kg | 0.0386 | U | 0.0382 | U | 0.0376 | U | 0.0355 | U | 1330 | U |
| Aroclor 1248 | 2 | mg/kg | 0.0386 | U | 0.0382 | U | 0.0376 | U | 0.0355 | U | 1330 | U |
| Aroclor 1254 | 2 | mg/kg | 0.0386 | U | 0.0382 | U | 0.0376 | U | 0.0355 | U | 13400 | |
| Aroclor 1260 | 2 | mg/kg | 0.0386 | U | 0.0382 | U | 0.0376 | U | 0.0355 | U | 1330 | U |
| Aroclor 1262 | 2 | mg/kg | 0.0386 | U | 0.0382 | U | 0.0376 | U | 0.0355 | U | 1330 | U |
| Aroclor 1268 | 2 | mg/kg | 0.0386 | U | 0.0382 | U | 0.0376 | U | 0.0355 | U | 1330 | U |

| LOCATION | | | DGA-10 SB-D5 2' | | DGA-10 SB-D5 3' | | DGA-10 SB-D5 4' | | DGA-10 SB-D5 5' | | DGA-10SB-C3 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402876-10 | | L1402876-11 | | L1402876-12 | | L1402876-13 | | L1402876-19 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 3.65 | U | 0.202 | U | 0.388 | U | 0.0371 | U | 9.91 | U |
| Aroclor 1221 | 2 | mg/kg | 3.65 | U | 0.202 | U | 0.388 | U | 0.0371 | U | 9.91 | U |
| Aroclor 1232 | 2 | mg/kg | 3.65 | U | 0.202 | U | 0.388 | U | 0.0371 | U | 9.91 | U |
| Aroclor 1242 | 2 | mg/kg | 3.65 | U | 0.202 | U | 0.388 | U | 0.0371 | U | 9.91 | U |
| Aroclor 1248 | 2 | mg/kg | 3.65 | U | 0.202 | U | 0.388 | U | 0.0371 | U | 9.91 | U |
| Aroclor 1254 | 2 | mg/kg | 22.2 | | 1.02 | | 4.52 | | 0.302 | | 109 | |
| Aroclor 1260 | 2 | mg/kg | 3.65 | U | 0.202 | U | 0.388 | U | 0.0371 | U | 9.91 | U |
| Aroclor 1262 | 2 | mg/kg | 3.65 | U | 0.202 | U | 0.388 | U | 0.0371 | U | 9.91 | U |
| Aroclor 1268 | 2 | mg/kg | 3.65 | U | 0.202 | U | 0.388 | U | 0.0371 | U | 9.91 | U |

| LOCATION | | | DGA-10SB-C3 2' | | DGA-10SB-C3 3' | | DGA-10SB-C3 4' | | DGA-10SB-C3 5' | | DGA-10 SB-B3 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402876-20 | | L1402876-21 | | L1402876-22 | | L1402876-23 | | L1402876-27 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 39.5 | U | 0.385 | U | 0.0374 | U | 0.0373 | U | 26.3 | U |
| Aroclor 1221 | 2 | mg/kg | 39.5 | U | 0.385 | U | 0.0374 | U | 0.0373 | U | 26.3 | U |
| Aroclor 1232 | 2 | mg/kg | 39.5 | U | 0.385 | U | 0.0374 | U | 0.0373 | U | 26.3 | U |
| Aroclor 1242 | 2 | mg/kg | 39.5 | U | 0.385 | U | 0.0374 | U | 0.0373 | U | 26.3 | U |
| Aroclor 1248 | 2 | mg/kg | 39.5 | U | 0.385 | U | 0.0374 | U | 0.0373 | U | 26.3 | U |
| Aroclor 1254 | 2 | mg/kg | 396 | | 4.27 | | 0.344 | | 0.0763 | | 80 | |
| Aroclor 1260 | 2 | mg/kg | 39.5 | U | 0.385 | U | 0.0374 | U | 0.0373 | U | 26.3 | U |
| Aroclor 1262 | 2 | mg/kg | 39.5 | U | 0.385 | U | 0.0374 | U | 0.0373 | U | 26.3 | U |
| Aroclor 1268 | 2 | mg/kg | 39.5 | U | 0.385 | U | 0.0374 | U | 0.0373 | U | 26.3 | U |

| LOCATION | | | DGA-10 SB-B3 2' | | DGA-10 SB-B3 3' | | DGA-10 SB-B3 4' | | DGA-10 SB-B3 5' | | DGA-10 SB-A3 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402876-28 | | L1402876-29 | | L1402876-30 | | L1402876-31 | | L1402877-01 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 3.89 | U | 0.0764 | U | 0.0365 | U | 0.0368 | U | 20.8 | U |
| Aroclor 1221 | 2 | mg/kg | 3.89 | U | 0.0764 | U | 0.0365 | U | 0.0368 | U | 20.8 | U |
| Aroclor 1232 | 2 | mg/kg | 3.89 | U | 0.0764 | U | 0.0365 | U | 0.0368 | U | 20.8 | U |
| Aroclor 1242 | 2 | mg/kg | 3.89 | U | 0.0764 | U | 0.0365 | U | 0.0368 | U | 20.8 | U |
| Aroclor 1248 | 2 | mg/kg | 3.89 | U | 0.0764 | U | 0.0365 | U | 0.0368 | U | 20.8 | U |
| Aroclor 1254 | 2 | mg/kg | 12.7 | | 0.969 | | 0.0619 | | 0.0388 | | 139 | |
| Aroclor 1260 | 2 | mg/kg | 3.89 | U | 0.0764 | U | 0.0365 | U | 0.0368 | U | 20.8 | U |
| Aroclor 1262 | 2 | mg/kg | 3.89 | U | 0.0764 | U | 0.0365 | U | 0.0368 | U | 20.8 | U |
| Aroclor 1268 | 2 | mg/kg | 3.89 | U | 0.0764 | U | 0.0365 | U | 0.0368 | U | 20.8 | U |

| LOCATION | | | DGA-10 SB-A3 2' | | DGA-10 SB-A3 3' | | DGA-10 SB-A3 4' | | DGA-10 SB-A3 5' | | DGA-10 SB-A1 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402877-02 | | L1402877-03 | | L1402877-04 | | L1402877-05 | | L1402877-11 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 3.78 | U | 0.0376 | U | 0.037 | U | 0.0349 | U | 3.46 | U |
| Aroclor 1221 | 2 | mg/kg | 3.78 | U | 0.0376 | U | 0.037 | U | 0.0349 | U | 3.46 | U |
| Aroclor 1232 | 2 | mg/kg | 3.78 | U | 0.0376 | U | 0.037 | U | 0.0349 | U | 3.46 | U |
| Aroclor 1242 | 2 | mg/kg | 3.78 | U | 0.0376 | U | 0.037 | U | 0.0349 | U | 3.46 | U |
| Aroclor 1248 | 2 | mg/kg | 3.78 | U | 0.0376 | U | 0.037 | U | 0.0349 | U | 3.46 | U |
| Aroclor 1254 | 2 | mg/kg | 8.59 | | 0.132 | | 0.037 | U | 0.0462 | | 10.7 | |
| Aroclor 1260 | 2 | mg/kg | 3.78 | U | 0.0376 | U | 0.037 | U | 0.0349 | U | 3.46 | U |
| Aroclor 1262 | 2 | mg/kg | 3.78 | U | 0.0376 | U | 0.037 | U | 0.0349 | U | 3.46 | U |
| Aroclor 1268 | 2 | mg/kg | 3.78 | U | 0.0376 | U | 0.037 | U | 0.0349 | U | 3.46 | U |

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| LOCATION | | | DGA-10 SB-A1 2' | | DGA-10 SB-A1 3' | | DGA-10 SB-A1 4' | | DGA-10 SB-A1 5' | | DGA-10 SB-FFF102 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402877-12 | | L1402877-13 | | L1402877-14 | | L1402877-15 | | L1402877-18 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 0.721 | U | 0.0687 | U | 0.0684 | U | 0.0724 | U | 0.152 | U |
| Aroclor 1221 | 2 | mg/kg | 0.721 | U | 0.0687 | U | 0.0684 | U | 0.0724 | U | 0.152 | U |
| Aroclor 1232 | 2 | mg/kg | 0.721 | U | 0.0687 | U | 0.0684 | U | 0.0724 | U | 0.152 | U |
| Aroclor 1242 | 2 | mg/kg | 0.721 | U | 0.0687 | U | 0.0684 | U | 0.0724 | U | 0.152 | U |
| Aroclor 1248 | 2 | mg/kg | 0.721 | U | 0.0687 | U | 0.0684 | U | 0.0724 | U | 0.152 | U |
| Aroclor 1254 | 2 | mg/kg | 3.97 | | 0.282 | | 0.129 | | 0.175 | | 1.75 | |
| Aroclor 1260 | 2 | mg/kg | 0.721 | U | 0.0687 | U | 0.0684 | U | 0.0724 | U | 0.152 | U |
| Aroclor 1262 | 2 | mg/kg | 0.721 | U | 0.0687 | U | 0.0684 | U | 0.0724 | U | 0.152 | U |
| Aroclor 1268 | 2 | mg/kg | 0.721 | U | 0.0687 | U | 0.0684 | U | 0.0724 | U | 0.152 | U |

| LOCATION | | | DGA-10 SB-FFF102 2' | | DGA-10 SB-FFF102 3' | | DGA-10 SB-FFF102 4' | | DGA-10 SB-FFF102 5' | | DGA-10 SB-PPP0 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402877-19 | | L1402877-20 | | L1402877-21 | | L1402877-22 | | L1402877-24 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 0.0664 | U | 0.175 | U | 0.177 | U | 0.171 | U | 2.34 | U |
| Aroclor 1221 | 2 | mg/kg | 0.0664 | U | 0.175 | U | 0.177 | U | 0.171 | U | 2.34 | U |
| Aroclor 1232 | 2 | mg/kg | 0.0664 | U | 0.175 | U | 0.177 | U | 0.171 | U | 2.34 | U |
| Aroclor 1242 | 2 | mg/kg | 0.0664 | U | 0.175 | U | 0.177 | U | 0.171 | U | 2.34 | U |
| Aroclor 1248 | 2 | mg/kg | 0.0664 | U | 0.175 | U | 0.177 | U | 0.171 | U | 2.34 | U |
| Aroclor 1254 | 2 | mg/kg | 0.935 | | 3.11 | | 0.925 | | 1.61 | | 9.17 | |
| Aroclor 1260 | 2 | mg/kg | 0.0664 | U | 0.175 | U | 0.177 | U | 0.171 | U | 2.34 | U |
| Aroclor 1262 | 2 | mg/kg | 0.0664 | U | 0.175 | U | 0.177 | U | 0.171 | U | 2.34 | U |
| Aroclor 1268 | 2 | mg/kg | 0.0664 | U | 0.175 | U | 0.177 | U | 0.171 | U | 2.34 | U |

| LOCATION | | | DGA-10 SB-PPP0 2' | | DGA-10 SB-PPP0 3' | | DGA-10 SB-PPP0 4' | | DGA-10 SB-PPP0 5' | | DGA-10 SB-WW7 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402877-25 | | L1402877-26 | | L1402877-27 | | L1402877-28 | | L1402878-01 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 0.736 | U | 0.173 | U | 0.172 | U | 0.0703 | U | 44.4 | U |
| Aroclor 1221 | 2 | mg/kg | 0.736 | U | 0.173 | U | 0.172 | U | 0.0703 | U | 44.4 | U |
| Aroclor 1232 | 2 | mg/kg | 0.736 | U | 0.173 | U | 0.172 | U | 0.0703 | U | 44.4 | U |
| Aroclor 1242 | 2 | mg/kg | 0.736 | U | 0.173 | U | 0.172 | U | 0.0703 | U | 44.4 | U |
| Aroclor 1248 | 2 | mg/kg | 0.736 | U | 0.173 | U | 0.172 | U | 0.0703 | U | 44.4 | U |
| Aroclor 1254 | 2 | mg/kg | 5.55 | | 1.08 | | 1.4 | | 0.387 | | 549 | |
| Aroclor 1260 | 2 | mg/kg | 0.736 | U | 0.173 | U | 0.172 | U | 0.0703 | U | 44.4 | U |
| Aroclor 1262 | 2 | mg/kg | 0.736 | U | 0.173 | U | 0.172 | U | 0.0703 | U | 44.4 | U |
| Aroclor 1268 | 2 | mg/kg | 0.736 | U | 0.173 | U | 0.172 | U | 0.0703 | U | 44.4 | U |

| LOCATION | | | DGA-10 SB-WW7 2' | | DGA-10 SB-WW7 3' | | DGA-10 SB-WW7 4' | | DGA-10 SB-WW7 5' | | DGA-10 SB-WW10 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402878-02 | | L1402878-03 | | L1402878-04 | | L1402878-05 | | L1402878-08 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 72.1 | U | 0.347 | U | 0.0339 | U | 0.0328 | U | 202 | U |
| Aroclor 1221 | 2 | mg/kg | 72.1 | U | 0.347 | U | 0.0339 | U | 0.0328 | U | 202 | U |
| Aroclor 1232 | 2 | mg/kg | 72.1 | U | 0.347 | U | 0.0339 | U | 0.0328 | U | 202 | U |
| Aroclor 1242 | 2 | mg/kg | 72.1 | U | 0.347 | U | 0.0339 | U | 0.0328 | U | 202 | U |
| Aroclor 1248 | 2 | mg/kg | 72.1 | U | 0.347 | U | 0.0339 | U | 0.0328 | U | 202 | U |
| Aroclor 1254 | 2 | mg/kg | 518 | | 1.05 | | 0.176 | | 0.117 | | 2880 | |
| Aroclor 1260 | 2 | mg/kg | 72.1 | U | 0.347 | U | 0.0339 | U | 0.0328 | U | 202 | U |
| Aroclor 1262 | 2 | mg/kg | 72.1 | U | 0.347 | U | 0.0339 | U | 0.0328 | U | 202 | U |
| Aroclor 1268 | 2 | mg/kg | 72.1 | U | 0.347 | U | 0.0339 | U | 0.0328 | U | 202 | U |

| LOCATION | | | DGA-10 SB-WW10 2' | | DGA-10 SB-WW10 3' | | DGA-10 SB-WW10 4' | | DGA-10 SB-WW10 5' | | DGA-10 SB-AAA10 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402878-09 | | L1402878-10 | | L1402878-11 | | L1402878-12 | | L1402878-15 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 3.63 | U | 0.334 | U | 0.331 | U | 0.184 | U | 39 | U |
| Aroclor 1221 | 2 | mg/kg | 3.63 | U | 0.334 | U | 0.331 | U | 0.184 | U | 39 | U |
| Aroclor 1232 | 2 | mg/kg | 3.63 | U | 0.334 | U | 0.331 | U | 0.184 | U | 39 | U |
| Aroclor 1242 | 2 | mg/kg | 3.63 | U | 0.334 | U | 0.331 | U | 0.184 | U | 39 | U |
| Aroclor 1248 | 2 | mg/kg | 3.63 | U | 0.334 | U | 0.331 | U | 0.184 | U | 39 | U |
| Aroclor 1254 | 2 | mg/kg | 20.7 | | 3.26 | | 1.03 | | 0.387 | | 381 | |
| Aroclor 1260 | 2 | mg/kg | 3.63 | U | 0.334 | U | 0.331 | U | 0.184 | U | 39 | U |
| Aroclor 1262 | 2 | mg/kg | 3.63 | U | 0.334 | U | 0.331 | U | 0.184 | U | 39 | U |
| Aroclor 1268 | 2 | mg/kg | 3.63 | U | 0.334 | U | 0.331 | U | 0.184 | U | 39 | U |

| LOCATION | | | DGA-10 SB-AAA10 2' | | DGA-10 SB-AAA10 3' | | DGA-10 SB-AAA10 4' | | DGA-10 SB-AAA10 5' | | DGA-10 SB-PPP8 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402878-16 | | L1402878-17 | | L1402878-18 | | L1402878-19 | | L1402881-01 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 4.01 | U | 0.177 | U | 0.0387 | U | 0.0369 | U | 4.38 | U |
| Aroclor 1221 | 2 | mg/kg | 4.01 | U | 0.177 | U | 0.0387 | U | 0.0369 | U | 4.38 | U |
| Aroclor 1232 | 2 | mg/kg | 4.01 | U | 0.177 | U | 0.0387 | U | 0.0369 | U | 4.38 | U |
| Aroclor 1242 | 2 | mg/kg | 4.01 | U | 0.177 | U | 0.0387 | U | 0.0369 | U | 4.38 | U |
| Aroclor 1248 | 2 | mg/kg | 4.01 | U | 0.177 | U | 0.0387 | U | 0.0369 | U | 4.38 | U |
| Aroclor 1254 | 2 | mg/kg | 44.3 | | 0.706 | | 0.152 | | 0.0648 | | 30 | |
| Aroclor 1260 | 2 | mg/kg | 4.01 | U | 0.177 | U | 0.0387 | U | 0.0369 | U | 4.38 | U |
| Aroclor 1262 | 2 | mg/kg | 4.01 | U | 0.177 | U | 0.0387 | U | 0.0369 | U | 4.38 | U |
| Aroclor 1268 | 2 | mg/kg | 4.01 | U | 0.177 | U | 0.0387 | U | 0.0369 | U | 4.38 | U |

| LOCATION | | | DGA-10 SB-PPP8 2' | | DGA-10 SB-PPP8 3' | | DGA-10 SB-PPP8 4' | | DGA-10 SB-PPP8 5' | | DGA-10 SB-TT3 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402881-02 | | L1402881-03 | | L1402881-04 | | L1402881-05 | | L1402881-09 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 3.61 | U | 0.358 | U | 0.0339 | U | 0.0352 | U | 4.42 | U |
| Aroclor 1221 | 2 | mg/kg | 3.61 | U | 0.358 | U | 0.0339 | U | 0.0352 | U | 4.42 | U |
| Aroclor 1232 | 2 | mg/kg | 3.61 | U | 0.358 | U | 0.0339 | U | 0.0352 | U | 4.42 | U |
| Aroclor 1242 | 2 | mg/kg | 3.61 | U | 0.358 | U | 0.0339 | U | 0.0352 | U | 4.42 | U |
| Aroclor 1248 | 2 | mg/kg | 3.61 | U | 0.358 | U | 0.0339 | U | 0.0352 | U | 4.42 | U |
| Aroclor 1254 | 2 | mg/kg | 6.36 | | 2.61 | | 0.0339 | U | 0.0352 | U | 52.7 | |
| Aroclor 1260 | 2 | mg/kg | 3.61 | U | 0.358 | U | 0.0339 | U | 0.0352 | U | 4.42 | U |
| Aroclor 1262 | 2 | mg/kg | 3.61 | U | 0.358 | U | 0.0339 | U | 0.0352 | U | 4.42 | U |
| Aroclor 1268 | 2 | mg/kg | 3.61 | U | 0.358 | U | 0.0339 | U | 0.0352 | U | 4.42 | U |

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| LOCATION | | | DGA-10 SB-TT3 2' | | DGA-10 SB-TT3 3' | | DGA-10 SB-TT3 4' | | DGA-10 SB-TT3 5' | | DGA-10 SB-SS7 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402881-10 | | L1402881-11 | | L1402881-12 | | L1402881-13 | | L1402881-19 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 18 | U | 0.179 | U | 0.0367 | U | 0.036 | U | 3.89 | U |
| Aroclor 1221 | 2 | mg/kg | 18 | U | 0.179 | U | 0.0367 | U | 0.036 | U | 3.89 | U |
| Aroclor 1232 | 2 | mg/kg | 18 | U | 0.179 | U | 0.0367 | U | 0.036 | U | 3.89 | U |
| Aroclor 1242 | 2 | mg/kg | 18 | U | 0.179 | U | 0.0367 | U | 0.036 | U | 3.89 | U |
| Aroclor 1248 | 2 | mg/kg | 18 | U | 0.179 | U | 0.0367 | U | 0.036 | U | 3.89 | U |
| Aroclor 1254 | 2 | mg/kg | 120 | | 1.32 | | 0.245 | | 0.036 | U | 8.03 | |
| Aroclor 1260 | 2 | mg/kg | 18 | U | 0.179 | U | 0.0367 | U | 0.036 | U | 3.89 | U |
| Aroclor 1262 | 2 | mg/kg | 18 | U | 0.179 | U | 0.0367 | U | 0.036 | U | 3.89 | U |
| Aroclor 1268 | 2 | mg/kg | 18 | U | 0.179 | U | 0.0367 | U | 0.036 | U | 3.89 | U |

| LOCATION | | | DGA-10 SB-SS7 2' | | DGA-10 SB-SS7 3' | | DGA-10 SB-SS7 4' | | DGA-10 SB-SS7 5' | | DGA-10 SB-TT9 1' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402881-20 | | L1402881-21 | | L1402881-22 | | L1402881-23 | | L1402881-26 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 0.0347 | U | 0.041 | U | 0.0384 | U | 0.0394 | U | 1570 | U |
| Aroclor 1221 | 2 | mg/kg | 0.0347 | U | 0.041 | U | 0.0384 | U | 0.0394 | U | 1570 | U |
| Aroclor 1232 | 2 | mg/kg | 0.0347 | U | 0.041 | U | 0.0384 | U | 0.0394 | U | 1570 | U |
| Aroclor 1242 | 2 | mg/kg | 0.0347 | U | 0.041 | U | 0.0384 | U | 0.0394 | U | 1570 | U |
| Aroclor 1248 | 2 | mg/kg | 0.0347 | U | 0.041 | U | 0.0384 | U | 0.0394 | U | 1570 | U |
| Aroclor 1254 | 2 | mg/kg | 0.164 | | 0.156 | | 0.072 | | 0.632 | | 21200 | |
| Aroclor 1260 | 2 | mg/kg | 0.0347 | U | 0.041 | U | 0.0384 | U | 0.0394 | U | 1570 | U |
| Aroclor 1262 | 2 | mg/kg | 0.0347 | U | 0.041 | U | 0.0384 | U | 0.0394 | U | 1570 | U |
| Aroclor 1268 | 2 | mg/kg | 0.0347 | U | 0.041 | U | 0.0384 | U | 0.0394 | U | 1570 | U |

| LOCATION | | | DGA-10 SB-TT9 2' | | DGA-10 SB-TT9 3' | | DGA-10 SB-TT9 4' | | DGA-10 SB-TT9 5' | |
|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402881-27 | | L1402881-28 | | L1402881-29 | | L1402881-30 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 3.66 | U | 0.384 | U | 0.37 | U | 0.352 | U |
| Aroclor 1221 | 2 | mg/kg | 3.66 | U | 0.384 | U | 0.37 | U | 0.352 | U |
| Aroclor 1232 | 2 | mg/kg | 3.66 | U | 0.384 | U | 0.37 | U | 0.352 | U |
| Aroclor 1242 | 2 | mg/kg | 3.66 | U | 0.384 | U | 0.37 | U | 0.352 | U |
| Aroclor 1248 | 2 | mg/kg | 3.66 | U | 0.384 | U | 0.37 | U | 0.352 | U |
| Aroclor 1254 | 2 | mg/kg | 47.2 | | 2.57 | | 2.02 | | 2.08 | |
| Aroclor 1260 | 2 | mg/kg | 3.66 | U | 0.384 | U | 0.37 | U | 0.352 | U |
| Aroclor 1262 | 2 | mg/kg | 3.66 | U | 0.384 | U | 0.37 | U | 0.352 | U |
| Aroclor 1268 | 2 | mg/kg | 3.66 | U | 0.384 | U | 0.37 | U | 0.352 | U |

| LOCATION | | | DUP 3050 | | DUP 3051 | | DUP 3052 | | DUP 3053 | | DUP 3054 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402873-01 | | L1402873-02 | | L1402873-03 | | L1402873-04 | | L1402873-05 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 0.0724 | U | 0.0407 | U | 0.0385 | U | 0.0363 | U | 4.06 | U |
| Aroclor 1221 | 2 | mg/kg | 0.0724 | U | 0.0407 | U | 0.0385 | U | 0.0363 | U | 4.06 | U |
| Aroclor 1232 | 2 | mg/kg | 0.0724 | U | 0.0407 | U | 0.0385 | U | 0.0363 | U | 4.06 | U |
| Aroclor 1242 | 2 | mg/kg | 0.0724 | U | 0.0407 | U | 0.0385 | U | 0.0363 | U | 4.06 | U |
| Aroclor 1248 | 2 | mg/kg | 0.0724 | U | 0.0407 | U | 0.0385 | U | 0.0363 | U | 4.06 | U |
| Aroclor 1254 | 2 | mg/kg | 0.457 | | 0.159 | | 0.0385 | U | 0.0363 | U | 12.7 | |
| Aroclor 1260 | 2 | mg/kg | 0.0724 | U | 0.0407 | U | 0.0385 | U | 0.0363 | U | 4.06 | U |
| Aroclor 1262 | 2 | mg/kg | 0.0724 | U | 0.0407 | U | 0.0385 | U | 0.0363 | U | 4.06 | U |
| Aroclor 1268 | 2 | mg/kg | 0.0724 | U | 0.0407 | U | 0.0385 | U | 0.0363 | U | 4.06 | U |

| LOCATION | | | DUP 3055 | | DUP 3056 | | DUP 3060 | | DUP 3058 | | DUP 3059 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402873-06 | | L1402873-07 | | L1402873-08 | | L1402873-09 | | L1402873-10 | |
| | S1/G1-08 | Units | | Qual | | Qual | | Qual | | Qual | | Qual |
| Aroclor 1016 | 2 | mg/kg | 0.0386 | U | 0.0387 | U | 0.0421 | U | 0.139 | U | 0.037 | U |
| Aroclor 1221 | 2 | mg/kg | 0.0386 | U | 0.0387 | U | 0.0421 | U | 0.139 | U | 0.037 | U |
| Aroclor 1232 | 2 | mg/kg | 0.0386 | U | 0.0387 | U | 0.0421 | U | 0.139 | U | 0.037 | U |
| Aroclor 1242 | 2 | mg/kg | 0.0386 | U | 0.0387 | U | 0.0421 | U | 0.139 | U | 0.037 | U |
| Aroclor 1248 | 2 | mg/kg | 0.0386 | U | 0.0387 | U | 0.0421 | U | 0.139 | U | 0.037 | U |
| Aroclor 1254 | 2 | mg/kg | 0.187 | | 0.129 | | 0.0421 | U | 1.35 | | 0.104 | |
| Aroclor 1260 | 2 | mg/kg | 0.0386 | U | 0.0387 | U | 0.0421 | U | 0.139 | U | 0.037 | U |
| Aroclor 1262 | 2 | mg/kg | 0.0386 | U | 0.0387 | U | 0.0421 | U | 0.139 | U | 0.037 | U |
| Aroclor 1268 | 2 | mg/kg | 0.0386 | U | 0.0387 | U | 0.0421 | U | 0.139 | U | 0.037 | U |

| LOCATION | | | DUP 3057 | |
|---|---|---|---|---|
| SAMPLING DATE | | | 04-FEB-14 | |
| LAB SAMPLE ID | | | L1402873-12 | |
| | S1/G1-08 | Units | | Qual |
| Aroclor 1016 | 2 | mg/kg | 0.207 | U |
| Aroclor 1221 | 2 | mg/kg | 0.207 | U |
| Aroclor 1232 | 2 | mg/kg | 0.207 | U |
| Aroclor 1242 | 2 | mg/kg | 0.207 | U |
| Aroclor 1248 | 2 | mg/kg | 0.207 | U |
| Aroclor 1254 | 2 | mg/kg | 1.44 | |
| Aroclor 1260 | 2 | mg/kg | 0.207 | U |
| Aroclor 1262 | 2 | mg/kg | 0.207 | U |
| Aroclor 1268 | 2 | mg/kg | 0.207 | U |

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**DMF PARCEL 1 / DMF PARCEL 2**

**RTN: 4-24296, 4-15490**

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**Table 1A**
**EPH, PAHs, and Coal Ash Soil Data**
**16 Blackmer Street**
**New Bedford, MA**
**1999, 2000, and 2006**
**Concentration (mg/kg)**

| SAMPLE IDENTIFICATION<br>SAMPLE DEPTH (FT)<br>COLLECTION DATE | Reportable Concentrations updated Feb. 2008<br>RCS-1 | <br>RSC-2 | SS-04A**<br>0-3<br>09/28/99 | SS-04B**<br>0-3<br>09/28/99 | TP-03<br>M&E<br>01/2000 | TP-04<br>M&E<br>01/2000 | CSS-2<br>0-3<br>03/06/00 | CSS-2<br>3-6<br>03/06/00 | CSS-500*<br>0-3<br>03/06/00 | CSS-500*<br>3-6<br>03/06/00 | CGW1/S-3<br>0-2<br>03/07/00 | BH2<br>2.5-4<br>05/25/06 | BH2<br>4-6.5<br>05/25/06 | Duplicate 4<br>(CSETP1 3-6')<br>05/25/06 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TARGET EPH** | | | | | | | | | | | | | | |
| C9-C18 Aliphatic Hydrocarbons | 1,000 | 3,000 | 3.2 | ND | DU | DU | ND | ND | ND | ND | ND | <13.2 | <11.8 | <13.0 |
| C19-C36 Aliphatic Hydrocarbons | 3,000 | 5,000 | 50 | 19 | DU | DU | 29 | 17.0 | 27.0 | 16.0 | 32.0 | 32.2 | 19.2 | <13.0 |
| C11-C22 Aromatic Hydrocarbons | 1,000 | 3,000 | 180 | 120 | DU | DU | 78.0 | 280.0 | 120.0 | 240.0 | 180.0 | 117.0 | 177.0 | <13.0 |
| **PAHs** | | | | | | | | | | | | | | |
| Naphthalene | 4 | 40 | 0.45 | 0.51 | DU | DU | ND | 2.200 | ND | 0.550 | 0.740 | 0.203 | 0.280 | <0.0649 |
| 2-Methylnaphthalene | 0.7 | 80 | 0.44 | 0.25 | DU | DU | 5.000 | 0.860 | ND | ND | ND | <0.0658 | <0.058 | <0.0649 |
| Acenaphthene | 2 | 3,000 | 0.47 | 1.2 | DU | DU | ND | 2.000 | 0.900 | 0.850 | 2.100 | 0.405 | 0.689 | <0.130 |
| Phenanthrene | 10 | 1,000 | 11 | 14 | DU | DU | 5.400 | 36.000 | 7.900 | 27.000 | 23.000 | 5.770 | 8.260 | <0.0649 |
| Acenaphthylene | 1 | 10 | 1.2 | 0.7 | DU | DU | ND | 0.600 | ND | 0.540 | ND | 0.213 | 0.276 | <0.0649 |
| Fluorene | 1,000 | 3,000 | 1.6 | 1.4 | DU | DU | 0.640 | 3.800 | 0.990 | 2.200 | 2.800 | 0.495 | 0.795 | <0.0325 |
| Anthracene | 1,000 | 3,000 | 3.3 | 4.2 | DU | DU | 1.400 | 8.300 | 2.300 | 6.400 | 6.500 | 1.130 | 1.720 | <0.0649 |
| Fluoranthene | 1,000 | 3,000 | 16 | 21 | DU | DU | 7.60 | 41.00 | 9.600 | 35.000 | 23.000 | 8.430 | 10.800 | <0.260 |
| Pyrene | 1,000 | 3,000 | 20 | 19 | DU | DU | 7.60 | 38.00 | 9.700 | 32.000 | 22.000 | 7.110 | 8.910 | <0.260 |
| Benz[a]Anthracene | 7 | 40 | 8.9 | 10 | DU | DU | 3.50 | 17.00 | 4.500 | 16.000 | 9.800 | 3.470 | 4.380 | <0.130 |
| Chrysene | 70 | 400 | 8.4 | 9.9 | DU | DU | 3.80 | 16.00 | 4.900 | 13.000 | 10.000 | 3.470 | 4.470 | <0.130 |
| Benzo[b]Fluoranthene | 7 | 40 | 7.7 | 9.1 | DU | DU | 3.900 | 18.000 | 5.100 | 14.000 | 9.700 | <0.197 | <0.176 | <0.195 |
| Benzo[k]Fluoranthene | 70 | 400 | 5 | 11 | DU | DU | 1.60 | 3.50 | 2.500 | 5.600 | 4.600 | <0.132 | <0.118 | <0.130 |
| Benzo[a]Pyrene | 2 | 4 | **8.2** | **11** | DU | DU | **3.200** | **13.000** | **4.100** | **11.000** | **8.400** | <0.132 | <0.118 | <0.130 |
| Indeno[1,2,3-c,d]Pyrene | 7 | 40 | 7.5 | 7.4 | DU | DU | 2.600 | 10.000 | 4.000 | 9.200 | 6.500 | <0.0658 | <0.0588 | <0.0649 |
| Dibenzo[a,h]Anthracene | 0.7 | 4 | **7.5** | 2.5 | DU | DU | 2.600 | **10.000** | **4.000** | **9.200** | **6.500** | <0.132 | <0.118 | <0.130 |
| Benzo[g,h,i]Perylene | 1,000 | 3,000 | 5.3 | 8.3 | DU | DU | 2.000 | 7.300 | 3.600 | 6.700 | 4.700 | <0.132 | <0.118 | <0.130 |
| **COAL ASH** | | | | | | | NA | NA | NA | NA | NA | NA | coal ash | NA |

* Duplicate of CSS-2
ND - Non Detect
NA - Not Analyzed
NS - Not Specified
**Bold** indicates RCS2 threshold exceeded

Cygnus TP-1 through TP-8 were NA for EPH/PAH
RCs updated in Feb 2008
** Pesticides detected at estimated concentrations less than the RSC-2 standards.
DU - Data unkown/Unavailable - data tables, missing from M&E and Cyngus reports, but discussed in body of report.

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**Table 1A**
**EPH, PAHs, and Coal Ash Soil Data**
**16 Blackmer Street**
**New Bedford, MA**
**1999, 2000, and 2006**
**Concentration (mg/kg)**

| SAMPLE IDENTIFICATION<br>SAMPLE DEPTH (FT)<br>COLLECTION DATE | Reportable Concentrations updated Feb. 2008<br>RCS-1 | <br>RSC-2 | BH1<br>0-2.5<br>05/25/06 | BH-1<br>2.5-5<br>05/25/06 | CSE TP-1<br>0-3<br>05/25/06 | CSE TP-1<br>3-6<br>05/25/06 | CSE TP-2<br>0-3<br>05/25/06 | CSE TP-2<br>3-6<br>05/25/06 | CSE TP-3<br>0-3<br>05/25/06 | Duplicate 3<br>(CSETP3 0-3')<br>05/25/06 | CSE TP-3<br>3-6<br>05/25/06 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **TARGET EPH** | | | | | | | | | | | |
| C9-C18 Aliphatic Hydrocarbons | 1,000 | 3,000 | <11.5 | <12.2 | <14.5 | <13.2 | <15.2 | <15.4 | <12.0 | <12.3 | <13.3 |
| C19-C36 Aliphatic Hydrocarbons | 3,000 | 5,000 | 20.2 | 83.4 | <14.5 | <13.2 | 15.2 | 54.7 | 12.7 | 44.1 | <13.3 |
| C11-C22 Aromatic Hydrocarbons | 1,000 | 3,000 | 292.0 | 242.0 | <14.5 | <13.2 | 902.0 | 84.3 | 337.0 | 613.0 | <13.3 |
| **PAHs** | | | | | | | | | | | |
| Naphthalene | 4 | 40 | 0.147 | 0.239 | <0.0725 | <0.0658 | <0.0758 | <0.0769 | 0.210 | 0.185 | <0.0667 |
| 2-Methylnaphthalene | 0.7 | 80 | <0.057 | <0.061 | <0.0725 | <0.0658 | <0.0758 | <0.0769 | <0.0602 | <0.0617 | <0.0667 |
| Acenaphthene | 2 | 3,000 | 0.602 | 0.420 | <0.145 | 0.132 | <0.152 | <0.154 | 0.301 | 0.827 | <0.133 |
| Phenanthrene | 10 | 1,000 | 25.800 | 6.740 | 0.380 | <0.0658 | 36.400 | 1.500 | 9.350 | 21.500 | <0.0667 |
| Acenaphthylene | 1 | 10 | 1.260 | 0.307 | <0.0725 | <0.0658 | 1.390 | 0.246 | 0.619 | 0.731 | <0.0667 |
| Fluorene | 1,000 | 3,000 | 1.830 | 0.505 | <0.0362 | <0.0329 | 1.320 | <0.0385 | 0.535 | 1.410 | <0.0333 |
| Anthracene | 1,000 | 3,000 | 4.660 | 1.300 | <0.0725 | <0.0658 | 7.840 | 0.317 | 1.600 | 3.700 | <0.0667 |
| Fluoranthene | 1,000 | 3,000 | 33.000 | 11.400 | 0.357 | <0.263 | 64.700 | 3.170 | 20.700 | 33.600 | <0.267 |
| Pyrene | 1,000 | 3,000 | 27.800 | 10.100 | 0.304 | <0.263 | 59.500 | 2.950 | 18.300 | 33.300 | <0.267 |
| Benz[a]Anthracene | 7 | 40 | 12.100 | 4.900 | 0.186 | <0.132 | **29.400** | 1.310 | **9.850** | **15.700** | <0.133 |
| Chrysene | 70 | 400 | 11.300 | 5.110 | 0.275 | <0.132 | 26.000 | 1.460 | 9.870 | 16.400 | <0.133 |
| Benzo[b]Fluoranthene | 7 | 40 | <0.172 | <0.183 | <0.217 | <0.197 | <0.227 | <0.231 | <0.181 | <0.185 | <0.200 |
| Benzo[k]Fluoranthene | 70 | 400 | <0.115 | <0.122 | <0.145 | <0.132 | <0.152 | <0.154 | <0.120 | <0.123 | <0.133 |
| Benzo[a]Pyrene | 2 | 4 | <0.115 | <0.122 | <0.145 | <0.132 | <0.152 | <0.154 | <0.120 | <0.123 | <0.133 |
| Indeno[1,2,3-c,d]Pyrene | 7 | 40 | <0.0575 | <0.0610 | <0.0725 | <0.0658 | <0.0758 | <0.0769 | <0.0602 | <0.0617 | <0.0667 |
| Dibenzo[a,h]Anthracene | 0.7 | 4 | <0.115 | <0.122 | <0.145 | <0.132 | <0.152 | <0.154 | <0.120 | <0.123 | <0.133 |
| Benzo[g,h,i]Perylene | 1,000 | 3,000 | <0.115 | <0.122 | <0.145 | <0.132 | <0.152 | <0.154 | <0.120 | <0.123 | <0.133 |
| **COAL ASH** | | | NA | NA | COAL ASH | NA | NA | NA | NA | NA | NA |

* Duplicate of CSS-2
ND - Non Detect
NA - Not Analyzed
NS - Not Specified
**Bold** indicates RCS2 threshold exceeded

Cygnus TP-1 through TP-8 were NA for EPH/PAH
RCs updated in Feb 2008

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**Table 1B**
**PCBs and Asbestos Containing Materials (ACM) Soil Data**
**16 Blackmer Street**
**New Bedford, MA**
**1999, 2000, and 2006**
**Concentration (mg/kg)**

| | South Area | North Area | North Area | South Area | South Area | South Area | South Area | South Area | North Area | North Area | North Area |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SAMPLE IDENTIFICATION** | **CGW1/S-3** | **BH1** | **BH-1** | **BH2** | **SS-04A** | **SS-04B** | **TP-03** | **TP-04** | **CSE TP-2** | **CSE TP-3** | **CSE TP-1** |
| **SAMPLE DEPTH (FT)** | **0-2** | **0-2.5** | **2.5-5** | **2.5-4** | **0-3** | **0-3** | | | **3-6** | **0-3** | **0-3** |
| **COLLECTION DATE** | **03/07/00** | **05/25/06** | **05/25/06** | **05/25/06** | **09/28/99** | **09/28/99** | **01/2000** | **01/2000** | **05/25/06** | **05/25/06** | **05/25/06** |
| **ASBESTOS** | | | | | | | | | | | |
| chrysotile | NA | NA | NA | <1% | NA | NA | NA | NA | ND | ND | ND |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| **POLYCHLORINATED BIPHENYLS (PCBs)** | | | | | | | | | | | |
| Aroclor 1221 | ND | <.0575 | <.0610 | <.0658 | ND | ND | DU | DU | <.0769 | <.0602 | <.0725 |
| Aroclor 1232 | ND | <.0575 | <.0610 | <.0658 | ND | ND | DU | DU | <.0769 | <.0602 | <.0725 |
| Aroclor 1248 | ND | <.0575 | <.0610 | <.0658 | ND | ND | DU | DU | <.0769 | <.0602 | <.0725 |
| Aroclor 1254 | ND | 0.073 | <.0610 | 0.105 | ND | 1.700 | DU | capacitors observed | <.0769 | 0.439 | <.0725 |
| Aroclor 1260 | ND | <.0575 | <.0610 | <.0658 | ND | ND | DU | DU | <.0769 | <.0602 | <.0725 |
| Aroclor 1262 | ND | <.0575 | <.0610 | <.0658 | ND | ND | DU | DU | <.0769 | <.0602 | <.0725 |
| Aroclor 1268 | ND | <.0575 | <.0610 | <.0658 | ND | ND | DU | DU | <.0769 | <.0602 | <.0725 |

ND - Not Dectected by lab method
NA - Not Analyzed
NS - Not Specified
**Bold** indicates RCS2 threshold exceeded
DU - Data unknown/Unavailable - data tables missing from M&E and Cyngus reports but discussed in body of report

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**Table 1C**
**Lead Soil Data**
**16 Blackmer Street**
**New Bedford, MA**
**1999, 2000, and 2006**

| Sample Identification Number | Sample Location | Sample Depth (ft) | Collection Date | Lead mg/kg |
|---|---|---|---|---|
| CSS-01 | South Area | 0-3 | 3/6/2000 | 260 |
| CSS-1 | South Area | 3-6 | 3/6/2000 | 130 |
| CSS-2 | South Area | 0-3 | 3/6/2000 | **400** |
| CSS-500 (duplicate CSS-2) | South Area | 0-3 | 3/6/2000 | **620** |
| CSS-2 | South Area | 3-6 | 3/6/2000 | 210 |
| CSS-500 (duplicate CSS-2) | South Area | 3-6 | 3/6/2000 | 160 |
| CSS-3 | South Area | 0-3 | 3/6/2000 | **2500** |
| CSS-3 | South Area | 3-6 | 3/6/2000 | 160 |
| CSS-4 | South Area | 0-3 | 3/6/2000 | **530** |
| CSS-4 | South Area | 3-6 | 3/6/2000 | 190 |
| CSS-5 | South Area | 0-3 | 3/6/2000 | **310** |
| CSS-5 | South Area | 3-6 | 3/6/2000 | 150 |
| CGW-1/S-3 | South Area | 0-2 | 3/7/2000 | **490** |
| TP-1 | North Area | 0-3 | 5/9/2000 | 190 |
| TP-2 | North Area | 0-3 | 5/9/2000 | 140 |
| TP-3 | North Area | 0-3 | 5/9/2000 | 160 |
| TP-4 | North Area | 0-3 | 5/9/2000 | 61 |
| TP-5 | South Area | 0-3 | 5/9/2000 | 100 |
| TP-X (TP5 duplicate) | South Area | 0-3 | 5/9/2000 | 220 |
| TP-6 | South Area | 0-3 | 5/9/2000 | **930** |
| TP-7 | North Area | 0-3 | 5/9/2000 | 63 |
| TP-8 | South Area | 0-3 | 5/9/2000 | 250 |
| BH1 | North Area | 0-2.5 | 5/28/2006 | 111 |
| BH1 | North Area | 2.5-5 | 5/28/2006 | 287 |
| Duplicate 1 (BH1 2.5-5) | North Area | 2.5-5 | 5/28/2006 | 194 |
| BH1 | North Area | 5-7.5 | 5/28/2006 | 5.25 |
| BH2 | South Area | 0-2.5 | 5/28/2006 | **313** |
| BH2 | South Area | 2.5-4 | 5/28/2006 | **339** |
| Duplicate 2 (BH2 2.5-4) | South Area | 2.5-5 | 5/28/2006 | **371** |
| BH2 | South Area | 4-6.5 | 5/28/2006 | **5780** |
| SS-04A | South Area | 0-3 | 9/28/99 | **3640** |
| SS-04B | South Area | 0-3 | 9/28/99 | **379** |
| CSE/TP-1 | North Area | 0-3 | 5/28/2006 | 42.1 |
| CSE/TP-1 | North Area | 3-6 | 5/28/2006 | 5.7 |
| CSE/TP-2 | North Area | 0-3 | 5/28/2006 | 77.9 |
| CSE/TP-2 | North Area | 3-6 | 5/28/2006 | 6.85 |
| CSE/TP-3 | North Area | 0-3 | 5/28/2006 | 256 |
| CSE/TP-3 | North Area | 3-6 | 5/28/2006 | 25.9 |
| BH-6A | South Adjacent Lot | 2.5-6 | 6/12/2006 | **550** |
| BH-6B | South Adjacent Lot | 2.5-6 | 6/12/2006 | 209 |
| BH-6C | South Adjacent Lot | 2.5-6 | 6/12/2006 | **1380** |
| BH-6D | South Adjacent Lot | 2.5-6 | 6/12/2006 | **611** |

| | |
|---|---|
| Upper Concentration Limit (Method 3) | 3000 |
| Reportable Concentration S1 | 300 |
| Reportable Concentration S2 | 300 |
| MCP Background - urban fill | 600 |
| - undefined in MCP | |

**Bold** indicates RC threshold has been exceeded
Underline indicates sample was non-detect and value is half method reporting limit.

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# Table 2
## EPH/PAHs/PCBs and Lead in Groundwater Data
## 16 Blackmer Street
## New Bedford, MA
## 2000 and 2006

| | | Destroyed | | | Destroyed | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | North Area | South Area | South Area | | South Area | | | | | |
| | | | | | | Reportable Concentration | | Method 1 Groundwater Standards | | |
| SAMPLE NUMBER: / COLLECTION DATE: | CSE-2 5/28/2006 | CSE-1 5/28/2006 | CSE-3 5/28/2006 | GW-01** 9/30/99 | CGW-1 3/10/2000 | GW-1 (ug/L) | GW-2 (ug/L) | GW-1 (ug/L) | GW-2 (ug/L) | GW-3 (ug/L) |
| **FULL EPH ANALYTICAL RESULTS (ug/L)** | | | | | | | | | | |
| 2-Methylnaphthalene | <1.20 | <1 | <1.14 | 14.00 | ND | 10 | 3000 | 10 | 10000 | 3000 |
| Acenaphthene | <1.20 | <1 | <1.14 | ND | ND | 20 | 5000 | 20 | NA | 5000 |
| Acenaphthylene | <1.20 | <1 | <1.14 | ND | ND | 300 | 3000 | 300 | NA | 3000 |
| Anthracene | <1.20 | <1 | <1.14 | ND | ND | 600 | 600 | 2000 | NA | 3000 |
| Benz[a]Anthracene | <1.20 | <1 | <1.14 | ND | ND | 1 | 3000 | 1 | NA | 1000 |
| Benzo[a]Pyrene | <0.0964 | <1.5 | <0.0909 | ND | ND | 0.2 | 3000 | 0.2 | NA | 500 |
| Benzo[b]Fluoranthene | <1.20 | <1 | <1.14 | ND | ND | 1 | 3000 | 1 | NA | 400 |
| Benzo[g,h,i]Perylene | <1.81 | <1.5 | <1.70 | ND | ND | 300 | 3000 | 300 | NA | 3000 |
| Benzo[k]Fluoranthene | <0.145 | <0.120 | <0.136 | ND | ND | 0.1 | 3000 | 1 | NA | 100 |
| Chrysene | <1.20 | <1 | <1.14 | ND | ND | 2 | 3000 | 2 | NA | 3000 |
| Dibenzo[a,h]Anthracene | <0.602 | <0.500 | <0.568 | ND | ND | 0.5 | 3000 | 1 | 20 | 50000 |
| Fluoranthene | <1.20 | <1 | <1.14 | ND | ND | 200 | 200 | 90 | NA | 200 |
| Fluorene | <1.20 | <1 | <1.14 | ND | ND | 300 | 3000 | 300 | NA | 3000 |
| Indeno[1,2,3-c,d]Pyrene | <1.20 | <0.240 | <0.273 | ND | ND | 0.5 | 3000 | 0.5 | NA | 100 |
| Naphthalene | <1.20 | <1 | <1.14 | 8.1 | ND | 20 | 6000 | 140 | 1000 | 20000 |
| Phenanthrene | <1.20 | <1 | <1.14 | ND | ND | 50 | 50 | 300 | NA | 50 |
| Pyrene | <1.81 | <1.5 | <1.7 | ND | ND | 200 | 3000 | 80 | NA | 20 |
| C9-C18 Aliphatic Hydrocarbons1 | <120 | <100 | <114 | ND | ND | 1000 | 1000 | 4000 | 1000 | 20000 |
| C19-C36 Aliphatic Hydrocarbons1 | <120 | <100 | <114 | ND | ND | 5000 | 20000 | 5000 | NA | 20000 |
| C11-C22 Aromatic Hydrocarbons1,2 | <120 | <100 | <114 | ND | ND | 200 | 30000 | 200 | 50000 | 30000 |
| **POLYCHLORINATED BIPHENYLS** | | | | | | | | | | |
| Aroclor 1016/1242 | <0.375 | <0.303 | <0.366 | ND | ND | 70 | 50000 | 0.5 | NA | 0.3 |
| Aroclor 1221 | <0.375 | <0.303 | <0.366 | ND | ND | 5 | 2000 | 0.5 | NA | 0.3 |
| Aroclor 1232 | <0.375 | <0.303 | <0.366 | ND | ND | 1000 | 6000 | 0.5 | NA | 0.3 |
| Aroclor 1248 | <0.375 | <0.303 | <0.366 | ND | ND | 700 | 4000 | 0.5 | NA | 0.3 |
| Aroclor 1254* | **0.871** | **0.72** | **0.83** | **2.6** | ND | 6000 | 6000 | 0.5 | NA | 0.3 |
| Aroclor 1260 | <0.375 | <0.303 | <0.366 | ND | ND | 6000 | 6000 | 0.5 | NA | 0.3 |
| Aroclor 1262 | <0.375 | <0.303 | <0.366 | ND | ND | 20 | 6000 | 0.5 | NA | 0.3 |
| Aroclor 1268 | <0.375 | <0.303 | <0.366 | ND | ND | 400 | 1000 | 0.5 | NA | 0.3 |
| **DISSOLVED LEAD** | <0.0150 | <0.0150 | <0.0150 | ND | NA | 1000 | 1000 | 15 | NA | 10 |

* sample was not filtered prior to lab analysis

** Pesticides detected in sample at concentrations less than the RCGW-2 standards.

\- undefined in MCP

***Bold italics*** indicates RC threshold has been exceeded

**Bold** indicate laboratory method reporting limit exceeded

NA - Not Applicable

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**FORMER DARTMOUTH FINISHING SITE**

**RTN: 4-23616**

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**Table 1a**
**Weston & Sampson**
**Summary of Test Pit Soil Analytical Results**
**45 Cove Street**
**New Bedford, MA**

| Parameters | Units | MCP RCS-1 Standards | MCP Method 1 Soil Cleanup Standards | | Sample ID, Depth, and Date | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | S-1/GW-2 | S-1/GW-3 | TP-1 (0-3') | TP-2 (0-3') | TP-3 (0-3') | TP-4 (0-3') | TP-5 (0-3') | TP-6 (0-3') | TP-7 (0-3') | TP-8 (0-3') | TP-9 (0-3') | TP-10 (0-3') | TP-11 (0-3') | TP-12 (0-3') | TP-13 (0-3') | TP-15 (0-3') | TP-17 (0-3') | TP-18 (0-3') | DUP-1 (TP-18) | TP-19 (0-3') |
| | | | | | 4/7/11 | 4/7/11 | 4/7/11 | 4/7/11 | 4/7/11 | 4/7/11 | 4/7/11 | 4/7/11 | 4/7/11 | 4/7/11 | 4/6/11 | 4/6/11 | 4/6/11 | 4/6/11 | 4/6/11 | 4/7/11 | 4/7/11 | 4/7/11 |
| **EPH** | | | | | | | | | | | | | | | | | | | | | |
| C9-C18 Aliphatics | mg/kg | 1,000 | 1,000 | 1,000 | <35 | <36 | <41 | <37 | <51 | <35 | <40 | <40 | 100 | <36 | <35 | <39 | <35 | <37 | <32 | <34 | <35 | 440 |
| C19-C36 Aliphatics | mg/kg | 3,000 | 3,000 | 3,000 | <35 | 85 | 68 | 45 | 160 | 190 | 190 | 220 | 970 | 110 | 49 | <39 | 50 | <37 | 39 | 160 | 160 | 170 |
| C11-C22 Aromatics | mg/kg | 1,000 | 1,000 | 1,000 | <35 | 100 | 56 | 46 | 170 | 89 | 120 | 160 | 3,500 | 82 | 48 | 45 | <35 | <37 | 49 | 82 | 88 | 160 |
| Unadjusted n-C11 to n-C22 Aromatics | mg/kg | NS | NS | NS | <35 | 120 | 58 | 49 | 200 | 90 | 130 | 170 | 4,500 | 88 | 52 | 51 | <35 | <37 | 58 | 120 | 89 | 180 |
| **SVOCs** | | | | | | | | | | | | | | | | | | | | | |
| Anthracene | mg/kg | 1,000 | 1,000 | 1,000 | NA | NA | NA | NA | NA | NA | <0.42 | <0.43 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 1.60 |
| Benzo(a)anthracene | mg/kg | 7 | 7 | 7 | NA | NA | NA | NA | NA | NA | 0.49 | 0.56 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 3.80 |
| Benzo(a)pyrene | mg/kg | 2 | 2 | 2 | NA | NA | NA | NA | NA | NA | 0.49 | 0.64 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 3.50 |
| Benzo(b)fluoranthene | mg/kg | 7 | 7 | 7 | NA | NA | NA | NA | NA | NA | 0.68 | 0.74 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 4.00 |
| Benzo(g,h,i)perylene | mg/kg | 1,000 | 1,000 | 1,000 | NA | NA | NA | NA | NA | NA | <0.42 | <0.43 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 0.53 |
| Benzo(k)fluoranthene | mg/kg | 70 | 70 | 70 | NA | NA | NA | NA | NA | NA | <0.42 | <0.43 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 1.50 |
| Chrysene | mg/kg | 70 | 70 | 70 | NA | NA | NA | NA | NA | NA | 0.55 | 0.65 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 3.80 |
| Fluoranthene | mg/kg | 1,000 | 1,000 | 1,000 | NA | NA | NA | NA | NA | NA | 0.93 | 0.90 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 7.00 |
| Fluorene | mg/kg | 1,000 | 1,000 | 1,000 | NA | NA | NA | NA | NA | NA | <0.42 | <0.43 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 0.51 |
| Indeno(1,2,3-cd) Pyrene | mg/kg | 7 | 7 | 7 | NA | NA | NA | NA | NA | NA | <0.42 | <0.43 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 0.77 |
| 2-Methylnaphthalene | mg/kg | 0.7 | 80 | 300 | NA | NA | NA | NA | NA | NA | <0.42 | <0.43 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 0.62 |
| Naphthalene | mg/kg | 4 | 40 | 500 | NA | NA | NA | NA | NA | NA | <0.42 | <0.43 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 5.80 |
| Phenanthrene | mg/kg | 10 | 500 | 500 | NA | NA | NA | NA | NA | NA | 0.67 | 0.44 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 5.10 |
| Pyrene | mg/kg | 1,000 | 1,000 | 1,000 | NA | NA | NA | NA | NA | NA | 0.89 | 1.00 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | 6.80 |
| Bis(2-ethylhexyl)phthalate | mg/kg | 200 | 200 | 200 | NA | NA | NA | NA | NA | NA | <0.42 | <0.43 | NA | <0.41 | NA | NA | <0.39 | NA | NA | NA | NA | <0.410 |
| **VPH** | | | | | | | | | | | | | | | | | | | | | |
| C5-C8 Aliphatics | mg/kg | 100 | 100 | 100 | NA | NA | NA | NA | NA | NA | <1.6 | <1.7 | NA | <1.3 | NA | NA | <1.4 | NA | NA | NA | NA | 32 |
| C9-C12 Aliphatics | mg/kg | 1,000 | 1,000 | 1,000 | NA | NA | NA | NA | NA | NA | 2 | 5.6 | NA | 3.3 | NA | NA | <1.4 | NA | NA | NA | NA | 720 |
| C9-C10 Aromatics | mg/kg | 100 | 100 | 100 | NA | NA | NA | NA | NA | NA | <1.6 | 4.4 | NA | 3.9 | NA | NA | <1.4 | NA | NA | NA | NA | 680 |
| Unadjusted C5-C8 Aliphatics | mg/kg | NS | NS | NS | NA | NA | NA | NA | NA | NA | <1.6 | <1.7 | NA | <1.3 | NA | NA | <1.4 | NA | NA | NA | NA | 33 |
| Unadjusted C9-C12 Aliphatics | mg/kg | NS | NS | NS | NA | NA | NA | NA | NA | NA | 2.7 | 10 | NA | 7.3 | NA | NA | <1.4 | NA | NA | NA | NA | 1,400 |
| **VOCs 8260** | | | | | | | | | | | | | | | | | | | | | |
| Isopropylbenzene | mg/kg | NS | NS | NS | <0.0055 | <0.005 | <0.006 | <0.0056 | <0.009 | <0.005 | <0.007 | <0.006 | <0.008 | <0.250 | <0.005 | <0.0061 | <0.005 | <0.0058 | <0.0064 | <0.005 | <0.0062 | 7.9 |
| Naphthalene | mg/kg | 4 | 40 | 500 | <0.0055 | <0.005 | <0.006 | <0.0056 | <0.009 | <0.005 | <0.007 | <0.006 | <0.008 | <0.250 | <0.005 | <0.0061 | <0.005 | <0.0058 | <0.0064 | <0.005 | <0.0062 | 16 |
| N-Propylbenzene | mg/kg | NS | NS | NS | <0.0055 | <0.005 | <0.006 | <0.0056 | <0.009 | <0.005 | <0.007 | <0.006 | <0.008 | <0.250 | <0.005 | <0.0061 | <0.005 | <0.0058 | <0.0064 | <0.005 | <0.0062 | 13 |
| sec-Butylbenzene | mg/kg | NS | NS | NS | <0.0055 | <0.005 | <0.006 | <0.0056 | <0.009 | <0.005 | <0.007 | <0.006 | <0.008 | <0.250 | <0.005 | <0.0061 | <0.005 | <0.0058 | <0.0064 | <0.005 | <0.0062 | 13 |
| 1,2,4-Trimethylbenzene | mg/kg | NS | NS | NS | <0.0055 | <0.005 | <0.006 | <0.0056 | <0.009 | <0.005 | <0.007 | <0.006 | <0.008 | <0.250 | <0.005 | <0.0061 | <0.005 | <0.0058 | <0.0064 | <0.005 | <0.0062 | 140 |
| **Trace Metals** | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | mg/kg | 20 | 20 | 20 | <3.7 | <3.8 | <4.3 | <3.6 | <5.1 | <3.5 | <4 | <4 | <4.4 | <3.6 | <3.8 | <3.9 | <3.5 | <3.8 | <3.2 | <3.5 | <3.8 | <3.7 |
| Barium | mg/kg | 1,000 | 1,000 | 1,000 | 29 | 37 | 19 | 20 | 160 | 14 | 35 | 50 | 120 | 11 | 15 | 12 | 21 | 12 | 27 | 9.0 | 15 | 29 |
| Cadmium | mg/kg | 2 | 2 | 2 | <0.61 | <0.63 | <0.72 | <0.61 | <0.85 | <0.58 | <0.66 | 0.94 | <0.74 | <0.6 | <0.63 | <0.66 | <0.59 | <0.63 | <0.53 | <0.59 | <0.64 | <0.61 |
| Chromium | mg/kg | 30 | 30 | 30 | 7.2 | 54 | 9.5 | 7.1 | 12 | 5.0 | 8.5 | 73 | 100 | 20 | 8.6 | 6.4 | 12 | 4.0 | 8.8 | 300 | 6.1 | 5.9 |
| Lead | mg/kg | 300 | 300 | 300 | 85 | 42 | 33 | 44 | 320 | 21 | 48 | 110 | 1,400 | 7.4 | 6.9 | <6.6 | <5.9 | <6.3 | 34 | 38 | 26 | 52 |
| Mercury | mg/kg | 20 | 20 | 20 | 0.047 | 0.170 | 0.059 | 0.053 | 0.370 | 0.055 | 0.320 | 0.110 | 0.97 | 0.039 | 0.24 | 0.036 | <0.023 | <0.024 | 0.041 | <0.023 | 0.063 | 0.140 |
| Selenium | mg/kg | 400 | 400 | 400 | <6.1 | <6.3 | <7.2 | <6.1 | <8.5 | <5.8 | <6.6 | <6.7 | <7.4 | <6 | <6.3 | <6.6 | <5.9 | <6.3 | <5.3 | <5.9 | <6.4 | <6.1 |
| Silver | mg/kg | 100 | 100 | 100 | <1.2 | <1.3 | <1.4 | <1.2 | <1.7 | <1.2 | <1.3 | <1.3 | <1.5 | <1.2 | <1.3 | <1.3 | <1.2 | <1.3 | <1.1 | <1.2 | <1.3 | <1.2 |
| **PCBs** | | | | | | | | | | | | | | | | | | | | | |
| Aroclor 1254 | mg/kg | 2 | 2 | 2 | NA | NA | NA | NA | NA | NA | <0.11 | 0.12 | NA | <0.1 | NA | NA | <0.092 | NA | NA | NA | NA | <0.1 |
| Aroclor 1260 | mg/kg | 2 | 2 | 2 | NA | NA | NA | NA | NA | NA | <0.11 | <0.11 | NA | <0.1 | NA | NA | <0.092 | NA | NA | NA | NA | <0.1 |

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QC by LEM 5/31/11



**Abbreviations:**
SVOCs = Semi-Volatile Organic Compounds
EPH = Extractable Petroleum Hydrocarbons
VPH = Volatile Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls
mg/kg = milligrams per kilogram
NS = No Standard
NA = Not Analyzed

**Notes:**
Lab ID: 141086 & 141430
Standards are from the Massachusetts Contingency Plan (MCP),
310 CMR 40.0000, revised February 14, 2008.
< = indicates parameter not detected above laboratory method reporting limit, shown

**Table 1b**
**Weston & Sampson**
**Summary of Soil Boring & Stock Pile Analytical Results**
**45 Cove Street**
**New Bedford, MA**

| Parameters | Units | MCP RCS-1 Standards | MCP Method 1 Soil Cleanup | | Sample ID, Depth, and Date | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | S-1/GW-2 | S-1/GW-3 | WS-1 (0-3') | WS-3 (0-3') | WS-4 (0-3') | WS-7 (0-3') | WS-8 (0-3') | WS-9 (0-3') | WS-11 (0-3') | DUP-1 (WS-11) | WS-13 (0-3') | WS-14 (0-3') | WS-15 (0-3') | SP-1 | SP-2 | SP-3 | SP-4 | SP-5 |
| | | | | | 4/20/11 | 4/20/11 | 4/20/11 | 4/20/11 | 4/20/11 | 4/20/11 | 4/20/11 | 4/19/11 | 4/19/11 | 4/19/11 | 4/19/11 | 4/20/11 | 4/20/11 | 4/6/11 | 4/20/11 | 4/6/11 |
| **EPH** | | | | | | | | | | | | | | | | | | | | |
| C9-C18 Aliphatics | mg/kg | 1,000 | 1,000 | 1,000 | <68 | <35 | <39 | <35 | 66 | <34 | <33 | <34 | <33 | <34 | <23 | <33 | <34 | <430 | <24 | <36 |
| C19-C36 Aliphatics | mg/kg | 3,000 | 3,000 | 3,000 | 99 | 78 | 110 | 210 | 300 | 71 | 65 | 68 | 40 | 79 | 90 | 260 | 1,000 | 2,900 | 550 | 200 |
| C11-C22 Aromatics | mg/kg | 1,000 | 1,000 | 1,000 | 140 | 96 | 98 | 160 | 500 | 87 | 50 | 52 | 33 | 41 | 98 | 3,400 | 1,000 | 5,000 | 1,700 | 140 |
| Unadjusted n-C11 to n-C22 Aromati | mg/kg | NS | NS | NS | 160 | 110 | 100 | 170 | 620 | 110 | 52 | 56 | 34 | 42 | 120 | 4,200 | 1,100 | 6,400 | 2,000 | 150 |
| **SVOCs** | | | | | | | | | | | | | | | | | | | | |
| Anthracene | mg/kg | 1,000 | 1,000 | 1,000 | 0.88 | <0.38 | <0.44 | <0.38 | 0.46 | <0.38 | <0.37 | <0.36 | <0.35 | <0.39 | 1.10 | 21 | 2.50 | <24 | 16 | 0.43 |
| Benzo(a)anthracene | mg/kg | 7 | 7 | 7 | 2.10 | 1.50 | <0.44 | 1.40 | 2.20 | 0.40 | <0.37 | <0.36 | <0.35 | <0.39 | 3.10 | 80 | 10 | 130 | 77 | 1.30 |
| Benzo(a)pyrene | mg/kg | 2 | 2 | 2 | 1.70 | 1.40 | <0.44 | 1.10 | 1.90 | 0.38 | <0.37 | <0.36 | <0.35 | <0.39 | 2.70 | 66 | 10 | 110 | 62 | 1.20 |
| Benzo(b)fluoranthene | mg/kg | 7 | 7 | 7 | 2.20 | 2.00 | <0.44 | 1.80 | 3.00 | 0.52 | <0.37 | <0.36 | <0.35 | 0.41 | 4.10 | 89 | 15 | 140 | 83 | 1.60 |
| Benzo(g,h,i)perylene | mg/kg | 1,000 | 1,000 | 1,000 | 1.10 | 0.52 | <0.44 | <0.38 | 0.57 | <0.38 | <0.37 | <0.36 | <0.35 | <0.39 | 0.65 | 30 | <1.9 | 52 | 19 | 0.39 |
| Benzo(k)fluoranthene | mg/kg | 70 | 70 | 70 | 0.77 | 0.70 | <0.44 | 0.63 | 0.95 | <0.38 | <0.37 | <0.36 | <0.35 | <0.39 | 1.30 | 36 | 5.20 | 53 | 33 | 0.57 |
| Chrysene | mg/kg | 70 | 70 | 70 | 2.00 | 1.50 | <0.44 | 1.20 | 2.20 | 0.39 | <0.37 | <0.36 | <0.35 | <0.39 | 2.90 | 81 | 11 | 130 | 71 | 1.40 |
| Fluoranthene | mg/kg | 1,000 | 1,000 | 1,000 | 4.90 | 3.00 | <0.44 | 2.30 | 4.40 | 0.80 | 0.37 | 0.43 | <0.35 | 0.75 | 6.60 | 160 | 20 | 230 | 140 | 2.80 |
| Fluorene | mg/kg | 1,000 | 1,000 | 1,000 | <0.75 | <0.38 | <0.44 | <0.38 | <0.39 | <0.38 | <0.37 | <0.36 | <0.35 | <0.39 | <0.37 | <18 | <1.9 | <24 | <7.7 | <0.39 |
| Indeno(1,2,3-cd) Pyrene | mg/kg | 7 | 7 | 7 | 1.10 | 0.63 | <0.44 | 0.47 | 0.74 | <0.38 | <0.37 | <0.36 | <0.35 | <0.39 | 0.89 | 41 | 2.60 | 71 | 27 | 0.51 |
| 2-Methylnaphthalene | mg/kg | 0.7 | 80 | 300 | <0.75 | <0.38 | <0.44 | <0.38 | <0.39 | <0.38 | <0.37 | <0.36 | <0.35 | <0.39 | <0.37 | <18 | <1.9 | <24 | <7.7 | <0.39 |
| Naphthalene | mg/kg | 4 | 40 | 500 | <0.75 | <0.38 | <0.44 | <0.38 | <0.39 | <0.38 | <0.37 | <0.36 | <0.35 | <0.39 | <0.37 | <18 | <1.9 | <24 | <7.7 | <0.39 |
| Phenanthrene | mg/kg | 10 | 500 | 500 | 4.70 | 1.90 | <0.44 | 1.10 | 2.60 | 0.51 | <0.37 | <0.36 | <0.35 | 0.52 | 4.80 | 110 | 13 | 110 | 70 | 2.00 |
| Pyrene | mg/kg | 1,000 | 1,000 | 1,000 | 4.20 | 2.70 | <0.44 | 1.70 | 3.50 | 0.65 | <0.37 | 0.37 | <0.35 | 0.64 | 5.10 | 140 | 17 | 210 | 120 | 2.30 |
| Bis(2-ethylhexyl)phthalate | mg/kg | 200 | 200 | 200 | <0.75 | <0.38 | <0.44 | <0.38 | <0.39 | 0.70 | <0.37 | <0.36 | <0.35 | <0.39 | <0.37 | <18 | <1.9 | <24 | <7.7 | <0.39 |
| **VPH** | | | | | | | | | | | | | | | | | | | | |
| C5-C8 Aliphatics | mg/kg | 100 | 100 | 100 | <3.7 | 2.1 | <1.6 | <1.1 | 1.4 | <1.1 | <1.0 | 1.0 | 1.4 | <1.0 | <1.1 | <1.0 | <1.4 | <2.5 | <1.7 | <1.5 |
| C9-C12 Aliphatics | mg/kg | 1,000 | 1,000 | 1,000 | <3.7 | <1.3 | <1.6 | <1.1 | 20 | 4.3 | <1.0 | <1.0 | <1.0 | <1.0 | <1.1 | 1.0 | 6.1 | <2.5 | <1.7 | <1.5 |
| C9-C10 Aromatics | mg/kg | 100 | 100 | 100 | <3.7 | <1.3 | <1.6 | <1.1 | 21 | 2.3 | <1.0 | <1.0 | <1.0 | <1.0 | <1.1 | <1.0 | 1.8 | <2.5 | <1.7 | <1.5 |
| Unadjusted C5-C8 Aliphatics | mg/kg | NS | NS | NS | <3.7 | 2.2 | <1.6 | <1.1 | 1.5 | <1.1 | <1.0 | 1.1 | 1.4 | <1.0 | <1.1 | <1.0 | <1.4 | <2.5 | <1.7 | <1.5 |
| Unadjusted C9-C12 Aliphatics | mg/kg | NS | NS | NS | <3.7 | <1.3 | <1.6 | <1.1 | 42 | 6.7 | <1.0 | <1.0 | <1.0 | <1.0 | <1.1 | 1.5 | 8.1 | <2.5 | 2.5 | <1.5 |
| **VOCs 8260** | | | | | | | | | | | | | | | | | | | | |
| Isopropylbenzene | mg/kg | NS | NS | NS | <0.014 | <0.0054 | <0.0065 | <0.0055 | <0.250 | <0.250 | <0.0053 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0063 | <0.0065 | <0.011 | <0.0082 | <0.0051 |
| Naphthalene | mg/kg | 4 | 40 | 500 | <0.014 | <0.0054 | <0.0065 | <0.0055 | <0.250 | <0.250 | <0.0053 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0063 | <0.0065 | <0.011 | <0.0082 | <0.0051 |
| N-Propylbenzene | mg/kg | NS | NS | NS | <0.014 | <0.0054 | <0.0065 | <0.0055 | <0.250 | <0.250 | <0.0053 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0063 | <0.0065 | <0.011 | <0.0082 | <0.0051 |
| sec-Butylbenzene | mg/kg | NS | NS | NS | <0.014 | <0.0054 | <0.0065 | <0.0055 | <0.250 | <0.250 | <0.0053 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0063 | <0.0065 | <0.011 | <0.0082 | <0.0051 |
| 1,2,4-Trimethylbenzene | mg/kg | NS | NS | NS | <0.014 | <0.0054 | <0.0065 | <0.0055 | <0.250 | <0.250 | <0.0053 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0063 | <0.0065 | <0.011 | <0.0082 | <0.0051 |
| **Trace Metals** | | | | | | | | | | | | | | | | | | | | |
| Arsenic | mg/kg | 20 | 20 | 20 | <6.7 | <3.6 | <3.9 | <3.5 | <3.7 | <3.4 | <3.3 | <3.4 | <3.4 | <3.4 | <3.6 | <3.4 | 5.30 | 13 | 7.70 | <3.7 |
| Barium | mg/kg | 1,000 | 1,000 | 1,000 | 19 | 47 | 18 | 49 | 27 | 21 | 18 | 16 | 26 | 12 | 39 | 84 | 280 | 1,500 | 490 | 410 |
| Cadmium | mg/kg | 2 | 2 | 2 | <1.1 | <0.6 | <0.66 | <0.59 | <0.61 | <0.56 | <0.55 | <0.56 | <0.57 | <0.57 | <0.6 | 0.66 | 0.92 | 4.8 | 1.90 | 0.62 |
| Chromium | mg/kg | 30 | 30 | 30 | 8.30 | 15 | 13 | 8.5 | 17 | 13 | 12 | 9.30 | 8.00 | 6.90 | 9.5 | 32 | 20 | 63 | 28 | 16 |
| Lead | mg/kg | 300 | 300 | 300 | 100 | 64 | 12 | 75.0 | 46 | 36 | 8.50 | 7.10 | <5.7 | 6.20 | 47 | 230 | 340 | 2,600 | 970 | 140 |
| Mercury | mg/kg | 20 | 20 | 20 | 0.05 | 0.110 | 0.095 | 0.540 | 0.100 | 0.30 | 0.180 | 0.140 | <0.019 | <0.019 | 0.080 | 0.620 | 0.66 | 11 | 2.30 | 0.320 |
| Selenium | mg/kg | 400 | 400 | 400 | <11 | <6.0 | <6.6 | <5.9 | <6.1 | <5.6 | <5.5 | <5.6 | <5.7 | <5.7 | <6.0 | <5.7 | <5.6 | <7.6 | <6.2 | <6.1 |
| Silver | mg/kg | 100 | 100 | 100 | <2.2 | <1.2 | <1.3 | <1.2 | <1.2 | <1.1 | <1.1 | <1.1 | <1.1 | <1.1 | <1.2 | <1.1 | <1.1 | <1.5 | <1.2 | <1.2 |
| **PCBs** | | | | | | | | | | | | | | | | | | | | |
| Aroclor 1254 | mg/kg | 2 | 2 | 2 | <0.18 | 0.31 | <0.1 | <0.091 | <0.096 | <0.09 | <0.089 | <0.088 | <0.088 | <0.094 | <0.094 | 0.86 | 1.3 | 0.73 | 1.3 | 0.18 |
| Aroclor 1260 | mg/kg | 2 | 2 | 2 | <0.18 | <0.094 | <0.1 | <0.091 | <0.096 | <0.09 | <0.089 | <0.088 | <0.088 | <0.094 | <0.094 | <0.09 | <0.18 | 0.49 | <0.097 | <0.094 |

QC by LEM 5/31/11

O:\New Bedford MA\Brownfields 2100655\Cove Street Site\Phase II Documents\Data Tables\[Soil Analytical Results.xls]Sheet1

**Abbreviations:**
SVOCs = Semi-Volatile Organic Compounds
EPH = Extractable Petroleum Hydrocarbons
VPH = Volatile Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls
mg/kg = milligrams per kilogram
NS = No Standard
NA = Not Analyzed

**Notes:**
Lab ID: 141086 & 141430
Standards are from the Massachusetts Contingency Plan (MCP),
310 CMR 40.0000, revised February 14, 2008.
< = indicates parameter not detected above laboratory method reporting limit, shown

DRAFT

**Table 1c**
**Weston & Sampson**
**Summary of Soil Analytical Results**
**45 Cove Street**
**New Bedford, MA**
**April, May, August 2012**

| Parameters | Units | MassDEP Reportable Concentrations[5] | Method 1 Soil Standards[1] | | | | Sampling Location, Depth, and Date | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RC S-1 | S-1/GW2 | S-1/GW3 | S-2/GW2 | S-2/GW3 | TP-19N 0-3 ft 5/7/12 | TP-19N 0-3 ft 8/9/12 | TP-19S 0-3 ft 5/7/12 | TP-19S 0-3 ft 8/10/12 | TP-19E 0-3 ft 4/30/12 | TP-19E 0-3 ft 8/9/12 | TP-19W 0-3 ft 5/7/12 | TP-19W 0-3 ft 8/10/12 | TP-2N 0-3 ft 5/7/12 | TP-2N 0-3 ft 8/10/12 | TP-2W 0-3 ft 5/7/12 | TP-2W 0-3 ft 8/10/12 | TP-18W 0-3 ft 5/7/12 | TP-18W 0-3 ft 8/10/12 | TP-18S 0-3 ft 5/7/12 | TP-18S 0-3 ft 8/10/12 | DUP-1 0-3 ft 8/10/12 |
| **TPH** | | | | | | | | | | | | | | | | | | | | | | | |
| UNADJUSTED TPH | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | 150 | NA | 125 | NA | 2700 * | NA | 240 * | NA | 290 * | NA | 800 * | NA | 380 * | NA | 220 | NA | NA |
| **EPH** | | | | | | | | | | | | | | | | | | | | | | | |
| C9-C18 ALIPHATICS | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | 19 | NA | 120 | NA | 60 | NA | <20 | NA | <14 | NA | <13 | NA | <13 | NA | <14 | <13 |
| C19-C36 ALIPHATICS | mg/kg | 3000 | 3000 | 3000 | 5000 | 5000 | NA | 36 | NA | 350 | NA | 140 | NA | <20 | NA | 41 | NA | <13 | NA | 24 | NA | <14 | 13 |
| Unadjusted n-C11 to n-C22 AROMATICS | mg/kg | NS | NS | NS | NS | NS | NA | 67 | NA | 330 | NA | 260 | NA | <20 | NA | 69 | NA | 29 | NA | 39 | NA | <14 | 17 |
| C11-C22 AROMATICS | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | 49 | NA | 300 | NA | 180 | NA | <20 | NA | 55 | NA | 23 | NA | 35 | NA | <14 | 16 |
| ACENAPHTHENE | mg/kg | 4 | 1000 | 1000 | 3000 | 3000 | NA | 0.26 | NA | 1.3 | NA | 0.70 | NA | <0.20 | NA | <0.14 | NA | 0.13 | NA | <0.13 | NA | <0.14 | <0.13 |
| ACENAPHTHYLENE | mg/kg | 1 | 600 | 10 | 600 | 10 | NA | <0.12 | NA | 0.85 | NA | <0.38 | NA | <0.20 | NA | <0.14 | NA | <0.13 | NA | <0.13 | NA | <0.14 | <0.13 |
| ANTHRACENE | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | 0.46 | NA | <0.80 | NA | 1.5 | NA | <0.20 | NA | 0.37 | NA | <0.13 | NA | <0.13 | NA | <0.14 | <0.13 |
| BENZO(A)ANTHRACENE | mg/kg | 7 | 7 | 7 | 40 | 40 | NA | 1.5 | NA | 2.2 | NA | 6.8 | NA | 0.20 | NA | 1.0 | NA | 0.62 | NA | 0.45 | NA | <0.14 | 0.35 |
| BENZO(A)PYRENE | mg/kg | 2 | 2 | 2 | 4 | 4 | NA | 1.2 | NA | 1.8 | NA | 5.5 | NA | <0.20 | NA | 0.91 | NA | 0.43 | NA | 0.42 | NA | <0.14 | <0.13 |
| BENZO(B)FLUORANTHENE | mg/kg | 7 | 7 | 7 | 40 | 40 | NA | 1.7 | NA | 3.0 | NA | 8.0 | NA | <0.20 | NA | 1.3 | NA | 0.51 | NA | 0.53 | NA | <0.14 | <0.13 |
| BENZO(G,H,I)PERYLENE | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | 0.70 | NA | <0.80 | NA | 3.7 | NA | <0.20 | NA | 0.53 | NA | 0.35 | NA | 0.60 | NA | <0.14 | <0.13 |
| BENZO(K)FLUORANTHENE | mg/kg | 70 | 70 | 70 | 400 | 400 | NA | 0.57 | NA | 1.6 | NA | 2.8 | NA | <0.20 | NA | 0.46 | NA | 0.15 | NA | 0.26 | NA | <0.14 | <0.13 |
| CHRYSENE | mg/kg | 70 | 70 | 70 | 400 | 400 | NA | 1.6 | NA | 1.9 | NA | 7.1 | NA | 0.22 | NA | 1.2 | NA | 0.55 | NA | 0.33 | NA | <0.14 | 0.16 |
| DIBENZ(A,H)ANTHRACENE | mg/kg | 0.7 | 0.7 | 0.7 | 4 | 4 | NA | 0.27 | NA | <0.80 [6] | NA | 1.2 | NA | <0.20 | NA | 0.22 | NA | <0.13 | NA | <0.13 | NA | <0.14 | <0.13 |
| FLUORANTHENE | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | 2.9 | NA | 4.3 | NA | 12 | NA | 0.27 | NA | 2.5 | NA | 0.82 | NA | 0.71 | NA | <0.14 | <0.13 |
| FLUORENE | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | 0.35 | NA | 0.86 | NA | 0.78 | NA | <0.20 | NA | 0.21 | NA | <0.13 | NA | <0.13 | NA | <0.14 | <0.13 |
| INDENO(1,2,3-CD)PYRENE | mg/kg | 7 | 7 | 7 | 40 | 40 | NA | 0.84 | NA | <0.80 | NA | 3.9 | NA | <0.20 | NA | 0.65 | NA | 0.27 | NA | <0.13 | NA | <0.14 | <0.13 |
| 2-METHYLNAPHTHALENE | mg/kg | 0.7 | 80 | 300 | 80 | 500 | NA | <0.12 | NA | 11 | NA | <0.38 | NA | <0.20 | NA | <0.14 | NA | <0.13 | NA | <0.13 | NA | <0.14 | <0.13 |
| NAPHTHALENE | mg/kg | 4 | 40 | 500 | 40 | 1000 | NA | 0.19 | NA | 0.86 | NA | <0.38 | NA | <0.20 | NA | <0.14 | NA | <0.13 | NA | <0.13 | NA | <0.14 | <0.13 |
| PHENANTHRENE | mg/kg | 10 | 500 | 500 | 1000 | 1000 | NA | 2.5 | NA | 2.5 | NA | 8.4 | NA | 0.20 | NA | 1.7 | NA | 0.82 | NA | 0.19 | NA | <0.14 | <0.13 |
| PYRENE | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | 2.7 | NA | 4.3 | NA | 12 | NA | 0.27 | NA | 2.3 | NA | 0.93 | NA | 0.80 | NA | <0.14 | <0.13 |
| **VPH** | | | | | | | | | | | | | | | | | | | | | | | |
| C5-C8 ALIPHATICS | mg/kg | 100 | 100 | 100 | 500 | 500 | <7.8 | NA | <4.3 | NA | <83 | NA | <4.4 | NA | <13 | NA | <16 | NA | <31 | NA | <21 | NA | NA |
| C9-C12 ALIPHATICS | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | 20 | NA | 14 | NA | 1,800 | NA | 11 | NA | <13 | NA | <16 | NA | <31 | NA | <21 | NA | NA |
| C9-C10 AROMATICS | mg/kg | 100 | 100 | 100 | 500 | 500 | 110 | NA | 13 | NA | 1,600 | NA | 6.6 | NA | <13 | NA | <16 | NA | <31 | NA | <21 | NA | NA |
| MTBE | mg/kg | 0.1 | 100 | 100 | 100 | 500 | <0.078 | NA | <0.043 | NA | <0.830 | NA | <0.044 | NA | <0.130 | NA | <0.160 | NA | <0.310 | NA | <0.210 | NA | NA |
| BENZENE | mg/kg | 2 | 30 | 30 | 200 | 200 | <0.390 | NA | <0.210 | NA | <4.1 | NA | <0.220 | NA | <0.670 | NA | <0.780 | NA | <1.5 | NA | <1.0 | NA | NA |
| TOLUENE | mg/kg | 30 | 500 | 500 | 1000 | 1000 | <0.390 | NA | <0.210 | NA | <4.1 | NA | <0.220 | NA | <0.670 | NA | <0.780 | NA | <1.5 | NA | <1.0 | NA | NA |
| ETHYLBENZENE | mg/kg | 40 | 500 | 500 | 1000 | 1000 | <0.390 | NA | <0.210 | NA | <4.1 | NA | <0.220 | NA | <0.670 | NA | <0.780 | NA | <1.5 | NA | <1.0 | NA | NA |
| M,P- XYLENES | mg/kg | 300 [4] | 300 [4] | 500 [4] | 300 [4] | 1000 [4] | <0.390 | NA | <0.210 | NA | <4.1 | NA | <0.220 | NA | <0.670 | NA | <0.780 | NA | <1.5 | NA | <1.0 | NA | NA |
| O-XYLENE | mg/kg | | | | | | <0.390 | NA | <0.210 | NA | <4.1 | NA | <0.220 | NA | <0.670 | NA | <0.780 | NA | <1.5 | NA | <1.0 | NA | NA |
| NAPHTHALENE | mg/kg | 4 | 40 | 500 | 40 | 1000 | 0.400 | NA | <0.210 | NA | 28 | NA | <0.220 | NA | <0.670 | NA | <0.780 | NA | <1.5 | NA | <1.0 | NA | NA |
| **Inorganics** | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL CHROMIUM[2] | mg/kg | 30 | 30 | 30 | 200 | 200 | 8.2 | 11 | 9.3 | 46 | 7.6 | 48 | 8.6 | 12 | 94.0 | 30 | 39.0 | 9.0 | 12.0 | 130 | 12.0 | 6.4 | 6.2 |
| TRIVALENT CHROMIUM | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA[3] | 11 | NA[3] | 46 | NA[3] | 48 | NA[3] | 12 | NA[3] | 30 | NA[3] | 9.0 | NA[3] | 130 | NA[3] | 6.4 | 6.2 |
| HEXAVALENT CHROMIUM | mg/kg | 30 | 30 | 30 | 200 | 200 | <1.3[3] | <0.39 | <1.1[3] | <0.52 | <1.5[3] | <0.61 | <1.1[3] | <7.8 | <1.6[3] | <1.1 | <1.8[3] | <0.40 | <2.2[3] | <1.0 | <1.6[3] | <1.1 | <0.41 |
| LEAD | mg/kg | 300 | 300 | 300 | 300 | 300 | 21 | NA | 20 | NA | 160 | NA | 51 | NA | 200 | NA | 200 | NA | 730 | NA | 51 | NA | NA |
| **General Chemistry** | | | | | | | | | | | | | | | | | | | | | | | |
| pH | pH units | NS | NS | NS | NS | NS | 7.4 | 7.8 | 7.8 | 7.8 | 8.4 | 7.8 | 8.3 | 7.6 | 7.9 | 7.4 | 8.2 | 7.1 | 8.0 | 7.2 | 7.9 | 7.4 | 7.3 |
| ORP | mV | NS | NS | NS | NS | NS | 180 | 86 | 220 | 83 | 170 | 100 | 170 | 98 | 220 | 78 | 200 | 66 | 210 | 82 | 220 | 86 | 83 |
| PERCENT SOLIDS | % weight | NS | NS | NS | NS | NS | NA | 80.1 | NA | 61.2 | NA | 52.1 | NA | 50.3 | NA | 68.8 | NA | 77.2 | NA | 75.1 | NA | 72.1 | 77.0 |

QA/QC by LEM 6/7/12; JRS 8/22/12

**Abbreviations:**
EPH = Extractable Petroleum Hydrocarbons
TPH = Total Petroleum Hydrocarbons
VPH = Volatile Petroleum Hydrocarbons
mg/kg = milligrams per kilogram
mV = millivolts
NS = No Standard
NA = Not Analyzed
RC = Reportable Concentration
ORP = Oxidation/Reduction Potential

**Notes:**
* = Reported result is an estimated concentration.
< = indicates parameter not detected above laboratory method reporting limit, shown
1 = Standards are from the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000, revised June 26, 2009
2 = Total Chromium standard applies only in the absence of chromium speciation
3 = Laboratory results for hexavalent chromium are considered invalid due to holding time non-conformances; therefore, results are compared to the Total Chromium standard
4 = Standard is for mixed isomers, MassDEP does not publish standards for individual isomers
5 = Standards are from the MassDEP website updated February 2008
6 = Reporting limits exceed the RC S-1 standard
7 = Reporting limits exceed the applicable Method 1 standard and the RC S-1 standard

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**Table 1d**
**Weston & Sampson**
**Summary of Soil Analytical Results**
**45 Cove Street**
**New Bedford, MA**
**April, May, August 2012**

| Parameters | Units | MassDEP Reportable Concentrations[5] | Method 1 Soil Standards[1] | | | | Sampling Location, Depth, and Date | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RC S-1 | S-1/GW2 | S-1/GW3 | S-2/GW2 | S-2/GW3 | TP-8N 0-3 ft 5/7/12 | TP-8N 0-3 ft 8/9/12 | TP-8S 0-3 ft 5/7/12 | TP-8S 0-3 ft 8/9/12 | TP-8E 0-3 ft 5/7/12 | TP-8E 0-3 ft 8/9/12 | TP-8W 0-3 ft 5/7/12 | TP-8W 0-3 ft 8/9/12 | TP-9N 0-3 ft 4/30/12 | TP-9N 0-3 ft 8/9/12 | TP-9S 0-3 ft 4/30/12 | TP-9S 0-3 ft 8/9/12 | TP-9E 0-3 ft 4/30/12 | TP-9E 0-3 ft 8/9/12 | TP-9W 0-3 ft 4/30/12 | TP-Dup 0-3 ft 4/30/12 | TP-9W 0-3 ft 8/9/12 |
| **TPH** | | | | | | | | | | | | | | | | | | | | | | | |
| UNADJUSTED TPH | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | 260 | NA | 290 * | NA | 390 * | NA | 440 * | NA | 660 * | NA | 990 * | NA | 180 * | NA | 320 * | 630 * | NA |
| **EPH** | | | | | | | | | | | | | | | | | | | | | | | |
| C9-C18 ALIPHATICS | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | <14 | NA | 34 | NA | <13 | NA | <18 | NA | <14 | NA | <12 | NA | <14 | NA | NA | 310 |
| C19-C36 ALIPHATICS | mg/kg | 3000 | 3000 | 3000 | 5000 | 5000 | NA | 20 | NA | 250 | NA | <13 | NA | 23 | NA | 58 | NA | 18 | NA | 17 | NA | NA | 1100 |
| Unadjusted n-C11 to n-C22 AROMATICS | mg/kg | NS | NS | NS | NS | NS | NA | 33 | NA | 190 | NA | <13 | NA | 43 | NA | 130 | NA | 240 | NA | 41 | NA | NA | 2200 |
| C11-C22 AROMATICS | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | 31 | NA | 160 | NA | <13 | NA | 43 | NA | 100 | NA | 140 | NA | 35 | NA | NA | 2000 |
| ACENAPHTHENE | mg/kg | 4 | 1000 | 1000 | 3000 | 3000 | NA | <0.14 | NA | <0.27 | NA | <0.13 | NA | <0.18 | NA | 0.28 | NA | 0.48 | NA | <0.14 | NA | NA | 2.0 |
| ACENAPHTHYLENE | mg/kg | 1 | 600 | 10 | 600 | 10 | NA | <0.14 | NA | <0.27 | NA | <0.13 | NA | <0.18 | NA | <0.14 | NA | 0.41 | NA | <0.14 | NA | NA | <0.73 |
| ANTHRACENE | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | <0.14 | NA | 0.47 | NA | <0.13 | NA | <0.18 | NA | 0.58 | NA | 3.1 | NA | <0.14 | NA | NA | 5.3 |
| BENZO(A)ANTHRACENE | mg/kg | 7 | 7 | 7 | 40 | 40 | NA | 0.31 | NA | 5.6 | NA | <0.13 | NA | <0.18 | NA | 2.3 | NA | 6.8 | NA | 0.45 | NA | NA | 13 |
| BENZO(A)PYRENE | mg/kg | 2 | 2 | 2 | 4 | 4 | NA | 0.18 | NA | 2.1 | NA | <0.13 | NA | <0.18 | NA | 1.9 | NA | 6.1 | NA | 0.46 | NA | NA | 12 |
| BENZO(B)FLUORANTHENE | mg/kg | 7 | 7 | 7 | 40 | 40 | NA | 0.24 | NA | 3.0 | NA | <0.13 | NA | <0.18 | NA | 2.9 | NA | 8.3 | NA | 0.64 | NA | NA | 16 |
| BENZO(G,H,I)PERYLENE | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | <0.14 | NA | 1.4 | NA | <0.13 | NA | <0.18 | NA | <0.14 | NA | 5.5 | NA | <0.14 | NA | NA | 4.6 |
| BENZO(K)FLUORANTHENE | mg/kg | 70 | 70 | 70 | 400 | 400 | NA | <0.14 | NA | 1.1 | NA | <0.13 | NA | <0.18 | NA | 0.98 | NA | 3.1 | NA | 0.21 | NA | NA | 6.3 |
| CHRYSENE | mg/kg | 70 | 70 | 70 | 400 | 400 | NA | 0.25 | NA | 2.8 | NA | <0.13 | NA | <0.18 | NA | 2.4 | NA | 7.2 | NA | 0.54 | NA | NA | 13 |
| DIBENZ(A,H)ANTHRACENE | mg/kg | 0.7 | 0.7 | 0.7 | 4 | 4 | NA | <0.14 | NA | 0.41 | NA | <0.13 | NA | <0.18 | NA | 0.39 | NA | 0.95 | NA | <0.14 | NA | NA | 2.0 |
| FLUORANTHENE | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | 0.38 | NA | 4.3 | NA | <0.13 | NA | <0.18 | NA | 5.2 | NA | 19 | NA | 1.0 | NA | NA | 38 |
| FLUORENE | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | <0.14 | NA | 0.30 | NA | <0.13 | NA | <0.18 | NA | 0.36 | NA | 1.2 | NA | <0.14 | NA | NA | 3.1 |
| INDENO(1,2,3-CD)PYRENE | mg/kg | 7 | 7 | 7 | 40 | 40 | NA | <0.14 | NA | 1.4 | NA | <0.13 | NA | <0.18 | NA | 1.4 | NA | 4.3 | NA | 0.36 | NA | NA | 5.8 |
| 2-METHYLNAPHTHALENE | mg/kg | 0.7 | 80 | 300 | 80 | 500 | NA | <0.14 | NA | <0.27 | NA | <0.13 | NA | <0.18 | NA | <0.14 | NA | <0.12 | NA | <0.14 | NA | NA | <0.73 [6] |
| NAPHTHALENE | mg/kg | 4 | 40 | 500 | 40 | 1000 | NA | <0.14 | NA | <0.27 | NA | <0.13 | NA | <0.18 | NA | <0.14 | NA | <0.12 | NA | <0.14 | NA | NA | 0.81 |
| PHENANTHRENE | mg/kg | 10 | 500 | 500 | 1000 | 1000 | NA | 0.27 | NA | 2.8 | NA | <0.13 | NA | <0.18 | NA | 2.6 | NA | 14 | NA | 0.66 | NA | NA | 34 |
| PYRENE | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA | 0.36 | NA | 4.3 | NA | <0.13 | NA | 0.39 | NA | 4.8 | NA | 17 | NA | 0.97 | NA | NA | 40 |
| **VPH** | | | | | | | | | | | | | | | | | | | | | | | |
| C5-C8 ALIPHATICS | mg/kg | 100 | 100 | 100 | 500 | 500 | <14 | NA | <12 | NA | <26 | NA | <22 | NA | <9.2 | NA | <78 | NA | <6.3 | NA | <5.9 | <5.3 | NA |
| C9-C12 ALIPHATICS | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | <14 | NA | <12 | NA | <26 | NA | <22 | NA | <9.2 | NA | <78 | NA | 23 | NA | <5.9 | <5.3 | NA |
| C9-C10 AROMATICS | mg/kg | 100 | 100 | 100 | 500 | 500 | <14 | NA | <12 | NA | <26 | NA | <22 | NA | <9.2 | NA | <78 | NA | 12 | NA | <5.9 | <5.3 | NA |
| MTBE | mg/kg | 0.1 | 100 | 100 | 100 | 500 | <0.140 | NA | <0.120 | NA | <0.260 | NA | <0.220 | NA | <0.092 | NA | <0.780 | NA | <0.063 | NA | <0.059 | <0.053 | NA |
| BENZENE | mg/kg | 2 | 30 | 30 | 200 | 200 | <0.720 | NA | <0.620 | NA | <1.3 | NA | <1.1 | NA | <0.460 | NA | <3.9 | NA | <0.310 | NA | <0.300 | <0.270 | NA |
| TOLUENE | mg/kg | 30 | 500 | 500 | 1000 | 1000 | <0.720 | NA | <0.620 | NA | <1.3 | NA | <1.1 | NA | <0.460 | NA | <3.9 | NA | <0.310 | NA | <0.300 | <0.270 | NA |
| ETHYLBENZENE | mg/kg | 40 | 500 | 500 | 1000 | 1000 | <0.720 | NA | <0.620 | NA | <1.3 | NA | <1.1 | NA | <0.460 | NA | <3.9 | NA | <0.310 | NA | <0.300 | <0.270 | NA |
| M,P- XYLENES | mg/kg | 300 [4] | 300 [4] | 500 [4] | 300 [4] | 1000 [4] | <0.720 | NA | <0.620 | NA | <1.3 | NA | <1.1 | NA | <0.460 | NA | <3.9 | NA | <0.310 | NA | 0.5 | <0.270 | NA |
| O-XYLENE | mg/kg | | | | | | <0.720 | NA | <0.620 | NA | <1.3 | NA | <1.1 | NA | <0.460 | NA | <3.9 | NA | <0.310 | NA | <0.300 | <0.270 | NA |
| NAPHTHALENE | mg/kg | 4 | 40 | 500 | 40 | 1000 | <0.720 | NA | <0.620 | NA | <1.3 | NA | <1.1 | NA | <0.460 | NA | <3.9 | NA | <0.310 | NA | <0.300 | <0.270 | NA |
| **Inorganics** | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL CHROMIUM[2] | mg/kg | 30 | 30 | 30 | 200 | 200 | 18.0 | 11.0 | 28.0 | 36.0 | 15.0 | 11.0 | 9.9 | 20.0 | 28.0 | 25.0 | 8.4 | 11.0 | 13.0 | 10.0 | 10.0 | 12.0 | 170.0 |
| TRIVALENT CHROMIUM | mg/kg | 1000 | 1000 | 1000 | 3000 | 3000 | NA[3] | 11.0 | NA[3] | 36.0 | NA[3] | 11.0 | NA[3] | 20.0 | NA[3] | 25.0 | NA[3] | 11.0 | NA[3] | 10.0 | NA[3] | NA[3] | 170.0 |
| HEXAVALENT CHROMIUM | mg/kg | 30 | 30 | 30 | 200 | 200 | <1.9[3] | <0.44 | <1.9[3] | <0.44 | <2.8[3] | 1.0 | <1.5[3] | <1.4 | <1.4[3] | <1.1 | <5.7[3] | <0.98 | <1.2[3] | <1.1 | <1.2[3] | <1.2[3] | <0.46 |
| LEAD | mg/kg | 300 | 300 | 300 | 300 | 300 | 15 | NA | 120 | NA | 50 | NA | 31 | NA | 120 | NA | 9.4 | NA | 58 | NA | 25 | 33 | NA |
| **General Chemistry** | | | | | | | | | | | | | | | | | | | | | | | |
| pH | pH units | NS | NS | NS | NS | NS | 8.2 | 7.8 | 8.4 | 7.8 | 8.3 | 8.0 | 8.6 | 8.1 | 7.7 | 7.4 | 7.8 | 7.9 | 9.1 | 7.8 | 9.1 | 9.2 | 7.4 |
| ORP | mV | NS | NS | NS | NS | NS | 200 | 96 | 190 | 110 | 190 | 100 | 190 | 100 | 240 | 68 | 260 | 90 | 190 | 89 | 190 | 170 | 76 |
| PERCENT SOLIDS | % weight | NS | NS | NS | NS | NS | NA | 71.4 | NA | 35.9 | NA | 78.5 | NA | 54.8 | NA | 72.2 | NA | 81.3 | NA | 71.6 | NA | NA | 68 |

QA/QC by LEM 6/7/12; JRS 8/22/12

**Abbreviations:**
EPH = Extractable Petroleum Hydrocarbons
TPH = Total Petroleum Hydrocarbons
VPH = Volatile Petroleum Hydrocarbons
mg/kg = milligrams per kilogram
mV = millivolts
NS = No Standard
NA = Not Analyzed
RC = Reportable Concentration
ORP = Oxidation/Reduction Potential

**Notes:**
* = Reported result is an estimated concentration.
< = indicates parameter not detected above laboratory method reporting limit, shown
1 = Standards are from the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000, revised June 26, 2009
2 = Total Chromium standard applies only in the absence of chromium speciation
3 = Laboratory results for hexavalent chromium are considered invalid due to holding time non-conformances; therefore, results are compared to the Total Chromium standard
4 = Standard is for mixed isomers, MassDEP does not publish standards for individual isomers
5 = Standards are from the MassDEP website updated February 2008
6 = Reporting limits exceed the RC S-1 standard
7 = Reporting limits exceed the applicable Method 1 standard and the RC S-1 standard

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**Table 2a**
**Weston & Sampson**
**Summary of Groundwater Analytical Results**
**45 Cove Street**
**New Bedford, MA**

| Parameters | Units | MCP RCGW-2 Standards | MCP Method 1 Groundwater Cleanup Standards | | Sample ID and Date | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | GW-2 | GW-3 | MW-1 4/29/11 | MW-2 4/29/11 | MW-4 4/28/11 | MW-5 4/29/11 | MW-6 4/28/11 | WS-1 4/29/11 | DUP-1 (WS-1) 4/29/11 | WS-3 4/29/11 | WS-4 4/29/11 | WS-7 4/28/11 | WS-8 4/29/11 | WS-9 4/28/11 | WS-11 4/28/11 | WS-13 4/28/11 | WS-14 4/28/11 | WS-15 4/28/11 |
| **EPH** | | | | | | | | | | | | | | | | | | | | |
| C9-C18 Aliphatics | mg/kg | 5 | 5 | 50 | <0.14 | <0.2 | <0.12 | <0.2 | <0.15 | <0.2 | <0.2 | <0.2 | <0.13 | <0.15 | 0.87 | <0.16 | <0.16 | <0.15 | <0.15 | <0.15 |
| C19-C36 Aliphatics | mg/kg | 50 | NS | 50 | <0.14 | <0.2 | <0.12 | <0.2 | <0.15 | <0.2 | <0.2 | <0.2 | <0.13 | <0.15 | 0.72 | <0.16 | <0.16 | <0.15 | <0.15 | <0.15 |
| C11-C22 Aromatics | mg/kg | 5 | 50 | 5 | <0.14 | <0.2 | <0.12 | <0.2 | <0.15 | <0.2 | <0.2 | <0.2 | <0.13 | <0.15 | 0.48 | <0.16 | <0.16 | <0.15 | <0.15 | <0.15 |
| Unadjusted n-C11 to n-C22 Aromat | mg/kg | NS | NS | NS | <0.14 | <0.2 | <0.12 | <0.2 | <0.15 | <0.2 | <0.2 | <0.2 | <0.13 | <0.15 | 0.51 | <0.16 | <0.16 | <0.15 | <0.15 | <0.15 |
| **PAHs** | | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | | 6 | NS | 6 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(a)anthracene | mg/kg | 1 | NS | 1.0 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.0003 | <0.0001 | <0.0001 | 0.0002 | <0.0001 | 0.0002 | <0.0001 | <0.0001 | <0.0001 |
| Benzo(a)pyrene | mg/kg | 0.5 | NS | 0.5 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.0003 | <0.0001 | <0.0001 | 0.0002 | <0.0001 | 0.0002 | <0.0001 | <0.0001 | <0.0001 |
| Benzo(b)fluoranthene | mg/kg | 0.4 | NS | 0.4 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0005 | <0.0001 | <0.0001 | 0.0004 | <0.0001 | <0.0005 | 0.0004 | <0.0001 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(g,h,i)perylene | mg/kg | 0.02 | NS | 0.02 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0005 | <0.0001 | <0.0001 | 0.0002 | <0.0001 | <0.0005 | 0.0002 | <0.0001 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(k)fluoranthene | mg/kg | 0.1 | NS | 0.1 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0005 | <0.0001 | <0.0001 | 0.0001 | <0.0001 | <0.0005 | 0.0001 | <0.0001 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Chrysene | mg/kg | 0.07 | NS | 0.07 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.0003 | <0.0001 | <0.0001 | 0.0002 | <0.0001 | 0.0002 | <0.0001 | <0.0001 | <0.0001 |
| Fluoranthene | mg/kg | 0.2 | NS | 0.2 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0006 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Indeno(1,2,3-cd) Pyrene | mg/kg | 0.1 | NS | 0.1 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.0002 | <0.0001 | <0.0001 | 0.0002 | <0.0001 | 0.0002 | <0.0001 | <0.0001 | <0.0001 |
| 2-Methylnaphthalene | mg/kg | 2 | 2 | 20 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0006 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Naphthalene | mg/kg | 1.0 | 1 | 20 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.011 | 0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Pyrene | mg/kg | 0.02 | NS | 0.02 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| **VPH** | | | | | | | | | | | | | | | | | | | | |
| C5-C8 Aliphatics | mg/kg | 3 | 3 | 50 | <0.02 | <0.02 | <0.020 | <0.02 | <0.020 | <0.02 | <0.02 | <0.02 | <0.02 | <0.020 | <0.04 | <0.020 | 0.02 | <0.020 | 0.04 | <0.020 |
| C9-C12 Aliphatics | mg/kg | 5 | 5 | 50 | <0.02 | <0.02 | <0.020 | <0.02 | <0.020 | 0.033 | 0.031 | <0.02 | <0.02 | 0.035 | 0.54 | 0.037 | <0.020 | <0.020 | 0.027 | <0.020 |
| C9-C10 Aromatics | mg/kg | 7 | 7 | 50 | <0.02 | <0.02 | <0.020 | <0.02 | <0.020 | 0.028 | 0.027 | <0.02 | <0.02 | 0.026 | 0.99 | 0.025 | <0.020 | <0.020 | 0.029 | <0.020 |
| Unadjusted C5-C8 Aliphatics | mg/kg | NS | NS | NS | <0.02 | <0.02 | <0.020 | <0.02 | <0.020 | <0.02 | <0.02 | <0.02 | <0.02 | 0.02 | <0.04 | <0.020 | 0.021 | <0.020 | 0.042 | <0.020 |
| Unadjusted C9-C12 Aliphatics | mg/kg | NS | NS | NS | <0.02 | <0.02 | <0.020 | <0.02 | <0.020 | 0.061 | 0.059 | 0.033 | 0.024 | 0.063 | 1.6 | 0.062 | 0.035 | <0.020 | 0.059 | 0.022 |
| **Target VOCs** | | | | | | | | | | | | | | | | | | | | |
| Benzene | mg/kg | 2 | 2 | 10 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.002 | <0.001 | <0.001 | <0.002 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Total Xylenes | mg/kg | 5 | 9 | 5 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.017 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Naphthalene | mg/kg | 1 | 1 | 20 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | 0.023 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| **VOCs 8260** | | | | | | | | | | | | | | | | | | | | |
| Acetone | mg/kg | 50 | 50 | 50 | 0.19 | <0.01 | <0.01 | <0.01 | <0.01 | 0.026 | 0.023 | 0.011 | 0.13 | 0.016 | <0.1 | 0.073 | 0.046 | 0.016 | 0.14 | 0.022 |
| Chloromethane | mg/kg | NS | NS | NS | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0057 | <0.0005 | <0.0005 | <0.005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Butanone | mg/kg | 50 | 50 | 50 | 0.0071 | <0.005 | <0.005 | <0.005 | <0.005 | 0.0061 | <0.005 | <0.005 | 0.0055 | <0.005 | <0.05 | 0.0065 | 0.0093 | <0.005 | 0.021 | <0.005 |
| Benzene | mg/kg | 2 | 2 | 10 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0018 | <0.0005 | <0.0005 | <0.005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Hexanone | mg/kg | NS | NS | NS | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.05 | <0.005 | 0.018 | <0.005 | 0.0091 | <0.005 |
| 4-Isopropyltoluene | mg/kg | NS | NS | NS | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0064 | 0.0016 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Isopropylbenzene | mg/kg | NS | NS | NS | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.032 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Naphthalene | mg/kg | 1 | 1 | 20 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.023 | 0.0011 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| N-Propylbenzene | mg/kg | NS | NS | NS | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.017 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| sec-Butylbenzene | mg/kg | NS | NS | NS | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.016 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,2,4-Trimethylbenzene | mg/kg | NS | NS | NS | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.51 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Toluene | mg/kg | 40 | 50 | 40 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.00056 | <0.0005 | <0.0005 | <0.005 | 0.00051 | 0.00064 | <0.0005 | 0.0016 | 0.00069 |
| Total Xylenes | mg/kg | 5 | 9 | 5 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.013 | <0.0005 | <0.0005 | <0.0005 | 0.00055 | <0.0005 |
| 1,3,5-Trimethylbenzene | mg/kg | NS | NS | NS | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.044 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| **Trace Metals** | | | | | | | | | | | | | | | | | | | | |
| Arsenic | mg/kg | 0.9 | NS | 0.9 | <0.01 | <0.01 | 0.02 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Barium | mg/kg | 50 | NS | 50 | 0.14 | 0.11 | 0.40 | <0.05 | <0.05 | 0.21 | 0.22 | 0.08 | 0.23 | 0.11 | 0.06 | 0.34 | <0.05 | <0.05 | <0.05 | <0.05 |
| Cadmium | mg/kg | 0.004 | NS | 0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| Chromium | mg/kg | 0.3 | NS | 0.3 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.03 | <0.01 | <0.01 | <0.01 |
| Mercury | mg/kg | 0.02 | NS | 0.02 | <0.0002 | 0.0003 | <0.0002 | 0.0002 | <0.0002 | <0.0002 | 0.0003 | 0.0002 | 0.0003 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| Selenium | mg/kg | 0.1 | NS | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Silver | mg/kg | 0.007 | NS | 0.007 | <0.007 | <0.007 | 0.039 | <0.007 | <0.007 | 0.012 | 0.014 | <0.007 | 0.014 | <0.007 | 0.018 | <0.007 | <0.007 | <0.007 | <0.007 | <0.007 |

QC by LEM 5/31/11

**Abbreviations:**
SVOCs = Semi-Volatile Organic Compounds
EPH = Extractable Petroleum Hydrocarbons
VPH = Volatile Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls
mg/kg = milligrams per kilogram
NS = No Standard
NA = Not Analyzed

**Notes:**
Lab ID: 141550 & 141577
Standards are from the Massachusetts Contingency Plan (MCP),
310 CMR 40.0000, revised February 14, 2008.
< = indicates parameter not detected above laboratory method reporting limit, shown

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**Table 2b**
**Weston & Sampson**
**Summary of Groundwater Analytical Results**
**45 Cove Street**
**New Bedford, MA**
**April 16, 2012**

| Parameter | Units | Method 1 GW-1 Standard (1) | Method 1 GW-2 Standard (1) | Method 1 GW-3 Standard (1) | Monitoring Wells | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | WS-4 | WS-4 (DUP-1) | MW-4 | WS-1 | WS-8 |
| **Dissolved Metals** | | | | | | | | | |
| Silver | mg/L | 100 | NS | 0.007 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 |

QC by EN

O:\New Bedford - Cove St\Cove St\Reports\Phase I Site Investigation & Tier Classification\Tables\[Table 2b - Groundwater Analytical Results REV JSC.xls]Sheet1

**Abbreviations:**

mg/L = milligrams per liter
NS = no standard

**Notes:**

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**CP BRODEUR, INC.**

**RTN: 4-23643**

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | A01 | A02 | A02 | A02 | A02 | A02 | A03 | A04 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-A01-0-1 | SO-A02-0-1 | SO-A02-0-2 | SO-A02-2-4 | SO-A02-4-6 | SO-A02-6-8 | SO-A03-0-1 | SO-A04-0-1 |
| Collection Depth (ft bgs) | MCP | 0 - 1 | 0 - 1 | 0 - 2 | 2 - 4 | 4 - 6 | 6 - 8 | 0 - 1 | 0 - 1 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.069) | 0.11 (0.069) | ND (0.071) | ND (0.073) | ND (0.073) | ND (0.096) | 0.12 (0.067) | ND (0.07) |
| Aroclor-1016 | NE | ND (0.069) | ND (0.069) | ND (0.071) | ND (0.073) | ND (0.073) | ND (0.096) | ND (0.067) | ND (0.07) |
| Aroclor-1221 | NE | ND (0.069) | ND (0.069) | ND (0.071) | ND (0.073) | ND (0.073) | ND (0.096) | ND (0.067) | ND (0.07) |
| Aroclor-1232 | NE | ND (0.069) | ND (0.069) | ND (0.071) | ND (0.073) | ND (0.073) | ND (0.096) | ND (0.067) | ND (0.07) |
| Aroclor-1242 | NE | ND (0.069) | ND (0.069) | ND (0.071) | ND (0.073) | ND (0.073) | ND (0.096) | ND (0.067) | ND (0.07) |
| Aroclor-1248 | NE | ND (0.069) | ND (0.069) | ND (0.071) | ND (0.073) | ND (0.073) | ND (0.096) | ND (0.067) | ND (0.07) |
| Aroclor-1254 | NE | ND (0.069) | 0.11 (0.069) | ND (0.071) | ND (0.073) | ND (0.073) | ND (0.096) | 0.12 (0.067) | ND (0.07) |
| Aroclor-1260 | NE | ND (0.069) | ND (0.069) | ND (0.071) | ND (0.073) | ND (0.073) | ND (0.096) | ND (0.067) | ND (0.07) |
| Aroclor-1262 | NE | ND (0.069) | ND (0.069) | ND (0.071) | ND (0.073) | ND (0.073) | ND (0.096) | ND (0.067) | ND (0.07) |
| Aroclor-1268 | NE | ND (0.069) | ND (0.069) | ND (0.071) | ND (0.073) | ND (0.073) | ND (0.096) | ND (0.067) | ND (0.07) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | A05 | A06 | A07 | A08 | A09 | A10 | B01 | B01 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-A05-0-1 | SO-A06-0-1 | SO-A07-0-1 | SO-A08-0-1 | SO-A09-0-1 | SO-A10-0-1 | SO-B01-0-1 | DUP-5 |
| Collection Depth (ft bgs) | MCP | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | | | | Field Duplicate |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.07) | ND (0.07) | ND (0.072) | ND (0.067) | ND (0.069) | ND (0.069) | ND (0.068) | ND (0.068) |
| Aroclor-1016 | NE | ND (0.07) | ND (0.07) | ND (0.072) | ND (0.067) | ND (0.069) | ND (0.069) | ND (0.068) | ND (0.068) |
| Aroclor-1221 | NE | ND (0.07) | ND (0.07) | ND (0.072) | ND (0.067) | ND (0.069) | ND (0.069) | ND (0.068) | ND (0.068) |
| Aroclor-1232 | NE | ND (0.07) | ND (0.07) | ND (0.072) | ND (0.067) | ND (0.069) | ND (0.069) | ND (0.068) | ND (0.068) |
| Aroclor-1242 | NE | ND (0.07) | ND (0.07) | ND (0.072) | ND (0.067) | ND (0.069) | ND (0.069) | ND (0.068) | ND (0.068) |
| Aroclor-1248 | NE | ND (0.07) | ND (0.07) | ND (0.072) | ND (0.067) | ND (0.069) | ND (0.069) | ND (0.068) | ND (0.068) |
| Aroclor-1254 | NE | ND (0.07) | ND (0.07) | ND (0.072) | ND (0.067) | ND (0.069) | ND (0.069) | ND (0.068) | ND (0.068) |
| Aroclor-1260 | NE | ND (0.07) | ND (0.07) | ND (0.072) | ND (0.067) | ND (0.069) | ND (0.069) | ND (0.068) | ND (0.068) |
| Aroclor-1262 | NE | ND (0.07) | ND (0.07) | ND (0.072) | ND (0.067) | ND (0.069) | ND (0.069) | ND (0.068) | ND (0.068) |
| Aroclor-1268 | NE | ND (0.07) | ND (0.07) | ND (0.072) | ND (0.067) | ND (0.069) | ND (0.069) | ND (0.068) | ND (0.068) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | B02 | B04 | B05 | B06 | B07 | B08 | B09 | B10 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-B02-0-1 | SO-B04-0-1 | SO-B05-0-1 | SO-B06-0-1 | SO-B07-0-1 | SO-B08-0-1 | SO-B09-0-1 | SO-B10-0-1 |
| Collection Depth (ft bgs) | MCP | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.073) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.071) | ND (0.071) | ND (0.071) |
| Aroclor-1016 | NE | ND (0.073) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.071) | ND (0.071) | ND (0.071) |
| Aroclor-1221 | NE | ND (0.073) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.071) | ND (0.071) | ND (0.071) |
| Aroclor-1232 | NE | ND (0.073) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.071) | ND (0.071) | ND (0.071) |
| Aroclor-1242 | NE | ND (0.073) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.071) | ND (0.071) | ND (0.071) |
| Aroclor-1248 | NE | ND (0.073) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.071) | ND (0.071) | ND (0.071) |
| Aroclor-1254 | NE | ND (0.073) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.071) | ND (0.071) | ND (0.071) |
| Aroclor-1260 | NE | ND (0.073) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.071) | ND (0.071) | ND (0.071) |
| Aroclor-1262 | NE | ND (0.073) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.071) | ND (0.071) | ND (0.071) |
| Aroclor-1268 | NE | ND (0.073) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.068) | ND (0.071) | ND (0.071) | ND (0.071) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | C01 | C02 | C04 | C05 | C06 | C07 | C07 | C07 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-C01-0-1 | SO-C02-0-1 | SO-C04-0-1 | SO-C05-0-1 | SO-C06-0-1 | SO-C07-0-1 | SO-C07-0-2 | SO-C07-2-4 |
| Collection Depth (ft bgs) | MCP | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 2 | 2 - 4 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.07) | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.071) |
| Aroclor-1016 | NE | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.07) | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.071) |
| Aroclor-1221 | NE | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.07) | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.071) |
| Aroclor-1232 | NE | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.07) | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.071) |
| Aroclor-1242 | NE | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.07) | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.071) |
| Aroclor-1248 | NE | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.07) | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.071) |
| Aroclor-1254 | NE | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.07) | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.071) |
| Aroclor-1260 | NE | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.07) | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.071) |
| Aroclor-1262 | NE | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.07) | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.071) |
| Aroclor-1268 | NE | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.07) | ND (0.067) | ND (0.068) | ND (0.068) | ND (0.071) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | C07 | C07 | C08 | C09 | C09 | C09 | C09 | C09 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-C07-4-6 | SO-C07-6-8 | SO-C08-0-1 | SO-C09-0-1 | SO-C09-0-2 | SO-C09-2-4 | SO-C09-4-6 | SO-C09-6-8 |
| Collection Depth (ft bgs) | MCP | 4 - 6 | 6 - 8 | 0 - 1 | 0 - 1 | 0 - 2 | 2 - 4 | 4 - 6 | 6 - 8 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.071) | 0.56 (0.072) | ND (0.071) | ND (0.075) | ND (0.071) | 0.52 (0.069) | 0.038 (0.034) | 0.12 (0.093) |
| Aroclor-1016 | NE | ND (0.071) | ND (0.072) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.034) | ND (0.093) |
| Aroclor-1221 | NE | ND (0.071) | ND (0.072) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.034) | ND (0.093) |
| Aroclor-1232 | NE | ND (0.071) | ND (0.072) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.034) | ND (0.093) |
| Aroclor-1242 | NE | ND (0.071) | ND (0.072) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.034) | ND (0.093) |
| Aroclor-1248 | NE | ND (0.071) | ND (0.072) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.034) | ND (0.093) |
| Aroclor-1254 | NE | ND (0.071) | 0.56 (0.072) | ND (0.071) | ND (0.075) | ND (0.071) | 0.52 (0.069) | 0.038 (0.034) | 0.12 (0.093) |
| Aroclor-1260 | NE | ND (0.071) | ND (0.072) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.034) | ND (0.093) |
| Aroclor-1262 | NE | ND (0.071) | ND (0.072) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.034) | ND (0.093) |
| Aroclor-1268 | NE | ND (0.071) | ND (0.072) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.034) | ND (0.093) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | C09 | C10 | D01 | D02 | D03 | D03 | D04 | D04 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | DUP-6 | SO-C10-0-1 | SO-D01-0-1 | SO-D02-0-1 | SO-D03-0-1 | DUP-2 | SO-D04-0-1 | SO-D04-0-2 |
| Collection Depth (ft bgs) | MCP | 4 - 6 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 2 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | Field Duplicate | | | | | Field Duplicate | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.069) | ND (0.07) | ND (0.069) | ND (0.069) | ND (0.069) | ND (0.067) | ND (0.068) | ND (0.068) |
| Aroclor-1016 | NE | ND (0.069) | ND (0.07) | ND (0.069) | ND (0.069) | ND (0.069) | ND (0.067) | ND (0.068) | ND (0.068) |
| Aroclor-1221 | NE | ND (0.069) | ND (0.07) | ND (0.069) | ND (0.069) | ND (0.069) | ND (0.067) | ND (0.068) | ND (0.068) |
| Aroclor-1232 | NE | ND (0.069) | ND (0.07) | ND (0.069) | ND (0.069) | ND (0.069) | ND (0.067) | ND (0.068) | ND (0.068) |
| Aroclor-1242 | NE | ND (0.069) | ND (0.07) | ND (0.069) | ND (0.069) | ND (0.069) | ND (0.067) | ND (0.068) | ND (0.068) |
| Aroclor-1248 | NE | ND (0.069) | ND (0.07) | ND (0.069) | ND (0.069) | ND (0.069) | ND (0.067) | ND (0.068) | ND (0.068) |
| Aroclor-1254 | NE | ND (0.069) | ND (0.07) | ND (0.069) | ND (0.069) | ND (0.069) | ND (0.067) | ND (0.068) | ND (0.068) |
| Aroclor-1260 | NE | ND (0.069) | ND (0.07) | ND (0.069) | ND (0.069) | ND (0.069) | ND (0.067) | ND (0.068) | ND (0.068) |
| Aroclor-1262 | NE | ND (0.069) | ND (0.07) | ND (0.069) | ND (0.069) | ND (0.069) | ND (0.067) | ND (0.068) | ND (0.068) |
| Aroclor-1268 | NE | ND (0.069) | ND (0.07) | ND (0.069) | ND (0.069) | ND (0.069) | ND (0.067) | ND (0.068) | ND (0.068) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | D04 | D04 | D04 | D05 | D05 | D06 | D07 | D08 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-D04-2-4 | SO-D04-4-6 | SO-D04-6-8 | SO-D05-0-1 | DUP-1 | SO-D06-0-1 | SO-D07-0-1 | SO-D08-0-1 |
| Collection Depth (ft bgs) | MCP | 2 - 4 | 4 - 6 | 6 - 8 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | Field Duplicate | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.07) | 0.082 (0.076) | 0.1 (0.084) | ND (0.069) | ND (0.068) | ND (0.067) | ND (0.068) | ND (0.069) |
| Aroclor-1016 | NE | ND (0.07) | ND (0.076) | ND (0.084) | ND (0.069) | ND (0.068) | ND (0.067) | ND (0.068) | ND (0.069) |
| Aroclor-1221 | NE | ND (0.07) | ND (0.076) | ND (0.084) | ND (0.069) | ND (0.068) | ND (0.067) | ND (0.068) | ND (0.069) |
| Aroclor-1232 | NE | ND (0.07) | ND (0.076) | ND (0.084) | ND (0.069) | ND (0.068) | ND (0.067) | ND (0.068) | ND (0.069) |
| Aroclor-1242 | NE | ND (0.07) | ND (0.076) | ND (0.084) | ND (0.069) | ND (0.068) | ND (0.067) | ND (0.068) | ND (0.069) |
| Aroclor-1248 | NE | ND (0.07) | ND (0.076) | ND (0.084) | ND (0.069) | ND (0.068) | ND (0.067) | ND (0.068) | ND (0.069) |
| Aroclor-1254 | NE | ND (0.07) | 0.082 (0.076) | 0.1 (0.084) | ND (0.069) | ND (0.068) | ND (0.067) | ND (0.068) | ND (0.069) |
| Aroclor-1260 | NE | ND (0.07) | ND (0.076) | ND (0.084) | ND (0.069) | ND (0.068) | ND (0.067) | ND (0.068) | ND (0.069) |
| Aroclor-1262 | NE | ND (0.07) | ND (0.076) | ND (0.084) | ND (0.069) | ND (0.068) | ND (0.067) | ND (0.068) | ND (0.069) |
| Aroclor-1268 | NE | ND (0.07) | ND (0.076) | ND (0.084) | ND (0.069) | ND (0.068) | ND (0.067) | ND (0.068) | ND (0.069) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | D09 | D10 | E01 | E02 | E02 | E03 | E04 | E05 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-D09-0-1 | SO-D10-0-1 | SO-E01-0-1 | SO-E02-0-1 | DUP-3 | SO-E03-0-1 | SO-E04-0-1 | SO-E05-0-1 |
| Collection Depth (ft bgs) | MCP | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | Field Duplicate | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.068) | ND (0.081) | ND (0.07) | ND (0.071) | ND (0.072) | ND (0.069) | ND (0.068) | 0.076 (0.07) |
| Aroclor-1016 | NE | ND (0.068) | ND (0.081) | ND (0.07) | ND (0.071) | ND (0.072) | ND (0.069) | ND (0.068) | ND (0.07) |
| Aroclor-1221 | NE | ND (0.068) | ND (0.081) | ND (0.07) | ND (0.071) | ND (0.072) | ND (0.069) | ND (0.068) | ND (0.07) |
| Aroclor-1232 | NE | ND (0.068) | ND (0.081) | ND (0.07) | ND (0.071) | ND (0.072) | ND (0.069) | ND (0.068) | ND (0.07) |
| Aroclor-1242 | NE | ND (0.068) | ND (0.081) | ND (0.07) | ND (0.071) | ND (0.072) | ND (0.069) | ND (0.068) | ND (0.07) |
| Aroclor-1248 | NE | ND (0.068) | ND (0.081) | ND (0.07) | ND (0.071) | ND (0.072) | ND (0.069) | ND (0.068) | ND (0.07) |
| Aroclor-1254 | NE | ND (0.068) | ND (0.081) | ND (0.07) | ND (0.071) | ND (0.072) | ND (0.069) | ND (0.068) | 0.076 (0.07) |
| Aroclor-1260 | NE | ND (0.068) | ND (0.081) | ND (0.07) | ND (0.071) | ND (0.072) | ND (0.069) | ND (0.068) | ND (0.07) |
| Aroclor-1262 | NE | ND (0.068) | ND (0.081) | ND (0.07) | ND (0.071) | ND (0.072) | ND (0.069) | ND (0.068) | ND (0.07) |
| Aroclor-1268 | NE | ND (0.068) | ND (0.081) | ND (0.07) | ND (0.071) | ND (0.072) | ND (0.069) | ND (0.068) | ND (0.07) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | E06 | E07 | E08 | E09 | E09 | E10 | F01 | F02 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-E06-0-1 | SO-E07-0-1 | SO-E08-0-1 | SO-E09-0-1 | DUP-4 | SO-E10-0-1 | SO-F01-0-1 | SO-F02-0-1 |
| Collection Depth (ft bgs) | MCP | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | Field Duplicate | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.068) | ND (0.069) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.069) | ND (0.074) | ND (0.074) |
| Aroclor-1016 | NE | ND (0.068) | ND (0.069) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.069) | ND (0.074) | ND (0.074) |
| Aroclor-1221 | NE | ND (0.068) | ND (0.069) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.069) | ND (0.074) | ND (0.074) |
| Aroclor-1232 | NE | ND (0.068) | ND (0.069) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.069) | ND (0.074) | ND (0.074) |
| Aroclor-1242 | NE | ND (0.068) | ND (0.069) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.069) | ND (0.074) | ND (0.074) |
| Aroclor-1248 | NE | ND (0.068) | ND (0.069) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.069) | ND (0.074) | ND (0.074) |
| Aroclor-1254 | NE | ND (0.068) | ND (0.069) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.069) | ND (0.074) | ND (0.074) |
| Aroclor-1260 | NE | ND (0.068) | ND (0.069) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.069) | ND (0.074) | ND (0.074) |
| Aroclor-1262 | NE | ND (0.068) | ND (0.069) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.069) | ND (0.074) | ND (0.074) |
| Aroclor-1268 | NE | ND (0.068) | ND (0.069) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.069) | ND (0.074) | ND (0.074) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | F03 | F04 | F04 | F04 | F04 | F04 | F05 | F06 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-F03-0-1 | SO-F04-0-1 | SO-F04-0-2 | SO-F04-2-4 | SO-F04-4-6 | SO-F04-6-8 | SO-F05-0-1 | SO-F06-0-1 |
| Collection Depth (ft bgs) | MCP | 0 - 1 | 0 - 1 | 0 - 2 | 2 - 4 | 4 - 6 | 6 - 8 | 0 - 1 | 0 - 1 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.071) | 0.14 (0.073) | 0.3 (0.075) | ND (0.074) | ND (0.076) | ND (0.077) | ND (0.068) | 0.3 (0.07) |
| Aroclor-1016 | NE | ND (0.071) | ND (0.073) | ND (0.075) | ND (0.074) | ND (0.076) | ND (0.077) | ND (0.068) | ND (0.07) |
| Aroclor-1221 | NE | ND (0.071) | ND (0.073) | ND (0.075) | ND (0.074) | ND (0.076) | ND (0.077) | ND (0.068) | ND (0.07) |
| Aroclor-1232 | NE | ND (0.071) | ND (0.073) | ND (0.075) | ND (0.074) | ND (0.076) | ND (0.077) | ND (0.068) | ND (0.07) |
| Aroclor-1242 | NE | ND (0.071) | ND (0.073) | ND (0.075) | ND (0.074) | ND (0.076) | ND (0.077) | ND (0.068) | ND (0.07) |
| Aroclor-1248 | NE | ND (0.071) | ND (0.073) | ND (0.075) | ND (0.074) | ND (0.076) | ND (0.077) | ND (0.068) | ND (0.07) |
| Aroclor-1254 | NE | ND (0.071) | 0.14 (0.073) | 0.3 (0.075) | ND (0.074) | ND (0.076) | ND (0.077) | ND (0.068) | 0.3 (0.07) |
| Aroclor-1260 | NE | ND (0.071) | ND (0.073) | ND (0.075) | ND (0.074) | ND (0.076) | ND (0.077) | ND (0.068) | ND (0.07) |
| Aroclor-1262 | NE | ND (0.071) | ND (0.073) | ND (0.075) | ND (0.074) | ND (0.076) | ND (0.077) | ND (0.068) | ND (0.07) |
| Aroclor-1268 | NE | ND (0.071) | ND (0.073) | ND (0.075) | ND (0.074) | ND (0.076) | ND (0.077) | ND (0.068) | ND (0.07) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | F07 | F07 | F07 | F07 | F07 | F08 | F09 | F10 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-F07-0-1 | SO-F07-0-2 | SO-F07-2-4 | SO-F07-4-6 | SO-F07-6-8 | SO-F08-0-1 | SO-F09-0-1 | SO-F10-0-1 |
| Collection Depth (ft bgs) | MCP | 0 - 1 | 0 - 2 | 2 - 4 | 4 - 6 | 6 - 8 | 0 - 1 | 0 - 1 | 0 - 1 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.069) | ND (0.071) | ND (0.07) | 0.08 (0.073) | 0.24 (0.073) | ND (0.071) | ND (0.069) | ND (0.067) |
| Aroclor-1016 | NE | ND (0.069) | ND (0.071) | ND (0.07) | ND (0.073) | ND (0.073) | ND (0.071) | ND (0.069) | ND (0.067) |
| Aroclor-1221 | NE | ND (0.069) | ND (0.071) | ND (0.07) | ND (0.073) | ND (0.073) | ND (0.071) | ND (0.069) | ND (0.067) |
| Aroclor-1232 | NE | ND (0.069) | ND (0.071) | ND (0.07) | ND (0.073) | ND (0.073) | ND (0.071) | ND (0.069) | ND (0.067) |
| Aroclor-1242 | NE | ND (0.069) | ND (0.071) | ND (0.07) | ND (0.073) | ND (0.073) | ND (0.071) | ND (0.069) | ND (0.067) |
| Aroclor-1248 | NE | ND (0.069) | ND (0.071) | ND (0.07) | ND (0.073) | ND (0.073) | ND (0.071) | ND (0.069) | ND (0.067) |
| Aroclor-1254 | NE | ND (0.069) | ND (0.071) | ND (0.07) | 0.08 (0.073) | 0.24 (0.073) | ND (0.071) | ND (0.069) | ND (0.067) |
| Aroclor-1260 | NE | ND (0.069) | ND (0.071) | ND (0.07) | ND (0.073) | ND (0.073) | ND (0.071) | ND (0.069) | ND (0.067) |
| Aroclor-1262 | NE | ND (0.069) | ND (0.071) | ND (0.07) | ND (0.073) | ND (0.073) | ND (0.071) | ND (0.069) | ND (0.067) |
| Aroclor-1268 | NE | ND (0.069) | ND (0.071) | ND (0.07) | ND (0.073) | ND (0.073) | ND (0.071) | ND (0.069) | ND (0.067) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | G01 | G02 | G02 | G02 | G02 | G02 | G03 | G04 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-G01-0-1 | SO-G02-0-1 | SO-G02-0-2 | SO-G02-2-4 | SO-G02-4-6 | SO-G02-6-8 | SO-G03-0-1 | SO-G04-0-1 |
| Collection Depth (ft bgs) | MCP | 0 - 1 | 0 - 1 | 0 - 2 | 2 - 4 | 4 - 6 | 6 - 8 | 0 - 1 | 0 - 1 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.073) | ND (0.071) | ND (0.071) | ND (0.076) | 0.1 (0.098) | 1.7 (0.48) | ND (0.068) | 0.44 (0.073) |
| Aroclor-1016 | NE | ND (0.073) | ND (0.071) | ND (0.071) | ND (0.076) | ND (0.098) | ND (0.48) | ND (0.068) | ND (0.073) |
| Aroclor-1221 | NE | ND (0.073) | ND (0.071) | ND (0.071) | ND (0.076) | ND (0.098) | ND (0.48) | ND (0.068) | ND (0.073) |
| Aroclor-1232 | NE | ND (0.073) | ND (0.071) | ND (0.071) | ND (0.076) | ND (0.098) | ND (0.48) | ND (0.068) | ND (0.073) |
| Aroclor-1242 | NE | ND (0.073) | ND (0.071) | ND (0.071) | ND (0.076) | ND (0.098) | ND (0.48) | ND (0.068) | ND (0.073) |
| Aroclor-1248 | NE | ND (0.073) | ND (0.071) | ND (0.071) | ND (0.076) | ND (0.098) | ND (0.48) | ND (0.068) | ND (0.073) |
| Aroclor-1254 | NE | ND (0.073) | ND (0.071) | ND (0.071) | ND (0.076) | 0.1 (0.098) | 1.7 (0.48) | ND (0.068) | 0.44 (0.073) |
| Aroclor-1260 | NE | ND (0.073) | ND (0.071) | ND (0.071) | ND (0.076) | ND (0.098) | ND (0.48) | ND (0.068) | ND (0.073) |
| Aroclor-1262 | NE | ND (0.073) | ND (0.071) | ND (0.071) | ND (0.076) | ND (0.098) | ND (0.48) | ND (0.068) | ND (0.073) |
| Aroclor-1268 | NE | ND (0.073) | ND (0.071) | ND (0.071) | ND (0.076) | ND (0.098) | ND (0.48) | ND (0.068) | ND (0.073) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | G05 | G06 | G07 | G08 | G09 | G09 | G09 | G09 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-G05-0-1 | SO-G06-0-1 | SO-G07-0-1 | SO-G08-0-1 | SO-G09-0-1 | SO-G09-0-2 | SO-G09-2-4 | SO-G09-4-6 |
| Collection Depth (ft bgs) | MCP | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 2 | 2 - 4 | 4 - 6 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.068) | ND (0.071) | ND (0.07) | ND (0.07) | ND (0.069) | ND (0.07) | ND (0.071) | ND (0.075) |
| Aroclor-1016 | NE | ND (0.068) | ND (0.071) | ND (0.07) | ND (0.07) | ND (0.069) | ND (0.07) | ND (0.071) | ND (0.075) |
| Aroclor-1221 | NE | ND (0.068) | ND (0.071) | ND (0.07) | ND (0.07) | ND (0.069) | ND (0.07) | ND (0.071) | ND (0.075) |
| Aroclor-1232 | NE | ND (0.068) | ND (0.071) | ND (0.07) | ND (0.07) | ND (0.069) | ND (0.07) | ND (0.071) | ND (0.075) |
| Aroclor-1242 | NE | ND (0.068) | ND (0.071) | ND (0.07) | ND (0.07) | ND (0.069) | ND (0.07) | ND (0.071) | ND (0.075) |
| Aroclor-1248 | NE | ND (0.068) | ND (0.071) | ND (0.07) | ND (0.07) | ND (0.069) | ND (0.07) | ND (0.071) | ND (0.075) |
| Aroclor-1254 | NE | ND (0.068) | ND (0.071) | ND (0.07) | ND (0.07) | ND (0.069) | ND (0.07) | ND (0.071) | ND (0.075) |
| Aroclor-1260 | NE | ND (0.068) | ND (0.071) | ND (0.07) | ND (0.07) | ND (0.069) | ND (0.07) | ND (0.071) | ND (0.075) |
| Aroclor-1262 | NE | ND (0.068) | ND (0.071) | ND (0.07) | ND (0.07) | ND (0.069) | ND (0.07) | ND (0.071) | ND (0.075) |
| Aroclor-1268 | NE | ND (0.068) | ND (0.071) | ND (0.07) | ND (0.07) | ND (0.069) | ND (0.07) | ND (0.071) | ND (0.075) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | G09 | G10 | H01 | H02 | H03 | H04 | H05 | H06 |
|---|---|---|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-G09-6-8 | SO-G10-0-1 | SO-H01-0-1 | SO-H02-0-1 | SO-H03-0-1 | SO-H04-0-1 | SO-H05-0-1 | SO-H06-0-1 |
| Collection Depth (ft bgs) | MCP | 6 - 8 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | | | | |
| PCBs (total) | 4 | ND (0.076) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.075) | 0.16 (0.071) | ND (0.069) | ND (0.069) |
| Aroclor-1016 | NE | ND (0.076) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.069) |
| Aroclor-1221 | NE | ND (0.076) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.069) |
| Aroclor-1232 | NE | ND (0.076) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.069) |
| Aroclor-1242 | NE | ND (0.076) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.069) |
| Aroclor-1248 | NE | ND (0.076) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.069) |
| Aroclor-1254 | NE | ND (0.076) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.075) | 0.16 (0.071) | ND (0.069) | ND (0.069) |
| Aroclor-1260 | NE | ND (0.076) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.069) |
| Aroclor-1262 | NE | ND (0.076) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.069) |
| Aroclor-1268 | NE | ND (0.076) | ND (0.07) | ND (0.07) | ND (0.071) | ND (0.075) | ND (0.071) | ND (0.069) | ND (0.069) |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 10 | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 400 | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 20 | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 1,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 1**
**Summary of Polychlorinated Biphenyl and Extractable Petroleum Hydrocarbon Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | H07 | H08 | H09 | H10 | A02 |
|---|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-H07-0-1 | SO-H08-0-1 | SO-H09-0-1 | SO-H10-0-1 | PS-A02-8-9 |
| Collection Depth (ft bgs) | MCP | 0 - 1 | 0 - 1 | 0 - 1 | 0 - 1 | 8 - 9 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 | 10/25/2021 |
| Comments | | | | | | |
| **PCBs analyzed via EPA Method SW8082** | | | | | | |
| PCBs (total) | 4 | ND (0.07) | ND (0.074) | ND (0.07) | 0.45 (0.07) | NA |
| Aroclor-1016 | NE | ND (0.07) | ND (0.074) | ND (0.07) | ND (0.07) | NA |
| Aroclor-1221 | NE | ND (0.07) | ND (0.074) | ND (0.07) | ND (0.07) | NA |
| Aroclor-1232 | NE | ND (0.07) | ND (0.074) | ND (0.07) | ND (0.07) | NA |
| Aroclor-1242 | NE | ND (0.07) | ND (0.074) | ND (0.07) | ND (0.07) | NA |
| Aroclor-1248 | NE | ND (0.07) | ND (0.074) | ND (0.07) | ND (0.07) | NA |
| Aroclor-1254 | NE | ND (0.07) | ND (0.074) | ND (0.07) | 0.45 (0.07) | NA |
| Aroclor-1260 | NE | ND (0.07) | ND (0.074) | ND (0.07) | ND (0.07) | NA |
| Aroclor-1262 | NE | ND (0.07) | ND (0.074) | ND (0.07) | ND (0.07) | NA |
| Aroclor-1268 | NE | ND (0.07) | ND (0.074) | ND (0.07) | ND (0.07) | NA |
| **PAHs analyzed via EPA Method EPH-19-2.1** | | | | | | |
| Acenaphthene | 3,000 | NA | NA | NA | NA | ND (0.23) |
| Acenaphthylene | 10 | NA | NA | NA | NA | ND (0.23) |
| Anthracene | 3,000 | NA | NA | NA | NA | ND (0.23) |
| Benzo(a)anthracene | 40 | NA | NA | NA | NA | ND (0.23) |
| Benzo(a)pyrene | 7 | NA | NA | NA | NA | ND (0.23) |
| Benzo(b)fluoranthene | 40 | NA | NA | NA | NA | ND (0.23) |
| Benzo(g,h,i)perylene | 3,000 | NA | NA | NA | NA | ND (0.23) |
| Benzo(k)fluoranthene | 400 | NA | NA | NA | NA | ND (0.23) |
| Chrysene | 400 | NA | NA | NA | NA | ND (0.23) |
| Dibenz(a,h)anthracene | 4 | NA | NA | NA | NA | ND (0.23) |
| Fluoranthene | 3,000 | NA | NA | NA | NA | ND (0.23) |
| Fluorene | 3,000 | NA | NA | NA | NA | ND (0.23) |
| Indeno(1,2,3-cd)pyrene | 40 | NA | NA | NA | NA | ND (0.23) |
| 2-Methylnaphthalene | 80 | NA | NA | NA | NA | ND (0.23) |
| Naphthalene | 20 | NA | NA | NA | NA | ND (0.23) |
| Phenanthrene | 1,000 | NA | NA | NA | NA | ND (0.23) |
| Pyrene | 3,000 | NA | NA | NA | NA | ND (0.23) |
| **EPHs analyzed via EPA Method EPH-19-2.1** | | | | | | |
| C19-C36 Aliphatics | 5,000 | NA | NA | NA | NA | ND (66) |
| C9-C18 Aliphatic Hydrocarbons | 3,000 | NA | NA | NA | NA | ND (66) |
| C11-C22 Aromatics (Adjusted) | 3,000 | NA | NA | NA | NA | ND (66) |
| C11-C22 Aromatics (Unadjusted) | 3,000 | NA | NA | NA | NA | ND (66) |
| Petroleum Hydrocarbons (Extractable) | 3,000 | NA | NA | NA | NA | ND (66) |

**Notes:**
1 All concentrations are presented in mg/kg.
2 No concentrations exceed the MCP RCS-2 criteria, dated April 25, 2014.

**Abbreviations:**
EPH -- Extractable Petroleum Hydrocarbon
ND -- Not Detected.
NE -- Not Established.
NA -- Not Analyzed.
PAH -- Polycyclic Aromatic Hydrocarbon
PCB -- Polychlorinated Biphenyl
( ) -- Detection Limit.

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**TABLE 2**
**Summary of Landfill Disposal Characterization Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | Q01 | Q02 | Q03 | Q04 |
|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-Q1-0-2 | SO-Q2-0-2 | SO-Q3-0-2 | SO-Q4-0-2 |
| Collection Depth (ft bgs) | MCP | 0 - 2 | 0 - 2 | 0 - 2 | 0 - 2 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/26/2021 | 10/26/2021 | 10/26/2021 | 10/26/2021 |
| Comments | | | | | |
| **Waste Characterization analyzed via various methods** | | | | | |
| Corrosivity | NE | Negative | Negative | Negative | Negative |
| Flashpoint (°F) | NE | ND (200) | ND (200) | ND (200) | ND (200) |
| Cyanide (Reactive) | NE | ND (5) | ND (5) | ND (5) | ND (5) |
| Sulfide (Reactive) | NE | ND (20) | ND (20) | ND (20) | ND (20) |
| Reactivity | NE | Negative | Negative | Negative | Negative |
| Ignitability (°F) | NE | ND (140) | ND (140) | ND (140) | ND (140) |
| Solids (total) (%) | NE | 94 | 90 | 94 | 95 |
| pH (Standard Units) | NE | 6.94 (1) | 7.88 (1) | 6.82 (1) | 7.01 (1) |
| **Volatile Organic Compound analyzed via EPA Method SW8260** | | | | | |
| Acetone | 50 | ND (0.24) | ND (0.29) | ND (0.28) | ND (0.26) |
| Acrylonitrile | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Benzene | 200 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1-Methyl-2-isopropylbenzene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Bromobenzene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Bromochloromethane | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Bromodichloromethane | 0.1 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Bromoform | 1 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Bromomethane | 0.5 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 2-Butanone | 50 | ND (0.029) | ND (0.035) | ND (0.033) | ND (0.032) |
| n-Butylbenzene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| sec-Butylbenzene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| tert-Butylbenzene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Carbon Disulfide | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Carbon Tetrachloride | 5 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Chlorobenzene | 3 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Chloroethane | 1000 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Chloroform | 0.2 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Chloromethane | 1000 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 2-Chlorotoluene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 4-Chlorotoluene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Cumene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| p-Cymene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,2-Dibromo-3-chloropropane | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Dibromochloromethane | 0.03 | ND (0.0029) | ND (0.0035) | ND (0.0033) | ND (0.0032) |
| 1,2-Dibromoethane | 0.1 | ND (0.00049) | ND (0.00058) | ND (0.00055) | ND (0.00053) |
| Dibromomethane | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| trans-1,4-Dichloro-2-butene | NE | ND (0.0098) | ND (0.012) | ND (0.011) | ND (0.011) |
| 1,2-Dichlorobenzene | 100 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,3-Dichlorobenzene | 200 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,4-Dichlorobenzene | 1 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Dichlorodifluoromethane | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,1-Dichloroethane | 9 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,2-Dichloroethane | 0.1 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,1-Dichloroethene | 40 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| cis-1,2-Dichloroethene | 0.1 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| trans-1,2-Dichloroethene | 1 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,2-Dichloropropane | 0.1 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,3-Dichloropropane | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 2,2-Dichloropropane | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,1-Dichloropropene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,3-Dichloropropene (total) | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| cis-1,3-Dichloropropene | 0.4 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| trans-1,3-Dichloropropene | 0.4 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,4-Dioxane | 6 | ND (0.098) | ND (0.12) | ND (0.11) | ND (0.11) |
| Ethyl tert-butyl ether | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| t-Amyl methyl ether | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Ethyl Benzene | 1000 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Diethyl ether | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 2-Hexanone | NE | ND (0.024) | ND (0.029) | ND (0.028) | ND (0.026) |

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**TABLE 2**
**Summary of Landfill Disposal Characterization Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | Q01 | Q02 | Q03 | Q04 |
|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-Q1-0-2 | SO-Q2-0-2 | SO-Q3-0-2 | SO-Q4-0-2 |
| Collection Depth (ft bgs) | MCP | 0 - 2 | 0 - 2 | 0 - 2 | 0 - 2 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/26/2021 | 10/26/2021 | 10/26/2021 | 10/26/2021 |
| Comments | | | | | |
| Hexachlorobutadiene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Methyl tert-butyl ether | 100 | ND (0.0098) | ND (0.012) | ND (0.011) | ND (0.011) |
| 4-Methyl-2-pentanone | 50 | ND (0.024) | ND (0.029) | ND (0.028) | ND (0.026) |
| Methylene Chloride | 20 | ND (0.0098) | ND (0.012) | ND (0.011) | ND (0.011) |
| Diisopropyl ether | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Naphthalene | 20 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| n-Propylbenzene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Styrene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,1,1,2-Tetrachloroethane | 0.1 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,1,2,2-Tetrachloroethane | NE | ND (0.0029) | ND (0.0035) | ND (0.0033) | ND (0.0032) |
| Tetrachloroethene | 10 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Tetrahydrofuran | NE | ND (0.0098) | ND (0.012) | ND (0.011) | ND (0.011) |
| Toluene | 1000 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,2,3-Trichlorobenzene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,2,4-Trichlorobenzene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,1,1-Trichloroethane | 600 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,1,2-Trichloroethane | 2 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Trichloroethene | 0.3 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Trichlorofluoromethane | 10000 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,2,3-Trichloropropane | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | NE | ND (0.0098) | ND (0.012) | ND (0.011) | ND (0.011) |
| 1,2,4-Trimethylbenzene | 10000 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| 1,3,5-Trimethylbenzene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Vinyl Chloride | 0.7 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| m,p-xylene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| ortho-xylene | NE | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| Xylenes (total) | 100 | ND (0.0049) | ND (0.0058) | ND (0.0055) | ND (0.0053) |
| **Semivolatile Organic Hydrocarbons analyzed via EPA Method SW8270** | | | | | |
| Acenaphthene | 3000 | ND (0.24) | 0.62 (0.25) | ND (0.25) | ND (0.24) |
| Acenaphthylene | 10 | ND (0.24) | 3.6 (0.25) | ND (0.25) | ND (0.24) |
| Acetophenone | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Aniline | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| Anthracene | 3000 | ND (0.24) | 5.6 (0.25) | ND (0.25) | ND (0.24) |
| Benzidine | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Benzo(a)anthracene | 40 | ND (0.24) | 11 (2.5) | ND (0.25) | ND (0.24) |
| Benzo(a)pyrene | 7 | ND (0.24) | **9.1 (2.5)** | ND (0.25) | ND (0.24) |
| Benzo(b)fluoranthene | 40 | ND (0.24) | 6.7 (0.25) | ND (0.25) | ND (0.24) |
| Benzo(g,h,i)perylene | 3000 | ND (0.24) | 4 (0.25) | ND (0.25) | ND (0.24) |
| Benzo(k)fluoranthene | 400 | ND (0.24) | 5.5 (0.25) | ND (0.25) | ND (0.24) |
| Benzoic Acid | NE | ND (0.7) | ND (0.72) | ND (0.7) | ND (0.69) |
| bis(2-Chloroethoxy)methane | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| bis(2-Chloroethyl) ether | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| 4-Bromophenyl-phenyl ether | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| Carbazole | NE | ND (0.35) | 0.95 (0.36) | ND (0.35) | ND (0.35) |
| 4-Chloro-3-methylphenol | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 4-Chloroaniline | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 2-Chloronaphthalene | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 2-Chlorophenol | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 4-Chlorophenyl-phenyl ether | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Chrysene | 400 | ND (0.24) | 9.7 (2.5) | ND (0.25) | ND (0.24) |
| m/p-cresol | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| Dibenz(a,h)anthracene | 4 | ND (0.24) | 1.3 (0.25) | ND (0.25) | ND (0.24) |
| Dibenzofuran | NE | ND (0.24) | 2.3 (0.25) | ND (0.25) | ND (0.24) |
| 1,2-Dichlorobenzene | 100 | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 1,3-Dichlorobenzene | 200 | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 1,4-Dichlorobenzene | 1 | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 1,2,4-Trichlorobenzene | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 3,3'-Dichlorobenzidine | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 2,4-Dichlorophenol | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 2,4-Dimethylphenol | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 4,6-Dinitro-2-methylphenol | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| 2,4-Dinitrophenol | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |

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**TABLE 2**
**Summary of Landfill Disposal Characterization Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | Q01 | Q02 | Q03 | Q04 |
|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-Q1-0-2 | SO-Q2-0-2 | SO-Q3-0-2 | SO-Q4-0-2 |
| Collection Depth (ft bgs) | MCP | 0 - 2 | 0 - 2 | 0 - 2 | 0 - 2 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/26/2021 | 10/26/2021 | 10/26/2021 | 10/26/2021 |
| Comments | | | | | |
| 2,4-Dinitrotoluene | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 2,6-Dinitrotoluene | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 1,2-Diphenylhydrazine | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| Fluoranthene | 3000 | ND (0.24) | 32 (2.5) | ND (0.25) | ND (0.24) |
| Fluorene | 3000 | ND (0.24) | 2.1 (0.25) | ND (0.25) | ND (0.24) |
| Hexachlorobenzene | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Hexachlorobutadiene | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Hexachlorocyclopentadiene | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Hexachloroethane | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Indeno(1,2,3-cd)pyrene | 40 | ND (0.24) | 5 (0.25) | ND (0.25) | ND (0.24) |
| Isophorone | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 2-Methylnaphthalene | 80 | ND (0.24) | 2 (0.25) | ND (0.25) | ND (0.24) |
| 2-Methylphenol | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Naphthalene | 20 | ND (0.24) | 2.2 (0.25) | ND (0.25) | ND (0.24) |
| 2-Nitroaniline | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| 3-Nitroaniline | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| 4-Nitroaniline | NE | ND (0.56) | ND (0.58) | ND (0.56) | ND (0.55) |
| Nitrobenzene | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 2-Nitrophenol | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 4-Nitrophenol | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| N-Nitrosodimethylamine | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| N-Nitrosodiphenylamine | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| N-Nitroso-di-n-propylamine | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 2,2'-oxybis(1-Chloropropane) | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Pentachloronitrobenzene | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| Pentachlorophenol | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| Phenanthrene | 1000 | ND (0.24) | 34 (2.5) | ND (0.25) | ND (0.24) |
| Phenol | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| bis(2-Ethylhexyl)phthalate | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| Butylbenzylphthalate | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Diethylphthalate | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Dimethylphthalate | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Di-n-butylphthalate | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| Di-n-octylphthalate | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| Pyrene | 3000 | ND (0.24) | 26 (2.5) | ND (0.25) | ND (0.24) |
| Pyridine | NE | ND (0.35) | ND (0.36) | ND (0.35) | ND (0.35) |
| 1,2,4,5-Tetrachlorobenzene | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 2,4,5-Trichlorophenol | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| 2,4,6-Trichlorophenol | NE | ND (0.24) | ND (0.25) | ND (0.25) | ND (0.24) |
| **Total Petroleum Hydrocarbons analyzed via EPA Method SW8015D** | | | | | |
| #2 Fuel Oil | NE | ND (52) | ND (55) | ND (52) | ND (51) |
| #4 Fuel Oil | NE | ND (52) | ND (55) | ND (52) | ND (51) |
| #6 Fuel Oil | NE | ND (52) | ND (55) | ND (52) | ND (51) |
| Kerosene | NE | ND (52) | ND (55) | ND (52) | ND (51) |
| Motor Oil | NE | ND (52) | ND (55) | ND (52) | ND (51) |
| Petroleum Hydrocarbon (Unidentified ) | NE | ND (52) | ND (55) | ND (52) | ND (51) |
| Petroleum Hydrocarbons (Extractable) | 3000 | ND (52) | ND (55) | ND (52) | ND (51) |
| **Polychlorinated Biphenyls analyzed via EPA Method SW8082** | | | | | |
| PCBs (total) | 4 | ND (0.069) | ND (0.073) | ND (0.069) | ND (0.07) |
| Aroclor-1221 | NE | ND (0.069) | ND (0.073) | ND (0.069) | ND (0.07) |
| Aroclor-1232 | NE | ND (0.069) | ND (0.073) | ND (0.069) | ND (0.07) |
| Aroclor-1242 | NE | ND (0.069) | ND (0.073) | ND (0.069) | ND (0.07) |
| Aroclor-1248 | NE | ND (0.069) | ND (0.073) | ND (0.069) | ND (0.07) |
| Aroclor-1254 | NE | ND (0.069) | ND (0.073) | ND (0.069) | ND (0.07) |
| Aroclor-1260 | NE | ND (0.069) | ND (0.073) | ND (0.069) | ND (0.07) |
| Aroclor-1262 | NE | ND (0.069) | ND (0.073) | ND (0.069) | ND (0.07) |
| Aroclor-1268 | NE | ND (0.069) | ND (0.073) | ND (0.069) | ND (0.07) |

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**TABLE 2**
**Summary of Landfill Disposal Characterization Soil Sampling Results**
**80 Wright Street, New Bedford, MA**

| Location | | Q01 | Q02 | Q03 | Q04 |
|---|---|---|---|---|---|
| Ramboll Sample ID | | SO-Q1-0-2 | SO-Q2-0-2 | SO-Q3-0-2 | SO-Q4-0-2 |
| Collection Depth (ft bgs) | MCP | 0 - 2 | 0 - 2 | 0 - 2 | 0 - 2 |
| Sample Method | RCS-2 | Direct Push | Direct Push | Direct Push | Direct Push |
| Sample Date | | 10/26/2021 | 10/26/2021 | 10/26/2021 | 10/26/2021 |
| Comments | | | | | |
| **Total Metals analyzed via EPA Method SW6010D** | | | | | |
| Arsenic | 20 | 1.23 (0.74) | 2.35 (0.69) | 0.91 (0.63) | 0.93 (0.73) |
| Barium | 3000 | 14.7 (0.37) | 39.4 (0.34) | 22.2 (0.32) | 9.92 (0.37) |
| Cadmium | 100 | ND (0.37) | 0.78 (0.34) | ND (0.32) | ND (0.37) |
| Chromium (total) | 200 | 4.99 (0.37) | 8.81 (0.34) | 4.86 (0.32) | 3.36 (0.37) |
| Lead | 600 | 26.5 (0.37) | 229 (0.34) | 8.72 (0.32) | 9.97 (0.37) |
| Selenium | 700 | ND (1.5) | ND (1.4) | ND (1.3) | ND (1.5) |
| Silver | 200 | ND (0.37) | ND (0.34) | ND (0.32) | ND (0.37) |
| **TCLP Metals analyzed via EPA Method SW6010D (mg/L)** | | | | | |
| Lead | NE | NA | 0.27 (0.10) | NA | NA |
| **Mercury analyzed via EPA Method SW7471** | | | | | |
| Mercury | 30 | ND (0.03) | 0.05 (0.03) | ND (0.03) | ND (0.03) |
| **Pesticides analyzed via EPA Method SW8151** | | | | | |
| 2-sec-Butyl-4,6-dinitrophenol (Dinoseb) | NE | ND (0.026) | ND (0.028) | ND (0.026) | ND (0.026) |
| 2,4-D | NE | ND (0.053) | ND (0.055) | ND (0.053) | ND (0.052) |
| Dalapon | NE | ND (0.026) | ND (0.028) | ND (0.026) | ND (0.026) |
| 2,4-DB | NE | ND (0.026) | ND (0.028) | ND (0.026) | ND (0.026) |
| Dicamba | NE | ND (0.026) | ND (0.028) | ND (0.026) | ND (0.026) |
| Dichloroprop | NE | ND (0.039) | ND (0.042) | ND (0.04) | ND (0.039) |
| MCPA (2-Methyl-4-chlorophenoxy acetic acid) | NE | ND (3.2) | ND (3.3) | ND (3.2) | ND (3.1) |
| Mecoprop | NE | ND (3.2) | ND (3.3) | ND (3.2) | ND (3.1) |
| 2,4,5-T | NE | ND (0.026) | ND (0.028) | ND (0.026) | ND (0.026) |
| 2,4,5-TP | NE | ND (0.026) | ND (0.028) | ND (0.026) | ND (0.026) |
| **Pesticides analyzed via EPA Method SW8081** | | | | | |
| Alachlor | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| Aldrin | NE | ND (0.0035) | ND (0.0037) | ND (0.0035) | ND (0.0035) |
| alpha-BHC | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| beta-BHC | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| delta-BHC | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| gamma-BHC | NE | ND (0.0014) | ND (0.0015) | ND (0.0014) | ND (0.0014) |
| Chlordane (total) | NE | ND (0.014) | ND (0.015) | ND (0.014) | ND (0.014) |
| 4,4'-DDD | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| 4,4'-DDE | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| 4,4'-DDT | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| Dieldrin | NE | ND (0.0035) | ND (0.0037) | ND (0.0035) | ND (0.0035) |
| Endosulfan I | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| Endosulfan II | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| Endosulfan sulfate | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| Endrin | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| Endrin aldehyde | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| Endrin ketone | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| Heptachlor | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| Heptachlor epoxide | NE | ND (0.0069) | ND (0.0073) | ND (0.0069) | ND (0.007) |
| Hexachlorobenzene | NE | ND (0.0035) | ND (0.0037) | ND (0.0035) | ND (0.0035) |
| Methoxychlor | NE | ND (0.035) | ND (0.037) | ND (0.035) | ND (0.035) |
| Toxaphene | NE | ND (0.14) | ND (0.15) | ND (0.14) | ND (0.14) |

**Notes:**

1 All concentrations are presented mg/kg unless noted otherwise.

2 Concentrations that exceed the MCP RCS-2, dated April 25,2014, are **boldfaced**.

**Abbreviations:**

NA -- Not Analyzed.
NE -- Not Established.
ND -- Not Detected.
( ) -- Detection Limit.
TCLP -- Toxicity Characteristic Leaching Procedure

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# EXHIBIT C
# ACTIVITY AND USE LIMITATIONS

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**MAIN TERMINAL (DRAFT) AUL**

**RTNS: 4-23736 4-24296, 4-15490**

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Form 1075

NOTICE OF ACTIVITY AND USE LIMITATION
M.G.L. c. 21E, § 6 and 310 CMR 40.0000

Disposal Site Names: RIST Property (former RIST, LLC) RTN 4-23736
DMF Parcel 1, RTN 4-24296
DMF Parcel 2, RTN 4-15490
Riverfront Parcel

This Notice of Activity and Use Limitation ("Notice") is made as of this _____ day of _____, 2021, by The Massachusetts Clean Energy Technology Center, with a mailing address of 63 Franklin Street, 3rd Floor Boston, Massachusetts, 02110 and The City of New Bedford Massachusetts, with a mailing address of 133 Williams Street, New Bedford, Massachusetts 02740 together with his/her/its/their successors and assigns (collectively "Owners").

WITNESSETH:

WHEREAS, the Massachusetts Clean Energy Technology Center is the owner in fee simple of certain parcels of land depicted as:

**Parcel Name:** **RIST Property (former RIST, LLC), RTN 4-23736**
Address: North of Blackmer Street
Parcel ID/Size: Map 31 Parcel 288 / 7.75 acres

And, WHEREAS, the City of New Bedford, Massachusetts is the owner in fee simple of certain parcels of land, under lease to the Massachusetts Clean Energy Technology Center, and depicted as:

**Parcel Name:** **DMF Parcel 1, RTN 4-24296**
Address: North of 16 Blackmer Street
Parcel ID/Size: Map 25A, Parcel 53 / 1.2 acres

**Parcel Name:** **DMF Parcel 2, RTN 4-15490**
Address: 16 Blackmer Street
Parcel ID/Size: Map 25A, Parcel 49 / 2.2 acres

**Parcel Name:** **Riverfront Parcel**
Address: SE Blackmer Street
Parcel ID/Size: Map 25A, Parcel 48 / 9.227 acres
Area of Parcel Subject to AUL: 6.32 acres

WHEREAS, said four parcels of land, which are more particularly bounded and described in **Exhibit A**, attached hereto and made a part hereof ("Property"), are subject to this Notice of Activity and Use Limitation.

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WHEREAS, the Properties together comprise all of a disposal site as the result of releases of oil and/or hazardous material. **Exhibit B** is a sketch plan showing the relationship of the Properties subject to this Notice of Activity and Use Limitation to the boundaries of said disposal site existing within the limits of the Properties and to the extent such boundaries have been established. **Exhibit B** is attached hereto and made a part hereof; and,

WHEREAS, one or more response actions have been selected for the Disposal Site in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 ("MCP"). Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil and/or (b) the restriction of certain activities occurring in, on, through, over or under the Properties. A description of the basis for such restrictions, and the oil and/or hazardous material release event(s) or site history that resulted in the contaminated media subject to the Activity and Use Limitation Opinion which is attached hereto as **Exhibit C** and made a part hereof;

NOW, THEREFORE, notice is hereby given that the activity and use limitations set forth in this Notice of Activity and Use Limitation are as follows:

1. Activities and Uses Consistent with Maintaining No Significant Risk Conditions. The following Activities and Uses are consistent with maintaining a Permanent Solution and a condition of No Significant Risk and, as such, may occur on the Properties pursuant to 310 CMR 40.0000:

   (i) Commercial and industrial activities and uses which do not involve the disturbance of soil located greater than 3 feet below the ground surface within the AUL area within the RIST property, DMF Parcel 1 and DMF Parcel 2 and Riverfront Parcel properties described above, as long as the Obligations and Conditions specified herein are followed;
   (ii) Any non-residential uses of all of the Properties, including those that are currently conducted, in which a child's presence (other than incidental) is not likely;
   (iii) Short-term (6 months or less) underground utility and/or construction activities which are likely to disturb soil as described in Paragraph 1(i), provided that such activities are conducted in accordance with the soil management provisions of the Massachusetts Contingency Plan (MCP) cited at 310 CMR 40.0030 and all applicable worker health and safety practices pursuant to 310 CMR 40.0018;
   (iv) Construction or excavation activities are allowed, except as prohibited in Paragraph 2 (ii);
   (v) Such other activities or uses which, in the Opinion of a Massachusetts Licensed Site Professional ("LSP"), shall present no greater risk of harm to human health, safety, public welfare or the environment than the activities and uses set forth in this paragraph; and,
   (vi) Other activities or uses of the Properties not identified in Paragraph 2 as Activities and Uses Inconsistent with the AUL.

2. Activities and Uses Inconsistent Maintaining No Significant Risk Conditions. The following Activities and Uses are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk pursuant to 310 CMR 40.0000, and, as such, may not occur on the Properties:

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(i) Use of the Properties (all) as a residence or for growing fruits or vegetables for human consumption, as a school, daycare, nursery, recreational area (such as a park or athletic field), and/or any other use in which a child's presence (other than incidental) is likely;

(ii) Any long-term (greater than 6 months) activity at the Properties that is reasonably likely to result in an excavation greater than 3 feet below grade within the RIST property, DMF Parcel 1, DMF Parcel 2 and Riverfront Parcel properties and excavation of soil at or below the ground surface within the Shuster Bulkhead Parcel, relocation or removal of contaminated soil, unless such activity is first evaluated by an LSP who renders an Opinion stating that such activity is consistent with maintaining a condition of No Significant Risk and that such activity is conducted in accordance with Obligations (i) and (ii), set forth below; and,

(iii) Any excavation activity which may disturb the soil located at a depth greater than 3 feet below ground surface within the AUL area associated with the RIST property, DMF Parcel 1, DMF Parcel 2 and Riverfront Parcel properties without prior development and implementation of a Soil Management Plan and a Health and Safety Plan in accordance with Obligations (i) and (ii) of this Notice.

3. Obligations and Conditions. The following obligations and/or conditions are necessary and shall be undertaken and/or maintained at the Properties to maintain a Permanent Solution and a condition of No Significant Risk:

(i) Any long-term (greater than 6 months) activity at or use of the Properties that is reasonably likely to result in the excavation, relocation, or removal of contaminated soil requires preparation and implementation of a Health and Safety Plan under the guidance of an LSP. At a minimum, the Health and Safety Plan must inform underground utility workers and other workers who may come into contact with soil in the AUL area of (1) the nature and hazards of the contaminants identified in the soil, (2) potential exposure routes, (3) measures to prevent exposure, (4) protective clothing requirements, and (5) any other health and safety measures appropriate for the activity or use;

(ii) Any long-term (greater than 6 months) activity at or use of the Properties that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a written Soil Management Plan under the guidance of an LSP. At a minimum, the Soil Management Plan must (1) describe the soil excavation and stockpile storage methods that will be used to prevent accidental exposure to the excavated soil, including indirect exposure via surface water runoff or fugitive dust emissions, (2) contain procedures to limit access to the excavated soil and the excavation area by Property workers not covered by the Health and Safety Plan, children, Property abutters, or accidental trespassers, (3) contain procedures for characterizing, transporting and recycling/disposing excavated soil, and (4) provide for the restoration of the excavated area as soon as practicable; and,

(iii) Any soil removed from the Properties must be characterized and disposed of in accordance with federal, state and local regulations, including the MCP, 310 CMR 40.0000.

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Properties which may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by a Licensed Site Professional who shall render an Opinion,

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in accordance with 310 CMR 40.1080, as to whether the proposed changes are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Permanent or Temporary Solution. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by a Licensed Site Professional in accordance with 310 CMR 40.1080, and without additional response actions, if necessary, to maintain a condition of No Significant Risk. If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by a Licensed Site Professional in accordance with 310 CMR 40.1080, the owner or operator of the Properties subject to this Notice at the time that the activities, uses and/or exposures change, shall comply with the requirements set forth in 310 CMR 40.0020.

6. Incorporation into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Properties or a portion thereof is conveyed in accordance with 310 CMR 40.1074(5).

Owner hereby authorizes and consents to the filing and recordation and/or registration of this Notice, said Notice to become effective when executed under seal by the undersigned Licensed Site Professional, and recorded and/or registered with the appropriate Registry of Deeds and/or Land Registration Office(s).

WITNESS the execution hereof under seal this _____ day of _____, 20____.

_____
Name
Title
Massachusetts Clean Energy Technology Center

COMMONWEALTH OF MASSACHUSETTS

_____, ss _____, 20____

On this ____ day of _____, 2019, before me, the undersigned notary public, personally appeared _____ (name of document signer), proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose.

(as partner for _____, a partnership)
(as _____ for _____, a corporation)

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(as attorney in fact for _____, the principal)
(as _____ for Massachusetts Clean Energy Technology Center (a) (the) _____)
_____ (official signature and seal of notary)

WITNESS the execution hereof under seal this _____ day of _____, 20____.

_____
Name
Title
City of New Bedford

COMMONWEALTH OF MASSACHUSETTS

_____, ss _____, 20____

On this ____ day of _____, 2019, before me, the undersigned notary public, personally appeared _____ (name of document signer), proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose.

(as partner for _____, a partnership)
(as _____ for _____, a corporation)
(as attorney in fact for _____, the principal)

DRAFT

The undersigned Licensed Site Professional hereby certifies that in his Opinion this Notice of Activity and Use Limitation is consistent with a Permanent Solution and maintaining a condition of No Significant Risk.

Date: _____ _____

David B. Sherman
Licensed Site Professional

(Licensed Site Professional SEAL)

COMMONWEALTH OF MASSACHUSETTS

_____, ss _____, 20__

On this ____ day of _____, 2019, before me, the undersigned notary public, personally appeared _____, proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he)(she) signed it voluntarily for its stated purpose.

(as partner for _____, a partnership)
(as _____ for _____, a corporation)
(as attorney in fact for _____, the principal)
(as _____ for _____, (a) (the) _____)
_____ (official signature and seal of notary)

Upon recording, return to:

Apex Companies, LLC.
58H Connecticut Avenue
South Windsor, CT 06074

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**NEW BEDFORD RADIO (HALL COMM) AUL**

**RTN: 4-25350**

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(13)

2019 00022060
Bk: 12943 Pg: 240 Pg: 1 of 13 BE
Doc: NOTICE 09/27/2019 01:44

NOTICE OF ACTIVITY AND USE LIMITATION

M.G.L. c. 21E, § 6 and 310 CMR 40.0000
Disposal Site Name: New Bedford Radio, Inc. (Hall Comm.)
DEP Release Tracking No.: 4-25350

This Notice of Activity and Use Limitation ("Notice") is made as of this 16th day of September 2019, by The Massachusetts Clean Energy Center, with a mailing address of 63 Franklin Street, 3rd Floor Boston, New Bedford, Massachusetts, 02110, and Hall Communications, Inc. with a mailing address of 1996 Auction Road, Manheim, Pennsylvania, 17545 together with his/her/its/their successors and assigns (each an "Owner", and collectively "Owners").

WITNESSETH:

WHEREAS, the Massachusetts Clean Energy Center is the owner in fee simple of a certain parcel of land depicted as "Lot 1" on a that certain *Plan of Land, MacArthur Boulevard, Assessor's Map 31 Lot 234, New Bedford, Massachusetts,* dated March 18, 2015 (with revisions through July 13, 2016), and prepared by Thompson Farland with certification date August 8, 2016, and recorded in the Bristol County Registry of Deeds in Plan Book 174, Page 73 (the "Survey"), and Hall Communications, Inc. is the owner in fee simple of a certain parcel of land depicted as "Lot 2" on the Survey. Said "Lot 1" and said "Lot 2", having been created in a subdivision of land owned by Hall Communications, Inc. for the purpose of the sale of Lot 1 to the Massachusetts Clean Energy Center, and for Hall Communications, Inc. to retain Lot 2. For title information see deed recorded with the Bristol County Registry of Deeds in Book 11982, page 152.

WHEREAS, said parcels of land, which are more particularly bounded and described in **Exhibit A**, attached hereto and made a part hereof ("Property"), are subject to this Notice.

WHEREAS, the Property comprises all of a disposal site (the "AUL Area") as the result of releases of oil and/or hazardous material. **Exhibit B,** which is attached hereto and made a part hereof, is a copy of the Survey showing the Property subject to this Notice; and

WHEREAS, one or more response actions have been selected for the AUL Area in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 *et seq.* ("MCP"). Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil at the Property, and/or (b) the restriction of certain activities occurring in, on, through, over or under the Property. A description of the basis for such restrictions, and the oil and/or hazardous material release event(s) or site history that resulted in the contaminated media subject to this Notice, are set forth in the Activity and Use Limitation Opinion, which is attached hereto as **Exhibit C** and made a part hereof;

NOW, THEREFORE, notice is hereby given that the activity and use limitations ("AULs") for the Property are as follows:

1. Activities and Uses Consistent with Maintaining No Significant Risk Conditions. The following Activities and Uses are consistent with maintaining a Permanent Solution and a condition of No Significant Risk and, as such, may occur on the Property pursuant to the MCP:

   (i) Commercial and industrial activities and uses which do not involve the disturbance of soil located greater than 3 feet below the ground surface within Lot 1 and

APEX COMPANIES LLC
Attn: DAVID SHERMAN
58 H Connecticut Ave
South Windsor, CT 06074

disturbance of soil at or below the ground surface within Lot 2, as long as the Obligations and Conditions specified herein are followed;

(ii) Any non-residential uses of the Property (both Lot 1 and Lot 2), including those that are currently conducted, in which a child's presence (other than incidental) is not likely;

(iii) Short-term (6 months or less) underground utility and/or construction activities which are likely to disturb soil more than permitted in Paragraph 1(i), provided that such activities are conducted in accordance with the soil management provisions of the MCP cited at 310 CMR 40.0030 and all applicable worker health and safety practices pursuant to 310 CMR 40.0018;

(iv) Construction or excavation activities are allowed, except as prohibited in Paragraph 2 (ii);

(v) Such other activities or uses which, in the Opinion of a Massachusetts Licensed Site Professional ("LSP"), shall present no greater risk of harm to human health, safety, public welfare or the environment than the activities and uses set forth in this Paragraph 1; and

(vi) Other activities or uses of the Property not identified in Paragraph 2 as Activities and Uses Inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk.

2. Activities and Uses Inconsistent with Maintaining No Significant Risk Conditions. The following Activities and Uses are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk pursuant to the MCP, and, as such, may not occur on the Property:

(i) Use of the Property (Lot 1 and Lot 2) as a residence, for growing fruits or vegetables for human consumption, as a school, daycare, nursery, recreational area (such as a park or athletic field), and/or for any other use in which a child's presence (other than incidental) is likely;

(ii) Any long-term (greater than 6 months) activity at the Property that is reasonably likely to result in the excavation greater than 3 feet below grade in Lot 1 and at or below surface grade in Lot 2, relocation or removal of the contaminated soil, unless such activity is first evaluated by an LSP who renders an Opinion stating that such activity is consistent with maintaining a condition of No Significant Risk and that such activity is conducted in accordance with Obligations set forth in paragraph 3 (i) and (ii) of this Notice; and

(iii) Any excavation activity which may disturb the soil located at a depth greater than 3 feet below ground surface within Lot 1 and at or below surface grade in Lot 2, without prior development and implementation of a Soil Management Plan and a Health and Safety Plan in accordance with Obligations set forth in paragraph 3 (i) and (ii) of this Notice.

3. Obligations and Conditions. The following obligations and/or conditions are necessary and shall be undertaken and/or maintained at the Property by the Owner of either Lot 1 or Lot 2, or both, as applicable, to maintain a Permanent Solution and a condition of No Significant Risk:

(i) Any long-term (greater than 6 months) activity at or use of either Lot 1 or Lot 2 of the Property that is reasonably likely to result in the excavation, relocation, or removal of contaminated soil requires preparation and implementation of a Health and Safety Plan under the guidance of an LSP. At a minimum, the Health and Safety Plan must

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inform underground utility workers and other workers who may come into contact with soil in the AUL Area of (1) the nature and hazards of the contaminants identified in the soil, (2) potential exposure routes, (3) measures to prevent exposure, (4) protective clothing requirements, and (5) any other health and safety measures appropriate for the activity or use;

(ii) Any long-term (greater than 6 months) activity at or use of either Lot 1 or Lot 2 of the Property that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a written Soil Management Plan under the guidance of an LSP. At a minimum, the Soil Management Plan must (1) describe the soil excavation and stockpile storage methods that will be used to prevent accidental exposure to the excavated soil, including indirect exposure via surface water runoff or fugitive dust emissions, (2) contain procedures to limit access to the excavated soil and the excavation area by Property workers not covered by the Health and Safety Plan, children, Property abutters, or accidental trespassers, (3) contain procedures for characterizing, transporting and recycling/disposing excavated soil, and (4) provide for the restoration of the excavated area as soon as practicable; and

(iii) Any soil removed from either Lot 1 or Lot 2 of the Property must be characterized and disposed of in accordance with federal, state and local regulations, including the MCP.

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Property which may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by a LSP who shall render an Opinion, in accordance with 310 CMR 40.1080, as to whether the proposed changes are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Permanent or Temporary Solution. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by a LSP in accordance with 310 CMR 40.1080, and without additional response actions, if necessary, to maintain a condition of No Significant Risk. If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by a LSP in accordance with 310 CMR 40.1080, the Owner of either Lot 1 or Lot 2 within the Property subject to this Notice at the time that the applicable activities, uses and/or exposures change on that particular Lot, shall comply with the requirements set forth in 310 CMR 40.0020.

6. Incorporation into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Property or a portion thereof is conveyed in accordance with 310 CMR 40.1074(5).

Owners hereby authorize and consent to the filing and recordation and/or registration of this Notice, said Notice to become effective when executed under seal by the undersigned LSP, and recorded and/or registered with the appropriate Registry of Deeds and/or Land Registration Office(s).

DRAFT

WITNESS the execution hereof under seal this 8th day of August, 2019.

By: _____
Name: Jennifer Daloisio
as: CFO
of Massachusetts Clean Energy Center

WITNESS the execution hereof under seal this 23rd day of August, 2019.

By: _____
Janet P. Hamm, CPA, CGMA
as CFO of Hall Communications, Inc.

COMMONWEALTH OF MASSACHUSETTS

Suffolk County, ss August 8, 2019

On this 8 day of August, 2019, before me, the undersigned notary public, personally appeared Jennifer Daloisio, proved to me through satisfactory evidence of identification, which were person known to me, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose as CFO for the Massachusetts Clean Energy Technology Center, an independent public instrumentality of the Commonwealth of Massachusetts.

_____ (official signature and seal of notary)

ALEXANDRA ZALTMAN
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
September 9, 2022

STATE OF FLORIDA

County of Polk, ss August 23, 2019

On this 23 day of August, 2019, before me, the undersigned notary public, personally appeared Janet P. Hamm, proved to me through satisfactory evidence of identification, which were known to me, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that she signed it voluntarily for its stated purpose as CFO of Hall Communications, Inc., a Delaware corporation.

_____ (official signature and seal of notary)

LISA M. GIFFORD
Commission # GG 167582
Expires January 3, 2022
Bonded Thru Troy Fain Insurance 800-385-7019



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The undersigned Licensed Site Professional hereby certifies that in his Opinion this Notice of Activity and Use Limitation is consistent with a Permanent Solution and maintaining a condition of No Significant Risk.

Date: 9/16/2019

David B. Sherman
Licensed Site Professional

(Licensed Site Professional SEAL)

COMMONWEALTH OF MASSACHUSETTS

_____, ss September 16, 2019

On this 16 day of September, 2019, before me, the undersigned notary public, personally appeared David Sherman, proved to me through satisfactory evidence of identification, which were person known to me, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he)(she) signed it voluntarily for its stated purpose.

China Starks
Notary Public-Connecticut
My Commission Expires
May 31, 2022

(as partner for _____, a partnership)
(as _____ for _____, a corporation)
(as attorney in fact for _____, the principal)
(as _____ for _____, (a) (the) _____)
China Starks (official signature and seal of notary)

Upon recording, return to:

Apex Companies, LLC.
58H Connecticut Avenue
South Windsor, CT 06074

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Exhibit A

Metes and Bounds Description of Parcel of Land Containing Area Subject to AUL

A certain parcel of land situated on the southeasterly side of Macarthur Drive in New Bedford, Massachusetts, being shown as Lots 1 and 2 on a plan entitled "Plan of Land, Macarthur Boulevard, Assessors Map 31 Lot 234, New Bedford, Massachusetts, Prepared for Apex Companies, LLC, revised July 13, 2016" prepared by Thompson Farland, Inc, being further bounded and described as follows:

Beginning at a point on the southeasterly side of Macarthur Drive, said point being the northeasterly corner of land now or formerly belonging to Carlos and Conceicao Rafael and the northwesterly corner of the herein describer parcel;

Thence running along said Macarthur Drive by a curve deflecting to the left, having a radius of 155.00 feet and an arc length of 182.67 feet to a corner and land now or formerly belonging to C P Brodeur, Inc;

Thence turning and running by said C P Brodeur, Inc land, S11°43'37"E, 148.08 feet to a corner;

Thence turning and running still by said C P Brodeur, Inc land and land now or formerly belong to R C P Realty LLC and Dennis Saluti "Trustee", Michael St. Ours "Trustee", N75°39'17"E, 440.37 feet to a corner and land now or formerly belonging to Rist LLC;

Thence turning and running along said Rist LLC land, S14°20'43"E, 389.25 feet to a corner and land now or formerly belonging to Fargo Realty Trust;

Thence turning and running along said Fargo Realty Trust land and land now or formerly belonging to DeCosta Realty Trust, S76°40'51"W, 504.23 feet to a corner and land now or formerly belonging to Gregory G. White and David R. Belzer, Trustees;

Thence turning and running along said Gregory G.White and David R. Belzer, Trustees land and land now or formerly belonging to Carlos and Conceicao Rafael, N07°51'03"W, 314.29 feet to a corner;

Thence running still by said Rafael land, N46°24'07"W, 81.49 feet to a point of curvature;

Thence running still by said Rafael land by a curve deflecting to the left, having a radius of 20.00 feet and an arc length of 27.37 feet to Macarthur Drive and the point of beginning.

Said Lots 1 (MassCEC; Map 31 Lot 234) and Lot 2 (Hall Communications, Inc.; Map 31 Lot 234) contain a total area of 4.40 Acres more or less.

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# EXHIBIT B - Activity & Use Limitation



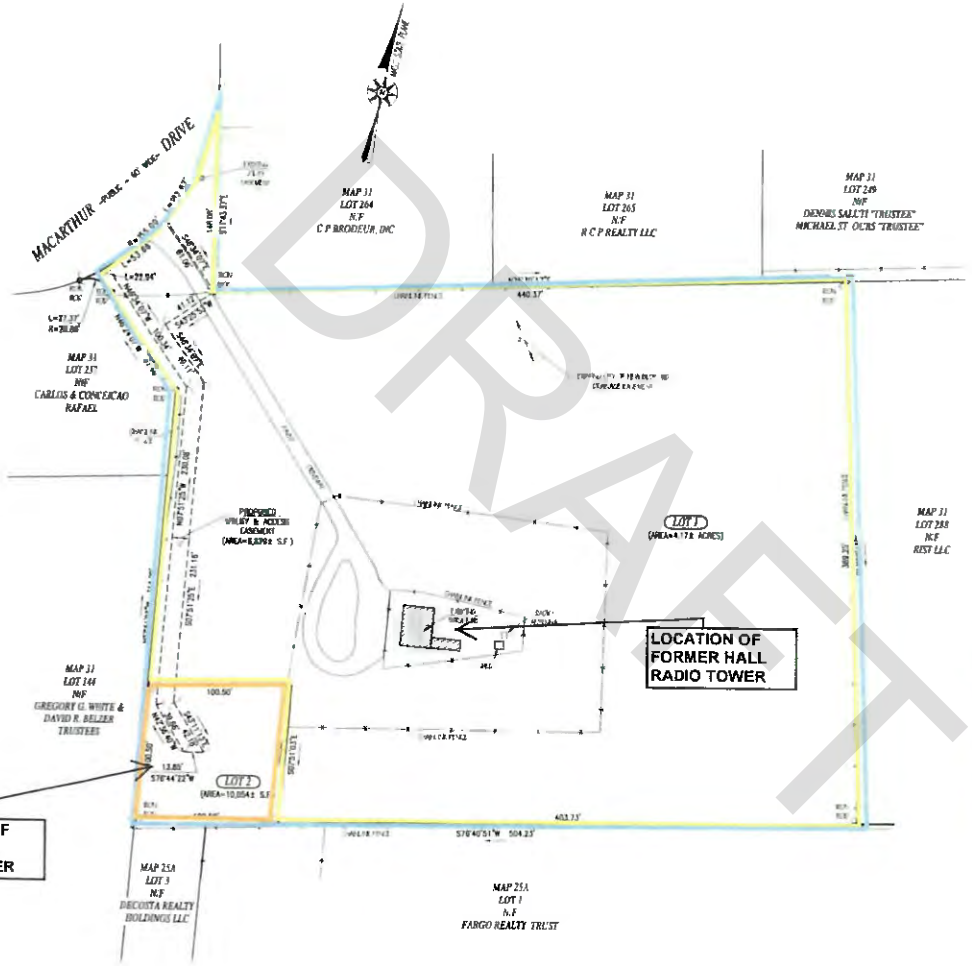
LOCUS MAP SCALE: 1"=2,000'±

## – ZONING DATA –

DISTRICT: WATERFRONT INDUSTRIAL

| DESCRIPTION | REQUIRED |
|---|---|
| LOT AREA | 0 S.F. |
| LOT FRONTAGE | 0 FT. |
| FRONT SETBACK | 10 FT. |
| SIDE SETBACK | 10 FT. |
| REAR SETBACK | *10 FT. |

*REAR SETBACK EQUALS 20 FEET FOR STRUCTURES OVER 3 STORIES




LEGEND

DISPOSAL SITE BOUNDARY (RTN 4-25350)

AREA SUBJECT TO AUL (LOT 1)

AREA SUBJECT TO AUL (LOT 2)

FOR REGISTRY USE ONLY

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

BRIAN C. MURPHY, P.L.S. — 7/13/2016 DATE

NEW BEDFORD PLANNING BOARD

APPROVAL UNDER THE SUBDIVISION CONTROL LAW NOT REQUIRED

DATE: _____

NOTES:
1. THE PURPOSE OF THIS PLAN IS TO SUBDIVIDE EXISTING ASSESSORS MAP 31, LOT 234 INTO LOT 1 AND LOT 2 AND TO CREATE AN ACCESS AND UTILITY EASEMENT TO BENEFIT LOT 2.
2. BOUNDARY AND DETAIL SURVEY PERFORMED BY THOMPSON FARLAND, INC. IN MARCH 2014.
3. ENDORSEMENT OF THIS PLAN AND THE PROPOSED UTILITY AND ACCESS EASEMENT WILL NOT AFFECT THE CITY OF NEW BEDFORD'S DRAINAGE EASEMENT.

RECORD OWNER:
NEW BEDFORD RADIO INC
C/O HALL COMMUNICATIONS, INC
75 OXFORD STREET, SUITE 402
PROVIDENCE, RI 02905
DEED BOOK 1536 PAGE 1120
DEED BOOK 1568 PAGE 576
DEED BOOK 1717 PAGE 56

PLAN REFERENCES:
PLAN BOOK 157 PAGE 74
PLAN BOOK 187 PAGE 49
PLAN BOOK 99 PAGE 71

REVISIONS

| | | |
|---|---|---|
| 1 | 6/2/16 | EASEMENT REVISION |
| 2 | 7/8/16 | PLANNING BOARD COMMENTS |
| 3 | 7/13/16 | NOTE REVISION |

THOMPSONFARLAND
PROFESSIONAL ENGINEERS // LAND SURVEYORS
www.ThompsonFarland.com
(MAIN OFFICE) 305 COMMERCIAL STREET, NEW BEDFORD, MA 02740 P.(508) 717-4479
NEW BEDFORD | TAUNTON | HARWICH | MARLBOROUGH

DRAWN BY: CKC
DESIGNED BY:
CHECKED BY: BJM

PLAN OF LAND
—MACARTHUR BOULEVARD—
ASSESSORS MAP 31 LOT 234
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: APEX COMPANIES, LLC
184 HIGH STREET, SUITE 502
BOSTON, MA 02210

MARCH 18, 2015
SCALE: 1"=40'
JOB NO. 10-540
LATEST REVISION: JULY 13, 2015

SHEET 1 OF 1

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## ACTIVITY AND USE LIMITATION OPINION

RTN 4-25350

### 1.0 Introduction

This Licensed Site Professional (LSP) Opinion for the Notice of Activity and Use Limitation (AUL) was prepared by David B. Sherman (LSP No. 8904) on behalf of the Massachusetts Clean Energy Center (MassCEC) and N B Radio, Inc. c/o Hall Communications, for release conditions at the parcel of land located at ES R S Front Street, in New Bedford, Bristol County, Massachusetts (the Property). The MassDEP has assigned Release Tracking Number (RTN) 4-25350 to this site. The Disposal Site is comprised of 2 lots (Lot 1 and Lot 2). Lot 1 is currently owned by the MassCEC and Lot 2 is currently owned by Hall Communications and is also the location of the new radio tower. This LSP Opinion was prepared in accordance with 310 CMR 40.1074 and (1) explains why implementation of the AUL is appropriate to maintain a level of No Significant Risk at the Property (as defined in the AUL), (2) describes activities and uses prohibited in the area of the Property to be subject to the AUL, (3) identifies permitted activities and uses in the AUL area, and (4) identifies conditions or obligations for the AUL area in order to maintain a level of No Significant Risk.

The referenced parcel is part of the New Bedford Marine Commerce Terminal (Terminal) project constructed under the direction of the USEPA, by virtue of a State Enhanced Remedy provision (dated July 1, 2013) of the New Bedford Harbor Superfund Site Record of Decision, and the Final Determination for the South Terminal Project, dated November 16, 2012 and its subsequent modifications. While crafting the Final Determination, EPA:

- reviewed historic data associated with previous uses of some of the properties involved in the project;
- reviewed historic environmental investigations conducted to date on some of the properties involved in the project;
- directed the Commonwealth to conduct environmental investigations on certain properties associated with the project;
- requested proposals for environmental remediation on certain properties associated with the project, and reviewed and accepted those proposals;
- requested commitments from the MassCEC with regard to future maintenance of the existing, 3-foot engineered environmental cap on certain properties associated with the project.

EPA directly regulated the environmental investigations and proposed remediation for the New Bedford Marine Commerce Terminal project as completed by the Massachusetts Clean Energy Center (MassCEC). EPA also had an active role in regulating the investigations and proposed remediation for the project, and some aspects of the 21E/MCP process were reviewed and regulated by EPA. Additionally, various elements of MassCEC's appropriate response actions were listed in the Final Determination. The MassDEP provided an Adequately Regulated Determination for the Marine Commerce Terminal Project in a letter dated July 1, 2013, under 310 CMR 40.0110 of the Massachusetts Contingency Plan.

### 2.0 Property Background

Multiple environmental investigations on the property have identified elevated levels of polychlorinated biphenyls, metals (lead and cadmium) and polycyclic aromatic hydrocarbons (PAHs) in soil, likely attributed to the presence of historic urban fill emplaced along the New Bedford waterfront area. As the

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northeastern portion of the site was found to contain the most elevated concentrations of contaminants in soil, an environmental engineered cap consisting of 3 feet of imported, clean engineered fill was placed over the entire footprint to Lot 1 with the upper twelve-inches comprised of an engineered dense aggregate substrate. Based on the presence of substantially lower contaminant concentrations and federal restrictions regarding the height of the new radio tower located on Lot 2, this portion of the property did not receive the 3 feet of imported clean engineered fill. The construction activity was completed as detailed in the Release Abatement Measure Plan submitted to the MassDEP in October 20, 2014.

The Terminal project involved the construction of a multi-purpose facility designed to support the construction, assembly and deployment of offshore wind projects, as well as handle bulk, break-bulk, container and large specialty marine cargo. The Terminal is a 26-acre property that was designed to serve as a staging area for various cargoes associated with the Terminal operations. From 2013 to 2015 the entire Terminal property was remediated and backfilled with a minimum of 3 feet of clean imported engineered fill. The fill material for preparing the subgrade beneath the site was either generated during the associated Terminal channel dredging or imported fill from landside aggregate facilities. The fill material was placed in lifts and compacted to bring the final grade of the Terminal property to existing street level. An eight-foot tall security fence has been installed around the perimeter of the main Terminal property. Extensive site assessment activities and remedial actions involving localized soil excavation and removal have been conducted on the property to characterize and abate impacts to underlying subsurface media. These areas were subsequently backfilled and capped with clean materials.

The Property is relatively square in shape with maximum dimensions of 390 feet by 420 feet, encompassing an area of approximately 4.40 acres. The Property is bordered by Seatrade International to the west, North Coast Seafood to the south, the former RIST, LLC parcel to the east and C.P. Brodeur, Inc. to the north. This parcel was recently subdivided in accordance with the ANR plan dated March 18, 2015. Lot 1 of Parcel A is currently owned by the Massachusetts Clean Energy Center (MassCEC). Lot 2 of Parcel A is currently owned by NB Radio, Inc.

Current site features and parcel descriptions are depicted on **Exhibit B** to this AUL.

**2.1 Disposal Site Description**

| | |
|---|---|
| **Parcel Name:** | **Former Hall Radio Tower - RTN 4-25350** |
| Address: | ES R S Front Street |
| Parcel ID/Size: | Book 1536 Page 1120/ 4.40 acres (total) |
| Current Owner: | MassCEC Lot 1, NB Radio, Inc. Lot 2 |
| Date Reported: | October 1, 2014 |
| MCP Status: | Permanent Solution with Conditions |

This property is currently a portion of the New Bedford Marine Commerce Terminal and is situated between Potomska Street to the north and South Front Street to the west. During subsurface investigations conducted between October 2014 and May 2016, concentrations of polychlorinated biphenyls, lead, cadmium and select PAH compounds were identified above reportable concentrations. The majority of this impact was found in the northeastern portion of Lot 1. Soil impacts in this area were excavated and

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removed and 3 feet of clean, imported engineered fill was placed throughout the entire foot print of Lot 1 as an engineered environmental cap. The AUL area encompasses the entire site (Lot 1 and Lot 2) to prevent exposure to the soils.

In addition to the subsurface investigations and Release Abatement Measure (RAM) activities conducted between October 2014 and August 2016, additional remedial activities were completed over the entire New Bedford Marine Commerce Terminal Property. The remedial (RAM) activities completed at this subject property included:

- Removal of 1,876 tons of PCB, metals, total petroleum hydrocarbons and PAH impacted soil to out of state landfills under a Hazardous Waste Manifest to the Heritage Environmental Services in Roachdale, Indiana facilities;
- In accordance with the EPA's Final Determination for the South Terminal Project, soils containing concentrations of PCBs up to 50ppm were allowed to be left in place and capped as described below;
- General grading of the Disposal Site; and
- Construction of an environmental engineered cap over Lot 1 consisting of 3 feet of clean, imported engineered fill, the upper twelve-inches of which was comprised of a mixed, dense aggregate engineered layer.

**3.0 Summary of the Risk Characterization**

A Method 3 Risk Characterization has been prepared by Apex in anticipation of regulatory (MCP) site closure. The results of the risk characterization are the basis for the decision regarding the Permanent Solution with Conditions (PSC) for the release at the Site pursuant to 310 CMR 40.1000. A summary of the Risk Characterization is presented below.

The contaminants of concern identified at the site included, polychlorinated biphenyls (PCBs); certain polyaromatic hydrocarbons (PAHs) and certain metals (lead and cadmium).

The Terminal Property is currently a marine cargo facility that acts as a storage and staging area for marine vessels and cargo operations. Under foreseeable future conditions, receptors reasonably likely to be present on site include workers, security personnel, escorted visitors, vessel crews, trespassers, landscapers, utility workers, and construction workers. Lot 2, currently owned by Hall Communications, is occupied by a new, 600-foot tall radio tower used for transmission services for FM broadcasting. The Method 3 Risk Characterization determined that "No Significant Risk" of harm to human health exists at the Site for each receptor type considered in the risk characterization based on current and foreseeable uses. It also determined that "No Significant Risk" of harm to safety, public welfare and the environment exists at all portions of the Site. As a result of the risk characterization, an AUL is required to limit residential, and certain other construction uses of the property. In addition, due to the presence of elevated concentrations of compounds of concern in soil, the AUL includes requirements for soil management if soil intrusive work is planned to be conducted. The property is included in its entirety (Lot 1 and Lot 2) within the Disposal Site Boundary for RTN 4-25350.

**4.0 Use of the AUL to Maintain a Level of No Significant Risk**

As described in the Risk Characterization, a condition of No Significant Risk to human health, safety, public welfare and the environment currently exists at the Site. However, this conclusion is based on the assumption that the Property will not be used for residential purposes or for the growing of fruits or

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vegetables for human consumption. This restriction is extended to limit the use of the Property as a school, daycare, nursery, recreational area (such as a park or athletic field) and/or any other use in which a child's presence is likely to be more than incidental. All other reasonably foreseeable site uses were considered. In addition, because residual contamination is present at the site, this AUL will also provide appropriate notice to future Site users to exercise appropriate caution when encountering or handling soil, and ensure that unnecessary exposures do not occur and that contaminated soils are managed appropriately.

**5.0 Acceptable Activities and Uses**

The AUL Opinion provides that a condition of No Significant Risk to health, safety, or public welfare exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) as long as any of the following activities and uses occur on the Property:

(i) Commercial and industrial activities and uses which do not involve the disturbance of soil located greater than 3 feet below the ground surface within the entire footprint of Lot 1 and at or below surface grade within the entire footprint of Lot 2, as long as the Obligations and Conditions specified herein are followed;

(ii) Any non-residential uses of the Property, including those that are currently conducted, in which a child's presence (other than incidental) is not likely;

(iii) Short-term (6 months or less) underground utility and/or construction activities which are likely to disturb soil, provided that such activities are conducted in accordance with the soil management provisions of the Massachusetts Contingency Plan (MCP) cited at 310 CMR 40.0030 and all applicable worker health and safety practices pursuant to 310 CMR 40.0018;

(iv) Construction or excavation activities are allowed, except as prohibited in Paragraph 6 (ii);

(v) Such other activities or uses which, in the Opinion of a Massachusetts Licensed Site Professional ("LSP"), shall present no greater risk of harm to human health, safety, public welfare or the environment than the activities and uses set forth in this paragraph; and

(vi) Other activities or uses of the Property not identified in Paragraph 6 as Activities and Uses Inconsistent with the AUL.

**6.0 Restricted Activities and Uses**

Activities and uses that are inconsistent with the objectives of this Notice of AUL, and that, if implemented at the Site, may result in a significant risk of harm to human health, safety, or public welfare, are as follows:

(i) Use of the Property as a residence or for growing fruits or vegetables for human consumption, as a school, daycare, nursery, recreational area (such as a park or athletic field), and/or any other use in which a child's presence (other than incidental) is likely;

(ii) Any long-term (greater than 6 months) activity at the Property that is reasonably likely to result in the excavation greater than 3 feet below grade within the entire footprint of Lot 1 or excavation at or below surface grade within the entire footprint of Lot 2, relocation or removal of the contaminated soil, unless such activity is first evaluated by an LSP who renders an Opinion stating that such activity is consistent

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with maintaining a condition of No Significant Risk and that such activity is conducted in accordance with Obligations (1) and (2), set forth below; and

(iii) Any excavation activity which may disturb the soil located at a depth greater than 3 feet below ground surface within the entire footprint of Lot 1 and/or disturbance of soil located at or below surface grade within the entire footprint of Lot 2 AUL area, without prior development and implementation of a Soil Management Plan and a Health and Safety Plan in accordance with Obligations (i) and (ii) of this Notice.

**7.0 Obligations for the AUL Area**

If applicable, obligations and/or conditions to be undertaken and/or maintained at the Site to maintain a condition of No Significant Risk, as set forth in the AUL Opinion, shall include the following:

1. Any long-term (greater than 6 months) activity at or use of the Property that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a **Health and Safety Plan** under the guidance of an LSP. At a minimum, the Health and Safety Plan must inform underground utility workers and other workers who may come into contact with soil in the AUL area of (1) the nature and hazards of the contaminants identified in the soil, (2) potential exposure routes, (3) measures to prevent exposure, (4) protective clothing requirements, and (5) any other health and safety measures appropriate for the activity or use;

2. Any long-term (greater than 6 months) activity at or use of the Property that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a written **Soil Management Plan** under the guidance of an LSP. At a minimum, the Soil Management Plan must (1) describe the soil excavation and stockpile storage methods that will be used to prevent accidental exposure to the excavated soil, including indirect exposure via surface water runoff or fugitive dust emissions, (2) contain procedures to limit access to the excavated soil and the excavation area by Property workers not covered by the Health and Safety Plan, children, Property abutters, or accidental trespassers, (3) contain procedures for characterizing, transporting and recycling/disposing excavated soil, and (4) provide for the restoration of the excavated area as soon as practicable; and

3. Any soil removed from the Property, other than the clean overburden and backfill, must be characterized and disposed of in accordance with federal, state and local regulations, including the MCP 310 CMR 40.0000.

4. The engineered environmental cap constructed within the entire footprint of Lot 1 must be regularly inspected, maintained, repaired and/or replaced with a comparable cap to prevent future exposure to underlying contaminated soil immediately following the completion of any activity that involves its removal and/or disturbance.

5. The engineered environmental cap constructed over Lot 1 shall consist of at least 3 feet of clean engineered fill material such as Dense Graded Aggregate or an engineer and LSP approved equal, or 6 inches of pavement or a building.

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## 8.0 Summary and Conclusions

This LSP Opinion has been prepared for implementation of a Notice of AUL for a release at the ES R S Front Street Property, (Registry of Deeds Book 1536, Page 1120) in New Bedford, Bristol County, Massachusetts. A Method 3 Risk Characterization indicates that restrictions on activities and uses of this Property are required to maintain a condition of No Significant Risk to human health, safety or public welfare. In general, use of the Property for residential purposes, growing fruits or vegetables for human consumption, or any other use in which a child 's presence (other than incidental) is likely, are to be limited as set forth in Section 6.0. In addition, activities and uses that may result in the excavation, relocation, or removal of contaminated soil at the Property may be permitted with certain precautions.

Date: 9/16/2019

David B. Sherman, LSP

LSP Seal:




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**DMF PARCEL 2 AUL**

**RTN: 4-15490**

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BK 9630 PG 39
02/03/10 09:19 DOC. 2648
Bristol Co. S.D.

CONFIRMATORY NOTICE OF ACTIVITY AND USE LIMITATION
M.G.L. c. 21E, § 6 and 310 CMR 40.0000

Disposal Site Name: Former Standard Times Site - Lot 3, 16 Blackmer Street, New Bedford, MA
DEP Release Tracking No.(s): 4-15490

This Confirmatory Notice of Activity and Use Limitation ("Notice") is made as of this 2nd day of February, 2010, by the Commonwealth of Massachusetts Department of Fish and Game located at 251 Causeway Street, Suite 400, Boston, Massachusetts 02114, together with his/her/its/their successors and assigns (collectively "Owner").

W I T N E S S E T H:

WHEREAS, the Commonwealth of Massachusetts Department of Fish and Game, is the owner in fee simple of that certain parcel of vacant land located in New Bedford, Bristol County, Massachusetts, pursuant to a deed recorded with the Bristol County Registry of Deeds (Southern District) in Book 7642, Page 344;

WHEREAS, said parcel of land, which is more particularly bounded and described in Exhibit A, attached hereto and made a part hereof ("Property") is subject to this Notice of Activity and Use Limitation. The Property is shown on a plan recorded in the Bristol County Registry of Deeds (Southern District) in Plan Book 148, Plan 92,

WHEREAS, a portion of the Property ("Portion of the Property") is subject to this Notice of Activity and Use Limitation. The Portion of the Property is more particularly bounded and described in Exhibit A-1, attached hereto and made a part hereof. The Portion of the Property is shown on a plan recorded with the Bristol County Registry of Deeds (Southern District) in Plan Book 163, Plan 106, and/or on a sketch plan attached hereto and filed herewith for registration;

WHEREAS, the Portion of the Property comprises part of a disposal site as the result of a release of oil and/or hazardous material. Exhibit B is a sketch plan showing the relationship of the Portion of the Property subject to this Notice of Activity and Use Limitation to the boundaries of said disposal site existing within the limits of the Property and to the extent such boundaries have been established. Exhibit B is attached hereto and made a part hereof; and

WHEREAS, one or more response actions have been selected for the Portion of the Disposal Site in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 ("MCP"). Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil and/or (b) the restriction of certain activities occurring in, on, through, over or under the Portion of the Property. The basis for such restrictions is set forth in an Activity and Use Limitation Opinion ("AUL Opinion"), dated March 5, 2009 (which is

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attached as Exhibit C of the original Notice of Activity and Use Limitation dated March 9, 2009, and recorded with the Registry of Deeds in Book 9289, Page 7.

NOW, THEREFORE, notice is hereby given that the activity and use limitations set forth in said AUL Opinion are as follows:

1. Activities and Uses Consistent with the AUL Opinion. The AUL Opinion provides that a condition of No Significant Risk to health, safety, public welfare or the environment exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) so long as any of the following activities and uses occur on the Portion of the Property:

(i) Commercial and industrial activities and uses including, but not limited to, vehicular parking, pedestrian and vehicular traffic, passive recreation, landscaping, routine maintenance or any other use that does not compromise the structural integrity of the protective barrier, as defined in 3.(iv) and/or disturb contaminated soil located directly beneath the barrier;

(ii) Excavation associated with emergency or short term (three months or less) underground utility and/or construction work, provided it is conducted in accordance with a Soil Management Plan and a Health and Safety Plan in accordance with Obligations (i) and (ii) of this Notice; and involves the repair and/or replacement of the protective barrier with a comparable barrier immediately following the completion of the project;

(iii) Activities and uses that are not identified by this Notice as being inconsistent with maintaining a condition of No Significant Risk; and

(iv) Such other activities and uses which, in the Opinion of an LSP, shall present no greater risk of harm to health, safety, public welfare, or the environment than the activities and uses set forth in this paragraph.

2. Activities and Uses Inconsistent with the AUL Opinion. Activities and uses that are inconsistent with the objectives of this Notice of Activity and Use Limitation, and which, if implemented at the Portion of the Property, may result in a significant risk of harm to health, safety, public welfare or the environment or in a substantial hazard, are as follows:

(i) Use of the Property as a residence, school, nursery, daycare, recreational area and/or other such use at which a child's regular presence is likely

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(ii) Activities and/or uses which are likely to involve the removal and/or disturbance of the protective barrier in the AUL Area and/or the disturbance of the contaminated soil located beneath the protective barrier without prior development of a Soil Management Plan and a Health and Safety Plan in accordance with Obligations (i) and (ii) of the LSP Opinion;

(iii) Relocation of the contaminated soil from beneath the protective barrier in the AUL Area unless an LSP renders an Opinion that states such relocation is consistent with maintaining a condition of No Significant Risk; and

(iv) Activities and/or uses that may cause physical or chemical deterioration, breakage, or structural damage to the protective barrier.

3. Obligations and Conditions Set Forth in the AUL Opinion. If applicable, obligations and/or conditions to be undertaken and/or maintained at the Portion of the Property to maintain a condition of No Significant Risk as set forth in the AUL Opinion shall include the following:

(i) A Soil Management Plan must be prepared by an LSP and implemented prior to the commencement of any activity that is likely to disturb the contaminated soil located immediately beneath the protective barrier. The Soil Management Plan must be prepared in accordance with the guidelines discussed in the Activity and Use Limitation opinion attached hereto as Exhibit C of the original Notice of Activity and Use Limitation;

(ii) A Health and Safety Plan must be prepared and implemented in accordance with the guidelines discussed in the Activity and Use Limitation Opinion attached hereto as Exhibit C of the original Notice of Activity and Use Limitation prior to the commencement of any activity that involves the removal and/or disturbance of the protective barrier and/or is likely to disturb the underlying contaminated soil within the AUL Area;.

(iii) The protective barrier within the AUL Area must be repaired and/or replaced with a comparable barrier to prevent future exposures to underlying contaminated soil immediately following the completion of any activity that involves its removal and/or disturbance;

(iv) The protective barrier shall consist of either a minimum of 3-inches of asphalt pavement (or concrete), 3-feet of clean soil or a building

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(v) The protective barrier must be maintained within the designated AUL area to ensure that the contaminated soil located beneath the barrier remains inaccessible; and

(vi) Annual inspections and associated record-keeping activities must be performed to confirm that the barrier is being properly maintained to prevent exposure(s) to contaminated soil located immediately beneath the protective barrier.

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Portion of the Property that may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by an LSP who shall render an Opinion, in accordance with 310 CMR 40.1080 *et seq.*, as to whether the proposed changes will present a significant risk of harm to health, safety, public welfare or the environment. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Response Action Outcome. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by an LSP in accordance with 310 CMR 40.1080 *et seq.*, and without additional response actions, if necessary, to achieve or maintain a condition of No Significant Risk or to eliminate substantial hazards.

If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by an LSP in accordance with 310 CMR 40.1080 *et seq.*, the owner or operator of the Portion of the Property subject to this Notice at the time that the activities, uses and/or exposures change, shall comply with the requirements set forth in 310 CMR 40.0020.

6. Incorporation Into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Property or a portion thereof is conveyed.

Owner hereby authorizes and consents to the filing and recordation and/or registration of this Confirmatory Notice, said Confirmatory Notice to become effective when executed under seal by the undersigned LSP, and recorded and/or registered with the appropriate Registry(ies) of Deeds and/or Land Registration Office(s).

This Confirmatory Notice of Activity and Use Limitation is given to correct

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the inadvertent error(s) made in the Notice of Activity and Use Limitation dated March 9, 2009, and recorded with the Registry of Deeds in Book 9289, Page 7, said error(s) being as follows:

(i) Exhibit B of the recorded Notice of Activity and Use Limitation did not properly depict AUL limits relative to the defined Site boundaries.

The corrected Site Sketch has been provided and attached hereto as Exhibit B. In all other respects, the terms of the Notice of Activity and Use Limitation remain unchanged.

WITNESS the execution hereof under seal this 20th day of January, 2010.

Commonwealth of Massachusetts, Department of Fish and Game

Mary B. Griffin

By: Mary B. Griffin
Commissioner

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COMMONWEALTH OF MASSACHUSETTS

Bristol, ss January 20, 2010

On this 20th day of January, 2010, before me, the undersigned notary public, personally appeared Mary B. Griffin, proved to me through satisfactory evidence of identification, which were personally known, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that she signed it voluntarily for its stated purpose as Commissioner of the Commonwealth of Massachusetts Department of Fish and Game.

GLENDA L. DiFILIPPO
NOTARY PUBLIC
Commonwealth of Massachusetts
My Commission Expires
October 31, 2014

Glenda L DiFilippo

The undersigned LSP hereby certifies that he executed the aforesaid Activity and Use Limitation Opinion attached hereto as Exhibit C and made a part hereof and that in his Opinion this Confirmatory Notice of Activity and Use Limitation is consistent with the terms set forth in said Activity and Use Limitation Opinion.

Date: Feb 2, 2010




Kevin J. Beaulieu, LSP

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COMMONWEALTH OF MASSACHUSETTS

Bristol, ss February 2, 2010

On this 2nd day of February, 2010, before me, the undersigned notary public, personally appeared Kevin J. Beaulieu, proved to me through satisfactory evidence of identification, which were personally known, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose as LSP for Commonwealth of Massachusetts Department of Fish and Game.

Notary Public, Linda Mayo
My Commission Expires: 1/21/2011

Upon recording, return to:

Commonwealth of Massachusetts Department of Fish and Game
251 Causeway Street, Suite 400
Boston, MA 02114

**EXHIBIT A**

(Description of Parcel of Land Containing Area Subject to AUL)

A certain parcel of land shown as Lot 3B on a Plan entitled "Approval Not Required Plan of Land located in New Bedford, MA prepared for City of New Bedford Redevelopment Authority", Scale 1"=60', dated November 21, 2001, prepared by Kenneth R. Ferreira Engineering, Inc., New Bedford, MA, recorded in the Bristol County Registry of Deeds in Plan Book 148 at Page 92, and being more particularly bounded and described as follows:

| | |
|---|---|
| BEGINNING | at a point on the easterly side of a cul-de-sac of said Blackmer Street marking the southwest corner of the parcel herein described as shown on said Plan; thence |
| Northwesterly | on a curve to the left with a radius of 75.00 feet an arc distance of 85.64 feet by said cul-de-sac of Blackmer Street to a point as shown on said Plan; thence |
| Northerly | on a curve to the right with a radius of 30.00 feet an arc distance of 24.04 feet by said cul-de-sac of Blackmer Street and by Lot 2B to a point as shown on said Plan; thence |
| N 13° 21' 47" W | one hundred eighty-three and 45/100 (183.45) feet by said Lot 2B to a point marking the northwest corner of the parcel herein described and the southwest corner of Lot 3A as shown on said Plan; thence |
| S 76° 40' 57" W | three hundred seventy-one and 74/100 (371.74) feet by said Lot 3A to a point marking the northeast corner of the parcel herein described and the southeast corner of said Lot 3A as shown on said Plan; thence |
| S 01° 54' 01" E | two hundred eighty-nine and 61/100 (289.61) feet to a point as shown on said Plan; thence |
| S 76° 40' 53" W | two hundred ninety-six and 56/100 (296.56) feet to the PLACE OF BEGINNING, containing 95,197 square feet of land, more or less, as shown on said Plan. |

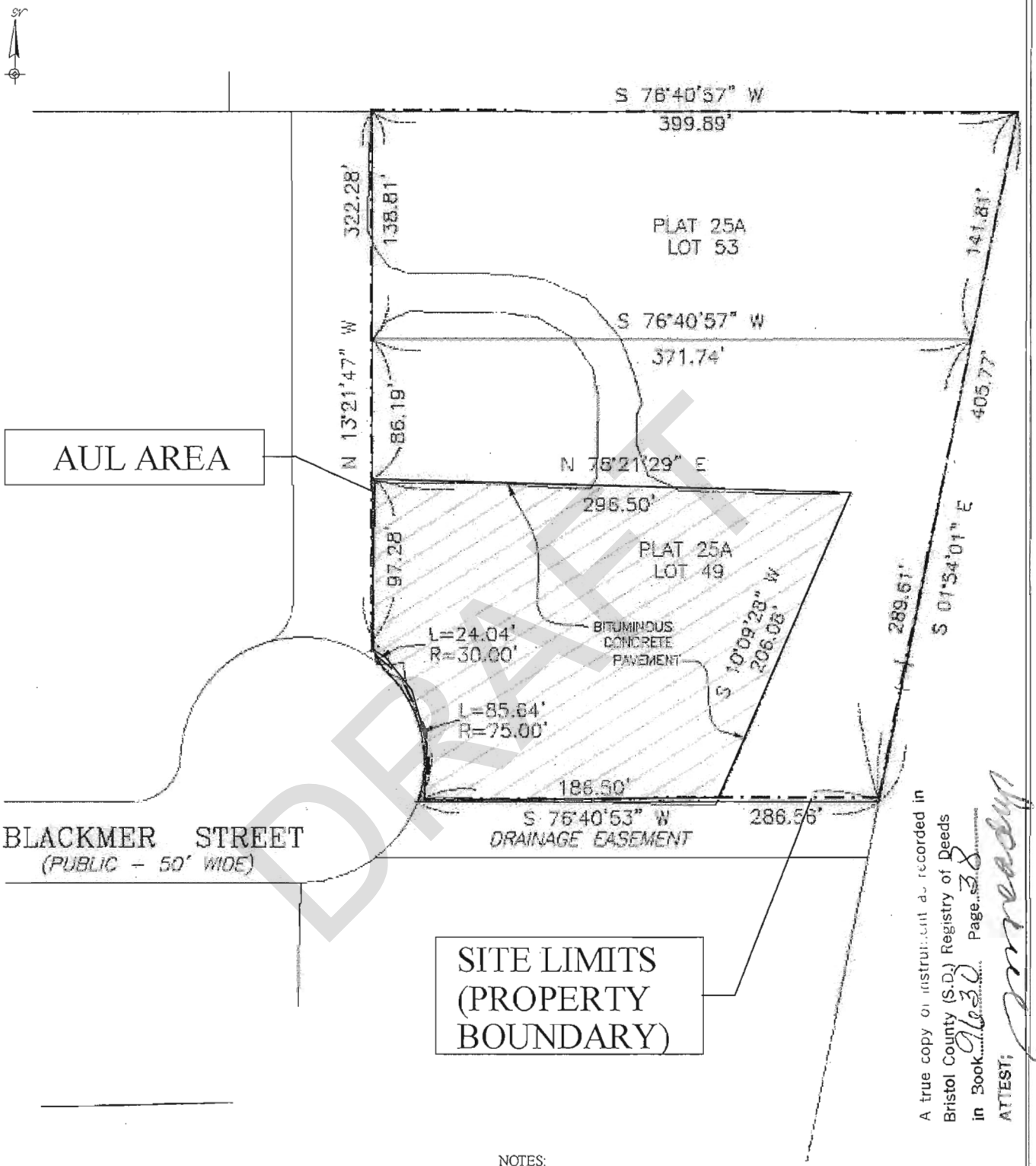
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**EXHIBIT A-1**
(Description of Area Subject to AUL)

That certain portion of a parcel of land, said parcel of land being situated in New Bedford, Bristol County, Massachusetts, and being shown as Lot 3B on the aforementioned plan recorded with said Deeds in Plan Book 148, Page 92, said portion being shown as the "Activity and Use Limitation Area" on a plan entitled, "Activity and Use Limitation Plan of Land in New Bedford, MA", dated December 2, 2008, Scale 1"=40', prepared by SITEC, Inc., Dartmouth, Massachusetts, and recorded with the Bristol County Registry of Deeds in Plan Book 163, Page 106 and being more particularly bounded and described as follows:

| | |
|---|---|
| BEGINNING | AT A POINT IN THE EASTERLY SIDELINE OF BLACKMER STREET, SAID POINT BEING THE SOUTHWEST CORNER OF THE PARCEL SHOWN AS LOT 3B ON PLAN RECORDED AT PLAN BOOK 148 PAGE 92 IN THE BRISTOL COUNTY REGISTRY OF DEEDS; THENCE |
| NORTHWESTERLY | ON A CURVE TO THE LEFT WITH A RADIUS OF 75.00 FEET AN ARC DISTANCE OF 85.64 FEET TO A POINT; THENCE |
| NORTHERLY | ON A CURVE TO THE RIGHT WITH A RADIUS OF 30.00 FEET AN ARC DISTANCE OF 24.04 FEET TO A POINT; THENCE |
| N 13°21 '47" W | NINETY-SEVEN AND 28/100 FEET (97.28') TO A POINT; THENCE |
| N 78°21'29" E | TWO HUNDRED NINETY-SIX AND 50/100 FEET (296.50') TO A POINT; THENCE |
| S 10°09'28" W | TWO HUNDRED SIX AND 08/100 FEET (206.08') TO A POINT; THENCE |
| S 76°40'53" W | ONE HUNDRED EIGHTY-SIX AND 50/100 FEET (186.50') TO THE POINT OF BEGINNING, CONTAINING 47,368 SQUARE FEET OF LAND, MORE OR LESS. |

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A true copy of instrument as recorded in
Bristol County (S.D.) Registry of Deeds
in Book 9630 Page 38
ATTEST: [signature]
REGISTER

NOTES:
(1) DRAWING DETAILS OBTAINED FROM ASSESSORS MAPS, AERIAL PHOTOGRAPHS, SURVEY PLANS GENERATED BY SITEC ENGINEERING INC. AND FIELD OBSERVATIONS. ALL SCALES ARE APPROXIMATE

| | | | |
|---|---|---|---|
| DRAWN BY: KJB<br>PROJ. MGR: KJB<br>PROJECT NO: W024<br>SCALE: 1" = 100'<br>DATE: 12/04/08 | GRAPHICAL SCALE<br>0 50 100 200<br>COMMON SENSE ENVIRONMENTAL, INC.<br>50 THERESA STREET<br>DARTMOUTH, MASSACHUSETTS 02748<br>PHONE: 508-991-3491 | SKETCH PLAN<br>COMMERCIAL PROPERTY<br>16 BLACKMER STREET<br>NEW BEDFORD, MASSACHUSETTS | EXHIBIT:<br>B |

Bristol County Southern District
25 N. 6th Street
New Bedford, Massachusetts 02740

02/03/10

COMMON SENSE ENVIRON SA

| | | | |
|---|---|---|---|
| # 8 Rec:time 919 Type | NAUL | | 50.00 |
| DOC. 2648 BK 9630-0038 | C. P. | | 20.00 |
| | R. D. | | 5.00 |
| # 9 Copies | | | 9.00 |
| Total | | | 84.00 |
| # 10 Payment Check | | | 84.00 |

THANK YOU! J. Mark Treadup
Register of Deeds

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**FORMER DARTMOUTH FINISHING SITE AUL**

**RTN: 4-23616**

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BK 11656 PG 310
04/14/16 11:04 DOC. 7877
Bristol Co. S.D.

NOTICE OF ACTIVITY AND USE LIMITATION

M.G.L. c. 21E, § 6 and 310 CMR 40.0000
Disposal Site Name: Former Dartmouth Finishing
DEP Release Tracking No.: 4-23616

This Notice of Activity and Use Limitation ("Notice") is made as of this 14th day of April, 2016, by The City of New Bedford, 133 Williams Street, New Bedford, Massachusetts, together with his/her/its/their successors and assigns (collectively "Owner").

WITNESSETH:

WHEREAS, The City of New Bedford, is the owner in fee simple of that certain parcel of vacant land located in New Bedford, Bristol County, Massachusetts, pursuant to a deed recorded with the Bristol County South Registry of Deeds in Book 8689 Page 93

WHEREAS, said parcel of land, which is more particularly bounded and described in Exhibit A, attached hereto and made a part hereof ("Property") is subject to this Notice of Activity and Use Limitation. The Property is shown on a plan recorded in the Bristol County Registry of Deeds in Plan Book 34, Plan 26;

WHEREAS, the Property comprises all of a disposal site as the result of releases of oil and/or hazardous material. Exhibit B is a sketch plan showing the relationship of the Property subject to this Notice of Activity and Use Limitation to the boundaries of said disposal site existing within the limits of the Property and to the extent such boundaries have been established. Exhibit B is attached hereto and made a part hereof; and

WHEREAS, one or more response actions have been selected for the Disposal Site in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 ("MCP". Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil and/or (b) the restriction of certain activities occurring in, on, through, over or under the Property. A description of the basis for such restrictions, and the oil and/or hazardous material release event(s) or site history that resulted in the contaminated media subject to the Notice of Activity and Use Limitation which is attached hereto as Exhibit C and made a part hereof;

NOW, THEREFORE, notice is hereby given that the activity and use limitations set forth in this Notice of Activity and Use Limitation are as follows:

1. Activities and Uses Consistent with Maintaining No Significant Risk Conditions. The following Activities and Uses are consistent with maintaining a Permanent Solution and a condition of No Significant Risk and, as such, may occur on the Property pursuant to 310 CMR 40.0000:

   (i) Commercial and industrial activities and uses which do not involve the disturbance of soil located greater than 3 feet below the ground surface within the AUL area, as long as the Obligations and Conditions specified herein are followed;
   (ii) Any non-residential uses of the Property, including those that are currently conducted, in which a child's presence (other than incidental) is not likely;
   (iii) Short-term (6 months or less) underground utility and/or construction activities which are likely to disturb soil, provided that such activities are conducted in accordance with the soil management provisions of the Massachusetts Contingency Plan (MCP) cited at 310 CMR 40.0030 and all applicable worker health and safety practices pursuant to 310 CMR 40.0018;
   (iv) Construction or excavation activities are allowed, except as prohibited in Paragraph 2 (ii);
   (v) Such other activities or uses which, in the Opinion of a Massachusetts Licensed Site Professional ("LSP"), shall present no greater risk of harm to human health, safety, public welfare or the environment than the activities and uses set forth in this paragraph; and
   (vi) Other activities or uses of the Property not identified in Paragraph 2 as Activities and Uses Inconsistent with the AUL.

2. Activities and Uses Inconsistent Maintaining No Significant Risk Conditions. The following Activities and Uses are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk pursuant to 310 CMR 40.0000, and, as such, may not occur on the Property:

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(i) Use of the Property as a residence or for growing fruits or vegetables for human consumption, as a school, daycare, nursery, recreational area (such as a park or athletic field), and/or any other use in which a child's presence (other than incidental) is likely;

(ii) Any long-term (greater than 6 months) activity at the Property that is reasonably likely to result in the excavation greater than 3 feet below grade, relocation or removal of the contaminated soil, unless such activity is first evaluated by an LSP who renders an Opinion stating that such activity is consistent with maintaining a condition of No Significant Risk and that such activity is conducted in accordance with Obligations (i) and (ii), set forth below; and

(iii) Any excavation activity which may disturb the soil located at a depth greater than 3 feet below ground surface within the AUL area, without prior development and implementation of a Soil Management Plan and a Health and Safety Plan in accordance with Obligations (i) and (ii) of this Notice.

3. Obligations and Conditions. The following obligations and/or conditions are necessary and shall be undertaken and/or maintained at the Property to maintain a Permanent Solution and a condition of No Significant Risk:

(i) Any long-term (greater than 6 months) activity at or use of the Property that is reasonably likely to result in the excavation, relocation, or removal of contaminated soil requires preparation and implementation of a Health and Safety Plan under the guidance of an LSP. At a minimum, the Health and Safety Plan must inform underground utility workers and other workers who may come into contact with soil in the AUL area of (1) the nature and hazards of the contaminants identified in the soil, (2) potential exposure routes, (3) measures to prevent exposure, (4) protective clothing requirements, and (5) any other health and safety measures appropriate for the activity or use;

(ii) Any long-term (greater than 6 months) activity at or use of the Property that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a written Soil Management Plan under the guidance of an LSP. At a minimum, the Soil Management Plan must (1) describe the soil excavation and stockpile storage methods that will be used to prevent accidental exposure to the excavated soil, including indirect exposure via surface water runoff or fugitive dust emissions, (2) contain procedures to limit access to the excavated soil and the excavation area by Property workers not covered by the Health and Safety Plan, children, Property abutters, or accidental trespassers, (3) contain procedures for characterizing, transporting and recycling/disposing excavated soil, and (4) provide for the restoration of the excavated area as soon as practicable;

(iii) Any soil removed from the Property, other than the clean backfill and overburden, must be characterized and disposed of in accordance with federal, state and local regulations, including the MCP, 310 CMR 40.0000.

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Property which may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by a Licensed Site Professional who shall render an Opinion, in accordance with 310 CMR 40.1080, as to whether the proposed changes are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Permanent or Temporary Solution. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by a Licensed Site Professional in accordance with 310 CMR 40.1080, and without additional response actions, if necessary, to maintain a condition of No Significant Risk. If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by a Licensed Site Professional in accordance with 310 CMR 40.1080, the owner or operator of the Property subject to this Notice at the time that the activities, uses and/or exposures change, shall comply with the requirements set forth in 310 CMR 40.0020.

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6. Incorporation into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Property or a portion thereof is conveyed in accordance with 310 CMR 40.1074(5).

Owner hereby authorizes and consents to the filing and recordation and/or registration of this Notice, said Notice to become effective when executed under seal by the undersigned Licensed Site Professional, and recorded and/or registered with the appropriate Registry of Deeds and/or Land Registration Office(s). Exhibit D, attached hereto, is an Affidavit of Authority of signature for Renee Fernandes.

WITNESS the execution hereof under seal this 14th day of April, 2016.

R Renee Fernandes

Renee Fernandes
Treasurer/Collector
City of New Bedford

COMMONWEALTH OF MASSACHUSETTS

Bristol, ss APRIL 14, 2016

On this 14 day of APRIL, 2016, before me, the undersigned notary public, personally appeared Renee Fernandes, proved to me through satisfactory evidence of identification, which were MA LIC., to be the person whose name is signed on the preceding or attached document, and acknowledged to me that she signed it voluntarily for its stated purpose.

as Treasurer/Collector for The City of New Bedford, the

Deborah L. Gonzaga (official signature and seal of notary)

DEBORAH L. GONZAGA
MY COMM. EXPIRES JUNE 18, 2021
NOTARY PUBLIC
COMMONWEALTH OF MASSACHUSETTS

The undersigned Licensed Site Professional hereby certifies that in his Opinion this Notice of Activity and Use Limitation is consistent with a Permanent Solution and maintaining a condition of No Significant Risk.

Date: April 14, 2016

Michael P. Bingham
Licensed Site Professional
Apex Companies, LLC

(Licensed Site Professional SEAL)

COMMONWEALTH OF MASSACHUSETTS
MICHAEL P. BINGHAM No. 4141 REGISTERED
LICENSED SITE PROFESSIONAL

COMMONWEALTH OF MASSACHUSETTS

Bristol, ss APRIL 14, 2016

DRAFT

On this 14 day of APRIL, 2016, before me, the undersigned notary public, personally appeared Michael P. Bingham, proved to me through satisfactory evidence of identification, which were MA LIC., to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he)(she) signed it voluntarily for its stated purpose.

(official signature and seal of notary)

DEBORAH L. GONZAGA
MY COMM. EXPIRES JUNE 18, 2021
NOTARY PUBLIC COMMONWEALTH OF MASSACHUSETTS

Upon recording, return to:

Apex Companies, LLC.
125 Broad Street, 5th Floor
Boston, MA 02110

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# Exhibit A

## Metes and Bounds Description of Parcel of Land Containing Area Subject to AUL

A certain parcel of land being shown as Activities and Use Limitation (AUL) on a plan recorded herewith. More particularly described as follows:

Beginning at a point in the north line of Cove Street distant easterly therein from the east line of Harbor Street two hundred fifty-six and 47/100 (256.47) feet; thence northerly by land of Naushon Mill, Inc., a distance of eight hundred fifty-eight and 80/100 (858.80) feet to a corner; thence easterly by last named land a distance of two hundred four and 51/100 (204.51) feet to a corner; thence southeasterly by said last named land a distance of seventeen and 1/100 (17.01) feet to a point; thence southerly a distance of twenty two and 52/100 (22.52) feet to a point; thence easterly a distance of fourteen and 80/100 (14.80) feet to a point in the westerly face of an existing two-story brick building; thence southerly by line of last named building a distance of four hundred twenty-eight and 56/100 (428.56) feet to a point; thence westerly a distance of twenty-two and 14/100 (22.14) feet to a point; thence southerly a distance of three hundred fifty-six and 80/100 (356.80) feet to a point in the north line of Cove Street being easterly therein four hundred seventy-two and 67/100 (472.67) feet from the east line of Harbor Street; thence westerly in said north line of Cove Street a distance of one hundred forty-six (146) feet to a point of curvature; thence westerly in the said north line of Cove Street along the arc of a circle having a radius of 488.72 feet a distance of seventy and 20/100 (70.20) feet to the point of beginning.

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LOCUS MAP SCALE: 1"=2,000'±

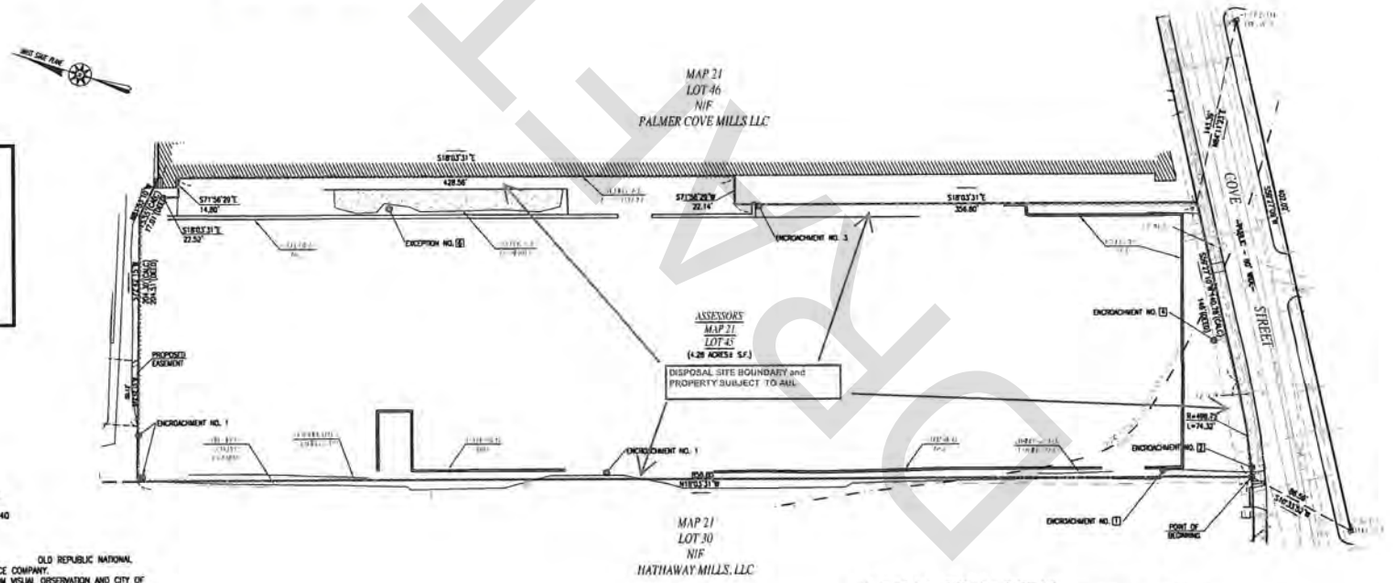
**LEGAL DESCRIPTION:**
THE LAND IN NEW BEDFORD, BRISTOL COUNTY, MASSACHUSETTS, WITH THE BUILDINGS THEREON, BOUNDED AND DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT IN THE NORTH LINE OF COVE STREET DISTANT EASTERLY THEREIN FROM THE EAST LINE OF HARBOR STREET TWO HUNDRED FIFTY-SIX AND 47/100 (256.47) FEET; THENCE NORTHERLY BY LAND OF NAUSHON MILL, INC., A DISTANCE OF EIGHT HUNDRED FIFTY-EIGHT AND 80/100 (858.80) FEET TO A CORNER; THENCE EASTERLY BY LAST NAMED LAND A DISTANCE OF TWO HUNDRED FOUR AND 51/100 (204.51) FEET TO A CORNER; THENCE SOUTHEASTERLY BY SAID LAST NAMED LAND A DISTANCE OF SEVENTEEN AND 01/100 (17.01) FEET TO A POINT; THENCE SOUTHERLY A DISTANCE OF TWENTY-TWO AND 52/100 (22.52) FEET TO A POINT; THENCE EASTERLY A DISTANCE OF FOURTEEN AND 80/100 (14.80) FEET TO A POINT IN THE WESTERLY FACE OF AN EXISTING TWO-STORY BRICK BUILDING; THENCE SOUTHERLY BY A LINE OF LAST NAMED BUILDING A DISTANCE OF FOUR HUNDRED TWENTY-EIGHT AND 56/100 (428.56) FEET TO A POINT; THENCE WESTERLY A DISTANCE OF TWENTY-TWO AND 14/100 (22.14) FEET TO A POINT; THENCE SOUTHERLY A DISTANCE OF THREE HUNDRED FIFTY-SIX AND 80/100 (356.80) FEET TO A POINT IN THE NORTHERLY LINE OF COVE STREET; BEING EASTERLY THEREIN FOUR HUNDRED SEVENTY-TWO AND 67/100 (472.67) FEET FROM THE EAST LINE OF HARBOR STREET; THENCE WESTERLY IN THE SAID NORTH LINE OF COVE STREET A DISTANCE OF ONE HUNDRED FORTY-SIX (146) FEET TO A POINT OF CURVATURE; THENCE WESTERLY IN THE SAID NORTH LINE OF COVE STREET ALONG THE ARC OF A CIRCLE HAVING A RADIUS OF 488.72 FEET A DISTANCE OF SEVENTY AND 20/100 (70.20) FEET TO THE POINT OF BEGINNING.
SAID LAND IS SHOWN ON PLAN SHOWING LAND CONVEYED BY THE CITY OF NEW BEDFORD TO SPENCER GREEN DATED MAY 1942, MADE BY ABEL A. VALENTE C.E. FILED IN THE BRISTOL COUNTY S.D. REGISTRY OF DEEDS IN PLAN BOOK 34 PAGE 26.

**SURVEYOR'S DESCRIPTION (DISCREPANCIES UNCOVERED DURING COURSE OF SURVEY):**
THE LAND IN NEW BEDFORD, BRISTOL COUNTY, MASSACHUSETTS, WITH THE BUILDINGS THEREON, BOUNDED AND DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT IN THE NORTH LINE OF COVE STREET DISTANT EASTERLY THEREIN FROM THE EAST LINE OF HARBOR STREET TWO HUNDRED FIFTY-SEVEN AND 92/100 (257.92) FEET; THENCE NORTHERLY BY LAND OF NAUSHON MILL, INC., A DISTANCE OF EIGHT HUNDRED FIFTY-EIGHT AND 80/100 (858.80) FEET TO A CORNER; THENCE EASTERLY BY LAST NAMED LAND A DISTANCE OF TWO HUNDRED FOUR AND 30/100 (204.30) FEET TO A CORNER; THENCE SOUTHEASTERLY BY SAID LAST NAMED LAND A DISTANCE OF FIFTEEN AND 55/100 (15.55) FEET TO A POINT; THENCE SOUTHERLY A DISTANCE OF TWENTY-TWO AND 52/100 (22.52) FEET TO A POINT; THENCE EASTERLY A DISTANCE OF FOURTEEN AND 80/100 (14.80) FEET TO A POINT IN THE WESTERLY FACE OF AN EXISTING TWO-STORY BRICK BUILDING; THENCE SOUTHERLY BY A LINE OF LAST NAMED BUILDING A DISTANCE OF FOUR HUNDRED TWENTY-EIGHT AND 56/100 (428.56) FEET TO A POINT; THENCE WESTERLY A DISTANCE OF TWENTY-TWO AND 14/100 (22.14) FEET TO A POINT; THENCE SOUTHERLY A DISTANCE OF THREE HUNDRED FIFTY-SIX AND 80/100 (356.80) FEET TO A POINT IN THE NORTHERLY LINE OF COVE STREET; BEING EASTERLY THEREIN FOUR HUNDRED SEVENTY-THREE AND 03/100 (473.02) FEET FROM THE EAST LINE OF HARBOR STREET; THENCE WESTERLY IN THE SAID NORTH LINE OF COVE STREET A DISTANCE OF ONE HUNDRED FORTY AND 78/100 (140.78) FEET TO A POINT OF CURVATURE; THENCE WESTERLY IN THE SAID NORTH LINE OF COVE STREET ALONG THE ARC OF A CIRCLE HAVING A RADIUS OF 488.72 FEET A DISTANCE OF SEVENTY-FOUR AND 32/100 (74.32) FEET TO THE POINT OF BEGINNING.

**LEGEND**

| EXISTING | DESCRIPTION |
|---|---|
| | PROPERTY LINE |
| | CHAIN LINK FENCE |
| | WATER LINE |
| | WATER GATE |
| | HYDRANT |
| | SEWER LINE |
| | SEWER MANHOLE |
| | DRAIN LINE |
| | DRAIN MANHOLE |
| | CATCH BASIN |
| | GAS LINE |
| | GAS GATE |

EXHIBIT B




**RECORD OWNER:**
CITY OF NEW BEDFORD
133 WILLIAM STREET
NEW BEDFORD, MA 02740

**NOTES:**
1. TITLE POLICY: OLD REPUBLIC NATIONAL LAND TITLE INSURANCE COMPANY.
2. UTILITIES TAKEN FROM VISUAL OBSERVATION AND CITY OF NEW BEDFORD RECORDS.
3. NO BUILDINGS EXISTING ON SURVEYED PROPERTY.

**PLAN REFERENCES:**
PLAN BOOK 34 PAGE 26

**FLOOD NOTE:**
BY GRAPHIC PLOTTING ONLY, THE PROPERTY DEPICTED ON THIS PLAN FALLS IN ZONE "X" AND "AE" (EL.5), AS SHOWN ON THE FLOOD INSURANCE RATE MAP No. 25005C0481F EFFECTIVE DATE: JULY 7, 2009

**ENCROACHMENTS:**
1. PAVEMENT ONTO LOCUS
2. CHAINLINK FENCE ONTO COVE STREET
3. FOUNDATION WALL ONTO MAP 21 LOT 46
4. WATER LINE AND HYDRANT ONTO LOCUS

0' 40' 80' 120'
1" = 40'

**SCHEDULE B – SECTION 2 – EXCEPTIONS:**
6. RIGHTS RESERVED IN AN AREA MARKED AS "B" ON THE PLAN REFERRED TO IN EXHIBIT "A" FOR PURPOSES OF REPAIRING, MAINTAINING AND RENEWING ANY PART OF THE BUILDING ON LAND TO THE EAST OF THE INSURED PREMISES AS SET FORTH IN A DEED FROM THE CITY OF NEW BEDFORD TO SPENCER GREEN DATED MAY 26, 1942 AND RECORDED IN BOOK 854 PAGE 482. (SHOWN ON PLAN)
7. EASEMENT FOR UTILITY PURPOSES GRANTED BY NASH REALTY CORP. TO NAUSHON MILL, INC. IN AN INSTRUMENT RECORDED ON NOVEMBER 17, 1942 IN BOOK 862 PAGE 378. (NOT PLOTTABLE)

**CERTIFICATION:**
TO APEX COMPANIES, LLC, CITY OF NEW BEDFORD, OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 7A, 7b, 8, 11a, 11b AND 18 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MAY 18, 2012.

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REVISIONS

THOMPSONFARLAND
PROFESSIONAL ENGINEERS // LAND SURVEYORS
www.ThompsonFarland.com
(MAIN OFFICE) 396 COUNTY STREET, NEW BEDFORD, MA 02740 P.508.717.2470
NEW BEDFORD | TAUNTON | CAMBRIDGE | MARLBOROUGH

DRAWN BY: SMB
DESIGNED BY:
CHECKED BY: BJM

# ALTA ACSM LAND TITLE
COVE STREET
ASSESSORS MAP 21 LOT 45
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: APEX COMPANIES, LLC
184 HIGH STREET, SUITE 502
BOSTON, MA 02210

JULY 13, 2012
SCALE: 1"=40'
JOB NO. 10-540
LATEST REVISION:

SHEET 1 OF 1

BK 11656 PG 316

# ACTIVITY AND USE LIMITATION OPINION

## 1.0 Introduction

This Licensed Site Professional (LSP) Opinion for the Notice of Activity and Use Limitation (AUL) was prepared by Michael Bingham (LSP No. 4141) on behalf of The City of New Bedford, for release conditions at the 45 Cove Street property in New Bedford, Bristol County, Massachusetts (the Property). The MassDEP has assigned Release Tracking Number (RTN) 4-23616 to this site. This LSP Opinion was prepared in accordance with 310 CMR 40.1074 and (1) explains why implementation of the AUL is appropriate to maintain a level of No Significant Risk at the Property (as defined in the AUL), (2) describes activities and uses prohibited in the area of the Property to be subject to the AUL, (3) identifies permitted activities and uses in the AUL area, and (4) identifies conditions or obligations for the AUL area in order to maintain a level of No Significant Risk.

## 2.0 Property Background

The Property consists of one vacant parcel totaling approximately 4.304 acres located at 45 Cove Street in New Bedford, Massachusetts. The Property was previously improved with a single story brick building that occupied most of the Property and was formerly occupied by Dartmouth Finishing, a fabric finishing and dyeing business, which abandoned the property in 1994. . The building demolition was completed in 2002, and except for soil stockpile and demolition debris the Property has remained vacant since. The City acquired the Property as a tax foreclosure in June 2007.

The Property was identified to be redeveloped by the nearby Marine Commerce Terminal in New Bedford (Terminal) project. The Terminal project involved the construction of a multi-purpose facility designed to support the construction, assembly and deployment of offshore wind projects, as well as handle bulk, break-bulk, container and large specialty marine cargo. The Property was selected to serve as a staging area for various cargoes associated with the Terminal operations. In 2015 the Property was graded and at least 5 feet of clean dredge material and dense graded aggregate, generated during the MCT channel dredging, was brought in to bring the final grade to street level and a fence was installed around the perimeter.

Current site features are depicted on Exhibit B to this AUL.

## 2.1 Disposal Site Description

A Notice of Noncompliance (NON) was issued by MassDEP to Dartmouth Finishing in 1994 for violations of state hazardous waste, air quality, and industrial wastewater programs. MassDEP and the EPA responded to a notification in 1997 by the New Bedford Fire Department that OHM present in corroded drums in the former Site building represented a threat of release. The MassDEP issued RTN 4-12810 for the Site on January 21, 1997. A total of 480 drums varying in size from 40 gallons to 85 gallons, one aboveground tank, four vats, and two No. 6 fuel oil underground storage tanks (USTs) were inventoried by the EPA. A removal action included pumping oil from the two USTs, removing sludge from the vats and troughs in the basement, and removing 480 drums of OHM for off-site disposal to abate the identified imminent hazard and stabilize site conditions.

An Immediate Response Action (IRA) for RTN 4-12810 was completed at the Property in 2004 and included the removal of two 10,000-gallon USTs and approximately 80 cubic yards of petroleum-impacted soil. Based on the results of the 2004 subsurface investigation and the completion of a Method 1 Risk Characterization, an Immediate Response Action Completion Statement and Class A-2 Response Action Outcome Statement were submitted in August 2004 for RTN 4-12810 by Roberts Consulting in August 2004. The contaminants of concern in the RAO and Method 3 Risk Characterization, identified below the concrete basement slab, were: arsenic, lead, and petroleum compounds. Mr. Charles Kibbee, of G & L Bedford Realty, Inc. was listed as the owner of the property.

Additional subsurface investigation was completed at the property as due diligence for a property transfer in 2012, which identified a new reportable release. The 2012 Phase II CSA investigation identified contaminant concentrations in soil and groundwater above applicable MassDEP Reportable Concentrations (RCs) at the Site. Specifically, the report identified additional contaminants of concern and areas of release in soil and groundwater beneath the concrete slab at the Site that were inconsistent with the previous RAO submittal filed for the Site with the MassDEP in 2004. In addition, the analysis of stockpiled soil staged above the slab identified contaminant concentrations greater than regulatory reportable thresholds. These soils were not previously sampled as part of the prior RAO and are located above the slab, suggesting a different exposure assumption. Also, the investigation identified concentrations of dissolved silver in groundwater above applicable reporting criteria, which was not addressed in the previous RAO findings. The detection of new contaminants of concern concentrations in soil and groundwater was reported on October 3, 2011 under a 120-day notification obligation to MassDEP which assigned RTN 4-23616 to the release.

Remedial activities completed at the Site during construction included:

- Crushing of concrete and construction debris in the stockpiled material in the former basement area;

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- Levelling of the stockpiled construction debris within the basement footprint to evenly distribute the material into an approximately one-foot thickness;
- Removal of **approximately 76 tons** of petroleum impacted material encountered during Site construction and back fill activities under Bill of Lading protocol;
- Importing approximately 40,000 cubic yards of pre-characterized and clean dredge material, consisting of glacial-fluvial sediments, to bring the grade to approximately 0ne foot below final design grade;
- The addition of a minimum of one-foot of dense graded aggregate compacted and contoured to design specifications.

### 3.0 Summary of the Risk Characterization

A Method 3 Risk Characterization was prepared in November 2015 by Apex in anticipation of site closure. The results of the risk characterization are the basis for the decision regarding the Permanent Solution with Conditions (PSC) for the release at the Site pursuant to 310 CMR 40.1000. A summary of the Risk Characterization is presented below.

The contaminants of concern and the maximum remaining concentration exceeding applicable Method 1 Risk Characterization criteria, per 310 CMR 40.0975(6) are listed below:

- Total petroleum hydrocarbons – 2,00 mg/kg;
- C11-C22 Aromatic hydrocarbons – 3,500 mg/kg;
- C9-C10 Aromatic hydrocarbons – 1,600 mg/kg;
- C9-C12 Aliphatics hydrocarbons – 1,800 mg/kg;\
- Lead – 2,900 mg/kg (no TCLP exceedance);
- Total Chromium – 300 mg/kg;
- Benzo(a)anthracene – 13 mg/kg;
- Benzo9a)pyrene – 12 mg/kg;
- Benzon(b)flouranthene – 16 mg/kg; and
- Dibenzo(a,h)anthracene 2 mg/kg.

The Property is currently a storage and staging area associated with the nearby marine terminal. Under foreseeable future conditions, receptors reasonably likely to be present on site include workers, security personnel, escorted visitors, trespassers, landscapers, utility workers, and construction workers. The Risk Characterization determined that "No Significant Risk" of harm to human health exists at the Site for each receptor type considered in the risk characterization. It also determined that "No Significant Risk" of harm to safety, public welfare and the environment exists at all portions of the Site. As a result of the risk characterization, an AUL is required to limit Residential use of the property. In addition, due to the presence of elevated concentrations of compounds of concern in soil, the AUL includes requirements for soil management if soil intrusive work is planned below the environmental cap. The disposal site includes the entire property (see Exhibit B of the AUL).

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### 4.0 Use of the AUL to Maintain a Level of No Significant Risk

As described in the Risk Characterization, a condition of No Significant Risk to human health, safety, public welfare and the environment currently exists at the Site. However, this conclusion is based on the assumption that the Property will not be used for residential purposes or for the growing of fruits or vegetables for human consumption. This restriction is extended to limit the use of the Property as a school, daycare, nursery, recreational area (such as a park or athletic field) and/or any other use in which a child's presence is likely to be more than incidental. All other reasonably foreseeable site uses were considered. In addition, because residual contamination was documented in soil below the clean fill barrier, this AUL will also provide appropriate notice to future Site users to exercise appropriate caution when handling soil, and ensure that unnecessary exposures do not occur and that contaminated materials are handled appropriately.

### 5.0 Acceptable Activities and Uses

The AUL Opinion provides that a condition of No Significant Risk to health, safety, or public welfare exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) as long as any of the following activities and uses occur on the Property:

(i) Commercial and industrial activities and uses which do not involve the disturbance of soil located greater than 3 feet below the ground surface within the AUL area, as long as the Obligations and Conditions specified herein are followed;

(ii) Any non-residential uses of the Property, including those that are currently conducted, in which a child's presence (other than incidental) is not likely;

(iii) Short-term (6 months or less) underground utility and/or construction activities which are likely to disturb soil, provided that such activities are conducted in accordance with the soil management provisions of the

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Massachusetts Contingency Plan (MCP) cited at 310 CMR 40.0030 and all applicable worker health and safety practices pursuant to 310 CMR 40.0018;

(iv) Construction or excavation activities are allowed, except as prohibited in Paragraph 6 (ii);

(v) Such other activities or uses which, in the Opinion of a Massachusetts Licensed Site Professional ("LSP"), shall present no greater risk of harm to human health, safety, public welfare or the environment than the activities and uses set forth in this paragraph; and

(vi) Other activities or uses of the Property not identified in Paragraph 6 as Activities and Uses Inconsistent with the AUL.

**6.0 Restricted Activities and Uses**

Activities and uses that are inconsistent with the objectives of this Notice of AUL, and that, if implemented at the Site, may result in a significant risk of harm to human health, safety, or public welfare, are as follows:

(i) Use of the Property as a residence or for growing fruits or vegetables for human consumption, as a school, daycare, nursery, recreational area (such as a park or athletic field), and/or any other use in which a child's presence (other than incidental) is likely;

(ii) Any long-term (greater than 6 months) activity at the Property that is reasonably likely to result in the excavation greater than 3 feet below grade, relocation or removal of the contaminated soil, unless such activity is first evaluated by an LSP who renders an Opinion stating that such activity is consistent with maintaining a condition of No Significant Risk and that such activity is conducted in accordance with Obligations (i) and (ii), set forth below; and

(iii) Any excavation activity which may disturb the soil located at a depth greater than 3 feet below ground surface within the AUL area, without prior development and implementation of a Soil Management Plan and a Health and Safety Plan in accordance with Obligations (i) and (ii) of this Notice.

**7.0 Obligations for the AUL Area**

If applicable, obligations and/or conditions to be undertaken and/or maintained at the Site to maintain a condition of No Significant Risk, as set forth in the AUL Opinion, shall include the following:

1. Any long-term (greater than 6 months) activity at or use of the Property that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a Health and Safety Plan under the guidance of an LSP. At a minimum, the Health and Safety Plan must inform underground utility workers and other workers who may come into contact with soil in the AUL area of (1) the nature and hazards of the contaminants identified in the soil, (2) potential exposure routes, (3) measures to prevent exposure, (4) protective clothing requirements, and (5) any other health and safety measures appropriate for the activity or use;

2. Any long-term (greater than 6 months) activity at or use of the Property that is reasonably likely to result in the excavation, relocation, or removal of the contaminated soil requires preparation and implementation of a written Soil Management Plan under the guidance of an LSP. At a minimum, the Soil Management Plan must (1) describe the soil excavation and stockpile storage methods that will be used to prevent accidental exposure to the excavated soil, including indirect exposure via surface water runoff or fugitive dust emissions, (2) contain procedures to limit access to the excavated soil and the excavation area by Property workers not covered by the Health and Safety Plan, children, Property abutters, or accidental trespassers, (3) contain procedures for characterizing, transporting and recycling/disposing excavated soil, and (4) provide for the restoration of the excavated area as soon as practicable; and

3. Any soil removed from the Property, other than the clean overburden and backfill, must be characterized and disposed of in accordance with federal, state and local regulations, including the MCP 310 CMR 40.0000.

**8.0 Summary and Conclusions**

This LSP Opinion has been prepared for implementation of a Notice of AUL for a release at the 45 Cove Street property in New Bedford, Bristol County, Massachusetts. A Method 3 Risk Characterization indicates that restrictions on activities and uses of this Property are required to maintain a condition of No Significant Risk to human health, safety or public welfare. In general, use of the Property for residential purposes, growing fruits or vegetables for human consumption, or any other use in which a child 's presence (other than incidental) is likely, are to be limited as set forth in Section 6.0. In addition, activities and uses that may result in the excavation, relocation, or removal of contaminated soil at the Property may be permitted with certain precautions.

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EXHIBIT D

**AFFIDAVIT OF AUTHORITY**

Now comes Renee Fernandes, the Treasurer of the City of New Bedford, who upon oath hereby deposes and states:

1. The City of New Bedford, a municipal corporation existing under the laws of the Commonwealth of Massachusetts, with an address of 133 William Street, New Bedford, Bristol County, Massachusetts, is the record owner of certain real property shown as New Bedford Assessor's Map 21, Lot 45, formerly known and numbered as 45 Cove Street, New Bedford, Bristol County, Massachusetts (the "Property") pursuant to a judgment of the Land Court dated June 12, 2007 and recorded in the Bristol County (S.D.) Registry of Deeds in Book 8689, Page 93.

2. Pursuant to Section 2-102 of the Code of Ordinances of the City of New Bedford, I, as the Treasurer, am the custodian of all property acquired through the tax title process and therefore the person authorized to execute any and all documents regarding the property, including but not limited to an Activity and Use Limitation.

Signed under the pains and penalties of perjury this 11th day of April, 2016

Renee Fernandes
Treasurer, City of New Bedford

***COMMONWEALTH OF MASSACHUSETTS***

BRISTOL, ss April 11, 2016

On this 11th day of April, before me, the undersigned Notary Public, personally appeared the above-named Renee Fernandes proved to me by satisfactory evidence of identification, being (check whichever applies): ☐ driver's license or other state or federal governmental document bearing a photographic image, ☐ oath or affirmation of a credible witness known to me who knows the above signatory, or ☐ my own personal knowledge of the identity of the signatory, to be the person who signed the preceding document in my presence, and who swore or affirmed to me that the contents of the document are truthful and accurate to the best of her knowledge and belief, as the duly authorized treasurer of the City of New Bedford.

Print Name of Notary Public: Blair S. Bailey

My Commission Expires: 02/29/2019

BLAIR S. BAILEY
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
February 29, 2019

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**CP BRODEUR, INC.**

**RTN: 4-23643**

DRAFT

SITEC
ENVIRONMENTAL
Civil and Environmental Engineering, Land Use
Planning, Hazardous and Solid Waste Consulting

SITEC ENVIRONMENTAL, Inc.
769 Plain Street, Unit C
Marshfield, MA 02050
Tel. (781) 319-0100 FAX (781) 834-4783

449 Faunce Corner Road
Dartmouth, MA 02747
Tel. (508) 998-2125 FAX (508) 998-7554

February 17, 2012

Massachusetts Department of Environmental Protection
Southeast Regional Office
Bureau of Waste Site Cleanup
20 Riverside Drive
Lakeville, MA 02347

**RE: Notice of an Activity and Use Limitation**
**Release Tracking Nos.: 4-23643**
**CP Brodeur Inc.**
**80 Wright Street**
**New Bedford, Massachusetts**

To Whom It May Concern:

A Class A-3 Response Action Outcome was filed by SITEC Environmental, Inc. on February 10, 2012 concerning the above referenced disposal site. In accordance with 310 CMR 40.1074(4), please find attached the following items:

- Certified Registry copies of the Notice of the Activity and Use Limitation bearing book and page numbers; and
- Registry copies of the referenced Survey Plans Bering book and page numbers.

For SITEC Environmental, Inc.

Geoffrey Souza, LSP
Environmental Assessment Manager

*Attachments*
Attachment 1 - Certified Registry copy of the Notice of an Activity and Use Limitation
Attachment 2 -Certified Registry copies of the referenced Survey Plans
Attachment 3 - PRP Authorization

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**ATTACHMENT 1**

**REGISTRY COPY OF THE CONFIRMATORY NOTICE OF AN ACTIVITY AND USE LIMITATION**

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BK 10291 PG 102
02/09/12 10:32 DOC. 3200
Bristol Co. S.D.

**Form 1075**

NOTICE OF ACTIVITY AND USE LIMITATION
M.G.L. c. 21E, § 6 and 310 CMR 40.0000

Disposal Site Name: CP Brodeur, Inc
DEP Release Tracking No.: 4-23643

This Notice of Activity and Use Limitation ("Notice") is made as of this 9 day of February, 2012, by CP Brodeur, Inc., a Massachusetts corporation whose address is 80 Wright Street, New Bedford, Massachusetts, together with their successors and assigns (collectively "Owner").

W I T N E S S E T H:

WHEREAS, CP Brodeur, Inc. is the owner in fee simple of that certain parcel of land located in New Bedford, Bristol County, Massachusetts with the buildings and improvements thereon pursuant to a deed recorded with the Bristol County Registry of Deeds in Book 1744 Page 996;

WHEREAS, said parcel of land, which is more particularly bounded and described in Exhibit A, attached hereto and made apart hereof ("Property") is subject to this Notice of Activity and Use Limitation. The Property is shown on a plan recorded in the Bristol County Registry of Deeds in Plan Book 99, Plan 12;

WHEREAS, a portion of the Property ("Portion of the Property") is subject to this Notice of Activity and Use Limitation. The Portion of the Property is more particularly bounded and described in Exhibit A-1, attached hereto and made a part hereof. The Portion of the Property is shown as "ACTIVITY AND USE LIMITATION AREA" on a plan recorded in the Bristol County Registry of Deeds in Plan Book 168, Plan 84.

WHEREAS, the Portion of the Property comprises all a disposal site as the result of a release of oil and/or hazardous material. Exhibit B is a sketch plan showing the relationship of the Portion of the Property subject to this Notice of Activity and Use Limitation to the boundaries of said disposal site existing within the limits of the Property and to the extent such boundaries have been established. Exhibit B is attached hereto and made a part hereof; and

WHEREAS, one or more response actions have been selected for the Disposal Site in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 ("MCP"). Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil and (b) the restriction of certain activities occurring in, on, through, over or under the Portion of the Property. The basis for such restrictions is set forth in an Activity and Use Limitation Opinion ("AUL Opinion"), dated January 13, 2012 (which is attached hereto as Exhibit C and made apart hereof);

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NOW, THEREFORE, notice is hereby given that the activity and use limitations set forth in said AUL Opinion are as follows:

1. Activities and Uses Consistent with the AUL Opinion. The AUL Opinion provides that a condition of No Significant Risk to health, safety, public welfare or the environment exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) so long as any of the following activities and uses occur on the Portion of the Property:

(i) Retail, commercial and/or industrial activities and uses, including but not limited to, associated pedestrian and vehicular traffic;

(ii) Excavation associated with underground utility work and/or construction work;

(iii) Activities associated with the routine maintenance of the property; including, but not limited to, mowing, landscaping, vegetation/debris removal, street sweeping, and catch basin cleaning;

(iv) Activities and uses which are not identified by this Notice as being inconsistent with maintaining a condition of No Significant Risk;

(v) Such other activities and uses which, in the Opinion of an LSP, shall present no greater risk of harm to health, safety, public welfare, or the environment than the activities and uses set forth in this paragraph; and

(vi) Such other activities and uses not identified in Paragraph 2 as being Activities and Uses Inconsistent with the AUL.

2. Activities and Uses Inconsistent with the AUL Opinion. Activities and uses which are inconsistent with the objectives of this Notice of Activity and Use Limitation, and which, if implemented at the Portion of the Property, may result in a significant risk of harm to health, safety, public welfare or the environment or in a substantial hazard, are as follows:

(i) Use of the Portion of the Property as a residence, school, playground, daycare facility or other use at which a child's regular presence is likely;

(ii) Use of the Portion of the Property for agriculture including, but not limited to, growing of homegrown produce except in raised planting beds;

(iii) Activities and/or uses that may cause physical or chemical deterioration, breakage, or structural damage to the concrete pavement on the Portion of the Property; and

(iv) Relocation of the contaminated soil from beneath the Portion of the Property unless an LSP renders an Opinion which states that such relocation is consistent with maintaining a condition of No Significant Risk.

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3. Obligations and Conditions Set Forth in the AUL Opinion. If applicable, obligations and/or conditions to be undertaken and/or maintained at the Portion of the Property to maintain a condition of No Significant Risk as set forth in the AUL Opinion shall include the following:

(i) The concrete pavement must be maintained within the Portion of the Property to prevent exposures to the underlying contaminated soil;

(ii) A Soil Management Plan must be prepared by an LSP and implemented prior to the commencement of any activity that is likely to disturb the contaminated soil located below the concrete pavement on the Portion of the Property;

(iii) The concrete pavement within the Portion of the Property must be repaired or replaced with a comparable barrier following the completion of any activity that involves its removal and/or disturbance;

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Portion of the Property which may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by an LSP who shall render an Opinion, in accordance with 310 CMR 40.1080 *et seq.*, as to whether the proposed changes will present a significant risk of harm to health, safety, public welfare or the environment. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Response Action Outcome. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by an LSP in accordance with 310 CMR 40.1080 *et seq.*, and without additional response actions, if necessary, to achieve or maintain a condition of No Significant Risk or to eliminate substantial hazards.

If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by an LSP in accordance with 310 CMR 40.1080 *et seq.*, the owner or operator of the Portion of the Property subject to this Notice at the time that the activities, uses and/or exposures change, shall comply with the requirements set forth in 310 CMR 40.0020.

6. Incorporation Into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Property or a portion thereof is conveyed.

Owner hereby authorizes and consents to the filing and recordation and/or registration of this Notice, said Notice to become effective when executed under seal by the undersigned LSP, and recorded and/or registered with the appropriate Registry of Deeds and/or Land Registration Office.

DRAFT

WITNESS the execution hereof under seal this 8th day of February, 2012.

CP Brodeur, Inc.

Cindy Pettway, President and Treasurer

COMMONWEALTH OF MASSACHUSETTS

_____, ss February 8th, 2012

On this 8th day of February, 2012, before me, the undersigned notary public, personally appeared Cindy Pettway, proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he and she signed it voluntarily for its stated purpose.

Notary Public: Michael J McGreavy
My Commission Expires: 2/8/2012

The undersigned LSP hereby certifies that he executed the aforesaid Activity and Use Limitation Opinion attached hereto as Exhibit C and made a part hereof and that in his Opinion this Notice of Activity and Use Limitation is consistent with the terms set forth in said Activity and Use Limitation Opinion.

Date: 2/9/12

Geoffrey Souza, LSP No. 412[illegible]

[LSP SEAL]

COMMONWEALTH OF MASSACHUSETTS

Massachusetts, Bristol County ss February 9, 2012

On this 9th day of February, 2012, before me, the undersigned notary public, personally appeared Geoffrey Souza, provided to me through satisfactory evidence of identification, which were Drivers License, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

Notary Public: Amanda Woodard
My Commission Expires: 10/04/2013

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**EXHIBIT A**

(Description of Parcel of Land Containing Area Subject to AUL)

Beginning at a point in the southerly line of Wright Street said point being at the northwesterly corner of Parcel No. 1 Lot G of plan hereinafter described;

Thence south 12° 44' 02" east 244.41 feet;

Thence south 75° 39' 23" west 130.73 feet;

Thence north 11° 43' 32" west 148.07 feet to a point;

Thence north 11° 43' 32" west 68.66 feet to a point in the easterly line of MacArthur Drive;

Thence in an arc whose radius is 32.00 feet for a distance of 49.72 feet to a point in the southerly line of Wright Street;

Thence north 77° 17' 58" east 95.00 feet to the point of beginning, containing 31,451 square feet.

Being Lot G on plan of land entitled "The City of New Bedford, New Bedford Redevelopment Authority, Disposition Map Parcel No. 1 & 3, South Terminal Urban Renewal Project", dated September 14, 1977, Scale 1"=80', prepared by New Bedford Redevelopment Authority, New Bedford, Massachusetts and recorded with the Bristol County Registry of Deeds in Plan Book 99, Plan 12.

DRAFT

**EXHIBIT A-1**

(Description of Area Subject to AUL)

That certain portion of a parcel of land, said parcel of land being situated at 80 Wright Street in New Bedford, Bristol County, Massachusetts, and said portion being shown as "Activity and Use Limitation Area" on a plan entitled, "Plan of Activity and Use Limitation in New Bedford, MA", dated January 12, 2012, Scale 1"=20', prepared by SITEC, Inc., Dartmouth, Massachusetts, and recorded with the Bristol County Registry of Deeds in Plan Book 168, Plan 84, and said portion being more particularly bounded and described as follows:

Starting at a point on the southerly property line of the locus property, S 75° 39' 23" W, 114.23 feet distant from the southeastern-most corner of the locus lot, thence;

Perpendicular from said point on the southerly property line, 90.2 feet to the southeastern-most corner of the activity and use limitation area to be described.

Now beginning at said southeastern-most corner of the activity and use limitation area to be described, thence;

S 78° 19' 07" W, 49.93 feet, thence;

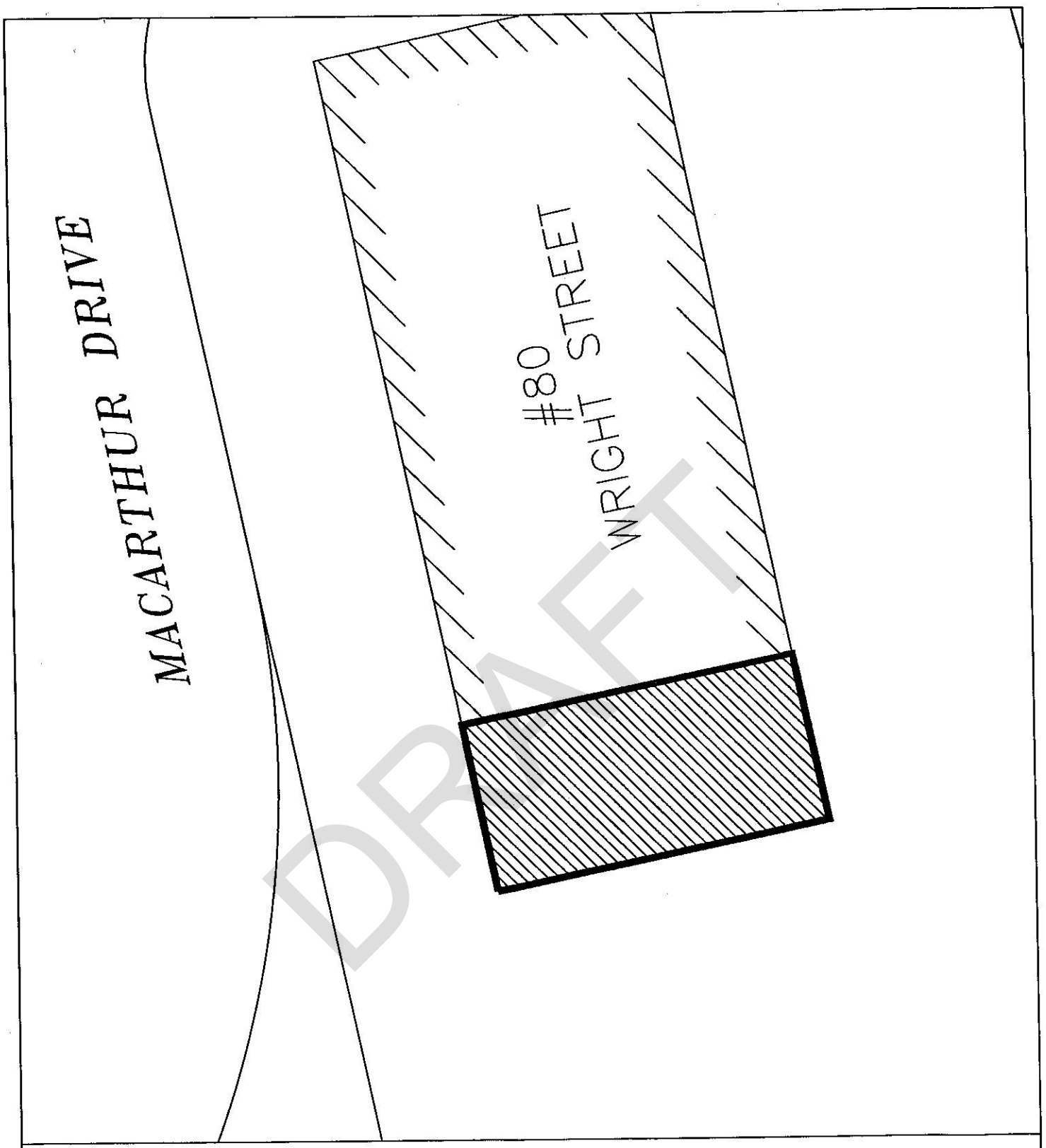
N 11° 35' 58" W, 25.02 feet, thence;

N 78° 19' 07" E 49.93 feet, thence;

S 11° 35' 58" E, 25.02 feet to the point of beginning.

Containing 1,249 square feet, more or less.

DRAFT




LEGEND

BOUNDRY OF AREA SUBJECT TO AUL

AREA OF THE DISPOSAL SITE (TO THE EXTENT DEFINED)

EXHIBIT B

scale: 1"=20'

0 10 20

SKETCH PLAN OF AREA SUBJECT TO AUL IN RELATION TO BOUNDRIES OF DISPOSAL SITE

SITEC ENVIRONMENTAL
769 Plain Street, Unit C
Marshfield, MA 02050
Tel. (781) 319-0100 FAX (781) 834-4783

SITEC
ENVIRONMENTAL
Civil and Environmental Engineering, Land Use
Planning, Hazardous and Solid Waste Consulting

SITEC ENVIRONMENTAL, Inc.
769 Plain Street, Unit C
Marshfield, MA 02050
Tel. (781) 319-0100 FAX (781) 834-4783

449 Faunce Corner Road
Dartmouth, MA 02747
Tel. (508) 998-2125 FAX (508) 998-7554



January 13, 2012

CP Brodeur, Inc.
80 Wright Street
New Bedford, MA 02745

**RE: Activity and Use Limitation (AUL) Opinion**
**80 Wright Street**
**New Bedford, Massachusetts**

Dear Mrs. Pettway:

This Activity and Use Limitation (AUL) Opinion was prepared pursuant to 310 CMR 40.1074(1)(b) for a parcel of land located at 80 Wright Street, New Bedford, Bristol County, Massachusetts, and as identified as City of New Bedford Tax Assessor's Map 31, Lot 264 with the buildings and improvements thereon (the "Property").

Site History

21E investigations conducted at the Property identified elevated levels of petroleum hydrocarbons in soil and groundwater under the addition to the south of the building (the "Site"). The elevated levels of petroleum hydrocarbons are likely attributable to a leaking oil water separator located in the center of the Site. The Massachusetts Department of Environmental Protection (MassDEP) was notified of the release and a Release Abatement Measure (RAM) was completed to repair the soil water separator and stabilize the release. Site investigations were completed to define the nature and extent of the contamination and characterize the risk to human health and the environment.

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Reason for Activity and Use Limitation

A Method 3 Risk Assessment was prepared to support the Response Action Outcome (RAO) for this Site. The Site is covered with an concrete barrier and contaminated soil is located greater than 3 feet below the ground surface eliminating routine direct contact with the sub-surface contaminated soil by full time workers, visitors, and trespassers; however, if this concrete barrier is removed this exposure pathway may become available and a level of "No Significant Risk" may not be maintained. The AUL requires the maintenance of the barrier to eliminate this exposure pathway. In addition, to inhibit increased risk of harm to human health, the AUL prohibits the use of the AUL area as a residence or other use where the routine high frequency and high intensity presence of a child is likely (i.e. daycare facility). Gardening will also be prohibited in the AUL area, which may cause a condition of "Significant Risk" if produce is grown in the contaminated soil.

Permitted Uses and Activities

(i) Retail, commercial and/or industrial activities and uses, including but not limited to, associated pedestrian and vehicular traffic;

(ii) Excavation associated with underground utility work and/or construction work;

(iii) Activities associated with the routine maintenance of the property; including, but not limited to, mowing, landscaping, vegetation/debris removal, street sweeping, and catch basin cleaning;

(iv) Activities and uses which are not identified by this Notice as being inconsistent with maintaining a condition of No Significant Risk;

(v) Such other activities and uses which, in the Opinion of an LSP, shall present no greater risk of harm to health, safety, public welfare, or the environment than the activities and uses set forth in this paragraph; and

(iv) Such other activities and uses not identified below as being Restricted Activities and Uses.

Restricted Uses and Activities

(i) Use of the Site as a residence, school, playground, daycare facility or other use at which a child's regular presence is likely;

(ii) Use of the Site for agriculture including, but not limited to, growing of homegrown produce except in raised planting beds;

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BK 10291 PG 111

(iii) Activities and/or uses that may cause physical or chemical deterioration, breakage, or structural damage to the concrete pavement on the Site; and

(iv) Relocation of the contaminated soil from beneath the Site unless an LSP renders an Opinion which states that such relocation is consistent with maintaining a condition of No Significant Risk.

Obligations and Conditions

(i) The concrete pavement must be maintained within the Site to prevent exposures to the underlying contaminated soil;

(ii) A Soil Management Plan must be prepared by an LSP and implemented prior to the commencement of any activity that is likely to disturb the contaminated soil located below the concrete pavement on the Site;

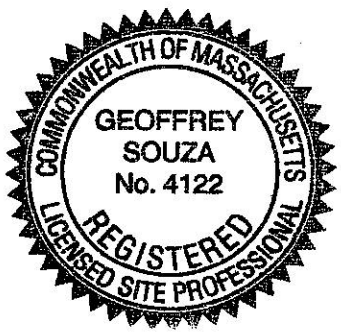
(iii) The concrete pavement within the Site must be repaired or replaced with a comparable barrier following the completion of any activity that involves its removal and/or disturbance;

It is the opinion of SITEC Environmental, Inc. that implementation of the AUL insures that the residual contamination is unlikely to pose any significant risk to the public health or to present a condition of further environmental concern. Consequently, compliance with the requirements of the AUL also presents a regulatory closure which is unlikely to pose a future liability relative to MGL Chapter 21E and 310 CMR 40.0000 (MCP).

The AUL Opinion expressed herein has been developed based on the review of historical data, site reconnaissance, field observations and measurements, and site-specific analytical results. SITEC Environmental, Inc. makes no claims or representations (implicit or implied) as to the completeness or accuracy of information or data developed by others. Based on available information, research and site observations documented to date, the LSP Opinion forms a sound basis for effecting regulatory closure of this project via a Class A-3 RAO with an AUL, as defined.

For SITEC ENVIRONMENTAL, INC.

Geoffrey Souza, LSP
Licensed Site Professional #4122




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# ATTACHMENT 2

## CERTIFIED REGISTRY COPIES OF THE REFERENCED SURVEY PLANS

DRAFT

61-66

PARCEL NO. 4

SOUTH (60.00' Wide) ST.

N 77°-17'-58" E → 850.10'

R=22.00' L=34.18' Δ=89°-01'-30"

R=22.00' L=33.89' Δ=88°-15'-53"

DRIVE (60.00' Wide) N 11°-43'-32" W → 327.72'

PARCEL NO. 3
341,961 SQ. FT.

262.76' ← S 14°-26'-09" E

ST. HASSEY (60.00' Wide) N 14°-26'-09" W →

R=95.00' L=152.10' Δ=91°-44'-07"

R=32.00' L=50.81' Δ=90°-58'-30"

780.67' ← S 77°-17'-58" W

WRIGHT (60.00' Wide) ST.

95.00' N 77°-17'-58" E → 687.79'

R=155.00' L=248.17' Δ=91°-44'-07"

L=216.78' Δ=80°-08'-03"

547.99'

139.80'

N 77°-17'-58" E → 460.20'

R=32.00' L=49.72' Δ=89°-01'-30"

MAC ARTHUR DRIVE N 11°-43'-32" W → 68.66'

PARCEL NO. 1 LOT "G" 31,451 SQ. FT.

244.41' N 12°-42'-02" W →

PARCEL NO. 1
129,630 SQ. FT.

N 12°-42'-02" W → 228.70'

10.00' N 12°-42'-02" W →

PARCEL NO. 1 LOT "F"
128,058 SQ. FT.

201.39'

N227,880.56
E759,955.86

5.00'

606.34'

148.07' N 11°-43'-32" W → 148.07'

R=155.00' L=236.40 Δ=87°22'-55"

130.73' 548.23' ← S 75°-39'-23" W 1438.37'

PARCEL NO. 1 LOT "E" 4,630 SQ. FT.

PARCEL NO. 10

PARCEL NO. 2

N 77°-17'-58" E → 300.14' 20' Easement

PARCEL NO. 1 LOT "A" 0.826 Acres

120.00'

N 77°-17'-58" E → 300.14'

PARCEL NO. 1 LOT "B" 0.826 Acres

120.00'

N 77°-17'-58" E → 300.14'

PARCEL NO. 1 LOT "C" 0.827 Acres

88.73'

L=31.39' Δ=11°-36'-04"

N 77°-17'-58" E → 300.30'

← L=20.60' 20' Easement 308.77'

PARCEL NO. 1 LOT "D" 48,639.67 SQ.FT.

138.51'

S 14°-26'-09" E → 1,651.16'

Combined Pierhead and Bulkhead line

Registry use only.

RECD & RECORDED

SEP 21 11 51 AM '77

REGISTRY OF DEEDS
BRISTOL COUNTY
SOUTHERN DISTRICT

I CERTIFY THAT I HAVE CONFORMED WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS IN PREPARING THIS PLAN.

Manuel J. Viveiros 9/15/77

COMMONWEALTH OF MASSACHUSETTS
MANUEL J. VIVEIROS
REGISTERED
REGISTERED LAND SURVEYOR

9-19-77
Richard Walega
City Planner

80' 40' 0 40' 80'
SCALE: 1"= 80'

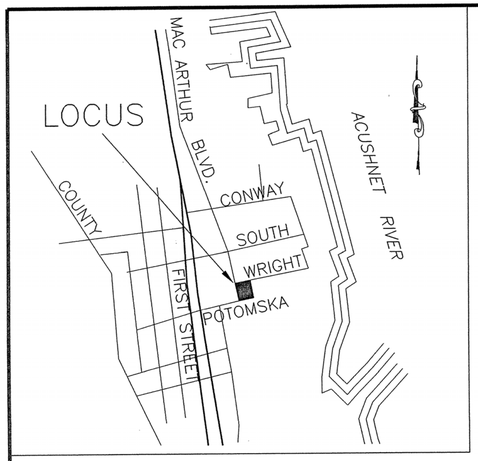
THE CITY OF NEW BEDFORD
NEW BEDFORD REDEVELOPMENT AUTHORITY

DISPOSITION MAP
PARCEL NO. 1 & 3
SOUTH TERMINAL URBAN RENEWAL PROJECT
PREPARED BY
NEW BEDFORD REDEVELOPMENT AUTHORITY
NEW BEDFORD
MASS.
DATE: SEPT. 14, 1977

DRAFT

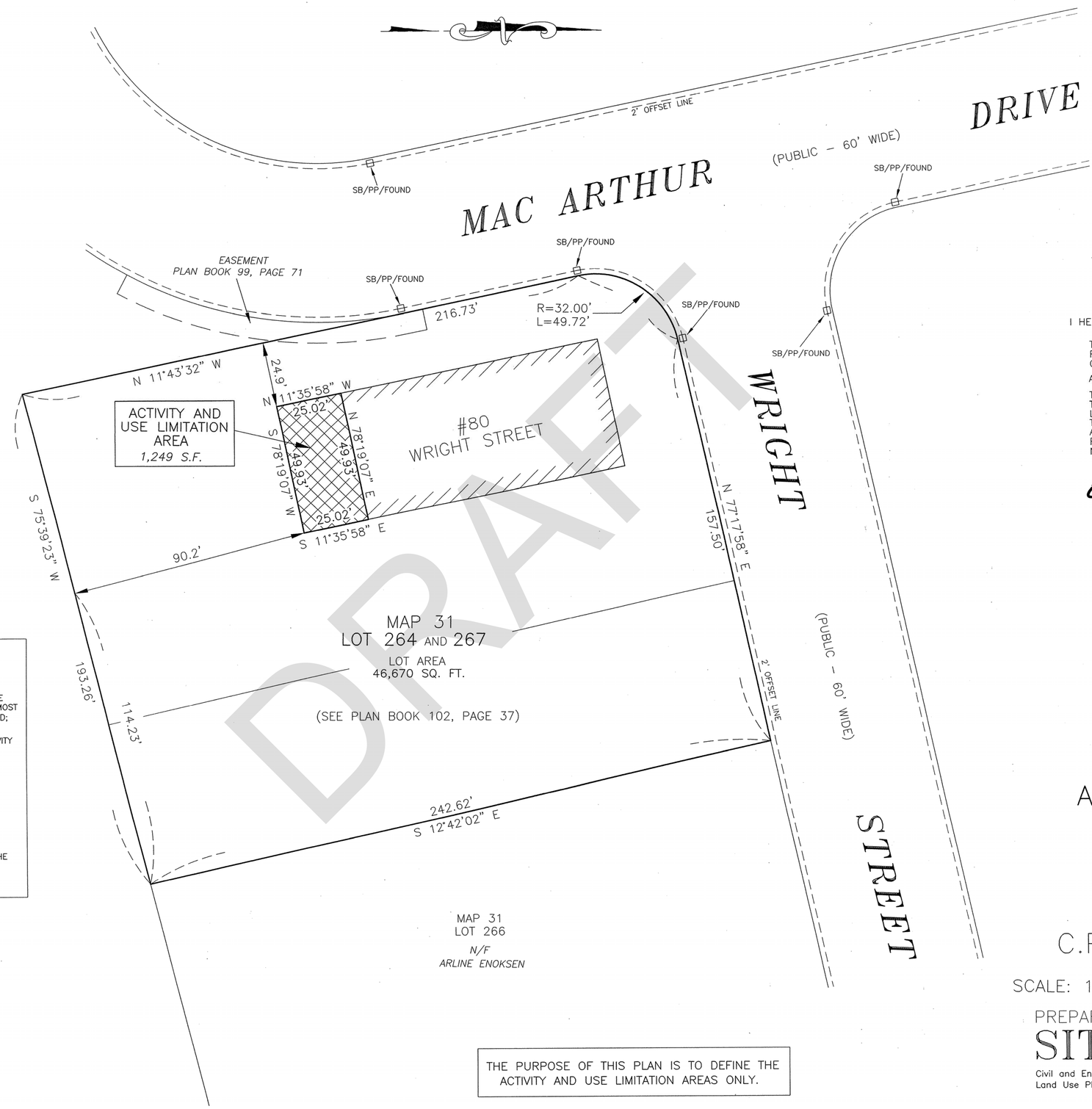
99-12

99-12




LOCUS MAP

PLAT 31
LOT 234, 240 & 261
*N/F*
*HALL COMUNICATIONS INC.*
*PLAN BOOK 147, PAGE 9*




DRAFT

01/29/12 09:57
PLAN RECORDED
BRISTOL S.D.
REGISTER
in 168-84

FOR REGISTRY USE ONLY

I HEREBY CERTIFY THAT;

THIS PLAN CONFORMS WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS;

AND

THE PROPERTY LINES SHOWN ON THIS PLAN ARE THE LINES DIVIDING EXISTING OWNERSHIPS, AND THE LINES OF THE STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED, AND THAT NO NEW LINES FOR DIVISION OF EXISTING OWNERSHIPS OR FOR NEW WAYS ARE SHOWN.

PROFESSIONAL LAND SURVEYOR — DATE 1/12/2012

COMMONWEALTH OF MASSACHUSETTS
JOHN
HANCOCK
ZYLL
NO. 39535
PROFESSIONAL
LAND SURVEYOR

**ACTIVITY AND USE LIMITATION AREA**
**LEGAL DESCRIPTION**

ACTIVITY AND USE LIMITATION AREA IN NEW BEDFORD, MA,:

STARTING AT A POINT WHICH IS 90.2 FEET PERPENDICULAR FROM THE SOUTHERLY PROPERTY LINE, SAID POINT BEING THE SOUTHEASTERN–MOST CORNER OF THE ACTIVITY AND USE LIMITATION AREA TO BE DESCRIBED;

NOW BEGINNING AT SAID SOUTHEASTERN–MOST CORNER OF THE ACTIVITY AND USE LIMITATION AREA TO BE DESCIBED;

THENCE, S 78°19'07" W, 49.93 FEET;

THENCE, N 11°35'58" W, 25.02 FEET;

THENCE, N 78°19'07" E, 49.93 FEET;

THENCE, S 11°35'58" E, 25.02 FEET TO THE POINT OF BEGINNING.

CONTAINING 1,249 SQUARE FEET, MORE OR LESS.

MEANING TO DESCRIBE THE SOUTHERNMOST TWENTY–FIVE FEET OF THE BUILDING AT 80 WRIGHT STREET.

THE PURPOSE OF THIS PLAN IS TO DEFINE THE ACTIVITY AND USE LIMITATION AREAS ONLY.

0' 20' 40' 60'

# PLAN OF ACTIVITY AND USE LIMITATION IN NEW BEDFORD, MA

PREPARED FOR

## C.P. BRODEUR INC.

SCALE: 1"=20' JANUARY 12, 2012

PREPARED BY
SITEC
Civil and Environmental Engineering
Land Use Planning
449 Faunce Corner Road
Dartmouth, MA 02747
(508) 998–2125
FAX (508) 998–7554

168-84

168-84

# ATTACHMENT 3

**PRP AUTHORIZATION**

DRAFT

# C.P. BRODEUR, INC.

80 WRIGHT STREET
NEW BEDFORD, MA 02740
508-993-0334 PHONE
508-990-3671 FAX

October 31, 2011

Massachusetts Department of Environmental Protection

20 Riverside Drive

Lakeville, MA 02347

**RE: C.P. Brodour**

**80 Wright Street**

**New Bedford, Massachusetts**

**Release Tracking No.: 4-23643**

DRAFT

To Whom It May Concern:

In accordance 310 CMR 40.0009(2), I am authorizing SITEC Environmental, Inc. to act as my agent in electronically filing any required Massachusetts Contingency Plan documents for the above referenced release.

Sincerely,

Cindy Pettway

# EXHIBIT D
# BORING LOGS AND TEST PITS

DRAFT

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-1-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/09/2023 **DATE COMPLETED** 11/09/2023
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623886 **LONGITUDE** -70.918409
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/09/2023 7.5 ft / Elev 2.5 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Property 1 (54 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | MATERIAL DESCRIPTION | REMARKS | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 10 | 0.2 ft 3" Asphalt | | | | | | |
| | 9.8 | Tan to Gray, Silty Sand, Trace Gravel, Medium Dense, SM, **(FILL)** | Analytical Samples submitted from 0'-4' and 8'-9.5' bgs. | SS S-1 | 100 | 9-10-12-8 (22) | | 0.1 |
| | 8.0 | 2.0 ft Black to Brown, Slightly Organic Silty Sand, Trace Gravel, Coal, Dry, Medium Dense, Slightly Organic Odor, SM, **(FILL)** | | SS S-2 | 75 | 4-5-8-9 (13) | | 1.4 |
| 5 | 6.0 | 4.0 ft Brown, Silty Sand with Gravel, Dry, Medium Dense, SM, **(FILL)** | | SS S-3 | 50 | 7-8-4-6 (12) | | 0.6 |
| | 4.0 | 6.0 ft Black, Slightly Organic Silt with Sand and Gravel, Trace Wood, Damp, Medium Stiff, Slightly Organic Odor, ML, **(FILL)** | | SS S-4 | 12 | 5-3-4-2 (7) | | 0.7 |
| | 2.5 | 7.5 ft ▽ | | | | | | 0.6 |
| | 2.0 | 8.0 ft Gray, Silty Sand, Few Cinders, Wet, Loose, SM, **(FILL)** | | SS S-5 | 88 | WOH-WOH-2-2 (2) | | 0.3 |
| | 0.5 | 9.5 ft Brown, Fibrous PEAT, Damp, Soft, PT, Organic Content 42.4%, **(Organics)** | | | | | | 0.2 |
| 10 | 0 | Gray, Silty Sand with Gravel, Trace Roots/ Wood, Wet, Very Loose to Medium Dense, SM, **(OUTWASH)** | | SS S-6 | 80 | 3-7-17-17 (24) | | 0.9 |
| | -1.0 | 11.0 ft Brown, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(TILL)** | | SS S-7 | 75 | 13-34-30-50 (64) | | 0.8 |
| | -4.0 | 14.0 ft End of boring at 14.0 feet | Split spoon refusal at 14' bgs. | | | | | |
| 15 | | | | | | | | |
| 20 | -10 | | | | | | | |
| 25 | | | | | | | | |
| 30 | -20 | | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

DRAFT

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-2-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/09/2023 **DATE COMPLETED** 11/09/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623973 **LONGITUDE** -70.917976
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/09/2023 12.0 ft / Elev -1.0 ft
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | ELEVATION (ft) | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 11 | Analytical samples submitted from 0'-4' and 8.8'-10' bgs. | Tan, Silty Sand with Gravel, Dry, Loose, SM, **(FILL)** | SS S-1 | 75 | 3-3-6-6 (9) | | 0.1 |
| 2.0 ft | 9.0 | | Light Brown, Silty Sand, Moist, Medium Dense, SM, **(FILL)** | SS S-2 | 100 | 4-5-10-12 (15) | | 0.2 |
| 5.0 ft | 6.0 | | Dark Brown, SLIGHTLY ORGANIC SILTY SAND WITH GRAVEL, Trace Brick, Roots, Moist, Medium Dense, SM, Organic Content 2.1%, **(FILL)** | SS S-3 | 100 | 8-13-11-12 (24) | | 0.3 |
| 8.0 ft | 3.0 | | Tan, Silty Sand, Trace Gravel, Dry, Very Loose, SM, **(FILL)** | SS S-4 | 90 | 10-11-8-9 (19) | | 0.3 |
| 8.8 ft | 2.2 | | Dark Brown, Organic Silt with Sand, Trace Roots, Dry, Soft, OL, **(ORGANICS)** | SS S-5 | 65 | 2-1-1-2 (2) | | 0.3 |
| 10.0 ft | 1.0 | | Black, Organic Sand with Silt, Moist, Very Soft, OL, Organic Content 9.7%, **(ORGANICS)** | SS S-6 | 100 | -- | | 0.1 |
| 12.0 ft ▽ | -1.0 | | Dark Brown, Slightly Organic Silty Sand, Trace Roots, Moist, Loose, SM, **(ORGANICS)** | SS S-7 | 100 | -- | | 0.6 |
| 14.0 ft | -3.0 | | | | | | | |
| 15.0 ft | -4.0 | | Brown, Silty Sand, Wet, Medium Dense, SM, **(OUTWASH)** | SS S-8 | 70 | 11-11-17-21 (28) | | 0.6 |
| 17.0 ft | -6.0 | | Gray, Silty Sand with Gravel, Wet, Dense, SM, **(OUTWASH)** | SS S-9 | 95 | 10-15-21-18 (36) | | 0.5 |
| 19.0 ft | -8.0 | | Brown, Silty Sand, Wet, Medium Dense, SM, **(OUTWASH)** | SS S-10 | 60 | 12-14-12-15 (26) | | 0.2 |
| 21.0 ft | -10.0 | | Gray, Silty Sand with Gravel, Wet, Dense, GM, **(TILL)** | SS S-11 | 40 | 11-15-21-22 (36) | | 0.3 |
| 25.0 ft | -14.0 | Split Spoon Refusal at 25.5' bgs | | SS S-12 | 25 | 6-16-24-21 (40) | | 0.2 |
| 25.5 ft | -14.5 | | No Recovery | SS S-13 | 0 | 45 (45) | | |
| | | | End of boring at 25.5 feet | | | | | |
| 30 | -19 | | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-3-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/10/2023 **DATE COMPLETED** 11/10/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623423 **LONGITUDE** -70.917839
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/10/2023 8.0 ft / Elev 3.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Property 1 (54 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 11 | Analytical Sample submitted from 0'-4' bgs. | Dark Brown, Silty Sand, Trace Roots, Dry, Medium Dense, SM, **(FILL)** | SS S-1 | 38 | 2-14-9-5 (23) | | 0.3 |
| 2.0 ft | 9.0 | | Brown, SILTY SAND, Dry, Loose, SM, **(FILL)** | SS S-2 | 65 | 3-2-2-3 (4) | | 0.2 |
| 4.0 ft | 7.0 | | Tan to Brown, Silty Sand, Dry, Loose, SM, **(FILL)** | SS S-3 | 95 | 2-2-3-3 (5) | | 0.2 |
| 5.5 ft | 5.5 | | Brown to Black, Silty Sand with Gravel, Trace Brick, Trace Roots, Dry to Moist, Medium Dense, SM, **(FILL)** | SS S-4 | 50 | 6-6-4-4 (10) | | 0.8 |
| 8.0 ft ▽ | 3.0 | 3" spoon driven after 2" spoon to obtain additional soil recovery. | Brown, Silty Gravel with Sand, Wet, Medium Dense, GM, **(OUTWASH)** | SS S-5 | 25 | 5-6-5-4 (11) | | 0.2 |
| 10.0 ft | 1.0 | | Tan to Gray, Silty Sand with Gravel, Wet, Very Dense to Medium Dense, SM, **(TILL)** | SS S-6 | 65 | 10-30-35-28 (65) | | 0.2 |
| | | Split spoon refusal at 13' bgs | | SS S-7 | 50 | 22-50 | | 0.5 |
| 15 | | | | SS S-8 | 55 | 11-14-14-17 (28) | | 0.3 |
| 16.0 ft | -5.0 | Split spoon refusal at 16.5' bgs | | | | | | |
| 16.5 ft | -5.5 | | No Recovery | SS S-9 | -- | 50 | | 0.5 |
| | | | End of boring at 16.5 feet | | | | | |
| 20 | -9 | | | | | | | |
| 25 | | | | | | | | |
| 30 | -19 | | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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Raynham, MA 02767

# BORING NUMBER CEC-4-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/09/2023 **DATE COMPLETED** 11/09/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623573 **LONGITUDE** -70.918352
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/09/2023 8.0 ft / Elev 3.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Property 1 (54 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 11 | Analytical samples submitted from 0'-4' and 8'-10' bgs. | 0.5 ft / 10.5: Tan, Poorly-Graded Sand with Silt and Gravel, Trace Roots, Dry, Medium Dense, SP-SM, **(FILL)** | SS S-1 | 95 | 5-6-6-5 (12) | | 10.0 |
| | | | Brown, Silty Sand, Trace Gravel, Dry, Medium Dense to Dense, SM, **(FILL)** | SS S-2 | 80 | 9-11-14-11 (25) | | 0.2 |
| | | | 4.5 ft / 6.5: Light Brown, Well-Graded Sand with Silt and Gravel, Dry, Dense, SW-SM, **(FILL)** | SS S-3 | 90 | 6-17-32-21 (49) | | 0.3 |
| 5 | | | 6.5 ft / 4.5: Dark Brown, Slightly Organic Silt with Sand and Gravel, Trace Bricks, Damp, Stiff, Slightly Organic Odor, ML, **(FILL)** | SS S-4 | 95 | 13-3-9-9 (12) | | 0.3 |
| | | | 8.0 ft ▽ / 3.0: Brown, Slightly Organic Silty Sand with Gravel, Trace Roots, Wet, Very Loose, SM, **(Organics)** | SS S-5 | 60 | 1-WOH-WOH-WOH (1) | | 1.7 |
| 10 | 1 | | 10.0 ft / 1.0: Brown, SILTY SAND, FEW GRAVEL, Trace Roots, Wet, Very Loose, SM, **(OUTWASH)** | SS S-6 | 50 | WOH-WOH-2-13 (2) | | 0.1 |
| | | | 12.0 ft / -1.0: Light Brown, Well-Graded Sand with Silt and Gravel, Wet, Medium Dense, SW-SM, **(OUTWASH)** | SS S-7 | 75 | 13-15-11-17 (26) | | 0.3 |
| | | | 14.0 ft / -3.0: Brown, Silty Sand with Gravel, Wet, Dense to Very Dense, SM, **(TILL)** | SS S-8 | 70 | 12-15-17-10 (32) | | 0.2 |
| 15 | | | | SS S-9 | 100 | 12-22-28-30 (50) | | 0.3 |
| | | | 18.0 ft / -7.0: No Recovery | SS S-10 | -- | 11-24-20-50 (44) | | |
| 20 | -9 | Sample S-11 was abandoned in the boring after snapping off of drill rods. | 20.0 ft / -9.0: End of boring at 20.0 feet | | | | | |
| 25 | | | | | | | | |
| 30 | -19 | | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-5-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/10/2023 **DATE COMPLETED** 11/10/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623647 **LONGITUDE** -70.918060
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/10/2023 8.0 ft / Elev 3.0 ft
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Analytical Samples submitted from 0'-4' and 8'-10' bgs. | 0.2 ft 3" Asphalt<br>Tan, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)** | 10.8 | SS S-1 | 95 | 17-9-10-3 (19) | | 0.1 |
| | | 2.0 ft<br>Light Brown, Silty Sand with Gravel, Dry, Medium Dense, SM, **(FILL)** | 9.0 | SS S-2 | 90 | 8-14-11-8 (25) | | 0.1 |
| 5 | | 5.5 ft<br>Gray To Black, Silty Sand with Gravel, Trace Wood/Brick, Moist, Medium Dense, SM, **(FILL)** | 5.5 | SS S-3 | 85 | 6-10-16-16 (26) | | 0.3 |
| | | 8.0 ft ▽<br>Dark Brown, Slightly Organic SILTY SAND, FEW GRAVEL, Wet, Loose, SM, Organic Content 1.9%, **(ORGANICS)** | 3.0 | SS S-4 | 50 | 9-10-6-4 (16) | | 0.5 |
| 10 | | 10.0 ft<br>Brown, Silty Sand with Gravel, Wet, Medium Dense, SM, **(TILL)** | 1.0 | SS S-5 | 80 | 3-2-2-2 (4) | | 0.3 |
| | | 12.0 ft<br>Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Very Dense, SP-SM, **(TILL)** | -1.0 | SS S-6 | 90 | 10-14-14-18 (28) | | 0.2 |
| | Split spoon refusal at 13.5' bgs. | 13.5 ft<br>End of boring at 13.5 feet | -2.5 | SS S-7 | 75 | 12-22-50 (72) | | 0.1 |
| 15 | | | | | | | | |
| 20 | | | -9 | | | | | |
| 25 | | | | | | | | |
| 30 | | | -19 | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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Raynham, MA 02767

# BORING NUMBER CEC-1-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/05/2023 **DATE COMPLETED** 12/05/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623895 **LONGITUDE** -70.917636
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 12/05/2023 4.0 ft / Elev 7.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Property 1 (18 Wright St. New Bedford, MA)

| DEPTH (ft) | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0 | 0.5 ft Brown, Silty Sand with Gravel, Trace Roots, Dry, Medium Dense, SM, **(FILL)** | 11 | | | | | | |
| | 2.0 ft Tan, Silty Sand with Gravel, Dry, Medium Dense, SM, **(FILL)** | 10.5 / 9.0 | SS S-1 | 95 | 3-7-8-9 (15) | | 0.2 | Analytical Sample submitted from 0'-4' bgs. |
| | Brown, Silty Sand with Gravel, Moist, Medium Dense, Slight Petroleum Odor, SM, **(FILL)** | | SS S-2 | 75 | 14-11-5-3 (16) | | 0.6 | |
| 5 | 4.5 ft Dark Brown, Slightly Organic SILTY SAND WITH GRAVEL, Trace Roots/Wood, Trace Brick, Debris, Moist, Medium Dense, SM, Organic Content 4.5%, **(FILL)** | 6.5 | SS S-3 | 90 | 3-4-6-28 (10) | | 1.0 | |
| | 6.0 ft Brown, Silty Sand with Gravel, Few Bricks, Wet, Dense, SM, **(FILL)** | 5.0 | SS S-4 | 55 | 25-15-16-10 (31) | | 0.0 | |
| | 8.0 ft Red to Brown, Poorly-Graded Gravel/Brick Debris, Few Sand, Wet, Loose, Petroleum Odor, GP, **(FILL)** | 3.0 | SS S-5 | 20 | 7-4-4-4 (8) | | 0.0 | No recovery, with 2" spoon, recovered 5" with 3" spoon. |
| 10 | 10.0 ft Brown, Slightly Organic POORLY-GRADED SAND WITH SILT AND GRAVEL, Trace Brick, Roots, Wet, Medium Dense, Slight Organic / Petroleum Odor, SP-SM, **(FILL)** | 1.0 / 1 | SS S-6 | 65 | 2-5-15-15 (20) | | 0.2 | |
| | 12.0 ft Dark Brown, Slightly Organic Silty Sand with Gravel, Trace Brick, Roots, Wet, Medium Dense, Slight Organic / Petroleum Odor, SM, **(FILL)** | -1.0 | SS S-7 | 90 | 7-5-10-11 (15) | | 0.2 | |
| 15 | 13.0 ft Gray, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(TILL)** | -2.0 | SS S-8 | 75 | 34-30-25-38 (55) | | 0.2 | |
| | | | SS S-9 | 100 | 21-23-35-34 (58) | | 0.3 | |
| 20 | 18.0 ft End of boring at 18.0 feet | -7.0 / -9 | | | | | | |
| 25 | | | | | | | | |
| 30 | | -19 | | | | | | |

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Raynham, MA 02767

# BORING NUMBER CEC-2-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/06/2023 **DATE COMPLETED** 12/06/2023
**GROUND ELEVATION** 8.70 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624047 **LONGITUDE** -70.917329
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 12/06/2023 6.0 ft / Elev 2.7 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Property 1 (18 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEV (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0.2 ft | | 3" Asphalt | 8.4 | | | | | |
| | Analytical Sample submitted from 0'-4' bgs. | Tan to Brown, Silty Sand with Gravel, Dry, Dense, SM, **(FILL)** | | SS S-1 | 60 | 11-13-22-17 (35) | | 0.3 |
| 2.2 ft | | Brown to Black, Poorly-Graded Gravel / Asphalt with Sand and Silt, Dry, Dense, GP, **(FILL)** | 6.4 | | | | | |
| | | | | SS S-2 | 750 | 27-26-13-10 (39) | | 1.2 |
| 3.8 ft | | | 5.0 | | | | | |
| 4.0 ft | | Tan, Silty Sand with Gravel, Dry, Dense, SM, **(FILL)** | 4.7 | | | | | |
| | | | | SS S-3 | 70 | 10-8-8-7 (16) | | 1.0 |
| 6.0 ft | | Dark Gray, POORLY-GRADED SAND WITH SILT AND GRAVEL, Few Debris / Roots, Dry, Medium Dense, SP-SM, **(FILL)** | 2.7 | | | | | |
| | | Gray, Poorly-Graded Sand with Silt, Trace Shells, Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-4 | 65 | 7-8-6-6 (14) | | 0.1 |
| 8.0 ft | | | 0.7 | | | | | |
| | | Gray, POORLY-GRADED SAND WITH SILT, Trace Shells, Wet, Loose, Slight Petroleum Odor, SP-SM, **(FILL)** | | SS S-5 | 45 | 3-2-2-4 (4) | | 1.3 |
| 10.0 ft | | | -1.3 | | | | | |
| 11.0 ft | | Black to Gray, Silty Sand with Gravel, Trace Shells, Wet, Medium Dense, Petroleum Odor, SM, **(FILL)** | -2.3 | SS S-6 | 70 | 5-5-14-16 (19) | | 1.9 |
| 12.5 ft | | Gray, Silty Gravel with Sand, Trace Shells, Wet, Medium Dense, GM, **(OUTWASH)** | -3.8 | | | | | |
| | | Grayish Brown, Silty Sand with Gravel, Wet, Medium Dense, SM, **(OUTWASH)** | | SS S-7 | 75 | 16-12-11-13 (23) | | 0.2 |
| 14.0 ft | | | -5.3 | | | | | |
| | | Tan, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(OUTWASH)** | | SS S-8 | 40 | 9-9-13-12 (22) | | 0.0 |
| 16.0 ft | | | -7.3 | | | | | |
| | Black, Slightly Organic Sand Seam at 18' bgs. | Tan, Well-Graded Sand with Silt, Wet, Medium Dense, SW-SM, **(OUTWASH)** | | SS S-9 | 55 | 7-12-12-11 (24) | | 0.2 |
| 18.0 ft | | Orange, Silty Sand with Gravel, Wet, Loose, SM, **(OUTWASH)** | -9.3 | | | | | |
| | | | | SS S-10 | 45 | 6-5-4-6 (9) | | 0.4 |
| 20.0 ft | | | -11.3 | | | | | |
| | | Orange / Brown, Well-Graded Sand with Silt, Wet, Medium Dense, SW-SM, **(OUTWASH)** | | SS S-11 | 60 | 2-4-6-20 (10) | | 0.8 |
| 22.0 ft | | Orange / Brown, Silty Gravel with Sand, Wet, Medium Dense to Very Dense, GM, **(TILL)** | -13.3 | | | | | |
| | | | | SS S-12 | 60 | 12-36-17-50 (53) | | 0.2 |
| | | | | SS S-13 | 45 | 11-12-17-17 (29) | | 0.5 |
| 26.0 ft | | End of boring at 26.0 feet | -17.3 | | | | | |

SPT N VALUE 20 40 60 80
PL MC LL 20 40 60 80
FINES CONTENT (%) 20 40 60 80

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Raynham, MA 02767

# BORING NUMBER CEC-3-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/06/2023 **DATE COMPLETED** 12/06/2023
**GROUND ELEVATION** 9.60 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624116 **LONGITUDE** -70.916931
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 12/06/2023 8.0 ft / Elev 1.6 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Property 1 (18 Wright St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | Analytical Sample submitted from 0.3'-4' bgs. | 0.2 ft 3" Asphalt<br>Tan, Silty Sand, Dry, Medium Dense, SM, **(FILL)** | 9.4 | SS S-1 | 55 | 4-6-11-12 (17) | | 0.0 |
| | | | 2.2 ft Brown, SILTY SAND, FEW GRAVEL, Dry, Medium Dense, SM, **(FILL)** | 7.4 | SS S-2 | 50 | 5-8-6-6 (14) | | 1.0 |
| 5 | | | 4.2 ft Brown to Dark Brown, Silty Sand with Gravel, Dry, Medium Dense to Dense, SM, **(FILL)** | 5.4 | SS S-3 | 50 | 7-5-6-22 (11) | | 0.0 |
| | | | 8.0 ft ▽ Brown to Gray, Poorly-Graded Sand with Silt, Trace Shells, Wet, Medium Dense to Loose, SP-SM, **(OUTWASH)** | 1.6 | SS S-4 | 50 | 25-24-24-17 (48) | | 0.3 |
| 10 | | | | 0 | SS S-5 | 55 | 4-6-5-4 (11) | | 0.2 |
| | | | | | SS S-6 | 55 | 3-4-4-4 (8) | | 0.9 |
| | | | 12.0 ft Gray, Slightly Organic SILTY SAND, FEW GRAVEL, Trace Shells, Wet, Loose, Slight Organic Odor, SM, Organic Content 1.1%, **(OUTWASH)** | -2.4 | SS S-7 | 75 | 5-3-5-9 (8) | | 1.2 |
| 15 | | | 14.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(OUTWASH)** | -4.4 | SS S-8 | 60 | 5-7-8-7 (15) | | 0.2 |
| | | | | | SS S-9 | 75 | 7-10-9-7 (19) | | 0.3 |
| | | | 18.0 ft End of boring at 18.0 feet | -8.4 | | | | | |
| 20 | | | | -10 | | | | | |
| 25 | | | | -20 | | | | | |
| 30 | | | | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-4-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/05/2023 **DATE COMPLETED** 12/05/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623463 **LONGITUDE** -70.917509
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING N/A; AT END OF CORING N/A; 24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Property 1 (18 Wright St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | Analytical Samples submitted from 0'-4' and 4'-5.75' bgs. | 0.5 ft: Dark Brown, Organic Silty Sand, Few Roots, Dry, Loose, SM, **(FILL)** | 10.5 | | | | | |
| | | | 2.0 ft: Tan, Silty Sand with Gravel, Trace Glass, Dry, Loose, SM, **(FILL)** | 9.0 | SS S-1 | 60 | 1-3-3-3 (6) | | 0.2 |
| | | | Brown, SILTY SAND, FEW GRAVEL, Dry, Loose, SM, **(FILL)** | | SS S-2 | 80 | 3-2-2-2 (4) | | 0.1 |
| | | | 4.0 ft: Light Brown, Silty Sand, Dry, Medium Dense, SM, **(FILL)** | 7.0 | SS S-3 | 74 | 2-5-7-45/0.3' (12) | | 0.3 |
| 5 | | Split spoon refusal at 5.75' bgs; Augers grinding 5.75-6'. Auger and split spoon refusal at 6.5'. | 5.8 ft: No Recovery | 5.2 | SS S-4 | 0 | 50-WOH/0.2' (50) | | -- |
| | | | 6.5 ft: End of boring at 6.5 feet | 4.5 | | | | | |
| 10 | | | | 1 | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | -9 | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | -19 | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-5-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/05/2023 **DATE COMPLETED** 12/05/2023
**GROUND ELEVATION** 8.80 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623533 **LONGITUDE** -70.916969
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | Split spoon and auger refusal at 1.25' bgs, offset 6' north. | Brown, Silty Sand with Gravel / Concrete, Trace Roots, Dry, Very Dense, SM, **(FILL)** | 8.8 | SS S-1 | 56 | 3-24-50/0.2' | | |
| | | | 2.0 ft / 6.8 | | | | | | |
| | | | Tan to Brown, Silty Sand with Gravel, Dry to Moist, Medium Dense to Very Dense, SM, **(FILL)** | | SS S-2 | 70 | 5-6-7-9 (13) | | |
| 5 | | Split spoon refusal at 5.5' bgs | | | SS S-3 | 55 | 5-10-81 (91) | | |
| | | | 5.5 ft / 3.3 | | | | | | |
| | | | End of boring at 5.5 feet | | | | | | |
| 10 | | Analytical Sample submitted from 0'-4' bgs. | | -1 | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | -11 | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | -21 | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-6-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/06/2023 **DATE COMPLETED** 12/06/2023
**GROUND ELEVATION** 9.10 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623677 **LONGITUDE** -70.916698
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING N/A; AT END OF CORING N/A; 24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Property 1 (18 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Analytical Sample submitted from 0'-4' bgs. | 0.5 ft: Dark Brown, Organic Silty Sand, Few Roots, Dry, Medium Dense, SM, **(FILL)** | 8.6 | SS S-1 | 65 | 2-5-5-8 (10) | | |
| | | Brown, Silty Sand with Gravel, Trace Debris, Roots, Dry, Medium Dense, SM, **(FILL)** | | SS S-2 | 70 | 7-8-9-7 (17) | | |
| 5 | | 5.0 ft: Black, Silty Sand with Gravel, Some Concrete/Brick/Wood, Dry to Moist, Medium Dense, SM, **(FILL)** | 4.1 | SS S-3 | 90 | 7-8-14-11 (22) | | |
| | | 6.0 ft: Dark Gray, POORLY-GRADED SAND WITH SILT AND GRAVEL, Some Concrete/Brick/Wood, Moist, Medium Dense, SP-SM, **(FILL)** | 3.1 | SS S-4 | 74 | 11-10-16-50 /0.3' (26) | | |
| | Split spoon refusal at 7.75' bgs | 7.8 ft: End of boring at 7.8 feet | 1.4 | | | | | |
| 10 | | | 0 | | | | | |
| 15 | | | -10 | | | | | |
| 20 | | | -20 | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-7-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/05/2023 **DATE COMPLETED** 12/05/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623464 **LONGITUDE** -70.917548
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 12/05/2023 8.0 ft / Elev 3.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Property 1 (18 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 11 | Analytical Samples submitted from 0'-4', 4'-8', and 8'-10' bgs. | 0.5 ft: Brown, Silty Sand with Gravel, Trace Roots, Dry, Loose, SM, **(FILL)** | | | | | |
| | | | 10.5 | | | | | |
| | | | Tan, Silty Sand, Dry, Loose, SM, **(FILL)** | SS S-1 | 88 | 2-2-4-6 (6) | | 0.1 |
| | | | 2.0 ft: Brown, Silty Sand with Gravel, Dry, Medium Dense to Very Dense, SM, **(FILL)** | SS S-2 | 20 | 4-6-5-4 (11) | | 0.7 |
| 5 | | Split spoon refusal at 4.6'. Augers grinding from 4.6-6' bgs through possible boulder or concrete. | | SS S-3 | 100 | 4-50/0.1' | | 0.1 |
| | | | 6.0 ft: Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Trace Debris, Moist to Wet, Medium Dense, SP-SM, **(FILL)** | SS S-4 | 45 | 4-5-11-15 (16) | | |
| | | | 8.0 ft ▽ Dark Brown, Silty Sand with Gravel, Trace Debris, Wet, Medium Dense, SM, **(FILL)** | SS S-5 | 50 | 4-6-8-16 (14) | | 0.0 |
| 10 | 1 | | 10.0 ft: Brown/Gray, Silty Sand with Gravel, Wet, Dense to Very Dense, SM, **(TILL)** | SS S-6 | 55 | 5-14-26-53 (40) | | 0.1 |
| | | | | | | | | 0.7 |
| | | Split spoon and auger refusal at 13.8' bgs. | 13.8 ft: End of boring at 13.8 feet | SS S-7 | 87 | 14-47-55 (102) | | 0.5 |
| 15 | | | | | | | | |
| 20 | -9 | | | | | | | |
| 25 | | | | | | | | |
| 30 | -19 | | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-8-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/05/2023 **DATE COMPLETED** 12/05/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623469 **LONGITUDE** -70.917443
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 12/05/2023 8.0 ft / Elev 3.0 ft
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Dark Brown, Organic Silty Sand with Gravel, Few Roots, Dry, Loose, SM, **(FILL)** | 11 | | | | | |
| 1.0 ft | | | Tan, Silty Sand, Dry, Loose, SM, **(FILL)** | 10.0 | SS S-1 | 60 | 1-1-3-7 (4) | | 0.1 |
| 2.0 ft | | Analytical Samples submitted from 2'-4' and 4'-8' bgs. | Brown, Poorly-Graded Sand with Silt and Gravel, Trace Debris, Dry, Medium Dense, SP-SM, **(FILL)** | 9.0 | SS S-2 | 70 | 5-5-5-4 (10) | | 0.1 |
| 4.0 ft | | | Brown, SILTY SAND WITH GRAVEL, Dry, Loose, Petroleum Odor at 5', SM, **(FILL)** | 7.0 | SS S-3 | 50 | 4-4-4-28 (8) | | 0.8 |
| 5 | | | | | | | | | |
| 6.0 ft | | | Dark Brown, Silty Sand with Gravel, Trace Shells/Brick/Asphalt/Glass, Wet, Medium Dense, SM, **(FILL)** | 5.0 | SS S-4 | 50 | 9-8-7-25 (15) | | 0.9 |
| 8.0 ft | | Split spoon and auger refusal at 8' bgs on possible concrete slab. | End of boring at 8.0 feet | 3.0 | | | | | |
| 10 | | | | 1 | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | -9 | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | -19 | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER A0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623433 **LONGITUDE** -70.917462
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1' and 1'-2' bgs. | Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft / 9.0<br>Tan, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.5 ft / 6.5<br>3.8 ft / 6.2<br>Asphalt<br>Brown to Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| 5 | | | 5.0 ft / 5.0<br>Brown, Poorly-Graded Sand with Silt and Gravel, Few Shell Fragments, Dry, SP-SM, **(FILL)** | DP S-2 | 100 | |
| | | | 6.5 ft / 3.5<br>End of boring at 6.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER A-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623500 **LONGITUDE** -70.917482
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as composite and from 0'-1', 1'-2' & 4'-5' bgs. | Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft / 10.0<br>Tan, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.5 ft / 7.5<br>3.8 ft / 7.2<br>Asphalt<br>Brown, Poorly-Graded Sand with Silt and Gravel, Few Shell Fragments, Dry, SP-SM, **(FILL)** | | | |
| 5 | | | | DP S-2 | 100 | |
| | | | 6.5 ft / 4.5<br>End of boring at 6.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER A-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623567 **LONGITUDE** -70.917503
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', 2'-3' & 3'-4' bgs. | Tan, Silty Sand, Trace Gravel, Little Roots, Dry, SM, **(FILL)** | | | |
| | | | 2.0 ft – 9.0 Tan, Poorly-Graded Sand with Gravel, Trace Silt, Dry, SP, **(FILL)** | DP S-1 | 100 | |
| | | | 4.5 ft – 6.5 Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** | | | |
| 5 | | Brick Fragments at 5.5' bgs. | | DP S-2 | 100 | |
| | | | 7.0 ft – 4.0 End of boring at 7.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER A-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623634 **LONGITUDE** -70.917524
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as composite and from 1'-2', 2'-3' & 4'-5' bgs. | Brown, Silty Sand, Little Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 10.0 | | | |
| | | | Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| | | | 6.3 ft — 4.7 | | | |
| | | | End of boring at 6.3 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER A-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/29/2023 **DATE COMPLETED** 12/29/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623700 **LONGITUDE** -70.917544
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 3'-4' bgs. | Brown, Silty Sand, Trace Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 4.0 ft / 7.0 | | | Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-2 | 100 | |
| 8.0 ft / 3.0 | | | End of boring at 8.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER A-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623767 **LONGITUDE** -70.917565
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as composite and from 1'-2', 2'-3', & 4'-5' bgs. | Brown, Silty Sand with Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 10.0 | | | |
| | | | Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| | | | 6.3 ft — 4.7 | | | |
| | | | End of boring at 6.3 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER A-6



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623834 **LONGITUDE** -70.917585
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** 4.0 ft / Elev 7.0 ft
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2' & 4'-5' bgs. | Brown, Silty Sand with Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 10.0 | | | |
| | | | Tan, Silty Sand with Gravel, Dry to Wet, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 4.0 ft ▽ — 7.0 | | | |
| | | | Brown, Poorly-Graded Sand with Silt and Gravel, Moist, SP-SM, **(FILL)** | | | |
| 5 | | | 5.5 ft — 5.5 | DP S-2 | 100 | |
| | | | End of boring at 5.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER A-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623900 **LONGITUDE** -70.917605
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as composite from 1'-4' bgs. Rock fragment at 2.5' bgs. | 0.5 ft Brown, Silty Sand with Roots, Dry, SM, **(TOPSOIL)** 10.5<br>Tan, Silty Sand with Gravel, Dry to Moist, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 4.0 ft 7.0<br>4.5 ft Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM, **(FILL)** 6.5 | | | |
| 5 | | | End of boring at 4.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER AA0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623418 **LONGITUDE** -70.917551
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2' & 4'-5' bgs. | Brown, Silty Sand with Gravel, Few Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft 9.0 | | | |
| | | | Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 2.0 ft 8.0 | | | |
| | | | Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| | | | 6.0 ft 4.0 | | | |
| | | | End of boring at 6.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER AA-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623485 **LONGITUDE** -70.917572
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 4'-5' bgs. | Brown to Tan, Silty Sand with Gravel, Trace Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.5 ft / 9.5 | | | |
| | | | Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 6.0 ft / 5.0 | DP S-2 | 100 | |
| | | | End of boring at 6.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER AA-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623551 **LONGITUDE** -70.917592
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2' & 4'-5' bgs. | Brown to Tan, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 10.0 | | | |
| | | | Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 2.5 ft — 8.5 | DP S-1 | 100 | |
| | | | Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | | | |
| 5 | | | 5.5 ft — 5.5 | DP S-2 | 100 | |
| | | | End of boring at 5.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER AA-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623618 **LONGITUDE** -70.917613
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 3'-4' bgs. | Brown to Tan, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 10.0<br>Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 2.5 ft — 8.5<br>Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.5 ft — 5.5<br>End of boring at 5.5 feet | DP S-2 | 100 | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER AA-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623685 **LONGITUDE** -70.917633
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2', 2'-3', & 4'-5' bgs. | 0.8 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 10.2 | | | |
| | | | Tan to Brown, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.0 ft 8.0 Brown, Silty Sand with Gravel, Trace Shell Fragments, Dry, SM, **(FILL)** | | | |
| 5 | | | | DP S-2 | 100 | |
| | | | 6.5 ft 4.5 End of boring at 6.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER AA-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623752 **LONGITUDE** -70.917654
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2' & 4'-5' bgs. | 0.8 ft — Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** — 10.2<br>Tan, Silty Sand, Dry, SM, **(FILL)**<br>2.8 ft — 8.2<br>Brown to Tan, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM, **(FILL)**<br>6.5 ft — 4.5<br>End of boring at 6.5 feet | DP S-1<br>DP S-2 | 100<br>100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER AA-6



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623819 **LONGITUDE** -70.917674
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2' & 4'-5' bgs. | Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 10.0 | | | |
| | | | Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.2 ft — 7.8 | | | |
| | | | Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | | | |
| 5 | | | 6.3 ft — 4.7 | DP S-2 | 100 | |
| | | | End of boring at 6.3 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER AA-8.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623986 **LONGITUDE** -70.917726
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as composite. | 0.5 ft Asphalt<br>Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** 10.5<br>3.0 ft Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Dry to Moist, SP-SM, **(FILL)** 8.0<br>5.0 ft 6.0<br>End of boring at 5.0 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623449 **LONGITUDE** -70.917373
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', 2'-3, & 3'-4' bgs. | 0.8 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 9.2<br>Tan, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 4.5 ft 5.5<br>End of boring at 4.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623515 **LONGITUDE** -70.917393
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', & 4'-5' bgs. | 0.5 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 10.5<br>Tan, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.8 ft 7.2<br>Brown, Poorly-Graded Sand with Silt and Gravel, Few Shell Fragments, Dry, SP-SM, **(FILL)** 4.8 ft 6.2 | | | |
| 5 | | | End of boring at 4.8 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623582 **LONGITUDE** -70.917414
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2', 2'-3', & 4'-5' bgs. | 0.5 ft – 10.5: Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)**; Tan, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.2 ft – 7.8: Asphalt | | | |
| | | | 3.8 ft – 7.2: Brown, Poorly-Graded Sand with Silt and Gravel, Few Shell Fragments, Dry, SP-SM, **(FILL)** | | | |
| 5 | | | 5.0 ft – 6.0: End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623649 **LONGITUDE** -70.917434
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', & 2'-3' bgs. | Tan, Poorly-Graded Sand with Silt, Trace Roots, SP-SM **(FILL)** | | | |
| | | | 1.5 ft / 9.5 — Tan, Poorly-Graded Sand with Silt and Gravel, SP-SM **(FILL)** | DP S-1 | 100 | |
| | | | 3.5 ft / 7.5 — Brown, Poorly-Graded Sand with Silt and Gravel, SP-SM, **(FILL)** | | | |
| 5 | | | 6.0 ft / 5.0 — End of boring at 6.0 feet | DP S-2 | 100 | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623716 **LONGITUDE** -70.917455
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 2'-3' bgs. | Tan, Silty Sand with Gravel, Trace Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.5 ft — 9.5 | | | |
| | | Rock Fragments at 4.5' bgs. | Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| | | | 7.0 ft — 4.0 | | | |
| | | | End of boring at 7.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623783 **LONGITUDE** -70.917475
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2', 2'-3', & 4'-5' bgs. | Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft | | | |
| | | | Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry to Moist, SP-SM, **(FILL)** 10.0 | DP S-1 | 100 | |
| 5 | | | 6.3 ft 4.7 | DP S-2 | 100 | |
| | | | End of boring at 6.3 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B-6



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623850 **LONGITUDE** -70.917496
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-2' bgs. | Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 10.0 | | | |
| | | | Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| | | | 6.3 ft — 4.7 | | | |
| | | | End of boring at 6.3 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER BB0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/29/2023 **DATE COMPLETED** 12/29/2023
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623402 **LONGITUDE** -70.917640
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 3'-4' bgs. | Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 75 | |
| | | | 4.0 ft 6.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER BB-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623469 **LONGITUDE** -70.917661
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as a composite and from 0'-1', 1'-2', 2'-3', 3'-4', & 4'-5' bgs. | Gray, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 1.5 ft — 9.5<br>Tan, Poorly-Graded Sand with Silt and Gravel, Few Shell Fragments, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft — 6.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER BB-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/29/2023 **DATE COMPLETED** 12/29/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623536 **LONGITUDE** -70.917681
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2', 2'-3', & 3'-4' bgs. | Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 75 | |
| 4.0 ft / 7.0 | | | Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | DP S-2 | 75 | |
| 8.0 ft / 3.0 | | | End of boring at 8.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER BB-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623603 **LONGITUDE** -70.917702
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as composite and from 1'-2' & 4'-5' bgs. | Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | | | |
| 2.0 ft / 9.0 | | | Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shells, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| 6.0 ft / 5.0 | | | End of boring at 6.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER BB-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623670 **LONGITUDE** -70.917722
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2' & 4'-5' bgs. | Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | | | |
| 2.0 ft / 9.0 | | | Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shells, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| 6.0 ft / 5.0 | | | End of boring at 6.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER BB-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623737 **LONGITUDE** -70.917743
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as composite and from 1'-2' & 4'-5' bgs. | Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | | | |
| 2.0 ft | | | Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shells, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| 6.0 ft | | | End of boring at 6.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER BB-6



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623803 **LONGITUDE** -70.917763
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Trace Roots from 0-0.5' bgs.<br><br>Analytical samples submitted from 1'-2' & 4'-5' bgs. | Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 3.5 ft | | | Brown, Poorly-Graded Sand with Silt and Gravel, Moist, SP-SM, **(FILL)** 7.5 | | | |
| 5.0 ft | | | 6.0<br>End of boring at 5.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER BB-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623870 **LONGITUDE** -70.917784
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Trace roots from 0-0.5' bgs.<br><br>Analytical samples submitted as composite from 1'-4' bgs. | Brown to Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 3.0 ft | | | 8.0 | | | |
| 4.0 ft | | | Gray to Brown, Poorly-Graded Sand with Silt and Gravel, Dry to Moist, SP-SM, **(FILL)** 7.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER C0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623464 **LONGITUDE** -70.917284
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2' & 4'-5' bgs. | 0.8 ft — Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** — 9.2<br>Tan, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 3.5 ft — Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM **(FILL)** — 6.5<br>5.5 ft — 4.5<br>End of boring at 5.5 feet | DP S-2 | 100 | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER C-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623531 **LONGITUDE** -70.917304
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED B** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as composite and from 0'-1', 1'-2', & 3'-4' bgs. | 0.5 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 10.5<br>Tan, Silty Sand, Dry, SM, **(FILL)**<br>2.5 ft 8.5<br>Brown to Tan, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**<br>4.0 ft 7.0<br>End of boring at 4.0 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER C-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/29/2023 **DATE COMPLETED** 12/29/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623613 **LONGITUDE** -70.917236
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 3'-4' bgs. | Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 4.0 ft 7.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER C-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623664 **LONGITUDE** -70.917345
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** D Barboza **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as a composite and from 1'-2' & 4'-5' bgs. | 0.8 ft Brown, Silty Sand with Gravel, Few Roots, Dry, SM, **(TOPSOIL)** 10.2 | DP S-1 | 100 | |
| | | | Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | | | |
| | | | 3.5 ft Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 7.5 | | | |
| 5 | | | 4.8 ft End of boring at 4.8 feet 6.2 | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER C-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/29/2023 **DATE COMPLETED** 12/29/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623731 **LONGITUDE** -70.917366
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', & 2'-3' bgs. | Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 75 | |
| | | | 4.0 ft 7.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER C-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623798 **LONGITUDE** -70.917386
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as composite and from 1'-2' & 4'-5' bgs.<br><br>Rock fragments at 4' bgs. | 0.5 ft Brown, Silty Sand with Gravel, Few Roots, Dry, SM, **(TOPSOIL)** 10.5<br>Tan, Silty Sand, Dry, SM, **(FILL)**<br>2.0 ft 9.0<br>Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**<br>5.0 ft 6.0<br>End of boring at 5.0 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER C-6



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623865 **LONGITUDE** -70.917407
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2' bgs.<br>Rock fragments at 2' bgs. | 0.5 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 10.5<br>1.0 ft Tan, Silty Sand, Dry, SM, **(FILL)** 10.0<br>Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**<br>4.0 ft 7.0<br>End of boring at 4.0 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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Raynham, MA 02767

# BORING NUMBER C-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623932 **LONGITUDE** -70.917427
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as composite from 1'-4' bgs. | 0.5 ft Brown, Silty Sand with Gravel, Few Roots, Dry, SM, **(TOPSOIL)** 10.5<br>Tan, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 4.0 ft 7.0<br>4.3 ft Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 6.7<br>End of boring at 4.3 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER CC0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623387 **LONGITUDE** -70.917729
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2', 3'-4', & 5'-6' bgs. | Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft / 9.0<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | | | |
| | | | 3.0 ft / 7.0<br>Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick, Trace Wood, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| | | | 6.0 ft / 4.0<br>End of boring at 6.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER CC-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623454 **LONGITUDE** -70.917750
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2', 3'-4', & 5'-6' bgs. | Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 10.0 | | | |
| | | | Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.0 ft — 8.0 | | | |
| 5 | | | Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick, Trace Wood, Dry, SP-SM, **(FILL)** | DP S-2 | 100 | |
| | | | 6.0 ft — 5.0 | | | |
| | | | End of boring at 6.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER CC-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623521 **LONGITUDE** -70.917770
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2' & 4'-5' bgs. | Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 10.0 | | | |
| | | | Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.0 ft — 8.0 | | | |
| | | | Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick, Trace Wood, Dry, SP-SM, **(FILL)** | | | |
| 5 | | | 6.0 ft — 5.0 | DP S-2 | 100 | |
| | | | End of boring at 6.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER D0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/29/2023 **DATE COMPLETED** 12/29/2023
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623479 **LONGITUDE** -70.917195
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', & 2'-3' bgs. | Brown, Silty Sand with Gravel, Trace Brick, Dry, SM, **(FILL)** | DP S-1 | 75 | |
| | | | 4.0 ft 6.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER D-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/29/2023 **DATE COMPLETED** 12/29/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623546 **LONGITUDE** -70.917215
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2' & 2'-3' bgs. | Brown, Silty Sand with Gravel, Trace Brick, Dry, SM, **(FILL)** | DP 'S-1 | 75 | |
| | | | 4.0 ft 7.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER D-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623613 **LONGITUDE** -70.917236
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2' bgs. | 0.4 ft Asphalt 10.6<br>Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM **(FILL)**<br>2.0 ft 9.0<br>Brown, Well -Graded Sand with Gravel, Dry, SW, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.5 ft 5.5<br>End of boring at 5.5 feet | DP S-2 | 100 | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER D-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/29/2023 **DATE COMPLETED** 12/29/2023
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623680 **LONGITUDE** -70.917256
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', & 2'-3' bgs. | Brown, Silty Sand, Trace Bricks, Dry, SM, **(FILL)** | DP S-1 | 75 | |
| | | | 4.0 ft 7.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER D-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623747 **LONGITUDE** -70.917277
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2' & 4'-5' bgs. | 0.4 ft Asphalt 10.6<br>Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM **(FILL)**<br>2.0 ft 9.0<br>Brown, Well-Graded Sand with Gravel, Dry, SW **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.5 ft 5.5<br>End of boring at 5.5 feet | DP S-2 | 100 | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER D-8.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624048 **LONGITUDE** -70.917369
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as composite from 1'-3' bgs. | 0.4 ft Asphalt 10.6<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.5 ft 7.5<br>4.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 7.0<br>End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER DD0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623372 **LONGITUDE** -70.917818
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-2' & 4'-5' bgs. | Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 9.0 | | | |
| | | | Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.0 ft — 7.0 | | | |
| | | | Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick, Trace Wood, Dry, SP-SM, **(FILL)** | | | |
| 5 | | | | DP S-2 | 100 | |
| | | | 6.0 ft — 4.0 | | | |
| | | | End of boring at 6.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER DD-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623438 **LONGITUDE** -70.917839
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as composite and from 1'-2' & 4'-5' bgs. | Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft / 10.0 — Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | | | |
| | | | 3.0 ft / 8.0 — Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick, Trace Wood, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 6.0 ft / 5.0 — End of boring at 6.0 feet | DP S-2 | 100 | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER DD-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623505 **LONGITUDE** -70.917859
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | | Tan, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 1.0 ft – 10.0 | | | |
| | | Analytical sample submitted from 3'-4' bgs. | Brown, Poorly-Graded Sand with Silt, Trace Shell Fragments, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 6.0 ft – 5.0 | DP S-2 | 100 | |
| | | | End of boring at 6.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER DD-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623572 **LONGITUDE** -70.917880
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-4' bgs. | 0.5 ft Asphalt<br>Tan, Poorly-Graded Sand with Gravel, Dry, SP, **(FILL)** 10.5 | DP S-1 | 100 | |
| 5 | | | 5.0 ft Brown, Poorly-Graded Sand with Gravel, Dry, SP, **(OUTWASH)** 6.0 | DP S-2 | 100 | |
| | | | 8.0 ft End of boring at 8.0 feet 3.0 | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER DD-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623706 **LONGITUDE** -70.917921
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-4' bgs. | 0.5 ft Asphalt<br>Tan, Silty Sand, Dry, SM, **(FILL)** 10.5<br>1.5 ft 9.5<br>Gray, Poorly-Graded Sand with Gravel, Trace Shells, Dry, SP, **(FILL)**<br>4.5 ft 6.5<br>End of boring at 4.5 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER DD-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623839 **LONGITUDE** -70.917962
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0.5'-3' bgs. | 0.4 ft Concrete 10.6<br>Tan, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**<br>2.0 ft 9.0<br>Tan, Silty Sand, Dry, SM, **(FILL)**<br>3.0 ft 8.0<br>End of boring at 3.0 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER E0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/29/2023 **DATE COMPLETED** 06/21/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623495 **LONGITUDE** -70.917105
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | | Dark Brown, Well-Graded Sand with Silt and Gravel, Dry, SW-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft — 5.0<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-2 | 100 | |
| 10 | | Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 9'-10' bgs. | 8.5 ft — 1.5<br>Brown, Poorly-Graded Sand with Gravel, Dry, SP, **(FILL)**<br>10.0 ft — 0.0<br>End of boring at 10.0 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER E-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623562 **LONGITUDE** -70.917126
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as a composite and from 0'-1', 1'-2', 2'-3', 4'-5' & 9'-10' bgs. | Brown, Well-Graded Sand with Silt and Gravel, Dry, SW-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft — 6.0<br>Tan, Poorly-Graded Sand with Gravel, Dry, SP, **(FILL)** | | | |
| | | | 6.5 ft — 4.5<br>Brown, Poorly-Graded Sand with Silt and Gravel, Few Asphalt/Brick Fragments, Dry, SP-SM, **(FILL)** | DP S-2 | 100 | |
| 10 | | | 10.0 ft — 1.0<br>End of boring at 10.0 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER E-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/03/2024 **DATE COMPLETED** 05/03/2024
**GROUND ELEVATION** 15.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623628 **LONGITUDE** -70.917147
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Boring located inside existing building.<br><br>Analytical sample submitted from 1'-2' & 4'-5' bgs. | 0.5 ft Concrete 14.5<br>Brown to Tan, Silty Sand with Gravel, Trace Brick, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 6.5 ft 8.5<br>Tan to Brown, Silty Sand with Gravel, Dry, SM, **(OUTWASH)** | DP S-2 | 100 | |
| 10 | | | 9.5 ft 5.5<br>End of boring at 9.5 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER E-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/03/2024 **DATE COMPLETED** 05/03/2024
**GROUND ELEVATION** 15.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623695 **LONGITUDE** -70.917167
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-3' & 3'-7' bgs. | 0.5 ft Concrete 14.5<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.0 ft 12.0<br>Brown, Silty Sand with Gravel, Dry, SM, **(OUTWASH)** | | | |
| 5 | | | | DP S-2 | 100 | |
| | | | 8.0 ft 7.0<br>End of boring at 8.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER E-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623829 **LONGITUDE** -70.917208
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-4' bgs. | 0.4 ft Asphalt 10.6<br>Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| | | Rock fragments at 3.5' bgs. | 4.3 ft 6.7<br>End of boring at 4.3 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER E-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623963 **LONGITUDE** -70.917249
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-4' bgs. | 0.4 ft Asphalt 10.6<br>1.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM **(FILL)** 10.0<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**<br>4.5 ft 6.5<br>End of boring at 4.5 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER EE0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623356 **LONGITUDE** -70.917907
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-2' bgs. | Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | | | |
| | | | 1.0 ft — 9.0<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.0 ft — 7.0<br>3.5 ft — 6.5<br>Brown, Poorly-Graded Sand with Clay and Gravel, Dry, SP-SC, **(FILL)** | | | |
| | | | End of boring at 3.5 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER EE0.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623323 **LONGITUDE** -70.917897
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-2' bgs. | Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | | | |
| | | | 1.0 ft — 9.0<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.0 ft — 7.0<br>3.5 ft — 6.5<br>Brown, Poorly-Graded Sand with Clay and Gravel, Dry, SP-SC, **(FILL)** | | | |
| | | | End of boring at 3.5 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER EE-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623423 **LONGITUDE** -70.917928
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | | Tan, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 10.0 | | | |
| | | Analytical sample submitted from 3'-4' bgs. | Brown, Poorly-Graded Sand with Silt, Trace Shell Fragments, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| | | | 7.0 ft — 4.0 | | | |
| | | | End of boring at 7.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER EE-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623490 **LONGITUDE** -70.917948
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 3'-4' bgs. | 0.5 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 10.5<br>Brown to Tan, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | Brick fragments at 4' bgs. | 5.0 ft 6.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER EE-8.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623924 **LONGITUDE** -70.918082
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-4' bgs. | 0.5 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 9.5<br>Tan, Silty Sand, Dry, SM, **(FILL)**<br>3.0 ft 7.0<br>Brown to Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**<br>4.5 ft 5.5<br>End of boring at 4.5 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER F0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/29/2023 **DATE COMPLETED** 12/29/2023
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623510 **LONGITUDE** -70.917016
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 3'-4' bgs. | Brown, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 4.0 ft 6.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER F-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623577 **LONGITUDE** -70.917037
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1' & 1'-2' bgs. | Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 10.0<br>Tan, Poorly-Graded Sand, Dry, SP, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft — 6.0<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | | | |
| | | | 6.5 ft — 4.5<br>Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick Fragments, Dry, SP-SM, **(FILL)** | DP S-2 | 100 | |
| 10 | | | 10.0 ft — 1.0<br>End of boring at 10.0 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER F-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/03/2024 **DATE COMPLETED** 05/03/2024
**GROUND ELEVATION** 15.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623644 **LONGITUDE** -70.917057
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Boring located inside existing building.<br><br>Analytical samples submitted from 1'-2' & 4'-5' bgs.<br><br>Brick and rock fragments observed from 2 to 7' bgs. | 0.5 ft Concrete 14.5<br>Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| | | | 9.5 ft 5.5<br>End of boring at 9.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER FF0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623341 **LONGITUDE** -70.917997
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2' & 4'-5' bgs. | Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | | | |
| | | | 1.0 ft — 9.0<br>Tan, Silty Sand, Little Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.0 ft — 7.0<br>Brown, Poorly-Graded Sand with Clay and Gravel, Dry, SP-SC, **(FILL)** | | | |
| 5 | | | 5.0 ft — 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER FF-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623408 **LONGITUDE** -70.918017
**SAMPLING METHOD** Direct Push
**WATER LEVELS** ▽ **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
▼ **AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
▼ **24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as composite and from 0'-1', 1'-2', 3'-4', & 4'-5' bgs.<br><br>Brick fragments at 4' bgs. | Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | | | |
| | | | 1.0 ft — 10.0<br>Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 3.0 ft — 8.0 | DP S-1 | 100 | |
| | | | 3.5 ft — 7.5<br>Brown, Poorly-Graded Sand with Clay, Dry, SP-SC, **(FILL)** | | | |
| | | | Brown, Poorly-Graded Sand with Gravel, Dry, SP, **(FILL)** | | | |
| 5 | | | 5.0 ft — 6.0 | | | |
| | | | End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER FF-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623474 **LONGITUDE** -70.918038
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2' & 4'-5' bgs. | Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | | | |
| | | | 1.0 ft — 10.0<br>Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 3.0 ft — 8.0 | DP S-1 | 100 | |
| | | | 3.5 ft — 7.5<br>Brown, Poorly-Graded Sand with Clay, Dry, SP-SC, **(FILL)** | | | |
| 5 | | | Brown, Poorly-Graded Sand with Gravel, Dry, SP, **(FILL)** | | | |
| | | | 5.0 ft — 6.0 | | | |
| | | | End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER FF-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623541 **LONGITUDE** -70.918058
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1' to 4' bgs. | 0.5 ft Asphalt<br>Tan, Silty Sand, Dry, SM, **(FILL)** 10.5<br>3.5 ft 7.5<br>4.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 7.0<br>End of boring at 4.0 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER FF-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623675 **LONGITUDE** -70.918099
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-4' bgs. | 0.5 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 10.5<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**<br>4.0 ft 7.0<br>End of boring at 4.0 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER FF-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623809 **LONGITUDE** -70.918140
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-3.5' bgs. | 0.5 ft Asphalt 9.5<br>Tan, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)**<br>3.0 ft 7.0<br>3.5 ft Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 6.5<br>End of boring at 3.5 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER G0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/21/2024 **DATE COMPLETED** 06/21/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623525 **LONGITUDE** -70.916927
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-1' bgs. | Tan, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.5 ft — 8.5<br>Brown, Poorly-Graded Sand with Gravel, Dry, SP, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| | | | 8.5 ft — 1.5<br>Brown, Peat, Moist, PT, **(ORGANICS)** | | | |
| 10 | | | 10.0 ft — 0.0<br>End of boring at 10.0 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER G-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623592 **LONGITUDE** -70.916948
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted as composite and from 0'-1', 1'-2', 4'-5', & 9'-10' bgs. | Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 1.0 ft — 10.0<br>Tan, Poorly-Graded Sand, Dry, SP, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft — 6.0<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | | | |
| | | | 6.5 ft — 4.5<br>Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick Fragments, Dry, SP-SM, **(FILL)** | DP S-2 | 100 | |
| 10 | | | 10.0 ft — 1.0<br>End of boring at 10.0 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER G-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/03/2024 **DATE COMPLETED** 05/03/2024
**GROUND ELEVATION** 15.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623659 **LONGITUDE** -70.916968
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Boring located inside existing building.<br><br>Analytical samples submitted from 1'-2' & 4'-5' bgs. | 0.5 ft Concrete<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| 10 | | | 9.5 ft 5.5<br>End of boring at 9.5 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER G-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 15.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623726 **LONGITUDE** -70.916989
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Boring located inside existing building.<br><br>Analytical samples submitted from 0'-4' & 4'-8' bgs. | 0.5 ft Concrete 14.5<br>Tan, Silty Sand, Trace Gravel, Dry, SM, **(FILL)**<br>2.5 ft 12.5<br>Brown, Poorly-Graded Sand with Silt, Little Gravel, Dry, SP-SM, **(FILL)**<br>8.0 ft 7.0<br>End of boring at 8.0 feet | DP S-1<br>DP S-2 | 100<br>100 | |

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# BORING NUMBER G-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623860 **LONGITUDE** -70.917030
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | | 0.4 ft Asphalt 10.6<br>Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| | | Rock fragments at 3.5' bgs. | | | | |
| | | | 4.3 ft 6.7<br>Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** | | | |
| 5 | | Analytical samples submitted as composite and from 5'-6' & 9'-10' bgs. | | DP S-2 | 100 | |
| 10 | | | 10.0 ft 1.0<br>End of boring at 10.0 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER G-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623994 **LONGITUDE** -70.917071
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-4' bgs. | 0.4 ft Asphalt 10.6<br>1.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Trace Shell Fragments, Dry, SP-SM **(FILL)** 10.0<br>Tan to Brown, Silty Sand with Gravel, Dry, SM, **(FILL)**<br>4.0 ft 7.0<br>4.5 ft 6.5<br>End of boring at 4.5 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER GG0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623325 **LONGITUDE** -70.918086
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-2' bgs. | 0.8 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 9.2<br>Tan, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 4.0 ft 6.0<br>End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER GG-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623392 **LONGITUDE** -70.918106
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 1'-2' & 4'-5' bgs. | Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | | | |
| | | | 3.0 ft — 8.0<br>Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft — 6.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER GG-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623459 **LONGITUDE** -70.918127
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Trace roots from 0'-1' bgs.<br><br>Analytical samples submitted from 1'-2' & 4'-5' bgs. | Tan, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 4.0 ft – 7.0 | | | Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** | | | |
| 5.0 ft – 6.0 | | | End of boring at 5.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER H0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/29/2023 **DATE COMPLETED** 12/29/2023
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623541 **LONGITUDE** -70.916838
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', & 2'-3' bgs. | Brown, Silty Sand, Trace Brick, Dry, SM, **(FILL)** | DP S-1 | 75 | |
| | | | 4.0 ft — 6.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER H-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623608 **LONGITUDE** -70.916859
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-2' & 4'-5' bgs. | 0.8 ft — Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** — 10.2<br>Tan, Poorly-Graded Sand, Dry, SP, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft — 6.0<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**<br>6.5 ft — 4.5<br>Brown, Poorly-Graded Sand with Silt and Gravel, Trace Brick Fragments, Dry, SP-SM, **(FILL)** | DP S-2 | 100 | |
| 10 | | | 10.0 ft — 1.0<br>End of boring at 10.0 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER H-8.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624109 **LONGITUDE** -70.917013
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as a composite. | 0.5 ft Asphalt 10.5<br>Brown to Tan, Poorly Graded Sand with Silt and Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 4.5 ft 6.5<br>End of boring at 4.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER HH0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623310 **LONGITUDE** -70.918175
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-2' & 4'-5' bgs. | 0.5 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 9.5<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER HH-0.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623523 **LONGITUDE** -70.916833
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-1' bgs. | Brown, Silty Sand, Trace Brick, Dry, SM, **(FILL)** | DP S-1 | 75 | |
| | | | 4.0 ft 6.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER HH-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623377 **LONGITUDE** -70.918195
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as a composite. | Brown, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 1.5 ft — 9.5<br>Tan, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| | | | 4.0 ft — 7.0<br>End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER HH-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/30/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623510 **LONGITUDE** -70.918236
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as a composite. | Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 1.0 ft<br>Tan, Silty Sand, Dry, SM, **(FILL)** 10.0<br>5.0 ft 6.0<br>End of boring at 5.0 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER HH-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/30/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623644 **LONGITUDE** -70.918277
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as a composite. | 0.5 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 10.5<br>Tan, Silty Sand, Dry, SM, **(FILL)**<br>4.0 ft 7.0<br>End of boring at 4.0 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER HH-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623778 **LONGITUDE** -70.918318
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as a composite. | 0.5 ft Asphalt<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 9.5<br>3.0 ft<br>Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 7.0<br>4.0 ft 6.0<br>End of boring at 4.0 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER I0.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623540 **LONGITUDE** -70.916744
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-1' bgs. | Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 1.5 ft — Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** — 8.5 | DP S-1 | 100 | |
| | | | 4.0 ft — 6.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER I-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623623 **LONGITUDE** -70.916770
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as a composite. | Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| | | | 4.0 ft 7.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER I-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/01/2024 **DATE COMPLETED** 05/01/2024
**GROUND ELEVATION** 15.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623757 **LONGITUDE** -70.916811
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Boring located inside existing building. | 0.5 ft Concrete (14.5) | | | |
| | | | Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | Analytical sample submitted as composite and from 4'-8' bgs. | 2.5 ft Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** (12.5) | DP S-1 | 100 | |
| 5 | | | | DP S-2 | 100 | |
| | | | 8.0 ft End of boring at 8.0 feet (7.0) | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER I-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623891 **LONGITUDE** -70.916852
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as composite. | 0.5 ft Asphalt 10.5<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 3.5 ft 7.5<br>Tan to Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | | | |
| | | | 4.3 ft 6.7<br>End of boring at 4.3 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER I-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/02/2024 **DATE COMPLETED** 05/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624024 **LONGITUDE** -70.916893
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as composite. | 0.5 ft Asphalt<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** 10.5<br>3.5 ft 7.5<br>Tan to Gray, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)**<br>4.3 ft 6.7<br>End of boring at 4.3 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER II0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623294 **LONGITUDE** -70.918264
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-2' bgs. | Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 1.5 ft — 9.5 | | | |
| | | | Tan, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 4.0 ft — 7.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER II-0.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623261 **LONGITUDE** -70.918254
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Brick fragments at 0.75' bgs. | 0.8 ft — Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** — 9.2 | | | |
| | | | Tan to Brown, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | Analytical sample submitted as composite and from 1'-2' & 4'-5' bgs. | 6.0 ft — Tan, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** — 4.0 | DP S-2 | 100 | |
| | | | 8.0 ft — 2.0 | | | |
| 10 | | | End of boring at 8.0 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER II-8.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623863 **LONGITUDE** -70.918438
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING 04/29/2024 8.0 ft / Elev 2.0 ft
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as composite and from 5'-6' bgs. | 0.5 ft Asphalt<br>Tan, Silty Sand, Dry, SM, **(FILL)** 9.5<br>2.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** 8.0 | DP S-1 | 100 | |
| 5 | | | 4.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Few Organics, Dry, SP-SM, **(FILL)** 6.0<br>5.5 ft Brown, Peat, Moist, PT, **(ORGANICS)** 4.5<br>6.2 ft Gray to Tan, Poorly-Graded Sand with Silt and Gravel, Moist to Wet, SP-SM 3.8 | DP S-2 | 100 | |
| 10 | | | 11.3 ft -1.3<br>End of boring at 11.3 feet | DP S-3 | 100 | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
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# BORING NUMBER J0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 12/29/2023 **DATE COMPLETED** 12/29/2023
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623572 **LONGITUDE** -70.916660
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1', 1'-2', 2'-3', & 3'-4' bgs. | Brown, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 4.0 ft 6.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
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# BORING NUMBER JJ0



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623279 **LONGITUDE** -70.918353
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 1'-2' bgs. | Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 1.0 ft — Tan, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** — 10.0 | DP S-1 | 100 | |
| | | | 4.0 ft — 7.0 | | | |
| | | | End of boring at 4.0 feet | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
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# BORING NUMBER JJ-0.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/20/2024 **DATE COMPLETED** 06/20/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623242 **LONGITUDE** -70.918341
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Brick fragments at 0.75' bgs. | 0.8 ft — Light Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** — 10.2 | | | |
| | | | Tan to Brown, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | Analytical sample submitted from 1'-2' & 4'-5' bgs. | | | | |
| 5 | | | 6.0 ft — 5.0 | | | |
| | | | Tan, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | DP S-2 | 100 | |
| | | | 7.5 ft — 3.5 | | | |
| | | | End of boring at 7.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
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# BORING NUMBER JJ/II-2



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623421 **LONGITUDE** -70.918349
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as composite. | 0.5 ft Brown, Silty Sand, Trace Roots, Dry, SM, **(TOPSOIL)** 10.5<br>Tan, Silty Sand with Gravel, Dry, SM, **(FILL)**<br>3.5 ft 7.5<br>End of boring at 3.5 feet | DP S-1 | 100 | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
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# BORING NUMBER JJ/II-6



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 04/29/2024 **DATE COMPLETED** 04/29/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623688 **LONGITUDE** -70.918432
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (54 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted as composite. | 0.5 ft Tan, Silty Sand, Trace Roots, Dry, SM, **(FILL)** 10.5<br>Tan, Silty Sand, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | Trace Peat at 4.25'-4.5' bgs. | 4.5 ft 6.5<br>End of boring at 4.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER A0-5W



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623430 **LONGITUDE** -70.917480
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1' bgs. | Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0 | | | |
| | | | Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft – 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B0-5E



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/21/2024 **DATE COMPLETED** 06/21/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623452 **LONGITUDE** -70.917355
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-1' bgs. | 0.8 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 9.2<br>Tan, Silty Sand, Dry, SM, **(FILL)**<br>4.5 ft 5.5<br>End of boring at 4.5 feet | DP S-1 | 100 | |

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# BORING NUMBER B0-5W



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/21/2024 **DATE COMPLETED** 06/21/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623445 **LONGITUDE** -70.917391
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-1' bgs. | 0.8 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 9.2 | DP S-1 | 100 | |
| | | | Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 4.5 ft 5.5 | | | |
| 5 | | | End of boring at 4.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
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# BORING NUMBER B0-5N



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/21/2024 **DATE COMPLETED** 06/21/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623462 **LONGITUDE** -70.917377
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-1' bgs. | 0.8 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 10.2 | DP S-1 | 100 | |
| | | | Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 4.5 ft End of boring at 4.5 feet 6.5 | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B0-5S



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/21/2024 **DATE COMPLETED** 06/21/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623435 **LONGITUDE** -70.917369
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-1' bgs. | Brown, Silty Sand with Gravel, Trace Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 2.0 ft — 8.0 | | | |
| | | | Tan, Silty Sand with Gravel, Trace Glass and Asphalt Debris, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | Sampler refusal at 6' bgs due to brick fragments in sampler tip. | | DP S-2 | 100 | |
| | | | 6.0 ft — 4.0 | | | |
| | | | End of boring at 6.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
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# BORING NUMBER B0-10E



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/21/2024 **DATE COMPLETED** 06/21/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623455 **LONGITUDE** -70.917337
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-1' & 2'-3' bgs. | 0.8 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 9.2 | DP S-1 | 100 | |
| | | | Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 4.5 ft 5.5 | | | |
| 5 | | | End of boring at 4.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
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# BORING NUMBER B0-10W



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/21/2024 **DATE COMPLETED** 06/21/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623442 **LONGITUDE** -70.917408
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-1' & 2'-3' bgs. | 0.5 ft Brown, Silty Sand, Trace Roots, SM, **(TOPSOIL)** 9.5<br>Tan to Brown, Poorly-Graded Sand with Gravel, SP, **(FILL)** | DP S-1 | 100 | |
| 5 | | Sampler refusal at 6.5' bgs due to gravel in sampler tip. | 6.5 ft 3.5<br>End of boring at 6.5 feet | DP S-2 | 100 | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
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# BORING NUMBER B0-10N



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/21/2024 **DATE COMPLETED** 06/21/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623475 **LONGITUDE** -70.917381
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES**
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-1' bgs. | 0.8 ft Brown, Silty Sand, Few Roots, Dry, SM, **(TOPSOIL)** 10.2 | DP S-1 | 100 | |
| | | | Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| | | | 4.5 ft 6.5 | | | |
| 5 | | | End of boring at 4.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
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# BORING NUMBER B0-10S



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/21/2024 **DATE COMPLETED** 06/21/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623424 **LONGITUDE** -70.917365
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | | Brown, Silty Sand with Gravel, Trace Roots, Dry, SM, **(TOPSOIL)** | | | |
| | | | 2.0 ft / 8.0 | | | |
| | | Analytical sample submitted from 0'-1' & 2'-3' bgs. | Tan, Silty Sand with Gravel, Trace Glass/Asphalt Debris, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | Sampler refusal at 6.5' bgs due to brick fragments in sampler tip. | | DP S-2 | 100 | |
| | | | 6.5 ft / 3.5 | | | |
| | | | End of boring at 6.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
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# BORING NUMBER B0-15E



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623458 **LONGITUDE** -70.917319
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1' bgs. | Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0 | | | |
| | | | Tan to Brown, Poorly-Graded Sand with Silt, Trace Brick, Dry to Moist, SP-SM, **(FILL)** 5.0 ft – 5.0 | DP S-1 | 60 | |
| 5 | | | End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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Raynham, MA 02767

# BORING NUMBER B0-15W



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623439 **LONGITUDE** -70.917426
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1' bgs. | Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft 9.0 | | | |
| | | | Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** | DP S-1 | 80 | |
| 5 | | | 5.0 ft 5.0 End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B0-20E



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623461 **LONGITUDE** -70.917301
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1' bgs. | Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0 | | | |
| | | | Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** | DP S-1 | 60 | |
| 5 | | | 5.0 ft – 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B0-20W



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623436 **LONGITUDE** -70.917444
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-1' bgs. | Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0 | | | |
| | | | Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 80 | |
| 5 | | | 5.0 ft – 5.0 | | | |
| | | | End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B0-10S15E



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623434 **LONGITUDE** -70.917312
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1' & 2'-3' bgs. | Dark Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0 | DP S-1 | 80 | |
| | | | Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** | | | |
| 5 | | | 5.0 ft – 5.0 | | | |
| | | | End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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Raynham, MA 02767

# BORING NUMBER B0-10S15W



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623414 **LONGITUDE** -70.917419
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1' and 2'-3' bgs. | Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft – 9.0 | | | |
| | | | Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 5.0 ft – 5.0 | DP S-1 | 60 | |
| 5 | | | End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B0-10N15E



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623485 **LONGITUDE** -70.917328
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1' and 2'-3' bgs. | Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft | | | |
| | | | Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** 10.0 | DP S-1 | 80 | |
| 5 | | | 5.0 ft 6.0 End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER B0-10N15W



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623466 **LONGITUDE** -70.917434
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Property 1 (18 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical samples submitted from 0'-1' & 2'-3' bgs. | Brown, Poorly-Graded Sand with Silt, Trace Roots, Dry, SP-SM, **(TOPSOIL)** 1.0 ft | | | |
| | | | Tan to Brown, Poorly-Graded Sand with Silt, Trace Brick, Dry, SP-SM, **(FILL)** 10.0 | DP S-1 | 80 | |
| 5 | | | 5.0 ft 6.0 End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# Rock Types

| Rock Name | Characteristics | Symbol |
|---|---|---|
| Claystone | Clay sized particles that are consolidated, lacking fissility. | |
| Coal | Black and shiny, can break into cubes or conchoidally. | |
| Conglomerate | Gravel sized grains and larger held together by finer material, called a breccia if clasts are angular. | |
| Limestone | Effervesses w/ diluted HCl, can be composed of clay up to gravel particles (fossils). | |
| Sandstone | Primarily sand sized particles modified w/ the descriptor fine, medium, or coarse. | |
| Shale | Clay sized particles, shale has fissility which is a horizontal sheet-like or laminated feature. | |
| Siltstone | Composed of silt, normally breaks as irregular chunks. | |

# Rock Quality Descriptions

## Weathering

**Completely Weathered:** All rock material is decomposed and/or disintegrated. The original rock structure may still be intact.

**Highly Weathered:** More than half of the rock material is decomposed. Fresh rock is present only as a discontinuous framework or as corestones.

**Moderately Weathered:** Less than half of the rock material is decomposed. Fresh rock is present at a discontinuous framework or as corestones.

**Slightly Weathered:** Discoloration or staining indicates weathering of rock material on discontinuity surfaces. Rock may be discolored and softened.

**Fresh:** No visible signs of rock material weathering.

## RQD

| Descriptor | % |
|---|---|
| Very Poor | <25 |
| Poor | 25-50 |
| Fair | 50-75 |
| Good | 75-90 |
| Excellent | >90 |

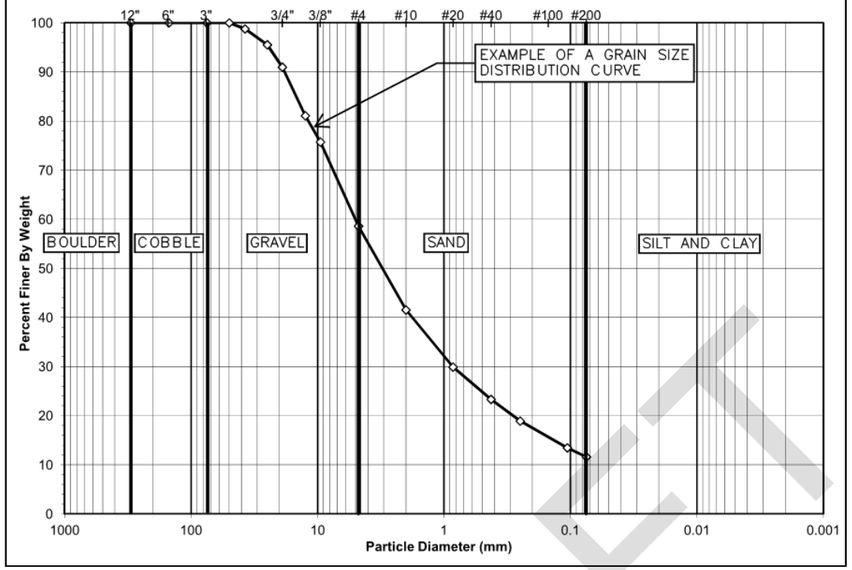
## Brokenness

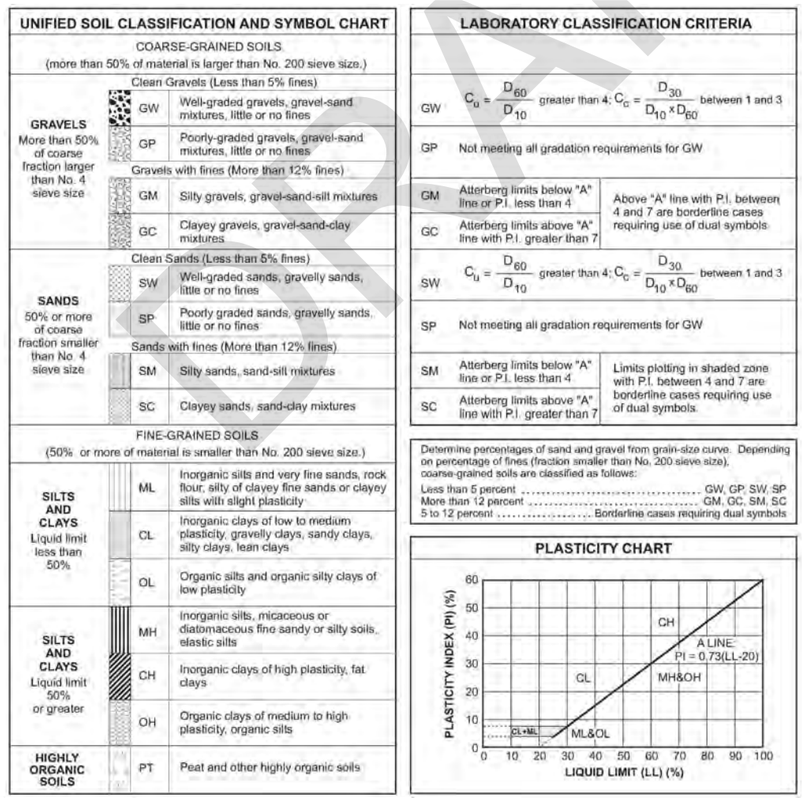
| Descriptor | Fracture Spacing (in & ft) |
|---|---|
| Very Broken | <1 (<0.08) |
| Broken | 1-3 (0.08-0.25) |
| Moderately Broken | 3-6 (0.25-0.5) |
| Slightly Broken | >6 (>0.5) |

## Rock Hardness

| Descriptor | Field Criterion | Relative Unconfined Compressive Strength |
|---|---|---|
| Very Hard | Difficult to break w/ Hammer | > 30,000 psi |
| Hard | Hand-held sample breaks w/ Hammer | 8,000 to 30,000 psi |
| Medium Hard | Cannot scrape surface w/ knife | 2,000 to 8,000 psi |
| Soft | Cutting or scraping w/ knife difficult | 500 to 2,000 psi |
| Very Soft | Can be cut w/ knife | < 500 psi |

# Grain Size Distribution Curve




# Glossary

**Alluvial Soil or Alluvium:** Soil deposited by water in a river, stream, floodplain, or delta.

**Bedrock:** Materials underlying soil or other unconsolidated surficial materials in which refusal is consistently encountered on lithified, undisturbed, natural bedrock.

**Colluvial Soil or Colluvium:** Incoherent soil on or at the base of a slope deposited by gravity or slope movement.

**Fill:** Soil derived from natural soil, rock, or processed materials that was placed by artificial methods, such as construction, waste disposal, or dumping.

**Glacial Outwash:** Soil, typically sand and gravel, deposited by glacial streams or meltwater in a preexisting valley or over a plain.

**Glacial Till:** Soil deposited by and underneath a glacier, generally consisting of a heterogeneous, unstratified mixture of clay, sand, gravel, and boulders.

**N-Value:** The blow count representation of the penetration resistance of the soil determined by the Standard Penetration Test (SPT). It is the sum of the number of blows required to drive the sampler the second and third 6-inch increments (sample depth interval of 6 to 18 inches) and is recorded in blows per foot (bpf). The N-value is considered to be an indication of the relative density of coarse-grained soils (sand and gravel) or consistency of fine-grained soils (silt and clay).

**Pocket Pen (PP):** Field penetration test performed using a hand-held penetrometer that estimates unconfined compressive strength of cohesive soil in tons per square foot (tsf).

**Recovery %:** Total length of rock core or soil sample retrieved divided by the total length of the core run or sample interval, expressed as a percentage.

**Refusal:** The depth at which greater than 50 SPT hammer blows are required to drive the sampling spoon 6 inches or less.

**Residual Soil or Residuum:** Soil derived from the physical or chemical weathering of the underlying parent bedrock, generally with N-values less than 30 and 50 bpf in cohesive and cohesionless materials, respectively.

**Rock Quality Designation (RQD):** The sum of the length of intact rock core pieces longer than 4 inches (excluding mechanical breaks) divided by the total length of the core run, expressed as a percentage.

**Shelby Tube:** A 2" to 3" diameter, thin walled sampling tube that is pushed into the soil to obtain a relatively undisturbed soil sample for geotechnical laboratory tests.

**Split Spoon Sampler:** A soil sampling tube which is driven, retrieved, and split-open lengthwise for removal and visual inspection, and testing of the soil obtained.

**Standard Penetration Test (SPT) ASTM D1586 :** Field penetration test consisting of driving a 2-inch outside diameter split-spoon sampler 18 inches using a 140-pound hammer free falling a distance of 30 inches. The number of blows required to advance the spoon through successive 6-inch increments is recorded to determine the N-value.

**Weathered Rock:** Materials derived from lithified, undisturbed, natural bedrock which are able to be sampled with a split-spoon. Cohesive and cohesionless materials generally have N-values greater than 30 and 50 bpf, respectively.

# N-Value Rating

**Fine-Grained Soils (Silt and Clay)**

| Consistency | Blows/ft | PP (tsf) |
|---|---|---|
| Very Soft | 0-2 | <0.25 |
| Soft | 3-4 | 0.25-0.5 |
| Medium Stiff | 5-8 | 0.5-1 |
| Stiff | 9-15 | 1-2 |
| Very Stiff | 16-32 | 2-4 |
| Hard | >32 | >4 |

**Coarse-Grained Soils (Sand and Gravel)**

| Relative Density | Blows/ft |
|---|---|
| Very Loose | 0-4 |
| Loose | 5-10 |
| Medium Dense | 11-30 |
| Dense | 31-50 |
| Very Dense | >50 |

# Unconsolidated Material

| Term | Grain Size in mm (in) | Approximate Example Size |
|---|---|---|
| Clay and Silt | <.075 | can't see grains to barely visible |
| Fine Sand | 0.075-0.4 | table salt to sugar |
| Med. Sand | 0.4-2.0 (~<1/16) | openings in a window screen |
| Coarse Sand | 2.0-4.75 (~1/16-1/8) | sidewalk salt |
| Gravel | 4.75-75 (~1/8-3) | pea to tennis ball |
| Cobble | 75-300 (3-12) | tennis ball to basketball |
| Boulder | >300 (>12) | larger than a basketball |

**Other Features** – Used to describe other identifiable, pertinent features (e.g., angularity of coarse-grained soils, organics, construction debris, etc.)

| Term | % |
|---|---|
| Trace | < 5 |
| Few | 5-15 |
| Some | 15-45 |

**Moisture Content**

Dry: Sample is dusty or obviously dry.
Moist: Anything that does not fit the definition of dry or wet.
Wet: Sample contains free water.

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Definitions of Standard Terms and Symbols

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Raynham, MA 02767

# BORING NUMBER CEC-2-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/13/2023 **DATE COMPLETED** 11/13/2023
**GROUND ELEVATION** 8.90 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.622983 **LONGITUDE** -70.919441
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/13/2023 8.0 ft / Elev 0.9 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Site 2 (350 S. Front St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Analytical sample submitted from 0'-6' bgs. | 0.2 ft 3" Asphalt<br>Brown, SILTY SAND WITH GRAVEL, Trace Glass, Asphalt Debris, Dry, Medium Dense, SM, **(FILL)** | 8.6 | SS S-1 | 65 | 14-5-5-7 (10) | | 0.8 |
| | | 2.5 ft Gray, Buried Concrete | 6.4 | | | | | |
| | | 3.0 ft / 3.2 ft Black, Buried Asphalt<br>Brown, Silty Sand with Gravel, Trace Glass, Brick, Asphalt Debris, Dry To Moist, Loose To Medium Dense, SM, **(FILL)** | 5.9 / 5.6 | SS S-2 | 90 | 33-32-27-15 (59) | | 0.5 |
| 5 | | | | SS S-3 | 50 | 10-6-4-3 (10) | | 0.3 |
| | | 7.0 ft<br>Dark Brown, Silty Sand, Trace Roots, Moist, Loose, SM, **(FILL)** | 1.9 | SS S-4 | 60 | 3-3-4-6 (7) | | 0.5 |
| | | 8.0 ft ▽<br>Dark Brown, Silty Sand with Gravel, Wet, Medium Dense, SM, **(OUTWASH)** | 0.9 | SS S-5 | 55 | 1-3-7-9 (10) | | 0.3 |
| 10 | | 10.0 ft<br>Light Brown, Silty Gravel with Sand, Wet, Dense, GM, **(TILL)** | -1.1 | SS S-6 | 60 | 9-17-19-20 (36) | | 0.3 |
| | | 12.0 ft<br>Brown, Silty Sand with Gravel, Wet, Dense, SM, **(TILL)** | -3.1 | SS S-7 | -- | 18-21-28-50 (49) | | 0.4 |
| | | 14.0 ft<br>End of boring at 14.0 feet | -5.1 | | | | | |
| 15 | | | | | | | | |
| 20 | | | -11 | | | | | |
| 25 | | | | | | | | |
| 30 | | | -21 | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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Raynham, MA 02767

# BORING NUMBER CEC-3-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/10/2023 **DATE COMPLETED** 11/10/2023
**GROUND ELEVATION** 8.30 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.622826 **LONGITUDE** -70.919178
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/10/2023 6.0 ft / Elev 2.3 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Site 2 (350 S. Front St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Analytical sample submitted from 0'-4' bgs. | 0.2 ft 3" Asphalt<br>Brown, Silty Sand with Gravel, Trace Brick, Dry to Moist, Loose to Dense, SM, **(FILL)** | 8.0 | SS S-1 | 55 | 9-7-4-1 (11) | | 0.2 |
| | | | | SS S-2 | 60 | 2-2-4-13 (6) | | 0.1 |
| 5 | | 6.0 ft ▽<br>Tan to Brown, Silty Gravel with Sand, Wet, Very Dense, GM, **(TILL)** | 2.3 | SS S-3 | 100 | 16-28-21-23 (49) | | 0.3 |
| | | | | SS S-4 | 60 | 22-24-28-19 (52) | | 0.3 |
| | | 8.0 ft<br>Brown, Silty Sand with Gravel, Wet, Dense, SM, **(TILL)** | 0.3 | SS S-5 | 75 | 19-22-21-37 (43) | | 0.3 |
| 10 | Augers grinding from 10-12' bgs. | 10.0 ft<br>Brown, Silty Sand with Gravel, Wet, Medium Dense to Dense, SM, **(TILL)** | -1.7 | SS S-6 | 50 | 3-5-17-17 (22) | | 0.1 |
| | | | | SS S-7 | 75 | 22-18-19-34 (37) | | 0.2 |
| | | 14.0 ft<br>End of boring at 14.0 feet | -5.7 | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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Raynham, MA 02767

# BORING NUMBER CEC-4-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/10/2023 **DATE COMPLETED** 11/10/2023
**GROUND ELEVATION** 6.70 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.622690 **LONGITUDE** -70.919692
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/10/2023 6.0 ft / Elev 0.7 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Site 2 (350 S. Front St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Analytical sample submitted from 0'-4' bgs. | Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Trace to Few Brick/ Asphalt/Misc. Debris, Dry, Medium Dense, SM, **(FILL)** | | SS S-1 | 58 | 19-11-12-14 (23) | | 0.1 |
| 2.0 ft | | 4.7 | | | | | | |
| | | Gray to Brown, Silty Sand with Gravel, Trace to Few Bricks/Asphalt/Misc. Debris, Dry to Moist, Medium Dense, SM, **(FILL)** | | SS S-2 | 100 | 8-11-12-13 (23) | | 0.2 |
| 5 | | | | SS S-3 | 100 | 9-12-8-13 (20) | | 0.3 |
| 6.0 ft ▽ | | 0.7 | | | | | | |
| | | Brown to Gray, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(TILL)** | | SS S-4 | 100 | 8-12-17-19 (29) | | 0.3 |
| | | | -3 | SS S-5 | 42 | 5-11-18-30 (29) | | 0.1 |
| 10 | Split spoon refusal at 10.5' bgs | | | | | | | |
| 10.5 ft | | -3.8 | | SS S-6 | 100 | 15-50/0' | | 0.1 |
| | | End of boring at 10.5 feet | | | | | | |
| 15 | | | -13 | | | | | |
| 20 | | | | | | | | |
| 25 | | | -23 | | | | | |
| 30 | | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-5-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/10/2023 **DATE COMPLETED** 11/10/2023
**GROUND ELEVATION** 8.20 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.622868 **LONGITUDE** -70.919452
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/10/2023 6.0 ft / Elev 2.2 ft
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
AT END OF CORING N/A
**NOTES** Site 2 (350 S. Front St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | Analytical sample submitted from 0'-4' bgs. | Brown, SILTY SAND WITH GRAVEL, Trace Debris, Dry, Medium Dense, SM, **(FILL)** | | SS S-1 | 75 | 21-14-14-9 (28) | | 0.5 |
| 2.0 ft | | Dark Brown, Silty Sand with Gravel, Trace Debris, Dry, Medium Dense, SM, **(FILL)** | 6.2 | SS S-2 | 55 | 6-6-5-10 (11) | | 0.2 |
| 4.0 ft | Split spoon refusal on possible slab or boulder at 4' bgs. Augered through obstruction to 6' bgs. | No Recovery | 4.2 | SS S-3 | -- | 50 | | |
| 5 | | | | | | | | |
| 6.0 ft ▽ | | Gray to Brown, Silty Sand with Gravel, Wet, Medium Dense to Dense, SM, **(TILL)** | 2.2 | SS S-4 | 75 | 17-15-15-12 (30) | | 0.2 |
| | | | -1 | SS S-5 | 100 | 6-10-15-12 (25) | | 0.2 |
| 10 | | | | SS S-6 | 50 | 8-17-17-17 (34) | | 0.2 |
| 13.5 ft | Split spoon refusal (spoon bouncing) at 13.5' bgs. | End of boring at 13.5 feet | -5.3 | SS S-7 | 55 | 22-25-16 (41) | | 0.1 |
| 15 | | | | | | | | |
| | | | -11 | | | | | |
| 20 | | | | | | | | |
| 25 | | | | | | | | |
| | | | -21 | | | | | |
| 30 | | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-6-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/19/2024 **DATE COMPLETED** 09/19/2024
**GROUND ELEVATION** 8.50 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Soil Exploration
**LATITUDE** Not obtained - radio tower interference **LONGITUDE**
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 8.5 ft / Elev 0.0 ft
AT END OF CORING 8.5 ft / Elev 0.0 ft
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Site 2 (350 S. Front St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0-4' & 5-7' bgs. | 0.2 ft 3" Asphalt 8.2<br>Brown, Silty Sand with Gravel, Trace Brick, Cinders, Dry, Medium Dense, SM, **(FILL)** | | SS S-1 | 70 | 8-8-6-5 (14) | |
| | | | | | SS S-2 | 50 | 3-3-5-8 (8) | |
| 5 | | | 5.5 ft 3.0<br>Tan and Gray, Silty Sand with Gravel, Moist to Wet, Medium Dense, SM, **(TILL)** | | SS S-3 | 83 | 17-18-17-17 (35) | |
| | | | 9.0 ft -0.5 | | SS S-4 | 88 | 16-14-20-19 (34) | |
| 10 | | | End of boring at 9.0 feet | -1 | | | | |
| 15 | | | | -11 | | | | |
| 20 | | | | | | | | |
| 25 | | | | -21 | | | | |
| 30 | | | | | | | | |

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# BORING NUMBER CEC-7-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/19/2024 **DATE COMPLETED** 09/19/2024
**GROUND ELEVATION** 9.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Soil X Corp
**LATITUDE** 41.622973 **LONGITUDE** -70.919285
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** D Barboza **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Site 2 (350 S. Front St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-4' bgs. | 0.2 ft Asphalt 8.8<br>Brown, Silty Sand with Gravel, Trace Brick, Cinder, Shells, Dry, SM, **(FILL)** | DP S-1 | 100 | |
| | | | 4.0 ft 5.0<br>Light Brown, Silty Sand with Gravel, Moist, SM, **(FILL)** | | | |
| 5 | | | 6.5 ft 2.5<br>Tan to Gray, Silty Sand with Gravel, Moist, SM, **(FILL)** | DP S-2 | 100 | |
| | | | 8.5 ft 0.5<br>End of boring at 8.5 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER CEC-8-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/23/2024 **DATE COMPLETED** 09/23/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Soil Exploration
**LATITUDE** Not obtained - radio tower interference **LONGITUDE**
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING 09/23/2024 7.5 ft / Elev 3.5 ft
**CEC REP** Tony Sousa **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Site 2 (350 S. Front St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 2-4', 7-8', & 12-14.5'. | 0.5 ft (10.5) 6" Concrete Slab<br>Light Brown, Poorly-Graded Sand with Silt and Gravel, Dry, SP-SM, **(FILL)** | | | 0.1 |
| | | | 2.0 ft (9.0) Dark Brown to Black, Silty Sand with Gravel, Trace Cinders, Concrete, Dry to Wet, SM, **(FILL)** | DP S-1 | 50 | 0.0 |
| 5 | | Strong gasoline odor from 7 to 14.5' bgs. | ▽ | DP S-2 | 68 | 0.0<br>0.0<br>0.9<br>134.6<br>127.8 |
| 10 | | Increased drilling difficulty at 10' bgs. | 10.0 ft (1.0) Gray, Silty Sand, Wet, SM, **(OUTWASH)**<br>11.0 ft (0.0) Gray, Silty Sand with Gravel, Wet, SM, **(TILL)** | DP S-3 | 95 | 211.8<br>22.6<br>46.1 |
| | | Probe refusal at 14.5' bgs. | 12.0 ft (-1.0) Gray, Poorly-Graded Sand with Silt and Gravel, Wet, SP-SM, **(TILL)** | DP S-4 | 100 | 100.7<br>97.9 |
| 15 | | | 14.5 ft (-3.5) End of boring at 14.5 feet | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER CEC-1-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/13/2023 **DATE COMPLETED** 11/13/2023
**GROUND ELEVATION** 8.10 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.622418 **LONGITUDE** -70.919612
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/13/2023 8.0 ft / Elev 0.1 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-4' bgs. | 0.2 ft 3" Asphalt | 7.8 | | | | | |
| | | | Brown, POORLY GRADED GRAVEL WITH SILT AND SAND, Dry, Medium Dense, GP-GM, **(FILL)** | | SS S-1 | 95 | 20-12-12-10 (24) | | 0.2 |
| | | | 2.0 ft Brown to Black, Silty Sand with Gravel, Trace Brick, Dry, Medium Dense, SM, **(FILL)** | 6.1 | SS S-2 | 90 | 10-7-4-5 (11) | | 0.4 |
| | | | 4.0 ft Dark Brown, SILTY SAND WITH GRAVEL, Trace Brick, Dry, Loose, SM, **(FILL)** | 4.1 | SS S-3 | 75 | 4-3-6-16 (9) | | 0.3 |
| 5 | | | 6.0 ft Gray, Silty Sand with Gravel, Moist, Very Dense, SM, **(TILL)** | 2.1 | SS S-4 | 75 | 26-30-27-37 (57) | | 0.2 |
| | | | 9.0 ft Light Brown, Silty Gravel with Sand, Wet, | -0.9 | SS S-5 | 55 | 16-28-36-30 (64) | | 0.1 |
| 10 | | | 10.0 ft Very Dense, GM, **(TILL)** | -1.9 | | | | | |
| | | | End of boring at 10.0 feet | | | | | | |
| 15 | | | | -11 | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | -21 | | | | | |
| 30 | | | | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-2-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/13/2023 **DATE COMPLETED** 11/13/2023
**GROUND ELEVATION** 8.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.622632 **LONGITUDE** -70.919198
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING 11/13/2023 8.0 ft / Elev 0.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 8 | Analytical sample submitted from 0'-4' bgs. | Brown, Silty Sand with Gravel, Trace Asphalt/Brick/Concrete Debris, Dry, Medium Dense to Dense, SM, **(FILL)** | SS S-1 | 55 | 16-15-14-12 (29) | | 1.3 |
| | | | | SS S-2 | 70 | 20-26-16-9 (42) | | 0.4 |
| 5 | | | | SS S-3 | 55 | 7-10-7-6 (17) | | 0.4 |
| | | | 7.0 ft / 1.0 — Dark Brown, Silty Sand with Gravel, Trace Roots, Moist, Loose, SM, **(FILL)** | SS S-4 | 65 | 8-4-3-3 (7) | | 0.8 |
| | | | 8.0 ft / 0.0 — Dark Brown, Slightly Organic Silty Sand with Gravel, Trace Roots, Wet, Very Loose, SM, Organic Content 1.7%, **(OUTWASH)** | SS S-5 | 50 | 1-1-1-1 (2) | | 0.5 |
| 10 | -2 | | 10.0 ft / -2.0 — Dark Brown, Silty Sand with Gravel, Wet, Medium Dense, SM, **(OUTWASH)** | SS S-6 | 55 | 4-5-7-5 (12) | | 0.6 |
| | | | 12.0 ft / -4.0 — Light Brown, Silty Gravel with Sand, Wet, Dense to Very Dense, GM, **(TILL)** | SS S-7 | 65 | 10-18-13-27 (31) | | 1.2 |
| | | Split spoon refusal at 15' bgs | 14.0 ft / -6.0 | | | | | |
| 15 | | | 15.0 ft / -7.0 — End of boring at 15.0 feet | SS S-8 | 100 | 18-50 | | 1.2 |
| 20 | -12 | | | | | | | |
| 25 | | | | | | | | |
| 30 | -22 | | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-5-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/13/2023 **DATE COMPLETED** 11/13/2023
**GROUND ELEVATION** 9.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.621744 **LONGITUDE** -70.919514
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING: Not Encountered; AT END OF CORING: N/A; 24 HRS AFTER DRILLING: N/A
**CEC REP** D Barboza **CHECKED BY** T. Sousa, P.E.
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) |
|---|---|---|---|---|---|---|---|---|
| 0 | 9 | Analytical sample submitted from 0'-4' bgs. | Dark Brown, Silty Sand with Gravel, Trace Brick, Trace Roots, Dry, Medium Dense to Dense, SM, **(FILL)** | SS S-1 | 75 | 5-10-11-8 (21) | | 0.5 |
| | | | | SS S-2 | 85 | 7-16-32-35 (48) | | 0.4 |
| | | | 4.0 ft / 5.0 | | | | | |
| 5 | | Split spoon refusal at 5.75' bgs | Light Brown, Silty Sand with Gravel, Dry, Very Dense, SM, **(TILL)** | SS S-3 | 91 | 22-33-40-50 /0.3' (73) | | 0.2 |
| | 3.2 | | 5.8 ft / End of boring at 5.8 feet | | | | | |
| 10 | -1 | | | | | | | |
| 15 | | | | | | | | |
| 20 | -11 | | | | | | | |
| 25 | | | | | | | | |
| 30 | -21 | | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-6-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/13/2023 **DATE COMPLETED** 11/13/2023
**GROUND ELEVATION** 9.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.622043 **LONGITUDE** -70.919576
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger + SPT
**WATER LEVELS** AT END OF SOIL SAMPLING: Not Encountered; AT END OF CORING: N/A; 24 HRS AFTER DRILLING: N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | PID (PPM) |
|---|---|---|---|---|---|---|---|
| 0 | Analytical sample submitted from depths 0'-4' bgs. | 0.2 ft 3" Asphalt<br>Brown, SILTY SAND WITH GRAVEL, Trace Brick, Glass, Dry, Medium Dense, SM, **(FILL)** | 8.8 | SS S-1 | 55 | 18-14-11-10 (25) | 0.1 |
| | | 3.0 ft<br>Dark Brown, Silty Sand, Dry, Medium Dense To Very Dense, SM, **(FILL)** | 6.0 | SS S-2 | 80 | 13-12-13-25 (25) | 0.4 |
| 5 | | | | SS S-3 | 75 | 5-19-27-25 (46) | 0.2 |
| | | | | SS S-4 | 80 | 28-24-35-25 (59) | 0.6 |
| | Split spoon refusal at 9.8' bgs. | 8.0 ft<br>Light Brown, Silty Sand with Gravel, Moist, Dense, SM, **(TILL)** | 1.0 | SS S-5 | 83 | 9-14-17-50/0.3' (31) | 0.5 |
| 10 | | 9.8 ft<br>End of boring at 9.8 feet | -0.8 | | | | |
| 15 | | | -1 | | | | |
| 20 | | | -11 | | | | |
| 25 | | | | | | | |
| 30 | | | -21 | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-7-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/19/2024 **DATE COMPLETED** 09/19/2024
**GROUND ELEVATION** 9.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Soil Exploration
**LATITUDE** Not obtained - radio tower interference **LONGITUDE**
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** D Barboza **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-4' & 5-10' bgs. | Dark Brown to Black, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 40 | |
| 5 | | | 5.0 ft 4.0 Tan, Silty Sand with Gravel, Dry, SM, **(TILL)** | DP S-2 | 60 | |
| 10 | | | 10.0 ft -1.0 End of boring at 10.0 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER CEC-8-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/19/2024 **DATE COMPLETED** 09/19/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Soil Exploration
**LATITUDE** Not obtained - radio tower interference **LONGITUDE**
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 7.0 ft / Elev 3.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** D Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | Analytical sample submitted from 0'-4' bgs. | 0.2 ft 3" Asphalt<br>Dark Gray, Silty Sand with Gravel, Trace Brick, Cinders, Dry, Medium Dense to Dense, SM, **(FILL)** | 9.8 | SS S-1 | 62 | 8-8-8-14 (16) |
| | | | | SS S-2 | 75 | 24-24-14-9 (38) |
| 5 | | 5.0 ft Tan, Silty Sand with Gravel, Dry, Medium Dense, SM, **(OUTWASH)** | 5.0 | SS S-3 | 100 | 16-14-11-8 (25) |
| | | 7.0 ft Tan, Silty Sand, Wet, Dense, SM, **(OUTWASH)** | 3.0 | | | |
| | | 8.0 ft Gray to Tan, Silty Sand with Gravel, Wet, Dense, SM, **(TILL)** | 2.0 | SS S-4 | 100 | 8-11-22-26 (33) |
| 10 | | 9.0 ft End of boring at 9.0 feet | 1.0 | | | |
| 15 | | | 0 | | | |
| 20 | | | -10 | | | |
| 25 | | | -20 | | | |
| 30 | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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Raynham, MA 02767

# BORING NUMBER CEC-9-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/19/2024 **DATE COMPLETED** 09/19/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Soil Exploration
**LATITUDE** Not obtained - radio tower interference **LONGITUDE**
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** D Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | | Brown, Silty Sand with Gravel, Dry, SM, **(TOPSOIL)** | | | |
| | | Analytical sample submitted from 2'-6' & 6'-8' bgs. | 2.0 ft — 8.0<br>Dark Brown to Black, Silty Sand with Gravel, Dry, SM, **(FILL)** | DP S-1 | 80 | |
| 5 | | | 6.0 ft — 4.0<br>Tan to Brown, Silty Sand with Gravel, Dry, SM, **(TILL)** | DP S-2 | 100 | |
| | | Sampler refusal at 8' bgs. | 8.0 ft — 2.0<br>End of boring at 8.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER CEC-10-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/19/2024 **DATE COMPLETED** 09/19/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Soil Exploration
**LATITUDE** Not obtained - radio tower interference **LONGITUDE**
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** D Barboza **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Analytical sample submitted from 0'-5' bgs. | Dark Gray, Silty Sand with Gravel/Debris, Dry, SM, **(FILL)** | | | |
| | | | 3.0 ft — 7.0 | DP S-1 | 85 | |
| | | | Tan, Silty Sand, Dry, SM, **(FILL)** | | | |
| 5 | | | 5.0 ft — 5.0 | | | |
| | | | Gray to Tan, Silty Sand with Gravel, Trace Brick, Dry, SM, **(FILL)** | | | |
| | | | 7.0 ft — 3.0 | | | |
| | | | Tan, Silty Sand with Gravel, Dry, SM, **(TILL)** | DP S-2 | 75 | |
| 10 | | | 10.0 ft — 0.0 | | | |
| | | | End of boring at 10.0 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER CEC-11-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/18/2024 **DATE COMPLETED** 09/18/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Soil X Corp.
**LATITUDE** Not obtained - radio tower interference **LONGITUDE**
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger
**WATER LEVELS** AT END OF SOIL SAMPLING N/A; AT END OF CORING N/A; 24 HRS AFTER DRILLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)

| DEPTH (ft) | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|
| 0 | Gray, 5-1/4" Concrete Slab (0.5 ft) | 10 | | | |
| | Brown, SILTY SAND, Dry, Very Dense to Medium Dense, SM, **(FILL)** | | SS S-1 | 95 | 30-46-42-17 (88) |
| | | | SS S-2 | 60 | 14-14-11-10 (25) |
| 5 | (5.0 ft) | 5.0 | | | |
| | Tan, Poorly-Graded Sand with Silt, Dry, Dense to Very Dense, SP-SM, **(OUTWASH)** | | SS S-3 | 75 | 13-15-15-19 (30) |
| | (8.0 ft) | 2.0 | SS S-4 | 75 | 17-25-27-25 (52) |
| | Brownish Tan, Silty Sand with Gravel, Moist, Very Dense, SM, **(TILL)** (9.0 ft) | 1.0 | | | |
| | End of boring at 9.0 feet | | | | |
| 10 | | 0 | | | |
| 15 | | | | | |
| 20 | | -10 | | | |
| 25 | | | | | |
| 30 | | -20 | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-12-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/18/2024 **DATE COMPLETED** 09/18/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Soil X Corp.
**LATITUDE** Not obtained - radio tower interference **LONGITUDE**
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger
**WATER LEVELS** AT END OF SOIL SAMPLING N/A; AT END OF CORING N/A; 24 HRS AFTER DRILLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)

| DEPTH (ft) | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|
| 0 | Gray, 6-5/8" Concrete Slab | 10 | | | |
| 0.6 ft | Tan to Brown, SILTY SAND WITH GRAVEL, Dry, Medium Dense, SM, **(FILL)** | 9.4 | SS S-1 | 66 | 8-10-9-5 (19) |
| 2.6 ft | Brown to Black, Silty Sand with Gravel, Trace Cinders, Dry, Dense, SM, **(FILL)** | 7.4 | SS S-2 | 80 | 9-14-16-7 (30) |
| 5 | | | | | |
| 5.0 ft | Orange, Silty Sand, Dry, Very Dense, SM, **(OUTWASH)** | 5.0 | | | |
| 6.0 ft | Tan to Gray, Silty Sand with Gravel, Dry, Very Dense, SM, **(TILL)** | 4.0 | SS S-3 | 83 | 20-22-30-28 (52) |
| | | | SS S-4 | 60 | 50-43-38-22 (81) |
| 9.0 ft | End of boring at 9.0 feet | 1.0 | | | |
| 10 | | 0 | | | |
| 15 | | | | | |
| 20 | | -10 | | | |
| 25 | | | | | |
| 30 | | -20 | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-13-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/18/2024 **DATE COMPLETED** 09/18/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Soil X Corp.
**LATITUDE** Not obtained - radio tower interference **LONGITUDE**
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger
**WATER LEVELS** AT END OF SOIL SAMPLING N/A; AT END OF CORING N/A; 24 HRS AFTER DRILLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | POCKET PEN. (tsf) | PID (PPM) | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 0 | 10 | 0.6 ft: Gray, 5-3/4" Concrete Slab | | | | | | |
| | | 0.6 ft – 9.4: Tan to Brown, SILTY SAND, Dry, Medium Dense, SM, **(FILL)** | SS S-1 | 80 | 11-9-9-6 (18) | | | |
| | | 2.6 ft – 7.4: Brown to Black, Silty Sand with Gravel, Trace Ash, Cinders, Dry, Medium Dense, SM, **(FILL)** | SS S-2 | 60 | 7-7-13-10 (20) | | | |
| 5 | | 5.0 ft – 5.0: Black, Silty Sand with Gravel, Dry, Loose, SM, **(FILL)** | SS S-3 | 50 | 8-3-2-2 (5) | | | |
| | | 7.5 ft – 2.5: Tan, Silty Sand with Gravel, Dry, Medium Dense to Very Dense, SM, **(TILL)** | SS S-4 | 60 | 1-10-12-16 (22) | | | |
| 10 | 0 | 9.2 ft – 0.8: End of boring at 9.2 feet | SS S-5 | 80 | 50/0.3' | | | Split Spoon Refusal at 9.2 ft bgs. |
| 15 | -5 | | | | | | | |
| 20 | -10 | | | | | | | |
| 25 | -15 | | | | | | | |
| 30 | -20 | | | | | | | |

SPT N VALUE: 20 40 60 80
PL MC LL: 20 40 60 80
FINES CONTENT (%): 20 40 60 80

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# BORING NUMBER CEC-14-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/18/2024 **DATE COMPLETED** 09/18/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Soil X Corp.
**LATITUDE** Not obtained - radio tower interference **LONGITUDE**
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger
**WATER LEVELS** AT END OF SOIL SAMPLING 9.0 ft / Elev 1.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | Analytical sample submitted from 0.6'-4.6' bgs. | 0.4 ft: Gray, 4-1/2" Concrete Slab | 9.6 | | | |
| | | Dark Brown, SILTY SAND, Dry, Dense, SM, **(FILL)** | | SS S-1 | 75 | 25-15-18-21 (33) |
| | | 2.6 ft: Black, Silty Sand with Gravel, Trace Ash, Dry, Dense, SM, **(FILL)** | 7.4 | | | |
| | | 3.6 ft: Gray, Poorly Graded Sand with Silt and Gravel, Trace Brick, Dry, Dense, SP-SM, **(FILL)** | 6.4 | SS S-2 | 60 | 26-31-15-12 (46) |
| 5 | | 5.0 ft: Orangish Tan, Silty Sand, Dry, Dense, SM, **(OUTWASH)** | 5.0 | SS S-3 | 75 | 17-16-21-18 (37) |
| | | 7.0 ft: Tan, Silty Sand with Gravel, Dry to Wet, Dense, SM, **(TILL)** | 3.0 | SS S-4 | 60 | 39-22-19-14 (41) |
| 10 | | 11.0 ft: End of boring at 11.0 feet | -1.0 | SS S-5 | 83 | 16-14-17-17 (31) |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-15-4



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/18/2024 **DATE COMPLETED** 09/18/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Soil X Corp.
**LATITUDE** Not obtained - radio tower interference **LONGITUDE**
**SAMPLING METHOD** 4-1/4-in Hollow Stem Auger
**WATER LEVELS** AT END OF SOIL SAMPLING 10.0 ft / Elev 0.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Site 2 (362 S. Front St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | Analytical sample submitted from 0.6'-4.6' bgs. | 0.6 ft Gray, 6-7/8" Concrete Slab | 9.4 | | | |
| | | Dark Brown, SILTY SAND WITH GRAVEL, Dry, Dense, SM, **(FILL)** | | SS S-1 | 60 | 16-17-15-10 (32) |
| | | 2.6 ft | 7.4 | | | |
| | | Dark Brown, Silty Sand, Dry, Medium Dense, SM, **(FILL)** | | SS S-2 | 75 | 13-15-11-10 (26) |
| 5 | | 4.6 ft | 5.4 | | | |
| | | Dark Brown, Silty Sand with Gravel, Trace Brick, Dry, Medium Dense, SM, **(FILL)** | | SS S-3 | 62 | 14-13-9-8 (22) |
| | | 6.0 ft | 4.0 | | | |
| | | Orange, Silty Sand, Dry, Medium Dense, SM, **(OUTWASH)** | | | | |
| | | 7.0 ft | 3.0 | | | |
| | | Tan, Poorly-Graded Sand with Silt, Dry, Dense, SP-SM, **(OUTWASH)** | | SS S-4 | 62 | 9-14-24-29 (38) |
| | | 9.0 ft | 1.0 | | | |
| 10 | | 10.0 ft ▽ Tan, Silty Sand, Moist, Very Dense, SM, **(OUTWASH)** | 0.0 | SS S-5 | 100 | 29-28-28-34 (56) |
| | | 11.0 ft Black to Gray, Silty Sand with Gravel, Wet, Very Dense, SM, **(TILL)** | -1.0 | | | |
| | | End of boring at 11.0 feet | | | | |
| 15 | | | | | | |
| 20 | | | -10 | | | |
| 25 | | | | | | |
| 30 | | | -20 | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER K-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623654 **LONGITUDE** -70.916591
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 10.6<br>Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 4.8 ft 5.0 ft Dark Gray, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** 6.2 6.0<br>End of boring at 5.0 feet | | | 0.0 |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER K-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623788 **LONGITUDE** -70.916632
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 10.6<br>Brown to Dark Gray, Poorly-Graded Sand with Silt, Trace Brick, Dry, SP-SM, **(FILL)** | DP S-1 | 90 | |
| 5 | | | 5.0 ft 6.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER K-4.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623888 **LONGITUDE** -70.916663
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 10.6<br>Brown to Dark Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft 6.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER L/M-4.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623911 **LONGITUDE** -70.916530
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 10.6<br>Tan to Brown to Gray, Poorly-Graded Sand with Silt, Trace Brick, Dry, SP-SM, **(FILL)** | DP S-1 | 80 | |
| 5 | | | 5.0 ft 6.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER L/M-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623677 **LONGITUDE** -70.916458
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 10.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Trace Brick, Dry, SP-SM, **(FILL)** | DP S-1 | 92 | |
| 5 | | | 5.0 ft 6.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER O-0.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623665 **LONGITUDE** -70.916220
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(TOPSOIL)** 10.6<br>Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 80 | |
| 5 | | | 5.0 ft 6.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER Q-0.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623696 **LONGITUDE** -70.916041
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.5 ft Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(TOPSOIL)** 10.5<br>Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft 6.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER Q-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624147 **LONGITUDE** -70.916180
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Site 3 (4 Wright St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft – 9.6: Black, Asphalt<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** | DP S-1 | 80 | |
| | | | 3.5 ft – 6.5: Gray to White, Poorly-Graded Gravel, GP, **(FILL)** | | | |
| 5 | | | 4.8 ft – 5.2: Dark Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-2 | 100 | |
| 10 | | | 10.0 ft – 0.0: End of boring at 10.0 feet | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER S-0.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623727 **LONGITUDE** -70.915863
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(TOPSOIL)** 10.6<br>Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft 6.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER S-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624178 **LONGITUDE** -70.916002
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 9.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** | DP S-1 | 90 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER U-0.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623758 **LONGITUDE** -70.915685
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.5 ft Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(TOPSOIL)** 10.5<br>Brown, Poorly-Graded Sand with Silt, Trace Glass, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft 6.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER U-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL**
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624209 **LONGITUDE** -70.915824
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 9.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** | DP S-1 | 90 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER W-0.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 11.00 ft **BACKFILL**
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623789 **LONGITUDE** -70.915507
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.5 ft Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(TOPSOIL)** 10.5<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** | DP S-1 | 80 | |
| 5 | | | 5.0 ft 6.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER W-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/02/2024 **DATE COMPLETED** 07/02/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624240 **LONGITUDE** -70.915645
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 9.6<br>Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER Y-0.5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623914 **LONGITUDE** -70.915299
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 9.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 94 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER Y-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624003 **LONGITUDE** -70.915385
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 9.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 92 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER Y-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL**
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624137 **LONGITUDE** -70.915426
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 9.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 96 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER Y-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 9.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624271 **LONGITUDE** -70.915467
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs | 0.4 ft Black, Asphalt 8.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry, SP-SM, **(FILL)** | DP S-1 | 80 | |
| 5 | | | 5.0 ft 4.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER A'-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623900 **LONGITUDE** -70.915166
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Gray, Poorly-Graded Gravel, GP, **(FILL)** 9.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 96 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER A'-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624034 **LONGITUDE** -70.915207
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 9.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 90 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER A'-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624168 **LONGITUDE** -70.915248
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 9.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 94 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER A'-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624301 **LONGITUDE** -70.915289
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 9.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 98 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER C'-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623931 **LONGITUDE** -70.914988
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 9.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 98 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER C'-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624065 **LONGITUDE** -70.915029
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 9.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 96 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER C'-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 10.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624199 **LONGITUDE** -70.915070
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 9.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 96 | |
| 5 | | | 5.0 ft 5.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER C'-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 9.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624332 **LONGITUDE** -70.915111
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 8.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 96 | |
| 5 | | | 5.0 ft 4.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER E'-1



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 9.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623952 **LONGITUDE** -70.914862
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 8.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 98 | |
| 5 | | | 5.0 ft 4.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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# BORING NUMBER E'-3



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 9.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624096 **LONGITUDE** -70.914850
**SAMPLING METHOD** Direct Push
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 8.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 96 | |
| 5 | | | 5.0 ft 4.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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Raynham, MA 02767

# BORING NUMBER E'-5



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 9.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624236 **LONGITUDE** -70.914847
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 8.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 100 | |
| 5 | | | 5.0 ft 4.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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31 Bellows Road
Raynham, MA 02767

# BORING NUMBER E'-7



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 07/01/2024 **DATE COMPLETED** 07/01/2024
**GROUND ELEVATION** 9.00 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624363 **LONGITUDE** -70.914933
**SAMPLING METHOD** Direct Push
**WATER LEVELS** **AT END OF SOIL SAMPLING** N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**AT END OF CORING** N/A
**NOTES** Site 3 (4 Wright St. New Bedford, MA)
**24 HRS AFTER DRILLING** N/A

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | | Composite analytical sample submitted from 0'-5' bgs. | 0.4 ft Black, Asphalt 8.6<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, SP-SM, **(FILL)** | DP S-1 | 94 | |
| 5 | | | 5.0 ft 4.0<br>End of boring at 5.0 feet | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

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**ATTACHMENT 14: SHUSTER BULKHEAD GEOTECHNICAL DATA REPORT – REVISION 1 (CIVIL & ENVIRONMENTAL CONSULTANTS, INC., APRIL 4, 2025)**

November 13, 2024
Revised April 4, 2025

Mr. Doug Ernst, P.E.
Foth Infrastructure & Environment, LLC
8191 Birchwood Court, Suite L
Johnston, IA 50131

Subject: Geotechnical Data Report – Revision 1
Proposed Shuster Bulkhead Replacement
4 Wright Street, New Bedford, Massachusetts 02740
CEC Project 332-344

Dear Mr. Ernst:

Civil & Environmental Consultants, Inc. (CEC) presents for your use our geotechnical data report for the above referenced project. This report presents a summary of the soil, bedrock, and subsurface water conditions at the site based on the data obtained from recent subsurface explorations coordinated by CEC and previous subsurface explorations performed by others. This report has been revised based on additional historical data provided to us by you.

CEC appreciates the opportunity to be of service to you on this project. Please call if you have any questions or comments.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Antonio E. Sousa, P.E.
Project Manager

Jeffrey C. Woodcock, P.E.*
Vice President
**Not licensed in Massachusetts*

# GEOTECHNICAL DATA REPORT

# PROPOSED SHUSTER BULKHEAD REPLACEMENT
# 4 WRIGHT STREET, NEW BEDFORD, MA 02740

**Prepared for:**

**FOTH INFRASTRUCTURE & ENVIRONMENT, LLC**

**CEC Project 332-344**

**APRIL 2025**

Civil & Environmental Consultants, Inc.

Boston & Peabody

31 Bellows Road, Raynham, MA 02767 | 2 Corporation Way, Suite 160, Peabody, MA 01960
p: 774-501-2176 f: 774-501-2669 | www.cecinc.com

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Appendix A – Important Information About This Geotechnical Engineering Report
Appendix B – Figures
Appendix C – Test Boring Logs
Appendix D – Rock Core Photo Log
Appendix E – Laboratory Test Results

# 1.0 INTRODUCTION

## 1.1 PURPOSE

The purpose of our services was to perform a series of subsurface explorations at the site to provide geotechnical data to Foth Infrastructure & Environment, LLC (Foth) in support of a proposed marine bulkhead and concrete platform to be designed by Foth.

## 1.2 SCOPE OF SERVICES

CEC completed the following scope of services to achieve the above-stated purpose.

(1) CEC planned and coordinated the office and field work, prepared a health and safety plan for the subsurface investigation and other field work associated with the project, and performed geotechnical research for site soils, geology, and historic conditions at the site. The subsurface explorations were coordinated between Foth and CEC.

(2) CEC located the test borings in the field utilizing a handheld Global Position System (GPS) unit. Ground surface elevations (rounded to the nearest half-foot) were obtained relative to existing site topography and their approximate locations are shown on Figure 1 of Appendix B.

(3) CEC subcontracted Geosearch Inc. (Geosearch) of Sterling, Massachusetts to drill several borings as part of three different mobilizations. The first mobilization consisted of drilling Borings CEC-1A through 3A between November 14 and 15, 2023. The second mobilization consisted of drilling Borings CEC-4A through 18A between May 20 and June 11, 2024. The third mobilization consisted of drilling Borings CEC-19A through 27A between August 26 and September 17, 2024. CEC's field representative monitored the subsurface exploration program, described the materials encountered while drilling and sampling, obtained water level readings, made modifications to the drilling program when necessary, and prepared field logs. CEC and Foth communicated daily during the subsurface explorations to modify the drilling program as needed and to discuss the

subsurface conditions prior to termination. Appendix C includes test boring logs for each test boring.

(4) CEC subcontracted Thielsch Engineering Laboratory of Cranston, Rhode Island to perform geotechnical laboratory testing on select soil and rock samples obtained during drilling operations.

(5) CEC reviewed the results of the subsurface exploration and laboratory testing and prepared this geotechnical report summarizing the data obtained in accordance with the purpose.

## 1.3 AUTHORIZATION

This geotechnical evaluation was performed, and the report was prepared in general accordance with Amendment #5 of the prime agreement between Foth and Massachusetts Clean Energy Council (MassCEC), dated August 2, 2024.

## 1.4 STANDARD OF CARE

The services performed by CEC were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the geotechnical engineering profession practicing contemporaneously under similar conditions in the locality of the project. No warranty, express or implied, is made. Appendix A contains a document entitled "Important Information About This Geotechnical-Engineering Report." This document further explains the realities of geotechnical engineering and the limitations that exist in evaluating geotechnical issues.

## 1.5 REPORT LIMITATIONS

CEC prepared this report for the purpose of design development. Reliance on this report by any party other than Foth or its agents is expressly forbidden. CEC assumes no liability for the use of this report or information contained herein for any other purpose. Contractors should not rely on the information in this report for bid development or construction, beyond the use of the factual data presented herein.

# 2.0 DATA OBTAINED

## 2.1 BACKGROUND INFORMATION

The site is located at 4 Wright Street in New Bedford, Massachusetts (see Figure 1 in Appendix B for Locus Map). A single-story building is located at the site and currently serves as an office for the New Bedford Marine Commerce Terminal. The building is surrounded by paved parking areas. The site is located on the west bank of the Acushnet River and contains a cellular sheetpile bulkhead along the river bank with a paved surface over the bulkhead. The site is relatively flat at about El. 9 to 10 feet.

CEC understands that Foth plans to design a new marine bulkhead and concrete platform at the site. Based on a preliminary plan set provided to us by Foth titled "Shuster Bulkhead Structural Improvements", dated February 29, 2024, the existing bulkhead will be removed and existing fill from within the cellular cofferdams will be dredged. A new bulkhead is proposed approximately 55 feet west of the existing bulkhead along the Acushnet River, and the area between the existing bulkhead (to be removed) and the proposed bulkhead will consist of a concrete platform designed to support 4,100 pounds per square foot (psf) across most of the platform. The platform is also proposed to extend west of the new bulkhead and will be approximately 87 feet long by about 200 feet wide. Refer to Figure 2 in Appendix B for the approximate location of the proposed platform and bulkhead. The preliminary plan set indicates the concrete platform will be supported by 24- to 30-inch diameter pipe piles and the new bulkhead will be constructed as a king pile combination wall of sheet piles and pipe piles with a row of tieback anchors.

## 2.2 SITE SOILS AND GEOLOGY

### 2.2.1 Soils

The United States Geologic Survey (USGS) "Surficial Materials Map of the New Bedford South Quadrangle, Massachusetts (2018)" classifies the surficial soils as postglacial deposits consisting of artificial fill (i.e. earth and manmade materials that have been artificially emplaced). The United

States Department of Agriculture (USDA) web soil survey classifies the near surface soils as urban land. Urban land consists of areas previously disturbed by man-made excavation and/or fill placement, most commonly for land development.

### 2.2.2 Geology

The Bedrock Geologic Map of Massachusetts (1983) indicates bedrock in the area consists of Alaskite (gneissic granite) or biotite gneiss from the Proterozoic Era.

## 2.3 SUBSURFACE EXPLORATIONS

### 2.3.1 Recent Test Borings

CEC subcontracted Geosearch to drill three initial test boings, designated as CEC-1A trough CEC-3A, at the site between November 14th and 15th, 2023. CEC subsequently retained Geosearch to drill an additional fifteen (15) test borings at the site between May 20th and June 11th, 2024, designated as CEC-4A through CEC-18A. The final mobilization occurred from August 26th to September 17th, 2024 in which Geosearch drilled an additional nine (9) test borings, CEC-19A through CEC-27A. CEC's field representative monitored the subsurface exploration program, described the materials encountered, obtained water level readings, made modifications to the drilling program when necessary based on daily communication with Foth's design team, and prepared field logs. Appendix C includes the logs for each test boring. Soil sampling in Test Borings CEC-1A through CEC-27A totaled approximately 660 linear feet of soil drilling and approximately 313 feet of rock drilling. The test boring depths ranged from approximately 29 to 70 feet below the ground surface and terminated in either glacial till, weathered rock or bedrock. Figure 2 in Appendix B depicts the locations of the test borings, and Table 1 summarizes the information from the subsurface explorations. Appendix C includes detailed test boring logs and a summary of the definitions of standard terms and symbols used in this report and on the test boring logs.

Geosearch, Inc. advanced the test borings performed for the subsurface explorations utilizing drive and wash drilling methods and split-spoon sampling through soil in accordance with the standard penetration test (SPT) outlined in ASTM D1586. Soil sampling intervals varied during the drilling between continuous sampling to 5-foot center to center spacings for Test Borings CEC-1A through CEC-18A. No soil sampling was performed for Test Borings CEC-19A through 27A as the intent of these test borings was to obtain rock cores.

A split-spoon sampler is a 2-inch outside-diameter (OD) tube that retains a soil sample when driven into the soil. Upon retrieval, the sampler is split open for removal and identification of the retained soil sample. The SPT consists of driving a split-spoon sampler through soil using the energy of a 140-pound hammer free-falling a distance of 30 inches and recording the number of blows required to drive the split-spoon sampler through four successive 6-inch increments. The sum of the number of blows required to drive the split-spoon sampler through the second and third increments is the N-value of the soil. Soil N-values are commonly used to estimate soil density, consistency, compressibility, and shear strength. Split-spoon refusal (herein defined as when 50 or more blows of the 140-pound hammer are required to drive the split-spoon 6-inches or less) was encountered in all of the test borings where soil sampling took place except for CEC-8A and CEC-13A. CEC's project representative described the soil color, relative density (based on the SPT N-values), texture, origin, and apparent moisture content for obtained soil samples.

Rock sampling was performed with a 2-inch inside diameter, double barrel rock core drill equipped with a diamond core bit. Rock coring generally took place in 5-foot runs in test borings CEC-4A, 5A, and 9A through 27A. A maximum of 35 feet of rock was drilled (25 feet cored, see test boring log for additional info) in CEC-23A. Upon retrieval of the rock cores, each core run was placed into a rock core box for visual observation and classification. CEC's project representative documented the rock core advancement rate per foot during coring, and described the rock type and fractures, as well as the degree of weathering and hardness. CEC's project representative also documented the Rock Quality Designation (RQD) of each core run which is defined as the sum of the length of rock fragments greater than or equal to 4 inches divided by the length of the core run.

Refer to the test boring logs in Appendix C for additional information on soil and rock samples as well as Appendix D for a rock core photo log.

### 2.3.2 Previous Test Borings (Performed by Others)

Previous test borings were performed at the site by CLE Engineering in 2012 in collaboration with Geologic Earth Exploration, and by Apex Companies, LLC in collaboration with New Hampshire Boring in 2010 and 2011. Nine test borings were located within 100 feet or less of the proposed bulkhead and platform and are considered relevant to this project. The approximate location of the nine test borings (SB-1 through SB-5 from CLE Engineering and A-2010-B1, A-2011-B18, A-2011-LB-B9, and A-2011-LB-B10 from Apex) are shown in Figure 2 in Appendix B and the test boring logs are located in Appendix C. These nine borings totaled approximately 307 linear feet of soil drilled and 112 linear feet of bedrock drilled. A summary of these test borings is also included in Table 1.

## 2.4 WATER LEVEL MEASUREMENTS

CEC encountered measurable subsurface water at the completion of test drilling and soil sampling in Test Borings CEC-1A through CEC-18A; subsurface water measurements were not obtained in Test Borings CEC-19A through CEC-27A. The water levels recorded after completing soil sampling at the test boring locations ranged from approximately 4 to 8 feet bgs. CEC's field representative classified the apparent moisture contents of soil samples as ranging from dry to wet and noted that the moisture content typically increased with depth. CEC did not collect 24-hour water level measurements in the test borings because the test borings were backfilled after completing soil sampling for safety purposes. Table 1 summarizes the water level measurements recorded at the test boring and test pit locations. The water level measurements are also included in the test boring logs located in Appendix C.

## 2.5 GEOTECHNICAL LABORATORY TESTING

CEC selected soil samples obtained during the subsurface exploration for geotechnical material properties testing. Laboratory testing performed on soil samples included the following tests:

- Eight (8) Moisture content tests in accordance with ASTM D2216 "Determination of Water Content of Soil and Rock by Mass";
- Forty-three (43) Grain size analyses in accordance with ASTM D6913 "Particle-Size Distribution of Soils Using Sieve Analysis";
- Two (2) Sulfate content in accordance with EPA Method 9038 "Sulfate (Turbidimetric)";
- Two (2) Chlorides contents in accordance with EPA Method 9250 "Chloride (Colorimetric, Automated Ferricyanide AAI)";
- Two (2) pH tests in accordance with ASTM D4972 "pH of Soils";
- Two (2) Resistivity tests in accordance with EPA Method 9050A "Specific Conductance"; and
- Sixteen (16) Unconfined Compressive Strength of Rock tests in accordance with ASTM 7012, Method D "Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying States of Stress and Temperatures"

As part of the 2012 mobilization coordinated by CLE Engineering, twenty-four unit weight tests were performed (ASTM standard not specified). In addition, as part of the 2010-2011 mobilizations coordinated by Apex, four moisture content tests (ASTM D2216) and four unit weight tests (ASTM D7263) were performed on the test borings within the vicinity of the Shuster Bulkhead.

Table 2 summarizes the results of the laboratory testing and Appendix E includes the complete laboratory test results.

**TABLE 1**
**SUBSURFACE EXPLORATION SUMMARY**
**Shuster Bulkhead Replacement**
**4 Wright St. New Bedford, MA**

| Test Boring/Test Pit | Approximate Existing Ground Elevation [1] (ft) | Approximate Thickness of Asphalt (ft) | Approximate Thickness of Fill/Marine Sediments (ft) | Approximate Thickness of Glacial Outwash (ft) | Approximate Thickness of Glacial Till (ft) | Total Thickness of Soil Sampled (ft) | Approximate Thickness of Boulders/Weathered Rock (ft) | Approximate Top of Bedrock Elevation (ft) | Total Thickness of Rock Drilled (ft) | Termination Depth (ft) | Water Level At Completion (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Performed by Civil & Environmental Consultants (2023-2024)** | | | | | | | | | | | |
| CEC-1A | 9 | 0.3 | 17.2 | 0.5 | 11.8 | 29.8 | -- | -20.8[3] | -- | 29.8 | 6.0 |
| CEC-2A | 9 | 0.2 | 29.8 | -- | 1.0 | 31.0 | -- | -- | -- | 31.0 | 8.0 |
| CEC-3A | 9 | 0.2 | 27.8 | -- | 1.2 | 29.2 | -- | -- | -- | 29.2 | 4.0 |
| CEC-4A | 9 | 0.4 | 28.6 | -- | 11.3 | 40.3 | 9.7 | -41.0 | 10.0 | 60.0 | 6.0 |
| CEC-5A | 9 | 0.4 | 28.6 | 5.0 | 10.0 | 44.0 | 10.0 | -- | -- | 54.0 | 4.0 |
| CEC-6A | 9 | 0.4 | 33.6 | -- | 9.9 | 43.9 | -- | -34.9[3] | -- | 44.0 | 6.5 |
| CEC-7A | 9 | 0.4 | 28.6 | 5.0 | 10.0 | 44.0 | -- | -35.0[3] | -- | 44.1 | 5.0 |
| CEC-8A | 9 | 0.4 | 28.6 | 5.0 | 5.0 | 39.0 | -- | -- | -- | 39.0 | 5.5 |
| CEC-9A | 9 | 0.4 | 14.9 | -- | 3.7 | 19.0 | -- | -10.0 | 22.0 | 41.0 | 6.5 |
| CEC-10A | 9 | 0.4 | 23.6 | 5.0 | 12.0 | 41.0 | -- | -32.0 | 10.0 | 51.0 | 6.0 |
| CEC-11A | 9 | 0.4 | 23.6 | 5.0 | 11.9 | 40.9 | 4.1 | -- | -- | 45.0 | 6.5 |
| CEC-12A | 9 | 0.4 | 19.6 | 9.0 | 11.8 | 40.8 | -- | -31.8 | 5.0 | 47.0 | 6.5 |
| CEC-13A | 9 | 0.4 | 23.6 | 1.0 | 18.0 | 43.0 | -- | -34.0 | 5.0 | 48.0 | 6.0 |
| CEC-14A | 9 | 0.4 | 13.6 | 4.0 | 16.0 | 34.0 | -- | -25.0 | 5.0 | 39.0 | 6.5 |
| CEC-15A | 9 | 0.4 | 21.6 | -- | 5.8 | 27.8 | -- | -18.8 | 6.2 | 34.0 | 5.5 |
| CEC-16A | 9 | 0.4 | 21.6 | 2.0 | 10.0 | 34.0 | -- | -25.0 | 5.0 | 39.0 | 6.5 |
| CEC-17A | 9 | 0.4 | 21.6 | -- | 16.0 | 38.0 | -- | -29.0 | 11.0 | 49.0 | 5.0 |
| CEC-18A | 9 | 0.4 | 17.1 | 2.5 | 20.5 | 40.5 | -- | -31.5 | 5.5 | 46.0 | 7.5 |
| CEC-19A | 9 | -- | -- | -- | -- | --[2] | -- | -38.0 | 25.0 | 72.0 | NR |
| CEC-20A | 9 | -- | -- | -- | -- | --[2] | -- | -35.0 | 21.0 | 65.0 | NR |
| CEC-21A | 9 | -- | -- | -- | -- | --[2] | -- | -33.0 | 18.0 | 60.0 | NR |

**TABLE 1**
**SUBSURFACE EXPLORATION SUMMARY**
**Shuster Bulkhead Replacement**
**4 Wright St. New Bedford, MA**

| Test Boring/Test Pit | Approximate Existing Ground Elevation [1] (ft) | Approximate Thickness of Asphalt (ft) | Approximate Thickness of Fill/Marine Sediments (ft) | Approximate Thickness of Glacial Outwash (ft) | Approximate Thickness of Glacial Till (ft) | Total Thickness of Soil Sampled (ft) | Approximate Thickness of Boulders/Weathered Rock (ft) | Approximate Top of Bedrock Elevation (ft) | Total Thickness of Rock Drilled (ft) | Termination Depth (ft) | Water Level At Completion (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CEC-22A | 9 | -- | -- | -- | -- | --[2] | -- | -31.0 | 21.0 | 61.0 | NR |
| CEC-23A | 9 | -- | -- | -- | -- | --[2] | -- | -10.0 | 35.0 | 54.0 | NR |
| CEC-24A | 9 | -- | -- | -- | -- | --[2] | -- | -35.0 | 26.0 | 70.0 | NR |
| CEC-25A | 9 | -- | -- | -- | -- | --[2] | -- | -35.0 | 21.0 | 65.0 | NR |
| CEC-26A | 9 | -- | -- | -- | -- | --[2] | -- | -40.0 | 11.0 | 60.0 | NR |
| CEC-27A | 9 | -- | -- | -- | -- | --[2] | -- | -32.0 | 26.0 | 67.0 | NR |
| **Totals:** | **--** | **6.7** | **423.6** | **44.0** | **185.9** | **660.2** | **23.8** | **--** | **288.7** | **--** | **--** |
| **Performed by CLE Engineering (2012)** | | | | | | | | | | | |
| SB-1 | 8.4 | -- | 39.0 | -- | 2.0 | 41.0 | -- | -32.6 | 10.0 | 51.0 | 5.0 |
| SB-2 | 8.4 | -- | 41.0 | -- | 2.0 | 43.0 | -- | -34.6 | 10.0 | 53.0 | 5.0 |
| SB-3 | 8.4 | -- | 41.0 | -- | 3.0 | 44.0 | -- | -35.6 | 10.0 | 54.0 | 5.0 |
| SB-4 | 8.4 | -- | 41.0 | -- | 0.5 | 41.5 | -- | -33.1 | 10.0 | 51.5 | 5.0 |
| SB-5 | 8.4 | -- | 41.0 | -- | 0.5 | 41.5 | -- | -33.1 | 10.0 | 51.5 | 5.0 |
| **Totals:** | **--** | **--** | **--** | **--** | **--** | **211.0** | **--** | **--** | **50.0** | **--** | **--** |
| **Performed by Apex Companies (2010-2011)** | | | | | | | | | | | |
| A-2010-B1 | -23.2 | -- | -- | -- | -- | 5.4 | -- | -28.5 | 10.0 | 15.4 | -- |
| A-2011-LB-B9 | 10.8 | -- | -- | -- | -- | 35.1 | -- | -24.3 | 6.0 | 41.1 | -- |
| A-2011-LB-B10 | 8.9 | -- | -- | -- | -- | 43.9 | -- | -35.0 | 30.4 | 74.3 | -- |
| A-2011-B18 | -20.9 | -- | -- | -- | -- | 11.8 | -- | -- | 15.8 | 27.5 | -- |
| **Totals:** | **--** | **--** | **--** | **--** | **--** | **96.1** | **--** | **--** | **62.2** | **--** | **--** |

Notes:

-- Not Obtained / Not Encountered / Not Applicable

NR Not Recorded

1. Ground surface elevations are considered approximate. CEC test borings are in reference to Mean Low Water (MLW) datum and Apex test borings are in reference to Mean Low Low Water datum (MLLW), which is 0.14 ft lower than MLW.
2. Test borings CEC-19A through 27A were advanced to apparent bedrock without obtaining soil samples.
3. Top of bedrock elevation for Test Borings CEC-1A, CEC-6A and CEC-7A was based on refusal conditions encountered; no bedrock was cored.

**TABLE 2**

**TABULATION OF LABORATORY TEST DATA**
**Shuster Bulkhead Replacement**
**4 Wright St. New Bedford, MA**

| Test Boring Designation | Sample Number | Approx. Ground Surface Elevation (ft) | Depth of Sample Tip (ft) | Elevation of Sample Tip (ft) | Subsurface Layer | Unconfined Compressive Strength-Rock (psi) | Failure Strain (%) | Poisson Ratio | Young's Modulus (psi) | Natural Water Content (% of dry weight) | Unit Weight (lbs/cu.ft) | PARTICLE SIZE DISTRIBUTION (%) | | | | | | | Unified Soil Classification | Resistivity (Mohm-cm) | Chloride (mg/kg) | Sulfate (mg/kg) | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Coarse Gravel | Fine Gravel | Coarse Sand | Medium Sand | Fine Sand | Silt | Clay | | | | | |
| **Performed by Civil & Environmental Consultants (2023-2024)** | | | | | | | | | | | | | | | | | | | | | | | |
| CEC-1A | S-1 | 9.0 | 2.3 | 6.7 | Fill | -- | -- | -- | -- | 3.5 | -- | 0.0 | 14.6 | 5.7 | 27.1 | 42.4 | 10.2 | | SP-SM | -- | -- | -- | -- |
| CEC-1A | S-7 | 9.0 | 14.0 | -5.0 | Fill | -- | -- | -- | -- | 17.8 | -- | 0.0 | 7.3 | 6.9 | 29.5 | 50.6 | 5.7 | | SP-SM | -- | -- | -- | -- |
| CEC-1A | S-8 | 9.0 | 16.0 | -7.0 | Fill | -- | -- | -- | -- | 12.4 | -- | 10.4 | 12.1 | 8.5 | 29.9 | 33.6 | 5.5 | | SP-SM | -- | -- | -- | -- |
| CEC-2A | S-6 | 9.0 | 12.0 | -3.0 | Fill | -- | -- | -- | -- | 10.8 | -- | 24.3 | 10.3 | 8.5 | 21.8 | 26.8 | 8.3 | | SP-SM | -- | -- | -- | -- |
| CEC-2A | S-10 | 9.0 | 20.0 | -11.0 | Fill | -- | -- | -- | -- | 9.7 | -- | 4.8 | 22.9 | 11.7 | 23.7 | 29.1 | 7.8 | | SP-SM | -- | -- | -- | -- |
| CEC-2A | S-13 | 9.0 | 26.0 | -17.0 | Fill | -- | -- | -- | -- | 15.5 | -- | 0.0 | 11.9 | 4.4 | 26.9 | 48.0 | 8.8 | | SP-SM | -- | -- | -- | -- |
| CEC-3A | S-6 | 9.0 | 12.0 | -3.0 | Fill | -- | -- | -- | -- | 13.3 | -- | 5.6 | 15.4 | 7.4 | 27.3 | 35.0 | 9.3 | | SW-SM | -- | -- | -- | -- |
| CEC-3A | S-9 | 9.0 | 18.0 | -9.0 | Fill | -- | -- | -- | -- | 14.4 | -- | 0.0 | 13.5 | 6.0 | 24.2 | 46.3 | 10.0 | | SW-SM | -- | -- | -- | -- |
| CEC-4A | S-3 | 9.0 | 11.0 | -2.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 13.0 | 5.7 | 21.5 | 43.6 | 16.2 | | SM | -- | -- | -- | -- |
| CEC-4A | S-4 | 9.0 | 16.0 | -7.0 | Fill | -- | -- | -- | -- | -- | -- | 7.3 | 6.0 | 3.9 | 18.2 | 51.5 | 13.1 | | SM | -- | -- | -- | -- |
| CEC-4A | S-6 | 9.0 | 26.0 | -17.0 | Fill | -- | -- | -- | -- | -- | -- | 10.2 | 22.1 | 6.0 | 23.2 | 32.9 | 5.6 | | SP-SM | -- | -- | -- | -- |
| CEC-4A | C-2 | 9.0 | 51.1 | -42.1 | Bedrock | 6,915 | 0.617 | 0.10 | 0.84E+06 | -- | 167.3 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-5A | S-2 | 9.0 | 6.0 | 3.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 10.5 | 8.3 | 24.7 | 42.8 | 13.7 | | SM | -- | -- | -- | -- |
| CEC-5A | S-4 | 9.0 | 16.0 | -7.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 11.0 | 9.2 | 27.5 | 42.3 | 10.0 | | SW-SM | -- | -- | -- | -- |
| CEC-5A | S-6 | 9.0 | 26.0 | -17.0 | Fill | -- | -- | -- | -- | -- | -- | 24.6 | 7.6 | 6.4 | 20.1 | 29.6 | 11.7 | | SP-SM | -- | -- | -- | -- |
| CEC-6A | S-2 | 9.0 | 6.0 | 3.0 | Fill | -- | -- | -- | -- | -- | -- | 13.3 | 27.0 | 7.5 | 14.7 | 26.0 | 11.5 | | SP-SM | -- | -- | -- | -- |
| CEC-6A | S-5 | 9.0 | 21.0 | -12.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 12.3 | 7.4 | 28.2 | 40.4 | 11.7 | | SP-SM | -- | -- | -- | -- |
| CEC-6A | S-6 | 9.0 | 26.0 | -17.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 27.1 | 12.2 | 25.2 | 31.6 | 3.9 | | SP | -- | -- | -- | -- |
| CEC-6A | S-8 | 9.0 | 36.0 | -27.0 | Glacial Till | -- | -- | -- | -- | -- | -- | 0.0 | 19.9 | 13.0 | 23.7 | 26.7 | 16.7 | | SM | -- | -- | -- | -- |
| CEC-7A | S-2 | 9.0 | 6.0 | 3.0 | Fill | -- | -- | -- | -- | -- | -- | 8.8 | 6.3 | 6.5 | 22.7 | 39.9 | 15.8 | | SM | -- | -- | -- | -- |
| CEC-7A | S-5 | 9.0 | 21.0 | -12.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 22.7 | 8.4 | 24.9 | 33.0 | 11.0 | | SP-SM | -- | -- | -- | -- |
| CEC-7A | S-7 | 9.0 | 31.0 | -22.0 | Glacial Outwash | -- | -- | -- | -- | -- | -- | 0.0 | 23.5 | 6.5 | 18.9 | 40.1 | 11.0 | | SP-SM | -- | -- | -- | -- |
| CEC-8A | S-2 | 9.0 | 6.0 | 3.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 10.3 | 7.0 | 25.1 | 40.4 | 17.2 | | SM | -- | -- | -- | -- |
| CEC-8A | S-4 | 9.0 | 16.0 | -7.0 | Fill | -- | -- | -- | -- | -- | -- | 16.1 | 17.1 | 4.8 | 24.7 | 34.5 | 2.8 | | SP | -- | -- | -- | -- |
| CEC-8A | S-7 | 9.0 | 31.0 | -22.0 | Glacial Outwash | -- | -- | -- | -- | -- | -- | 0.0 | 20.0 | 9.0 | 23.7 | 37.9 | 9.4 | | SP-SM | -- | -- | -- | -- |
| CEC-9A | S-1 | 9.0 | 2.0 | 7.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 16.1 | 5.5 | 22.5 | 41.1 | 14.8 | | SM | -- | -- | -- | -- |
| CEC-9A | S-3 | 9.0 | 11.0 | -2.0 | Fill | -- | -- | -- | -- | -- | -- | 16.8 | 9.9 | 6.1 | 22.5 | 39.9 | 4.8 | | SP | -- | -- | -- | -- |

**TABLE 2**

**TABULATION OF LABORATORY TEST DATA**
**Shuster Bulkhead Replacement**
**4 Wright St. New Bedford, MA**

| Test Boring Designation | Sample Number | Approx. Ground Surface Elevation (ft) | Depth of Sample Tip (ft) | Elevation of Sample Tip (ft) | Subsurface Layer | Unconfined Compressive Strength-Rock (psi) | Failure Strain (%) | Poisson Ratio | Young's Modulus (psi) | Natural Water Content (% of dry weight) | Unit Weight (lbs/cu.ft) | PARTICLE SIZE DISTRIBUTION (%) | | | | | | | Unified Soil Classification | Resistivity (Mohm-cm) | Chloride (mg/kg) | Sulfate (mg/kg) | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Coarse Gravel | Fine Gravel | Coarse Sand | Medium Sand | Fine Sand | Silt | Clay | | | | | |
| CEC-9A | C-1 | 9.0 | 22.9 | -13.9 | Bedrock | 11,697 | 0.582 | 0.10 | 1.48E+06 | -- | 163.7 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-10A | S-4 | 9.0 | 16.0 | -7.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 8.2 | 5.4 | 22.4 | 42.4 | 21.6 | | SM | -- | -- | -- | -- |
| CEC-10A | S-7 | 9.0 | 31.0 | -22.0 | Glacial Till | -- | -- | -- | -- | -- | -- | 0.0 | 21.7 | 13.7 | 24.2 | 22.2 | 18.2 | | SM | -- | -- | -- | -- |
| CEC-10A | C-1 | 9.0 | 43.2 | -34.2 | Bedrock | 7,884 | 0.414 | 0.17 | 1.62E+06 | -- | 164.3 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-11A | S-3 | 9.0 | 11.0 | -2.0 | Fill | -- | -- | -- | -- | -- | -- | 12.5 | 8.6 | 5.5 | 18.8 | 33.5 | 21.1 | | SM | -- | -- | -- | -- |
| CEC-11A | S-6 | 9.0 | 26.0 | -17.0 | Glacial Outwash | -- | -- | -- | -- | -- | -- | 0.0 | 6.3 | 2.4 | 3.4 | 60.1 | 27.8 | | SM | -- | -- | -- | -- |
| CEC-12A | S-1 | 9.0 | 2.0 | 7.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 7.0 | 4.6 | 21.2 | 47.1 | 20.1 | | SM | -- | -- | -- | -- |
| CEC-12A | S-6 | 9.0 | 26.0 | -17.0 | Glacial Outwash | -- | -- | -- | -- | -- | -- | 0.0 | 0.0 | 0.2 | 2.8 | 83.7 | 13.3 | | SM | -- | -- | -- | -- |
| CEC-12A | C-1 | 9.0 | 45.7 | -36.7 | Bedrock | 2,871 | 0.429 | 0.19 | 0.69E+06 | -- | 174.4 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-13A | S-2 | 9.0 | 6.0 | 3.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 1.0 | 1.3 | 8.3 | 37.4 | 52.0 | | ML | 0.002 | 203 | ND | 6.7 |
| CEC-13A | S-6 | 9.0 | 25.0 | -16.0 | Glacial Outwash | -- | -- | -- | -- | -- | -- | 11.8 | 9.9 | 7.8 | 19.7 | 28.8 | 22.0 | | SM | -- | -- | -- | -- |
| CEC-14A | S-8 | 9.0 | 16.0 | -7.0 | Glacial Outwash | -- | -- | -- | -- | -- | -- | 0.0 | 12.7 | 5.4 | 21.5 | 33.8 | 26.6 | | SM | -- | -- | -- | -- |
| CEC-14A | C-1 | 9.0 | 34.8 | -25.8 | Bedrock | 9,768 | 0.279 | 0.02 | 3.15E+06 | -- | 165.4 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-15A | S-7 | 9.0 | 14.0 | -5.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 16.4 | 5.4 | 26.8 | 41.2 | 10.2 | | SP-SM | -- | -- | -- | -- |
| CEC-15A | S-13 | 9.0 | 26.0 | -17.0 | Glacial Till | -- | -- | -- | -- | -- | -- | 9.3 | 19.6 | 19.8 | 29.6 | 14.3 | 7.4 | | SW-SM | -- | -- | -- | -- |
| CEC-15A | C-1 | 9.0 | 29.6 | -20.6 | Bedrock | 12,479 | 0.233 | 0.26 | 5.03E+06 | -- | 164.9 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-16A | S-5 | 9.0 | 10.0 | -1.0 | Fill | -- | -- | -- | -- | -- | -- | 17.1 | 5.7 | 4.4 | 15.7 | 32.0 | 25.1 | | SM | -- | -- | -- | -- |
| CEC-16A | S-12 | 9.0 | 24.0 | -15.0 | Glacial Outwash | -- | -- | -- | -- | -- | -- | 0.0 | 17.3 | 8.7 | 22.0 | 44.0 | 8.0 | | SP-SM | -- | -- | -- | -- |
| CEC-17A | S-5 | 9.0 | 10.0 | -1.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 5.5 | 3.8 | 12.8 | 48.2 | 29.7 | | SM | -- | -- | -- | -- |
| CEC-17A | S-9 | 9.0 | 18.0 | -9.0 | Fill | -- | -- | -- | -- | -- | -- | 4.5 | 8.9 | 5.7 | 30.1 | 37.4 | 13.4 | | SM | -- | -- | -- | -- |
| CEC-17A | S-16 | 9.0 | 32.0 | -23.0 | Glacial Till | -- | -- | -- | -- | -- | -- | 20.7 | 21.7 | 7.4 | 15.4 | 20.4 | 14.4 | | SM | -- | -- | -- | -- |
| CEC-18A | S-4 | 9.0 | 8.0 | 1.0 | Fill | -- | -- | -- | -- | -- | -- | 0.0 | 5.4 | 4.4 | 20.2 | 44.1 | 25.9 | | SM | 0.004 | 56 | ND | 6.7 |
| CEC-18A | C-1 | 9.0 | 41.5 | -32.5 | Bedrock | 25,815 | 0.323 | 0.09 | 7.92E+06 | -- | 183.5 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-19A | C-5 | 9.0 | 68.8 | -59.8 | Bedrock | 5,492 | 0.482 | 4.36[1] | 1.65E+06 | -- | 163.7 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-20A | C-3 | 9.0 | 55.8 | -46.8 | Bedrock | 12,093 | 0.593 | 0.25 | 1.90E+06 | -- | 164.4 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-21A | C-2 | 9.0 | 50.8 | -41.8 | Bedrock | 11,624 | 0.497 | 0.21 | 1.92E+06 | -- | 167.9 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-22A | C-1 | 9.0 | 42.9 | -33.9 | Bedrock | 16,107 | 0.288 | 0.12 | 4.91E+06 | -- | 165.4 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-23A | C-3 | 9.0 | 46.0 | -37 | Bedrock | 9,657 | 0.268 | 0.25 | 3.29E+06 | -- | 165.6 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |

**TABLE 2**

**TABULATION OF LABORATORY TEST DATA**
**Shuster Bulkhead Replacement**
**4 Wright St. New Bedford, MA**

| Test Boring Designation | Sample Number | Approx. Ground Surface Elevation (ft) | Depth of Sample Tip (ft) | Elevation of Sample Tip (ft) | Subsurface Layer | Unconfined Compressive Strength-Rock (psi) | Failure Strain (%) | Poisson Ratio | Young's Modulus (psi) | Natural Water Content (% of dry weight) | Unit Weight (lbs/cu.ft) | PARTICLE SIZE DISTRIBUTION (%) | | | | | | | Unified Soil Classification | Resistivity (Mohm-cm) | Chloride (mg/kg) | Sulfate (mg/kg) | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Coarse Gravel | Fine Gravel | Coarse Sand | Medium Sand | Fine Sand | Silt | Clay | | | | | |
| CEC-24A | C-5 | 9.0 | 66.4 | -57.4 | Bedrock | 9,075 | 0.427 | 0.48 | 1.52E+06 | -- | 168.2 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-25A | C-1 | 9.0 | 48.3 | -39.3 | Bedrock | 14,781 | 0.479 | 0.26 | 2.33E+06 | -- | 174.1 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-26A | C-1 | 9.0 | 50.7 | -41.7 | Bedrock | 14,038 | 0.465 | 0.68 | 2.43E+06 | -- | 176.8 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| CEC-27A | C-4 | 9.0 | 59.7 | -50.7 | Bedrock | 15,631 | 0.330 | 0.13 | 4.51E+06 | -- | 164.8 | -- | -- | -- | -- | -- | -- | | -- | -- | -- | -- | -- |
| **Performed by CLE Engineering (2012)** | | | | | | | | | | | | | | | | | | | | | | | |
| SB-1 | S-3 | 8.4 | 11.0 | -2.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 129.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-1 | S-5 | 8.4 | 21.0 | -12.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 106.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-1 | S-7 | 8.4 | 31.0 | -22.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 112.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-1 | S-8 | 8.4 | 36.0 | -27.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 117.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-2 | S-1 | 8.4 | 2.0 | 6.4 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 115.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-2 | S-3 | 8.4 | 11.0 | -2.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 107.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-2 | S-7 | 8.4 | 31.0 | -22.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 111.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-3 | S-2 | 8.4 | 6.0 | 2.4 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 150.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-3 | S-3 | 8.4 | 11.0 | -2.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 115.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-3 | S-4 | 8.4 | 16.0 | -7.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 142.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-3 | S-5 | 8.4 | 21.0 | -12.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 165.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-3 | S-6 | 8.4 | 26.0 | -17.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 167.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-3 | S-8 | 8.4 | 36.0 | -27.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 112.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-4 | S-1 | 8.4 | 2.0 | 6.4 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 127.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-4 | S-3 | 8.4 | 11.0 | -2.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 129.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-4 | S-4 | 8.4 | 16.0 | -7.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 108.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-4 | S-6 | 8.4 | 26.0 | -17.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 117.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-4 | S-7 | 8.4 | 31.0 | -22.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 153.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-4 | S-8 | 8.4 | 36.0 | -27.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 139.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-5 | S-2 | 8.4 | 4.0 | 4.4 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 113.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-5 | S-5 | 8.4 | 10.0 | -1.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 98.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-5 | S-8 | 8.4 | 16.0 | -7.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 117.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SB-5 | S-11 | 8.4 | 22.0 | -13.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 128.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

**TABLE 2**
**TABULATION OF LABORATORY TEST DATA**
**Shuster Bulkhead Replacement**
**4 Wright St. New Bedford, MA**

| Test Boring Designation | Sample Number | Approx. Ground Surface Elevation (ft) | Depth of Sample Tip (ft) | Elevation of Sample Tip (ft) | Subsurface Layer | Unconfined Compressive Strength-Rock (psi) | Failure Strain (%) | Poisson Ratio | Young's Modulus (psi) | Natural Water Content (% of dry weight) | Unit Weight (lbs/cu.ft) | PARTICLE SIZE DISTRIBUTION (%) | | | | | | | Unified Soil Classification | Resistivity (Mohm-cm) | Chloride (mg/kg) | Sulfate (mg/kg) | pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Coarse Gravel | Fine Gravel | Coarse Sand | Medium Sand | Fine Sand | Silt | Clay | | | | | |
| SB-5 | S-16 | 8.4 | 32.0 | -23.6 | Fill/Marine Sediments | -- | -- | -- | -- | -- | 157.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Performed by Apex Companies (2010-2011)** | | | | | | | | | | | | | | | | | | | | | | | |
| B-18 | -- | -20.9 | 2.0 | -22.9 | -- | -- | -- | -- | -- | 26.2 | 86.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| B-18 | -- | -20.9 | 6.5 | -27.4 | -- | -- | -- | -- | -- | 9.9/15.5 (2) | 131.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| B-18 | -- | -20.9 | 7.0 | -27.9 | -- | -- | -- | -- | -- | 24.9 | 121.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| B-18 | -- | -20.9 | 12.0 | -32.9 | -- | -- | -- | -- | -- | 15.9 | 132.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

Notes:

-- Not Obtained / Not Encountered / Not Applicable

(1) Minor Break at about 450 psi resulting in large Poisson's Ratio.

(2) Two moisture content results were obtained for this sample.

## 3.0 SUBSURFACE CONDITIONS

CEC presents the following summary of subsurface conditions based on our observations and data obtained. The subsurface materials encountered at the test boring locations included asphalt underlain by existing fill, glacial outwash, glacial till, weathered rock, and bedrock. The test borings performed by others appeared to contain similar subsurface layering to CEC's borings and are not discussed in detail the subsections below. The test borings performed at the site represent the subsurface conditions of the test locations at the time they were completed. Soil conditions encountered at other locations or times may differ.

### 3.1 ASPHALT

The existing site is primarily comprised of asphalt at the ground surface. CEC encountered asphalt pavement approximately 0.2 to 0.4 feet thick at all of the test boring locations, and pavement appeared to be placed directly on soil subgrade with no subbase drainage gravel layer.

### 3.2 EXISTING FILL CONDITIONS

Fill consists of soil, rock, or processed materials placed by human activities in order to raise a grade. The existing fill reportedly consists primarily of previously dredged marine sediment based on historical reports. CEC encountered existing fill at all test boring locations below the existing asphalt. The fill ranged in thickness from approximately 13.6 to 33.6 feet. The fill primarily consisted of poorly-graded sand with varying amounts of silt and gravel. The fill predominantly classified as SM (silty sand); SP (poorly-graded sands and gravely sands); SP-SM (poorly-graded sand with silt and gravel); and SW-SM (well-graded sand with silt and gravel) in accordance with the United Soil Classification System (USCS). One fine-grained sample of fill obtained in CEC-13A from 4 to 6 feet bgs was classified as ML (Sandy Silt). The relative density of the fill ranged from very loose to very dense, as SPT N-values in the existing fill ranged from 2 to 74 blows per foot (bpf) with an average of 19 bpf. The apparent moisture contents of the fill material ranged

from dry to moist. CEC's field representative determined apparent moisture contents based on visual observation of materials at the test boring locations at the time the test borings were drilled. Laboratory testing performed on the fill soils consisted of moisture content and grain size analysis. Moisture contents in the fill ranged from 3.5% to 17.8% and fines content in the fill ranged from 2.8% to 52%.

### 3.3 GLACIAL OUTWASH CONDITIONS

Glacial outwash consists of soil deposited by glacial streams or meltwater. CEC encountered glacial outwash soils below the fill in test borings CEC-1A, 5A, 7A, 8A, 10A to 14A, 16A and 18A and was approximately 0.5 to 9 feet thick where encountered. The glacial outwash primarily consisted of sand with varying amounts of gravel and silt. The glacial outwash samples were visually classified as SP-SM and SM in accordance with the USCS, with one sample (S-6 from 24 to 26 feet bgs in Boring CEC-10A) appeared to consist of poorly-graded gravel with silt (GP-GM). The relative density of the glacial outwash layer ranged from very loose to dense, as SPT N-values ranged from 3 to 37 bpf with an average of 16 bpf. All glacial outwash soil samples were observed below the water table.

Laboratory testing performed on the glacial outwash soils consisted of grain size analysis. The fines content in the glacial outwash ranged from 8% to 27.8%.

### 3.4 GLACIAL TILL CONDITIONS

Glacial till is defined herein as soil deposited by and underneath a glacier, generally consisting of a heterogeneous, unstratified mixture of clay, silt, sand, gravel, and boulders. CEC encountered glacial till in each boring directly beneath the fill or glacial outwash, and the glacial till was 3.7 to 20.5 feet thick. Test borings CEC-1A through CEC-3A and CEC-6A through CEC-8A terminated about 1 to 11.8 feet into the glacial till at 29.2 to 44 feet bgs. The glacial till primarily consisted of a well-sorted mix of sand, silt and gravel and were visually classified as SM, SP, SP-SM, SW-SM, ML, GM, GP, and GP-GM in accordance with the USCS. The relative density of the glacial till

ranged from loose to very dense, as SPT N-values in the glacial till layer ranged from 9 to 139 bpf with an average of 57 bpf. All glacial till soil samples were observed below the water table.

Laboratory testing performed on the glacial till soils consisted of grain size analysis. The fines content in the glacial till ranged from 7.4% to 18.2%.

## 3.5 WEATHERED ROCK CONDITIONS

Weathered rock is defined as materials derived from lithified, undisturbed, natural bedrock which are generally able to be sampled with a split-spoon. CEC encountered weathered rock at Test Borings CEC-4A, 5A and CEC-11A below glacial till at depths ranging from 40 to 54 feet bgs. The thickness of weathered rock ranged from approximately 4.1 to 10 feet. The relative density of the weathered rock was very dense, as SPT N-values ranged from 60 to 110 bpf with an average N value of 85 bpf. All weathered rock samples were observed below the water table. The one split spoon sample of weathered rock obtained generally consisted of Silty Sand with Gravel (SM). Weathered Rock was cored in Test Borings CEC-4A and 5A, but the RQD of the samples was 0 and the recovery of the samples ranged from 0 to 12%. The recovered weathered rock observed appeared to consist of highly weathered granite.

## 3.6 BEDROCK CONDITIONS

Bedrock is defined as materials underlying soil or other unconsolidated surficial materials in which refusal is consistently encountered. Bedrock was encountered in Test Borings CEC-4A, 9A, 10A, and CEC-12A through CEC-27A. The top of bedrock was encountered at about 20 to 50 feet bgs and was shallowest in the north-central area of the proposed bulkhead and platform (see Figure 3 for a Top of Bedrock Contour Map). Approximately 5 to 25 feet of bedrock was cored at the above noted test boring locations. The bedrock appeared to consist of gray to dark gray, medium to coarse grained granite or medium grained gabbro. Granite was more prevalent in the northern half of the site and gabbro was more prevalent in the southern half of the site, but intrusions of granite and gabbro were encountered across the site.

The bedrock ranged from fresh to slightly weathered. Six unconfined compressive strength tests were performed on gabbro cores, which ranged from 2,871 psi to 25,815 psi with an average compressive strength of 12,674 psi. Ten unconfined compressive strength tests were performed on granite cores, which ranged from 7,884 psi to 16,107 psi with an average compressive strength of 10,988 psi. In addition, the RQD of the gabbro cores ranged from 7% to 89% with an average of 47%, and the RQD of the granite cores ranged from 0% to 100% with an average of 54%.

## 3.7 GROUNDWATER CONDITIONS

CEC encountered groundwater at Test Borings CEC-1A to CEC-18A after completing soil sampling at depths ranging from approximately 4 to 7.5 feet bgs (El. 1.5 to 5 feet). Subsurface water conditions were not recorded in Test Borings CEC-19A through CEC-27A. Subsurface water conditions can fluctuate and vary based on precipitation, tidal influences, season, temperature, and other factors, and may vary at other times and locations across the site.

# APPENDIX A

# IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT

# Important Information about This

# Geotechnical-Engineering Report

**Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.**

**While you cannot eliminate all such risks, you can manage them. The following information is provided to help.**

**The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.**

## Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

## Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

## You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

## This Report May Not Be Reliable

*Do not rely on this report* if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

## Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

## This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

## This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

## Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

## Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

## Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

## Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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e-mail: info@geoprofessional.org www.geoprofessional.org

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# APPENDIX B

# FIGURES




## REFERENCE

1. U.S.G.S. 7.5' TOPOGRAPHIC MAP, Q249814, Q249818, Q253814, Q253818 QUADRANGLE, MA DATED: 2011.

SCALE IN FEET

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Civil & Environmental Consultants, Inc.

31 Bellows Road
Raynham, MA 02767

Ph: 774.501.2176

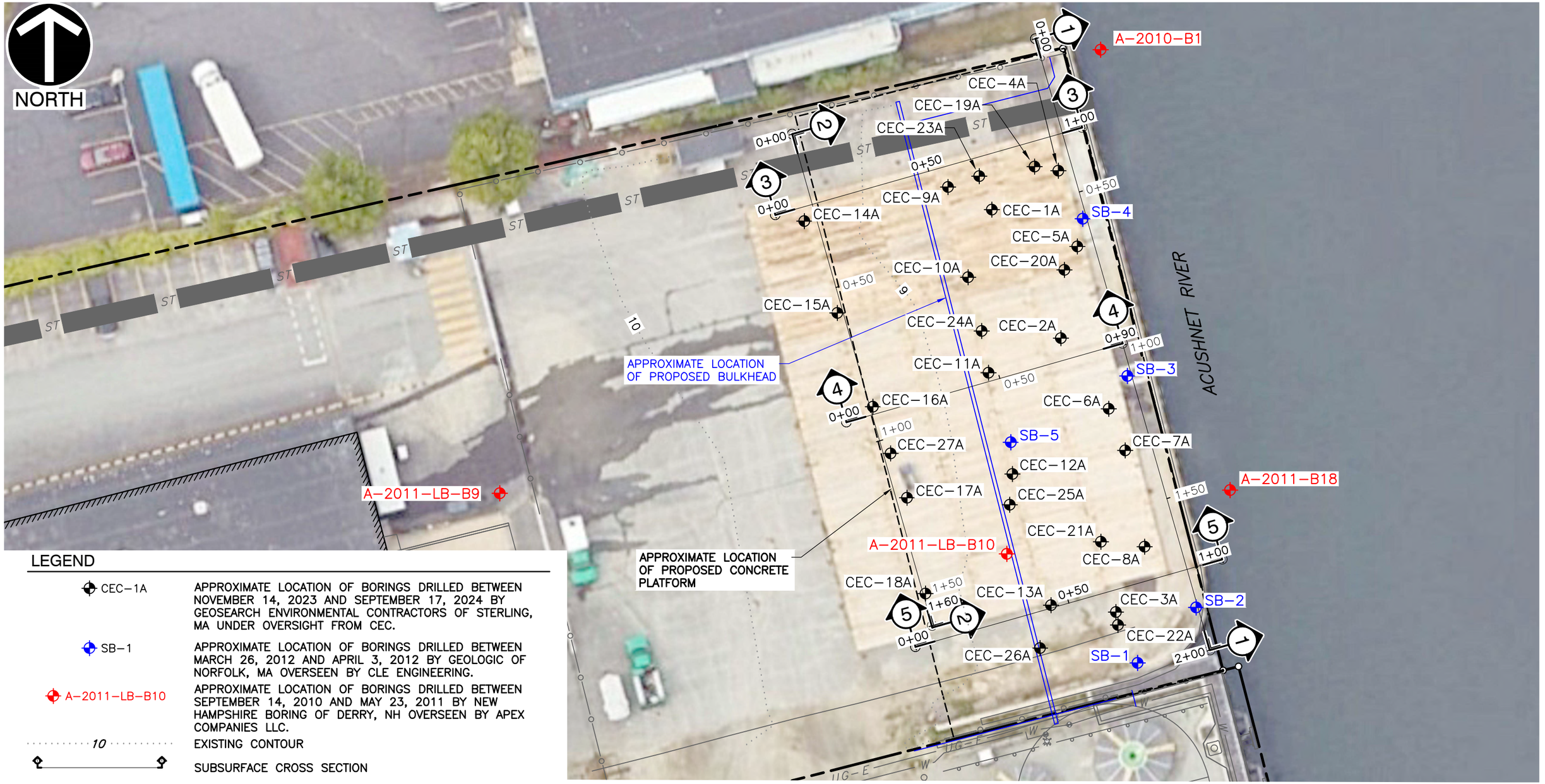
www.cecinc.com

FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
PROPOSED SHUSTER BULKHEAD
4 WRIGHT STREET, NEW BEDFORD, MA

SITE LOCATION MAP

| DRAWN BY: | JDV | CHECKED BY: | TES | APPROVED BY: | JCW | FIGURE NO.: |
|---|---|---|---|---|---|---|
| DATE: | APRIL 2025 | DWG SCALE: | 1"=1,000' | PROJECT NO: | 332-344 | 1 |

P:\330-000\332-344\-CADD\Dwg\GT02 - Site 4 - Shuster Bulkhead\332344-GT02-Site Figures_4 Wright.dwg\18 WRIGHT - FIG 1} LS:(4/2/2025 - abucco) - LP: 4/2/2025 3:30 PM




## LEGEND

| | |
|---|---|
| CEC-1A | APPROXIMATE LOCATION OF BORINGS DRILLED BETWEEN NOVEMBER 14, 2023 AND SEPTEMBER 17, 2024 BY GEOSEARCH ENVIRONMENTAL CONTRACTORS OF STERLING, MA UNDER OVERSIGHT FROM CEC. |
| SB-1 | APPROXIMATE LOCATION OF BORINGS DRILLED BETWEEN MARCH 26, 2012 AND APRIL 3, 2012 BY GEOLOGIC OF NORFOLK, MA OVERSEEN BY CLE ENGINEERING. |
| A-2011-LB-B10 | APPROXIMATE LOCATION OF BORINGS DRILLED BETWEEN SEPTEMBER 14, 2010 AND MAY 23, 2011 BY NEW HAMPSHIRE BORING OF DERRY, NH OVERSEEN BY APEX COMPANIES LLC. |
| 10 | EXISTING CONTOUR |
| | SUBSURFACE CROSS SECTION |

## REFERENCES/NOTES

1. CONTOURS ARE IN FEET AND REFER TO MEAN LOW WATER DATUM.
2. CEC BORING LOCATIONS WERE LOCATED USING A HANDHELD GPS. CLE AND APEX BORING LOCATION INFORMATION WAS PROVIDED TO CEC BY FOTH.
3. EXISTING SITE INFORMATION WAS OBTAINED FROM PLANS ENTITLED "MASSCEC MAIN TERMINAL AS-BUILTS", DATED 5/10/2023, BY FOTH, AND PROVIDED ELECTRONICALLY TO CEC BY FOTH. CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.
4. APPROXIMATE LOCATION OF PROPOSED BULKHEAD AND PROPOSED CONCRETE PLATFORM OBTAINED FROM PLANS ENTITLED "PROPOSED SITE PLAN", DATED 2/29/2024, BY FOTH, AND PROVIDED ELECTRONICALLY TO CEC BY FOTH. CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.

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0 30 60


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FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
PROPOSED SHUSTER BULKHEAD
4 WRIGHT STREET, NEW BEDFORD, MA

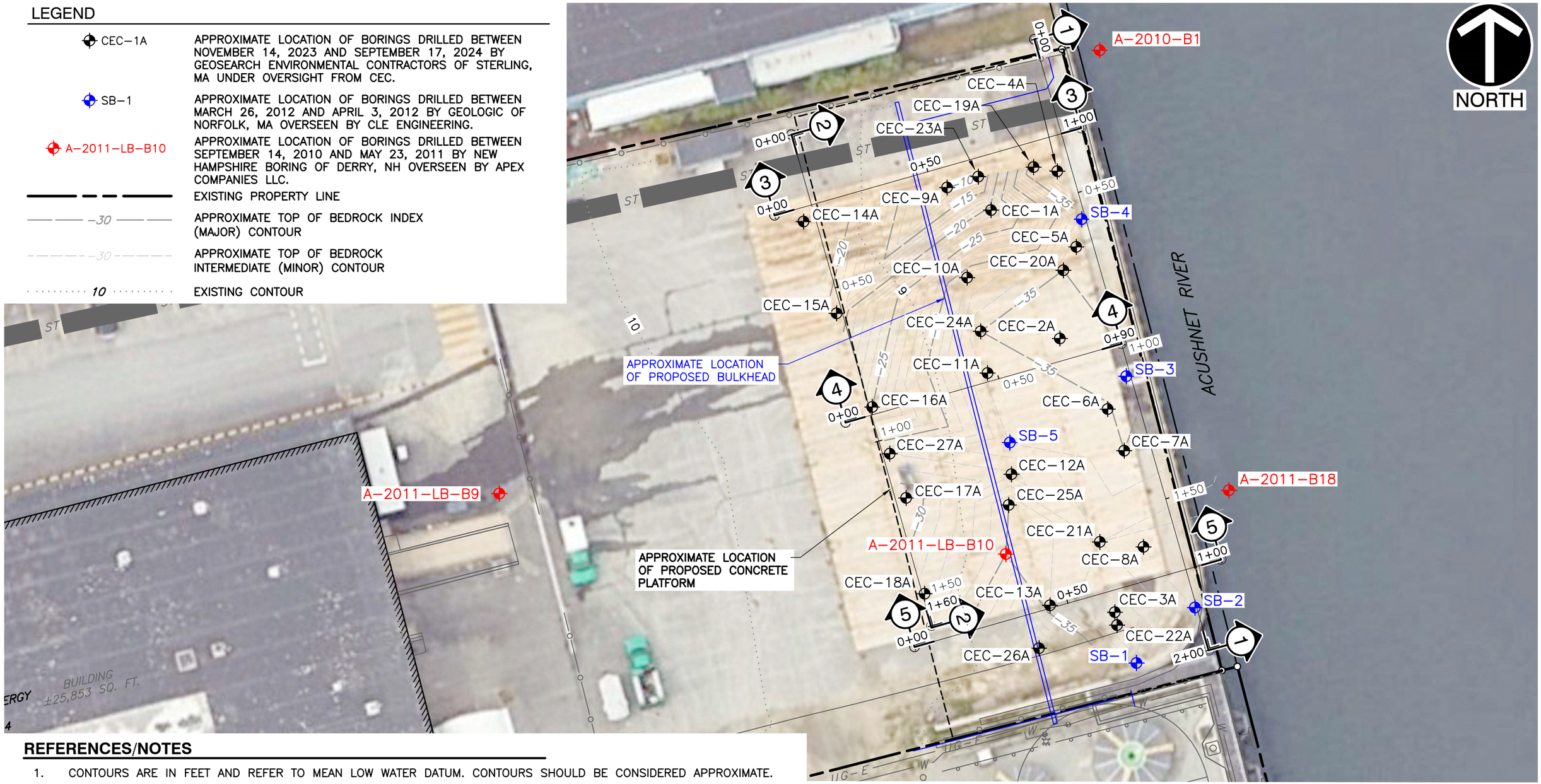
BORING LOCATION PLAN

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | TES | APPROVED BY: | JCW | FIGURE NO.: | 2 |
| DATE: | APRIL 2025 | DWG SCALE: | 1"=30' | PROJECT NO: | 332-344 | | |

P:\330-000\332-344\-CADD\Dwg\GT02 - Site 4 - Shuster Bulkhead\332344-GT02-Boring Location Plan.dwg[FIGURE 2] LS:(4/3/2025 - abucco) - LP: 4/3/2025 3:50 PM

## LEGEND

| | |
|---|---|
| CEC–1A | APPROXIMATE LOCATION OF BORINGS DRILLED BETWEEN NOVEMBER 14, 2023 AND SEPTEMBER 17, 2024 BY GEOSEARCH ENVIRONMENTAL CONTRACTORS OF STERLING, MA UNDER OVERSIGHT FROM CEC. |
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| A–2011–LB–B10 | APPROXIMATE LOCATION OF BORINGS DRILLED BETWEEN SEPTEMBER 14, 2010 AND MAY 23, 2011 BY NEW HAMPSHIRE BORING OF DERRY, NH OVERSEEN BY APEX COMPANIES LLC. |
| | EXISTING PROPERTY LINE |
| –30– | APPROXIMATE TOP OF BEDROCK INDEX (MAJOR) CONTOUR |
| –30– | APPROXIMATE TOP OF BEDROCK INTERMEDIATE (MINOR) CONTOUR |
| 10 | EXISTING CONTOUR |




## REFERENCES/NOTES

1. CONTOURS ARE IN FEET AND REFER TO MEAN LOW WATER DATUM. CONTOURS SHOULD BE CONSIDERED APPROXIMATE.
2. CEC BORING LOCATIONS WERE LOCATED USING A HANDHELD GPS. CLE AND APEX BORING LOCATION INFORMATION WAS PROVIDED TO CEC BY FOTH.
3. EXISTING SITE INFORMATION WAS OBTAINED FROM PLANS ENTITLED "MASSCEC MAIN TERMINAL AS–BUILTS", DATED 5/10/2023, BY FOTH, AND PROVIDED ELECTRONICALLY TO CEC BY FOTH. CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.
4. APPROXIMATE LOCATION OF PROPOSED BULKHEAD AND PROPOSED CONCRETE PLATFORM OBTAINED FROM PLANS ENTITLED "PROPOSED SITE PLAN", DATED 2/29/2024, BY FOTH, AND PROVIDED ELECTRONICALLY TO CEC BY FOTH. CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.
5. TOP OF BEDROCK AT CEC–1A, CEC–6A, CEC–7A AND CEC–11A WAS ASSUMED BASED ON DEPTH OF SPLIT SPOON REFUSAL.
6. TOP OF BEDROCK AT CEC–9A AND CEC–23A MAY REPRESENT A LARGE BOULDER.

SCALE IN FEET

0 30 60


Civil & Environmental Consultants, Inc.

31 Bellows Road
Raynham, MA 02767

Ph: 774.501.2176

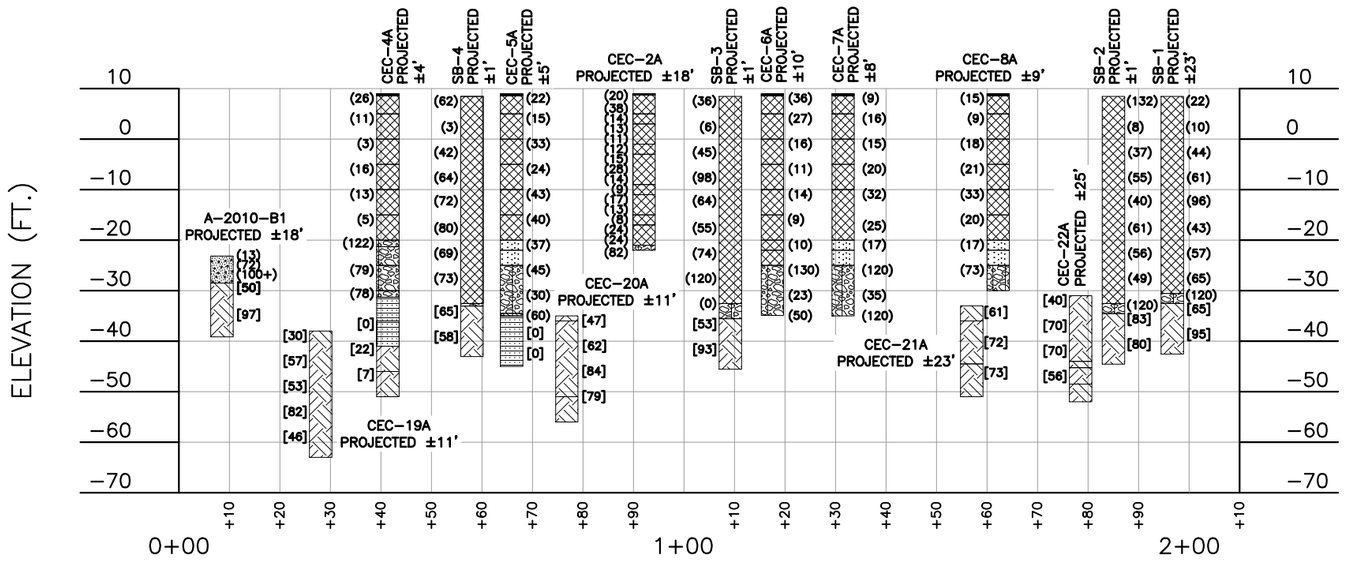
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FOTH INFRASTRUCTURE & ENVIRONMENT, LLC
PROPOSED SHUSTER BULKHEAD
4 WRIGHT STREET, NEW BEDFORD, MA

TOP OF BEDROCK CONTOUR MAP

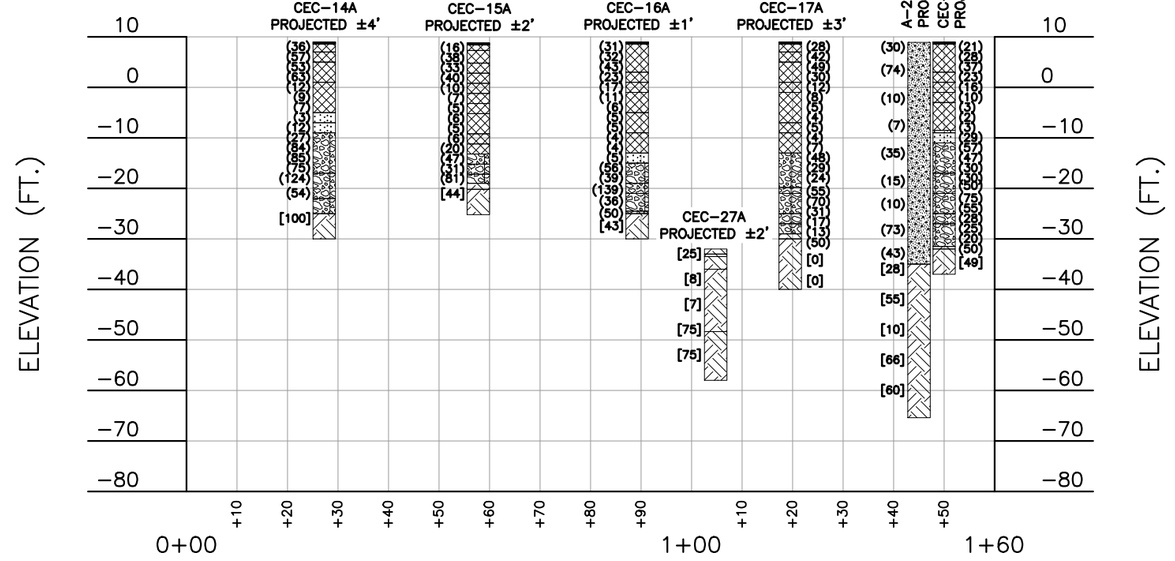
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | TES | APPROVED BY: | JCW | FIGURE NO.: | 3 |
| DATE: | APRIL 2025 | DWG SCALE: | 1"=30' | PROJECT NO: | 332-344 | | |

P:\330-000\332-344\-CADD\Dwg\GT02 - Site 4 - Shuster Bulkhead\332344-GT02-Boring Location Plan.dwg[FIGURE 3] LS:(4/3/2025 - abucco) - LP: 4/3/2025 3:50 PM



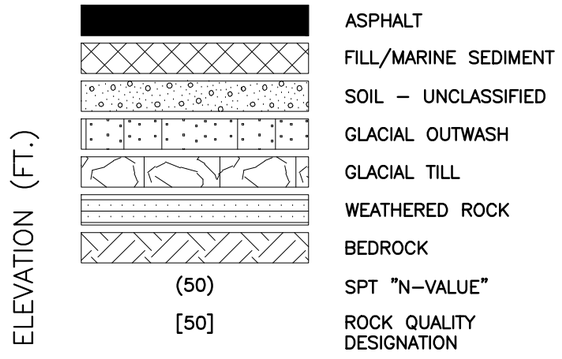

## ALIGNMENT 1 PROFILE

SCALE H:1"=30'; V:1"=30'




## ALIGNMENT 2 PROFILE

SCALE H:1"=30'; V:1"=30'




SCALE IN FEET

0 30 60

### NOTES/REFERENCES

1. CEC−19A WAS OFFSET APPROXIMATELY 10 FEET NORTH FOR CLARITY. CEC−20A WAS OFFSET APPROXIMATELY 5 FEET SOUTH FOR CLARITY. CEC−22A WAS OFFSET APPROXIMATELY 5 FEET NORTH FOR CLARITY.

2. A−2010−B1 AND A−2011−LB−B10 WERE PREVIOUSLY PERFORMED BY APEX ENVIRONMENTAL, INC. SB−1, SB−2, SB−3, AND SB−4 WERE PREVIOUSLY PERFORMED BY CLE ENGINEERING. MOST SOIL DESCRIPTIONS IN THE APEX LOGS DO NOT CONTAIN SOIL ORIGINS AND ARE THEREFORE CONSIDERED "SOIL − UNCLASSIFIED" IN THE ABOVE PROFILES.

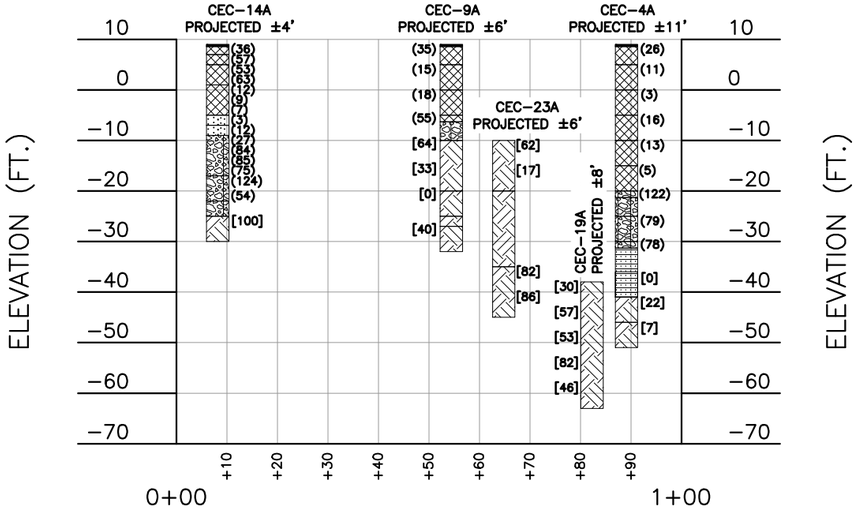

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FOTH INFRASTRUCTURE & ENVIORNMENT, LLC
PROPOSED SHUSTER BULKHEAD
4 WRIGHT STREET, NEW BEDFORD, MA

SUBSURFACE CROSS SECTIONS

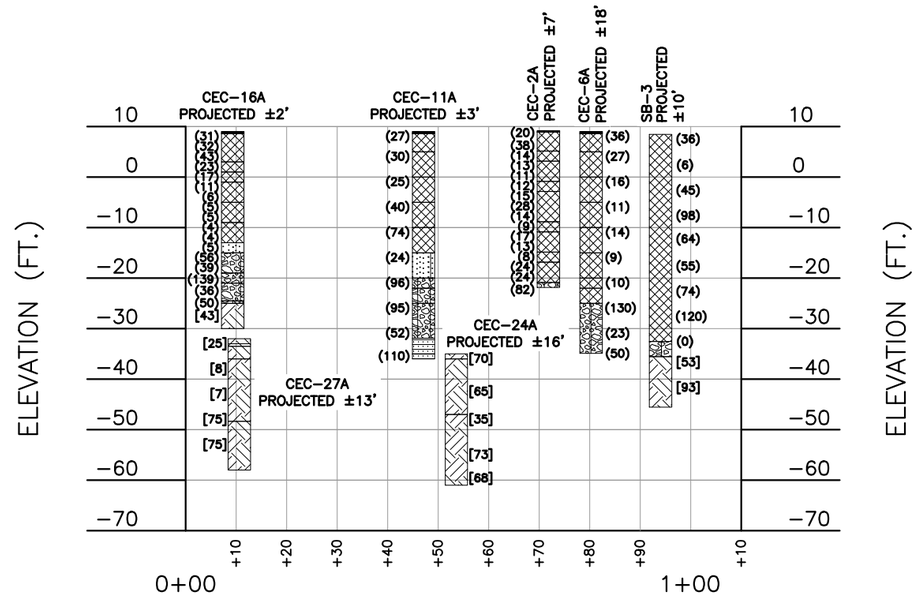
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | TES | APPROVED BY: | JCW | FIGURE NO.: | 4 |
| DATE: | APRIL 2025 | DWG SCALE: | AS SHOWN | PROJECT NO: | 332-344 | | |

P:\330−000\332−344\−CADD\Dwg\GT02 − Site 4 − Shuster Bulkhead\332344−GT02−Boring Log Sections.dwg[FIGURE 4] LS:(3/28/2025 − abucco) − LP: 4/2/2025 4:08 PM



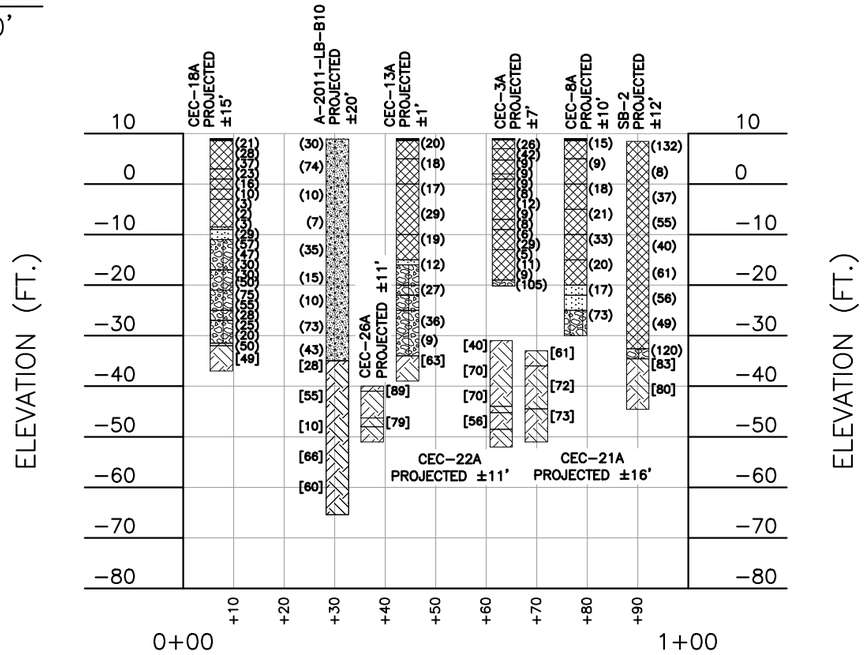

## ALIGNMENT 3 PROFILE

SCALE H:1"=30'; V:1"=30'




## ALIGNMENT 4 PROFILE

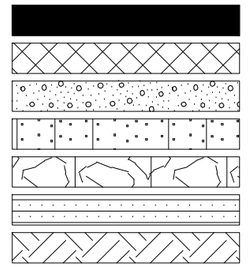
SCALE H:1"=30'; V:1"=30'




## ALIGNMENT 5 PROFILE

SCALE H:1"=30'; V:1"=30'

## LEGEND



- ASPHALT
- FILL/MARINE SEDIMENT
- SOIL – UNCLASSIFIED
- GLACIAL OUTWASH
- GLACIAL TILL
- WEATHERED ROCK
- BEDROCK
- (50) SPT "N–VALUE"
- [50] ROCK QUALITY DESIGNATION

SCALE IN FEET

0 30 60

## NOTES/REFERENCES

1. SB–3 WAS MOVED APPROXIMATELY 5 FEET SOUTH FOR CLARITY.
2. A–2010–B1 AND A–2011–LB–B10 WERE PREVIOUSLY PERFORMED BY APEX ENVIRONMENTAL, INC. SB–1, SB–2, SB–3, AND SB–4 WERE PREVIOUSLY PERFORMED BY CLE ENGINEERING. MOST SOIL DESCRIPTIONS IN THE APEX LOGS DO NOT CONTAIN SOIL ORIGINS AND ARE THEREFORE CONSIDERED "SOIL – UNCLASSIFIED" IN THE ABOVE PROFILES.


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FOTH INFRASTRUCTURE & ENVIORNMENT, LLC
PROPOSED SHUSTER BULKHEAD
4 WRIGHT STREET, NEW BEDFORD, MA

SUBSURFACE CROSS SECTIONS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AMB | CHECKED BY: | TES | APPROVED BY: | JCW | FIGURE NO.: | 5 |
| DATE: | APRIL 2025 | DWG SCALE: | AS SHOWN | PROJECT NO: | 332-344 | | |

P:\330-000\332-344\-CADD\Dwg\GT02 - Site 4 - Shuster Bulkhead\332344-GT02-Boring Log Sections.dwg[FIGURE 5] LS:(3/28/2025 - abucco) - LP: 4/2/2025 4:08 PM

# APPENDIX C

# TEST BORING LOGS

**PERFORMED BY CIVIL & ENVIRONMENTAL CONSULTANTS (2023-2024)**

# Rock Types

| Rock Name | Characteristics | Symbol |
|---|---|---|
| Claystone | Clay sized particles that are consolidated, lacking fissility. | |
| Coal | Black and shiny, can break into cubes or conchoidally. | |
| Conglomerate | Gravel sized grains and larger held together by finer material, called a breccia if clasts are angular. | |
| Limestone | Effervesses w/ diluted HCl, can be composed of clay up to gravel particles (fossils). | |
| Sandstone | Primarily sand sized particles modified w/ the descriptor fine, medium, or coarse. | |
| Shale | Clay sized particles, shale has fissility which is a horizontal sheet-like or laminated feature. | |
| Siltstone | Composed of silt, normally breaks as irregular chunks. | |

# Rock Quality Descriptions

## Weathering

**Completely Weathered:** All rock material is decomposed and/or disintegrated. The original rock structure may still be intact.

**Highly Weathered:** More than half of the rock material is decomposed. Fresh rock is present only as a discontinuous framework or as corestones.

**Moderately Weathered:** Less than half of the rock material is decomposed. Fresh rock is present at a discontinuous framework or as corestones.

**Slightly Weathered:** Discoloration or staining indicates weathering of rock material on discontinuity surfaces. Rock may be discolored and softened.

**Fresh:** No visible signs of rock material weathering.

## RQD

| Descriptor | % |
|---|---|
| Very Poor | <25 |
| Poor | 25-50 |
| Fair | 50-75 |
| Good | 75-90 |
| Excellent | >90 |

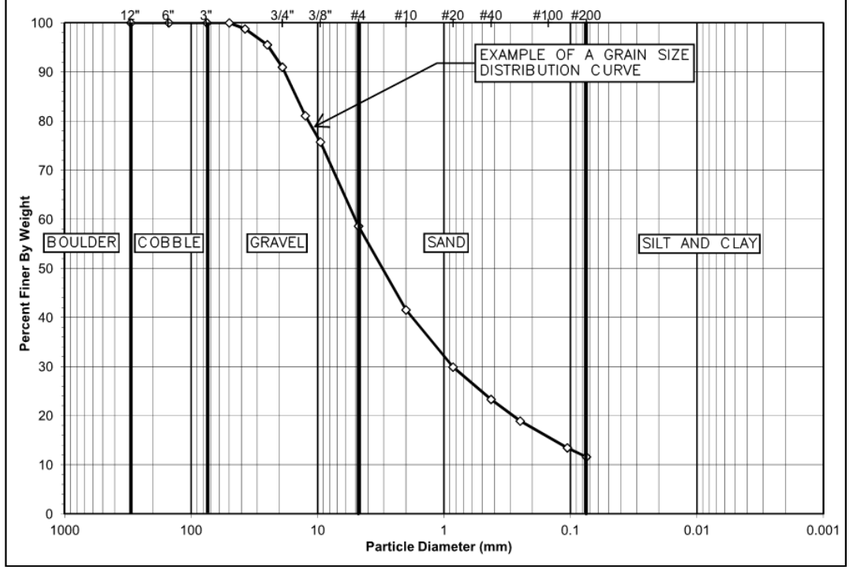
## Brokenness

| Descriptor | Fracture Spacing (in & ft) |
|---|---|
| Very Broken | <1 (<0.08) |
| Broken | 1-3 (0.08-0.25) |
| Moderately Broken | 3-6 (0.25-0.5) |
| Slightly Broken | >6 (>0.5) |

## Rock Hardness

| Descriptor | Field Criterion | Relative Unconfined Compressive Strength |
|---|---|---|
| Very Hard | Difficult to break w/ Hammer | > 30,000 psi |
| Hard | Hand-held sample breaks w/ Hammer | 8,000 to 30,000 psi |
| Medium Hard | Cannot scrape surface w/ knife | 2,000 to 8,000 psi |
| Soft | Cutting or scraping w/ knife difficult | 500 to 2,000 psi |
| Very Soft | Can be cut w/ knife | < 500 psi |

# Grain Size Distribution Curve




## UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS
(more than 50% of material is larger than No. 200 sieve size.)

| | | | |
|---|---|---|---|
| GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size | Clean Gravels (Less than 5% fines) | GW | Well-graded gravels, gravel-sand mixtures, little or no fines |
| | | GP | Poorly-graded gravels, gravel-sand mixtures, little or no fines |
| | Gravels with fines (More than 12% fines) | GM | Silty gravels, gravel-sand-silt mixtures |
| | | GC | Clayey gravels, gravel-sand-clay mixtures |
| SANDS 50% or more of coarse fraction smaller than No. 4 sieve size | Clean Sands (Less than 5% fines) | SW | Well-graded sands, gravelly sands, little or no fines |
| | | SP | Poorly graded sands, gravelly sands, little or no fines |
| | Sands with fines (More than 12% fines) | SM | Silty sands, sand-silt mixtures |
| | | SC | Clayey sands, sand-clay mixtures |

FINE-GRAINED SOILS
(50% or more of material is smaller than No. 200 sieve size.)

| | | | |
|---|---|---|---|
| SILTS AND CLAYS Liquid limit less than 50% | | ML | Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity |
| | | CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays |
| | | OL | Organic silts and organic silty clays of low plasticity |
| SILTS AND CLAYS Liquid limit 50% or greater | | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts |
| | | CH | Inorganic clays of high plasticity, fat clays |
| | | OH | Organic clays of medium to high plasticity, organic silts |
| HIGHLY ORGANIC SOILS | | PT | Peat and other highly organic soils |

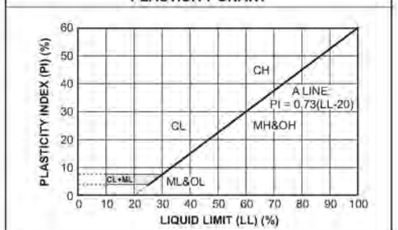
## LABORATORY CLASSIFICATION CRITERIA

| | | |
|---|---|---|
| GW | $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3 | |
| GP | Not meeting all gradation requirements for GW | |
| GM | Atterberg limits below "A" line or P.I. less than 4 | Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols |
| GC | Atterberg limits above "A" line with P.I. greater than 7 | |
| SW | $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3 | |
| SP | Not meeting all gradation requirements for GW | |
| SM | Atterberg limits below "A" line or P.I. less than 4 | Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols |
| SC | Atterberg limits above "A" line with P.I. greater than 7 | |

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

| | |
|---|---|
| Less than 5 percent | GW, GP, SW, SP |
| More than 12 percent | GM, GC, SM, SC |
| 5 to 12 percent | Borderline cases requiring dual symbols |

## PLASTICITY CHART




# Glossary

**Alluvial Soil or Alluvium:** Soil deposited by water in a river, stream, floodplain, or delta.

**Bedrock:** Materials underlying soil or other unconsolidated surficial materials in which refusal is consistently encountered on lithified, undisturbed, natural bedrock.

**Colluvial Soil or Colluvium:** Incoherent soil on or at the base of a slope deposited by gravity or slope movement.

**Fill:** Soil derived from natural soil, rock, or processed materials that was placed by artificial methods, such as construction, waste disposal, or dumping.

**Glacial Outwash:** Soil, typically sand and gravel, deposited by glacial streams or meltwater in a preexisting valley or over a plain.

**Glacial Till:** Soil deposited by and underneath a glacier, generally consisting of a heterogeneous, unstratified mixture of clay, sand, gravel, and boulders.

**N-Value:** The blow count representation of the penetration resistance of the soil determined by the Standard Penetration Test (SPT). It is the sum of the number of blows required to drive the sampler the second and third 6-inch increments (sample depth interval of 6 to 18 inches) and is recorded in blows per foot (bpf). The N-value is considered to be an indication of the relative density of coarse-grained soils (sand and gravel) or consistency of fine-grained soils (silt and clay).

**Pocket Pen (PP):** Field penetration test performed using a hand-held penetrometer that estimates unconfined compressive strength of cohesive soil in tons per square foot (tsf).

**Recovery %:** Total length of rock core or soil sample retrieved divided by the total length of the core run or sample interval, expressed as a percentage.

**Refusal:** The depth at which greater than 50 SPT hammer blows are required to drive the sampling spoon 6 inches or less.

**Residual Soil or Residuum:** Soil derived from the physical or chemical weathering of the underlying parent bedrock, generally with N-values less than 30 and 50 bpf in cohesive and cohesionless materials, respectively.

**Rock Quality Designation (RQD):** The sum of the length of intact rock core pieces longer than 4 inches (excluding mechanical breaks) divided by the total length of the core run, expressed as a percentage.

**Shelby Tube:** A 2" to 3" diameter, thin walled sampling tube that is pushed into the soil to obtain a relatively undisturbed soil sample for geotechnical laboratory tests.

**Split Spoon Sampler:** A soil sampling tube which is driven, retrieved, and split-open lengthwise for removal and visual inspection, and testing of the soil obtained.

**Standard Penetration Test (SPT) ASTM D1586 :** Field penetration test consisting of driving a 2-inch outside diameter split-spoon sampler 18 inches using a 140-pound hammer free falling a distance of 30 inches. The number of blows required to advance the spoon through successive 6-inch increments is recorded to determine the N-value.

**Weathered Rock:** Materials derived from lithified, undisturbed, natural bedrock which are able to be sampled with a split-spoon. Cohesive and cohesionless materials generally have N-values greater than 30 and 50 bpf, respectively.

# N-Value Rating

### Fine-Grained Soils (Silt and Clay)

| Consistency | Blows/ft | PP (tsf) |
|---|---|---|
| Very Soft | 0-2 | <0.25 |
| Soft | 3-4 | 0.25-0.5 |
| Medium Stiff | 5-8 | 0.5-1 |
| Stiff | 9-15 | 1-2 |
| Very Stiff | 16-32 | 2-4 |
| Hard | >32 | >4 |

### Coarse-Grained Soils (Sand and Gravel)

| Relative Density | Blows/ft |
|---|---|
| Very Loose | 0-4 |
| Loose | 5-10 |
| Medium Dense | 11-30 |
| Dense | 31-50 |
| Very Dense | >50 |

# Unconsolidated Material

| Term | Grain Size in mm (in) | Approximate Example Size |
|---|---|---|
| Clay and Silt | <.075 | can't see grains to barely visible |
| Fine Sand | 0.075-0.4 | table salt to sugar |
| Med. Sand | 0.4-2.0 (~<1/16) | openings in a window screen |
| Coarse Sand | 2.0-4.75 (~1/16-1/8) | sidewalk salt |
| Gravel | 4.75-75 (~1/8-3) | pea to tennis ball |
| Cobble | 75-300 (3-12) | tennis ball to basketball |
| Boulder | >300 (>12) | larger than a basketball |

**Other Features** – Used to describe other identifiable, pertinent features (e.g., angularity of coarse-grained soils, organics, construction debris, etc.)

| Term | % |
|---|---|
| Trace | < 5 |
| Few | 5-15 |
| Some | 15-45 |

**Moisture Content**
Dry: Sample is dusty or obviously dry.
Moist: Anything that does not fit the definition of dry or wet.
Wet: Sample contains free water.

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Definitions of Standard Terms and Symbols

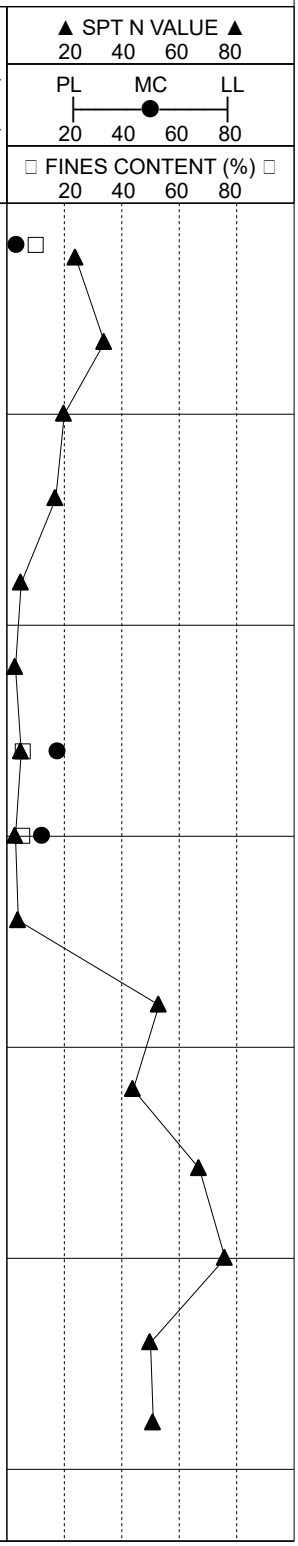
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-1A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/14/2023 **DATE COMPLETED** 11/14/2023
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624358 **LONGITUDE** -70.914750
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 11/14/2023 6.0 ft / Elev 3.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | MATERIAL DESCRIPTION | REMARKS | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | PID (PPM) |
|---|---|---|---|---|---|---|---|
| 0 | 9 | 0.3 ft 3" Asphalt (8.7) | | | | | |
| | | Light Brown, POORLY-GRADED SAND WITH SILT, FEW GRAVEL, Dry, Medium Dense, SP-SM, **(FILL)** | | SS S-1 | 70 | 10-11-13-12 (24) | 0.0 |
| | | 2.0 ft (7.0) Light Brown, Silty Sand, Trace Gravel, Dry to Moist, Medium Dense To Dense, SM, **(FILL)** | | SS S-2 | 70 | 16-19-15-19 (34) | 0.0 |
| 5 | | ▽ | | SS S-3 | 65 | 12-6-14-13 (20) | 0.1 |
| | | | | SS S-4 | 85 | 11-8-9-7 (17) | 0.1 |
| | | 8.0 ft (1.0) Brown, Poorly-Graded Sand with Silt, Trace Gravel, Wet, Loose, SP-SM, **(FILL)** | | SS S-5 | 55 | 3-2-3-3 (5) | 0.3 |
| 10 | 1 | 10.0 ft (-1.0) Brown, Poorly-Graded Sand with Silt, Few Gravel, Wet, Very Loose, SP-SM, **(FILL)** | | SS S-6 | 65 | 2-1-2-1 (3) | 0.4 |
| | | 12.0 ft (-3.0) Brown, POORLY-GRADED SAND WITH SILT, FEW GRAVEL, Wet, Loose, SP-SM, **(FILL)** | | SS S-7 | 55 | 2-2-3-5 (5) | 0.2 |
| | | 14.0 ft (-5.0) Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Very Loose to Loose, SP-SM, **(FILL)** | | SS S-8 | 65 | 5-1-2-1 (3) | 0.1 |
| 15 | | | | SS S-9 | 80 | 3-3-1-9 (4) | 0.5 |
| | | 17.5 ft (-8.5) 18.0 ft (-9.0) Dark Brown, Slightly Organic Silty Sand, Trace Gravel, Trace Shells, Wet, Loose, SM, **(OUTWASH)** | | SS S-10 | 90 | 13-23-30-31 (53) | 0.2 |
| 20 | 11 | 20.0 ft (-11.0) Brown, Silty Sand with Gravel, Wet, Very Dense, SM, **(TILL)** | | SS S-11 | 100 | 15-16-28-29 (44) | 0.1 |
| | | 21.0 ft (-12.0) Grayish Brown, Poorly-Graded Sand with Silt, Few Gravel, Wet, Dense, SP-SM, **(TILL)** | | SS S-12 | 91 | 12-30-37-50/ 0.3' (67) | 0.5 |
| | | Gray, Silty Sand, Trace Gravel, Wet, Very Dense, SM, **(TILL)** | Split Spoon Refusal at 23.8 ft bgs. | SS S-13 | 90 | 14-32-44-32 (76) | 0.2 |
| 25 | | | | SS S-14 | 75 | 29-25-25-29 (50) | 0.5 |
| | | | | SS S-15 | 83 | 28-20-31-50/ 0.3' (51) | 0.1 |
| 30 | 21 | 29.8 ft (-20.8) End of boring at 29.8 feet | Split Spoon And Roller Bit Refusal at 29.8 ft bgs. | | | | |



Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-2A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/14/2023 **DATE COMPLETED** 11/15/2023
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624247 **LONGITUDE** -70.914672
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 11/14/2023 8.0 ft / Elev 1.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | MATERIAL DESCRIPTION | REMARKS | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | PID (PPM) |
|---|---|---|---|---|---|---|---|
| 0 | 9 | 0.2 ft / 8.8: 3" Asphalt<br>Tan, Poorly-Graded Sand with Silt, Dry to Moist, Medium Dense to Dense, SP-SM, **(FILL)** | | SS S-1 | 75 | 9-10-10-17 (20) | 0.2 |
| | | | | SS S-2 | 75 | 15-19-19-19 (38) | 0.1 |
| 4.0 ft | 5.0 | | | | | | |
| 5 | | | | SS S-3 | 70 | 10-7-7-8 (14) | 0.1 |
| 6.0 ft | 3.0 | Tan to Brown, Poorly-Graded Sand with Silt and Gravel, Moist to Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-4 | 70 | 6-6-7-7 (13) | 0.2 |
| | | | | SS S-5 | 50 | 2-4-7-5 (11) | 0.1 |
| 10 | -1.0 / 1 | 10.0 ft: Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-6 | 70 | 5-5-7-9 (12) | 0.3 |
| 12.0 ft | -3.0 | Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-7 | 90 | 4-5-10-14 (15) | 0.2 |
| 15 | | | | SS S-8 | 55 | 7-12-16-24 (28) | 0.1 |
| | | | | SS S-9 | 55 | 7-5-9-14 (14) | 0.3 |
| 18.0 ft | -9.0 | Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Loose, SP-SM, **(FILL)** | | SS S-10 | 75 | 6-4-5-6 (9) | |
| 20.0 ft | -11.0 / -11 | Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-11 | 90 | 5-7-10-12 (17) | 0.2 |
| 20 | | | | SS S-12 | 70 | 5-6-7-7 (13) | 0.2 |
| 24.0 ft | -15.0 | | | | | | |
| | | Brown, POORLY-GRADED SAND WITH SILT, FEW GRAVEL, Wet, Loose, SP-SM, **(FILL)** | | SS S-13 | 75 | 4-5-3-4 (8) | 0.1 |
| 25 | | 26.0 ft: Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | | SS S-14 | 95 | 5-9-15-36 (24) | 0.1 |
| | | | | SS S-15 | 75 | 15-11-13-22 (24) | 0.2 |
| 30 | -21.0 / -21 | 30.0 ft | Split spoon refusal at 31 ft bgs. | | | | |
| 31.0 ft | -22.0 | Gray, Silty Sand with Gravel, Wet, Very Dense, SM, **(TILL)** | | SS S-16 | 100 | 7-32-50/0' | 0.1 |
| | | End of boring at 31.0 feet | | | | | 0.4 |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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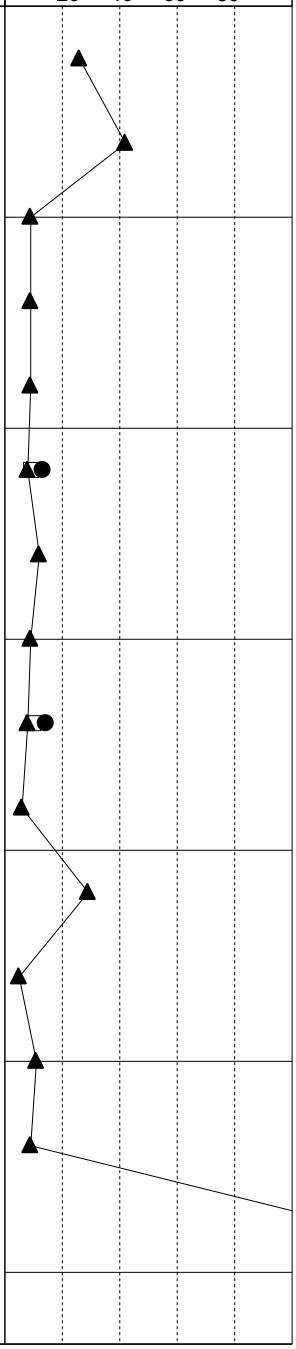
# BORING NUMBER CEC-3A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 11/15/2023 **DATE COMPLETED** 11/15/2023
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624011 **LONGITUDE** -70.914611
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 11/15/2023 4.0 ft / Elev 5.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | MATERIAL DESCRIPTION | ELEV (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | PID (PPM) |
|---|---|---|---|---|---|---|
| 0 | 0.2 ft 3" Asphalt | 8.8 | | | | |
| | Tan, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)** | | SS S-1 | 60 | 7-9-17-16 (26) | 0.1 |
| | 2.0 ft Tan, Poorly-Graded Sand with Silt and Gravel, Dry, Dense, SP-SM, **(FILL)** | 7.0 | SS S-2 | 65 | 15-27-15-13 (42) | 0.3 |
| | 4.2 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Loose, SP-SM, **(FILL)** | 4.8 | SS S-3 | 55 | 5-4-5-7 (9) | 0.1 |
| | 7.0 ft Gray To Brown, Silty Sand with Gravel, Wet, | 2.0 | SS S-4 | 75 | 7-5-4-7 (9) | 0.1 |
| | 8.0 ft Loose, SM, **(FILL)** Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Loose, SP-SM, **(FILL)** | 1.0 | SS S-5 | 50 | 4-5-4-5 (9) | 0.1 |
| | 10.0 ft Brown, WELL-GRADED SAND WITH SILT AND GRAVEL, Wet, Loose, SW-SM, **(FILL)** | -1.0 | SS S-6 | 55 | 2-2-6-5 (8) | 0.1 |
| | 12.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Loose to Medium Dense, SP-SM, **(FILL)** | -3.0 | SS S-7 | 70 | 4-5-7-9 (12) | 0.1 |
| | | | SS S-8 | 50 | 6-4-5-6 (9) | 0.1 |
| | 16.0 ft Brown, WELL-GRADED SAND WITH SILT, FEW GRAVEL, Wet, Loose, SW-SM, **(FILL)** | -7.0 | SS S-9 | 85 | 4-4-4-6 (8) | 0.1 |
| | 18.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Loose to Medium Dense, SP-SM, **(FILL)** | -9.0 | SS S-10 | 55 | 3-3-3-6 (6) | 0.2 |
| | | | SS S-11 | 60 | 9-13-16-24 (29) | 0.0 |
| | 22.0 ft Dark Gray, Silty Sand with Gravel, Trace Shells, Wet, Loose to Medium Dense, SM, **(FILL)** | -13.0 | SS S-12 | 38 | 2-3-2-3 (5) | 0.0 |
| | | | SS S-13 | 38 | 7-5-6-4 (11) | 0.1 |
| | | | SS S-14 | 56 | 2-5-4-9 (9) | 0.0 |
| | 28.0 ft Gray, Silty Sand with Gravel, Trace Shells, Wet, Very Dense, SM, **(TILL)** | -19.0 | SS S-15 | 64 | 25-50-55/0.2' (105) | 0.0 |
| | 29.2 ft End of boring at 29.2 feet | -20.2 | | | | |

Split spoon refusal at 29.2 ft bgs.



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# BORING NUMBER CEC-4A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/03/2024 **DATE COMPLETED** 06/05/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624391 **LONGITUDE** -70.914674
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING 06/05/2024 6.0 ft / Elev 3.0 ft
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | ELEVATION (ft) | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | 9 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft / 8.6: 5" Asphalt<br>Brown, Poorly-Graded Sand with Silt, Trace Gravel, Dry, Medium Dense, SP-SM, **(FILL)** | SS S-1 | 75 | 8-6-20-20 (26) |
| | | | 4.0 ft / 5.0: Brown, Poorly-Graded Sand with Silt, Moist, Medium Dense, SP-SM, **(FILL)** | SS S-2 | 40 | 16-5-6-6 (11) |
| 10 | -1 | | 9.0 ft / 0.0: Brown, SILTY SAND, Wet, Very Loose, SM, **(FILL)** | SS S-3 | 45 | 2-2-1-4 (3) |
| | | Composite analytical sample obtained from 12-24 ft. | 14.0 ft / -5.0: Brown, SILTY SAND, Wet, Medium Dense, SM, **(FILL)** | SS S-4 | 50 | 7-7-9-8 (16) |
| 20 | -11 | | 19.0 ft / -10.0: Brownish Gray, Poorly-Graded Sand, Wet, Medium Dense, SP, **(FILL)** | SS S-5 | 100 | 5-7-6-7 (13) |
| | | Composite analytical sample obtained from 24-36 ft. | 24.0 ft / -15.0: Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Loose, SP-SM, **(FILL)** | SS S-6 | 35 | 6-3-2-1 (5) |
| 30 | -21 | Split spoon refusal at 30.3 ft bgs. | 29.0 ft / -20.0: Brownish Gray to Orange, Poorly-Graded Sand with Gravel, Wet, Very Dense, SM, **(TILL)**<br>30.3 ft / -21.3 | SS S-7 | 100 | 24-22-100/0.3' (122) |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-4A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 34.0 ft | | | -25.0 | | | |
| 35 | | Brownish Gray to Orange, Silty Sand with Gravel, Wet, Very Dense, SM, **(TILL)** | | SS S-8 | 100 | 50-54-25-64 (79) |
| 39.0 ft | | | -30.0 | | | |
| 40 | Split spoon refusal at 40.3 ft bgs. | Brown to Gray, Sandy Silt, Wet, Hard, ML, **(TILL)** | -31 | SS S-9 | 100 | 14-13-65/0.3' (78) |
| 40.3 ft | | | -31.3 | | | |
| | Started coring at 45 ft bgs. | | | | | |
| | Core Rate | | | | | |
| 45 | 0.5 min/ft | No Recovery | | RC C-1 | 0 (0) | |
| | 0.5 min/ft | | | | | |
| | 0.75 min/ft | | | | | |
| | 1 min/ft | | | | | |
| | 2 min/ft | | | | | |
| 50.0 ft | | | -41.0 | | | |
| 50 | 1.75 min/ft | Dark Gray, Fine to Coarse Grained Gabbro, Slightly Weathered, Broken, Soft, Unconfined Compressive Strength = 6,915 psi, **(BEDROCK)** | -41 | RC C-2 | 66 (22) | |
| | 1.5 min/ft | | | | | |
| | 3.25 min/ft | | | | | |
| | 3.25 min/ft | | | | | |
| | 3.5 min/ft | | | | | |
| 55.0 ft | | | -46.0 | | | |
| 55 | 2.25 min/ft | Gray to White, Coarse Grained Granite, Slightly Weathered, Very Broken, Medium Hard, **(BEDROCK)** | | RC C-3 | 35 (7) | |
| | 1.25 min/ft | | | | | |
| | 1 min/ft | | | | | |
| | 1 min/ft | | | | | |
| | 1.5 min/ft | | | | | |
| 60.0 ft | | | -51.0 | | | |
| 60 | | End of boring at 60.0 feet | -51 | | | |
| 65 | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-5A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/05/2024 **DATE COMPLETED** 06/07/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624326 **LONGITUDE** -70.914652
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING 06/07/2024 4.0 ft / Elev 5.0 ft
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING N/A

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft 5" Asphalt<br>Brown, Poorly-Graded Sand with Silt, Trace Gravel, Dry, Medium Dense, SP-SM, **(FILL)** | 8.6 / 9 | SS S-1 | 33 | 9-9-13-15 (22) |
| 4.0 ft | | Brown, SILTY SAND, Moist, Medium Dense, SM, **(FILL)** | 5.0 | SS S-2 | 40 | 9-7-8-9 (15) |
| 5 | | | | | | |
| 9.0 ft | | Brown, Poorly-Graded Sand with Silt, Trace Gravel, Wet, Dense, SP-SM, **(FILL)** | 0.0 / -1 | SS S-3 | 50 | 17-15-18-9 (33) |
| 10 | Composite analytical sample obtained from 12-24 ft. | | | | | |
| 14.0 ft | | Brown, WELL-GRADED SAND WITH SILT, Wet, Medium Dense, SW-SM, **(FILL)** | -5.0 | SS S-4 | 40 | 13-11-13-10 (24) |
| 15 | | | | | | |
| 19.0 ft | | Brown, Poorly-Graded Sand, Wet, Dense, SP, **(FILL)** | -10.0 / -11 | SS S-5 | 65 | 23-23-20-35 (43) |
| 20 | | | | | | |
| 24.0 ft | Composite analytical sample obtained from 24-36 ft. | Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Dense, SP-SM, **(FILL)** | -15.0 | SS S-6 | 40 | 20-16-24-19 (40) |
| 25 | | | | | | |
| 29.0 ft | | Dark Gray, Poorly-Graded Sand with Silt, Trace Shells, Wet, Dense, SM, **(OUTWASH)** | -20.0 / -21 | SS S-7 | 40 | 7-15-22-17 (37) |
| 30 | | | | | | |
| 31.0 ft | | | -22.0 | | | |

SPT N VALUE: 20 40 60 80
PL MC LL: 20 40 60 80
FINES CONTENT (%): 20 40 60 80

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# BORING NUMBER CEC-5A



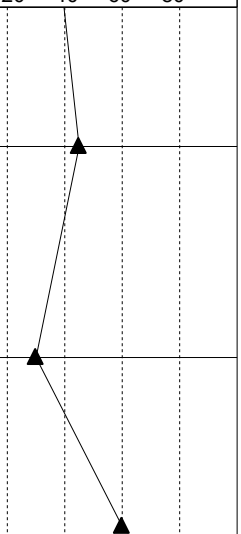
**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|---|
| | | | 34.0 ft — Brownish Gray to Orange, Silty Sand with Gravel, Wet, Dense to Very Dense, SM, **(TILL)** | -25.0 | | | |
| 35 | | | | | SS S-8 | 60 | 34-18-27-23 (45) |
| 40 | | | | -31 | SS S-9 | 50 | 17-12-18-30 (30) |
| | | Split spoon refusal at 44 ft bgs. | 43.5 ft — No Recovery | -34.5 | | | |
| | | Core Rate | 44.0 ft — Gray, Granite, Highly Weathered, Very Broken, Medium Hard, **(WEATHERED ROCK)** | -35.0 | SS S-10 | 0 | 60/0' (60) |
| 45 | | 2.25 min/ft | | | | | |
| | | 1.5 min/ft | | | | | |
| | | 1.5 min/ft | | | RC C-1 | 12 (0) | |
| | | 1.75 min/ft | | | | | |
| | | 1.25 min/ft | | | | | |
| | | 2.25 min/ft | | | | | |
| 50 | | | | -41 | | | |
| | | 1 min/ft | | | | | |
| | | 0.25 min/ft | | | RC C-2 | 5 (0) | |
| | | 1 min/ft | | | | | |
| | | 1 min/ft | | | | | |
| | | Sand infiltration noted at about 52 ft bgs. | 54.0 ft — End of boring at 54.0 feet | -45.0 | | | |
| 55 | | | | | | | |
| 60 | | | | -51 | | | |
| 65 | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80

PL MC LL
20 40 60 80

□ FINES CONTENT (%) □
20 40 60 80



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# BORING NUMBER CEC-6A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/11/2024 **DATE COMPLETED** 06/11/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624186 **LONGITUDE** -70.914618
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
AT END OF CORING 06/11/2024 6.5 ft / Elev 2.5 ft
24 HRS AFTER DRILLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft 5" Asphalt<br>Dark Brown, Poorly-Graded Sand with Silt and Gravel, Dry, Dense, SP-SM, **(FILL)** | 8.6 / 9 | SS S-1 | 90 | 17-14-22-20 (36) |
| 5 | | 4.0 ft<br>Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Moist, Medium Dense, SM, **(FILL)** | 5.0 | SS S-2 | 50 | 13-13-14-9 (27) |
| 10 | | 9.0 ft<br>Brownish Gray, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(FILL)** | 0.0 / -1 | SS S-3 | 50 | 11-6-10-7 (16) |
| 15 | Composite analytical sample obtained from 12-24 ft. | 14.0 ft<br>Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | -5.0 | SS S-4 | 25 | 6-5-6-5 (11) |
| 20 | | 19.0 ft<br>Brown, POORLY-GRADED SAND WITH SILT, Wet, Medium Dense, SP-SM, **(FILL)** | -10.0 / -11 | SS S-5 | 55 | 7-7-7-16 (14) |
| 25 | Composite analytical sample obtained from 24-36 ft. | 24.0 ft<br>Brown, POORLY GRADED SAND WITH GRAVEL, Wet, Loose, SP, **(FILL)** | -15.0 | SS S-6 | 25 | 5-4-5-4 (9) |
| 30 | | 29.0 ft<br>Brownish Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)**<br>31.0 ft | -20.0 / -21 / -22.0 | SS S-7 | 15 | 5-4-6-18 (10) |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-6A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|---|
| | | | 34.0 ft — Brown, SILTY SAND WITH GRAVEL, Wet, Very Dense to Medium Dense, SM, **(TILL)** | -25.0 | | | |
| 35 | | | | | SS S-8 | 70 | 40-40-90-74 (130) |
| 40 | | | | -31 | SS S-9 | 40 | 15-12-11-8 (23) |
| | | Split spoon refusal at 44 ft bgs. | 43.9 ft / 44.0 ft — No Recovery | -34.9 / -35.0 | S-10 | 0 | 50/0' |
| 45 | | | End of boring at 44.0 feet | | | | |
| 50 | | | | -41 | | | |
| 55 | | | | | | | |
| 60 | | | | -51 | | | |
| 65 | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-7A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/10/2024 **DATE COMPLETED** 06/11/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624150 **LONGITUDE** -70.914599
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
AT END OF CORING N/A
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)
24 HRS AFTER DRILLING 06/11/2024 5.0 ft / Elev 4.0 ft

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft 5" Asphalt<br>Brown, Poorly-Graded Sand with Silt, Dry, Loose, SP-SM, **(FILL)** | 8.6 | SS S-1 | 90 | 13-5-4-5 (9) |
| 5 | | 4.0 ft<br>Brown, SILTY SAND WITH GRAVEL, Moist, Medium Dense, SM, **(FILL)** | 5.0 | SS S-2 | 55 | 18-7-9-9 (16) |
| 10 | | 9.0 ft<br>Brown, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(FILL)** | 0.0 | SS S-3 | 75 | 11-7-8-8 (15) |
| 15 | Composite analytical sample obtained from 12-24 ft. | 14.0 ft<br>Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | -5.0 | SS S-4 | 40 | 4-8-12-6 (20) |
| 20 | | 19.0 ft<br>Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Dense to Medium Dense, SP-SM, **(FILL)** | -10.0 | SS S-5 | 50 | 14-15-17-12 (32) |
| 25 | Composite analytical sample obtained from 24-36 ft. | | | SS S-6 | 33 | 15-12-13-9 (25) |
| 30 | | 29.0 ft<br>Dark Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Medium Dense, SP-SM, **(OUTWASH)**<br>31.0 ft | -20.0<br>-22.0 | SS S-7 | 65 | 8-4-13-30 (17) |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-7A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|---|
| 35 | | | 34.0 ft<br>Brownish Orange, Silty Sand with Gravel, Moist, Very Dense to Dense, SM, **(TILL)** | -25.0 | SS S-8 | 55 | 21-37-83-74 (120) | |
| 40 | | | | -31 | SS S-9 | 40 | 31-16-19-14 (35) | |
| 45 | | Split spoon refusal at 44.1 ft bgs. | 44.0 ft<br>44.1 ft<br>No Recovery<br>End of boring at 44.1 feet | -35.0<br>-35.1 | SS S-10 | 0 | 120/0.1' (120) | |
| 50 | | | | -41 | | | | |
| 55 | | | | | | | | |
| 60 | | | | -51 | | | | |
| 65 | | | | | | | | |

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Raynham, MA 02767

# BORING NUMBER CEC-8A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/10/2024 **DATE COMPLETED** 06/10/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624067 **LONGITUDE** -70.914578
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 06/10/2024 5.5 ft / Elev 3.5 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft 5" Asphalt<br>Brown, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)** | 8.6 | SS S-1 | 40 | 10-6-9-6 (15) |
| | | 4.0 ft<br>Brown, SILTY SAND, Moist, Loose, SM, **(FILL)** | 5.0 | SS S-2 | 90 | 5-4-5-3 (9) |
| | | 9.0 ft<br>Brown, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(FILL)** | 0.0 | SS S-3 | 25 | 8-7-11-9 (18) |
| | Composite analytical sample obtained from 12-24 ft. | 14.0 ft<br>Brown, POORLY-GRADED SAND WITH GRAVEL, Wet, Medium Dense, SP, **(FILL)** | -5.0 | SS S-4 | 50 | 10-10-11-12 (21) |
| | | 19.0 ft<br>Brown, Poorly-Graded Sand with Silt, Wet, Dense, SP-SM, **(FILL)** | -10.0 | SS S-5 | 88 | 13-16-17-28 (33) |
| | Composite analytical sample obtained from 24-36 ft. | 24.0 ft<br>Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | -15.0 | SS S-6 | 35 | 15-10-10-11 (20) |
| | | 29.0 ft<br>Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Medium Dense, SP-SM, **(OUTWASH)**<br>31.0 ft | -20.0<br>-22.0 | SS S-7 | 40 | 6-7-10-6 (17) |

SPT N VALUE 20 40 60 80
PL MC LL 20 40 60 80
FINES CONTENT (%) 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-8A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|---|
| 35 | | | 34.0 ft<br>Brown, Silty Sand with Gravel, Wet, Very Dense, SM, **(TILL)** | -25.0 | SS S-8 | 45 | 95-33-40-24 (73) | |
| | | Casing broke off at 39 ft bgs. | 39.0 ft<br>End of boring at 39.0 feet | -30.0 | | | | |
| 40 | | | | -31 | | | | |
| 45 | | | | | | | | |
| 50 | | | | -41 | | | | |
| 55 | | | | | | | | |
| 60 | | | | -51 | | | | |
| 65 | | | | | | | | |

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# BORING NUMBER CEC-9A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/31/2024 **DATE COMPLETED** 06/03/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624378 **LONGITUDE** -70.914800
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING N/A
AT END OF CORING 06/03/2024 6.5 ft / Elev 2.5 ft
24 HRS AFTER DRILLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | Composite analytical sample collected from 0-12 ft bgs | 0.4 ft 5" Asphalt<br>Brown, SILTY SAND WITH GRAVEL, Dry, Dense, SM, **(FILL)** | 8.6 | SS S-1 | 50 | 15-20-15-8 (35) |
| 5 | | 4.0 ft<br>Brown, Poorly-Graded Sand with Silt, Moist, Medium Dense, SP-SM, **(FILL)** | 5.0 | SS S-2 | 71 | 9-9-6-7 (15) |
| 10 | | 9.0 ft<br>Brown, POORLY-GRADED SAND WITH GRAVEL, Wet, Medium Dense, SP, **(FILL)** | 0.0 | SS S-3 | 50 | 11-7-11-8 (18) |
| 15 | Split spoon refusal at 15.3 ft bgs. Washed down to 19 ft bgs. | 14.0 ft<br>Brown, Poorly-Graded Sand with Silt, Wet, Very Dense, SP-SM, **(FILL)**<br>15.3 ft | -5.0<br>-6.3 | SS S-4 | 38 | 3-5-50/0.3' |
| 20 | Core Rate<br>1.5 min/ft<br>1.25 min/ft<br>1.25 min/ft<br>0.75 min/ft<br>0.75 min/ft<br>1.25 min/ft | 19.0 ft<br>Gray, Coarse Grained Granite, Slightly Weathered, Slightly Broken to Moderately Broken, Medium Hard, Unconfined Compressive Strength = 11,697 psi, **(BEDROCK)** | -10.0 | RC C-1 | 87 (64) | |
| 25 | 1.25 min/ft<br>0.5 min/ft<br>1 min/ft<br>1.25 min/ft | | | RC C-2 | 68 (33) | |
| 30 | 1 min/ft<br>0.5 min/ft<br>0.5 min/ft | 29.0 ft<br>Gray, Coarse Grained Granite, Moderately Weathered, Very Broken, Medium Hard, **(BEDROCK)** | -20.0 | | | |

SPT N VALUE 20 40 60 80
PL MC LL 20 40 60 80
FINES CONTENT (%) 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-9A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|---|
| | | 1 min/ft | Gray, Coarse Grained Granite, Moderately Weathered, Very Broken, Medium Hard, **(BEDROCK)** | | RC C-3 | 28 (0) | | |
| | | 1 min/ft | | | | | | |
| | | Washed down to 36 ft bgs. | 34.0 ft | -25.0 | | | | |
| 35 | | | | | | | | |
| | | 1 min/ft | 36.0 ft | -27.0 | | | | |
| | | 0.75 min/ft | Gray to White, Coarse Grained Granite, Slightly Weathered, Moderately Broken, Medium Hard, **(BEDROCK)** | | | | | |
| | | 0.75 min/ft | | | RC C-4 | 83 (40) | | |
| | | 2.5 min/ft | | | | | | |
| 40 | | 2.5 min/ft | | -31 | | | | |
| | | | 41.0 ft | -32.0 | | | | |
| | | | End of boring at 41.0 feet | | | | | |
| 45 | | | | | | | | |
| 50 | | | | -41 | | | | |
| 55 | | | | | | | | |
| 60 | | | | -51 | | | | |
| 65 | | | | | | | | |

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# BORING NUMBER CEC-10A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/30/2024 **DATE COMPLETED** 05/31/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624300 **LONGITUDE** -70.914778
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: N/A; AT END OF CORING: 05/31/2024 6.0 ft / Elev 3.0 ft; 24 HRS AFTER DRILLING: N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft 5" Asphalt<br>Brown, Silty Sand, Dry, Medium Dense, SM, **(FILL)** | 8.6 / 9 | SS S-1 | 66 | 9-8-10-14 (18) |
| 4.0 ft | | Brown to Gray, Poorly-Graded Sand with Silt, Moist to Wet, Medium Dense, SP-SM, **(FILL)** | 5.0 | SS S-2 | 71 | 11-7-7-6 (14) |
| 10 | | | -1 | SS S-3 | 50 | 13-14-15-12 (29) |
| 14.0 ft | Composite analytical sample obtained from 12-24 ft. | Brown, SILTY SAND, Wet, Very Dense, SM, **(FILL)** | -5.0 | SS S-4 | 66 | 15-22-37-30 (59) |
| 19.0 ft | | Gray, Poorly-Graded Sand with Silt, Wet, Very Dense, SP-SM, **(FILL)** | -10.0 | SS S-5 | 58 | 18-28-30-30 (58) |
| 24.0 ft | | Dark Gray, Poorly-Graded Gravel with Silt, Wet, Medium Dense, GP-GM, **(OUTWASH)** | -15.0 | SS S-6 | 4 | 7-8-9-18 (17) |
| 29.0 ft | | Brown, SILTY SAND WITH GRAVEL, Wet, Very Dense, SM, **(TILL)** | -20.0 | SS S-7 | 38 | 21-24-45-34 (69) |
| 31.0 ft | | | -22.0 | | | |

SPT N VALUE 20 40 60 80
PL MC LL 20 40 60 80
FINES CONTENT (%) 20 40 60 80

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# BORING NUMBER CEC-10A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 34.0 ft | | Brown to Orange, Silty Sand with Gravel/ Weathered Rock, Wet, Medium Dense, SM, **(TILL)** | -25.0 | | | |
| 35 | | | | SS S-8 | 42 | 26-15-14-12 (29) |
| 36.0 ft | | | -27.0 | | | |
| | Split spoon refusal at 39 ft bgs. Began rock coring at 41 ft bgs. | | | | | |
| 39.0 ft | | No Recovery | -30.0 | SS S-9 | 0 | 50/0' |
| 40 | Core Rate | | -31 | | | |
| 41.0 ft | 2 min/ft | | -32.0 | | | |
| | 2 min/ft | Gray, Coarse Grained Granite, Slightly Weathered, Moderately Broken to Slightly Broken, Medium Hard, Unconfined Compressive Strength = 7,884 psi, **(BEDROCK)** | | | | |
| | 1.25 min/ft | | | RC C-1 | 100 (43) | |
| | 1.25 min/ft | | | | | |
| ft 45 | 4.25 min/0.5ft 1.5 min/ft | | | | | |
| | 1.75 min/ft | | | | | |
| | 1.75 min/ft | | | | | |
| | 1.75 min/ft | | | RC C-2 | 97 (64) | |
| | 1.25 min/ft | | | | | |
| 50 ft | 0.75 min/0.5ft | | -41 | | | |
| 51.0 ft | | | -42.0 | | | |
| | | End of boring at 51.0 feet | | | | |
| 55 | | | | | | |
| 60 | | | -51 | | | |
| 65 | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-11A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 06/07/2024 **DATE COMPLETED** 06/07/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624218 **LONGITUDE** -70.914755
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: N/A; AT END OF CORING: 06/07/2024 6.5 ft / Elev 2.5 ft; 24 HRS AFTER DRILLING: N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | REMARKS | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | 9 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft / 8.6: 5" Asphalt<br>Brown, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)** | SS S-1 | 65 | 8-13-14-13 (27) |
| 5 | | | 4.0 ft / 5.0: Brown, Silty Sand with Gravel, Moist, Dense, SM, **(FILL)** | SS S-2 | 50 | 14-17-13-11 (30) |
| 10 | -1 | | 9.0 ft / 0.0: Brown, SILTY SAND WITH GRAVEL, Wet, Medium Dense, SM, **(FILL)** | SS S-3 | 50 | 5-7-18-20 (25) |
| 15 | | Composite analytical sample obtained from 12-24 ft. | 14.0 ft / -5.0: Brownish Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Dense, SP-SM, **(FILL)** | SS S-4 | 65 | 20-19-21-28 (40) |
| 20 | -11 | | 19.0 ft / -10.0: Brownish Gray, Poorly-Graded Sand with Silt, Wet, Very Dense, SP-SM, **(FILL)** | SS S-5 | 65 | 22-36-38-42 (74) |
| 25 | | Slight organic odor at 24 ft bgs. | 24.0 ft / -15.0: Dark Brown, SILTY SAND, Wet, Medium Dense, SM, **(OUTWASH)** | SS S-6 | 38 | 10-13-11-14 (24) |
| 30 | -21 | | 29.0 ft / -20.0: Gray, Silty Sand with Gravel, Wet, Very Dense, SM, **(TILL)**<br>31.0 ft / -22.0 | SS S-7 | 65 | 31-41-55-65 (96) |

SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-11A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 35 | | 34.0 ft — Dark Orange, Silty Sand with Gravel, Wet, Very Dense, SM, **(TILL)** | -25.0 | SS S-8 | 65 | 14-36-59-36 (95) |
| 40 | Split spoon refusal at 40.9 ft bgs. | 40.9 ft | -31.9 | SS S-9 | 84 | 24-24-28-120 /0.4' (52) |
| 45 | Split spoon refusal at 45 ft bgs. | 44.0 ft — Gray, Silty Sand with Gravel, Wet, Very Dense, **(WEATHERED ROCK)** 45.0 ft — End of boring at 45.0 feet | -35.0 / -36.0 | SS S-10 | 100 | 35-110 (110) |
| 50 | | | -41 | | | |
| 55 | | | | | | |
| 60 | | | -51 | | | |
| 65 | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-12A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/29/2024 **DATE COMPLETED** 05/30/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624130 **LONGITUDE** -70.914729
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: N/A; AT END OF CORING: 05/30/2024 6.5 ft / Elev 2.5 ft; 24 HRS AFTER DRILLING: N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 ft. | 0.4 ft 5" Asphalt<br>Brown, SILTY SAND, Dry, Medium Dense, SM, **(FILL)** | 8.6 / 9 | SS S-1 | 88 | 7-5-7-5 (12) |
| | | 4.0 ft<br>Brown, Poorly-Graded Sand with Silt and Gravel, Moist, Medium Dense, SP-SM, **(FILL)** | 5.0 | SS S-2 | 62 | 10-9-12-9 (21) |
| 10 | | 9.0 ft<br>Brown, Silty Sand, Wet, Medium Dense, SM, **(FILL)** | 0.0 / -1 | SS S-3 | 4 | 6-5-7-7 (12) |
| | Composite analytical sample obtained from 12-24 ft. | 14.0 ft<br>Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | -5.0 | SS S-4 | 58 | 14-13-16-17 (29) |
| 20 | | 19.0 ft<br>Brownish Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Dense, SP-SM, **(FILL)**<br>20.0 ft<br>Gray, Silty Sand with Gravel, Wet, Dense, SM, **(OUTWASH)** | -10.0<br>-11.0 / -11 | SS S-5 | 54 | 19-17-20-18 (37) |
| 25 | | 24.0 ft<br>Dark Brown, SILTY SAND, Wet, Medium Dense, SM, **(OUTWASH)** | -15.0 | SS S-6 | 50 | 6-5-10-9 (15) |
| 30 | | 29.0 ft<br>Brown to Orange, Silty Sand with Gravel, Wet, Very Dense, SM, **(TILL)**<br>31.0 ft | -20.0<br>-22.0 / -21 | SS S-7 | 66 | 35-38-40-42 (78) |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-12A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|---|
| 35 | | | 34.0 ft — -25.0<br>35.0 ft — -26.0<br>Brown to Orange, Silty Sand with Gravel/ Weathered Rock, Wet, Very Dense, SM, **(TILL)**<br>Black, Poorly-Graded Gravel with Silt, Wet, Very Dense, GP-GM, **(TILL)** | | SS S-8 | 66 | 13-25-69-54 (94) |
| 40 | | Split spoon refusal at 40.8' bgs. Started coring at 42 ft bgs. | 39.0 ft — -30.0<br>Brown to Orange, Silty Sand with Gravel/ Weathered Rock, Wet, Very Dense, SM, **(TILL)**<br>40.8 ft — -31.8 | -31 | SS S-9 | 65 | 27-16-35-26/ 0.3' (51) |
| 45 | | Core Rate<br>1.75 min/ft<br>1.25 min/ft<br>1.5 min/ft<br>1.25 min/ft<br>2 min/ft | 42.0 ft — -33.0<br>Black to Gray, Coarse Grained Gabbro, Slightly Weathered, Moderately Broken, Soft, Unconfined Compressive Strength = 2,871 psi, **(BEDROCK)**<br>47.0 ft — -38.0<br>End of boring at 47.0 feet | | RC C-1 | 100 (56) | |
| 50 | | | | -41 | | | |
| 55 | | | | | | | |
| 60 | | | | -51 | | | |
| 65 | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-13A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/20/2024 **DATE COMPLETED** 05/21/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624017 **LONGITUDE** -70.914685
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 05/20/2024 6.0 ft / Elev 3.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | Composite analytical sample obtained from 0-12 and 12-24 ft. | 0.4 ft 5" Asphalt<br>Light Brown, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)** | 8.6 / 9 | SS S-1 | 75 | 8-6-14-10 (20) |
| 4.0 ft | | Brown, SANDY SILT, Moist, Medium Dense, ML, **(FILL)** | 5.0 | SS S-2 | 86 | 15-7-11-7 (18) |
| 9.0 ft | | Brown, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(FILL)** | 0.0 / -1 | SS S-3 | 50 | 4-5-12-13 (17) |
| | | | | SS S-4 | 50 | 15-13-16-13 (29) |
| 19.0 ft | Darker wash water observed at 21 ft bgs. | Brownish Gray, Poorly-Graded Sand with Silt and Shells, Wet, Medium Dense, SP-SM, **(FILL)** | -10.0 / -11 | SS S-5 | 45 | 9-8-11-11 (19) |
| 24.0 ft | | Dark Brown, SILTY SAND WITH GRAVEL, Wet, Medium Dense, SM, **(OUTWASH)** | -15.0 | | | |
| 25.0 ft | | Light Brown, Poorly-Graded Sand with Gravel, Medium Dense, SP, **(TILL)** | -16.0 | SS S-6 | 40 | 4-1-11-9 (12) |
| 29.0 ft | | Gray, Silty Sand with Gravel, Wet, Medium Dense, SM, **(TILL)** | -20.0 / -21 | SS S-7 | 30 | 14-14-13-10 (27) |
| 31.0 ft | | | -22.0 | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-13A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|---|
| 34.0 ft | | | Orange to Brown, Silty Sand with Gravel, Dense to Loose, SM, **(TILL)** | -25.0 | | | |
| 35 | | | | | SS S-8 | 40 | 17-15-21-42 (36) |
| 40 | | Increased driving resistance at 42 ft bgs. Began coring at 43 ft bgs. | | -31 | SS S-9 | 30 | 12-7-2-6 (9) |
| 43.0 ft | | Core Rate | Dark Gray to Black, Coarse Grained Gabbro, Slightly Weathered to Fresh, Moderately Broken, Soft, **(BEDROCK)** | -34.0 | | | |
| 45 | | 4.5 min/ft<br>3.75 min/ft<br>4 min/ft<br>3.25 min/ft<br>3 min/ft | | | RC C-1 | 100 (63) | |
| 48.0 ft | | | End of boring at 48.0 feet | -39.0 | | | |
| 50 | | | | -41 | | | |
| 55 | | | | | | | |
| 60 | | | | -51 | | | |
| 65 | | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

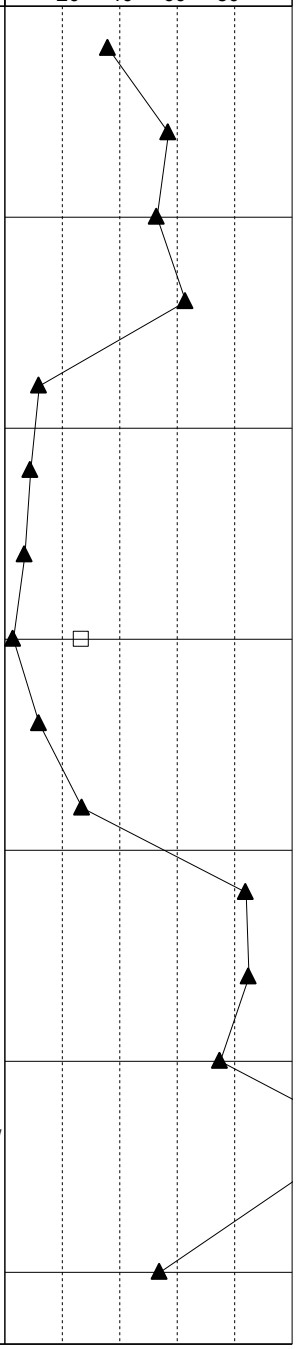
Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-14A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/28/2024 **DATE COMPLETED** 05/29/2024
**GROUND ELEVATION** 9.00 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624349 **LONGITUDE** -70.914965
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: N/A; AT END OF CORING: 05/29/2024 6.5 ft / Elev 2.5 ft; 24 HRS AFTER DRILLING: N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | REMARKS |
|---|---|---|---|---|---|---|
| 0 | 0.4 ft 5" Asphalt | 8.6 | | | | |
| | Light Brown, Silty Sand, Dry, Dense, SM, **(FILL)** | | SS S-1 | 25 | 13-11-25-27 (36) | |
| | 2.0 ft No Recovery | 7.0 | SS S-2 | 0 | 30-31-26-22 (57) | |
| | 4.0 ft Brown, Silty Sand, Moist, Very Dense, SM, **(FILL)** | 5.0 | SS S-3 | 79 | 19-20-33-36 (53) | |
| | | | SS S-4 | 100 | 21-20-43-32 (63) | |
| | 8.0 ft Brown, Poorly-Graded Sand with Silt, Wet, Medium Dense to Loose, SP-SM, **(FILL)** | 1.0 | SS S-5 | 12 | 7-5-7-5 (12) | |
| | | | SS S-6 | 75 | 4-5-4-5 (9) | |
| | | | SS S-7 | 38 | 3-3-4-3 (7) | |
| | 14.0 ft Dark Brown, SILTY SAND, Wet, Very Loose, SM, **(OUTWASH)** | -5.0 | SS S-8 | 55 | WOH-1-2-1 (3) | |
| | 16.0 ft Brownish Gray, Silty Sand, Trace Shells, Wet, Medium Dense, SM, **(OUTWASH)** | -7.0 | SS S-9 | 50 | 4-5-7-4 (12) | |
| | 18.0 ft Brown to Gray, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(TILL)** | -9.0 | SS S-10 | 46 | 10-12-15-14 (27) | |
| | | | SS S-11 | 100 | 32-35-49-42 (84) | |
| | | | SS S-12 | 75 | 25-25-60-58 (85) | |
| | | | SS S-13 | 58 | 40-37-38-62 (75) | |
| | 26.0 ft Brownish Gray to Orange, Silty Sand with Gravel/ Weathered Rock, Wet, Very Dense, SM, **(TILL)** | -17.0 | SS S-14 | 100 | 47-52-72-50/ 0' (124) | Split spoon refusal at 27.5 ft bgs. |
| | | | SS S-15 | 46 | 27-18-36-38 (54) | Split spoon refusal at 31 ft bgs. Started coring at 34 ft bgs. |
| | 31.0 ft | -22.0 | | | | |




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# BORING NUMBER CEC-14A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|---|
| 35 | | Core Rate<br>2 min/ft<br>1.5 min/ft<br>1.5 min/ft<br>1.5 min/ft<br>1.5 min/ft | 34.0 ft -25.0<br>Gray, Coarse Grained Granite, Fresh, Slightly Broken, Medium Hard, Unconfined Compressive Strength = 9,768 psi, **(BEDROCK)**<br>39.0 ft -30.0<br>End of boring at 39.0 feet | -31 | RC C-1 | 100 (100 ) | | |
| 40 | | | | | | | | |
| 45 | | | | | | | | |
| 50 | | | | -41 | | | | |
| 55 | | | | | | | | |
| 60 | | | | -51 | | | | |
| 65 | | | | | | | | |

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# BORING NUMBER CEC-15A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/28/2024 **DATE COMPLETED** 05/28/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624270 **LONGITUDE** -70.914928
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 05/28/2024 5.5 ft / Elev 3.5 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | REMARKS |
|---|---|---|---|---|---|---|
| 0 | 0.4 ft 5" Asphalt | 8.6 | | | | |
| | Brownish Tan, Poorly-Graded Sand with Silt and Gravel, Dry, Medium Dense, SP-SM, **(FILL)** | | SS S-1 | 75 | 11-7-9-12 (16) | |
| | 1.5 ft Light Brown, Poorly-Graded Sand with Silt, Dry, Dense, SP-SM, **(FILL)** | 7.5 | SS S-2 | 83 | 19-15-23-17 (38) | |
| | 4.0 ft Light Brown, Silty Sand, Moist, Dense, SM, **(FILL)** | 5.0 | SS S-3 | 50 | 12-15-18-17 (33) | |
| 5 | 6.0 ft Light Brown, Poorly-Graded Sand with Silt, Moist, Dense, SP-SM, **(FILL)** | 3.0 | SS S-4 | 100 | 20-24-16-13 (40) | |
| | 8.0 ft Brown, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(FILL)** | 1.0 | SS S-5 | 40 | 7-5-5-4 (10) | |
| 10 | 10.0 ft Brown, Poorly-Graded Sand with Silt and Gravel, Wet, Loose, SP-SM, **(FILL)** | -1.0 | SS S-6 | 71 | 3-3-4-3 (7) | |
| | 12.0 ft Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Wet, Loose, SP-SM, **(FILL)** | -3.0 | SS S-7 | 33 | 3-2-3-3 (5) | |
| | 14.0 ft Brown, Poorly-Graded Sand, Wet, Loose, SP, **(FILL)** | -5.0 | SS S-8 | 38 | 3-3-3-3 (6) | |
| 15 | | | SS S-9 | 71 | 2-2-3-4 (5) | |
| | 18.0 ft Brown, Poorly-Graded Sand with Silt, Wet, Loose, SP-SM, **(FILL)** | -9.0 | SS S-10 | 42 | 3-3-3-2 (6) | |
| 20 | 20.0 ft Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | -11.0 | SS S-11 | 42 | 2-5-15-37 (20) | |
| | 22.0 ft Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Dense, SP-SM, **(TILL)** | -13.0 | SS S-12 | 62 | 26-22-25-23 (47) | |
| | 24.0 ft Brown, WELL-GRADED SAND WITH SILT AND GRAVEL, Wet, Dense, SW-SM, **(TILL)** | -15.0 | SS S-13 | 50 | 19-15-16-12 (31) | Split spoon refusal at 27.8 ft bgs. Began coring at 29 ft bgs. |
| 25 | 26.0 ft Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Very Dense, SP-SM, **(TILL)** | -17.0 | SS S-14 | 100 | 25-30-51-50/ 0.3' (81) | |
| | 27.8 ft | -18.8 | | | | Core Rate |
| | 29.0 ft Gray, Coarse Grained Granite, Slightly Weathered, Moderately Broken, Medium Hard, Unconfined Compressive Strength = 12,479 psi, **(BEDROCK)** | -20.0 | | | | 3.75 min/ft |
| 30 | | -21 | | | | 3 min/ft |
| | | | | | | 0.75 min/ft |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-15A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|---|
| | | 0.75 min/ft<br>2.25 min/ft | Gray, Coarse Grained Granite, Slightly Weathered, Moderately Broken, Medium Hard, Unconfined Compressive Strength = 12,479 psi, **(BEDROCK)** | | RC C-1 | 60 (44) | | |
| | | | 34.0 ft | -25.0 | | | | |
| | | | End of boring at 34.0 feet | | | | | |
| 35 | | | | | | | | |
| 40 | | | | -31 | | | | |
| 45 | | | | | | | | |
| 50 | | | | -41 | | | | |
| 55 | | | | | | | | |
| 60 | | | | -51 | | | | |
| 65 | | | | | | | | |

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# BORING NUMBER CEC-16A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/24/2024 **DATE COMPLETED** 05/24/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624189 **LONGITUDE** -70.914888
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: N/A; AT END OF CORING: 05/28/2024 6.5 ft / Elev 2.5 ft; 24 HRS AFTER DRILLING: N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | MATERIAL DESCRIPTION | REMARKS | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| 0 | 9 | 0.4 ft / 8.6: 5" Asphalt<br>Tan to Brown, Poorly-Graded Sand with Silt, Dry to Moist, Dense, SP-SM, **(FILL)** | | SS S-1 | 83 | 13-10-21-16 (31) |
| | | | | SS S-2 | 88 | 15-13-19-23 (32) |
| 5 | | | | SS S-3 | 83 | 22-18-25-19 (43) |
| | | 6.0 ft / 3.0: Brown, Poorly-Graded Sand with Silt and Gravel, Moist, Medium Dense, SP-SM, **(FILL)** | | SS S-4 | 100 | 15-10-13-11 (23) |
| | | 8.0 ft / 1.0: Brown, SILTY SAND WITH GRAVEL, Wet, Medium Dense, SM, **(FILL)** | | SS S-5 | 25 | 11-7-10-10 (17) |
| 10 | -1 | 10.0 ft / -1.0: Brownish Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Loose to Medium Dense, SP-SM, **(FILL)** | | SS S-6 | 83 | 9-6-5-5 (11) |
| | | | | SS S-7 | 25 | 4-2-4-3 (6) |
| | | 14.0 ft / -5.0: Brownish Gray, Well-Graded Sand with Silt and Gravel, Wet, Loose, SW-SM, **(FILL)** | | SS S-8 | 55 | 4-2-3-3 (5) |
| 15 | | | | SS S-9 | 16 | 4-2-3-3 (5) |
| | | 18.0 ft / -9.0: Gray, Poorly-Graded Sand with Silt, Wet, Loose, SP-SM, **(FILL)** | | SS S-10 | 25 | 3-2-2-2 (4) |
| 20 | -11 | | | SS S-11 | 100 | 2-2-2-2 (4) |
| | | 22.0 ft / -13.0: Dark Brown, POORLY-GRADED SAND WITH SILT AND GRAVEL, Trace Shells, Wet, Loose, SP-SM, **(OUTWASH)** | | SS S-12 | 50 | 2-2-3-2 (5) |
| | | 24.0 ft / -15.0: Light Gray, Silty Sand with Gravel, Wet, Very Dense to Dense, SM, **(TILL)** | | SS S-13 | 75 | 5-19-37-38 (56) |
| 25 | | | | SS S-14 | 100 | 58-19-20-18 (39) |
| | | 28.0 ft / -19.0: Orange Brown to Gray, Silty Sand with Gravel, Wet, Very Dense, SM, **(TILL)** | | SS S-15 | 50 | 22-40-99-27 (139) |
| 30 | -21 | 30.0 ft / -21.0: Brown, Silty Gravel with Sand, Wet, Dense, SM, **(TILL)** | Split spoon refusal at 31.7 ft and 34 ft | SS S-16 | 65 | 21-21-15-100 /0.2' |

SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

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# BORING NUMBER CEC-16A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|---|
| | | bgs. | Brown, Silty Gravel with Sand, Wet, Dense, SM, **(TILL)** | | | | (36) | |
| | | Core Rate | 33.5 ft -24.5 | | | | | |
| | | 1.25 min/ft | 34.0 ft -25.0 No Recovery | | SS S-17 | 0 | 50/0' | |
| 35 | | 2.5 min/ft | Light Gray, Coarse Grained Granite, Slightly Weathered, Broken, Medium Hard, **(BEDROCK)** | | | | | |
| | | 2 min/ft | | | RC C-1 | 97 (43) | | |
| | | 1 min/ft | | | | | | |
| | | 1.75 min/ft | 39.0 ft -30.0 | | | | | |
| | | | End of boring at 39.0 feet | | | | | |
| 40 | | | | -31 | | | | |
| 45 | | | | | | | | |
| 50 | | | | -41 | | | | |
| 55 | | | | | | | | |
| 60 | | | | -51 | | | | |
| 65 | | | | | | | | |

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# BORING NUMBER CEC-17A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/22/2024 **DATE COMPLETED** 05/24/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624111 **LONGITUDE** -70.914850
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 05/24/2024 5.0 ft / Elev 4.0 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | ELEVATION (ft) | MATERIAL DESCRIPTION | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|
| 0 | 9 | 0.4 ft 5" Asphalt | | | |
| | 8.6 | Light Brown to Tan, Poorly-Graded Sand with Silt, Dry, Medium Dense, SP-SM, **(FILL)** | SS S-1 | 65 | 12-10-18-14 (28) |
| | 7.0 | 2.0 ft Brown to Tan, Poorly-Graded Sand with Silt and Gravel, Dry, Dense, SP-SM, **(FILL)** | SS S-2 | 75 | 17-16-26-21 (42) |
| | 5.0 | 4.0 ft Brown, Poorly-Graded Sand with Silt, Moist, Dense, SP-SM, **(FILL)** | SS S-3 | 65 | 20-22-27-26 (49) |
| 5 | | | SS S-4 | 100 | 11-13-17-12 (30) |
| | 1.0 | 8.0 ft Brown, SILTY SAND, Wet, Medium Dense, SM, **(FILL)** | SS S-5 | 48 | 8-6-6-8 (12) |
| | -1.0 | 10.0 ft Brown, Poorly-Graded Sand, Wet, Loose, SP, **(FILL)** | SS S-6 | 75 | 3-4-4-4 (8) |
| 10 | -1 | | SS S-7 | 30 | 3-2-3-4 (5) |
| | | | SS S-8 | 8 | 3-2-2-3 (4) |
| | -7.0 | 16.0 ft Brown, SILTY SAND, Wet, Loose, SM, **(FILL)** | SS S-9 | 83 | 4-1-4-4 (5) |
| | -9.0 | 18.0 ft Brownish Gray, Poorly-Graded Gravel with Sand, Wet, Loose, GP, **(FILL)** | SS S-10 | 5 | 4-2-2-1 (4) |
| 15 | -11 | | SS S-11 | 70 | 2-2-5-10 (7) |
| | -13.0 | 22.0 ft Gray, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(TILL)** | SS S-12 | 50 | 24-20-28-17 (48) |
| 20 | | | SS S-13 | 20 | 18-14-15-11 (29) |
| | | | SS S-14 | 100 | 10-12-12-13 (24) |
| | -19.8 | Split spoon refusal at 28.8 ft bgs. 28.8 ft | SS S-15 | 67 | 45-55/0.3' (55) |
| 25 | -21 | 30.0 ft | | | |
| | | Brownish Gray, SILTY SAND WITH GRAVEL, Wet, Very Dense to Dense, SM, **(TILL)** | SS S-16 | 40 | 18-18-52-33 (70) |
| 30 | | | | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-17A



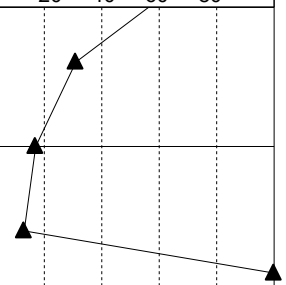
**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|
| | | Brownish Gray, SILTY SAND WITH GRAVEL, Wet, Very Dense to Dense, SM, **(TILL)** | | SS S-17 | 100 | 20-17-14-23 (31) |
| | | 34.0 ft | -25.0 | | | |
| 35 | | Brown to Tan, Silty Sand with Gravel, Wet, Medium Dense, SM, **(TILL)** | | SS S-18 | 25 | 15-8-9-9 (17) |
| | | 36.0 ft | -27.0 | | | |
| | Split spoon refusal at 38 ft bgs. Began coring at 39 ft bgs. | Brownish Orange, Silty Gravel with Sand, Wet, Medium Dense, GM, **(TILL)** | | SS S-19 | 25 | 10-7-6-31 (13) |
| | | 38.0 ft | -29.0 | | | |
| | | No Recovery | | SS S-20 | 0 | 50/0' |
| | | 39.0 ft | -30.0 | | | |
| | Core Rate | Gray, Coarse Grained Granite, Slightly Weathered, Broken, Medium Hard, **(BEDROCK)** | | | | |
| 40 | 1.25 min/ft | | -31 | | | |
| | 1.5 min/ft | | | | | |
| | 0.75 min/ft | | | RC C-1 | 23 (0) | |
| | 0.75 min/ft | | | | | |
| | 1.25 min/ft | | | | | |
| 45 | 1.75 min/ft | | | | | |
| | 1.25 min/ft | | | | | |
| | 1.5 min/ft | | | RC C-2 | 10 (0) | |
| | 1.25 min/ft | | | | | |
| | 1.25 min/ft | | | | | |
| | | 49.0 ft | -40.0 | | | |
| | | End of boring at 49.0 feet | | | | |
| 50 | | | -41 | | | |
| 55 | | | | | | |
| 60 | | | -51 | | | |
| 65 | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80

PL MC LL
20 40 60 80

□ FINES CONTENT (%) □
20 40 60 80



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# BORING NUMBER CEC-18A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 05/21/2024 **DATE COMPLETED** 05/22/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings/Cement/Bentonite
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624028 **LONGITUDE** -70.914829
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING 05/22/2024 7.5 ft / Elev 1.5 ft
AT END OF CORING N/A
24 HRS AFTER DRILLING N/A
**CEC REP** Cam Indeck **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | MATERIAL DESCRIPTION | ELEV (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) | REMARKS |
|---|---|---|---|---|---|---|
| 0 | 0.4 ft 5" Asphalt | 8.6 | | | | |
| | Light Brown, Poorly-Graded Sand with Silt, Dry, Medium Dense to Dense, SP-SM, **(FILL)** | | SS S-1 | 75 | 9-11-10-9 (21) | |
| | | | SS S-2 | 85 | 13-12-16-19 (28) | |
| 5 | | | SS S-3 | 85 | 20-19-18-16 (37) | |
| | 6.0 ft Brown, SILTY SAND, Wet, Medium Dense, SM, **(FILL)** | 3.0 | SS S-4 | 100 | 8-10-13-10 (23) | |
| | 8.0 ft Brown, Poorly-Graded Sand with Gravel, Wet, Medium Dense, SP-SM, **(FILL)** | 1.0 | SS S-5 | 45 | 11-9-7-6 (16) | |
| 10 | 10.0 ft Brownish Gray, Silty Sand, Wet, Medium Dens, SM, **(FILL)** | -1.0 | SS S-6 | 100 | 6-5-5-5 (10) | |
| | 12.0 ft Gray, Poorly-Graded Sand with Gravel, Wet, Very Loose, SP-SM, **(FILL)** | -3.0 | SS S-7 | 30 | 3-2-1-1 (3) | |
| 15 | | | SS S-8 | 35 | 2-1-1-1 (2) | |
| | 17.5 ft | -8.5 | SS S-9 | 85 | 2-1-2-1 (3) | |
| | 18.0 ft Blackish Gray, Slightly Organic Silty Sand, Wet, Very Loose, SM, **(OUTWASH)** | -9.0 | | | | |
| | Brownish Gray, Poorly-Graded Sand with Silt, Wet, Medium Dense, SP-SM, **(OUTWASH)** | | SS S-10 | 50 | 6-10-19-15 (29) | |
| 20 | 20.0 ft Brownish Gray, Silty Sand with Gravel, Wet, Dense to Very Dense, SM, **(TILL)** | -11.0 | SS S-11 | 100 | 20-24-33-30 (57) | |
| | | | SS S-12 | 60 | 28-27-20-16 (47) | |
| 25 | | | SS S-13 | 45 | 21-17-13-13 (30) | |
| | 26.0 ft Gray, Poorly-Graded Sand with Silt and Gravel, Wet, Dense, SP-SM, **(TILL)** | -17.0 | SS S-14 | 85 | 13-16-14-18 (30) | |
| | | | SS S-15 | 66 | 19-50 | Split spoon refusal at 29 ft bgs. |
| 30 | 30.0 ft Brownish Gray to Orange, Poorly-Graded Sand with Silt and Gravel, Wet, Very Dense, SP-SM, **(TILL)** | -21.0 | SS S-16 | 95 | 16-20-55-44 (75) | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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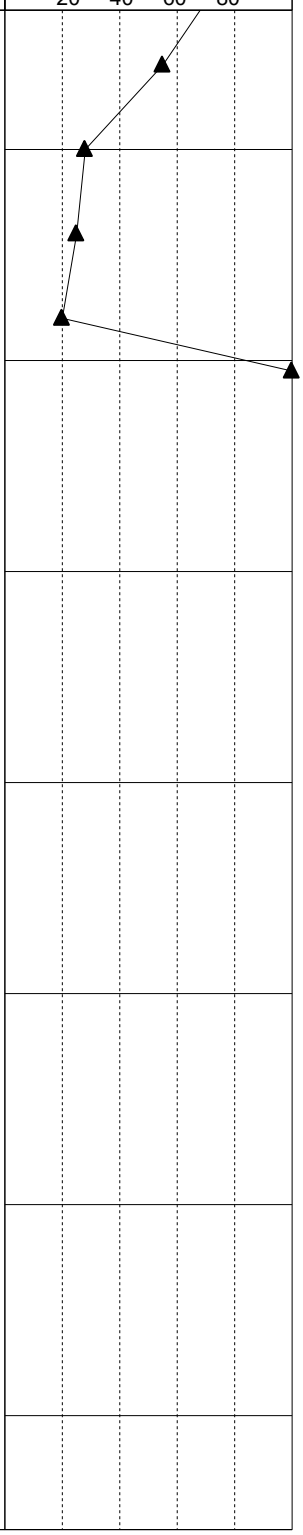
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# BORING NUMBER CEC-18A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | BLOWS COUNTS (N VALUES) |
|---|---|---|---|---|---|---|---|
| | | | Brownish Gray to Orange, Poorly-Graded Sand with Silt and Gravel, Wet, Very Dense, SP-SM, **(TILL)** | | SS S-17 | 70 | 16-30-25-39 (55) |
| | | | 34.0 ft | -25.0 | | | |
| 35 | | | Brownish Gray, Poorly-Graded Gravel with Sand, Wet, Medium Dense, GP, **(TILL)** | | SS S-18 | 12 | 15-17-11-9 (28) |
| | | | 36.0 ft | -27.0 | | | |
| | | | Orange to Brown, Silty Sand with Gravel, Wet, Medium Dense to Very Dense, SM, **(TILL)** | | SS S-19 | 100 | 8-13-12-18 (25) |
| | | | | | SS S-20 | 55 | 19-10-10-28 (20) |
| 40 | | Split spoon refusal at 40.5 ft bgs. Began coring at 41 ft bgs. | | -31 | SS S-21 | 50 | 50 |
| | | | 40.5 ft | -31.5 | | | |
| | | Core Rate | 41.0 ft | -32.0 | | | |
| | | 1.75 min/ft | Dark Gray to Black, Coarse Grained Gabbro, Slightly Weathered, Moderately Broken, Hard, Unconfined Compressive Strength = 25,815 psi, **(BEDROCK)** | | | | |
| | | 1.75 min/ft | | | RC C-1 | 100 (49) | |
| | | 1.5 min/ft | | | | | |
| 45 | | 1.75 min/ft | | | | | |
| | | 2 min/ft | 46.0 ft | -37.0 | | | |
| | | | End of boring at 46.0 feet | | | | |
| 50 | | | | -41 | | | |
| 55 | | | | | | | |
| 60 | | | | -51 | | | |
| 65 | | | | | | | |



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# BORING NUMBER CEC-19A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 08/26/2024 **DATE COMPLETED** 09/17/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cuttings
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624395 **LONGITUDE** -70.914701
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: Not Recorded; AT END OF CORING: Not Recorded; 24 HRS AFTER DRILLING: Not Recorded
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| 0 | | | 0.4 ft | 8.6 | | | |
| | | Casing advanced to 54.5 ft bgs through several feet of apparent weathered rock beginning at ~36 ft bgs. Tooling was lost in the hole at 54 ft bgs and boring was offset 3 ft west. | | | | | |
| 5 | | | | | | | |
| | | Boring advanced to apparent rock at 47 ft bgs. No soil samples obtained. Soil graphic log assumed to be similar to adjacent CEC-4A. | | | | | |
| 10 | | | | -1 | | | |
| 15 | | | | | | | |
| 20 | | | | -11 | | | |
| 25 | | | | | | | |
| | | | 29.0 ft | -20.0 | | | |
| 30 | | | | -21 | | | |

(Continued Next Page)

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# BORING NUMBER CEC-19A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| 35 | | (Offset) Increased drilling resistance at 41 ft bgs, began coring at 47 ft bgs | | | | | |
| 40 | | | 41.0 ft | -31 / -32.0 | | | |
| 45 | | Core Rate | 47.0 ft | -38.0 | | | |
| | | 2.25 min/ft | Gray to Dark Gray, Medium to Very Coarse Grained Granite, Fresh to Slightly Weathered, Moderately Broken to Broken, Soft, **(BEDROCK)** | | | | |
| | | 4 min/ft | | | | | |
| | | 3.5 min/ft | | | | | |
| 50 | | 3.5 min/ft | | -41 | RC C-1 | 84 (30) | |
| | | 7.5 min/ft | | | | | |
| | | 2.25 min/ft | | | | | |
| | | 3 min/ft | | | | | |
| | | 12.25 min/ft | | | | | |
| 55 | | 6 min/ft | | | RC C-2 | 100 (57) | |
| | | 2.5 min/ft | | | | | |
| | | 1.75 min/ft | | | | | |
| | | 3 min/ft | | | | | |
| | | 2.5 min/ft | | | | | |
| 60 | | 2.5 min/ft | | -51 | RC C-3 | 100 (53) | |
| | | 3.75 min/ft | | | | | |
| | | 2.25 min/ft | | | | | |
| | | 2.25 min/ft | | | | | |
| | | 2.75 min/ft | | | | | |
| 65 | | 2 min/ft | | | RC C-4 | 100 (82) | |
| | | 2.5 min/ft | | | | | |
| | | 3 min/ft | | | | | |

(Continued Next Page)

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# BORING NUMBER CEC-19A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| 70 | | 3 min/ft<br>3.5 min/ft<br>3.75 min/ft<br>4 min/ft | Gray to Dark Gray, Medium to Very Coarse Grained Granite, Fresh to Slightly Weathered, Moderately Broken to Broken, Soft, Unconfined Compressive Strength of core C-5= 5,492 psi, **(BEDROCK)** | -61 | RC C-5 | 100 (46) | |
| | | | 72.0 ft -63.0<br>End of boring at 72.0 feet | | | | |
| 75 | | | | | | | |
| 80 | | | | -71 | | | |
| 85 | | | | | | | |
| 90 | | | | -81 | | | |
| 95 | | | | | | | |
| 100 | | | | -91 | | | |

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# BORING NUMBER CEC-20A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/09/2024 **DATE COMPLETED** 09/10/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624306 **LONGITUDE** -70.914667
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: Not Recorded; AT END OF CORING: Not Recorded; 24 HRS AFTER DRILLING: Not Recorded
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| 0 | | Boring advanced to apparent rock at 44 ft bgs. No soil samples obtained. Soil graphic log assumed to be similar to adjacent CEC-5A. | 0.4 ft | 8.6 | | | |
| 5 | | | | | | | |
| 10 | | | | -1 | | | |
| 15 | | | | | | | |
| 20 | | | | -11 | | | |
| 25 | | | | | | | |
| 30 | | | 29.0 ft | -20.0 | | | |
| | | | | -21 | | | |

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# BORING NUMBER CEC-20A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| | | | 34.0 ft | -25.0 | | | |
| 35 | | | | | | | |
| 40 | | Increased drive resistance at 44 ft bgs, began coring at 45 ft bgs. | | -31 | | | |
| | | | 44.0 ft | -35.0 | | | |
| 45 | | Core Rate | 45.0 ft | -36.0 | | | |
| | | 3.5 min/ft | Gray to Dark Gray, Coarse to Very Coarse Grained Granite, Fresh to Slightly Weathered, Slightly Broken to Moderately Broken, Medium Hard, Unconfined Compressive Strength of core C-3 = 12,093 psi, **(BEDROCK)** | | | | |
| | | 1.75 min/ft | | | | | |
| | | 1.75 min/ft | | | RC C-1 | 95 (47) | |
| | | 2.75 min/ft | | | | | |
| | | 7 min/ft | | | | | |
| 50 | | 4 min/ft | | -41 | | | |
| | | 3.75 min/ft | | | | | |
| | | 3.75 min/ft | | | RC C-2 | 100 (63) | |
| | | 3 min/ft | | | | | |
| | | 4.25 min/ft | | | | | |
| 55 | | 4.25 min/ft | | | | | |
| | | 4.25 min/ft | | | | | |
| | | 4.5 min/ft | | | RC C-3 | 97 (84) | |
| | | 5.5 min/ft | | | | | |
| | | 5.75 min/ft | | | | | |
| 60 | | 2.5 min/ft | 60.0 ft | -51.0 | | | |
| | | 5.25 min/ft | Gray to Dark Gray, Coarse to Very Coarse Grained Granite with frequent Gabbro intrusions, Fresh to Slightly Weathered, Moderately Broken, Medium Hard to Soft, **(BEDROCK)** | -51 | | | |
| | | 5 min/ft | | | | | |
| | | 6.25 min/ft | | | RC C-4 | 100 (79) | |
| | | 6.75 min/ft | | | | | |
| 65 | | | 65.0 ft | -56.0 | | | |
| | | | End of boring at 65.0 feet | | | | |

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# BORING NUMBER CEC-21A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/13/2024 **DATE COMPLETED** 09/13/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624071 **LONGITUDE** -70.914628
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: Not Recorded; AT END OF CORING: Not Recorded; 24 HRS AFTER DRILLING: Not Recorded
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| 0 | | Boring advanced to apparent rock at 42 ft bgs. No soil samples obtained. Soil graphic log assumed to be similar to adjacent CEC-8A, and glacial till assumed to extend to top of bedrock. | 0.4 ft | 8.6 | | | |
| 5 | | | | | | | |
| 10 | | | | -1 | | | |
| 15 | | | | | | | |
| 20 | | | | -11 | | | |
| 25 | | | | | | | |
| | | | 29.0 ft | -20.0 | | | |
| 30 | | | | -21 | | | |

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# BORING NUMBER CEC-21A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) |
|---|---|---|---|---|---|
| 34.0 ft | | | -25.0 | | |
| 35 | | | | | |
| 40 | Increased drive resistance at 42 ft bgs, began coring at 46 ft bgs. | | -31 | | |
| 42.0 ft | | | -33.0 | | |
| 45 | Core Rate | 45.0 ft | -36.0 | | |
| | 3 min/ft | Dark Gray to Black, Medium Grained Gabbro with occasional Granite intrusions, Fresh to Slightly Weathered, Slightly Broken to Moderately Broken, Medium Hard, Unconfined Compressive Strength of core C-2 = 11,624 psi, **(BEDROCK)** | | RC C-1 | 100 (61) |
| | 5.75 min/ft | | | | |
| | 5.5 min/ft | | | | |
| | 5 min/ft | | | | |
| 50 | 3.75 min/ft | | -41 | | |
| | 1.5 min/ft | | | | |
| | 2 min/ft | | | | |
| | 2.25 min/ft | | | RC C-2 | 100 (72) |
| | 3 min/ft | 53.5 ft | -44.5 | | |
| | 3 min/ft | Dark Gray, Coarse Grained Granite, Fresh to Slightly Weathered, Moderately Broken, Medium Hard, **(BEDROCK)** | | | |
| 55 | 3.5 min/ft | | | | |
| | 3.5 min/ft | | | | |
| | 3.75 min/ft | | | RC C-3 | 100 (73) |
| | 5.25 min/ft | | | | |
| | 4.25 min/ft | | | | |
| 60 | | 60.0 ft | -51.0 | | |
| | | End of boring at 60.0 feet | -51 | | |
| 65 | | | | | |

▲ SPT N VALUE ▲
20 40 60 80

PL MC LL
20 40 60 80

□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-22A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/11/2024 **DATE COMPLETED** 09/12/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624000 **LONGITUDE** -70.914609
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: Not Recorded; AT END OF CORING: Not Recorded; 24 HRS AFTER DRILLING: Not Recorded
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| 0 | | Boring advanced to apparent rock at 40 ft bgs. No soil samples obtained. Soil graphic log assumed to be similar to adjacent CEC-3A, and glacial till assumed to extend to top of bedrock. | 0.4 ft | 8.6 | | | |
| 5 | | | | 3 | | | |
| 10 | | | | -1 | | | |
| 15 | | | | -6 | | | |
| 20 | | | | -11 | | | |
| 25 | | | | -16 | | | |
| | | | 28.0 ft | -19.0 | | | |
| 30 | | | | -21 | | | |

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# BORING NUMBER CEC-22A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) |
|---|---|---|---|---|---|
| 35 | Increased drive resistance at 40 ft bgs, began coring at 41 ft bgs | | | | |
| 40 | | 40.0 ft / 40.0 ft — -31.0 / -31.0 | -31 | | |
| | Core Rate | Gray to Dark Gray, Medium Grained Granite, Fresh to Slightly Weathered, Slightly Broken to Moderately Broken, Hard, Unconfined Compressive Strength of core C-1 = 16,107 psi, **(BEDROCK)** | | | |
| | 9.25 min/ft | | | | |
| | 12.25 min/ft | | | | |
| | 21 min/ft | | | RC C-1 | 97 (40) |
| | 20.75 min/ft | | | | |
| 45 | 34 min/ft | | | | |
| | 6.5 min/ft | | | | |
| | 2.25 min/ft | | | | |
| | 2.25 min/ft | | | RC C-2 | 87 (70) |
| | 2.25 min/ft | | | | |
| 50 | 2.5 min/ft | | -41 | | |
| | 3.25 min/ft | | | | |
| | 2.75 min/ft | 53.0 ft — -44.0 | | | |
| | 2.5 min/ft | Dark Gray to Black, Medium Grained Gabbro, Slightly Weathered, Broken, Soft, **(BEDROCK)** | | RC C-3 | 100 (70) |
| | 4 min/ft | 54.2 ft — -45.2 | | | |
| 55 | 5.25 min/ft | Gray to Dark Gray, Medium Grained Granite, Fresh, Moderately Broken, Medium Hard, **(BEDROCK)** | | | |
| | 4.5 min/ft | | | | |
| | 3 min/ft | 57.5 ft — -48.5 | | | |
| | 3 min/ft | Dark Gray to Black, Medium Grained Gabbro, Fresh to Slightly Weathered, Moderately Broken, Soft, **(BEDROCK)** | | RC C-4 | 100 (56) |
| | 2.75 min/ft | | | | |
| 60 | 3.75 min/ft | | -51 | | |
| | | 61.0 ft — -52.0 | | | |
| | | End of boring at 61.0 feet | | | |
| 65 | | | | | |

▲ SPT N VALUE ▲
20 40 60 80

PL MC LL
20 40 60 80

□ FINES CONTENT (%) □
20 40 60 80

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# BORING NUMBER CEC-23A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/06/2024 **DATE COMPLETED** 09/11/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624387 **LONGITUDE** -70.914764
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: Not Recorded; AT END OF CORING: Not Recorded; 24 HRS AFTER DRILLING: Not Recorded
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) |
|---|---|---|---|---|---|
| 0 | | 0.4 ft | 9 | | |
| | Boring advanced to apparent rock at 19 ft bgs. No soil samples obtained. Soil graphic log assumed to be similar to adjacent CEC-9A. | | 8.6 | | |
| 5 | | | | | |
| 10 | | | -1 | | |
| 15 | Increased drive resistance at 19 ft bgs, began coring at 19 ft bgs. | 15.3 ft | -6.3 | | |
| | Core Rate | 19.0 ft | -10.0 | | |
| | 4.25 min/ft | Gray, Medium Grained Granite, Slightly Weathered, Moderately Broken, Medium Hard, **(BEDROCK)** | | | |
| 20 | 5.25 min/ft | | -11 | | |
| | 5.25 min/ft | | | RC C-1 | 80 (62) |
| | 3.5 min/ft | | | | |
| | 2 min/ft | | | | |
| | 2 min/ft | | | | |
| 25 | 1.25 min/ft | | | | |
| | 2 min/ft | | | RC C-2 | 42 (17) |
| | 1.75 min/ft | | | | |
| | 3 min/ft | | | | |
| | Casing driven to 35 ft bgs after coring 19-29 ft bgs due to hole | 29.0 ft | -20.0 | | |
| 30 | | | -21 | | |

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80

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# BORING NUMBER CEC-23A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| 35 | | collapse. Core barrel was pinched in casing at 35 ft bgs and boring was offset 3 ft west. Apparent weathered rock was encountered from 29 ft to 44 ft bgs. Coring began at 44 ft bgs. | | | | | |
| 40 | | | | -31 | | | |
| | | Core Rate | 44.0 ft | -35.0 | | | |
| 45 | | 4 min/ft<br>4.25 min/ft<br>4 min/ft<br>5.25 min/ft<br>5.75 min/ft<br>5.75 min/ft | Gray to Dark Gray, Medium to Very Coarse Grained Granite, Fresh, Moderately Broken to Slightly Broken, Medium Hard, Unconfined Compressive Strength of core C-3 = 9,657 psi, **(BEDROCK)** | | RC C-3 | 100 (82) | |
| 50 | | 7.25 min/ft<br>9.25 min/ft<br>9.5 min/ft<br>10 min/ft | | -41 | RC C-4 | 100 (86) | |
| | | | 54.0 ft | -45.0 | | | |
| 55 | | | End of boring at 54.0 feet | | | | |
| 60 | | | | -51 | | | |
| 65 | | | | | | | |

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# BORING NUMBER CEC-24A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 08/30/2024 **DATE COMPLETED** 09/03/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624254 **LONGITUDE** -70.914763
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: Not Recorded; AT END OF CORING: Not Recorded; 24 HRS AFTER DRILLING: Not Recorded
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| 0 | | Boring advanced to apparent rock at 44 ft bgs. No soil samples obtained. Soil graphic log assumed to be similar to adjacent CEC-11A. | 0.4 ft | 8.6 | | | |
| 5 | | | | | | | |
| 10 | | | | -1 | | | |
| 15 | | | | | | | |
| 20 | | | | -11 | | | |
| | | | 24.0 ft | -15.0 | | | |
| 25 | | | | | | | |
| | | | 29.0 ft | -20.0 | | | |
| 30 | | | | -21 | | | |

(Continued Next Page)

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-24A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) |
|---|---|---|---|---|---|
| 35 | | | | | |
| 40 | | | -31 | | |
| | | 40.9 ft / -31.9 | | | |
| | Increased drive resistance at 44 ft bgs, began coring at 45 ft bgs. | | | | |
| | | 44.0 ft / -35.0 | | | |
| 45 | Core Rate | 45.0 ft / -36.0 | | | |
| | 4.5 min/ft | Gray, Medium Grained Granite, Fresh to Slightly Weathered, Moderately Broken, Medium Hard to Hard, **(BEDROCK)** | | | |
| | 3.75 min/ft | | | | |
| | 6.5 min/ft | | | RC C-1 | 88 (70) |
| | 7.25 min/ft | | | | |
| | 9 min/ft | | | | |
| 50 | 8 min/ft | | -41 | | |
| | 5 min/ft | | | | |
| | 12 min/ft | | | RC C-2 | 94 (65) |
| | 13 min/ft | | | | |
| | NR | | | | |
| 55 | 3.25 min/ft | | | | |
| | | 56.0 ft / -47.0 | | | |
| | 6.25 min/ft | Gray to Dark Gray, Coarse Grained Granite with frequent Gabbro intrusions, Fresh to Slightly Weathered, Broken to Moderately Broken, Medium Hard, Unconfined Compressive Strength of core C-5 = 9,075 psi, **(BEDROCK)** | | | |
| | 6.75 min/ft | | | RC C-3 | 100 (35) |
| | 8.5 min/ft | | | | |
| | 9.25 min/ft | | | | |
| 60 | 7.75 min/ft | | -51 | | |
| | 4.5 min/ft | | | | |
| | 8 min/ft | | | RC C-4 | 100 (73) |
| | 8.5 min/ft | | | | |
| | 13.5 min/ft | | | | |
| 65 | 5.5 min/ft | | | | |
| | 8.5 min/ft | | | | |
| | 7 min/ft | | | | |

▲ SPT N VALUE ▲ 20 40 60 80

PL MC LL 20 40 60 80

□ FINES CONTENT (%) □ 20 40 60 80

(Continued Next Page)

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-24A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| 70 | | 9 min/ft<br>14 min/ft | Gray to Dark Gray, Coarse Grained Granite with frequent Gabbro intrusions, Fresh to Slightly Weathered, Broken to Moderately Broken, Medium Hard, Unconfined Compressive Strength of core C-5 = 9,075 psi, **(BEDROCK)**<br>70.0 ft<br>End of boring at 70.0 feet | -61.0<br>-61 | RC C-5 | 95 (68) | |
| 75 | | | | | | | |
| 80 | | | | -71 | | | |
| 85 | | | | | | | |
| 90 | | | | -81 | | | |
| 95 | | | | | | | |
| 100 | | | | -91 | | | |

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-25A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 08/29/2024 **DATE COMPLETED** 08/29/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624104 **LONGITUDE** -70.914732
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: Not Recorded; AT END OF CORING: Not Recorded; 24 HRS AFTER DRILLING: Not Recorded
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| 0 | | Boring advanced to apparent rock at 44 ft bgs. No soil samples obtained. Soil graphic log assumed to be similar to adjacent CEC-12A. | 0.4 ft | 8.6 | | | |
| 5 | | | | | | | |
| 10 | | | | -1 | | | |
| 15 | | | | | | | |
| 20 | | | 20.0 ft | -11.0 | | | |
| 25 | | | | -11 | | | |
| 30 | | | 29.0 ft | -20.0 | | | |
| | | | | -21 | | | |

(Continued Next Page)

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-25A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) |
|---|---|---|---|---|---|
| 35 | | | | | |
| 40 | | | -31 | | |
| | Increased drive resistance at 44 ft bgs, began coring at 45 ft bgs. | 44.0 ft | -35.0 | | |
| 45 | Core Rate | 45.0 ft | -36.0 | | |
| | 1 min/ft | Black to Gray, Coarse Grained Gabbro, Fresh to Slightly Weathered, Broken to Moderately Broken, Medium Hard, Unconfined Compressive Strength of core C-1 = 14,781 psi, **(BEDROCK)** | | RC C-1 | 80 (50) |
| | 2.25 min/ft | | | | |
| | 2.5 min/ft | | | | |
| | 2.5 min/ft | | | | |
| 50 | 2.25 min/ft | | -41 | | |
| | 2.25 min/ft | | | | |
| | 2.25 min/ft | | | | |
| | 2.5 min/ft | | | RC C-2 | 100 (23) |
| | 3.25 min/ft | | | | |
| | 3.75 min/ft | | | | |
| 55 | 2.5 min/ft | | | | |
| | 2.75 min/ft | | | | |
| | 2.5 min/ft | 58.0 ft | -49.0 | RC C-3 | 100 (47) |
| | 2.75 min/ft | Light Gray, Medium Grained Granite with frequent Gabbro intrusions, Fresh to Slightly Weathered, Moderately Broken, Hard to Soft, **(BEDROCK)** | | | |
| | 3.75 min/ft | | | | |
| 60 | 4.75 min/ft | | -51 | | |
| | 7.25 min/ft | | | | |
| | 5 min/ft | | | RC C-4 | 100 (67) |
| | 8.5 min/ft | | | | |
| | 6.25 min/ft | 65.0 ft | -56.0 | | |
| 65 | | End of boring at 65.0 feet | | | |

▲ SPT N VALUE ▲
20 40 60 80

PL MC LL
20 40 60 80

□ FINES CONTENT (%) □
20 40 60 80

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-26A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 08/28/2024 **DATE COMPLETED** 08/29/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.623980 **LONGITUDE** -70.914698
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: Not Recorded; AT END OF CORING: Not Recorded; 24 HRS AFTER DRILLING: Not Recorded
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| 0 | | Boring advanced to apparent rock at 49 ft bgs. No soil samples obtained. Soil graphic log assumed to be similar to adjacent CEC-13A, and glacial till assumed to extend to top of bedrock. | 0.4 ft | 8.6 | | | |
| 5 | | | | 9 | | | |
| 10 | | | | -1 | | | |
| 15 | | | | | | | |
| 20 | | | | -11 | | | |
| 25 | | | 24.0 ft / 25.0 ft | -15.0 / -16.0 | | | |
| 30 | | | | -21 | | | |

(Continued Next Page)

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-26A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) |
|---|---|---|---|---|---|---|
| 35 | | | | | | |
| 40 | | | | -31 | | |
| 45 | | Increased driving resistance at 49 ft bgs, began coring at 50 ft bgs. | | | | |
| | | | 49.0 ft | -40.0 | | |
| 50 | | Core Rate | 50.0 ft | -41.0 | | |
| | | 2 min/ft | Dark Gray, Coarse Grained Gabbro, Fresh to Slightly Weathered, Slightly Broken, Medium Hard, Unconfined Compressive Strength = 14,038 psi, **(BEDROCK)** | -41 | | |
| | | 2 min/ft | | | | |
| | | 1.75 min/ft | | | RC C-1 | 100 (89) |
| | | 4 min/ft | | | | |
| | | 4.75 min/ft | | | | |
| 55 | | | 55.2 ft | -46.2 | | |
| | | 2.5 min/ft | Gray, Coarse Grained Granite, Fresh to Slightly Weathered, Moderately Broken, Medium Hard, **(BEDROCK)** | | | |
| | | 2 min/ft | 57.0 ft | -48.0 | | |
| | | 4.25 min/ft | Dark Gray, Coarse Grained Gabbro, Fresh to Slightly Weathered, Moderately Broken, Medium Hard, **(BEDROCK)** | | RC C-2 | 93 (79) |
| | | 5.25 min/ft | | | | |
| | | 4.5 min/ft | | | | |
| 60 | | | 60.0 ft | -51.0 | | |
| | | | End of boring at 60.0 feet | -51 | | |
| 65 | | | | | | |

▲ SPT N VALUE ▲
20 40 60 80

PL MC LL
20 40 60 80

□ FINES CONTENT (%) □
20 40 60 80

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Raynham, MA 02767

# BORING NUMBER CEC-27A



**CLIENT** Foth Infrastructure & Environment, LLC
**PROJECT NAME** MassCEC Expansion
**PROJECT NUMBER** 332-344
**PROJECT LOCATION** New Bedford, MA
**DATE STARTED** 09/05/2024 **DATE COMPLETED** 09/06/2024
**GROUND ELEVATION** 9.0 ft **BACKFILL** with Cement
**SAMPLING CONTRACTOR** Geosearch, Inc.
**LATITUDE** 41.624149 **LONGITUDE** -70.914868
**SAMPLING METHOD** Wash Rotary
**WATER LEVELS** AT END OF SOIL SAMPLING: Not Recorded; AT END OF CORING: Not Recorded; 24 HRS AFTER DRILLING: Not Recorded
**CEC REP** Dave Barboza **CHECKED BY** Tony Sousa, P.E.
**NOTES** Shuster Bulkhead (4 Wright St. New Bedford, MA)

| DEPTH (ft) | GRAPHIC LOG | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80 |
|---|---|---|---|---|---|---|---|
| 0 | | Boring advanced to apparent rock at 42 ft bgs. No soil samples obtained. Soil graphic log assumed to be similar to adjacent CEC-17A, and glacial till assumed to extend to top of bedrock. | 0.4 ft | 8.6 | | | |
| 5 | | | | 9 | | | |
| 10 | | | | -1 | | | |
| 15 | | | | | | | |
| 20 | | | | -11 | | | |
| | | | 22.0 ft | -13.0 | | | |
| 25 | | | | | | | |
| 30 | | | | -21 | | | |

(Continued Next Page)

Civil & Environmental Consultants, Inc.
31 Bellows Road
Raynham, MA 02767

# BORING NUMBER CEC-27A



**CLIENT** Foth Infrastructure & Environment, LLC **PROJECT NAME** MassCEC Expansion

**PROJECT NUMBER** 332-344 **PROJECT LOCATION** New Bedford, MA

| DEPTH (ft) | REMARKS | MATERIAL DESCRIPTION | ELEVATION (ft) | SAMPLE TYPE NUMBER | RECOVERY % (RQD) |
|---|---|---|---|---|---|
| 35 | | | | | |
| 40 | Increased drive resistance at 41 ft bgs, began coring at 42 ft bgs. | | -31 | | |
| | | 41.0 ft | -32.0 | | |
| | Core Rate | | | | |
| | | 42.0 ft | -33.0 | | |
| | 5.75 min/ft | 42.5 ft Dark Gray, Coarse Grained Gabbro, Slightly Weathered, Moderately Broken, Soft, **(BEDROCK)** | -33.5 | | |
| | 4.25 min/ft | Gray, Coarse Grained Granite, Moderately Weathered, Slightly Broken to Moderately Broken, Medium Hard, **(BEDROCK)** | | | |
| | 3.25 min/ft | 45.0 ft | -36.0 | RC C-1 | 100 (25) |
| 45 | 2 min/ft | Dark Gray to Black, Coarse Grained Gabbro, Fresh to Moderately Weathered, Slightly Broken to Very Broken, Soft, **(BEDROCK)** | | | |
| | 2.5 min/ft | | | | |
| | 4.75 min/ft | | | | |
| | 3.5 min/ft | | | | |
| | 2.75 min/ft | | | RC C-2 | 100 (8) |
| 50 | 3 min/ft | | -41 | | |
| | 2.75 min/ft | | | | |
| | 3.5 min/ft | | | | |
| | 3.25 min/ft | | | | |
| | 8.5 min/ft | | | RC C-3 | 65 (7) |
| 55 | 6 min/ft | | | | |
| | 12 min/ft | | | | |
| | 3.5 min/ft | 57.3 ft | -48.3 | | |
| | 3.5 min/ft | Gray to Dark Gray, Medium Grained Granite, Slightly Weathered, Slightly Broken, Hard, Unconfined Compressive Strength of core C-4= 15,631 psi, **(BEDROCK)** | | | |
| | 3 min/ft | | | RC C-4 | 100 (75) |
| 60 | 3 min/ft | | -51 | | |
| | 4.25 min/ft | | | | |
| | 2 min/ft | | | | |
| | 4 min/ft | | | | |
| | 4 min/ft | | | RC C-5 | 97 (75) |
| 65 | 4 min/ft | | | | |
| | 5.25 min/ft | 67.0 ft | -58.0 | | |
| | | End of boring at 67.0 feet | | | |

▲ SPT N VALUE ▲
20 40 60 80

PL MC LL
20 40 60 80

□ FINES CONTENT (%) □
20 40 60 80

**PERFORMED BY CLE ENGINEERING (2012)**

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| | | | |
|---|---|---|---|
| Boring | SB-1 | | |
| Page | 1 of 2 Sheets | | |
| Date | March 29-30, 2012 | | |
| Weather | Clear 50's | | |
| Groundwater Depth | 5' feet | Project Name | Shuster Investigation |
| Total Depth of Hole | 51' feet | Job No | |
| Depth to Cored Rock | 41' feet | Driller | Geologic. Driller:Dave, Hand: Johnny |
| | | Logged By | B. Hebbel, P.G. CLE Engineering |

| Elev. feet | Depth feet | Sample Type & No. | Blows per 6" | RQD or Blow Count | Pen. inch | Rec. inch | Graphic Log | Soil & Rock Descriptions |
|---|---|---|---|---|---|---|---|---|
| | | | 0 | | | | | |
| | | | 10 | | | | | |
| | 0'-2' | S-1 | 6 | 22 | 18" | 10" | | S-1= Sand fine-medium, loose, damp, pale yellow brown SP Poorly Graded Sand |
| | | | 12 | | | | | Roller bit from 0-0.5' through asphalt parking lot surface |
| | | | 10 | | | | | |
| | | | 21 | | | | | |
| | 4'-6' | S-2 | 120 | 10 | 13" | 12" | | S-2= 120 Blows for 1". No Recovery. Plans/figures indicate concrete slab/footing Roller bit to 9' |
| | | | 0 | | | | | |
| | | | 10 | | | | | |
| | | | 3 | | | | | |
| | 9'-11' | S-3 | 9 | 44 | 24" | 10" | | S-3= Sand fine to medium, loose wet pale gray SP Poorly Graded Sand |
| | | | 15 | | | | | |
| | | | 29 | | | | | |
| | | | 22 | | | | | |
| | 14'-16' | S-4 | 34 | 61 | 24" | 12" | | S-4=Sand fine to medium trace gravel fine-medium, medium dense wet pale gray SP Poorly |
| | | | 11 | | | | | Graded Sand |
| | | | 50 | | | | | |
| | | | 39 | | | | | |
| | 19'-21' | S-5 | 50 | 96 | 24" | 10" | | S-5=Sand fine to medium trace gravel fine-medium, medium dense wet pale gray SP Poorly |
| | | | 58 | | | | | Graded Sand |
| | | | 38 | | | | | |
| | | | 64 | | | | | |
| | 24'-26' | S-6 | 37 | 43 | 24" | 0" | | S-6= No sample recovery in spoon |
| | | | 25 | | | | | End Drilling Ops for 3/29/12 |
| | | | 18 | | | | | Resume Drilling Ops for 3/30/12 |
| | | | 28 | | | | | |
| | 29'-31' | S-7 | 18 | 57 | 24" | 10" | | S-7=Sand fine to medium, medium dense, wet pale brown to light gray SP |
| | | | 36 | | | | | Poorly Graded Sand |
| | | | 21 | | | | | |
| | | | 24 | | | | | |
| | 34'-36' | S-8 | 51 | 65 | 24" | 15" | | S-8=Sand fine to medium little gravel, fine little silt very dense wet bright yellow brown SP-SM |
| | | | 34 | | | | | Poorly Graded Sand with Silt and Gravel |
| | | | 31 | | | | | |
| | | | 57 | | | | | |
| | 39'-41' | S-9 | 120 | #REF! | 13" | 6" | | S-9=Sand fine to medium little gravel, fine little silt very dense wet yellow brown. Tip of spoon contains |
| | | | 0 | | | | | weathered bedrock Poorly Graded Sand with Silt and Gravel. End Boring at 41' Set up to core |

Notes: Boring taken as located by CLE in S-SE corner of Shuster Pier, Approx 3' in from edge of pier/water interface.
4" Casing either drilled, driven by auto-hammer, or pushed by drill rig.
SPT done with 2" split spoon sampler and 140lb weight falling 30"
0-2' Fill, 2'-39' Marine sediments, 39'-41' Glacial Till weathered rock, 41'-51' Bedrock

Key: Fines Content: trace (tr) = 1-10%, little (lt) = 10-20%, some (sm) = 20-35%, and (&) = 35-50%
Cohesionaless Soil Density (blows/ft): very loose (vl) = 0-4, loose (l) = 4-10, medium dense (md) = 10-30, dense (d) = 30-50 , very dense (vd) = 50+
Cohesive Soil Consistency (bows/ft): very soft (vs) <2, soft (s) = 2- 4 , firm (f) = 4-8 , stiff (st) = 8-15, very stiff (vs) = 15-30, hard (h) >30
Color: br = brown, gy = grey, gn = green, yl = yellow, ol = olive, og = orange, bl = black
Plasticity: np = non plastic, sp = slightly plastic, mp = moderately plastic, hp = highly plastic, vhp = very highly plastic

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| | | | |
|---|---|---|---|
| Groundwater Depth | 5 | feet | |
| Total Depth of Hole | 51 | feet | |
| Depth to Cored Rock | 41 | feet | |
| | | | |

| | |
|---|---|
| Boring | SB-1 |
| Page | 2 of 2 Sheets |
| Date | March 29-30, 2012 |
| Weather | Clear 50's |
| Project Name | Shuster Investigation |
| Job No | |
| Driller | Geologic. Driller:Dave, Hand: Johnny |
| Logged By | B. Hebbel, P.G. CLE Engineering |

| Drilling Details | Depth | | Sample | | | | | | | Soil & Rock Descriptions | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Run | feet | Run Time Min | Core Recov Length | Total Recov % | Solid Core Recovery % | Mod.Core Recov % | RQD | Intact Rock Str (Mpa) | Weat-hering | Structural Discontinuity | Rock Mass Desciption |
| R1 (60") | 41 | | | | | | | | | *FracturesTypical:* | Biotite Gneiss 41'-44' |
| | | | | | | | | | | Type: Fracture Zone | small to small blocks, slightly fractured |
| | | | | | | | | | | Dip Angle: 0-60 degrees | Massive no banding evident, slightly |
| | | | | | | | | | | Very Narrow, Unhealed, w/ decomposed | decomposed |
| | | | | | | | | | | rock-sands-silts, mod. smooth interface | Very strong |
| | 42 | 5 | | | | | | | | | |
| | 43 | 5 | | | | | | | | | |
| | 44 | 6 | | | | | | | | *FracturesTypical:* | Granitic Gneiss 44'-48' |
| | | | | | | | | | | Type: Fracture Zone | Light gray pale gray slight-mod fractured |
| | | | | | | | | | | Dip Angle: 0-60 degrees | Thinly banded slightly weathered |
| | | | | | | | | | | Very Narrow, Unhealed, w/ decomposed | Very Strong |
| | | | | | | | | | | rock-sands-silts, mod. smooth interface | |
| | 45 | 7 | | | | | | | | | |
| End R1 | 46 | 4 | | | | | | | | | |
| Start R2 (60") | 47 | 5 | | | | | | | | | |
| | 48 | 6 | | | | | | | | *FracturesTypical:* | Biotite Gneiss 48'-51' |
| | | | | | | | | | | Type: Fracture Zone | small to small blocks, slightly fractured |
| | | | | | | | | | | Dip Angle: 0-60 degrees | Massive no banding evident, slightly |
| | | | | | | | | | | Very Narrow, Unhealed, w/ decomposed | decomposed |
| | | | | | | | | | | rock-sands-silts, mod. smooth interface | Very strong |
| | 49 | 8 | | | | | | | | | |
| | 50 | 7 | | | | | | | | | |
| End R2 | 51 | 9 | | | | | | | | | |

Notes: Rock cored with swivel-type double-tube HQ core barrel.
Average coring rate = 62min/10' = 6.2 Min/Foot
R1 RQD=65%
R2 RQD=95%

Key: R.Q.D. (Sum core length >4"/Length of core run) x 100)

| | | | |
|---|---|---|---|
| cle engineering | | Boring | SB-2 |
| | | Page | 1 of 2 |
| | | Date | March 28-29, 2012 |
| | | Weather | Clear 50's |
| Groundwater Depth | 5' feet | Project Name | Shuster Investigation |
| Total Depth of Hole | 53' feet | Job No | |
| Depth to Cored Rock | 43' feet | Driller | Geologic. Driller:Dave, Hand: Johnny |
| | | Logged By | B. Hebbel, P.G. CLE Engineering |

| Elev. | Depth | Sample | | | | | Graphic Log | Soil & Rock Descriptions |
|---|---|---|---|---|---|---|---|---|
| | | Type & No. | Blows per 6" | RQD or Blow Count | Pen. inch | Rec. inch | | |
| feet | feet | | | | | | | |
| | | | 9 | | | | | |
| | 0-2' | S-1 | 9<br>12 | 132 | 18" | 10" | | S-1=Sand, fine, trace fine loose, damp, pale yellow brown SP Poorly Graded Sand<br>Roller bit from 0-0.5' through asphalt parking lot surface |
| | | | 120<br>0 | | 1 | | | |
| | 4'-6' | S-2 | 0<br>0 | 8 | 1" | 0" | | S-2= 120 Blows for 1". No Recovery. Plans/figures indicate concrete slab/footing Roller bit to 9' |
| | | | 8<br>8 | | | | | |
| | 9'-11' | S-3 | 11<br>8 | 37 | 24" | 12" | | S-3= Sand, fine to coarse sand loose, wet pale tan SW Well Graded Sand |
| | | | 29<br>25 | | | | | |
| | 14'-16' | S-4 | 34<br>31 | 55 | 24" | 6" | | S-4=Sand, fine to medium, dense wet pale gray SP Poorly Graded Sand |
| | | | 24<br>23 | | | | | |
| | 19'-21' | S-5 | 23<br>28 | 40 | 24" | 15" | | S-5=Sand, fine to medium, dense wet pale gray SP Poorly Graded Sand |
| | | | 12<br>28 | | | | | |
| | 24'-26' | S-6 | 26<br>36 | 61 | 24" | 0" | | S-6= No soil recovery. Large angular cobble lodged in spoon tip |
| | | | 25<br>23 | | | | | |
| | 29'-31' | S-7 | 50<br>21 | 56 | 24" | 6" | | S-7= Sand fine-medium trace gravel fine medium dense wet pale gray SP Poorly Graded Sand |
| | | | 35<br>34 | | | | | |
| | 34'-36' | S-8 | 120<br>0 | 49 | 16" | 6" | | S-8= Sand fine-coarse sand little gravel fine very dense wet pale brown SW Well Graded Sand with<br>Gravel. Roller bit resisting advancement with increased down pressure at 37.5'.End drilling ops 3/28/12 |
| | | | 49<br>98 | | | | | Resume drilling ops 3/29/12<br>Roller bit down to 38' to set up for coring and drillhead breaks through obstruction/boulder |
| | 38-'40' | S-9 | 120<br>0 | 0 | 15" | 10" | | S-9=Sand fine to medium little gravel, fine little silt very dense wet bright yellow brown SP-SM<br>Poorly Graded Sand with Silt and Gravel |
| | 43' | | | | | | | Roller bit down thru weathered bedrock to set up for coring and set casing in suitable rock<br>End boring at 43' to begin 10' core |

Notes: Boring taken in SE corner of end of Shuster Pier, Approx 3' in from pier/water edge.
4" Casing either drilled, driven by auto-hammer, or pushed by drill rig.
SPT done with 2" split spoon sampler and 140lb weight falling 30"
0-2' Fill, 2'-41' Marine sediments, 41'-43' Glacial Till weathered rock, 43'-53' Bedrock

Key: Fines Content: trace (tr) = 1-10%, little (lt) = 10-20%, some (sm) = 20-35%, and (&) = 35-50%
Cohesionless Soil Density (blows/ft): very loose (vl) = 0-4, loose (l) = 4-10, medium dense (md) = 10-30, dense (d) = 30-50 , very dense (vd) = 50+

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| | | | |
|---|---|---|---|
| Groundwater Depth | 5' | feet | |
| Total Depth of Hole | 53' | feet | |
| Depth to Cored Rock | 43' | feet | |
| | | | |

| | |
|---|---|
| Boring | SB-2 |
| Page | 2 of 2 |
| Date | March 28-29, 2012 |
| Weather | Clear 50's |
| Project Name | Shuster Investigation |
| Job No | |
| Driller | Geologic. Driller:Dave, Hand: Johnny |
| Logged By | B. Hebbel, P.G. CLE Engineering |

| Drilling Details Run | Depth feet | Run Time Min | Sample Core Recov Length | Total Recov % | Solid Core Recovery % | Mod.Core Recov % | RQD | Intact Rock Str (Mpa) | Weat-hering | Soil & Rock Descriptions: Structural Discontinuity | Rock Mass Desciption |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R1 (60") | 43 | | | | | | | | | *FracturesTypical:* | Granitic Gneiss 43'-48' |
| | | | | | | | | | | Type: Fracture Zone | Light gray pale gray slight-mod fractured |
| | | | | | | | | | | Dip Angle: 0-60 degrees | Thinly banded slightly weathered |
| | | | | | | | | | | Very Narrow, Unhealed, w/ decomposed | Very Strong |
| | | | | | | | | | | rock-sands-silts, mod. smooth interface | Very strong |
| | 44 | 6 | | | | | | | | | |
| | 45 | 7 | | | | | | | | | |
| | 46 | 8 | | | | | | | | | |
| | 47 | 11 | | | | | | | | | |
| | 48 | 10 | | | | | | | | *FracturesTypical:* | Biotite Gneiss 48'-52' |
| | | | | | | | | | | Type: Fracture Zone | Dk Gray to Black, slightly fractured |
| | | | | | | | | | | Dip Angle: 0-60 degrees | Massive no banding evident, slightly |
| | | | | | | | | | | Very Narrow, Unhealed, w/ decomposed | decomposed |
| End R1 | | | | | | | | | | rock-sands-silts, mod. smooth interface | Very strong |
| Start R2 (60") | 49 | 4 | | | | | | | | | |
| | 50 | 10 | | | | | | | | | |
| | 51 | 5 | | | | | | | | | |
| | 52 | 13 | | | | | | | | *FracturesTypical:* | Granitic Gneiss 52'-53' |
| | | | | | | | | | | Type: Fracture Zone | Light gray pale gray slight-mod fractured |
| | | | | | | | | | | Dip Angle: 0-60 degrees | Thinly banded slightly weathered |
| | | | | | | | | | | Very Narrow, Unhealed, w/ decomposed | Very Strong |
| | | | | | | | | | | rock-sands-silts, mod. smooth interface | |
| | 53 | 12 | | | | | | | | | |
| End R2 | | | | | | | | | | | |

Notes: Rock cored with swivel-type double-tube HQ core barrel.
Average coring rate = 86min/10' = 8.6 Min/Foot
R1 RQD=83%
R2 RQD=80%

Key: R.Q.D. (Sum core length >4"/Length of core run) x 100)

| | | | |
|---|---|---|---|
| Foth | | Boring | SB-3 |
| | | Page | 1 of 2 |
| | | Date | April 3, 2012 |
| | | Weather | Clear 50's |
| Groundwater Depth | 5' feet | Project Name | Shuster Investigation |
| Total Depth of Hole | 54' feet | Job No | |
| Depth to Cored Rock | 44' feet | Driller | Geologic. Driller:Dave, Hand: Johnny |
| | | Logged By | B. Hebbel, P.G. Foth |

| Elev. | Depth | Sample | | | | | Graphic Log | Soil & Rock Descriptions |
|---|---|---|---|---|---|---|---|---|
| | | Type & No. | Blows per 6" | RQD or Blow Count | Pen. inch | Rec. inch | | |
| feet | feet | | | | | | | |
| | | | 0 | | | | | |
| | | | 11 | | | | | |
| | 0'-2' | S-1 | 16 | 36 | 18" | 6" | | S-1= Sand fine-medium, loose, damp, pale yellow brown SP Poorly Graded Sand |
| | | | 12 | | | | | Roller bit from 0-0.5' through asphalt parking lot surface |
| | | | 24 | | | | | |
| | | | 29 | | | | | |
| | 4'-6' | S-2 | 120 | 6 | 13" | 6" | | S-2= 120 Blows for 1". Sand fine to medium loose wet pale brown. SP Poorly Graded Sand |
| | | | 0 | | | | | Plans/figures indicate concrete slab/footing Roller bit to 9' |
| | | | 6 | | | | | |
| | | | 3 | | | | | |
| | 9'-11' | S-3 | 4 | 45 | 24" | 6" | | S-3= Sand fine to medium, loose wet dark gray to black. SP Poorly Graded Sand |
| | | | 5 | | | | | |
| | | | 40 | | | | | |
| | | | 41 | | | | | |
| | 14'-16' | S-4 | 33 | 98 | 24" | 10" | | S-4=Sand fine to medium dense wet pale brown SP Poorly Graded Sand |
| | | | 38 | | | | | |
| | | | 60 | | | | | |
| | | | 35 | | | | | |
| | 19'-21' | S-5 | 32 | 64 | 24" | 14" | | S-5=Sand fine to medium trace gravel fine, medium dense wet pale gray SP Poorly |
| | | | 30 | | | | | Graded Sand |
| | | | 34 | | | | | |
| | | | 28 | | | | | |
| | 24'-26' | S-6 | 45 | 55 | 24" | 10" | | S-6= Sand fine to coarse, trace gravel fine dense wet, pale brown to gray. SW Well Graded Sand |
| | | | 35 | | | | | |
| | | | 20 | | | | | |
| | | | 18 | | | | | |
| | 29'-31' | S-7 | 25 | 74 | 24" | 6" | | S-7= Sand fine to coarse, trace gravel fine to medium dense wet, light gray. SW Well Graded Sand |
| | | | 7 | | | | | |
| | | | 67 | | | | | |
| | | | 120 | | | | | |
| | 34'-36' | S-8 | 0 | 120 | 9" | 5" | | S-8=Sand fine to medium little gravel, fine to coarse little silt very dense wet pale to medium gray |
| | | | 0 | | | | | SP Poorly Graded Sand with Gravel |
| | | | 120 | | | | | |
| | | | 0 | | | | | |
| | 39'-41' | S-9 | 0 | 0 | 3" | 3" | | S-9=Sand fine to medium little gravel fine to coarse little silt very dense wet yellow brown. |
| | | | 0 | | | | | SP-SM Poorly Graded Sand with Silt and Gravel. Roller bit resistance at 44'. End boring at 44' |

Notes: Boring taken along main section of Shuster Pier northward of SB-2 and 3' feet in from pier/water interface.
4" Casing either drilled, driven by auto-hammer, or pushed by drill rig.
SPT done with 2" split spoon sampler and 140lb weight falling 30"
0-2' Fill, 2'-41' Marine sediments, 41'-44' Glacial Till weathered rock, 44'-54' Bedrock

Key: Fines Content: trace (tr) = 1-10%, little (lt) = 10-20%, some (sm) = 20-35%, and (&) = 35-50%
Cohesionaless Soil Density (blows/ft): very loose (vl) = 0-4, loose (l) = 4-10, medium dense (md) = 10-30, dense (d) = 30-50 , very dense (vd) = 50+

| | | | |
|---|---|---|---|
| Groundwater Depth | 5' feet | Boring | SB-3 |
| Total Depth of Hole | 54' feet | Page | 2 of 2 |
| Depth to Cored Rock | 44' feet | Date | April 3, 2012 |
| | | Weather | Clear 50's |
| | | Project Name | Shuster Investigation |
| | | Job No | |
| | | Driller | Geologic. Driller:Dave, Hand: Johnny |
| | | Logged By | B. Hebbel, P.G. Foth |

| Drilling Details | Depth | Run | Sample | | | | RQD | Intact | Weat- | Soil & Rock Descriptions | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Time | Core Recov | Total Recov | Solid Core Recovery | Mod.Core Recov | | Rock | hering | | |
| Run | feet | Min | Length | % | % | % | | Str (Mpa) | | Structural Discontinuity | Rock Mass Desciption |
| R1 (60") | 44 | | | | | | | | | *FracturesTypical:* | Biotite Gneiss 44'-48' |
| | | | | | | | | | | Type: Fracture Zone | Dk Gray to Black, slightly fractured |
| | | | | | | | | | | Dip Angle: 0-60 degrees | Massive no banding evident, slightly |
| | | | | | | | | | | Very Narrow, Unhealed, w/ decomposed | decomposed |
| | | | | | | | | | | rock-sands-silts, Rough interface | Very strong |
| | 45 | 12 | | | | | | | | | |
| | 46 | 9 | | | | | | | | | |
| | 47 | 11 | | | | | | | | | |
| | 48 | 10 | | | | | | | | *FracturesTypical:* | Granitic Gneiss 48'-52' |
| | | | | | | | | | | Type: Fracture Zone | Light gray pale gray slight-mod fractured |
| | | | | | | | | | | Dip Angle: 0-60 degrees | Thinly banded slightly weathered |
| | | | | | | | | | | Very Narrow, Unhealed, w/ decomposed | Very Strong |
| | | | | | | | | | | rock-sands-silts, Rough interface | |
| End R1 | 49 | 7 | | | | | | | | | |
| Start R2 (60") | 50 | 8 | | | | | | | | | |
| | 51 | 10 | | | | | | | | | |
| | 52 | 6 | | | | | | | | *FracturesTypical:* | Biotite Gneiss 52'-54' |
| | | | | | | | | | | Type: Fracture Zone | Dk Gray to Black, slightly fractured |
| | | | | | | | | | | Dip Angle: 0-60 degrees | Massive no banding evident, slightly |
| | | | | | | | | | | Very Narrow, Unhealed, w/ decomposed | decomposed |
| | | | | | | | | | | rock-sands-silts, Rough interface | Very strong |
| | 53 | 8 | | | | | | | | | |
| End R2 | 54 | 8 | | | | | | | | | |

Notes: Rock cored with swivel-type double-tube HQ core barrel.
Average coring rate = 89min/10' = 8.9 Min/Foot
R1 RQD=53%
R2 RQD=93%

Key: R.Q.D. (Sum core length >4"/Length of core run) x 100)

| | | | |
|---|---|---|---|
| cle engineering | | Boring | SB-4 |
| | | Page | 1 of 2 |
| | | Date | March 30-April 2, 2012 |
| | | Weather | Clear 50's |
| Groundwater Depth | 5' feet | Project Name | Shuster Investigation |
| Total Depth of Hole | 51.5' feet | Job No | |
| Depth to Cored Rock | 41.5' feet | Driller | Geologic. Driller:Dave, Hand: Johnny |
| | | Logged By | B. Hebbel, P.G. CLE Engineering |

| Elev. | Depth | Sample | | | | | Graphic Log | Soil & Rock Descriptions |
|---|---|---|---|---|---|---|---|---|
| | | Type & | Blows per | RQD or Blow | Pen. | Rec. | | |
| feet | feet | No. | 6" | Count | inch | inch | | |
| | | | 0 | | | | | |
| | | | 9 | | | | | |
| | 0'-2' | S-1 | 14 | 62 | 18" | 6" | | S-1= Sand fine-medium, loose, damp, pale yellow brown SP Poorly Graded Sand |
| | | | 22 | | | | | Roller bit from 0-0.5' through asphalt parking lot surface |
| | | | 40 | | | | | |
| | | | 120 | | | | | |
| | 4'-6' | S-2 | 0 | 3 | 9" | 0" | | S-2= 120 Blows for 3". No sample recovery in split-spoon |
| | | | 0 | | | | | Plans/figures indicate concrete slab/footing Roller bit to 9' |
| | | | 3 | | | | | |
| | | | 4 | | | | | |
| | 9'-11' | S-3 | 12 | 42 | 24" | 6" | | S-3= Sand fine to medium, trace gravel fine loose wet gray. SP Poorly Graded Sand |
| | | | 13 | | | | | |
| | | | 29 | | | | | |
| | | | 25 | | | | | |
| | 14'-16' | S-4 | 26 | 64 | 24" | 11" | | S-4=Sand fine to medium little fine gravel medium dense wet pale brown SW Well Graded Sand |
| | | | 22 | | | | | With Gravel |
| | | | 42 | | | | | |
| | | | 44 | | | | | |
| | 19'-21' | S-5 | 24 | 72 | 24" | 11" | | S-5=Sand fine to coarse trace gravel fine, medium dense wet pale gray SW Well Graded Sand |
| | | | 28 | | | | | with Gravel. End Drilling Ops For 3/30/12 |
| | | | 44 | | | | | Resume Drilling Ops 4/2/12 |
| | | | 37 | | | | | |
| | 24'-26' | S-6 | 40 | 80 | 24" | 5" | | S-5=Sand fine to coarse little gravel fine to medium, dense wet pale gray SW Well Graded Sand |
| | | | 36 | | | | | With Gravel |
| | | | 44 | | | | | |
| | | | 40 | | | | | |
| | 29'-31' | S-7 | 22 | 69 | 24" | 10" | | S-7= Sand fine to coarse, little gravel fine to medium little silt dense wet, light gray. SP-SM |
| | | | 15 | | | | | Poorly Graded Sand With Silt and Gravel. |
| | | | 54 | | | | | |
| | | | 87 | | | | | |
| | 34'-36' | S-8 | 53 | 73 | 9" | 12" | | S-8=Sand fine to medium little gravel, fine to coarse little silt very dense wet pale to medium gray |
| | | | 34 | | | | | SP Poorly Graded Sand with Silt and Gravel |
| | | | 39 | | | | | |
| | | | 41 | | | | | |
| | 39'-41' | S-9 | 43 | #REF! | 16" | 4" | | S-9=Sand fine to medium trace gravel fine little silt very dense wet yellow brown. |
| | | | 0 | | | | | SP-SM Poorly Graded Sand with Silt and Gravel. Roller bit resistance at 41.5'. End boring at 41.5' |

Notes: Boring taken along main section of Shuster Pier northward of SB-3 and 3' feet in from pier/water interface.
4" Casing either drilled, driven by auto-hammer, or pushed by drill rig.
SPT done with 2" split spoon sampler and 140lb weight falling 30"
0-2' Fill, 2'-41' Marine sediments, 41'-41.5" Glacial Till weathered rock, 41.5'-51.5' Bedrock

Key: Fines Content: trace (tr) = 1-10%, little (lt) = 10-20%, some (sm) = 20-35%, and (&) = 35-50%

cle engineering

| | | | |
|---|---|---|---|
| Groundwater Depth | 5' | feet | |
| Total Depth of Hole | 51.5' | feet | |
| Depth to Cored Rock | 41.5' | feet | |
| | | | |

| | |
|---|---|
| Boring | SB-4 |
| Page | 2 of 2 |
| Date | March 30-April 2, 2012 |
| Weather | Clear 50's |
| Project Name | Shuster Investigation |
| Job No | |
| Driller | Geologic. Driller:Dave, Hand: Johnny |
| Logged By | B. Hebbel, P.G. CLE Engineering |

| Drilling Details | Depth | | Sample | | | | | | | Soil & Rock Descriptions | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Run Time | Core Recov | Total Recov | Solid Core Recovery | Mod.Core Recov | RQD | Intact Rock | Weat-hering | | |
| Run | feet | Min | Length | % | % | % | | Str (Mpa) | | Structural Discontinuity | Rock Mass Desciption |
| R1 (60") | 41.5 | 6 | | | | | | | | *FracturesTypical:* | Granitic Gneiss 41.5-51.5' |
| | | | | | | | | | | Type: Fracture Zone | Light gray pale gray slight-mod fractured |
| | | | | | | | | | | Dip Angle: 0-60 degrees | Thinly banded slightly weathered |
| | | | | | | | | | | Very Narrow, Unhealed, w/ decomposed | Very Strong |
| | | | | | | | | | | rock-sands-silts, mod. smooth interface | |
| | 42.5 | 8 | | | | | | | | | |
| | 43.5 | 9 | | | | | | | | | |
| | 44.5 | 7 | | | | | | | | | |
| | 45.5 | 9 | | | | | | | | | |
| End R1 | 46.5 | 7 | | | | | | | | | |
| Start R2 (60") | 47.5 | 6 | | | | | | | | | |
| | 48.5 | 7 | | | | | | | | | |
| | 49.5 | 7 | | | | | | | | | |
| | 50.5 | 5 | | | | | | | | | |
| End R2 | 51.5 | 12 | | | | | | | | | |

Notes:
Rock cored with swivel-type double-tube HQ core barrel.
Average coring rate = 78min/10' = 7.8 Min/Foot
R1 RQD=65%
R2 RQD=58%

Key: R.Q.D. (Sum core length >4"/Length of core run) x 100)

| | | | |
|---|---|---|---|
| cle engineering | Boring | SB 5 |
| | Page | 1 of 3 |
| | Date | March 26-27 2012 |
| | Weather | Clear 50's |
| Groundwater Depth 5' feet | Project Name | Shuster Investigation |
| Total Depth of Hole 52.5' feet | Job No | |
| Depth to Cored Rock 42.5' feet | Driller | Geologic. Driller:Dave, Hand: Johnny |
| | Logged By | B. Hebbel, P.G. CLE Engineering |

| Elev. | Depth | Sample | | | | | Graphic Log | Soil & Rock Descriptions |
|---|---|---|---|---|---|---|---|---|
| | | Type & No. | Blows per 6" | RQD or Blow Count | Pen. | Rec. | | |
| feet | feet | | | | inch | inch | | |
| | 0-2' | S-1 | 17<br>23<br>32 | 100 | 18" | 6" | | S-1=Sand, fine-medium, trace fine gravel, med dense, moist, pale yellow brown SP<br>Roller bit from 0-0.5' through asphalt parking lot surface |
| | 2'-4' | S-2 | 68<br>78<br>46<br>94 | 114 | 24" | 18" | | S-2=Sand, fine-medium trace gravel, very dense moist pale gray SP |
| | 4'-6' | S-3 | 20<br>20<br>20<br>14 | 24 | 24" | 10" | | S-3= Sand, medium trace gravel,coarse med-dense wet pale tan SP |
| | 6'-8' | S-4 | 10<br>8<br>7<br>8 | 12 | 24" | 5" | | S-4=Sand, medium little gravel fine-medium loose wet pale yellow brown SW |
| | 8'-10' | S-5 | 4<br>8<br>11<br>19 | 35 | 24" | 6" | | S-5= Sand medium trace gravel, medium loose wet pale brown SP |
| | 10'-12' | S-6 | 16<br>21<br>28<br>25 | 52 | 24" | 12" | | S-6= Sand fine-medium little gravel fine-medium med dense, wet pale gray SW Well Graded Sand<br>With Gravel |
| | 12'-14' | S-7 | 27<br>32<br>40<br>47 | 85 | 24" | 18" | | S-7= Sand fine-medium little gravel fine dense wet pale gray SW Well Graded Sand With Gravel |
| | 14'-16' | S-8 | 38<br>86<br>80<br>64 | 74 | 24" | 5" | | S-8= Sand fine-medium trace gravel fine very dense wet pale brown SP Poorly Graded Sand |
| | 16'-18' | S-9 | 10<br>24<br>31<br>29 | 47 | 24" | 6" | | S-9= Sand fine-medium trace gravel medium dense wet pale gray SP Poorly Graded Sand With Gravel |
| | 18'-20' | S-10 | 18<br>20<br>30<br>24 | 29 | 24" | 6" | | S-10= Sand fine-medium trace gravel medium dense wet pale brown to gray SP Poorly Graded Sand<br>With Gravel |
| | 20'-22' | S-11 | 5<br>6<br>13<br>29 | 29 | 24" | 12" | | S-11= Sand fine-medium trace gravel medium dense wet dark gray to black SP Poorly Graded Sand |

Notes: Boring taken within parking area main section of Shuster Pier westward of of SB-3 and SB-4 as located by CLE
4" Casing either drilled, driven by auto-hammer, or pushed by drill rig.
SPT done with 2" split spoon sampler and 140lb weight falling 30"
0-2' Fill, 2'-41' Marine sediments, 41'-41.5" Glacial Till weathered rock, 41.5'-51.5' Bedrock

Key: Fines Content: trace (tr) = 1-10%, little (lt) = 10-20%, some (sm) = 20-35%, and (&) = 35-50%
Cohesionaless Soil Density (blows/ft): very loose (vl) = 0-4, loose (l) = 4-10, medium dense (md) = 10-30, dense (d) = 30-50 , very dense (vd) = 50+

| | | | |
|---|---|---|---|
| Groundwater Depth | 5' feet | Boring | SB 5 |
| Total Depth of Hole | 52.5' feet | Page | 2 of 3 |
| Depth to Cored Rock | 42.5' feet | Date | March 26-27 2012 |
| | | Weather | Clear 50's |
| | | Project Name | Shuster Investigation |
| | | Job No | |
| | | Driller | Geologic. Driller:Dave, Hand: Johnny |
| | | Logged By | B. Hebbel, P.G. CLE Engineering |

| Elev. feet | Depth feet | Sample Type & No. | Blows per 6" | RQD or Blow Count | Pen. inch | Rec. inch | Graphic Log | Soil & Rock Descriptions |
|---|---|---|---|---|---|---|---|---|
| | | | 37<br>29 | | | | | |
| | 22'-24' | S-12 | 38<br>27 | 40 | 24" | 15" | | S-12= Sand fine-medium dense wet dark gray to black SP Poorly Graded Sand |
| | | | 13<br>21 | | | | | |
| | 24'-26 | S-13 | 37<br>25 | 52 | 24" | 12" | | S-13= Sand fine-medium trace gravel fine dense wet gray SP Poorly Graded Sand |
| | | | 27<br>29 | | | | | |
| | 26'-28' | S-14 | 21<br>19 | 48 | 24" | 10" | | S-14= Sand medium, dense wet pale brown SP Poorly Graded Sand |
| | | | 29<br>31 | | | | | |
| | 28'-30' | S-15 | 40<br>49 | 102 | 24" | 10" | | S-15=Sand, medium to coarse little gravel fine, dense wet pale yellow brown SW Well Graded Sand With Gravel |
| | | | 53<br>96 | | | | | |
| | 30'-32' | S-16 | 120/5"<br>0 | 120 | 17" | 6" | | S-16= Sand fine to medium little gravel little silt very dense wet olive brown SP-SM Poorly Graded Sand with Silt and Gravel End drilling operation for 3/26/12 |
| | | | 120<br>0 | | | | | Resume drilling operations 3/27/12 |
| | 32'-34' | S-17 | 0<br>0 | 25 | 1" | 0" | | S-17= Spoon refusal after 120 blows. Roller bit to determine if obstruction/boulder or bedrock |
| | | | 25<br>34 | | | | | Roller bit though obstruction (boulder) to 35' to collect sample interval 35'-37' |
| | 35'-37' | S-17A | 57<br>120 | 166 | 19" | 10" | | S-17A=Sand fine to medium little gravel fine to medium dense, wet medium yellow brown SP Poorly Graded Sand With Gravel |
| | | | 46<br>39 | | | | | Roller bit to 38' to resume continuous split spoon sampling. |
| | 38'-40' | S-18 | 96<br>120 | 240 | 21" | 5" | | S-18= Sand fine to medium little gravel fine to medium little silt very dense wet bright yellow brown SP-SM Poorly Graded Sand with Silt and Gravel |
| | | | 120<br>0 | | | | | |
| | 40'-42' | S-19 | 0<br>0 | 0 | 1" | 0" | | S-19= Blow count of 120 for 1". No measurable recovery Weathered dark grey to black ships in roller bit wash. Roller bit to confirm bedrock. Bedrock determined to be at 42.5' Set up for coring |
| | | | | | | | | |
| | | | | | | | | |

Notes:

Key:

cle engineering

| | | | |
|---|---|---|---|
| Groundwater Depth | 5' feet | Boring | SB-5 |
| Total Depth of Hole | 51.5' feet | Page | 3 of 3 |
| Depth to Cored Rock | 41.5' feet | Date | March 30-April 2, 2012 |
| | | Weather | Clear 50's |
| | | Project Name | Shuster Investigation |
| | | Job No | |
| | | Driller | Geologic. Driller:Dave, Hand: Johnny |
| | | Logged By | B. Hebbel, P.G. CLE Engineering |

| Drilling Details | Depth | Run | Sample | | | | RQD | Intact | Weat- | Soil & Rock Descriptions | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Time | Core Recov | Total Recov | Solid Core Recovery | Mod.Core Recov | | Rock | hering | | |
| Run | feet | Min | Length | % | % | % | | Str (Mpa) | | Structural Discontinuity | Rock Mass Desciption |
| R1 (60") | 41.5 | | | | | | | | | *FracturesTypical:* | Biotite Gneiss 41.5'-51.5' |
| | | | | | | | | | | Type: Shear Zone | Dk Gray to Black, slightly fractured |
| | | | | | | | | | | Dip Angle: 0-20 degrees | Massive no banding evident, slightly |
| | | | | | | | | | | Very Narrow, Unhealed, w/ decomposed | decomposed |
| | | | | | | | | | | rock-sands-silts, Rough interface | Very strong |
| | 42.5 | 9 | | | | | | | | | |
| | 43.5 | 17 | | | | | | | | | |
| | 44.5 | 11 | | | | | | | | | |
| | 45.5 | 9 | | | | | | | | | |
| End R1 | 46.5 | 15 | | | | | | | | | |
| Start R2 (60") | 47.5 | 10 | | | | | | | | *FracturesTypical:* | Biotite Gneiss |
| | | | | | | | | | | Type: Fracture Zone | small to small blocks, v. intensely fractured |
| | | | | | | | | | | Dip Angle: 0-20 degrees | Massive no banding evident, slightly |
| | | | | | | | | | | Very Narrow, Unhealed, w/ decomposed | decomposed |
| | | | | | | | | | | rock-sands-silts, Rough interface | Very strong |
| | 48.5 | 5 | | | | | | | | | |
| | 49.5 | 8 | | | | | | | | | |
| | 50.5 | 9 | | | | | | | | | |
| End R2 | 51.5 | 5 | | | | | | | | | |

Notes: Rock cored with swivel-type double-tube HQ core barrel.
Average coring rate = 98min/10' = 9.8 Min/Foot
R1 RQD=26%
R2 RQD=15%

Key: R.Q.D. (Sum core length >4"/Length of core run) x 100)

**PERFORMED BY APEX COMPANIES LLC (2010-2011)**

# BORING LOG

Date: 9/14/2010
Time: 8:00 AM

| | | | | | |
|---|---|---|---|---|---|
| Project: | Phase IV Dredging | | Project No: 6690.005 | X: 816198.2 | |
| Location: | South Terminal Expansion | | | Y: 2688154.5 | |
| Elevation at mudline: | -23.15' | Datum: | MLLW | | |
| Casing Type: Steel | | Boring Depth: | -38.5' MLLW | Boring No: | A-2010-B1 |
| Casing Diameter: | 4" | Drill Rig: | CME 45 | | |
| Drill Co: | NH Boring | Method: | Drill and Wash | Sheet: | 1 of 1 |
| Driller: | Todd Pentacost | Log By: | GCD | | |

| Depth below mudline (ft) | RQD | Penetration/ Recovery | Blows per 6" / Drill Min. per Foot | Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50% | Elevation (MLLW) |
|---|---|---|---|---|---|
| 2 | | 24" 6" | 11,2,11,13 | Dark Grey, fine to coarse SAND, some Silt, some fine to coarse Gravel. | -25.15 |
| 4 | | 24" 5" | 19,33,39,18 | Grey SILT and fine to coarse SAND, some fine to coarse Gravel - TILL | -27.15 |
| 4.75 | | 9" 4" | 15, 100/3" | Grey SILT some fine to coarse Sand, some fine to coarse Gravel. Refusal at -27.9 MLLW. | -27.9 |
| 5.35 | | | | Cleaned hole for coring run, roller bit to top of bedrock (-28.5 MLLW) | -28.5 |
| 11 | 50% | 5' 4.6' | 7,6,6,10,14 | Bedrock Core #1: -28.5 to - 33.5 MLLW - Intensely to moderately fractured grey Granitic Gneiss | -33.5 |
| 16 | 97% | 5' 4.85 | 6,6,6,9,11 | Bedrock Core #2: -33.5 to -38.5 MLLW - Moderately fractured grey Granitic Gneiss | -38.5 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments: Core run was completed at less revolutions per minute than recommended by core barrel manufacturer, so drill time is not a good indicator of rock competency.

Refusal: -27.9' MLLW

Elevation of Bedrock: -28.5' MLLW

Date: 5/9/2011
Time: 8:45 AM

# BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| Project: | Phase IV Dredging | | Project No: 6690.008 | X: 816028 | |
| Location: | South Terminal Expansion | | | Y: 2688602 | |
| Elevation at grade: | 10.77 | Datum: | MLLW | | |
| Casing Type: Steel | | Boring Depth: | -30.33' MLLW | Boring No: | A-2011-LB-B9/MW-6 |
| Casing Diameter: | 4" | Drill Rig: | D-120 | | |
| Drill Co: | NH Boring | Method: | Drill and Wash | Sheet: 1 of 1 | |
| Driller: | Norm Stuttard | Log By: | GAD | | |

| Depth below surface grade (ft) | RQD | Penetration/ Recovery | Blows per 6" / Drill Min. per Foot | Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50% | Elevation (MLLW) |
|---|---|---|---|---|---|
| 2.5 | | 24" 8" | 6,12,12,22 | Advanced roller bit through 6" Asphalt Surface. 6" yellow/orange, fine to medium SAND, 2" fine GRAVEL FILL. | 8.3 |
| 4.5 | | 6" 6" | 29,100 for 0" | Olive gray, fine to coarse SAND some silt, trace fine gravel. Obstruction encountered - advanced with roller bit from -2.5 to -4'. | 6.3 |
| 6.5 | | 24" 12" | 12,45,40,67 | Yellow/orange, fine to coarse SAND, trace fine gravel. | 4.3 |
| 8.5 | | 24" 6" | 47,60,51,55 | Yellow/orange, fine to coarse SAND, trace fine gravel. | 2.3 |
| 11 | | 24" 6" | 3,4,5,5 | Yellow/orange, fine to coarse SAND and SILT, trace fine gravel. | |
| 13 | | 24" 12" | 3,3,9,12 | Top 5": Yellow/orange, fine to coarse SAND and SILT. Next 1": Dark gray, fine SAND and SILT. Next 3": Olive gray, fine to medium SAND and SILT, little shell hash | -1.7 |
| 15 | | 24" 4" | 12,14,15,19 | Olive gray, fine to medium SAND and SILT, little shell hash. | |
| 17 | | 24" 6" | 5,6,10,22 | Olive gray, fine to medium SAND and SILT, little shell hash. | |
| 19 | | 24" 18" | 16,20,19,22 | Olive gray, fine to medium SAND and SILT, little shell hash, trace fine gravel. | -7.7 |
| 21 | | 24" 3" | 12,15,26,30 | Olive gray, fine to coarse SAND, trace silt, trace shell hash, trace fine gravel. | -9.7 |
| 22.5 | | 24" 15" | 27,29,33,34 | Olive gray, fine to coarse SAND, trace silt, trace shell hash, grades to light gray, fine SAND and SILT. | -11.7 |
| 24.5 | | 24" 15" | 37,63,81,57 | Light gray, fine to coarse SAND and SILT, trace fine gravel, becomes green gray, fine to coarse SAND and SILT with some fine gravel. | -13.7 |
| 26.5 | | 24" 12" | 29,39,50,54 | Green gray, fine to coarse SAND and SILT with some fine gravel. | -15.7 |
| 28.5 | | 24' 12" | 44,46,46,58 | Green gray, fine to coarse SAND and SILT with some fine gravel. | -17.7 |
| 30.5 | | 24" 15" | 37,53,67,88 | Green gray, fine to coarse SAND and SILT with some fine gravel. | -19.7 |
| 32.5 | | 24" 12" | 35,48,68,73 | Olive gray, fine to coarse SAND and SILT with trace fine gravel. | -21.7 |
| 33.75 | | 15" 15" | 23,38,100 for 3" | Olive gray, fine to coarse SAND and SILT with trace fine gravel. Obstruction encountered at -33.25' below surface grade or -23.0' MLLW. | -23.0 |
| 36.1 | | | | Advanced with roller bit through nested boulders and cobbles. Encountered competent bedrock at -24.3' MLLW. Cleaned hole and began core run at -25.33' MLLW | -25.3 |
| 41.1 | 75% | 5' 4.5' | 6,7,7,6,7 | Bedrock Core #1 : -25.33' to -30.33' MLLW Intensely to moderately fractured, grey, granitic GNEISS | -30.3 |

Comments: Groundwater elevation after construction of monitoring well was recorded at 2.89' MLLW
Refusal: -23.0' MLLW
Elevation of Bedrock: -24.33' MLLW

# BORING LOG

Date: 5/10/2011
Time: 9:30 AM

| | | | |
|---|---|---|---|
| Project: | Phase IV Dredging | Project No: 6690.008 | X: 816187 |
| Location: | South Terminal Expansion | | Y: 2688583 |
| Elevation at grade: | 8.9' | Datum: MLLW | |
| Casing Type: Steel | | Boring Depth: -65.35 MLLW | Boring No: A-2011-LB-B10 |
| Casing Diameter: | 4" | Drill Rig: D-120 | |
| Drill Co: | NH Boring | Method: Drill and Wash | Sheet: 1 of 1 |
| Driller: | Norm Stuttard | Log By: GAD | |

| Depth below surface grade (ft) | RQD | Penetration/ Recovery | Blows per 6" / Drill Min. per Foot | Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50% | Elevation (MLLW) |
|---|---|---|---|---|---|
| 2.50 | | 24" 14" | 15,11,19,14 | Advanced roller bit through - 6" Asphalt Surface 8" light brown, fine to coarse SAND 6" yellow/orange, fine to medium SAND and SILT. | 5.9 |
| 7.50 | | 24" 12" | 23,41,33,31 | Yellow/orange, fine to coarse SAND and SILT. | 1.4 |
| 12.50 | | 24" 8" | 4,5,5,7 | Yellow/orange, fine to coarse SAND and SILT. | -3.6 |
| 17.50 | | 24" 0" | 5,5,2,3 | No sample recovered. | -8.6 |
| 22.50 | | 24" 15" | 12,12,23,31 | Light gray, fine to coarse SAND, trace silt, trace fine gravel. | -13.6 |
| 27.50 | | 24" 12" | 3,6,9,10 | Green gray, fine to coarse SAND and SILT. | -18.6 |
| 32.50 | | 24" 3" | 7,5,5,5 | Green gray, fine to coarse SAND and SILT. | -23.6 |
| 37.50 | | 24" 12" | 60,33,40,4 | 5": Green gray, fine to coarse SAND and SILT, 7" light brown, fine to coarse SAND and SILT, trace fine gravel. | -28.6 |
| 42.50 | | 24" 10" | 20,31,12,11 | Light brown, fine to coarse SAND and SILT, little fine gravel, trace angular stone fragments. | -33.6 |
| 44.25 | | | | Bedrock encountered at -34.95' MLLW surface grade. Advanced roller bit into bedrock to -35.35' MLLW, cleaned hole and began core run. | -35.35 |
| 49.25 | 28% | 5' 4.35' | 6,6,7,7,7 | Bedrock Core #1 : -35.35' to -40.35' MLLW Intensely fractured, interbedded grey granitic GNEISS and intensely fractured, moderately weathered grey green DIABASE. | -40.35 |
| 54.25 | 55% | 5' 4.75' | 6,6,6,7,7 | Bedrock Core #2 : -45.35' to -50.35' MLLW Intensely to moderately fractured, fresh to slightly weathered, dark grey to black, DIABASE. | -45.35 |
| 59.25 | 10% | 5' 4.42 | 7,7,8,8,8 | Bedrock Core #3 : -45.35' to -50.35' MLLW Intensely fractured, dark grey, DIABASE. | -50.35 |
| 64.25 | 66% | 5' 4.8' | 7,7,7,8,8 | Bedrock Core #4 : -50.35' to -55.35' MLLW Moderately fractured, dark grey, DIABASE with grey granitic gneiss xenoliths. | -55.35 |
| 69.25 | 60% | 5' 4.53' | 8,8,7,7,7 | Bedrock Core #5 : -55.35' to -60.35' MLLW Intensely to moderately fractured, dark grey, DIABASE with grey granitic gneiss xenoliths. | -60.35 |
| 74.25 | | 5' 5' | 7,7,6,6,6 | Bedrock Core #6 : -60.35' to -65.35' MLLW Intensely to moderately fractured, dark grey, DIABASE with grey granitic gneiss xenoliths. | -65.35 |

Comments:
Refusal: -34.95' MLLW
Elevation of Bedrock: -34.95' MLLW

Date: 3/9/2011
Time: 8:15 AM

# BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| Project: | Phase IV Dredging | | Project No: 6690.008 | X: 816257 | |
| Location: | South Terminal Expansion | | | Y: 2688603 | |
| Elevation at mudline: | -20.9 | Datum: | MLLW | | |
| Casing Type: Steel | | Boring Depth: | -48.4' MLLW | Boring No: | A-2011-B18 |
| Casing Diameter: | 4" | Drill Rig: | CME 45 | | |
| Drill Co: | NH Boring | Method: | Drill and Wash | Sheet: | 1 of 1 |
| Driller: | Norman Stuttard | Log By: | GCD | | |

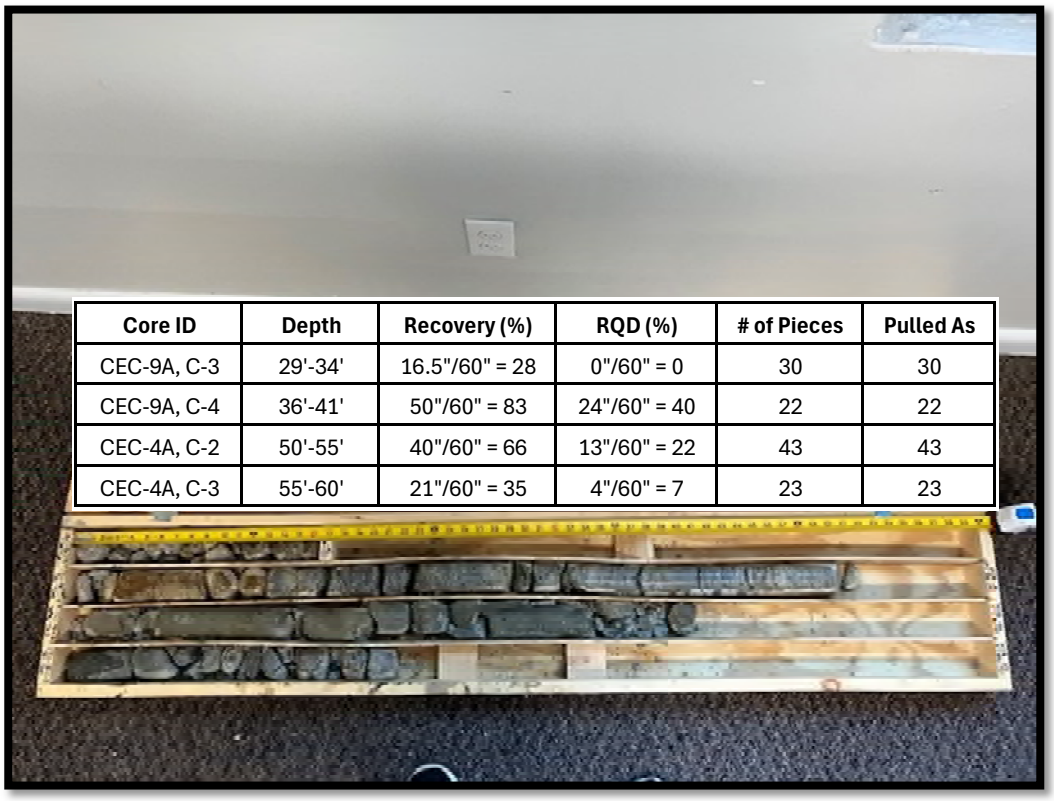
| Depth below mudline (ft) | RQD | Penetration/ Recovery | Blows per 6" / Drill Min. per Foot | Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50% | Elevation (MLLW) |
|---|---|---|---|---|---|
| 2 | | 24" 3" | WOR, WOR, WOR, WOR | Black, organic SILT, trace shell hash. | -22.9 |
| 7 | | 24" 10" | 7,9,15,19 | First 6" - Gray, medium to coarse SAND and GRAVEL, some shell hash. Last 4" Light brown, fine to coarse SAND, trace silt. | -27.9 |
| 10 | | | | Obstruction encountered -28.1' MLLW. Drilled with mill tooth roller bit through obstruction (approximately 8" thick). Collected split spoon from 10-12 feet. | -30.9 |
| 11.75 | | 24" 8" | 19,27,22,44 | Light brown to gray, fine to coarse SAND, trace silt. | -32.65 |
| 12.5 | | | | Obstruction encountered -32.65' MLLW. Continued drilling to confirm top of bedrock. Cleaned hole and began core run at -33.4 MLLW. | -33.4 |
| 17.5 | 68% | 5.0' 4.75' | 10-8-8-9-8 | Rock Core #1 -33.4 to -38.4 MLLW 0.0 -2.7' Intensely to moderately fractured moderate to slightly weathered grey granitic GNEISS. 2.7' to 4.75' moderately to slightly weathered dark grey DIABASE. | -38.4 |
| 22.5 | 20% | 5.0' 5.0' | 8-9-8-8-9 | Rock Core #2 -38.4 to -43.4 MLLW 0.0'-5.0' Intensely fractured moderately to slightly weathered dark grey DIABASE, iron stained vertical fractrues from 3.4' to 5.0'. | -43.4 |
| 27.5 | 46% | 5.0' 5.0' | 8-9-8-8-8 | Rock Core #3 -43.4 to -48.4' MLLW 0.0-2.6' Intensely fractured moderately fracture dark gray DIABASE. 2.6' - 4.4' moderately fractured granitic GNEISS, 4.4' - 5.0' moderately fractured gray DIABASE. | -48.4 |
| | | | | | |
| | | | | | |
| | | | | | |

Comments:

Refusal: -32.65 MLLW
Elevation of Bedrock: -32.65 MLLW

# APPENDIX D

# ROCK CORE PHOTO LOG



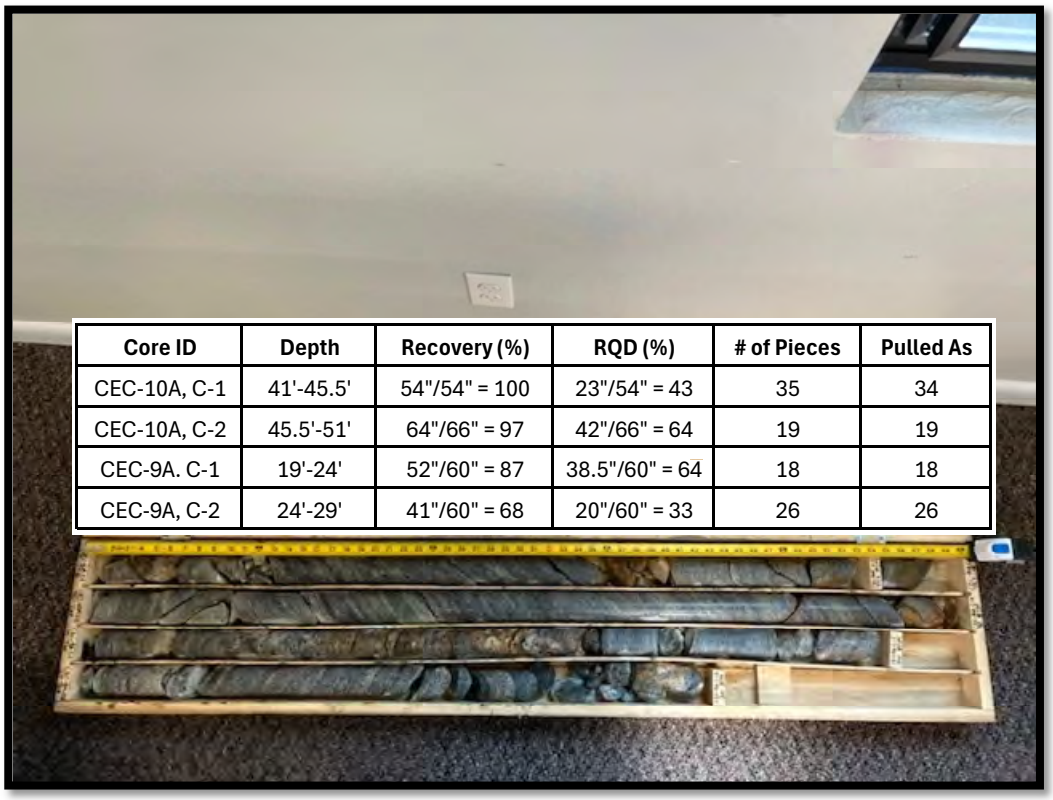
| Core ID | Depth | Recovery (%) | RQD (%) | # of Pieces | Pulled As |
|---|---|---|---|---|---|
| CEC-9A, C-3 | 29'-34' | 16.5"/60" = 28 | 0"/60" = 0 | 30 | 30 |
| CEC-9A, C-4 | 36'-41' | 50"/60" = 83 | 24"/60" = 40 | 22 | 22 |
| CEC-4A, C-2 | 50'-55' | 40"/60" = 66 | 13"/60" = 22 | 43 | 43 |
| CEC-4A, C-3 | 55'-60' | 21"/60" = 35 | 4"/60" = 7 | 23 | 23 |

**Boring CEC-9A (C-3, C-4) and CEC-4A (C-2, C-3), Box 1 of 14**



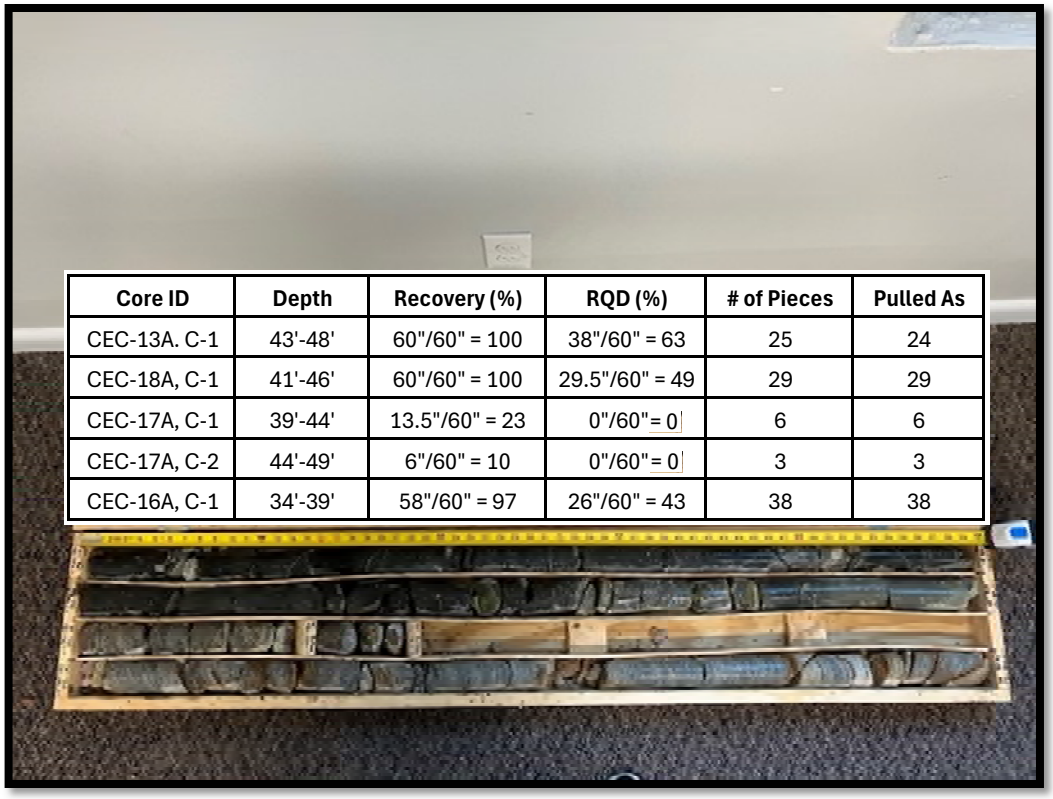
| Core ID | Depth | Recovery (%) | RQD (%) | # of Pieces | Pulled As |
|---|---|---|---|---|---|
| CEC-5A, C-1 | 44'-49' | 7"/60" = 12 | 0"/60" = 0 | 20 | 20 |
| CEC-5A, C-2 | 49'-54' | 3"/60" = 5 | 0"/60" = 0 | 1 | 1 |
| | | | | | |
| | | | | | |

**Boring CEC-5A (C-1, C-2) Box 2 of 14**



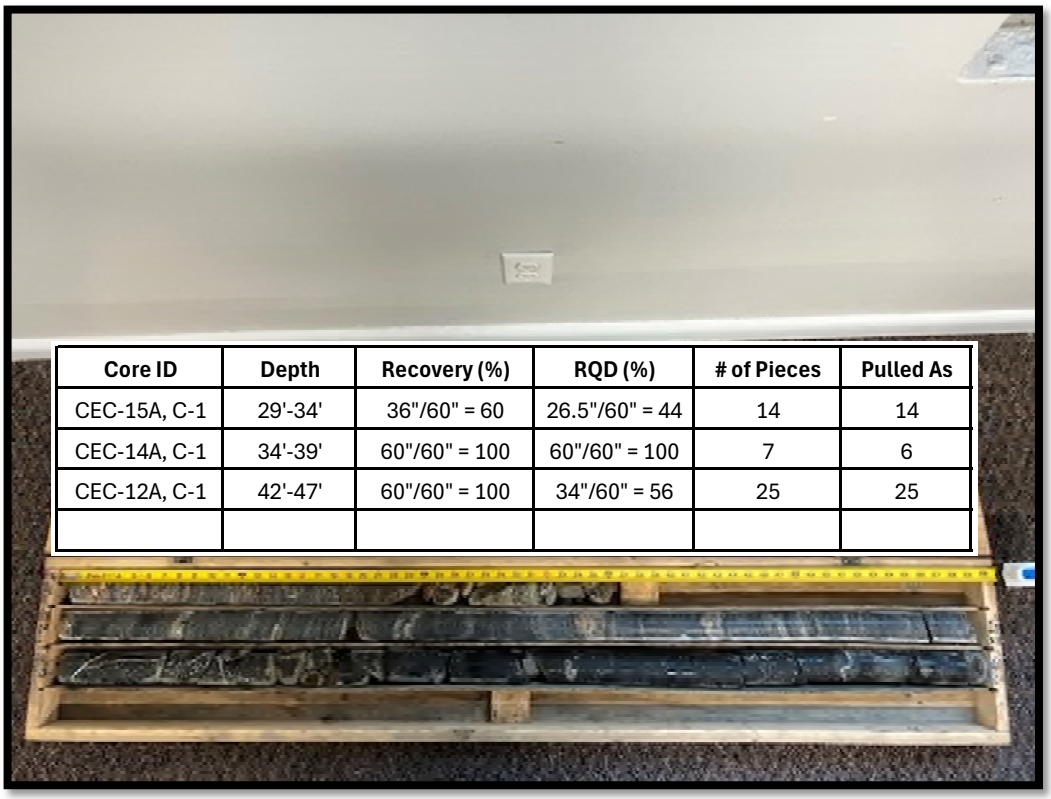
| Core ID | Depth | Recovery (%) | RQD (%) | # of Pieces | Pulled As |
|---|---|---|---|---|---|
| CEC-10A, C-1 | 41'-45.5' | 54"/54" = 100 | 23"/54" = 43 | 35 | 34 |
| CEC-10A, C-2 | 45.5'-51' | 64"/66" = 97 | 42"/66" = 64 | 19 | 19 |
| CEC-9A. C-1 | 19'-24' | 52"/60" = 87 | 38.5"/60" = 64 | 18 | 18 |
| CEC-9A, C-2 | 24'-29' | 41"/60" = 68 | 20"/60" = 33 | 26 | 26 |

**Boring CEC-10A (C-1, C-2) and 9A (C-1, C-2) Box 3 of 14**

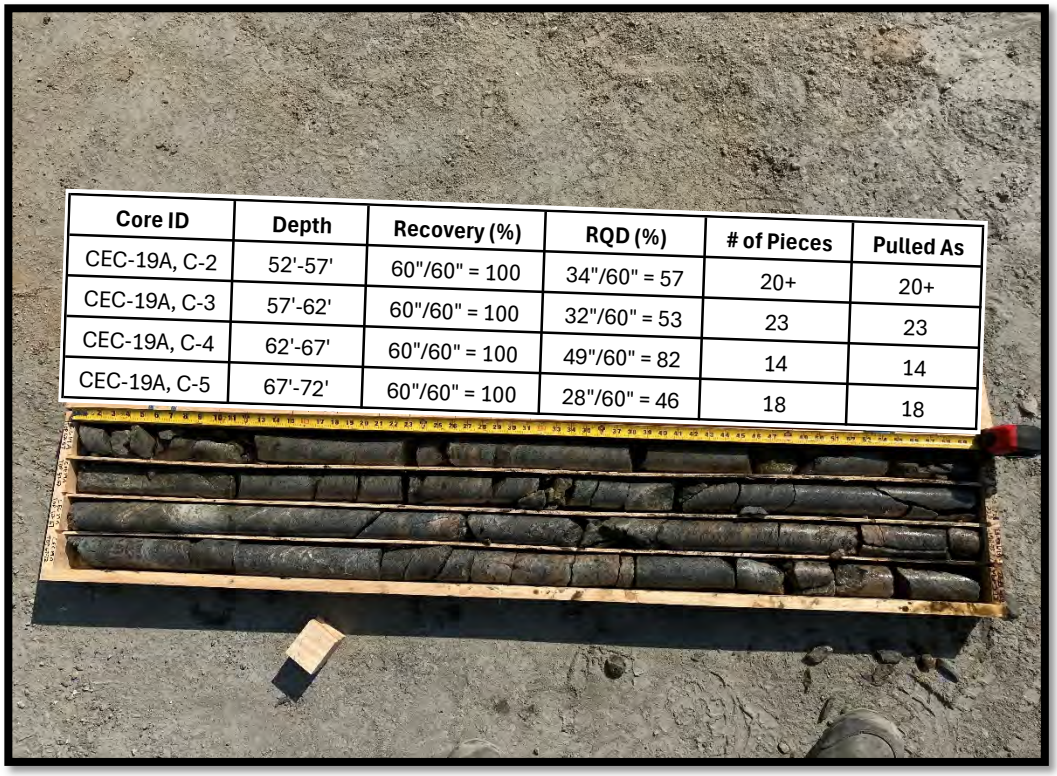


| Core ID | Depth | Recovery (%) | RQD (%) | # of Pieces | Pulled As |
|---|---|---|---|---|---|
| CEC-13A. C-1 | 43'-48' | 60"/60" = 100 | 38"/60" = 63 | 25 | 24 |
| CEC-18A, C-1 | 41'-46' | 60"/60" = 100 | 29.5"/60" = 49 | 29 | 29 |
| CEC-17A, C-1 | 39'-44' | 13.5"/60" = 23 | 0"/60"= 0 | 6 | 6 |
| CEC-17A, C-2 | 44'-49' | 6"/60" = 10 | 0"/60"= 0 | 3 | 3 |
| CEC-16A, C-1 | 34'-39' | 58"/60" = 97 | 26"/60" = 43 | 38 | 38 |

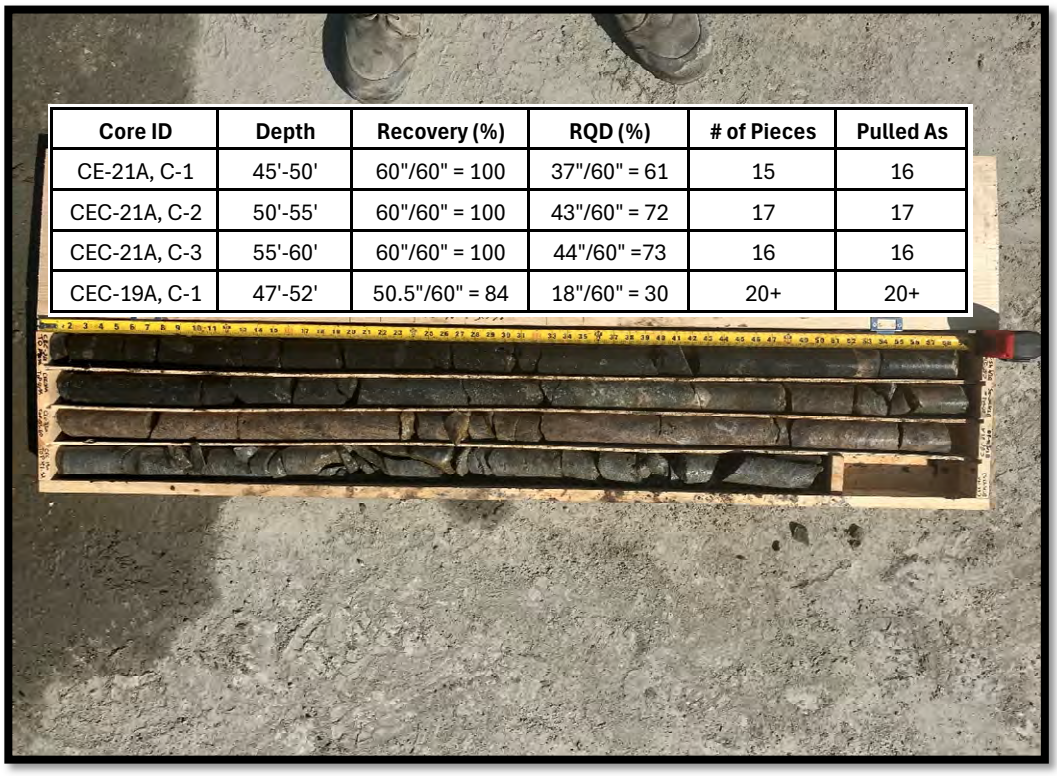
**Boring CEC-13A (C-1), CEC-18A (C-1), CEC-17A (C-1, C-2) and CEC-16A (C-1) Box 4 of 14**




**Boring CEC-15A (C-1), CEC-14A (C-1) and CEC-12A (C-1) Box 5 of 14**



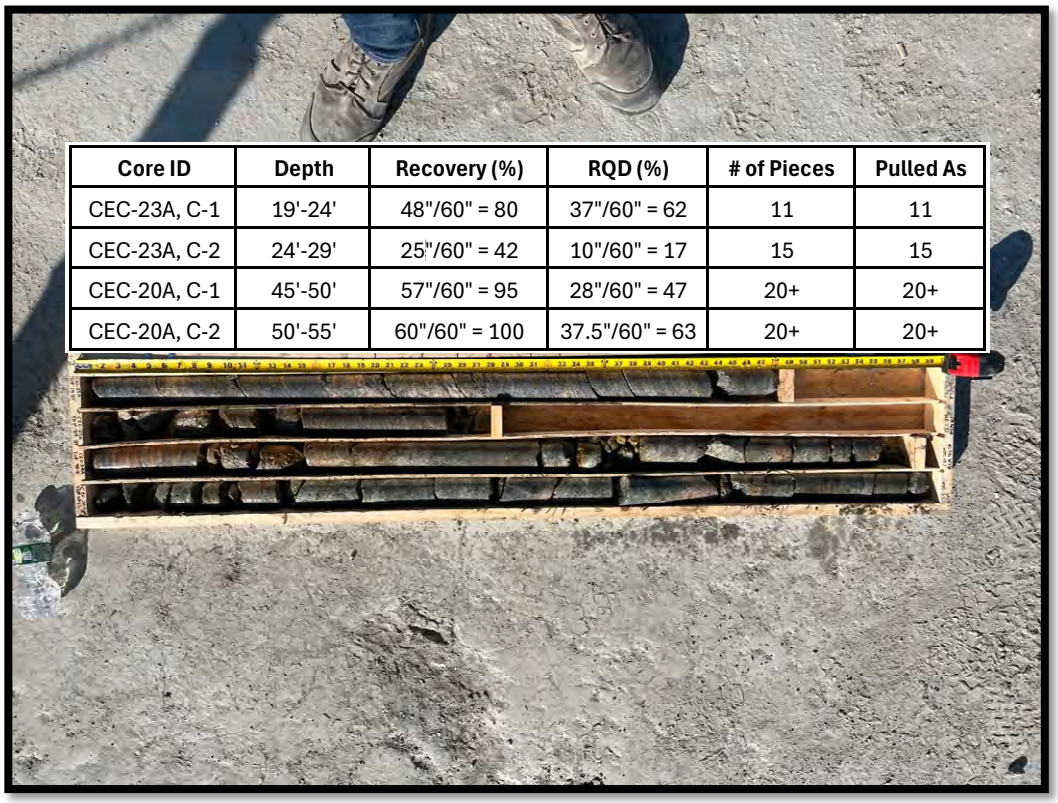

**Boring CEC-19A (C-2, C-3, C-4, C-5) Box 6 of 14**




**Boring CEC-21A (C-1, C-2, C-3) and CEC-19A (C-1) Box 7 of 14**



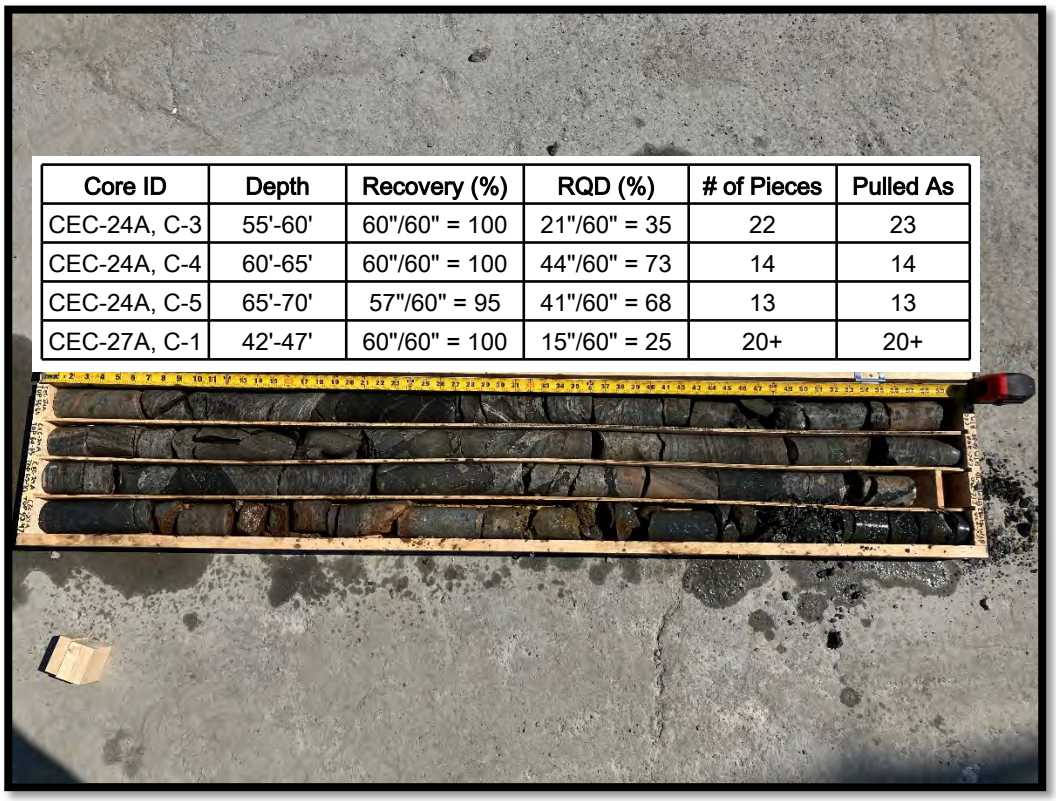

**Boring CEC-20A (C-3, C-4) and CEC-23A (C-3, C-4) Box 8 of 14**




**Boring CEC-23A (C-1, C-2) and CEC-20A (C-1, C-2) Box 9 of 14**

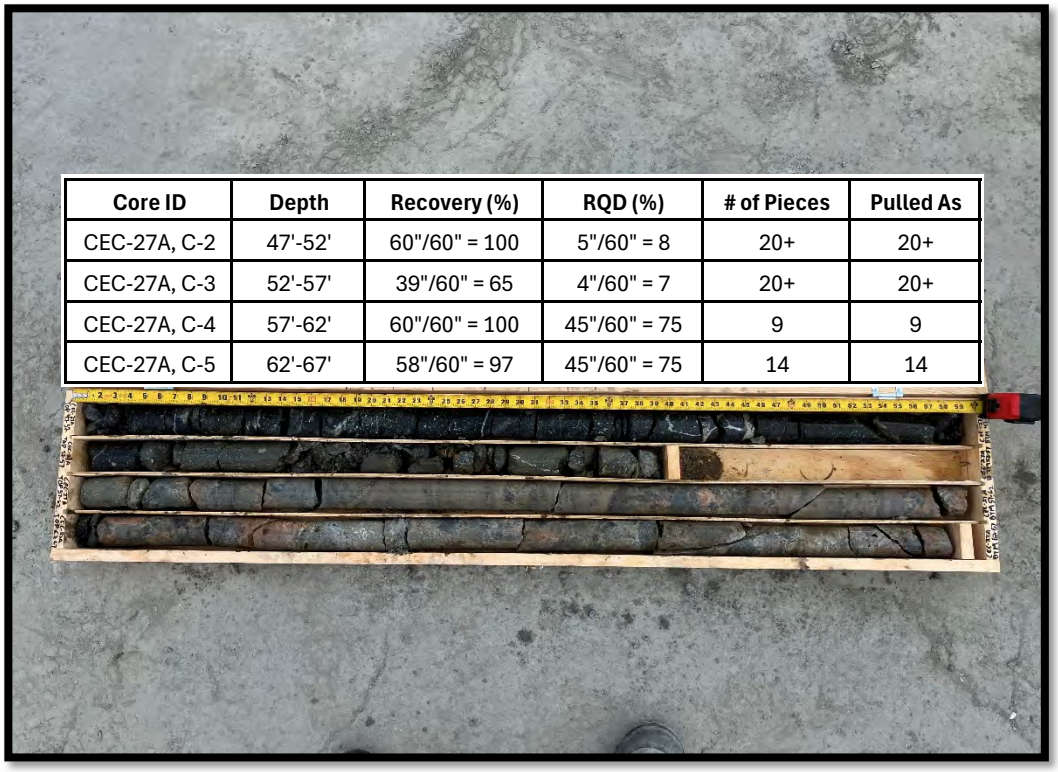



**Boring CEC-22A (C-1, C-2, C-3, C-4) Box 10 of 14**



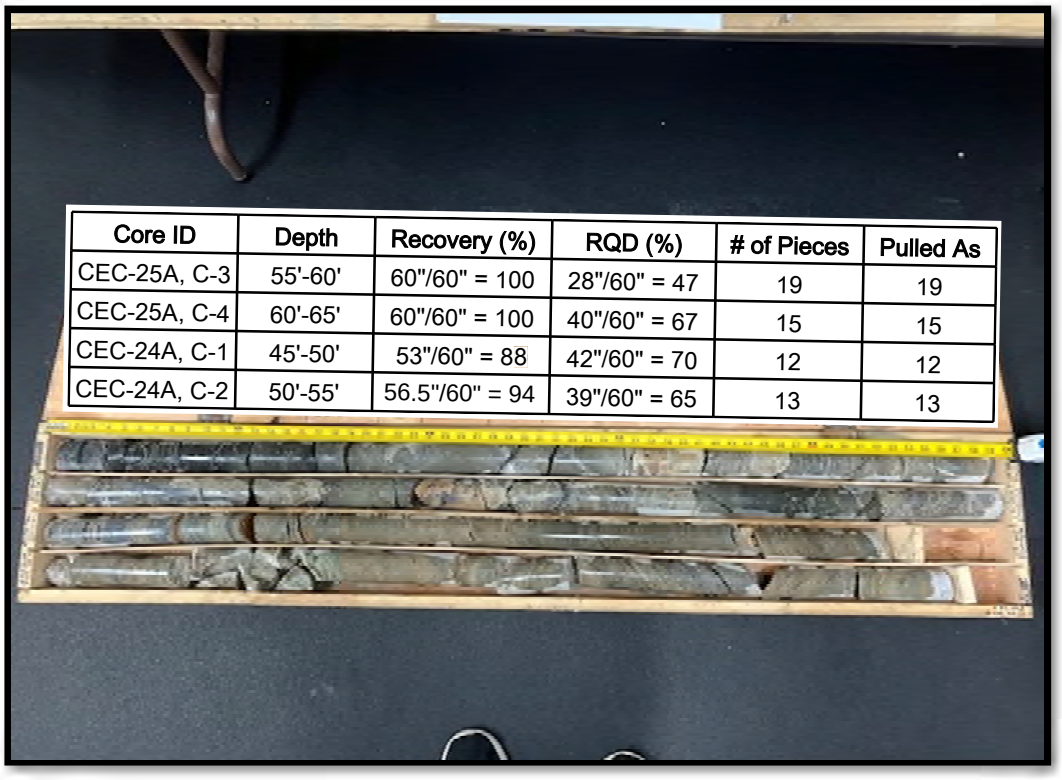
| Core ID | Depth | Recovery (%) | RQD (%) | # of Pieces | Pulled As |
|---|---|---|---|---|---|
| CEC-24A, C-3 | 55'-60' | 60"/60" = 100 | 21"/60" = 35 | 22 | 23 |
| CEC-24A, C-4 | 60'-65' | 60"/60" = 100 | 44"/60" = 73 | 14 | 14 |
| CEC-24A, C-5 | 65'-70' | 57"/60" = 95 | 41"/60" = 68 | 13 | 13 |
| CEC-27A, C-1 | 42'-47' | 60"/60" = 100 | 15"/60" = 25 | 20+ | 20+ |

**Boring CEC-24A (C-3, C-4, C-5) and CEC-27A (C-1) Box 11 of 14**



| Core ID | Depth | Recovery (%) | RQD (%) | # of Pieces | Pulled As |
|---|---|---|---|---|---|
| CEC-27A, C-2 | 47'-52' | 60"/60" = 100 | 5"/60" = 8 | 20+ | 20+ |
| CEC-27A, C-3 | 52'-57' | 39"/60" = 65 | 4"/60" = 7 | 20+ | 20+ |
| CEC-27A, C-4 | 57'-62' | 60"/60" = 100 | 45"/60" = 75 | 9 | 9 |
| CEC-27A, C-5 | 62'-67' | 58"/60" = 97 | 45"/60" = 75 | 14 | 14 |

**Boring CEC-27A (C-2, C-3, C-4, C-5) Box 12 of 14**




**Boring CEC-25A (C-3, C-4) and CEC-24A (C-1, C-2) Box 13 of 14**




**Boring CEC-26A (C-1, C-2) and CEC-25A (C-1, C-2) Box 14 of 14**

# APPENDIX E

# LABORATORY TEST RESULTS

**PERFORMED BY CIVIL & ENVIRONMENTAL CONSULTANTS (2023-2024)**

Thielsch
DIVISION OF THE RISE GROUP

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
cts.thielsch.com
*Let's Build a Solid Foundation*

| Client Information: | |
|---|---|
| Civil & Environmental Consultants | |
| Raynham, MA 02767 | |
| Project Manager: | Tony Sousa |
| Assigned By: | Tony Sousa |
| Collected By: | Client |

| Project Information: | |
|---|---|
| **MassCEC Expansion** | |
| **New Bedford, MA** | |
| Project Number: | 332-344 |
| Summary Page: | 1 of 1 |
| Report Date: | 12.05.23 |

## LABORATORY TESTING DATA SHEET, Report No.: 7423-L-215

| Boring No. | Sample No. | Depth (ft) | Laboratory No. | Identification Tests | | | | | | | | Proctor / CBR / Permeability Tests | | | | | | | | Laboratory Log and Soil Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | As Rcvd Moisture Content % | LL % | PL % | Gravel % | Sand % | Fines % | Org. % | pH | $g_d$ MAX (pcf) $W_{opt}$ (%) | $g_d$ MAX (pcf) $W_{opt}$ (%) (Corr.) | Dry unit wt. (pcf) | Test Moisture Content % | Target Test Setup as % of Proctor | CBR @ 0.1" | CBR @ 0.2" | Permeability cm/sec | |
| | | | | D2216 | D4318 | | D6913 | | | D2974 | D4792 | D1557 | | | | | | | | |
| CEC-6-4 | S-1 | 0-2 | 23-S-4766 | 9.0 | | | 33.6 | 54.2 | 12.2 | | | | | | | | | | | Brown silty sand with gravel |
| CEC-1A | S-1 | 0.3-2.3 | 23-S-4767 | 3.5 | | | 14.6 | 75.2 | 10.2 | | | | | | | | | | | Light Brown poorly graded sand with silt |
| CEC-1A | S-8 | 14-16 | 23-S-4768 | 12.4 | | | 22.5 | 72.0 | 5.5 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-1A | S-7 | 12-14 | 23-S-4769 | 17.8 | | | 7.3 | 87.0 | 5.7 | | | | | | | | | | | Brown poorly graded sand with silt |
| CEC-2A | S-6 | 10-12 | 23-S-4770 | 10.8 | | | 34.6 | 57.1 | 8.3 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-2A | S-10 | 18-20 | 23-S-4771 | 9.7 | | | 27.7 | 64.5 | 7.8 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-2A | S-13 | 24-26 | 23-S-4772 | 15.5 | | | 11.9 | 79.3 | 8.8 | | | | | | | | | | | Brown poorly graded sand with silt |
| CEC-3A | S-6 | 10-12 | 23-S-4773 | 13.3 | | | 21.0 | 69.7 | 9.3 | | | | | | | | | | | Brown well-graded sand with silt and gravel |
| CEC-3A | S-9 | 16-18 | 23-S-4774 | 14.4 | | | 13.5 | 76.5 | 10.0 | | | | | | | | | | | Brown well-graded sand with silt |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

Date Received: **11.27.23** Reviewed By: Date Reviewed: **12.05.23**

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 14.6 | 5.7 | 27.1 | 42.4 | 10.2 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 94.1 | | |
| 3/8" | 90.0 | | |
| #4 | 85.4 | | |
| #10 | 79.7 | | |
| #20 | 70.2 | | |
| #40 | 52.6 | | |
| #60 | 33.4 | | |
| #100 | 18.6 | | |
| #200 | 10.2 | | |

* (no specification provided)

**Soil Description**

Light Brown poorly graded sand with silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 9.5317 $D_{85}$= 4.4289 $D_{60}$= 0.5479
$D_{50}$= 0.3928 $D_{30}$= 0.2253 $D_{15}$= 0.1196
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-3

**Remarks**

Source of Sample: Boring Depth: 0.3-2.3'
Sample Number: CEC-1A / S-1

Date: 12.1.23

Thielsch Engineering Inc.

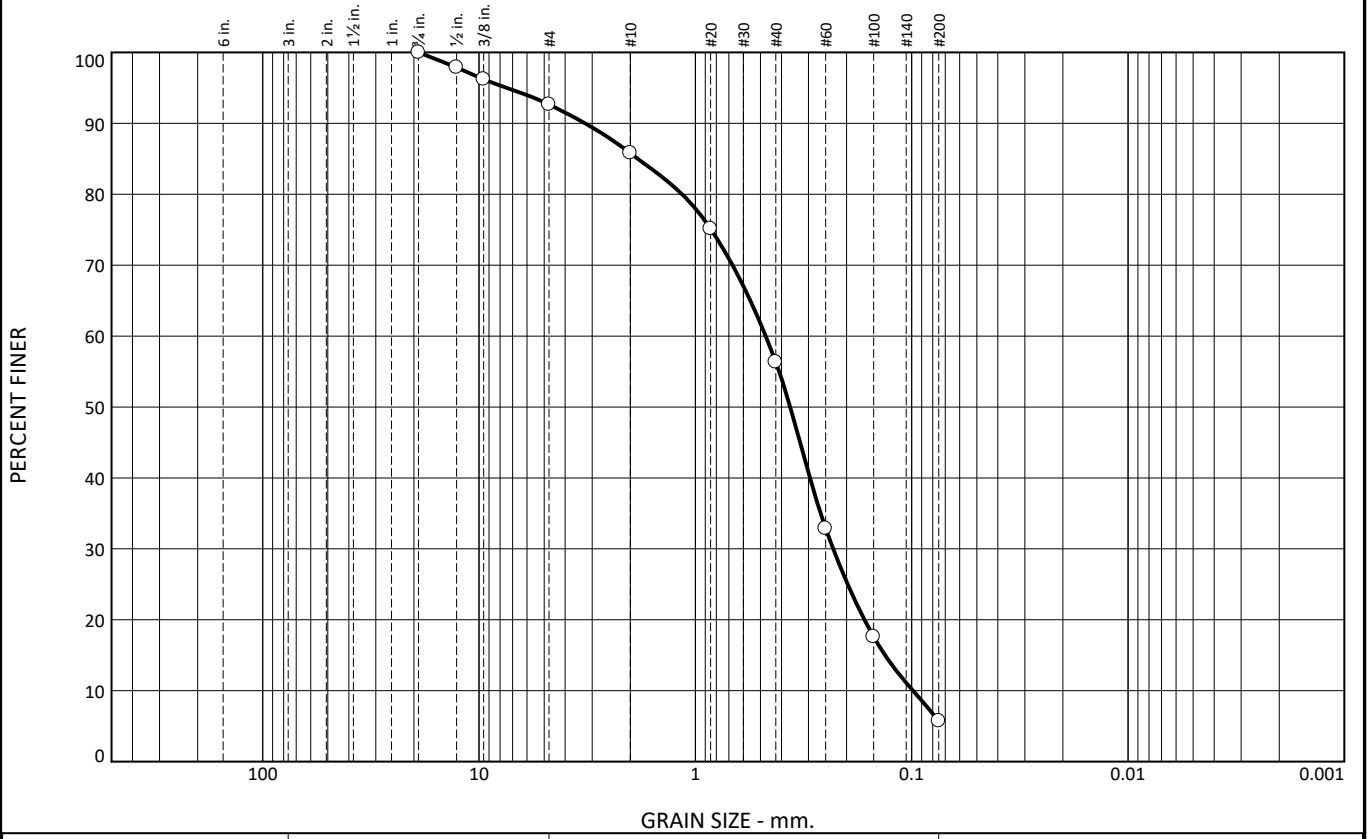
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344 Fig. 23-S-4767

Tested By: RB Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 7.3 | 6.9 | 29.5 | 50.6 | 5.7 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 97.9 | | |
| 3/8" | 96.2 | | |
| #4 | 92.7 | | |
| #10 | 85.8 | | |
| #20 | 75.1 | | |
| #40 | 56.3 | | |
| #60 | 32.9 | | |
| #100 | 17.6 | | |
| #200 | 5.7 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 3.2327 $D_{85}$= 1.8453 $D_{60}$= 0.4730
$D_{50}$= 0.3646 $D_{30}$= 0.2307 $D_{15}$= 0.1329
$D_{10}$= 0.0987 $C_u$= 4.79 $C_c$= 1.14

**Classification**

USCS= SP-SM AASHTO= A-3

**Remarks**

Source of Sample: Boring Depth: 12-14'
Sample Number: CEC-1A / S-7

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344 Fig. 23-S-4769

Tested By: RB Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 10.4 | 12.1 | 8.5 | 29.9 | 33.6 | 5.5 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 89.6 | | |
| 3/4" | 89.6 | | |
| 1/2" | 87.4 | | |
| 3/8" | 85.1 | | |
| #4 | 77.5 | | |
| #10 | 69.0 | | |
| #20 | 56.2 | | |
| #40 | 39.1 | | |
| #60 | 22.0 | | |
| #100 | 11.3 | | |
| #200 | 5.5 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 26.9954 $D_{85}$= 9.3936 $D_{60}$= 1.0467
$D_{50}$= 0.6406 $D_{30}$= 0.3220 $D_{15}$= 0.1856
$D_{10}$= 0.1356 $C_u$= 7.72 $C_c$= 0.73

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 14-16'
Sample Number: CEC-1A / S-8

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

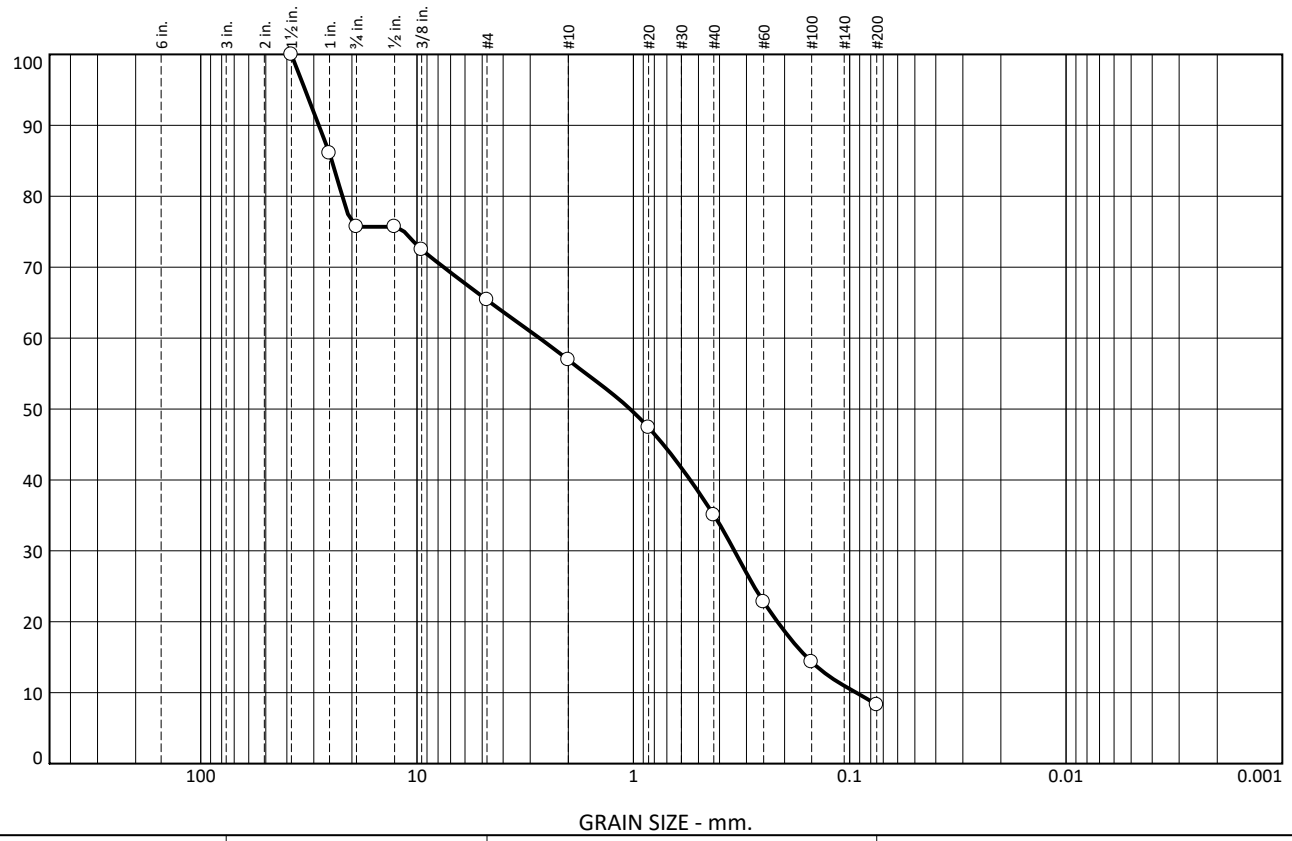
Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344

Fig. 23-S-4768

Tested By: RB Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 24.3 | 10.3 | 8.5 | 21.8 | 26.8 | 8.3 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 86.1 | | |
| 3/4" | 75.7 | | |
| 1/2" | 75.7 | | |
| 3/8" | 72.5 | | |
| #4 | 65.4 | | |
| #10 | 56.9 | | |
| #20 | 47.4 | | |
| #40 | 35.1 | | |
| #60 | 22.8 | | |
| #100 | 14.3 | | |
| #200 | 8.3 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 28.4430 $D_{85}$= 24.7077 $D_{60}$= 2.7187
$D_{50}$= 1.0362 $D_{30}$= 0.3410 $D_{15}$= 0.1578
$D_{10}$= 0.0933 $C_u$= 29.14 $C_c$= 0.46

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 10-12'
Sample Number: CEC-2A / S-6

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

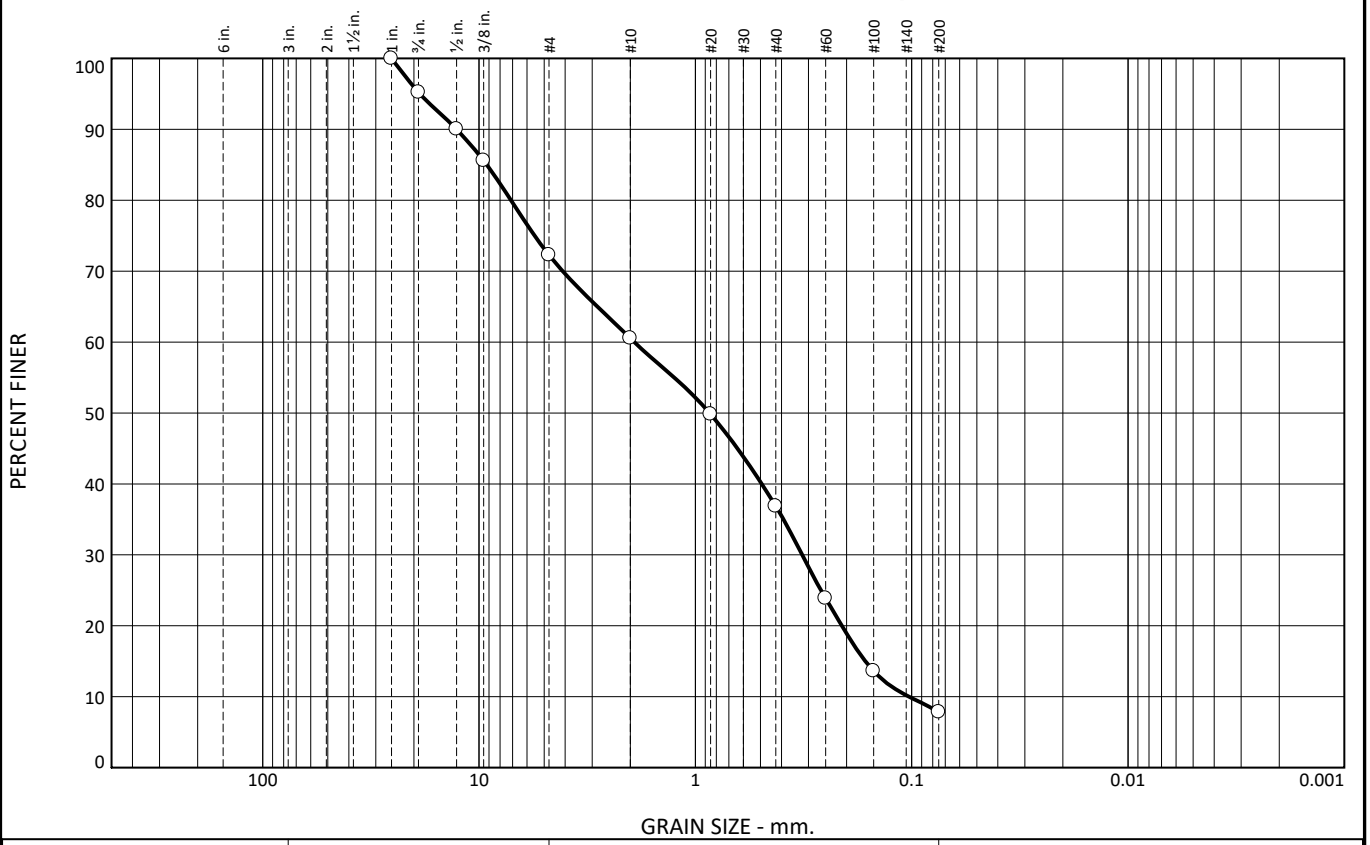
Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344

Fig. 23-S-4770

Tested By: RB Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 4.8 | 22.9 | 11.7 | 23.7 | 29.1 | 7.8 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 95.2 | | |
| 1/2" | 90.0 | | |
| 3/8" | 85.6 | | |
| #4 | 72.3 | | |
| #10 | 60.6 | | |
| #20 | 49.8 | | |
| #40 | 36.9 | | |
| #60 | 23.9 | | |
| #100 | 13.6 | | |
| #200 | 7.8 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 12.6898 $D_{85}$= 9.2105 $D_{60}$= 1.9159
$D_{50}$= 0.8595 $D_{30}$= 0.3209 $D_{15}$= 0.1639
$D_{10}$= 0.1030 $C_u$= 18.61 $C_c$= 0.52

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 18-20'
Sample Number: CEC-2A / S-10

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344

Fig. 23-S-4771

Tested By: RB Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 11.9 | 4.4 | 26.9 | 48.0 | 8.8 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 96.2 | | |
| 3/8" | 90.8 | | |
| #4 | 88.1 | | |
| #10 | 83.7 | | |
| #20 | 74.2 | | |
| #40 | 56.8 | | |
| #60 | 35.6 | | |
| #100 | 19.3 | | |
| #200 | 8.8 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 8.6787 $D_{85}$= 2.4025 $D_{60}$= 0.4700
$D_{50}$= 0.3543 $D_{30}$= 0.2134 $D_{15}$= 0.1194
$D_{10}$= 0.0815 $C_u$= 5.76 $C_c$= 1.19

**Classification**

USCS= SP-SM AASHTO= A-3

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-2A / S-13

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

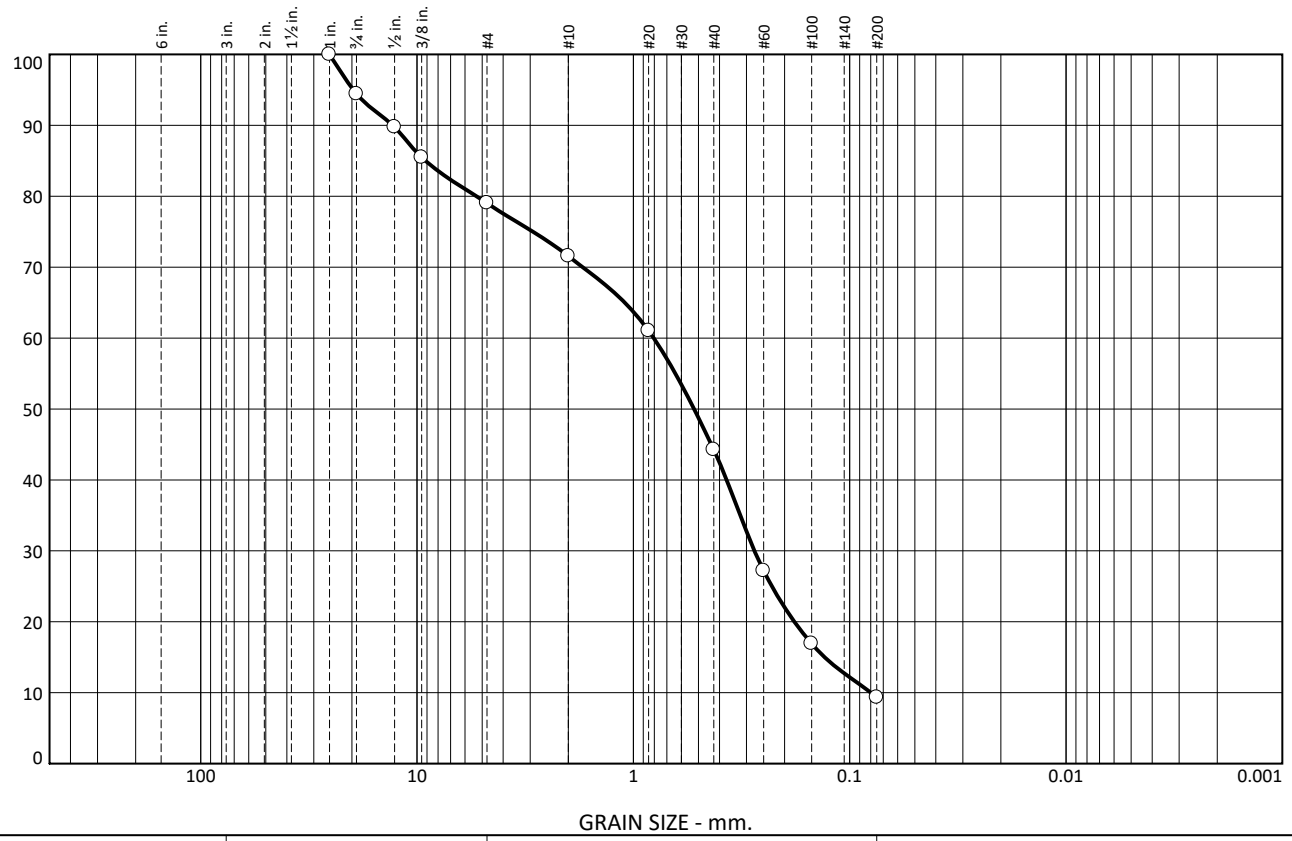
Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344

Fig. 23-S-4772

Tested By: RB Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 5.6 | 15.4 | 7.4 | 27.3 | 35.0 | 9.3 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 94.4 | | |
| 1/2" | 89.8 | | |
| 3/8" | 85.5 | | |
| #4 | 79.0 | | |
| #10 | 71.6 | | |
| #20 | 61.0 | | |
| #40 | 44.3 | | |
| #60 | 27.2 | | |
| #100 | 16.9 | | |
| #200 | 9.3 | | |

* (no specification provided)

**Soil Description**

Brown well-graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 12.9406 $D_{85}$= 9.1423 $D_{60}$= 0.8050
$D_{50}$= 0.5242 $D_{30}$= 0.2757 $D_{15}$= 0.1307
$D_{10}$= 0.0798 $C_u$= 10.08 $C_c$= 1.18

**Classification**

USCS= SW-SM AASHTO= A-1-b

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 10-12'
Sample Number: CEC-3A / S-6

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

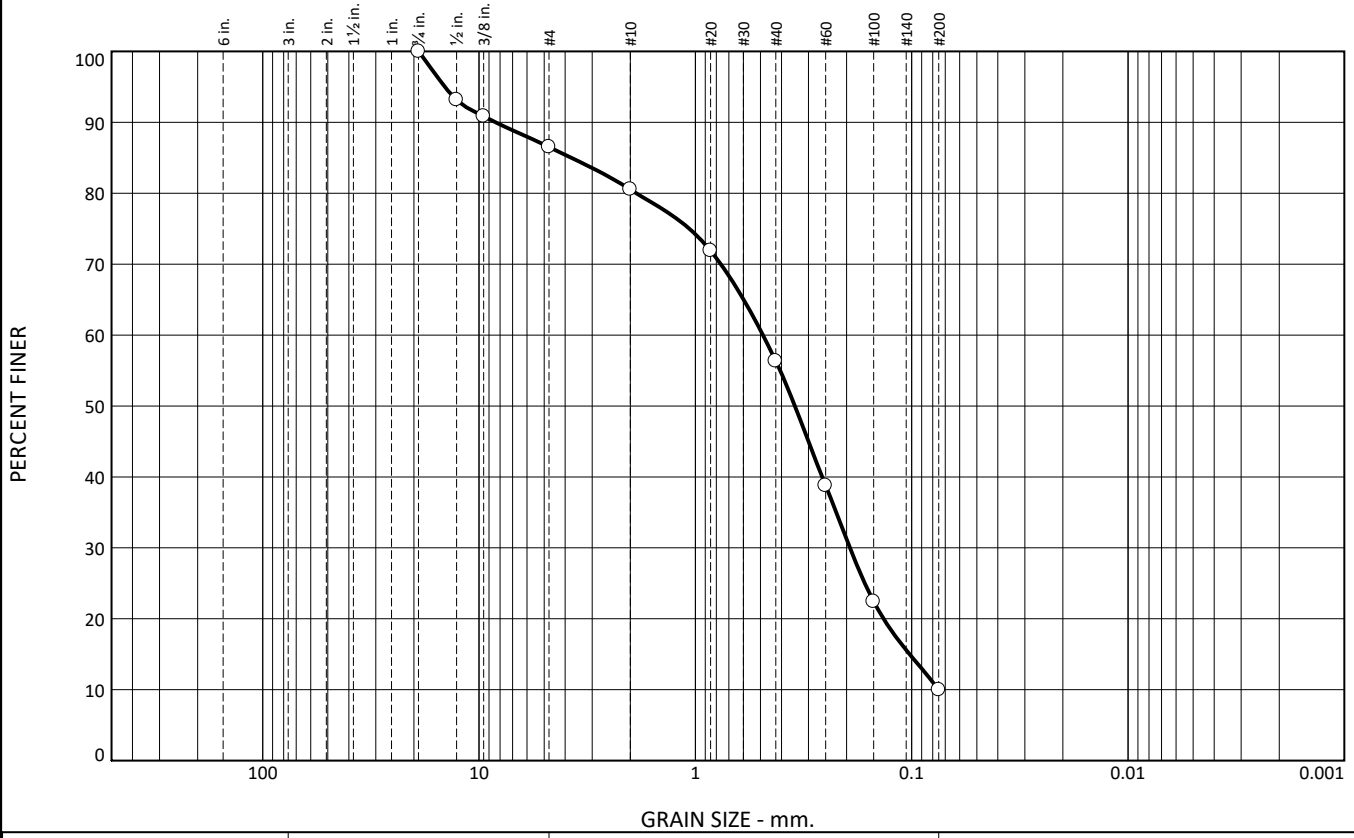
Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344

Fig. 23-S-4773

Tested By: RB Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 13.5 | 6.0 | 24.2 | 46.3 | 10.0 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 93.2 | | |
| 3/8" | 90.9 | | |
| #4 | 86.5 | | |
| #10 | 80.5 | | |
| #20 | 71.9 | | |
| #40 | 56.3 | | |
| #60 | 38.8 | | |
| #100 | 22.4 | | |
| #200 | 10.0 | | |

* (no specification provided)

**Soil Description**

Brown well-graded sand with silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 8.3764 $D_{85}$= 3.7433 $D_{60}$= 0.4870
$D_{50}$= 0.3468 $D_{30}$= 0.1930 $D_{15}$= 0.1023
$D_{10}$= 0.0752 $C_u$= 6.48 $C_c$= 1.02

**Classification**

USCS= SW-SM AASHTO= A-3

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 16-18'
Sample Number: CEC-3A / S-9

Date: 12.1.23

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: MassCEC Expansion
New Bedford, MA
Project No: 332-344

Fig. 23-S-4774

Tested By: RB Checked By: Kris Roland

Thielsch
DIVISION OF THE RISE GROUP

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Cranston RI, 02910
Phone: (401)-467-6454
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cts.thielsch.com
*Let's Build a Solid Foundation*

| Client Information: | |
|---|---|
| Civil & Environmental Consultants, Inc | |
| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned By: | Tony Sousa |
| Collected By: | CEC |

| Project Information: | |
|---|---|
| **Shuster Bulkhead Improvements** | |
| **4 Wright St., New Bedford MA** | |
| Project Number: | 332-344 |
| Summary Page: | 1 of 1 |
| Report Date: | 7/5/2024 |

## LABORATORY TESTING DATA SHEET, Report No.: 7424-F-210

| Boring No. | Sample ID | Depth (ft) | Laboratory No. | Identification Tests | | | | | | | | | Proctor / CBR / Permeability Tests | | | | | | | | Laboratory Log and Soil Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | As Rcvd Moisture Content % | LL % | PL % | OD LL | Gravel % | Sand % | Fines % | Org. % | pH | $g_d$ MAX (pcf) $W_{opt}$ (%) | $g_d$ MAX (pcf) $W_{opt}$ (%) (Corr.) | Dry unit wt. (pcf) | Test Moisture Content % | Target Test Setup as % of Proctor | CBR @ 0.1" | CBR @ 0.2" | Permeability cm/sec | |
| | | | | D2216 | D4318 | | | D6913 | | | D2974 | D4792 | D1557 | | | | | | | | |
| CEC-4A | S-3 | 9-11 | 24-S-2476 | | | | | 13.0 | 70.8 | 16.2 | | | | | | | | | | | Brown silty sand |
| CEC-4A | S-4 | 14-16 | 24-S-2477 | | | | | 13.3 | 73.6 | 13.1 | | | | | | | | | | | Brown silty sand |
| CEC-4A | S-6 | 24-26 | 24-S-2478 | | | | | 32.3 | 62.1 | 5.6 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-5A | S-2 | 4-6 | 24-S-2479 | | | | | 10.5 | 75.8 | 13.7 | | | | | | | | | | | Brown silty sand |
| CEC-5A | S-4 | 14-16 | 24-S-2480 | | | | | 11.0 | 79.0 | 10.0 | | | | | | | | | | | Brown well-graded sand with silt |
| CEC-5A | S-6 | 24-26 | 24-S-2481 | | | | | 32.2 | 56.1 | 11.7 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-6A | S-2 | 4-6 | 24-S-2482 | | | | | 40.3 | 48.2 | 11.5 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-6A | S-5 | 19-21 | 24-S-2483 | | | | | 12.3 | 76.0 | 11.7 | | | | | | | | | | | Brown poorly graded sand with silt |
| CEC-6A | S-6 | 24-26 | 24-S-2484 | | | | | 27.1 | 69.0 | 3.9 | | | | | | | | | | | Brown poorly graded sand with gravel |
| CEC-6A | S-8 | 34-36 | 24-S-2485 | | | | | 19.9 | 63.4 | 16.7 | | | | | | | | | | | Brown silty sand with gravel |
| CEC-7A | S-2 | 4-6 | 24-S-2486 | | | | | 15.1 | 69.1 | 15.8 | | | | | | | | | | | Brown silty sand with gravel |
| CEC-7A | S-5 | 19-21 | 24-S-2487 | | | | | 22.7 | 66.3 | 11.0 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |

Date Received: **6/24/2024** Reviewed By: Date Reviewed: **7/5/2024**

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 13.0 | 5.7 | 21.5 | 43.6 | 16.2 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 92.1 | | |
| 3/8" | 90.7 | | |
| #4 | 87.0 | | |
| #10 | 81.3 | | |
| #20 | 72.9 | | |
| #40 | 59.8 | | |
| #60 | 41.3 | | |
| #100 | 26.8 | | |
| #200 | 16.2 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 8.3104 $D_{85}$= 3.4062 $D_{60}$= 0.4287
$D_{50}$= 0.3189 $D_{30}$= 0.1715 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 9-11'
Sample Number: CEC-4A / S-3

Date: 7.2.24

Thielsch Engineering Inc.

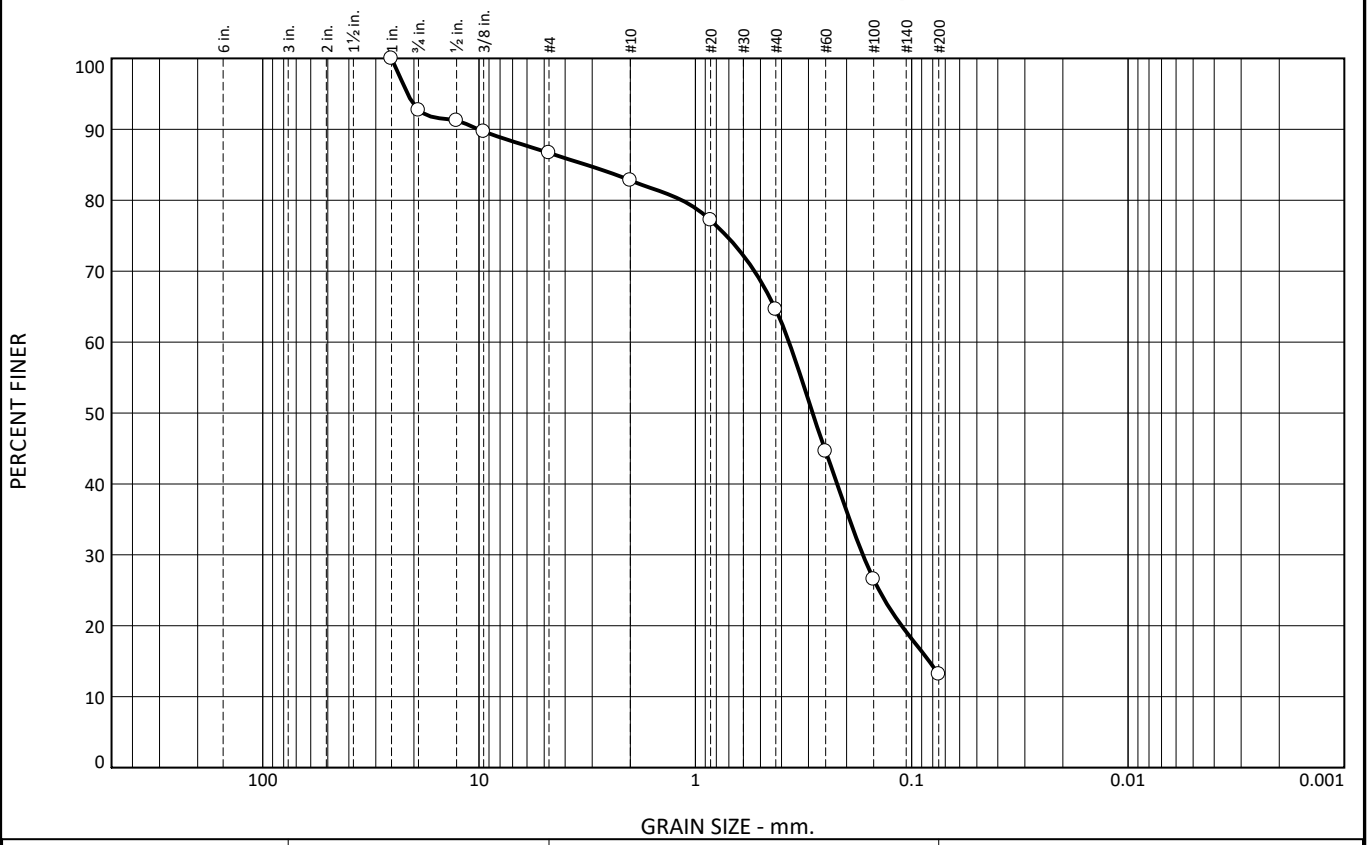
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2476

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 7.3 | 6.0 | 3.9 | 18.2 | 51.5 | 13.1 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 92.7 | | |
| 1/2" | 91.2 | | |
| 3/8" | 89.7 | | |
| #4 | 86.7 | | |
| #10 | 82.8 | | |
| #20 | 77.2 | | |
| #40 | 64.6 | | |
| #60 | 44.6 | | |
| #100 | 26.5 | | |
| #200 | 13.1 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 10.0828 $D_{85}$= 3.1897 $D_{60}$= 0.3692
$D_{50}$= 0.2872 $D_{30}$= 0.1682 $D_{15}$= 0.0830
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 14-16'
Sample Number: CEC-4A / S-4

Date: 7.2.24

Thielsch Engineering Inc.

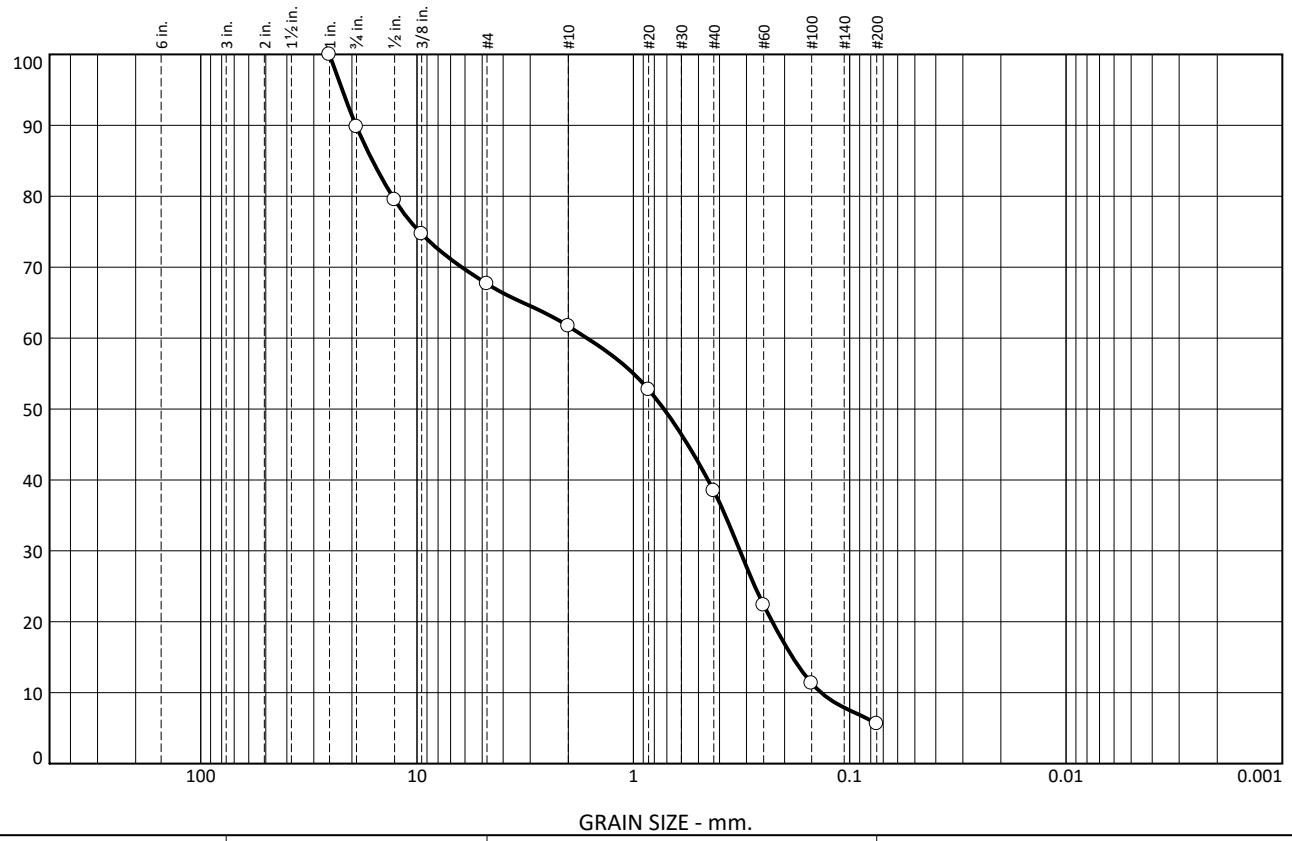
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2477

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 10.2 | 22.1 | 6.0 | 23.2 | 32.9 | 5.6 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 89.8 | | |
| 1/2" | 79.5 | | |
| 3/8" | 74.7 | | |
| #4 | 67.7 | | |
| #10 | 61.7 | | |
| #20 | 52.7 | | |
| #40 | 38.5 | | |
| #60 | 22.3 | | |
| #100 | 11.3 | | |
| #200 | 5.6 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 19.1731 $D_{85}$= 16.0597 $D_{60}$= 1.6406
$D_{50}$= 0.7224 $D_{30}$= 0.3216 $D_{15}$= 0.1837
$D_{10}$= 0.1356 $C_u$= 12.10 $C_c$= 0.47

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-4A / S-6

Date: 7.2.24

Thielsch Engineering Inc.

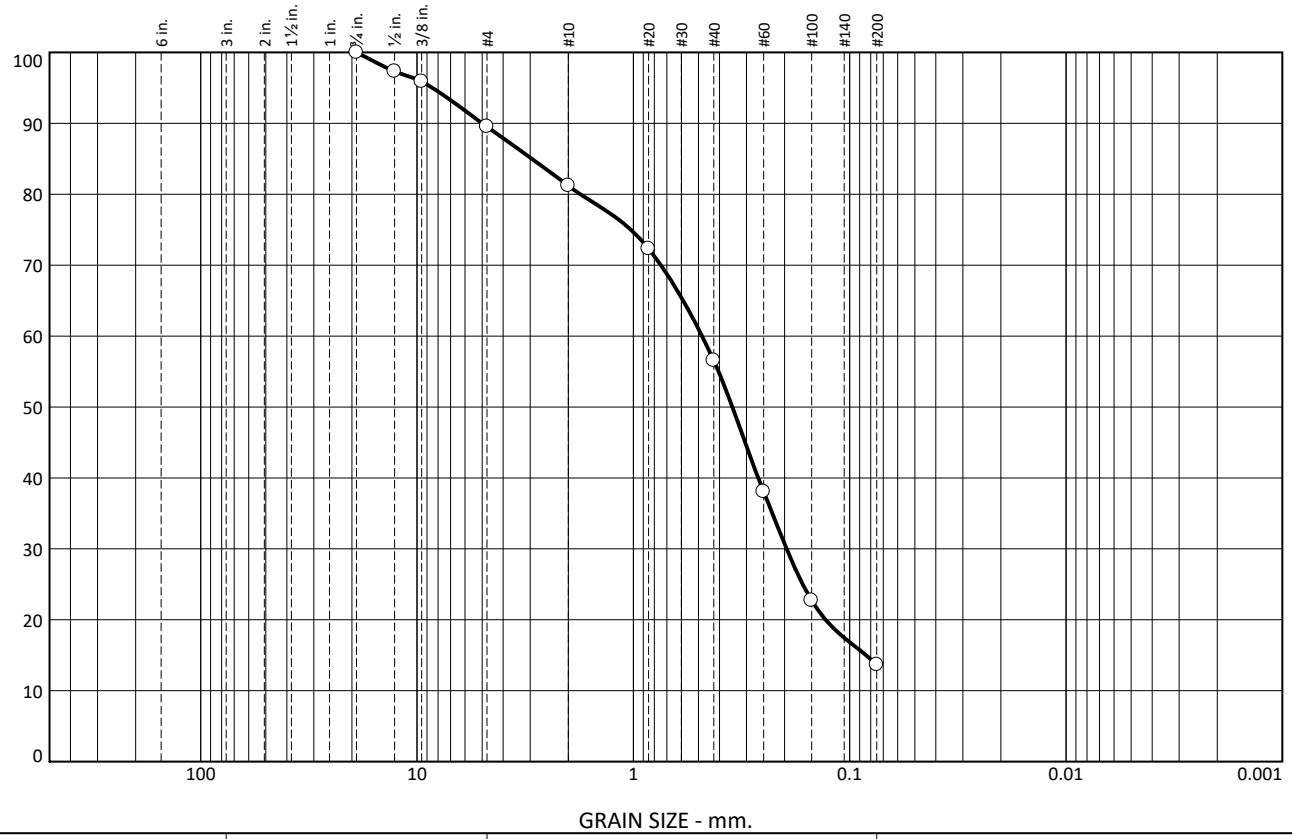
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2478

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 10.5 | 8.3 | 24.7 | 42.8 | 13.7 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 97.3 | | |
| 3/8" | 95.9 | | |
| #4 | 89.5 | | |
| #10 | 81.2 | | |
| #20 | 72.3 | | |
| #40 | 56.5 | | |
| #60 | 38.0 | | |
| #100 | 22.7 | | |
| #200 | 13.7 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 4.9938 $D_{85}$= 2.9460 $D_{60}$= 0.4815
$D_{50}$= 0.3487 $D_{30}$= 0.1956 $D_{15}$= 0.0840
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 4-6'
Sample Number: CEC-5A / S-2

Date: 7.2.24

Thielsch Engineering Inc.

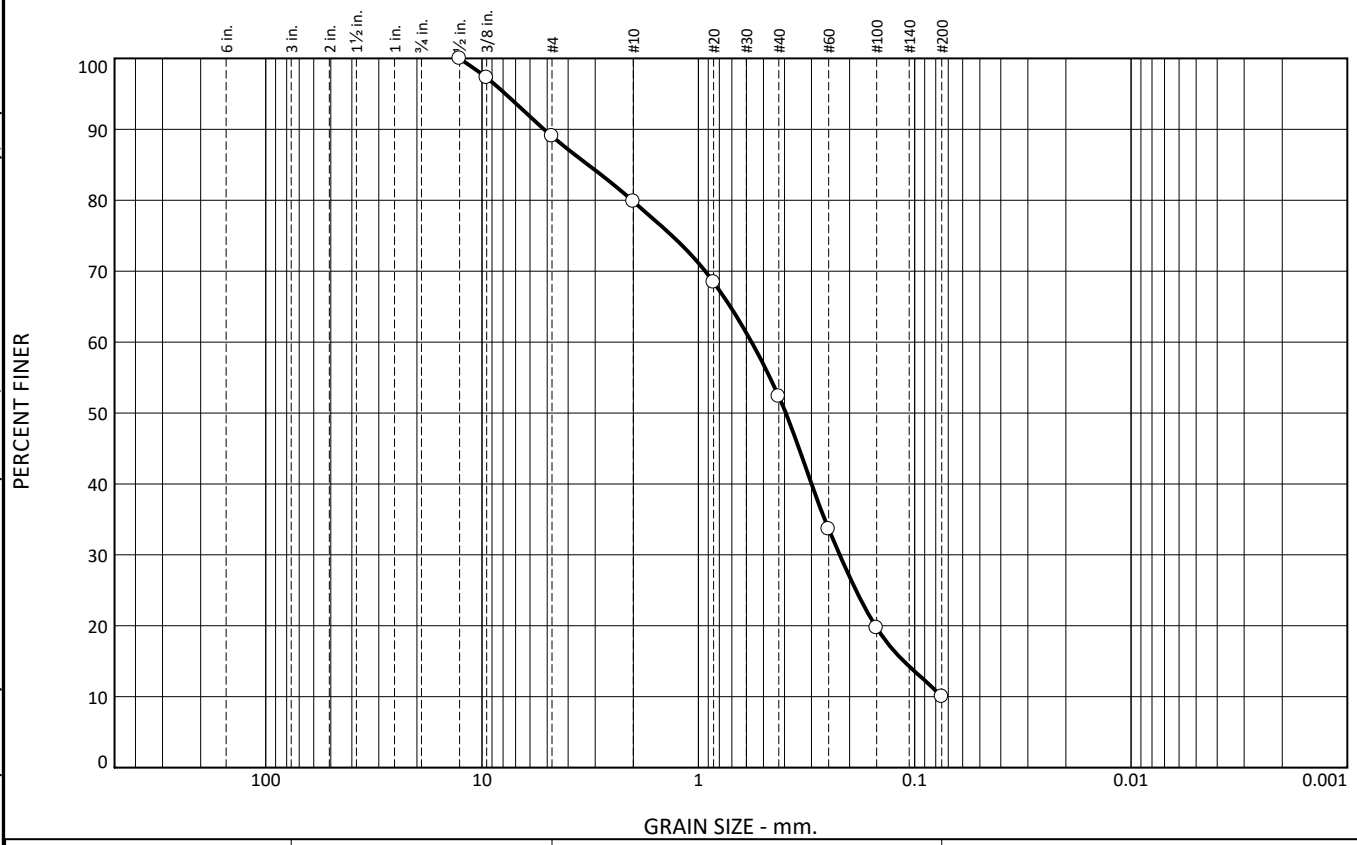
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2479

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 11.0 | 9.2 | 27.5 | 42.3 | 10.0 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1/2" | 100.0 | | |
| 3/8" | 97.3 | | |
| #4 | 89.0 | | |
| #10 | 79.8 | | |
| #20 | 68.4 | | |
| #40 | 52.3 | | |
| #60 | 33.6 | | |
| #100 | 19.7 | | |
| #200 | 10.0 | | |

* (no specification provided)

**Soil Description**

Brown well-graded sand with silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 5.1669 $D_{85}$= 3.2327 $D_{60}$= 0.5676
$D_{50}$= 0.3943 $D_{30}$= 0.2222 $D_{15}$= 0.1123
$D_{10}$= 0.0751 $C_u$= 7.56 $C_c$= 1.16

**Classification**

USCS= SW-SM AASHTO= A-3

**Remarks**

Source of Sample: Boring Depth: 14-16'
Sample Number: CEC-5A / S-4

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2480

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 24.6 | 7.6 | 6.4 | 20.1 | 29.6 | 11.7 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 75.4 | | |
| 1/2" | 75.4 | | |
| 3/8" | 74.8 | | |
| #4 | 67.8 | | |
| #10 | 61.4 | | |
| #20 | 52.9 | | |
| #40 | 41.3 | | |
| #60 | 29.3 | | |
| #100 | 19.4 | | |
| #200 | 11.7 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 23.0834 $D_{85}$= 22.0761 $D_{60}$= 1.7016
$D_{50}$= 0.6959 $D_{30}$= 0.2582 $D_{15}$= 0.1040
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-5A / S-6

Date: 7.2.24

Thielsch Engineering Inc.

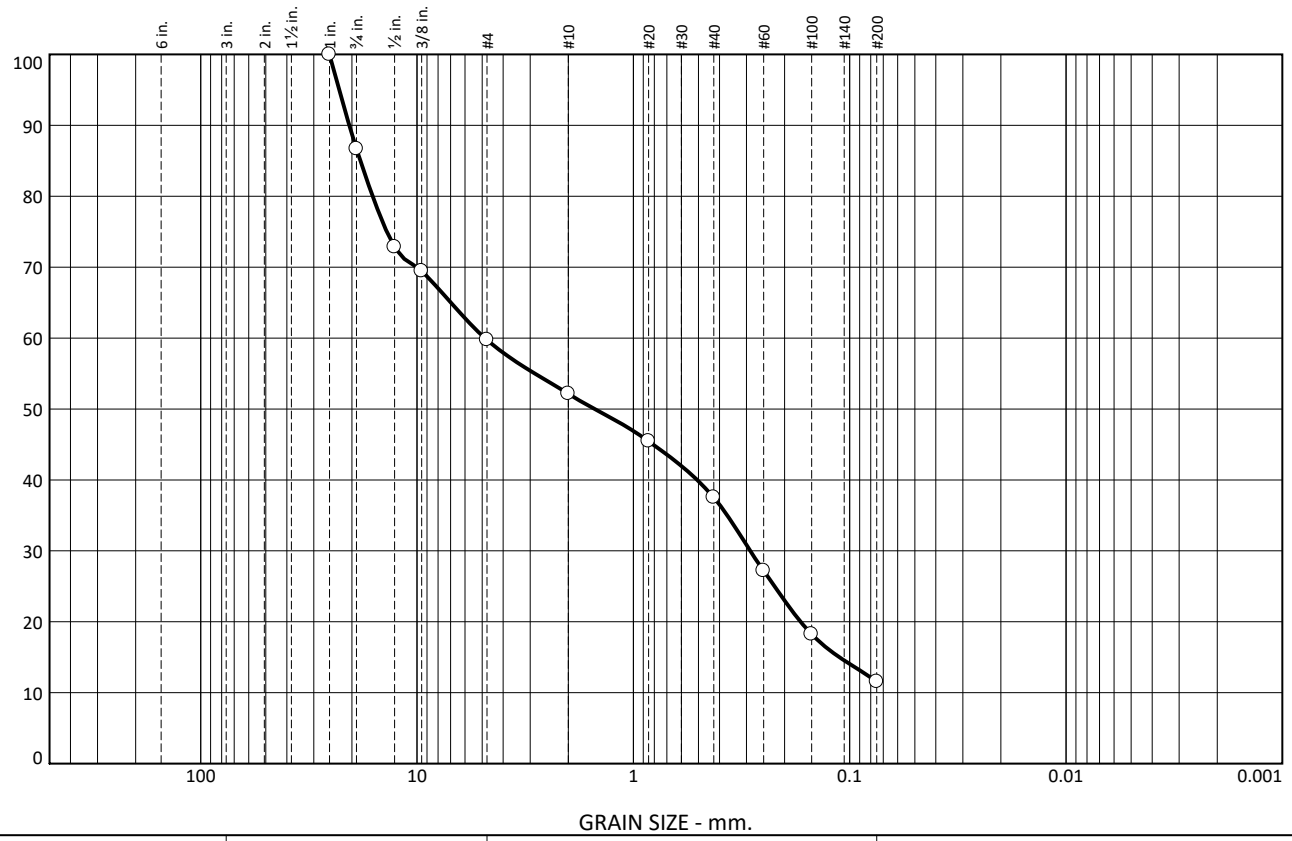
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2481

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 13.3 | 27.0 | 7.5 | 14.7 | 26.0 | 11.5 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 86.7 | | |
| 1/2" | 72.8 | | |
| 3/8" | 69.5 | | |
| #4 | 59.7 | | |
| #10 | 52.2 | | |
| #20 | 45.4 | | |
| #40 | 37.5 | | |
| #60 | 27.2 | | |
| #100 | 18.2 | | |
| #200 | 11.5 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 20.5835 $D_{85}$= 18.2740 $D_{60}$= 4.8553
$D_{50}$= 1.5089 $D_{30}$= 0.2884 $D_{15}$= 0.1116
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 4-6'
Sample Number: CEC-6A / S-2

Date: 7.2.24

Thielsch Engineering Inc.

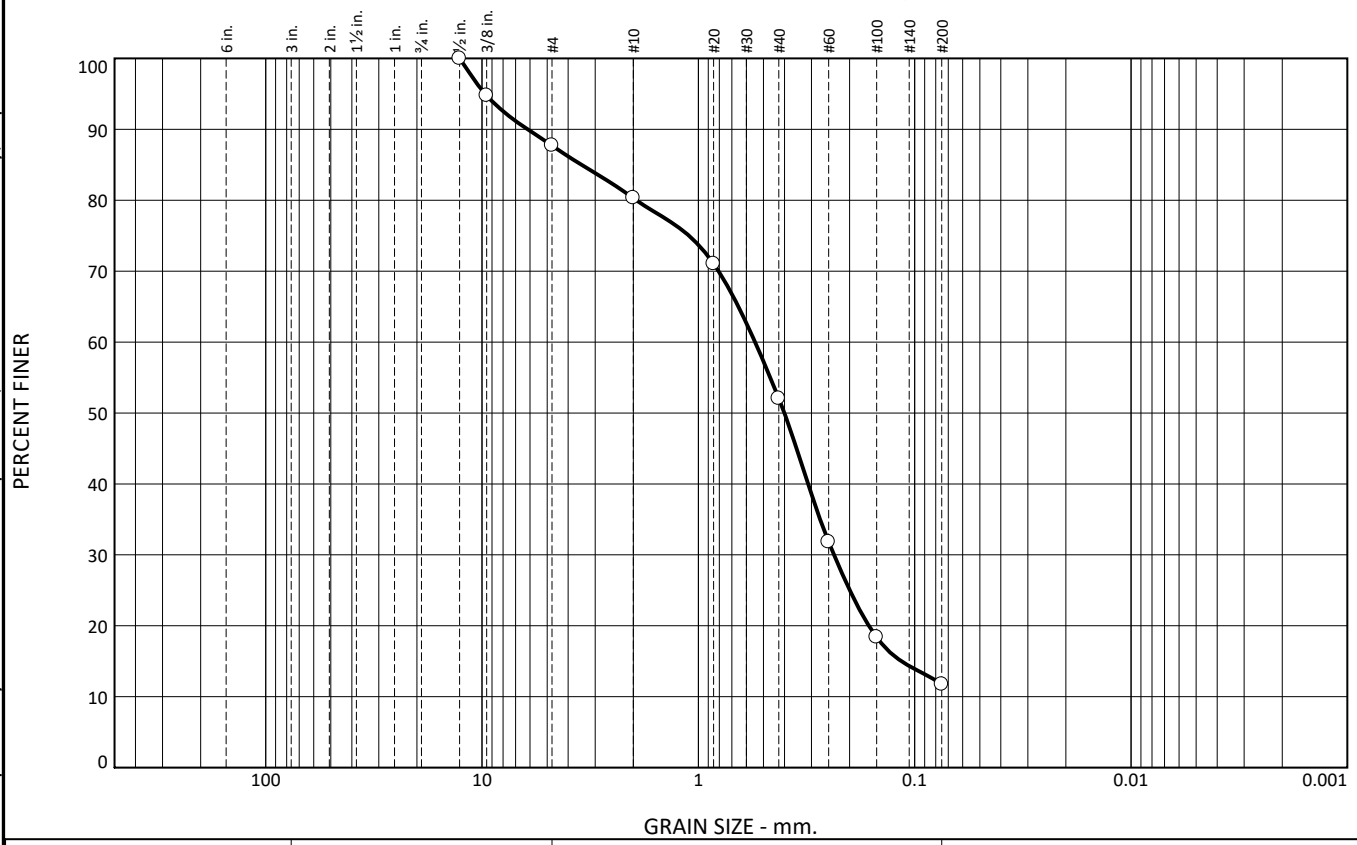
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2482

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 12.3 | 7.4 | 28.2 | 40.4 | 11.7 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1/2" | 100.0 | | |
| 3/8" | 94.8 | | |
| #4 | 87.7 | | |
| #10 | 80.3 | | |
| #20 | 71.0 | | |
| #40 | 52.1 | | |
| #60 | 31.8 | | |
| #100 | 18.4 | | |
| #200 | 11.7 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 6.1470 $D_{85}$= 3.4646 $D_{60}$= 0.5470
$D_{50}$= 0.4004 $D_{30}$= 0.2361 $D_{15}$= 0.1153
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 19-21'
Sample Number: CEC-6A / S-5

Date: 7.2.24

Thielsch Engineering Inc.

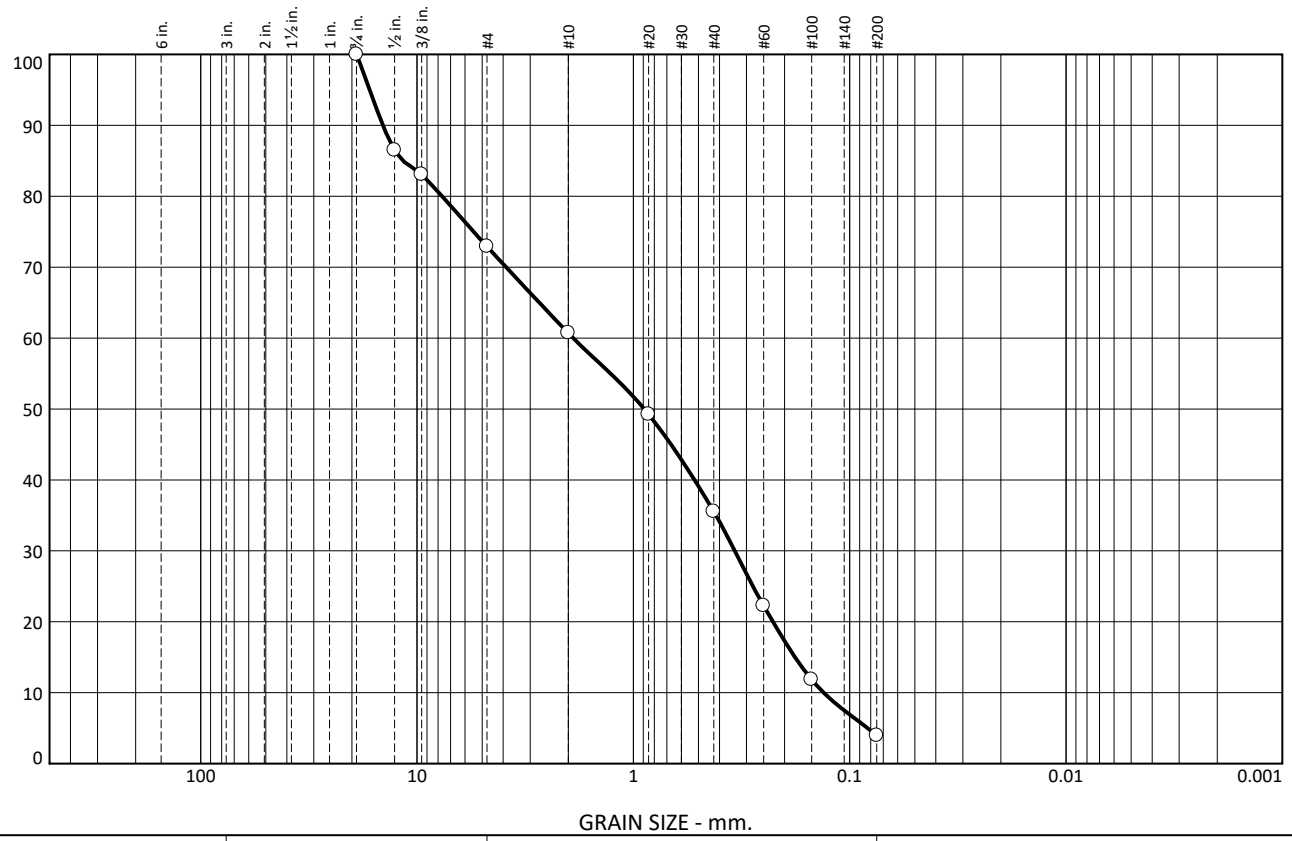
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2483

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 27.1 | 12.2 | 25.2 | 31.6 | 3.9 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 86.5 | | |
| 3/8" | 83.1 | | |
| #4 | 72.9 | | |
| #10 | 60.7 | | |
| #20 | 49.2 | | |
| #40 | 35.5 | | |
| #60 | 22.2 | | |
| #100 | 11.8 | | |
| #200 | 3.9 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 14.3811 $D_{85}$= 11.6145 $D_{60}$= 1.8972
$D_{50}$= 0.8907 $D_{30}$= 0.3398 $D_{15}$= 0.1790
$D_{10}$= 0.1320 $C_u$= 14.37 $C_c$= 0.46

**Classification**

USCS= SP AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-6A / S-6

Date: 7.2.24

Thielsch Engineering Inc.

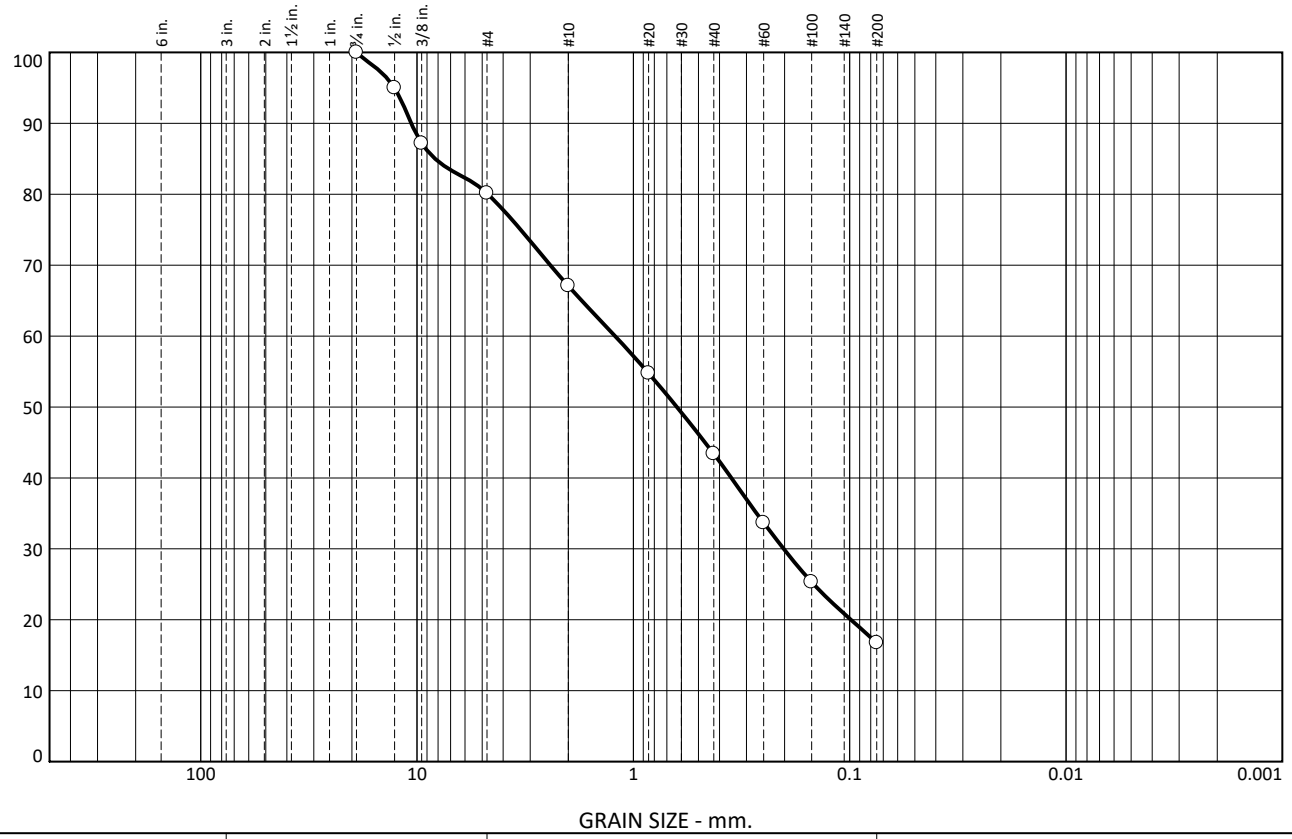
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2484

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 19.9 | 13.0 | 23.7 | 26.7 | 16.7 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 95.0 | | |
| 3/8" | 87.2 | | |
| #4 | 80.1 | | |
| #10 | 67.1 | | |
| #20 | 54.8 | | |
| #40 | 43.4 | | |
| #60 | 33.7 | | |
| #100 | 25.3 | | |
| #200 | 16.7 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 10.6329 $D_{85}$= 8.2491 $D_{60}$= 1.2155
$D_{50}$= 0.6294 $D_{30}$= 0.2019 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 34-36'
Sample Number: CEC-6A / S-8

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2485

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 8.8 | 6.3 | 6.5 | 22.7 | 39.9 | 15.8 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 91.2 | | |
| 1/2" | 91.2 | | |
| 3/8" | 91.2 | | |
| #4 | 84.9 | | |
| #10 | 78.4 | | |
| #20 | 69.7 | | |
| #40 | 55.7 | | |
| #60 | 39.0 | | |
| #100 | 25.5 | | |
| #200 | 15.8 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 7.5586 $D_{85}$= 4.7822 $D_{60}$= 0.5072
$D_{50}$= 0.3509 $D_{30}$= 0.1817 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 4-6'
Sample Number: CEC-7A / S-2

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2486

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 22.7 | 8.4 | 24.9 | 33.0 | 11.0 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 89.6 | | |
| 3/8" | 84.7 | | |
| #4 | 77.3 | | |
| #10 | 68.9 | | |
| #20 | 58.9 | | |
| #40 | 44.0 | | |
| #60 | 29.8 | | |
| #100 | 18.8 | | |
| #200 | 11.0 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 12.9414 $D_{85}$= 9.7343 $D_{60}$= 0.9106
$D_{50}$= 0.5482 $D_{30}$= 0.2520 $D_{15}$= 0.1117
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 19-21'
Sample Number: CEC-7A / S-5

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2487

Tested By: MCS Checked By: Kris Roland

Thielsch
DIVISION OF THE RISE GROUP

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
cts.thielsch.com
*Let's Build a Solid Foundation*

| Client Information: | |
|---|---|
| Civil & Environmental Consultants, Inc | |
| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned By: | Tony Sousa |
| Collected By: | CEC |

| Project Information: | |
|---|---|
| **Shuster Bulkhead Improvements** | |
| **4 Wright St., New Bedford MA** | |
| Project Number: | 332-344 |
| Summary Page: | 1 of 1 |
| Report Date: | 7/5/2024 |

## LABORATORY TESTING DATA SHEET, Report No.: 7424-F-211

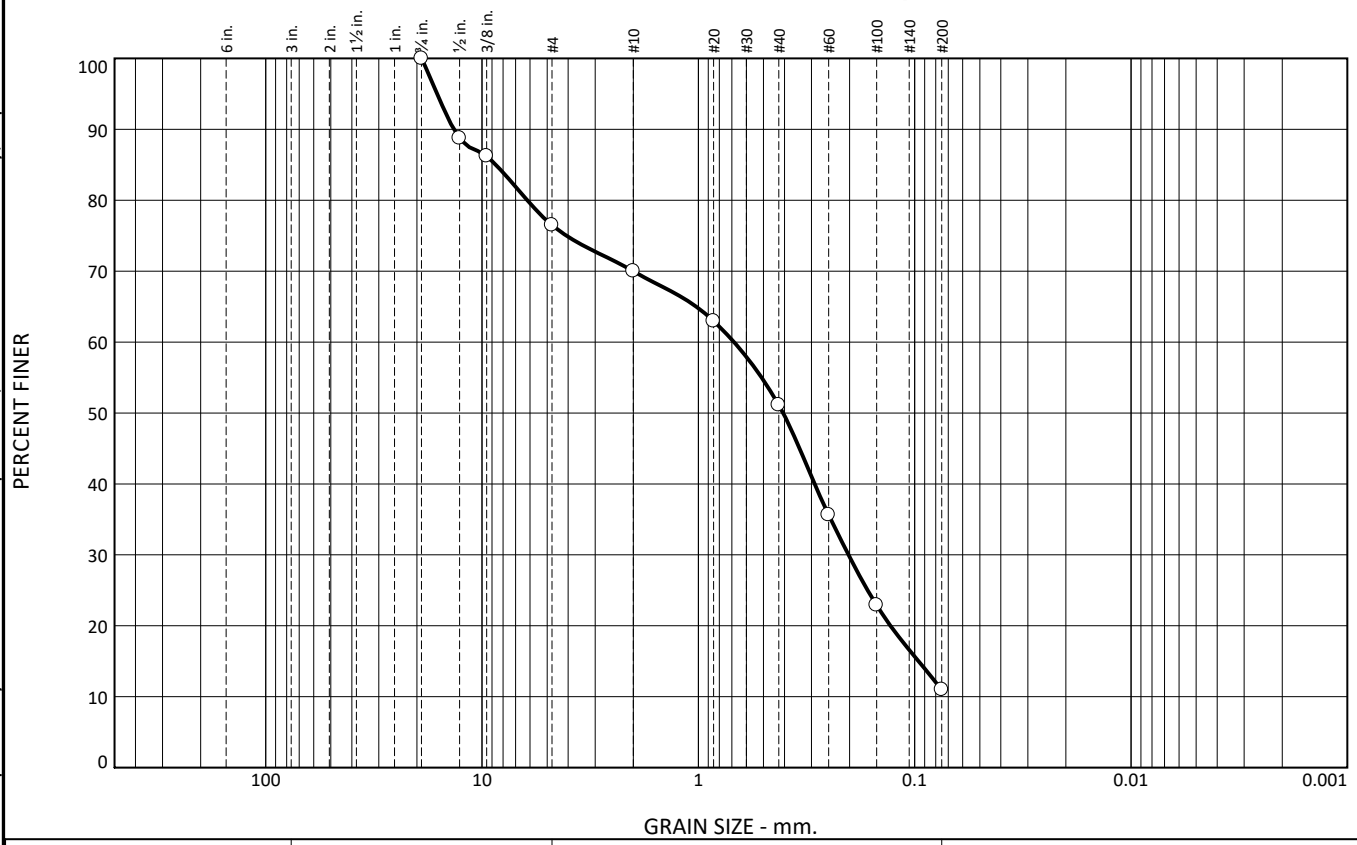
| Boring No. | Sample ID | Depth (ft) | Laboratory No. | Identification Tests | | | | | | | | | Proctor / CBR / Permeability Tests | | | | | | | | Laboratory Log and Soil Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | As Rcvd Moisture Content % | LL % | PL % | OD LL | Gravel % | Sand % | Fines % | Org. % | pH | $g_d$ MAX (pcf) $W_{opt}$ (%) | $g_d$ MAX (pcf) $W_{opt}$ (%) (Corr.) | Dry unit wt. (pcf) | Test Moisture Content % | Target Test Setup as % of Proctor | CBR @ 0.1" | CBR @ 0.2" | Permeability cm/sec | |
| | | | | D2216 | D4318 | | | D6913 | | | D2974 | D4792 | D1557 | | | | | | | | |
| CEC-7A | S-7 | 29-31 | 24-S-2488 | | | | | 23.5 | 65.5 | 11.0 | | | | | | | | | | | Dark Brown poorly graded sand with silt and gravel |
| CEC-8A | S-2 | 4-6 | 24-S-2489 | | | | | 10.3 | 72.5 | 17.2 | | | | | | | | | | | Brown silty sand |
| CEC-8A | S-4 | 14-16 | 24-S-2490 | | | | | 33.2 | 64.0 | 2.8 | | | | | | | | | | | Brown poorly graded sand with gravel |
| CEC-8A | S-7 | 29-31 | 24-S-2491 | | | | | 20.0 | 70.6 | 9.4 | | | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-9A | S-1 | 0-2 | 24-S-2492 | | | | | 16.1 | 69.1 | 14.8 | | | | | | | | | | | Brown silty sand with gravel |
| CEC-9A | S-3 | 9-11 | 24-S-2493 | | | | | 26.7 | 68.5 | 4.8 | | | | | | | | | | | Brown poorly graded sand with gravel |
| CEC-10A | S-4 | 14-16 | 24-S-2494 | | | | | 8.2 | 70.2 | 21.6 | | | | | | | | | | | Brown silty sand |
| CEC-10A | S-7 | 29-31 | 24-S-2495 | | | | | 21.7 | 60.1 | 18.2 | | | | | | | | | | | Brown silty sand with gravel |
| CEC-11A | S-3 | 9-11 | 24-S-2496 | | | | | 21.1 | 57.8 | 21.1 | | | | | | | | | | | Brown silty sand with gravel |
| CEC-11A | S-6 | 24-26 | 24-S-2497 | | | | | 6.3 | 65.9 | 27.8 | | | | | | | | | | | Dark Brown silty sand |
| CEC-12A | S-1 | 0-2 | 24-S-2498 | | | | | 7.0 | 72.9 | 20.1 | | | | | | | | | | | Brown silty sand |
| CEC-12A | S-6 | 24-26 | 24-S-2499 | | | | | 0.0 | 86.7 | 13.3 | | | | | | | | | | | Dark Brown silty sand |

Date Received: **6/24/2024** Reviewed By: Date Reviewed: **7/5/2024**

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 23.5 | 6.5 | 18.9 | 40.1 | 11.0 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 88.7 | | |
| 3/8" | 86.2 | | |
| #4 | 76.5 | | |
| #10 | 70.0 | | |
| #20 | 63.0 | | |
| #40 | 51.1 | | |
| #60 | 35.6 | | |
| #100 | 22.9 | | |
| #200 | 11.0 | | |

* (no specification provided)

**Soil Description**

Dark Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 13.4889 $D_{85}$= 8.6372 $D_{60}$= 0.6845
$D_{50}$= 0.4058 $D_{30}$= 0.2023 $D_{15}$= 0.0960
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 29-31'
Sample Number: CEC-7A / S-7

Date: 7.2.24

Thielsch Engineering Inc.

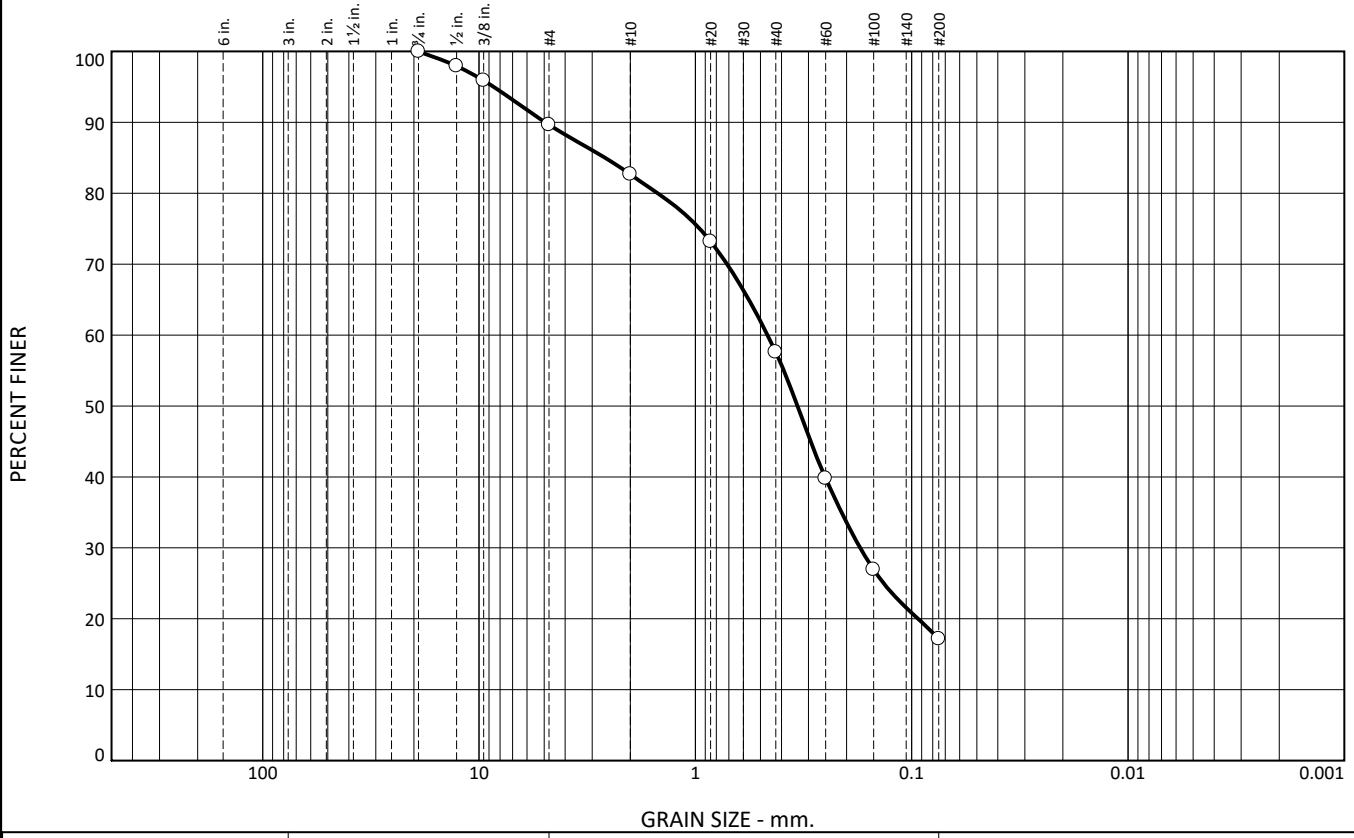
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2488

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 10.3 | 7.0 | 25.1 | 40.4 | 17.2 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 97.9 | | |
| 3/8" | 95.9 | | |
| #4 | 89.7 | | |
| #10 | 82.7 | | |
| #20 | 73.2 | | |
| #40 | 57.6 | | |
| #60 | 39.8 | | |
| #100 | 26.9 | | |
| #200 | 17.2 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 4.9391 $D_{85}$= 2.6132 $D_{60}$= 0.4641
$D_{50}$= 0.3372 $D_{30}$= 0.1731 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 4-6'
Sample Number: CEC-8A / S-2

Date: 7.2.24

Thielsch Engineering Inc.

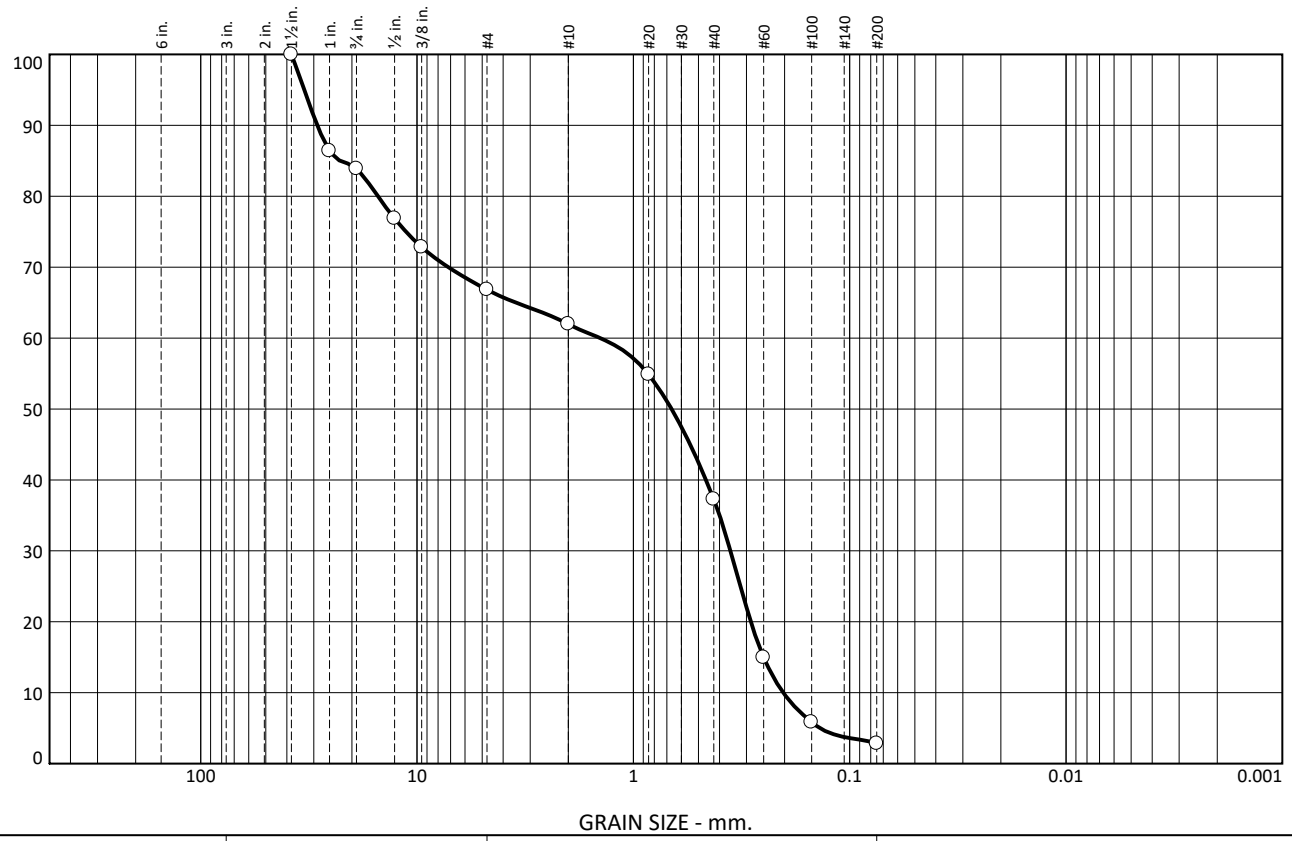
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2489

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 16.1 | 17.1 | 4.8 | 24.7 | 34.5 | 2.8 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 86.4 | | |
| 3/4" | 83.9 | | |
| 1/2" | 76.9 | | |
| 3/8" | 72.8 | | |
| #4 | 66.8 | | |
| #10 | 62.0 | | |
| #20 | 54.8 | | |
| #40 | 37.3 | | |
| #60 | 14.9 | | |
| #100 | 5.8 | | |
| #200 | 2.8 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 28.9135 $D_{85}$= 22.6654 $D_{60}$= 1.4222
$D_{50}$= 0.6660 $D_{30}$= 0.3560 $D_{15}$= 0.2504
$D_{10}$= 0.2029 $C_u$= 7.01 $C_c$= 0.44

**Classification**

USCS= SP AASHTO= A-1-b

**Remarks**

Sample received with standing water.

Source of Sample: Boring Depth: 14-16'
Sample Number: CEC-8A / S-4

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344

Fig. 24-S-2490

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 20.0 | 9.0 | 23.7 | 37.9 | 9.4 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 95.1 | | |
| 3/8" | 88.3 | | |
| #4 | 80.0 | | |
| #10 | 71.0 | | |
| #20 | 60.3 | | |
| #40 | 47.3 | | |
| #60 | 34.3 | | |
| #100 | 18.3 | | |
| #200 | 9.4 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 10.3082 $D_{85}$= 7.6318 $D_{60}$= 0.8327
$D_{50}$= 0.4830 $D_{30}$= 0.2177 $D_{15}$= 0.1242
$D_{10}$= 0.0785 $C_u$= 10.60 $C_c$= 0.72

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 29-31'
Sample Number: CEC-8A / S-7

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2491

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 16.1 | 5.5 | 22.5 | 41.1 | 14.8 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 93.2 | | |
| 3/8" | 88.7 | | |
| #4 | 83.9 | | |
| #10 | 78.4 | | |
| #20 | 69.9 | | |
| #40 | 55.9 | | |
| #60 | 38.9 | | |
| #100 | 26.1 | | |
| #200 | 14.8 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 10.4751 $D_{85}$= 5.6900 $D_{60}$= 0.5019
$D_{50}$= 0.3499 $D_{30}$= 0.1787 $D_{15}$= 0.0760
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 0-2'
Sample Number: CEC-9A / S-1

Date: 7.2.24

Thielsch Engineering Inc.

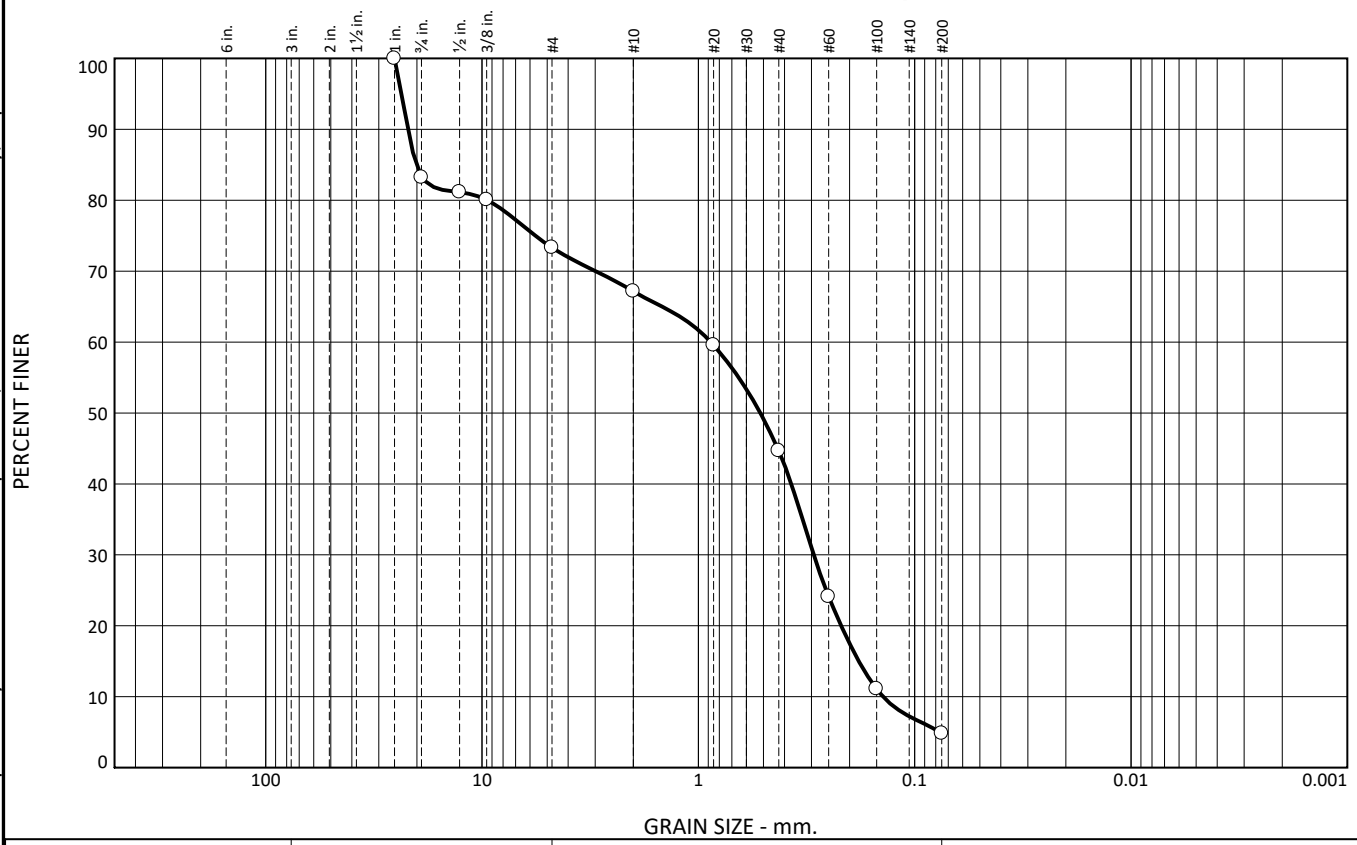
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2492

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 16.8 | 9.9 | 6.1 | 22.5 | 39.9 | 4.8 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 83.2 | | |
| 1/2" | 81.2 | | |
| 3/8" | 80.1 | | |
| #4 | 73.3 | | |
| #10 | 67.2 | | |
| #20 | 59.6 | | |
| #40 | 44.7 | | |
| #60 | 24.1 | | |
| #100 | 11.1 | | |
| #200 | 4.8 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 21.9788 $D_{85}$= 20.1845 $D_{60}$= 0.8760
$D_{50}$= 0.5172 $D_{30}$= 0.2928 $D_{15}$= 0.1813
$D_{10}$= 0.1401 $C_u$= 6.25 $C_c$= 0.70

**Classification**

USCS= SP AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 9-11'
Sample Number: CEC-9A / S-3

Date: 7.2.24

Thielsch Engineering Inc.

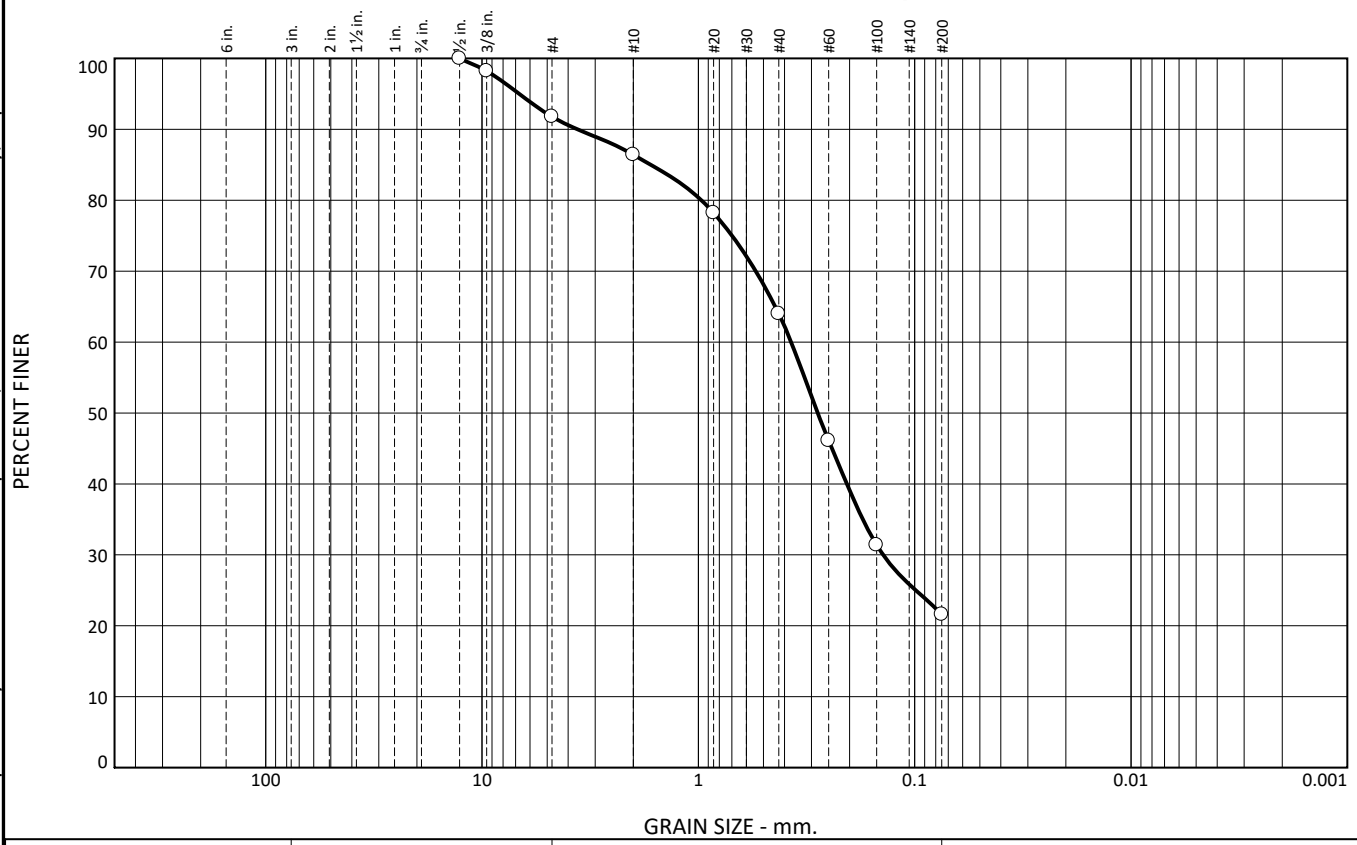
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2493

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 8.2 | 5.4 | 22.4 | 42.4 | 21.6 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1/2" | 100.0 | | |
| 3/8" | 98.2 | | |
| #4 | 91.8 | | |
| #10 | 86.4 | | |
| #20 | 78.2 | | |
| #40 | 64.0 | | |
| #60 | 46.1 | | |
| #100 | 31.4 | | |
| #200 | 21.6 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 3.6190 $D_{85}$= 1.6597 $D_{60}$= 0.3726
$D_{50}$= 0.2809 $D_{30}$= 0.1400 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 14-16'
Sample Number: CEC-10A / S-4

Date: 7.2.24

Thielsch Engineering Inc.

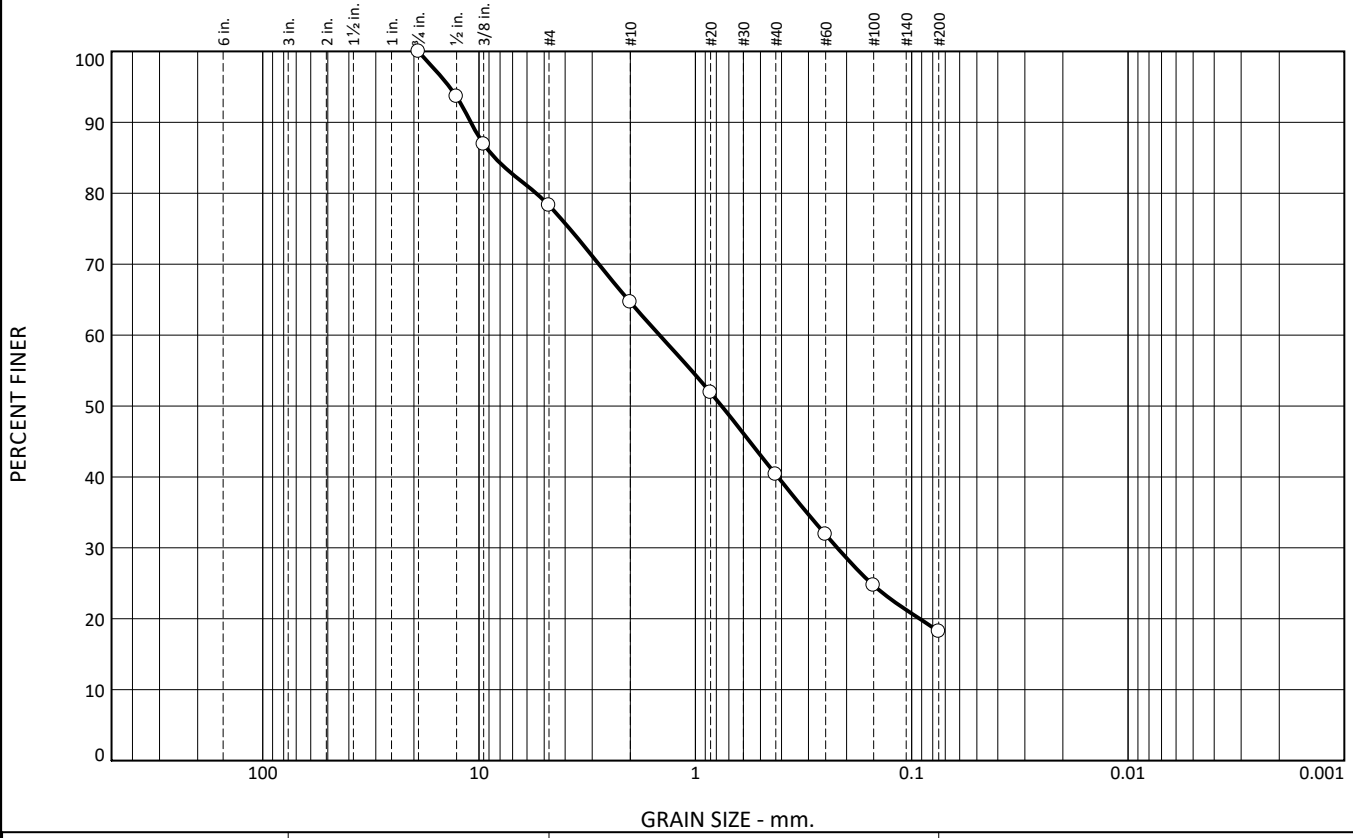
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2494

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 21.7 | 13.7 | 24.2 | 22.2 | 18.2 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 93.6 | | |
| 3/8" | 86.9 | | |
| #4 | 78.3 | | |
| #10 | 64.6 | | |
| #20 | 51.9 | | |
| #40 | 40.4 | | |
| #60 | 31.9 | | |
| #100 | 24.7 | | |
| #200 | 18.2 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 10.9057 $D_{85}$= 8.4458 $D_{60}$= 1.4639
$D_{50}$= 0.7560 $D_{30}$= 0.2207 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 29-31'
Sample Number: CEC-10A / S-7

Date: 7.2.24

Thielsch Engineering Inc.

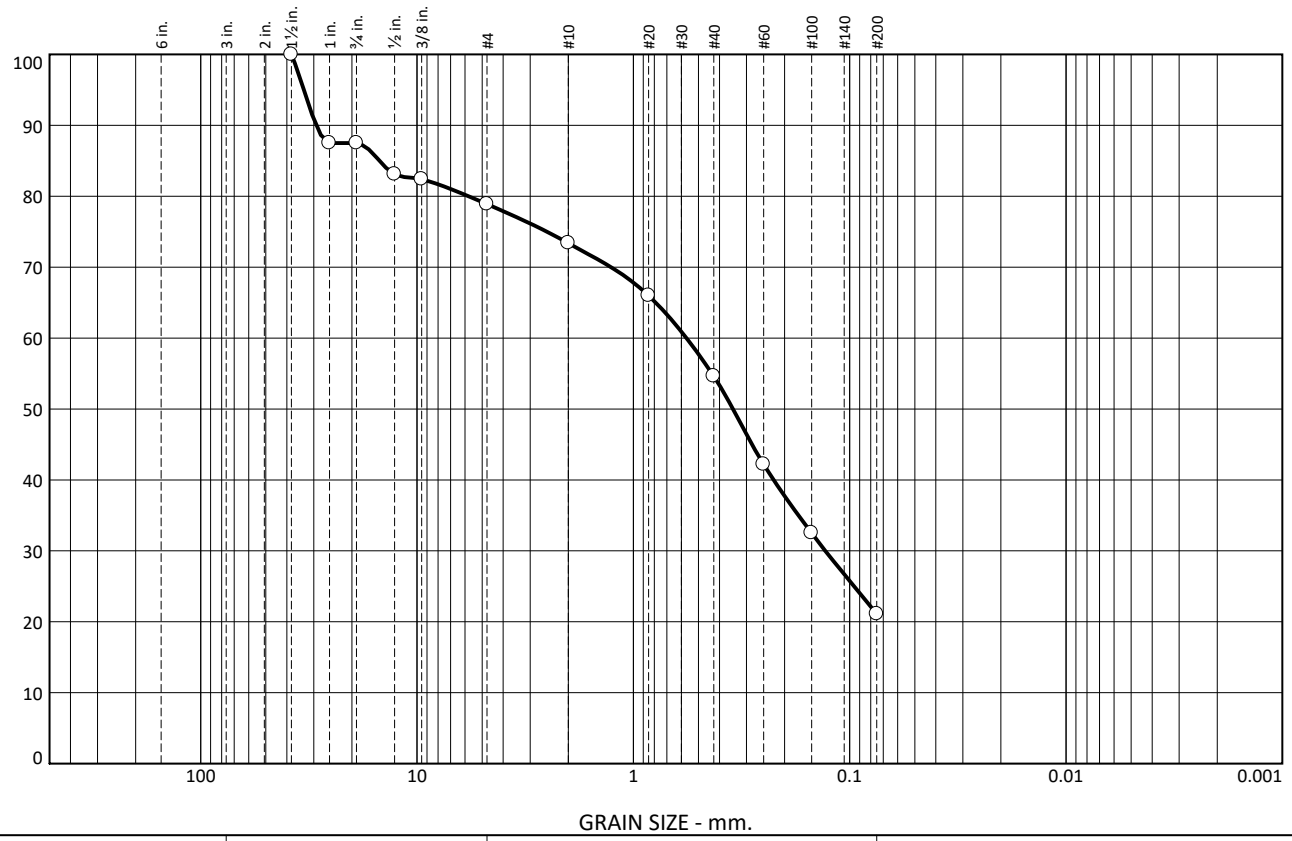
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2495

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 12.5 | 8.6 | 5.5 | 18.8 | 33.5 | 21.1 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 87.5 | | |
| 3/4" | 87.5 | | |
| 1/2" | 83.1 | | |
| 3/8" | 82.4 | | |
| #4 | 78.9 | | |
| #10 | 73.4 | | |
| #20 | 66.0 | | |
| #40 | 54.6 | | |
| #60 | 42.2 | | |
| #100 | 32.5 | | |
| #200 | 21.1 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 29.2429 $D_{85}$= 14.9037 $D_{60}$= 0.5682
$D_{50}$= 0.3465 $D_{30}$= 0.1296 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 9-11'
Sample Number: CEC-11A / S-3

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2496

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 6.3 | 2.4 | 3.4 | 60.1 | 27.8 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/8" | 100.0 | | |
| #4 | 93.7 | | |
| #10 | 91.3 | | |
| #20 | 89.8 | | |
| #40 | 87.9 | | |
| #60 | 77.3 | | |
| #100 | 54.5 | | |
| #200 | 27.8 | | |

* (no specification provided)

**Soil Description**

Dark Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 0.9878 $D_{85}$= 0.3388 $D_{60}$= 0.1695
$D_{50}$= 0.1344 $D_{30}$= 0.0795 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-11A / S-6

Date: 7.2.24

Thielsch Engineering Inc.

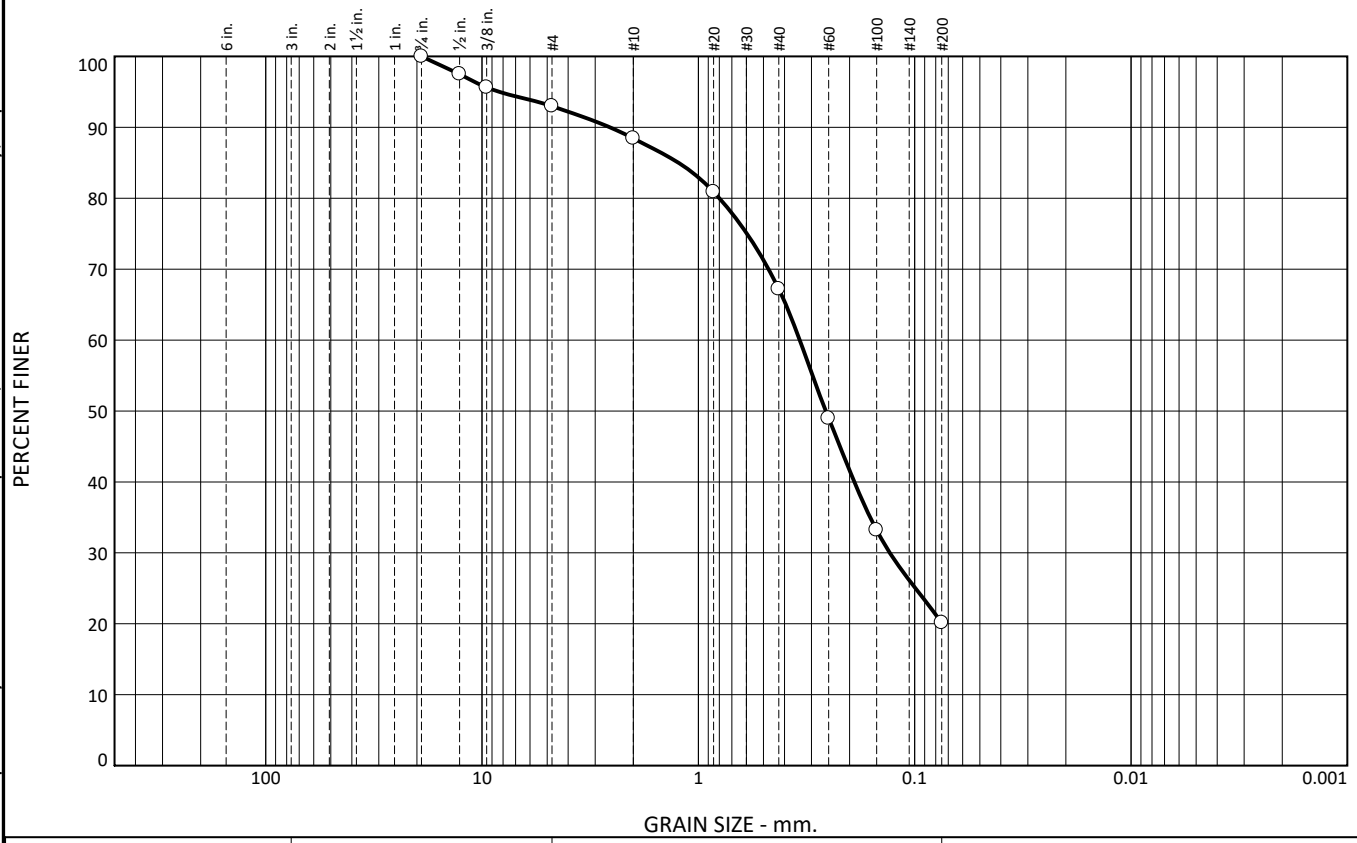
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2497

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 7.0 | 4.6 | 21.2 | 47.1 | 20.1 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 97.5 | | |
| 3/8" | 95.6 | | |
| #4 | 93.0 | | |
| #10 | 88.4 | | |
| #20 | 80.9 | | |
| #40 | 67.2 | | |
| #60 | 49.0 | | |
| #100 | 33.2 | | |
| #200 | 20.1 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 2.5587 $D_{85}$= 1.2349 $D_{60}$= 0.3400
$D_{50}$= 0.2578 $D_{30}$= 0.1303 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 0-2'
Sample Number: CEC-12A / S-1

Date: 7.2.24

Thielsch Engineering Inc.

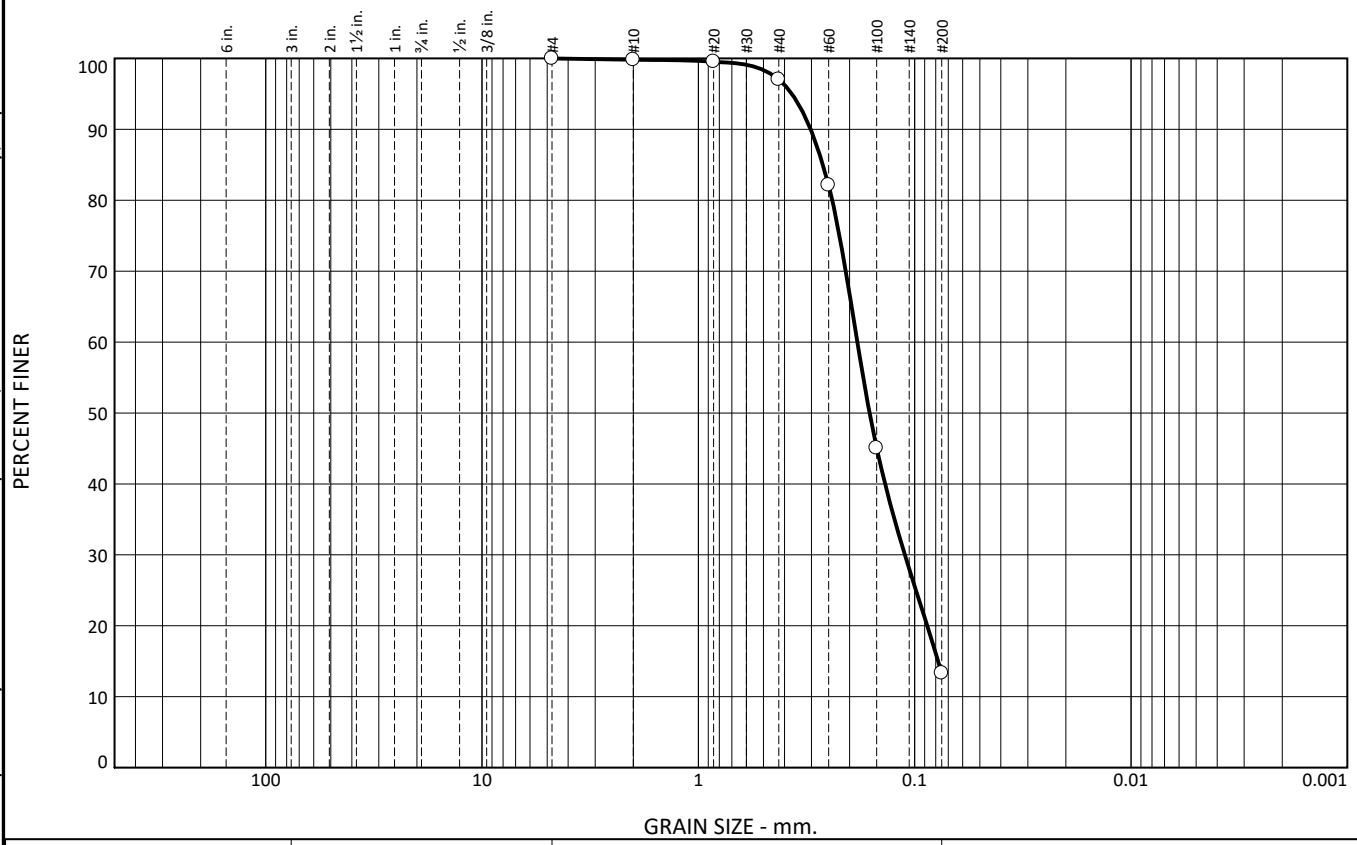
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2498

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines |
|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | |
| 0.0 | 0.0 | 0.0 | 0.2 | 2.8 | 83.7 | 13.3 |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| #4 | 100.0 | | |
| #10 | 99.8 | | |
| #20 | 99.5 | | |
| #40 | 97.0 | | |
| #60 | 82.1 | | |
| #100 | 45.0 | | |
| #200 | 13.3 | | |

* (no specification provided)

**Soil Description**

Dark Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 0.3027 $D_{85}$= 0.2657 $D_{60}$= 0.1841
$D_{50}$= 0.1618 $D_{30}$= 0.1111 $D_{15}$= 0.0779
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-12A / S-6

Date: 7.2.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2499

Tested By: MCS Checked By: Kris Roland

Thielsch
DIVISION OF THE RISE GROUP

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
cts.thielsch.com
*Let's Build a Solid Foundation*

| Client Information: | |
|---|---|
| Civil & Environmental Consultants, Inc | |
| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned By: | Tony Sousa |
| Collected By: | CEC |

| Project Information: | |
|---|---|
| **Shuster Bulkhead Improvements** | |
| **4 Wright St, New Bedford MA** | |
| Project Number: | 332-344 |
| Summary Page: | 1 of 1 |
| Report Date: | 7/10/2024 |

# LABORATORY TESTING DATA SHEET, Report No.: 7424-F-212

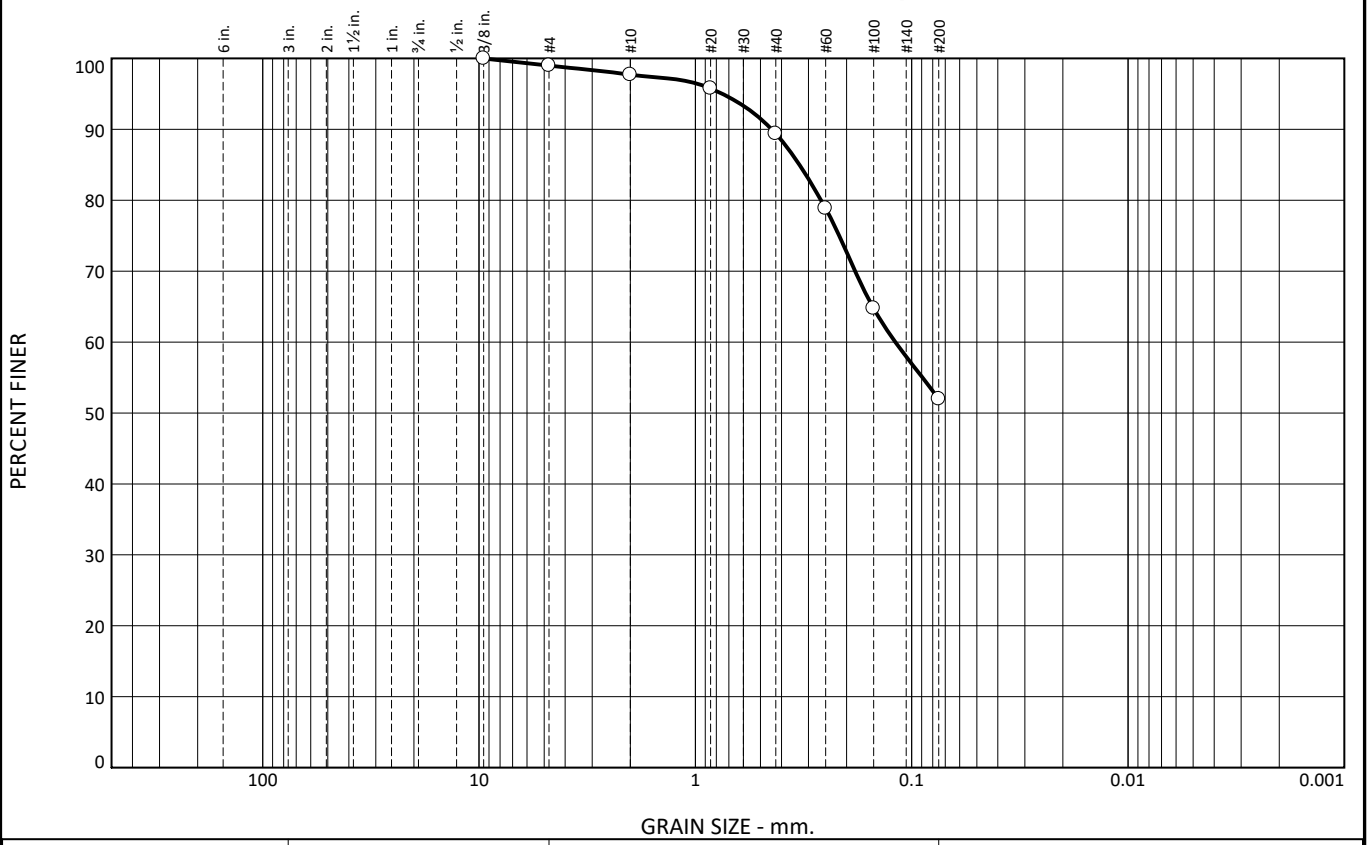
| Boring No. | Sample ID | Depth (ft) | Laboratory No. | Identification Tests | | | | | | Corrosivity Tests | | | | | | | | Laboratory Log and Soil Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | As Rcvd Moisture Content % | LL % | PL % | Gravel % | Sand % | Fines % | Resistivity (Mohms-cm) | Chloride (mg/kg) | Sulfate (mg/kg) | Sulfide (mg/kg) | Redox Potential (mv) | pH | Electrical Resist. As Rcvd Ohm-cm @ 60°F | Electrical Resist. Saturated Ohm-cm @ 60°F | |
| | | | | D2216 | D4318 | | D6913 | | | EPA | | | | | D4972 | G57 | | |
| CEC-13A | S-2 | 4-6 | 24-S-2500 | | | | 1.0 | 47.0 | 52.0 | 0.002 | 203 | ND | | | 6.7 | | | Brown sandy silt |
| CEC-13A | S-6 | 24-25 | 24-S-2501 | | | | 21.7 | 56.3 | 22.0 | | | | | | | | | Dark Brown silty sand with gravel |
| CEC-14A | S-8 | 14-16 | 24-S-2502 | | | | 12.7 | 60.7 | 26.6 | | | | | | | | | Dark Brown silty sand |
| CEC-15A | S-7 | 12-14 | 24-S-2503 | | | | 16.4 | 73.4 | 10.2 | | | | | | | | | Brown poorly graded sand with silt and gravel |
| CEC-15A | S-13 | 24-26 | 24-S-2504 | | | | 28.9 | 63.7 | 7.4 | | | | | | | | | Brown well-graded sand with silt and gravel |
| CEC-16A | S-5 | 8-10 | 24-S-2505 | | | | 22.8 | 52.1 | 25.1 | | | | | | | | | Brown silty sand with gravel |
| CEC-16A | S-12 | 22-24 | 24-S-2506 | | | | 17.3 | 74.7 | 8.0 | | | | | | | | | Dark Brown poorly graded sand with silt and gravel |
| CEC-17A | S-5 | 8-10 | 24-S-2507 | | | | 5.5 | 64.8 | 29.7 | | | | | | | | | Brown silty sand |
| CEC-17A | S-9 | 16-18 | 24-S-2508 | | | | 13.4 | 73.2 | 13.4 | | | | | | | | | Brown silty sand |
| CEC-17A | S-16 | 30-32 | 24-S-2509 | | | | 42.4 | 43.2 | 14.4 | | | | | | | | | Brown silty sand with gravel |
| CEC-18A | S-4 | 6-8 | 24-S-2510 | | | | 5.4 | 68.7 | 25.9 | 0.004 | 56 | ND | | | 6.7 | | | Brown silty sand |
| pH tested by RB 7-1-24. | | | | | | | | | | | | | | | | | | |

Date Received: **6/24/2024** Reviewed By: Date Reviewed: **7/10/2024**

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 1.0 | 1.3 | 8.3 | 37.4 | 52.0 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/8" | 100.0 | | |
| #4 | 99.0 | | |
| #10 | 97.7 | | |
| #20 | 95.8 | | |
| #40 | 89.4 | | |
| #60 | 78.9 | | |
| #100 | 64.7 | | |
| #200 | 52.0 | | |

* (no specification provided)

**Soil Description**

Brown sandy silt

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 0.4436 $D_{85}$= 0.3303 $D_{60}$= 0.1190
$D_{50}$= $D_{30}$= $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= ML AASHTO= A-4(0)

**Remarks**

Sample visually classified as non-plastic. Sample received with standing water.

Source of Sample: Boring Depth: 4-6'
Sample Number: CEC-13A / S-2

Date: 7.3.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2500

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 11.8 | 9.9 | 7.8 | 19.7 | 28.8 | 22.0 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 88.2 | | |
| 1/2" | 87.3 | | |
| 3/8" | 82.7 | | |
| #4 | 78.3 | | |
| #10 | 70.5 | | |
| #20 | 61.2 | | |
| #40 | 50.8 | | |
| #60 | 39.1 | | |
| #100 | 31.3 | | |
| #200 | 22.0 | | |

* (no specification provided)

**Soil Description**

Dark Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 20.6275 $D_{85}$= 10.8152 $D_{60}$= 0.7777
$D_{50}$= 0.4082 $D_{30}$= 0.1371 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 24-25'
Sample Number: CEC-13A / S-6

Date: 7.3.24

Thielsch Engineering Inc.

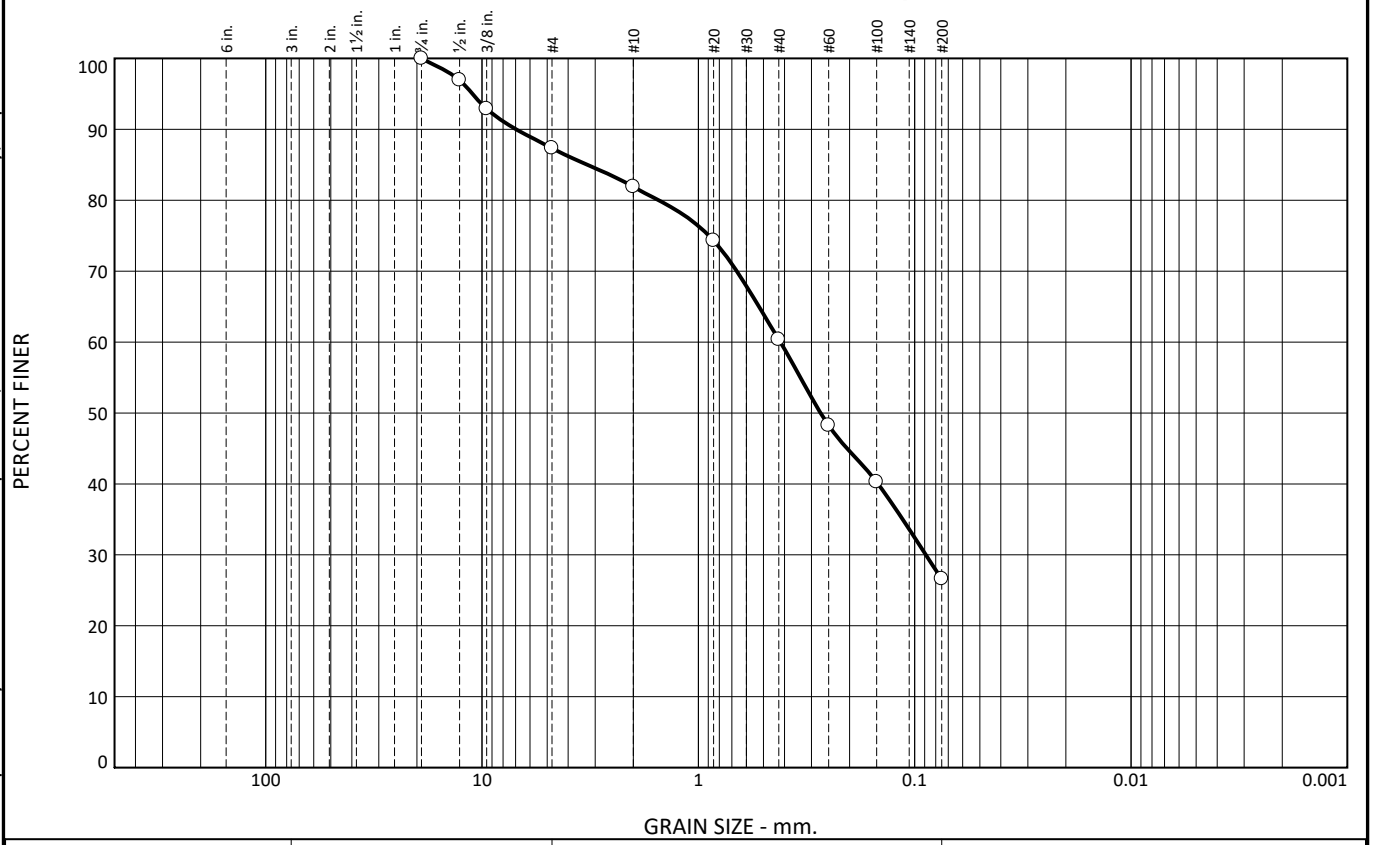
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2501

Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 12.7 | 5.4 | 21.5 | 33.8 | 26.6 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 97.0 | | |
| 3/8" | 92.9 | | |
| #4 | 87.3 | | |
| #10 | 81.9 | | |
| #20 | 74.3 | | |
| #40 | 60.4 | | |
| #60 | 48.2 | | |
| #100 | 40.3 | | |
| #200 | 26.6 | | |

* (no specification provided)

**Soil Description**

Dark Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 6.9456 $D_{85}$= 3.2596 $D_{60}$= 0.4179
$D_{50}$= 0.2724 $D_{30}$= 0.0888 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 14-16
Sample Number: CEC-14A / S-8

Date: 7.3.24

Thielsch Engineering Inc.

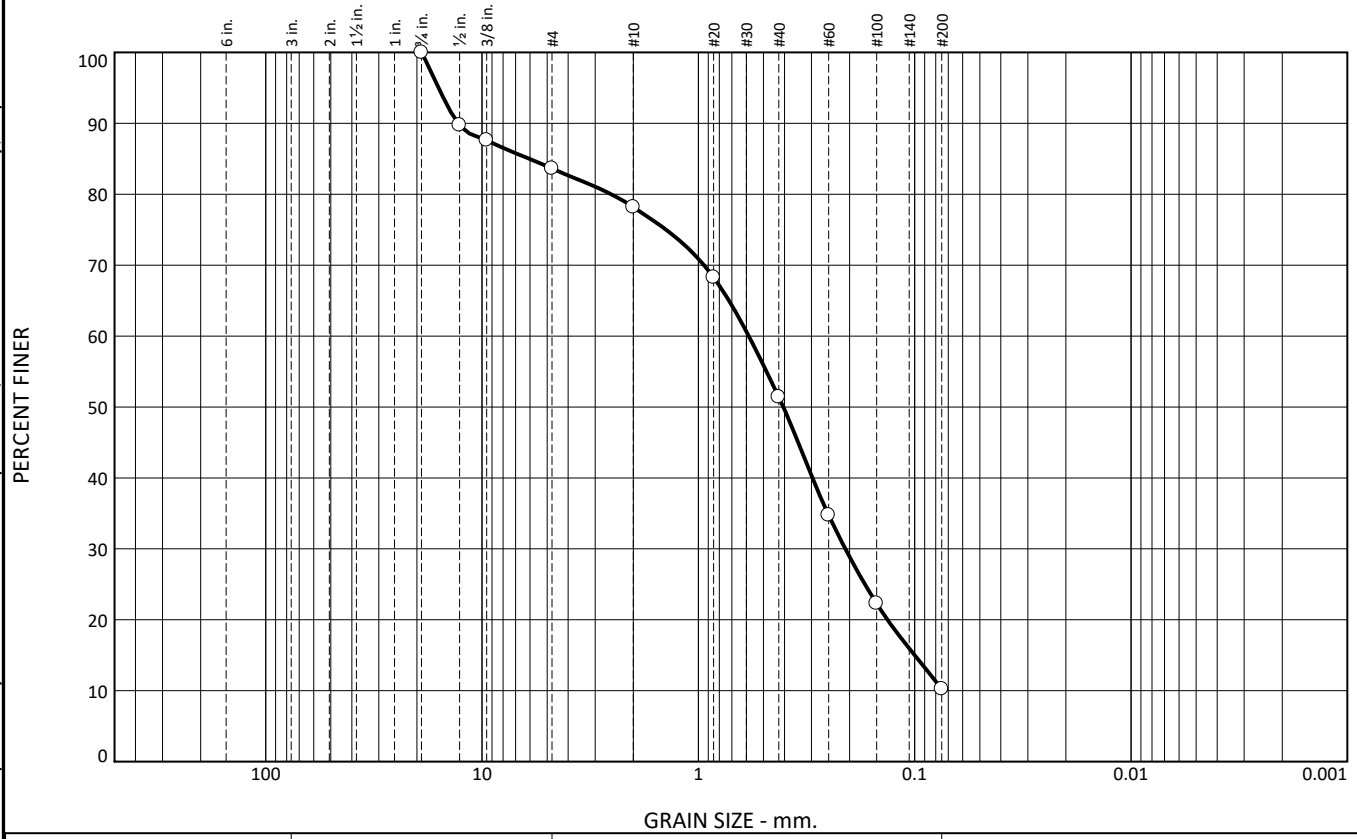
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2502

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 16.4 | 5.4 | 26.8 | 41.2 | 10.2 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 89.7 | | |
| 3/8" | 87.6 | | |
| #4 | 83.6 | | |
| #10 | 78.2 | | |
| #20 | 68.3 | | |
| #40 | 51.4 | | |
| #60 | 34.7 | | |
| #100 | 22.3 | | |
| #200 | 10.2 | | |

* (no specification provided)

**Soil Description**

Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 12.8933 $D_{85}$= 6.0467 $D_{60}$= 0.5849
$D_{50}$= 0.4049 $D_{30}$= 0.2092 $D_{15}$= 0.1001
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-3

**Remarks**

Source of Sample: Boring Depth: 12-14'
Sample Number: CEC-15A / S-7

Date: 7.3.24

Thielsch Engineering Inc.

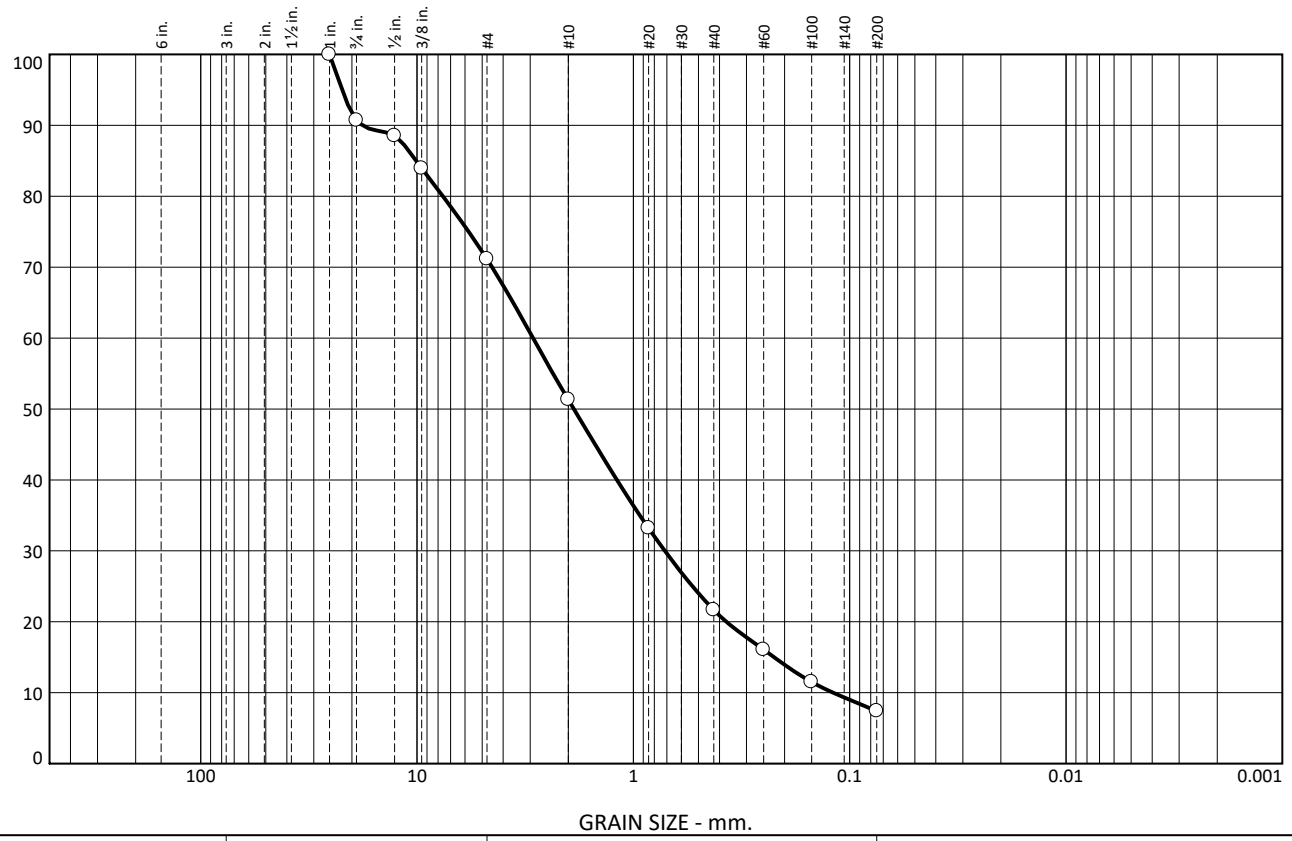
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2503

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 9.3 | 19.6 | 19.8 | 29.6 | 14.3 | 7.4 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 90.7 | | |
| 1/2" | 88.5 | | |
| 3/8" | 83.9 | | |
| #4 | 71.1 | | |
| #10 | 51.3 | | |
| #20 | 33.2 | | |
| #40 | 21.7 | | |
| #60 | 16.1 | | |
| #100 | 11.5 | | |
| #200 | 7.4 | | |

* (no specification provided)

**Soil Description**

Brown well-graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 17.9065 $D_{85}$= 10.1070 $D_{60}$= 2.9085
$D_{50}$= 1.8846 $D_{30}$= 0.7153 $D_{15}$= 0.2238
$D_{10}$= 0.1195 $C_u$= 24.34 $C_c$= 1.47

**Classification**

USCS= SW-SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 24-26'
Sample Number: CEC-15A / S-13

Date: 7.3.24

Thielsch Engineering Inc.

Cranston, RI

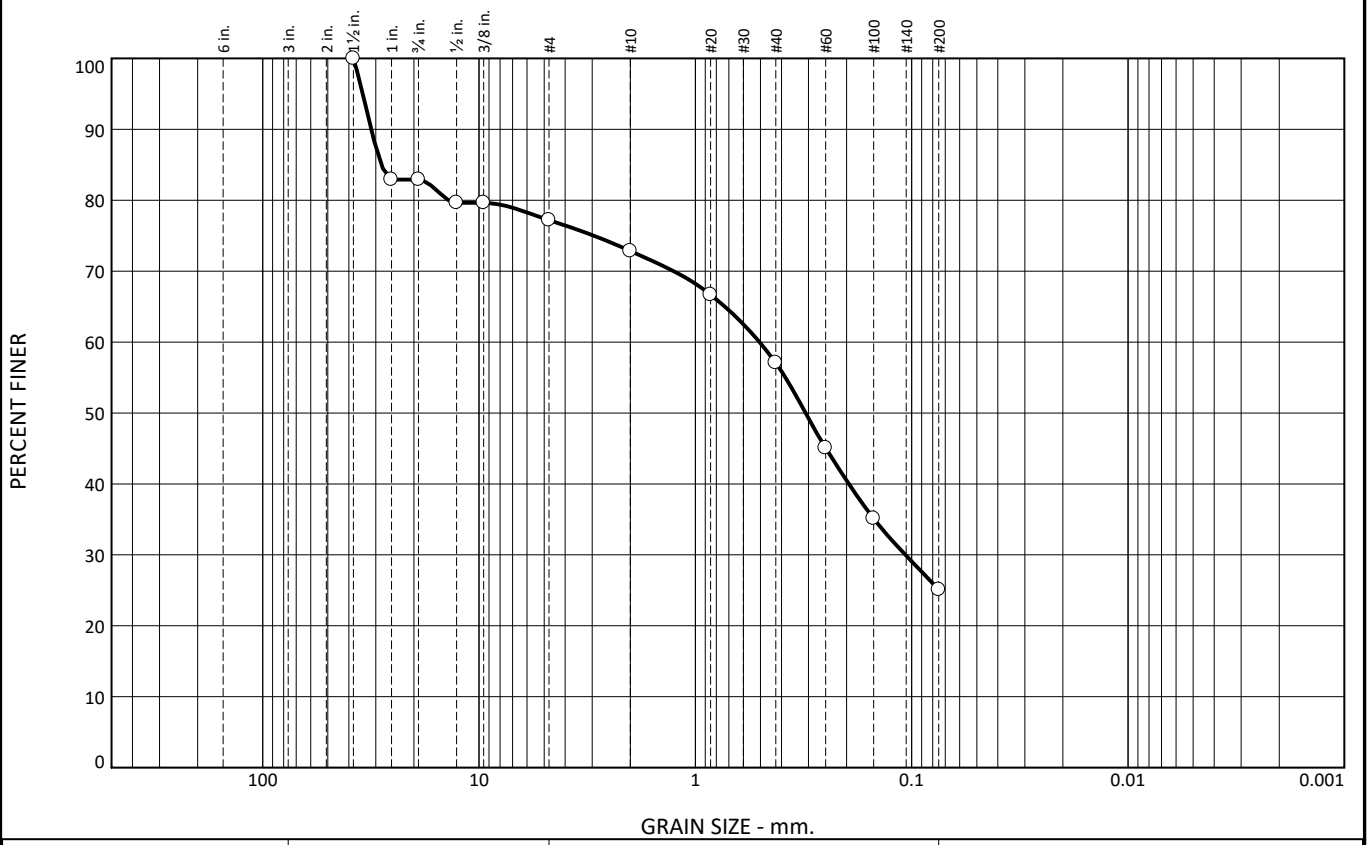
Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344

Fig. 24-S-2504

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 17.1 | 5.7 | 4.4 | 15.7 | 32.0 | 25.1 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 82.9 | | |
| 3/4" | 82.9 | | |
| 1/2" | 79.6 | | |
| 3/8" | 79.6 | | |
| #4 | 77.2 | | |
| #10 | 72.8 | | |
| #20 | 66.7 | | |
| #40 | 57.1 | | |
| #60 | 45.1 | | |
| #100 | 35.1 | | |
| #200 | 25.1 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 31.5033 $D_{85}$= 28.2766 $D_{60}$= 0.5052
$D_{50}$= 0.3095 $D_{30}$= 0.1070 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 8-10'
Sample Number: CEC-16A / S-5

Date: 7.3.24

Thielsch Engineering Inc.

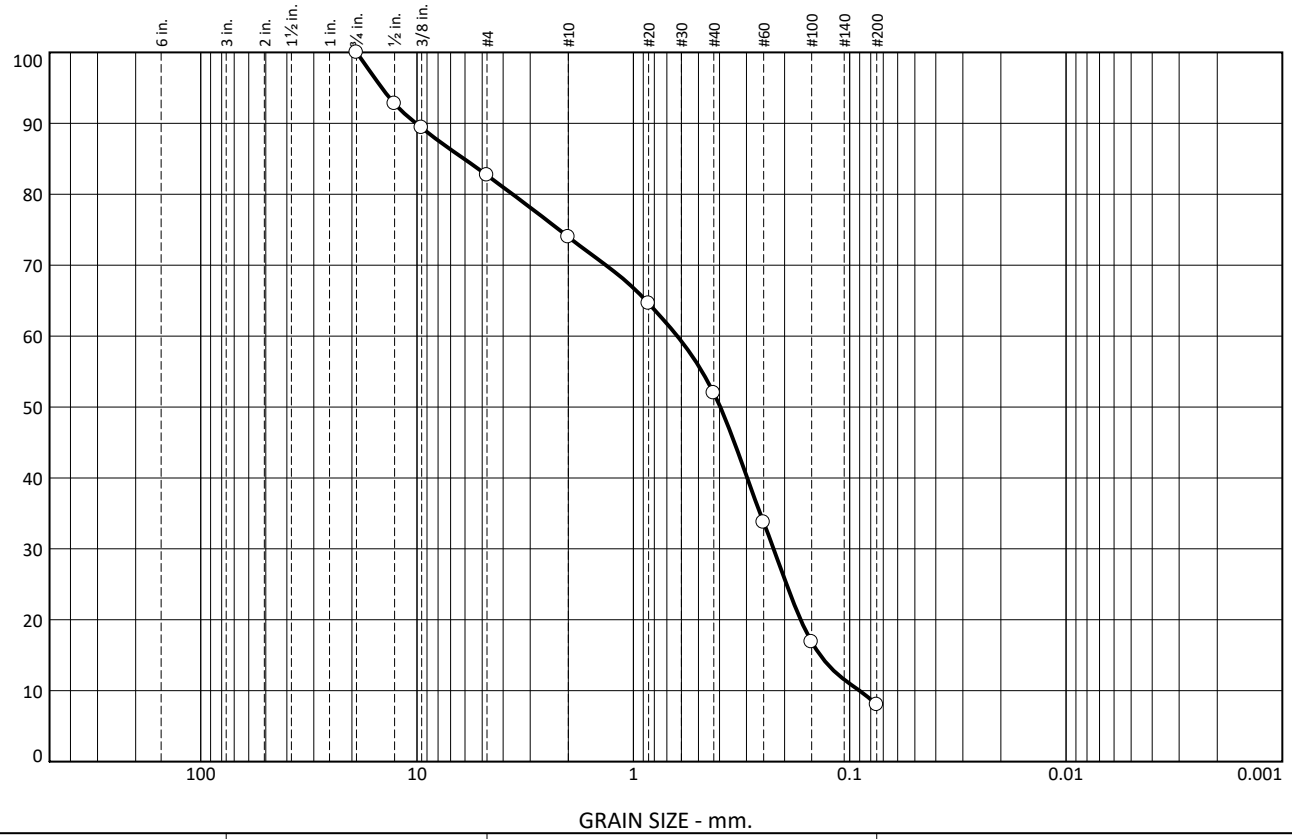
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2505

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 17.3 | 8.7 | 22.0 | 44.0 | 8.0 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 92.8 | | |
| 3/8" | 89.4 | | |
| #4 | 82.7 | | |
| #10 | 74.0 | | |
| #20 | 64.6 | | |
| #40 | 52.0 | | |
| #60 | 33.7 | | |
| #100 | 16.9 | | |
| #200 | 8.0 | | |

* (no specification provided)

**Soil Description**

Dark Brown poorly graded sand with silt and gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 10.0972 $D_{85}$= 6.0609 $D_{60}$= 0.6263
$D_{50}$= 0.3965 $D_{30}$= 0.2249 $D_{15}$= 0.1369
$D_{10}$= 0.0901 $C_u$= 6.95 $C_c$= 0.90

**Classification**

USCS= SP-SM AASHTO= A-3

**Remarks**

Source of Sample: Boring Depth: 22-24'
Sample Number: CEC-16A / S-12

Date: 7.3.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2506

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 5.5 | 3.8 | 12.8 | 48.2 | 29.7 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/8" | 100.0 | | |
| #4 | 94.5 | | |
| #10 | 90.7 | | |
| #20 | 85.8 | | |
| #40 | 77.9 | | |
| #60 | 67.0 | | |
| #100 | 53.5 | | |
| #200 | 29.7 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 1.7154 $D_{85}$= 0.7727 $D_{60}$= 0.1887
$D_{50}$= 0.1344 $D_{30}$= 0.0757 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 8-10'
Sample Number: CEC-17A / S-5

Date: 7.3.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2507

Tested By: MCS Checked By: Kris Roland

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# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 4.5 | 8.9 | 5.7 | 30.1 | 37.4 | 13.4 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 95.5 | | |
| 1/2" | 92.8 | | |
| 3/8" | 90.5 | | |
| #4 | 86.6 | | |
| #10 | 80.9 | | |
| #20 | 70.5 | | |
| #40 | 50.8 | | |
| #60 | 35.0 | | |
| #100 | 22.7 | | |
| #200 | 13.4 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 8.8663 $D_{85}$= 3.6027 $D_{60}$= 0.5739
$D_{50}$= 0.4136 $D_{30}$= 0.2070 $D_{15}$= 0.0850
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 16-18'
Sample Number: CEC-17A / S-9

Date: 7.3.24

Thielsch Engineering Inc.

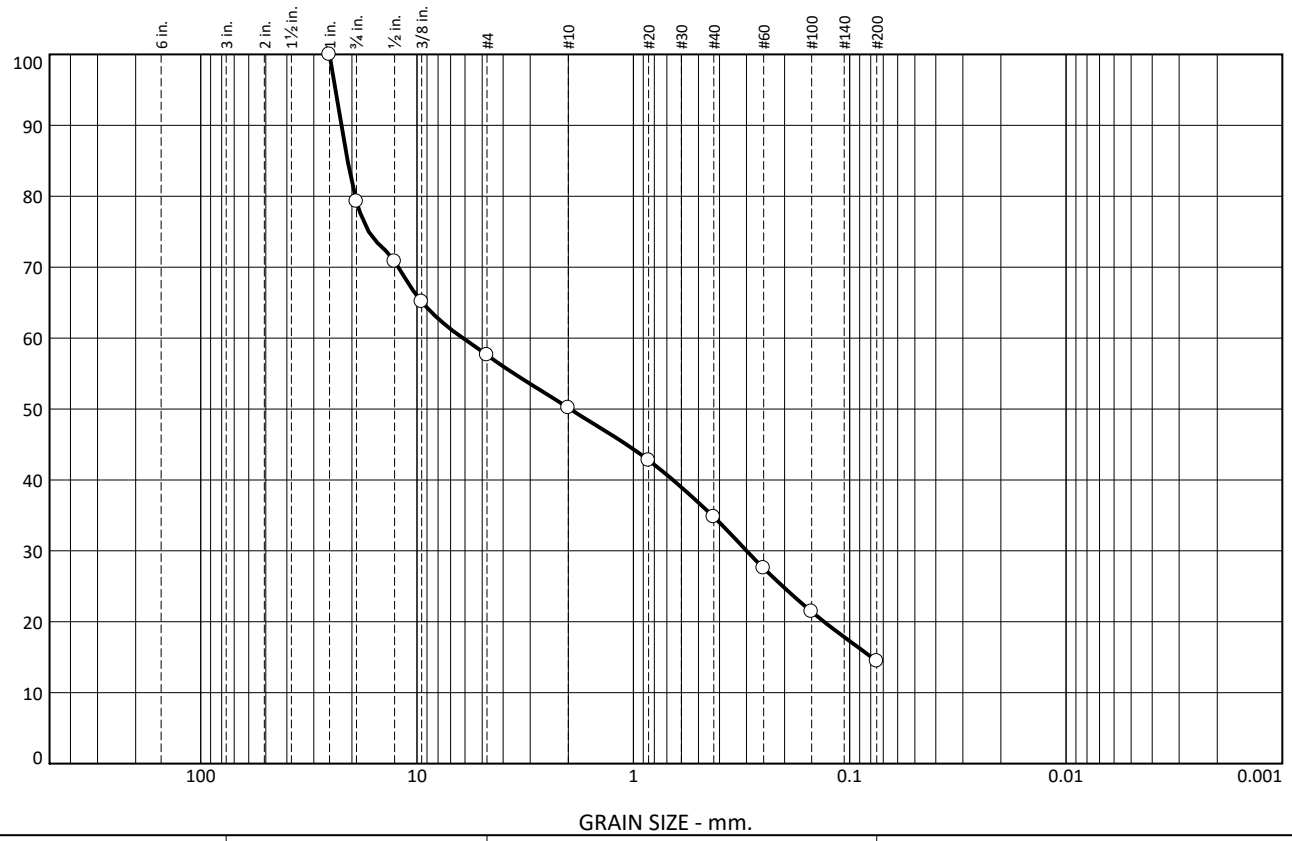
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2508

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 20.7 | 21.7 | 7.4 | 15.4 | 20.4 | 14.4 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 79.3 | | |
| 1/2" | 70.8 | | |
| 3/8" | 65.1 | | |
| #4 | 57.6 | | |
| #10 | 50.2 | | |
| #20 | 42.8 | | |
| #40 | 34.8 | | |
| #60 | 27.5 | | |
| #100 | 21.4 | | |
| #200 | 14.4 | | |

* (no specification provided)

**Soil Description**

Brown silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 22.3593 $D_{85}$= 20.9442 $D_{60}$= 6.1347
$D_{50}$= 1.9610 $D_{30}$= 0.2998 $D_{15}$= 0.0793
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Source of Sample: Boring Depth: 30-32'
Sample Number: CEC-17A / S-16

Date: 7.3.24

Thielsch Engineering Inc.

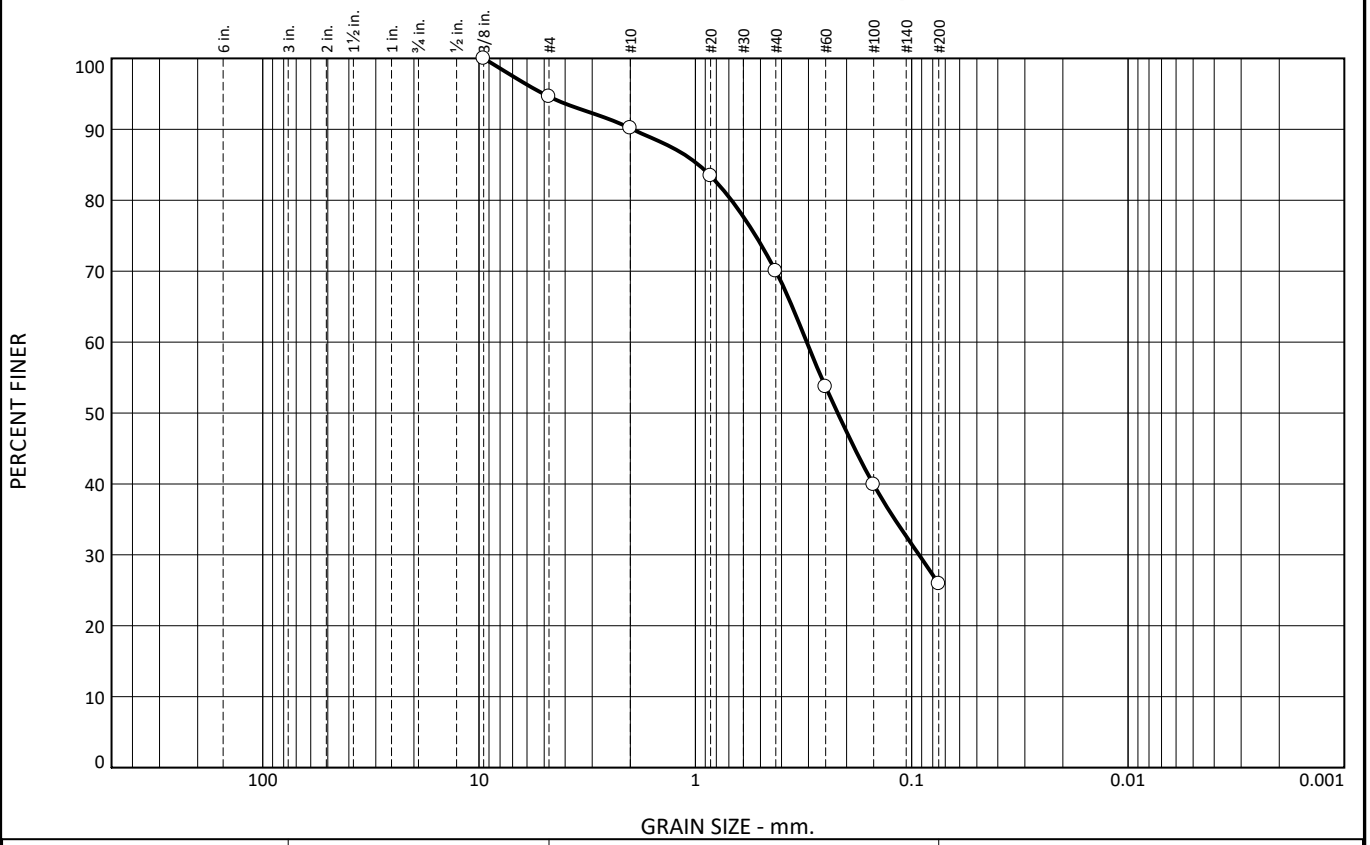
Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2509

Tested By: MCS Checked By: Kris Roland

These results are for the exclusive use of the client for whom they were obtained. This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 5.4 | 4.4 | 20.2 | 44.1 | 25.9 | |

| SIEVE SIZE OR DIAMETER | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/8" | 100.0 | | |
| #4 | 94.6 | | |
| #10 | 90.2 | | |
| #20 | 83.4 | | |
| #40 | 70.0 | | |
| #60 | 53.7 | | |
| #100 | 39.9 | | |
| #200 | 25.9 | | |

* (no specification provided)

**Soil Description**

Brown silty sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 1.9499 $D_{85}$= 0.9666 $D_{60}$= 0.3058
$D_{50}$= 0.2199 $D_{30}$= 0.0925 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Source of Sample: Boring Depth: 6-8'
Sample Number: CEC-18A / S-4

Date: 7.3.24

Thielsch Engineering Inc.

Cranston, RI

Client: Civil & Environmental Consultants, Inc
Project: Shuster Bulkhead Improvements
4 Wright St, New Bedford MA
Project No: 332-344 Fig. 24-S-2510

Tested By: MCS Checked By: Kris Roland

ESS Laboratory
DIVISION OF THE RISE GROUP
BAL Laboratory Analytical Balance

*CERTIFICATE OF ANALYSIS*

Kris Roland
Thielsch Engineering, Inc.
CTS Cranston
Cranston, RI 02910

**RE: Shuster Bulkhead Improvements (332.344)**
**ESS Laboratory Work Order Number: 24F1174**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

***REVIEWED***
***By ESS Laboratory at 8:42 pm, Jul 08, 2024***

**Analytical Summary**
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements ESS Laboratory Work Order: 24F1174

## SAMPLE RECEIPT

The following samples were received on June 28, 2024 for the analyses specified on the enclosed Chain of Custody Record.

**The client did not deliver the samples in a cooler.**

| Lab Number | Sample Name | Matrix | Analysis |
|---|---|---|---|
| 24F1174-01 | CEC-13A S-2 | Soil | 9038, 9050A, 9250 |
| 24F1174-02 | CEC-18A S-4 | Soil | 9038, 9050A, 9250 |

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements ESS Laboratory Work Order: 24F1174

## PROJECT NARRATIVE

**No unusual observations noted.**

**End of Project Narrative.**

## DATA USABILITY LINKS

***To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.***

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements ESS Laboratory Work Order: 24F1174

## CURRENT SW-846 METHODOLOGY VERSIONS

### Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

### Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements
Client Sample ID: CEC-13A S-2
Date Sampled: 06/28/24 12:30
Percent Solids: 82

ESS Laboratory Work Order: 24F1174
ESS Laboratory Sample ID: 24F1174-01
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **WL 203** (37) | --- | 9250 | --- | 1 | LAB | 07/02/24 13:05 | mg/kg dry | DG40218 |
| **Resistivity** | **WL 0.002** (N/A) | --- | 9050A | --- | 1 | JLK | 07/03/24 21:10 | Mohms/cm | DG40347 |
| Sulfate | **WL** ND (61) | --- | 9038 | --- | 1 | JLK | 07/01/24 19:22 | mg/kg dry | DG40157 |

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements
Client Sample ID: CEC-18A S-4
Date Sampled: 06/28/24 12:30
Percent Solids: 87

ESS Laboratory Work Order: 24F1174
ESS Laboratory Sample ID: 24F1174-02
Sample Matrix: Soil

## Classical Chemistry

| Analyte | Results (MRL) | MDL | Method | Limit | DF | Analyst | Analyzed | Units | Batch |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **WL 56** (34) | --- | 9250 | --- | 1 | LAB | 07/02/24 13:10 | mg/kg dry | DG40218 |
| **Resistivity** | **WL 0.004** (N/A) | --- | 9050A | --- | 1 | JLK | 07/03/24 21:10 | Mohms/cm | DG40347 |
| Sulfate | **WL** ND (57) | --- | 9038 | --- | 1 | JLK | 07/01/24 19:22 | mg/kg dry | DG40157 |

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements ESS Laboratory Work Order: 24F1174

# Quality Control Data

| Analyte | Result | MRL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| **Classical Chemistry** | | | | | | | | | | |
| **Batch DG40157 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Sulfate | ND | 5 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Sulfate | 10 | | mg/L | 9.988 | | 98 | 80-120 | | | |
| **Batch DG40218 - General Preparation** | | | | | | | | | | |
| **Blank** | | | | | | | | | | |
| Chloride | ND | 30 | mg/kg wet | | | | | | | |
| **LCS** | | | | | | | | | | |
| Chloride | 33 | | mg/L | 30.00 | | 109 | 90-110 | | | |

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements ESS Laboratory Work Order: 24F1174

**Notes and Definitions**

| | |
|---|---|
| WL | Results obtained from a deionized water leach of the sample. |
| U | Analyte included in the analysis, but not detected |
| ND | Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| MDL | Method Detection Limit |
| MRL | Method Reporting Limit |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| DL | Detection Limit |
| I/V | Initial Volume |
| F/V | Final Volume |
| § | Subcontracted analysis; see attached report |
| 1 | Range result excludes concentrations of surrogates and/or internal standards eluting in that range. |
| 2 | Range result excludes concentrations of target analytes eluting in that range. |
| 3 | Range result excludes the concentration of the C9-C10 aromatic range. |
| Avg | Results reported as a mathematical average. |
| NR | No Recovery |
| [CALC] | Calculated Analyte |
| SUB | Subcontracted analysis; see attached report |
| RL | Reporting Limit |
| EDL | Estimated Detection Limit |
| MF | Membrane Filtration |
| MPN | Most Probable Number |
| TNTC | Too numerous to Count |
| CFU | Colony Forming Units |

*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.
Client Project ID: Shuster Bulkhead Improvements ESS Laboratory Work Order: 24F1174

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: Thielsch Engineering, Inc - ESS

Shipped/Delivered Via: Client

ESS Project ID: 24F1174
Date Received: 6/28/2024
Project Due Date: 7/8/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? No
   Temp: 24.2 Iced with: None
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

| Sample Number | Container ID | Proper Container | Air Bubbles Present | Sufficient Volume | Container Type | Preservative | Record pH (Cyanide and 608 Pesticides) |
|---|---|---|---|---|---|---|---|
| 1 | 567144 | Yes | N/A | Yes | Driller Jar | NP | |
| 2 | 567145 | Yes | N/A | Yes | Driller Jar | NP | |

**2nd Review**

**Were all containers scanned into storage/lab?** Initials BB Yes / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 6/28/24 1525
Reviewed By: Date & Time: 06/28/24 1342

ESS LABORATORY

185 Frances Avenue
Cranston, RI 02921
Phone: 401-461-7181
Fax: 401-461-4486
www.esslaboratory.com

# CHAIN OF CUSTODY

ESS Lab # 24F1174 | Page 1 of 1

**Turn Time** ☐ >5 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ Same Day

**Regulatory State:** NY **Criteria:**

**Is this project for any of the following?:**
☐ CT RCP ☐ MA MCP ☐ RGP ☐ Permit ☐ 401 WQ

**ELECTRONIC DELIVERABLES (Final Reports are PDF)**
☐ Limit Checker ☐ State Forms ☐ EQuIS
☐ Excel ☐ Hard Copy ☐ Enviro Data
☐ CLP-Like Package ☐ Other (Specify) →

## CLIENT INFORMATION

**Client:** Thielsch Engineering
**Address:** 195 Frances Avenue, Cranston, RI 02910
**Phone:** (401) 430-0365
**Email Distribution List:** Please send reports to kroland@thielsch.com, rleblanc@thielsch.com, rroth@thielsch.com, avanasse@thielsch.com

## PROJECT INFORMATION

**Project Name:** Shuster Bulkhead Improvements
**Project Location:** New Bedford, MA
**Project Number:** 332.344
**Project Manager:** Kris Roland
**Bill to:**
**PO#:**
**Quote#:**

Client acknowledges that sampling is compliant with all EPA / State regulatory programs

## REQUESTED ANALYSES

| ESS Lab ID | Collection Date | Collection Time | Sample Type | Sample Matrix | Sample ID | Sulfate (EPA) | Chloride (EPA) | Resistivity (EPA) | Total Number of Bottles |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.28.24 | 12:30 | Composite | Soil | CEC-13A, S-2 | X | X | X | 1 |
| 2 | 6.28.24 | 12:30 | Composite | Soil | CEC-18A, S-4 | X | X | X | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

**Container Type:** AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial — G G G
**Container Volume:** 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other* — 10 10 10 — 1
**Preservation Code:** 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other* — 1 1 1

**Sampled by :** Becca Blake

**Chain needs to be filled out neatly and completely for on time delivery.**

**Laboratory Use Only**
Cooler Temperature (°C): 24.2 none

**Comments:** * Please specify "Other" preservative and containers types in this space

All samples submitted are subject to ESS Laboratory's payment terms and conditions.

**Dissolved Filtration**
☐ Lab Filter

| Relinquished by (Signature) | Date | Time | Received by (Signature) | Relinquished by (Signature) | Date | Time | Received by (Signature) |
|---|---|---|---|---|---|---|---|
| [signature] | 6.28.24 | 12:46 | [signature] | | | | |
| **Relinquished by (Signature)** | **Date** | **Time** | **Received by (Signature)** | **Relinquished by (Signature)** | **Date** | **Time** | **Received by (Signature)** |
| | | | | | | | |

Thielsch
DIVISION OF THE RISE GROUP

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
thielsch.com
*Let's Build a Solid Foundation*

| Client Information: | |
|---|---|
| Civil and Environmental Consultants | |
| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned By: | Tony Sousa |
| Collected By: | CEC |

| Project Information: | |
|---|---|
| **Shuster Bulkhead Improvements** | |
| **4 Wright St, New Bedford MA** | |
| Project Number: | 332-344 |
| Summary Page: | 1 of 1 |
| Report Date: | 7/23/2024 |

# LABORATORY TESTING DATA SHEET, Report No.: 7424-F-213

| Boring No. | Sample No. | Depth (ft) | Laboratory No. | Specimen Data | | | | | | Compressive Strength Tests | | | | | | | | Rock Formation or Description or Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Mohs Hard-ness | Diameter (in) | Length (in) | (1) Unit Weight (PCF) | (2) Wet Density (PCF) | Bulk $G_s$ | (3) Other Tests | (4) Strength PSI | (5) Strain % | (6) E sec PSI EE+06 | (7) Poisson's Ratio | st PSI | $Is_{50}$ PSI | (8) $s_c$ PSI | |
| CEC-4A | C-2 | 50.4-51.1 | 24-S-2511 | | 2.133 | 4.300 | 167.3 | | | EM | 6915 | 0.617 | 0.84 | 0.10 | | | | Grey Breccia |
| Fresh break | | | | | | | | | | | | | | | | | | |
| CEC-9A | C-1 | 22.5-22.9 | 24-S-2512 | | 2.054 | 4.331 | 163.7 | | | EM | 11697 | 0.582 | 1.48 | 0.03 | | | | Grey Partially Metamorphosed Granite |
| Fresh break | | | | | | | | | | | | | | | | | | |
| CEC-15A | C-1 | 29-29.6 | 24-S-2513 | | 2.054 | 4.304 | 164.9 | | | EM | 12479 | 0.233 | 5.03 | 0.26 | | | | Grey Partially Metamorphosed Granite |
| Fresh break | | | | | | | | | | | | | | | | | | |
| CEC-18A | C-1 | 41-41.5 | 24-S-2514 | | 2.060 | 4.465 | 183.5 | | | EM | 25815 | 0.323 | 7.92 | 0.09 | | | | Black Breccia |
| Broke along previously healed suture | | | | | | | | | | | | | | | | | | |

| Notes | | Notes | |
|---|---|---|---|
| (1) Volume Determined By Measuring Dimensions | (3) PLD=Point Load (diametrical), | | (5) Strain at Peak Deviator Stress |
| (2) Determined by Measuring Dimensions and Weight of Saturated Sample | PLA= Point Load (Axial) ST= Splitting Tensile | | (6) Represents Secant Modulus at 50% of Total Failure Stress |
| | U= Unconfined Compressive Strength | | (7) Represents Secant Poisson's Ratio at 50% of Total Failure Stress |
| | (4) Taken at Peak Deviator Stress | | (8) Estimated UCS from Table 1 of ASTM D5731 for NX cores (Is x 24) |

Date Received: **6/27/2024** Reviewed By: Date Review **7/23/2024**

This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.
This report shall not be reproduced, except in full, without prior written approval from the Agency, as defined in ASTM E329.

Thielsch
DIVISION OF THE RISE GROUP

195 Frances Avenue
Cranston, Rhode Island 02910
Phone: (401) 467-6454
Fax: (401) 467-2398
www.thielsch.com
*Let's Build a Solid Foundation*

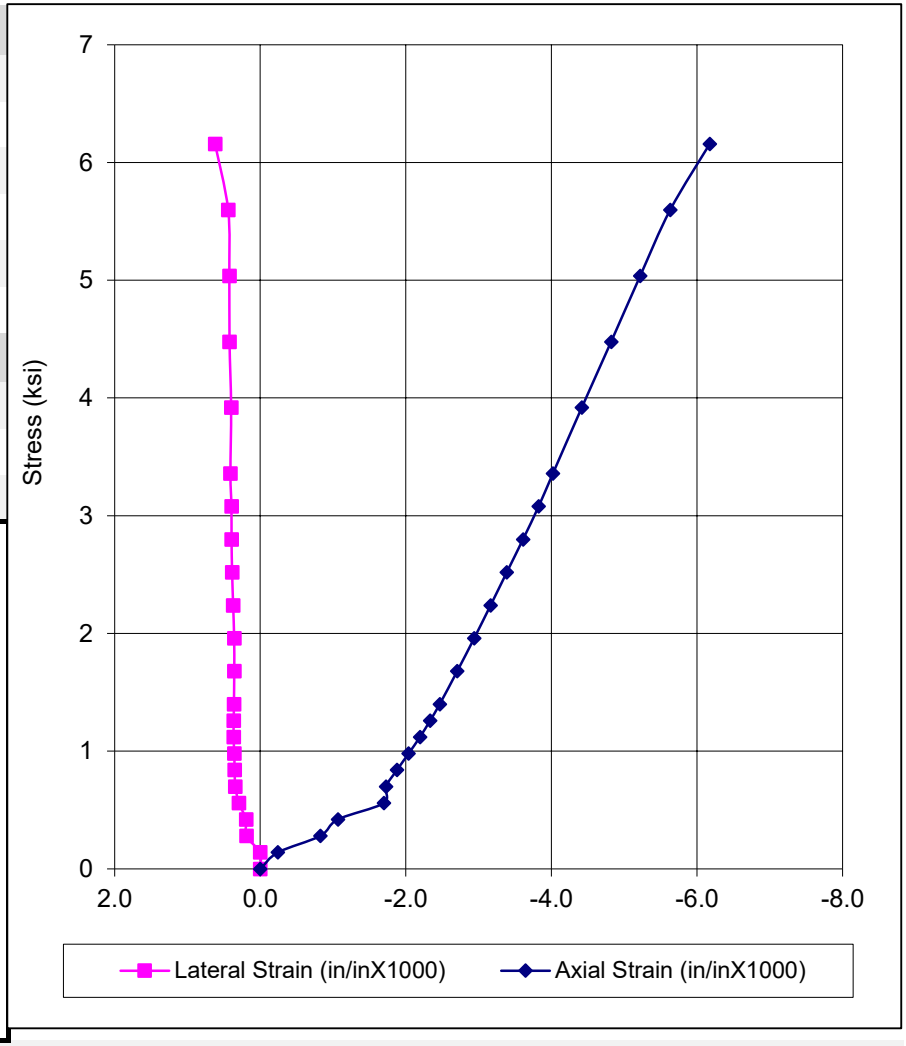
| **Client Information:** | |
|---|---|
| Civil and Environmental Consultants | |
| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned by: | Tony Sousa |
| Collected by: | CEC |

| **Project Information:** | |
|---|---|
| Shuster Bulkhead Improvements | |
| New Bedford, MA | |
| Project Number: | 332-344 |
| Technician: | AV |
| Report Date: | 07.23.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-4A | **Unit Weight (pcf):** | 167.3 |
| **Sample #:** | C-2 | **Failure Stress (psi):** | 6,915 |
| **Depth (ft):** | 50.4-51.1 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 50.7-51 | **Time to Failure (min)** | 6.60 |
| **Rock Type:** | Brown Breccia | | |
| **Features:** | Fresh Break | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.133 | **Poisson's Ratio @ 50%:** | 0.10 |
| **Length, L (in):** | 4.300 | **Strain %:** | 0.617 |
| **L:D Ratio:** | 2.02 | **E sec PSI @ 50%:** | 8.35E+05 |




**Testing Notes:** **Minor breaking between 500 and 2000 lb (140-600 psi) may invalidate E and Poisson's Ratio**

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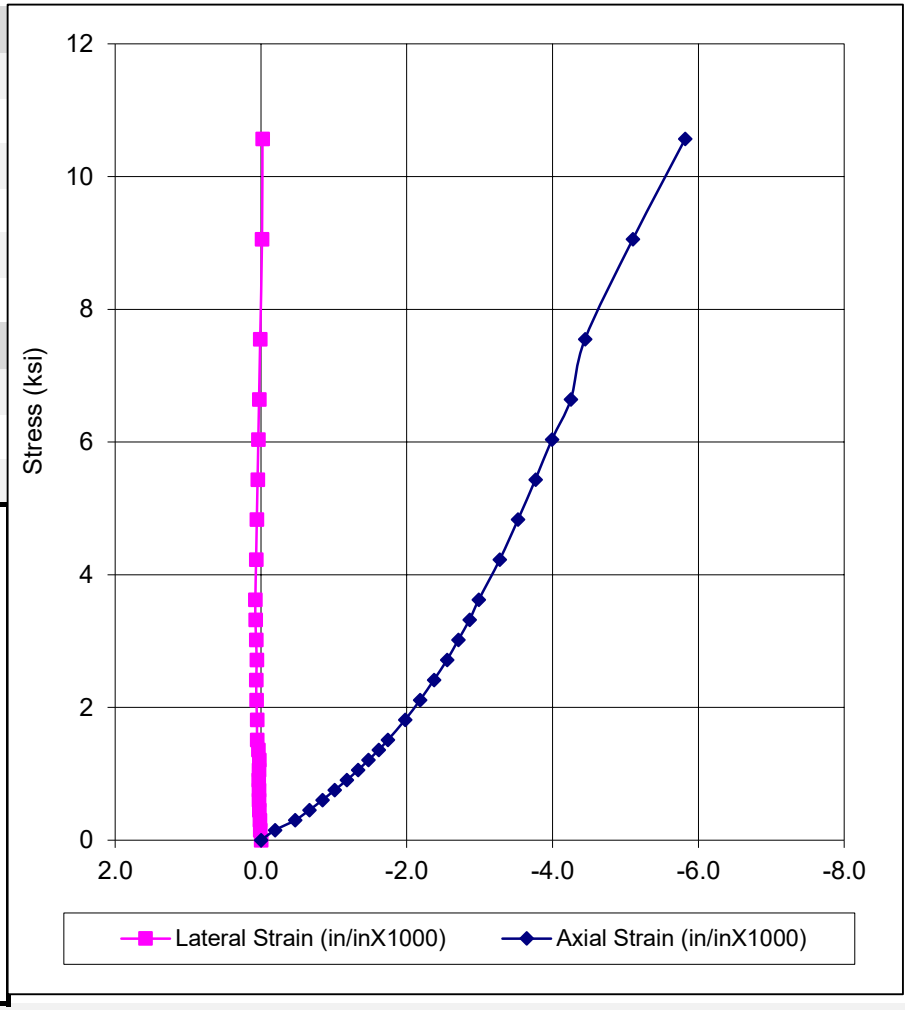
| **Client Information:** | |
|---|---|
| Civil and Environmental Consultants | |
| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned by: | Tony Sousa |
| Collected by: | CEC |

| **Project Information:** | |
|---|---|
| Shuster Bulkhead Improvements | |
| New Bedford, MA | |
| Project Number: | 332-344 |
| Technician: | AV |
| Report Date: | 07.23.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-9A | **Unit Weight (pcf):** | 163.7 |
| **Sample #:** | C-1 | **Failure Stress (psi):** | 11,697 |
| **Depth (ft):** | 22.5-22.9 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 22.6-23 | **Time to Failure (min)** | 10.33 |
| **Rock Type:** | Grey Partially Metamorphosed Granite | | |
| **Features:** | Fresh Break | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.054 | **Poisson's Ratio @ 50%:** | 0.03 |
| **Length, L (in):** | 4.331 | **Strain %:** | 0.582 |
| **L:D Ratio:** | 2.11 | **E sec PSI @ 50%:** | 1.48E+06 |




**Testing Notes:**

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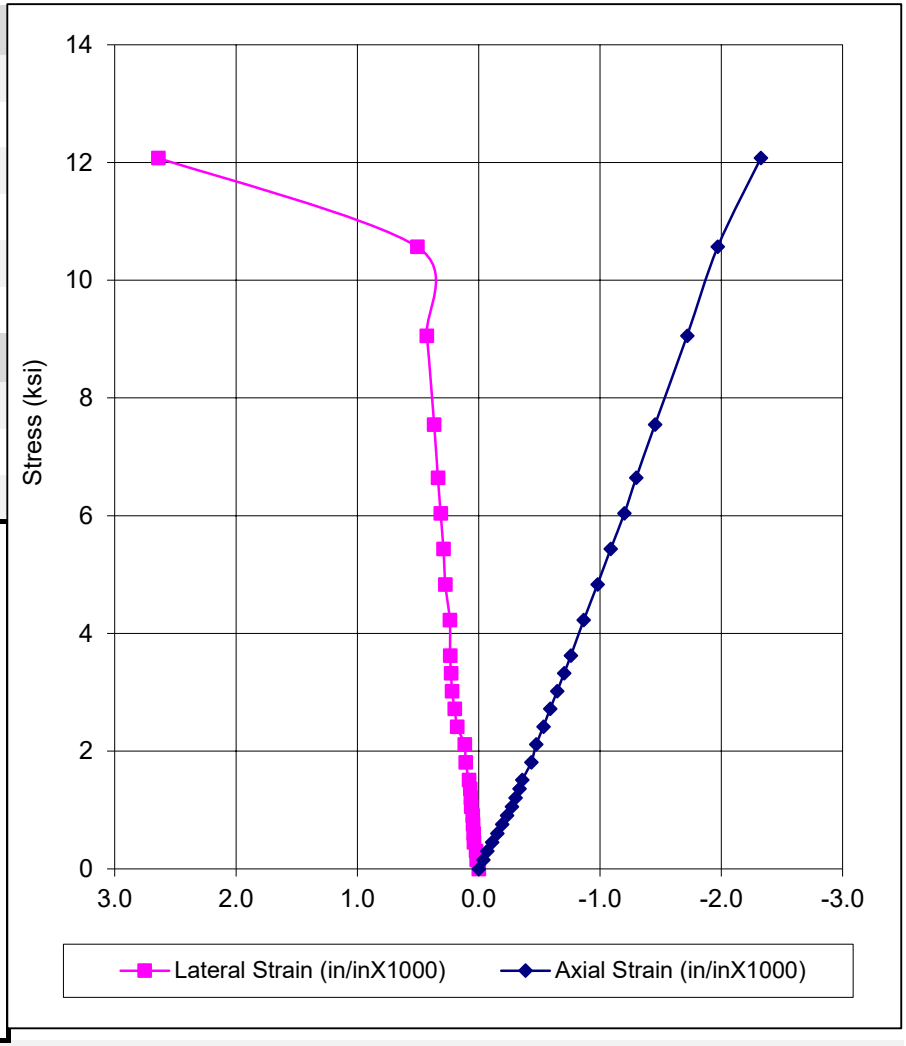
| **Client Information:** | |
|---|---|
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| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned by: | Tony Sousa |
| Collected by: | CEC |

| **Project Information:** | |
|---|---|
| Shuster Bulkhead Improvements | |
| New Bedford, MA | |
| Project Number: | 332-344 |
| Technician: | AV |
| Report Date: | 07.23.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-15A | **Unit Weight (pcf):** | 164.9 |
| **Sample #:** | C-1 | **Failure Stress (psi):** | 12,479 |
| **Depth (ft):** | 29-29.6 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 29.1-29.5 | **Time to Failure (min)** | 9.97 |
| **Rock Type:** | Grey Partially Metamorphosed Granite | | |
| **Features:** | Fresh Break | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.054 | **Poisson's Ratio @ 50%:** | 0.26 |
| **Length, L (in):** | 4.304 | **Strain %:** | 0.233 |
| **L:D Ratio:** | 2.10 | **E sec PSI @ 50%:** | 5.03E+06 |




**Testing Notes:** Partial break occurred along foliation

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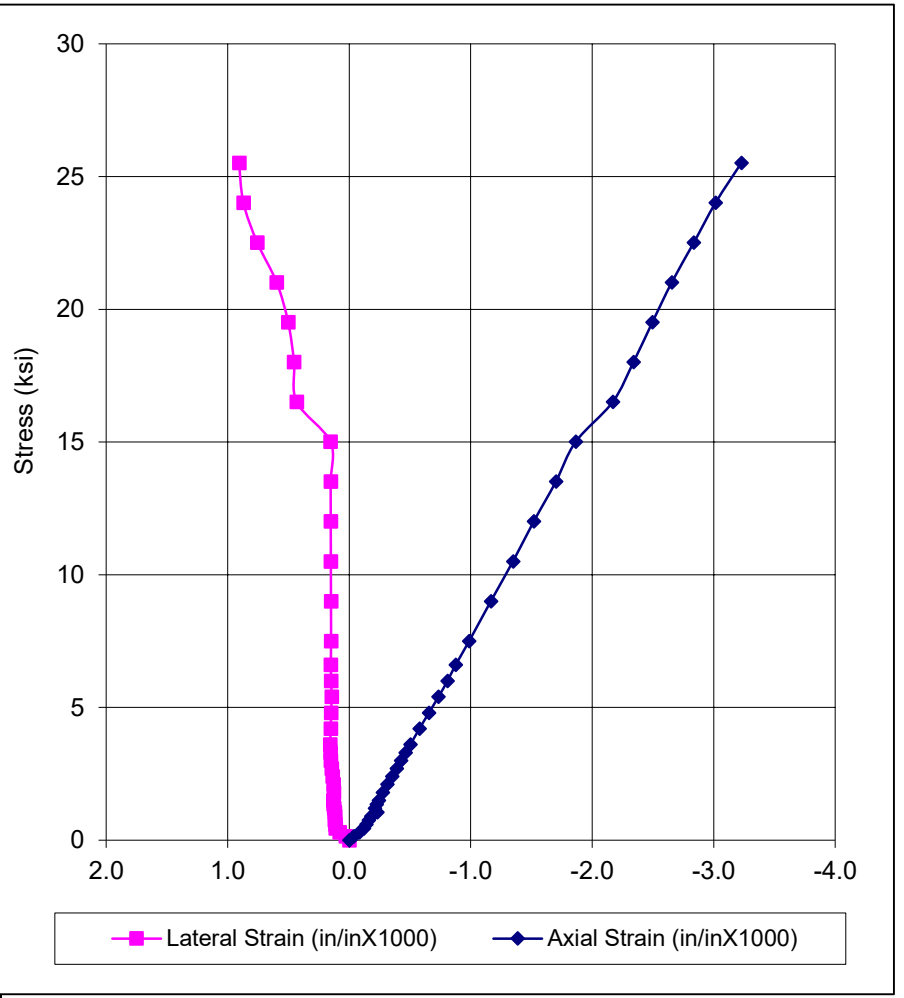
| **Client Information:** | |
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| Civil and Environmental Consultants | |
| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned by: | Tony Sousa |
| Collected by: | CEC |

| **Project Information:** | |
|---|---|
| Shuster Bulkhead Improvements | |
| New Bedford, MA | |
| Project Number: | 332-344 |
| Technician: | AV |
| Report Date: | 07.23.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-18A | **Unit Weight (pcf):** | 183.5 |
| **Sample #:** | C-1 | **Failure Stress (psi):** | 25,815 |
| **Depth (ft):** | 41-41.5 | **Failure Mode:** | |
| **Tested Depth (ft):** | 41.1-41.5 | **Time to Failure (min)** | 20.57 |
| **Rock Type:** | Black Breccia | | |
| **Features:** | Broke along previous suture | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.060 | **Poisson's Ratio @ 50%:** | 0.09 |
| **Length, L (in):** | 4.465 | **Strain %:** | 0.323 |
| **L:D Ratio:** | 2.17 | **E sec PSI @ 50%:** | 7.92E+06 |




**Testing Notes:** **Minor break at 50000 lb, ~15009 psi**

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| Project Information: | |
|---|---|
| **Shuster Bulkhead Improvements** | |
| **4 Wright St, New Bedford MA** | |
| Project Number: | 332-344 |
| Summary Page: | 1 of 1 |
| Report Date: | 7/23/2024 |

# LABORATORY TESTING DATA SHEET, Report No.: 7424-G-123

| Boring No. | Sample No. | Depth (ft) | Laboratory No. | Specimen Data | | | | | | Compressive Strength Tests | | | | | | | | Rock Formation or Description or Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Mohs Hard-ness | Diameter (in) | Length (in) | (1) Unit Weight (PCF) | (2) Wet Density (PCF) | Bulk $G_s$ | (3) Other Tests | (4) Strength PSI | (5) Strain % | (6) E sec PSI EE+06 | (7) Poisson's Ratio | st PSI | $Is_{50}$ PSI | (8) $s_c$ PSI | |
| CEC-10A | C-1 | 42.4-43.2 | 24-S-2590 | | 2.051 | 4.361 | 164.3 | | | EM | 7884 | 0.414 | 1.62 | 0.17 | | | | Grey Partially Metamorphosed Granite |
| Fresh break | | | | | | | | | | | | | | | | | | |
| CEC-12A | C-1 | 44.7-45.7 | 24-S-2591 | | 2.056 | 4.405 | 174.4 | | | EM | 2871 | 0.429 | 0.69 | 0.19 | | | | Black Breccia |
| Sample broke along existing fracture | | | | | | | | | | | | | | | | | | |
| CEC-14A | C-1 | 34-34.8 | 24-S-2592 | | 2.053 | 4.624 | 165.4 | | | EM | 9768 | 0.279 | 3.15 | 0.02 | | | | Grey Schist |
| Sample broke along foliation | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

| Notes | | Notes | |
|---|---|---|---|
| (1) Volume Determined By Measuring Dimensions | (3) PLD=Point Load (diametrical), | | (5) Strain at Peak Deviator Stress |
| (2) Determined by Measuring Dimensions and Weight of Saturated Sample | PLA= Point Load (Axial) ST= Splitting Tensile | | (6) Represents Secant Modulus at 50% of Total Failure Stress |
| | U= Unconfined Compressive Strength | | (7) Represents Secant Poisson's Ratio at 50% of Total Failure Stress |
| | (4) Taken at Peak Deviator Stress | | (8) Estimated UCS from Table 1 of ASTM D5731 for NX cores (Is x 24) |

Date Received: **7/5/2024** Reviewed By: Date Review **7/23/2024**

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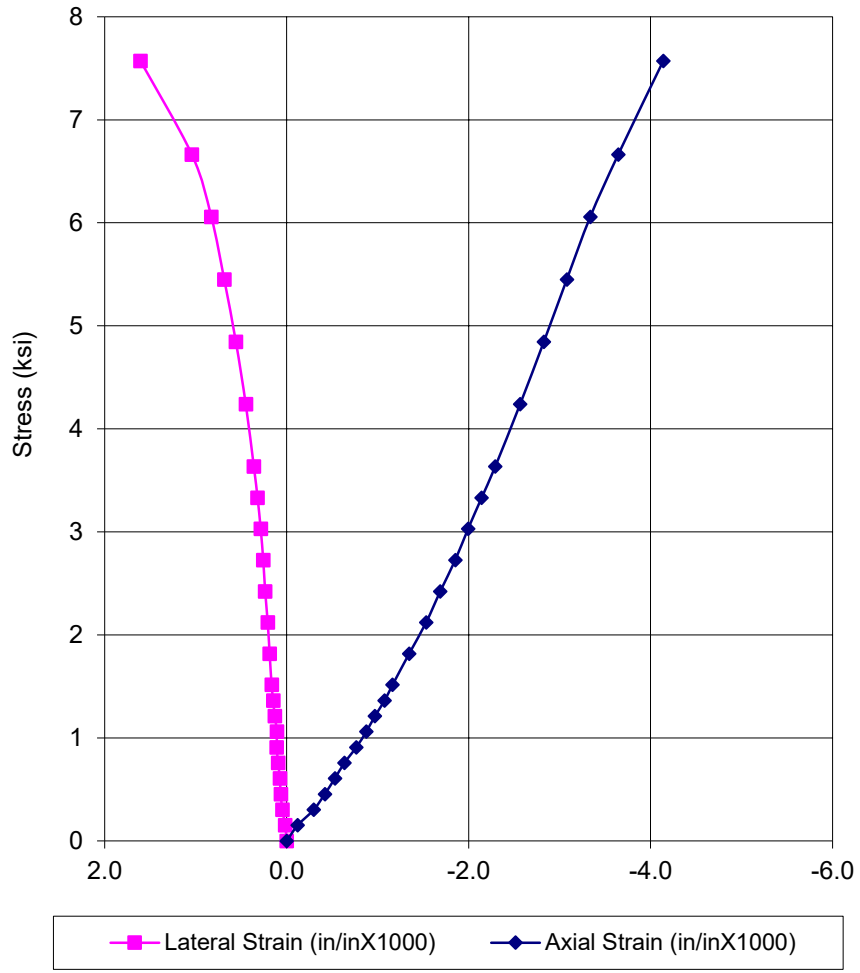
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| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned by: | Tony Sousa |
| Collected by: | CEC |

| **Project Information:** | |
|---|---|
| Shuster Bulkhead Improvements | |
| New Bedford, MA | |
| Project Number: | 332-344 |
| Technician: | AV |
| Report Date: | 07.23.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-10A | **Unit Weight (pcf):** | 164.3 |
| **Sample #:** | C-1 | **Failure Stress (psi):** | 7,884 |
| **Depth (ft):** | 42.4-43.2 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 42.9-43.1 | **Time to Failure (min)** | 6.28 |
| **Rock Type:** | Grey Partially Metamorphosed Granite | | |
| **Features:** | Fresh Break | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.051 | **Poisson's Ratio @ 50%:** | 0.17 |
| **Length, L (in):** | 4.361 | **Strain %:** | 0.414 |
| **L:D Ratio:** | 2.13 | **E sec PSI @ 50%:** | 1.62E+06 |



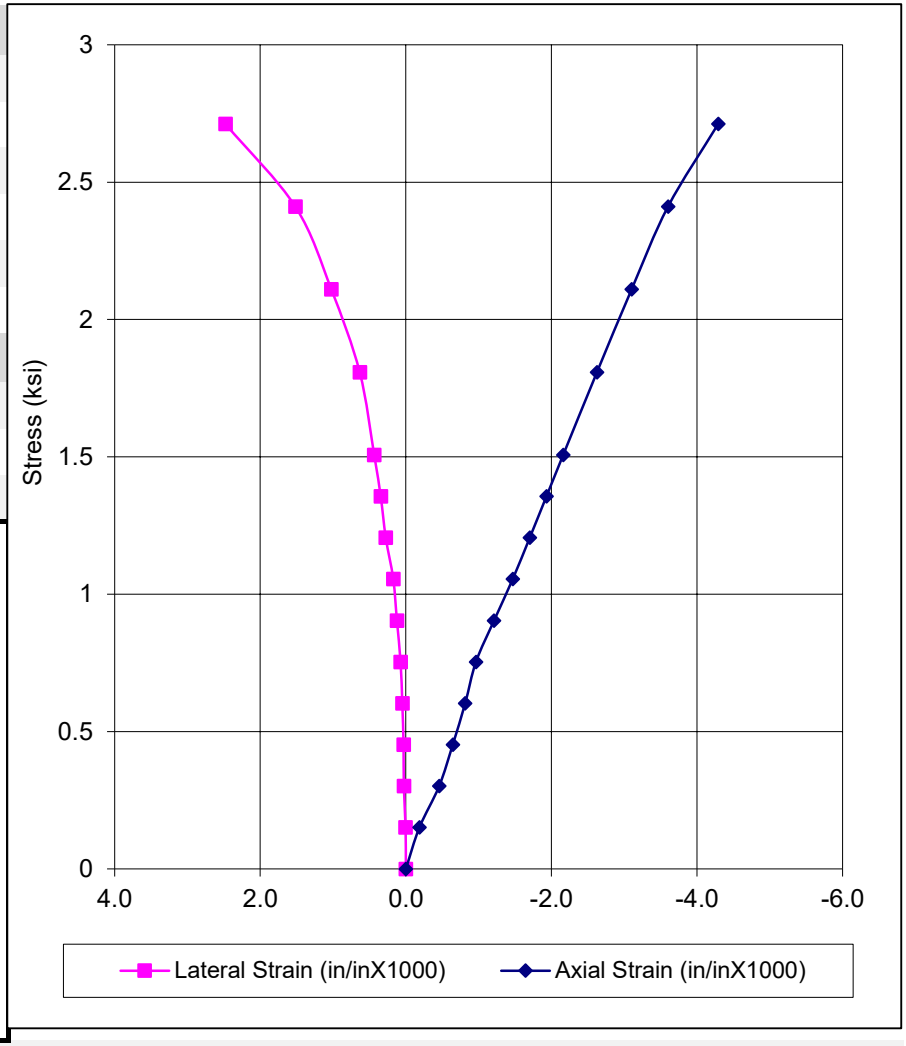

**Testing Notes:**

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|---|---|---|---|

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| Sample Information | | Compressive Test Information | |
|---|---|---|---|
| **Boring ID:** | CEC-12A | **Unit Weight (pcf):** | 174.4 |
| **Sample #:** | C-1 | **Failure Stress (psi):** | 2,871 |
| **Depth (ft):** | 44.7-45.7 | **Failure Mode:** | |
| **Tested Depth (ft):** | 45.4-45.8 | **Time to Failure (min)** | 2.37 |
| **Rock Type:** | Black Breccia | | |
| **Features:** | Broke along previous fracture | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.056 | **Poisson's Ratio @ 50%:** | 0.19 |
| **Length, L (in):** | 4.405 | **Strain %:** | 0.429 |
| **L:D Ratio:** | 2.14 | **E sec PSI @ 50%:** | 6.99E+05 |




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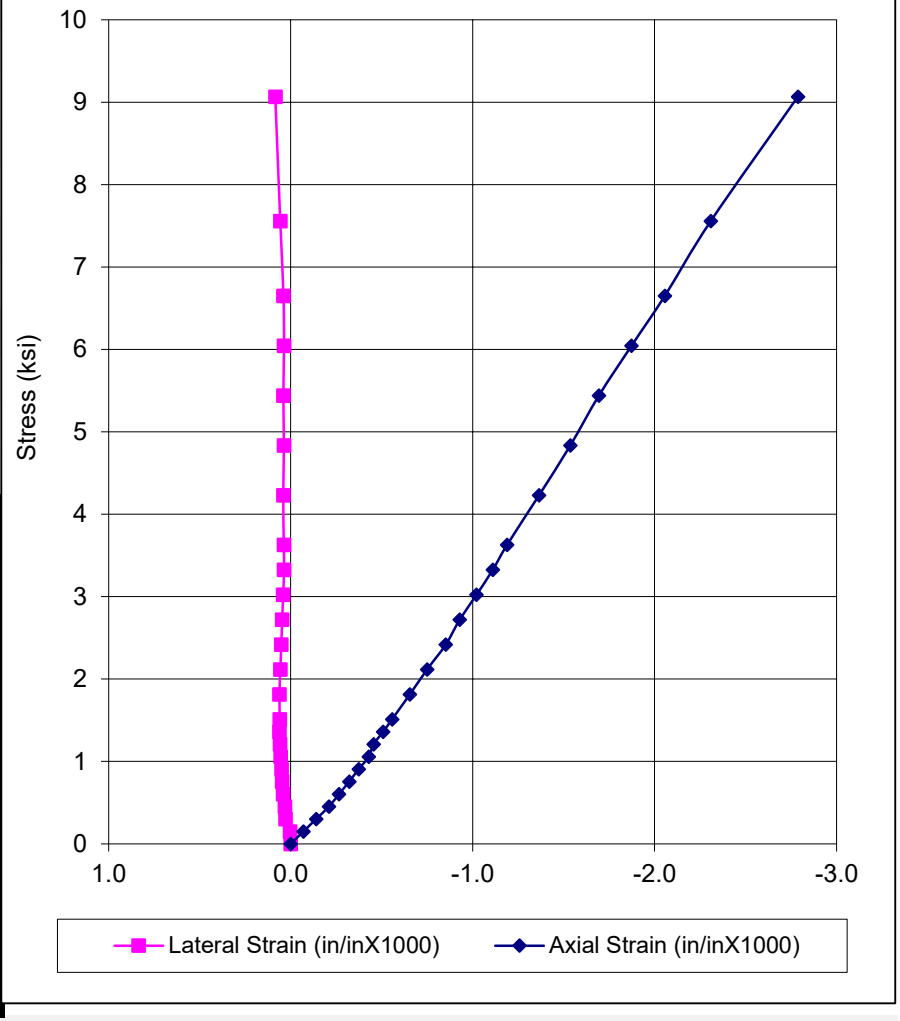
| **Project Information:** | |
|---|---|
| Shuster Bulkhead Improvements | |
| New Bedford, MA | |
| Project Number: | 332-344 |
| Technician: | AV |
| Report Date: | 07.23.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-14A | **Unit Weight (pcf):** | 165.4 |
| **Sample #:** | C-1 | **Failure Stress (psi):** | 9,768 |
| **Depth (ft):** | 34-34.8 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 34.1-34.5 | **Time to Failure (min)** | 8.12 |
| **Rock Type:** | Grey Schist | | |
| **Features:** | Broke along foliation | | |

| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
|---|---|---|---|
| **Diameter, D (in):** | 2.053 | **Poisson's Ratio @ 50%:** | 0.02 |
| **Length, L (in):** | 4.624 | **Strain %:** | 0.279 |
| **L:D Ratio:** | 2.25 | **E sec PSI @ 50%:** | 3.15E+06 |




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Client Information:
Civil and Environmental Consultants
Raynham, MA
Project Manager: Tony Sousa
Assigned By: Tony Sousa
Collected By: Client

Project Information:
**Shuster Bulkhead Replacement**
**New Bedford, MA**
Project Number: 332-334
Summary Page: 1 of 3
Report Date: 10.21.24

# LABORATORY TESTING DATA SHEET, Report No.: 7424-J-130

| Boring No. | Sample No. | Depth (ft) | Laboratory No. | Specimen Data | | | | | | Compressive Strength Tests | | | | | | | | Rock Formation or Description or Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Mohs Hard-ness | Diameter (in) | Length (in) | (1) Unit Weight (PCF) | (2) Wet Density (PCF) | Bulk $G_s$ | (3) Other Tests | (4) Strength PSI | (5) Strain % | (6) E sec PSI EE+06 | (7) Poisson's Ratio | st PSI | $Is_{50}$ PSI | (8) $s_c$ PSI | |
| CEC-19A | C-5 | 68.0-68.8 | 24-S-3977 | | 2.058 | 4.486 | 163.7 | | | U | 5492 | 0.482 | 1.65 | 4.36 | | | | Grey Granite |
| Fresh Break, Minor break at 1500 lbf ~ 450 psi resulting in a large Poisson's Ratio | | | | | | | | | | | | | | | | | | |
| CEC-20A | C-3 | 55.0-55.8 | 24-S-3978 | | 2.053 | 4.362 | 164.4 | | | U | 12093 | 0.593 | 1.90 | 0.25 | | | | Grey Granite |
| Fresh Break | | | | | | | | | | | | | | | | | | |
| CEC-21A | C-2 | 50.1-50.8 | 24-S-3979 | | 2.060 | 4.496 | 167.9 | | | U | 11624 | 0.497 | 1.92 | 0.21 | | | | Dark Grey Gabbro |
| Fresh Break | | | | | | | | | | | | | | | | | | |
| CEC-22A | C-1 | 42.1-42.9 | 24-S-3980 | | 2.056 | 4.689 | 165.4 | | | U | 16107 | 0.288 | 4.91 | 0.12 | | | | Grey Granite |
| Fresh Break | | | | | | | | | | | | | | | | | | |

Notes

(1) Volume Determined By Measuring Dimensions

(2) Determined by Measuring Dimensions and Weight of Saturated Sample

(3) PLD=Point Load (diametrical), PLA= Point Load (Axial) ST= Splitting Tensile U= Unconfined Compressive Strength

(4) Taken at Peak Deviator Stress

(5) Strain at Peak Deviator Stress

(6) Represents Secant Modulus at 50% of Total Failure Stress

(7) Represents Secant Poisson's Ratio at 50% of Total Failure Stress

(8) Estimated UCS from Table 1 of ASTM D5731 for NX cores (Is x 24)

Date Received: **09.27.24** Reviewed By: Date Review **10.21.24**

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Client Information:
Civil and Environmental Consultants
Raynham, MA
Project Manager: Tony Sousa
Assigned By: Tony Sousa
Collected By: Client

Project Information:
**Shuster Bulkhead Replacement**
**New Bedford, MA**
Project Number: 332-334
Summary Page: 2 of 3
Report Date: 10.21.24

# LABORATORY TESTING DATA SHEET, Report No.: 7424-J-130

| Boring No. | Sample No. | Depth (ft) | Laboratory No. | Specimen Data | | | | | | Compressive Strength Tests | | | | | | | | | Rock Formation or Description or Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Mohs Hard-ness | Diameter (in) | Length (in) | (1) Unit Weight (PCF) | (2) Wet Density (PCF) | Bulk $G_s$ | (3) Other Tests | (4) Strength PSI | (5) Strain % | (6) E sec PSI EE+06 | (7) Poisson's Ratio | st PSI | $Is_{50}$ PSI | (8) $s_c$ PSI | | |
| CEC-23A | C-3 | 45.3-46.0 | 24-S-3981 | | 2.059 | 4.446 | 165.6 | | | U | 9657 | 0.268 | 3.29 | 0.25 | | | | | Grey Granite |
| Fresh Break | | | | | | | | | | | | | | | | | | | |
| CEC-24A | C-5 | 65.4-66.4 | 24-S-3982 | | 2.060 | 4.643 | 168.2 | | | U | 9075 | 0.427 | 1.52 | 0.48 | | | | | Grey Granite and Dark Grey Gabbro Contact |
| Fresh Break, Minor break at about 14000lbf, 4202 psi affecting Poisson's Ratio | | | | | | | | | | | | | | | | | | | |
| CEC-25A | C-1 | 47.7-48.3 | 24-S-3983 | | 2.061 | 4.625 | 174.1 | | | U | 14781 | 0.479 | 2.33 | 0.26 | | | | | Dark Grey Gabbro |
| Fresh Break along healed suture | | | | | | | | | | | | | | | | | | | |
| CEC-26A | C-1 | 50.0-50.7 | 24-S-3984 | | 2.057 | 4.663 | 176.8 | | | U | 14038 | 0.465 | 2.43 | 0.68 | | | | | Dark Grey Gabbro |
| Fresh Break | | | | | | | | | | | | | | | | | | | |

Notes

(1) Volume Determined By Measuring Dimensions

(2) Determined by Measuring Dimensions and Weight of Saturated Sample

(3) PLD=Point Load (diametrical), PLA= Point Load (Axial) ST= Splitting Tensile U= Unconfined Compressive Strength

(4) Taken at Peak Deviator Stress

(5) Strain at Peak Deviator Stress

(6) Represents Secant Modulus at 50% of Total Failure Stress

(7) Represents Secant Poisson's Ratio at 50% of Total Failure Stress

(8) Estimated UCS from Table 1 of ASTM D5731 for NX cores (Is x 24)

Date Received: **09.27.24** Reviewed By: Date Review **10.21.24**

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| Raynham, MA | |
| Project Manager: | Tony Sousa |
| Assigned By: | Tony Sousa |
| Collected By: | Client |

| Project Information: | |
|---|---|
| **Shuster Bulkhead Replacement** | |
| **New Bedford, MA** | |
| Project Number: | 332-334 |
| Summary Page: | 3 of 3 |
| Report Date: | 10.21.24 |

# LABORATORY TESTING DATA SHEET, Report No.: 7424-J-130

| Boring No. | Sample No. | Depth (ft) | Laboratory No. | Specimen Data | | | | | | Compressive Strength Tests | | | | | | | | Rock Formation or Description or Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Mohs Hard-ness | Diameter (in) | Length (in) | (1) Unit Weight (PCF) | (2) Wet Density (PCF) | Bulk $G_s$ | (3) Other Tests | (4) Strength PSI | (5) Strain % | (6) E sec PSI EE+06 | (7) Poisson's Ratio | st PSI | $Is_{50}$ PSI | (8) $s_c$ PSI | |
| CEC-27A | C-4 | 58.3-59.7 | 24-S-3985 | | 2.057 | 4.791 | 164.8 | | | U | 15631 | 0.330 | 4.51 | 0.13 | | | | Grey Granite |
| Fresh Break, Minor break at about 25000 lbf, ~7527 psi | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | |

| | Notes | | Notes | |
|---|---|---|---|---|
| (1) Volume Determined By Measuring Dimensions | | (3) PLD=Point Load (diametrical), | | (5) Strain at Peak Deviator Stress |
| (2) Determined by Measuring Dimensions and Weight of Saturated Sample | | PLA= Point Load (Axial) ST= Splitting Tensile | | (6) Represents Secant Modulus at 50% of Total Failure Stress |
| | | U= Unconfined Compressive Strength | | (7) Represents Secant Poisson's Ratio at 50% of Total Failure Stress |
| | | (4) Taken at Peak Deviator Stress | | (8) Estimated UCS from Table 1 of ASTM D5731 for NX cores (Is x 24) |

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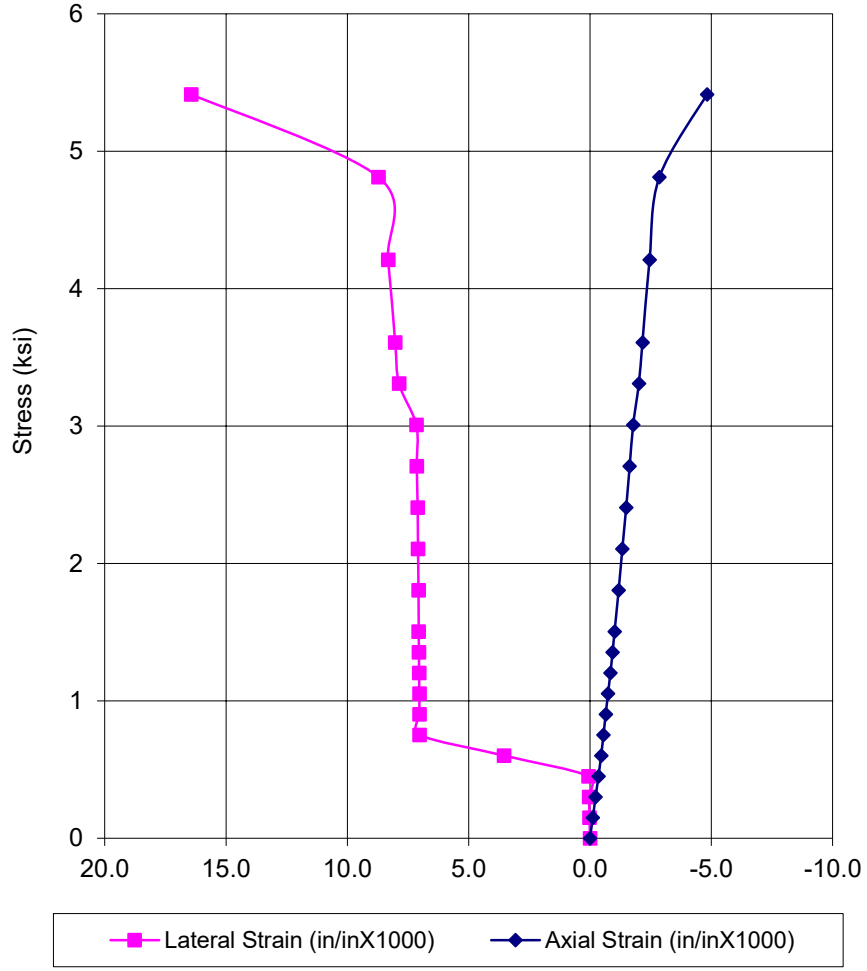
| **Client Information:** | |
|---|---|
| Civil and Environmental Consultants | |
| Raynham, Ma | |
| Project Manager: | Tony Sousa |
| Assigned by: | Tony Sousa |
| Collected by: | Client |

| **Project Information:** | |
|---|---|
| Shuster Bulkead Replacememt | |
| New Bedford, MA | |
| Project Number: | 332-334 |
| Technician: | AV |
| Report Date: | 10.16.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-19A | **Unit Weight (pcf):** | 163.7 |
| **Sample #:** | C-5 | **Failure Stress (psi):** | 5,492 |
| **Depth (ft):** | 68.0-38.8 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 68.35-68.73 | **Time to Failure (min)** | 3.50 |
| **Rock Type:** | Grey Granite | | |
| **Features:** | Fresh Break | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.058 | **Poisson's Ratio @ 50%:** | 4.36 |
| **Length, L (in):** | 4.486 | **Strain %:** | 0.482 |
| **L:D Ratio:** | 2.18 | **E sec PSI @ 50%:** | 1.65E+06 |




**Testing Notes:** **Minor break at about 1500 lbf, ~450 psi resulting in large Poisson's Ratio**

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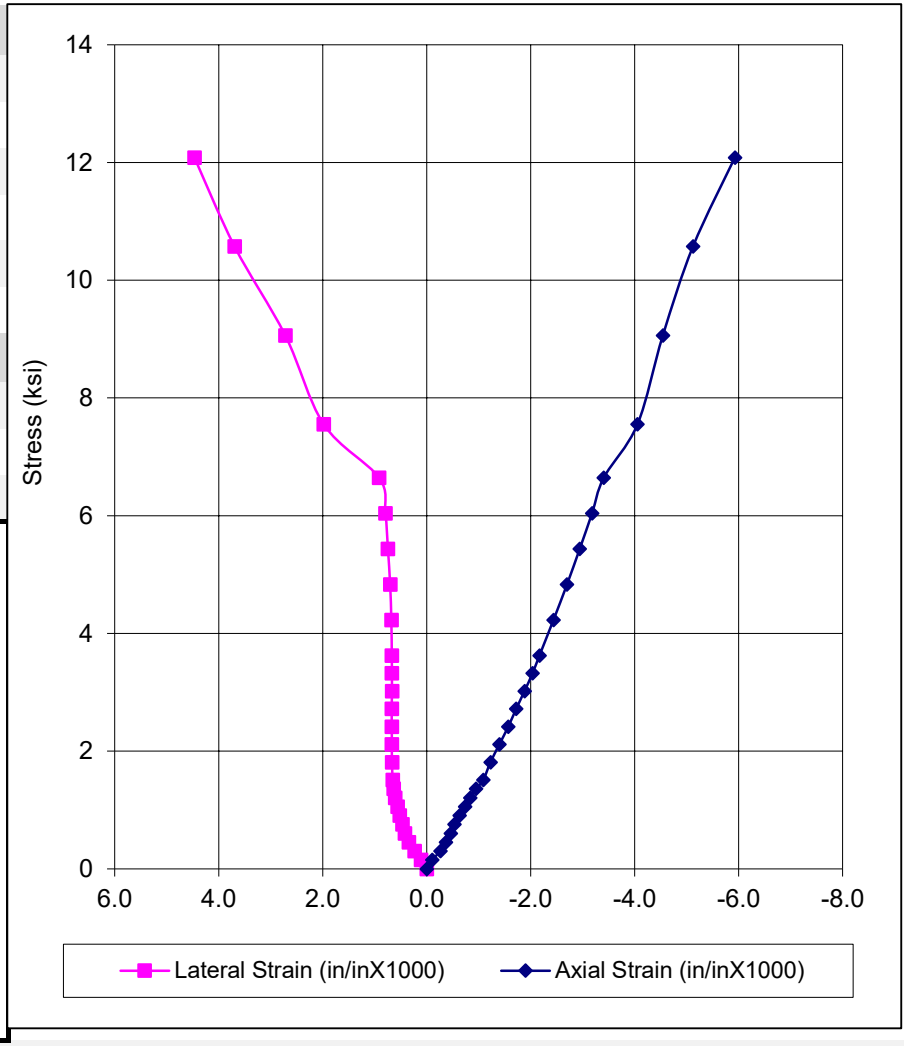
| **Client Information:** | |
|---|---|
| Civil and Environmental Consultants | |
| Raynham, Ma | |
| Project Manager: | Tony Sousa |
| Assigned by: | Tony Sousa |
| Collected by: | Client |

| **Project Information:** | |
|---|---|
| Shuster Bulkhead Replacement | |
| New Bedford, MA | |
| Project Number: | 332-344 |
| Technician: | SBR |
| Report Date: | 10.19.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-20A | **Unit Weight (pcf):** | 164.4 |
| **Sample #:** | C-3 | **Failure Stress (psi):** | 12,093 |
| **Depth (ft):** | 55-55.8 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 55.09-55.44 | **Time to Failure (min)** | 7.62 |
| **Rock Type:** | Grey Granite | | |
| **Features:** | Fresh Break | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.053 | **Poisson's Ratio @ 50%:** | 0.25 |
| **Length, L (in):** | 4.362 | **Strain %:** | 0.593 |
| **L:D Ratio:** | 2.12 | **E sec PSI @ 50%:** | 1.90E+06 |




**Testing Notes:**

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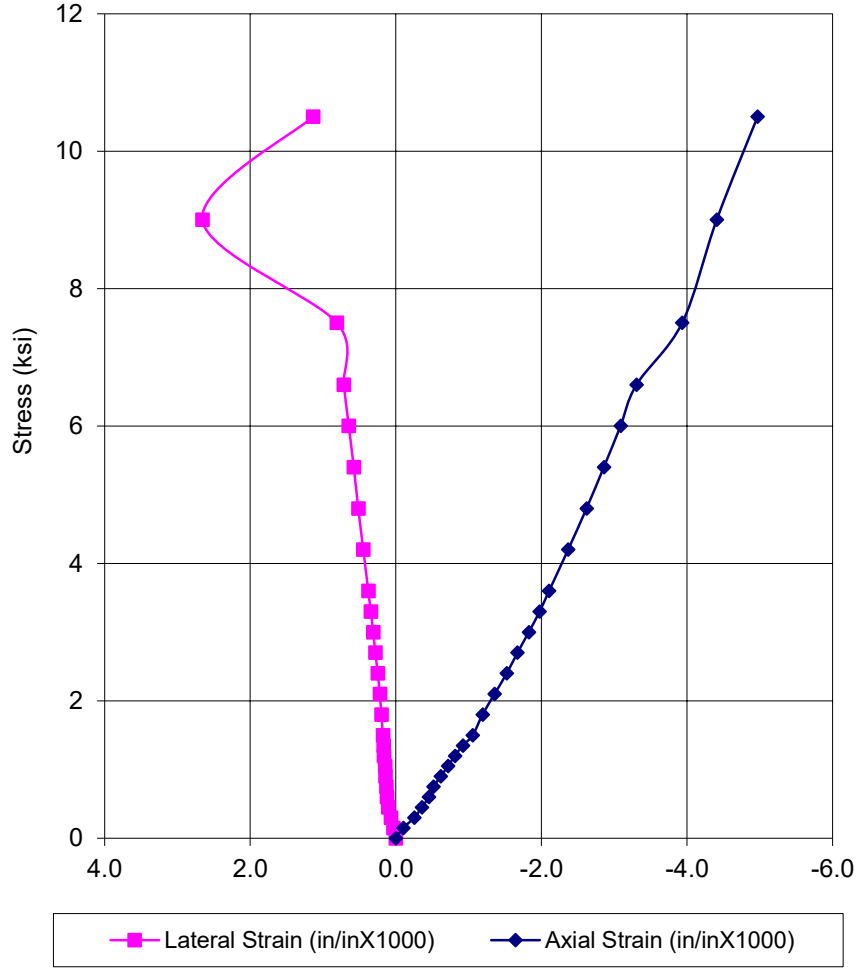
| **Client Information:** | |
|---|---|
| Civil and Environmental Consultants | |
| Raynham, Ma | |
| Project Manager: | Tony Sousa |
| Assigned by: | Tony Sousa |
| Collected by: | Client |

| **Project Information:** | |
|---|---|
| Shuster Bulkead Replacememt | |
| New Bedford, MA | |
| Project Number: | 332-334 |
| Technician: | AV |
| Report Date: | 10.16.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-21A | **Unit Weight (pcf):** | 167.9 |
| **Sample #:** | C-2 | **Failure Stress (psi):** | 11,624 |
| **Depth (ft):** | 50.1-50.8 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 50.39-50.79 | **Time to Failure (min)** | 7.37 |
| **Rock Type:** | Dark Grey Gabbro | | |
| **Features:** | Fresh Break | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.060 | **Poisson's Ratio @ 50%:** | 0.21 |
| **Length, L (in):** | 4.496 | **Strain %:** | 0.497 |
| **L:D Ratio:** | 2.18 | **E sec PSI @ 50%:** | 1.92E+06 |



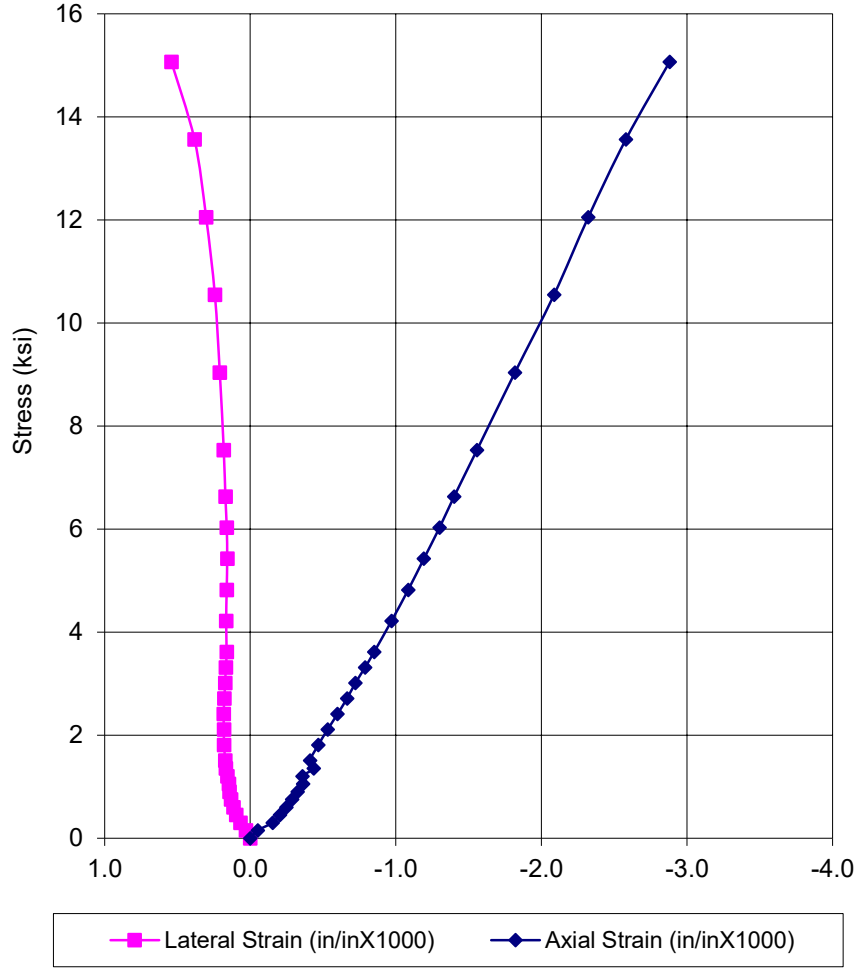

**Testing Notes:**

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|---|---|---|---|

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| Sample Information | | Compressive Test Information | |
|---|---|---|---|
| **Boring ID:** | CEC-22A | **Unit Weight (pcf):** | 165.4 |
| **Sample #:** | C-1 | **Failure Stress (psi):** | 16,107 |
| **Depth (ft):** | 42.1-42.9 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 42.5-42.9 | **Time to Failure (min)** | 10.13 |
| **Rock Type:** | Grey Granite | | |
| **Features:** | Fresh Break | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.056 | **Poisson's Ratio @ 50%:** | 0.12 |
| **Length, L (in):** | 4.689 | **Strain %:** | 0.288 |
| **L:D Ratio:** | 2.28 | **E sec PSI @ 50%:** | 4.91E+06 |



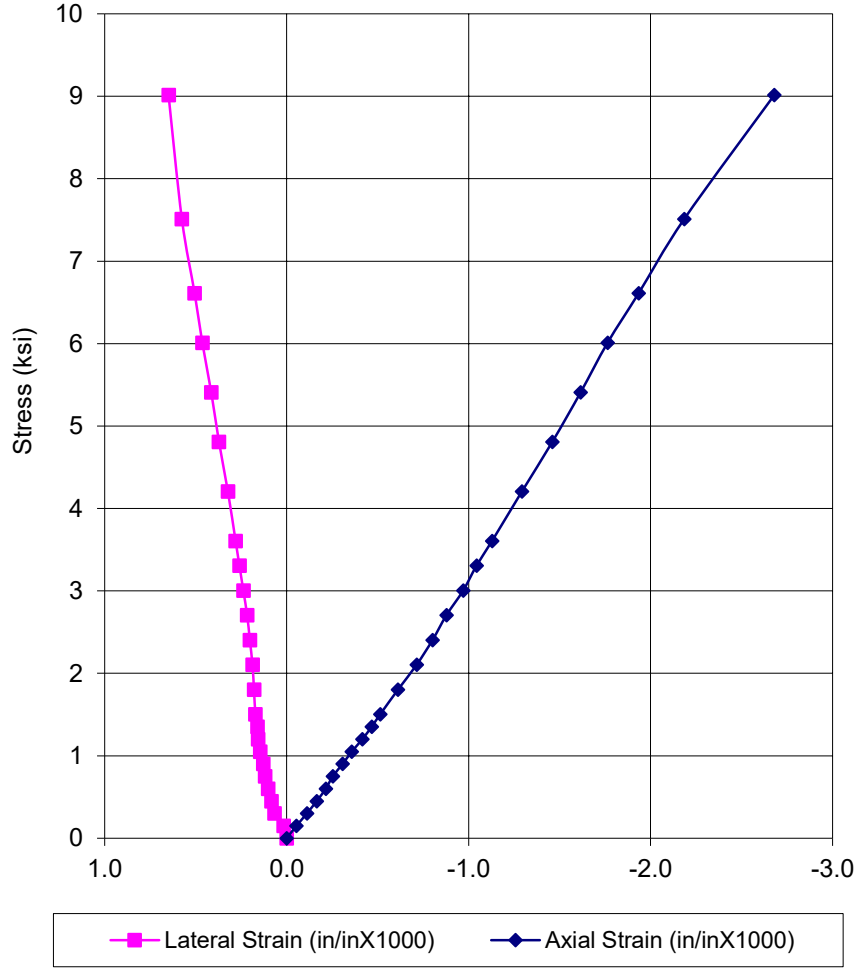

**Testing Notes:**

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|---|---|---|---|

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| Sample Information | | Compressive Test Information | |
|---|---|---|---|
| **Boring ID:** | CEC-23A | **Unit Weight (pcf):** | 165.6 |
| **Sample #:** | C-3 | **Failure Stress (psi):** | 9,657 |
| **Depth (ft):** | 45.3-46 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 45.29-45.68 | **Time to Failure (min)** | 6.08 |
| **Rock Type:** | Grey Granite | | |
| **Features:** | Fresh Break | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.059 | **Poisson's Ratio @ 50%:** | 0.25 |
| **Length, L (in):** | 4.446 | **Strain %:** | 0.268 |
| **L:D Ratio:** | 2.16 | **E sec PSI @ 50%:** | 3.29E+06 |




**Testing Notes:**

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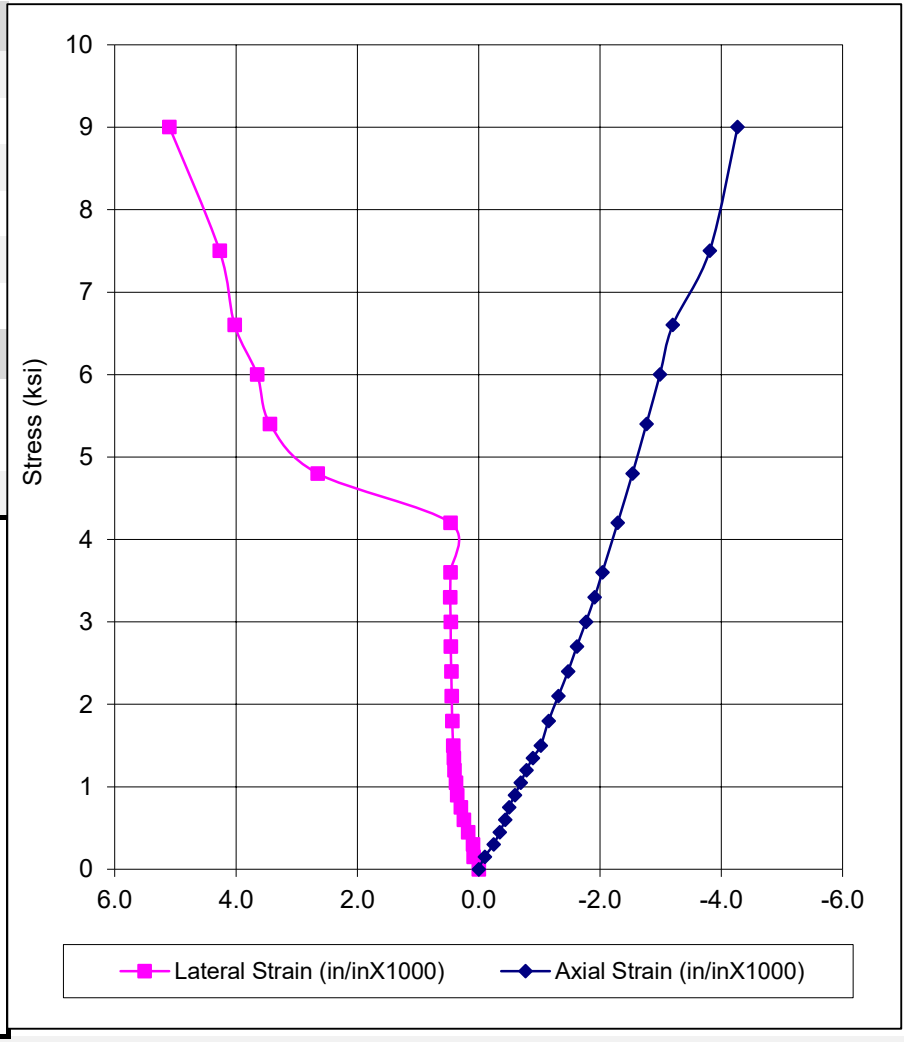
| **Client Information:** | |
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| Raynham, Ma | |
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| Assigned by: | Tony Sousa |
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| **Project Information:** | |
|---|---|
| Shuster Bulkead Replacememt | |
| New Bedford, MA | |
| Project Number: | 332-334 |
| Technician: | AV |
| Report Date: | 10.16.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-24A | **Unit Weight (pcf):** | 168.2 |
| **Sample #:** | C-5 | **Failure Stress (psi):** | 9,075 |
| **Depth (ft):** | 65.4-66.4 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 65.87-66.28 | **Time to Failure (min)** | 5.75 |
| **Rock Type:** | Grey Granite and Dark Grey Gabbro Contact | | |
| **Features:** | Fresh Break | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.060 | **Poisson's Ratio @ 50%:** | 0.48 |
| **Length, L (in):** | 4.643 | **Strain %:** | 0.427 |
| **L:D Ratio:** | 2.25 | **E sec PSI @ 50%:** | 1.52E+06 |




**Testing Notes:** **Minor break at about 14000 lbf, ~4201 psi**

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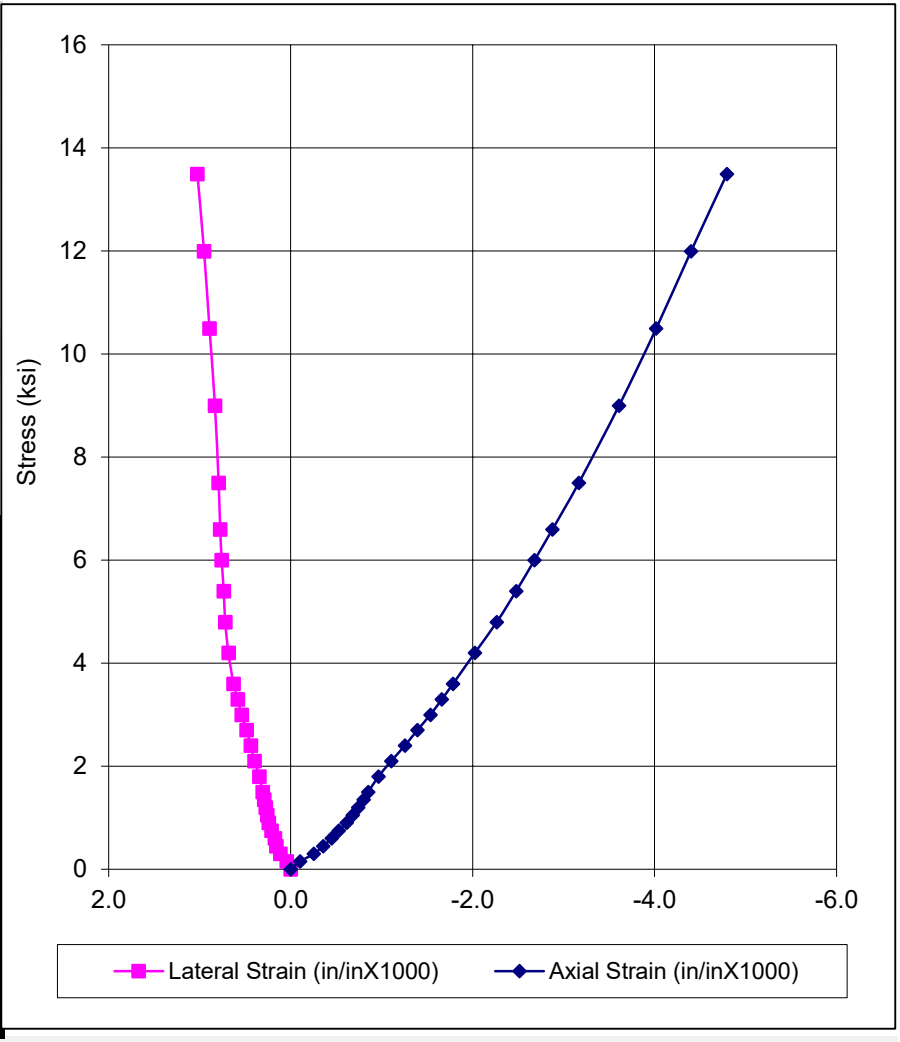
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| Civil and Environmental Consultants | |
| Raynham, Ma | |
| Project Manager: | Tony Sousa |
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| Collected by: | Client |

| **Project Information:** | |
|---|---|
| Shuster Bulkead Replacememt | |
| New Bedford, MA | |
| Project Number: | 332-334 |
| Technician: | AV |
| Report Date: | 10.16.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-25A | **Unit Weight (pcf):** | 174.1 |
| **Sample #:** | C-1 | **Failure Stress (psi):** | 14,781 |
| **Depth (ft):** | 47.7-48.3 | **Failure Mode:** | Suture |
| **Tested Depth (ft):** | 47.73-48.14 | **Time to Failure (min)** | 9.38 |
| **Rock Type:** | Dark Grey Gabbro | | |
| **Features:** | Broke along healed suture | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.061 | **Poisson's Ratio @ 50%:** | 0.26 |
| **Length, L (in):** | 4.625 | **Strain %:** | 0.479 |
| **L:D Ratio:** | 2.24 | **E sec PSI @ 50%:** | 2.33E+06 |




**Testing Notes:**

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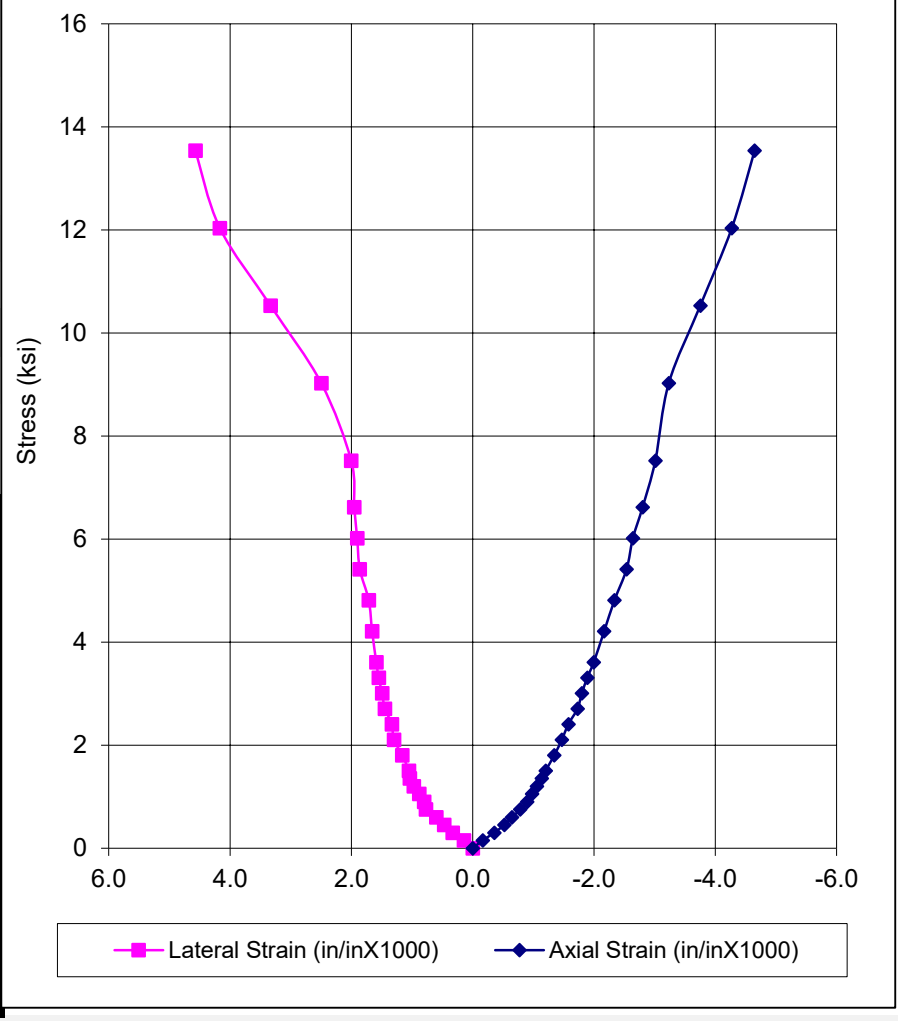
| **Client Information:** | |
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| Civil and Environmental Consultants | |
| Raynham, Ma | |
| Project Manager: | Tony Sousa |
| Assigned by: | Tony Sousa |
| Collected by: | Client |

| **Project Information:** | |
|---|---|
| Shuster Bulkead Replacememt | |
| New Bedford, MA | |
| Project Number: | 332-334 |
| Technician: | AV |
| Report Date: | 10.16.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-26A | **Unit Weight (pcf):** | 176.8 |
| **Sample #:** | C-1 | **Failure Stress (psi):** | 14,038 |
| **Depth (ft):** | 50.0-50.7 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 50.22-50.63 | **Time to Failure (min)** | 8.78 |
| **Rock Type:** | Dark Grey Gabbro | | |
| **Features:** | Fresh Break | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.057 | **Poisson's Ratio @ 50%:** | 0.68 |
| **Length, L (in):** | 4.663 | **Strain %:** | 0.465 |
| **L:D Ratio:** | 2.27 | **E sec PSI @ 50%:** | 2.43E+06 |




**Testing Notes:**

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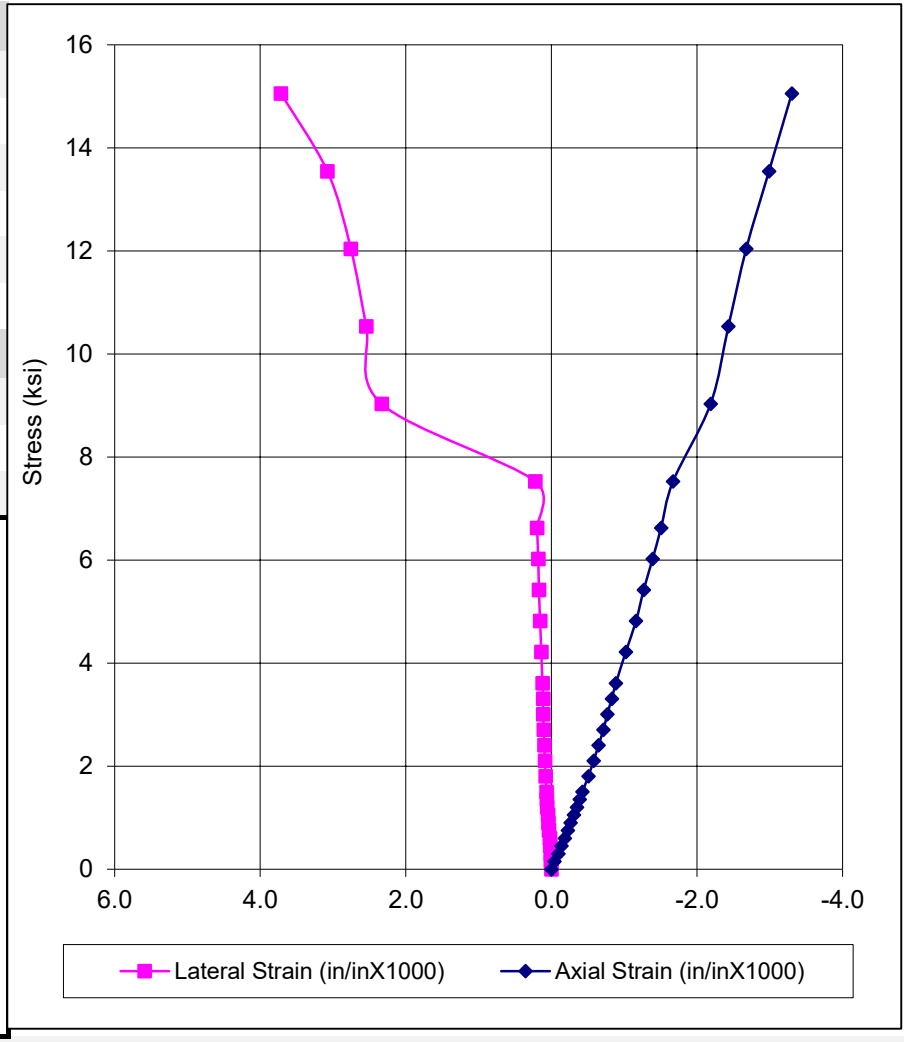
| **Client Information:** | |
|---|---|
| Civil and Environmental Consultants | |
| Raynham, Ma | |
| Project Manager: | Tony Sousa |
| Assigned by: | Tony Sousa |
| Collected by: | Client |

| **Project Information:** | |
|---|---|
| Shuster Bulkead Replacememt | |
| New Bedford, MA | |
| Project Number: | 332-334 |
| Technician: | AV |
| Report Date: | 10.16.24 |

# ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

| **Sample Information** | | **Compressive Test Information** | |
|---|---|---|---|
| **Boring ID:** | CEC-27A | **Unit Weight (pcf):** | 164.8 |
| **Sample #:** | C-4 | **Failure Stress (psi):** | 15,631 |
| **Depth (ft):** | 58.3-59.7 | **Failure Mode:** | Fresh |
| **Tested Depth (ft):** | 58.35-58.78 | **Time to Failure (min)** | 9.83 |
| **Rock Type:** | Grey Granite | | |
| **Features:** | Fresh Break | | |
| **Test Specimen Information** | | **Elastic Moduli Test Information** | |
| **Diameter, D (in):** | 2.057 | **Poisson's Ratio @ 50%:** | 0.13 |
| **Length, L (in):** | 4.791 | **Strain %:** | 0.330 |
| **L:D Ratio:** | 2.33 | **E sec PSI @ 50%:** | 4.51E+06 |




**Testing Notes:** **Minor break at about 25000 lbf, ~7527 psi**

**PERFORMED BY CLE ENGINEERING (2012)**

**Shuster Site - Geotechnical Investigations**
**Evaluation of In-situ Soil Unit Weight**

**Boring No. 1**
**Ex. Grade EL. 8.44**

| Sample No. | Depth Interval Below Ex. Grade (feet) | EL. Below Ex. Grade (feet) | Blows per 6" | Soil Description | Sample Dia. (in.) | Sample Length (in.) | Sample Vol. ($ft^3$) | Sample Wgt. (g) | Sample Wgt. (lbs) | $\gamma$ (psf) |
|---|---|---|---|---|---|---|---|---|---|---|
| S-3 | 9.0 | -0.6 | 10-3-9-15 | loose, wet pale gray f-m sand | 1.5 | 3.0 | 0.00307 | 180 | 0.397 | 129.3 |
| | 11.0 | -2.6 | | | | | | | | |
| | | | | | | | | | | |
| S-5 | 19.0 | -10.6 | 50-39-50-58 | dense, wet pale gray f-m sand, tr. fine gravel | 1.5 | 3.0 | 0.00307 | 148 | 0.326 | 106.4 |
| | 21.0 | -12.6 | | | | | | | | |
| | | | | | | | | | | |
| S-7 | 29.0 | -20.6 | 18-28-18-36 | med. dense, wet f-m sand | 1.5 | 3.0 | 0.00307 | 156 | 0.344 | 112.1 |
| | 31.0 | -22.6 | | | | | | | | |
| | | | | | | | | | | |
| S-9 | 34.0 | -25.6 | 21-24-51-34 | med, dense, wet yellow/brown m-c sand; little silt; tr. f-m gravel | 1.5 | 3.0 | 0.00307 | 164 | 0.362 | 117.8 |
| | 36.0 | -27.6 | | | | | | | | |

**Shuster Site - Geotechnical Investigations**
**Evaluation of In-situ Soil Unit Weight**

**Boring No. 2**
**Ex. Grade EL. 8.44**

| Sample No. | Depth Interval Below Ex. Grade (feet) | EL. Below Ex. Grade (feet) | Blows per 6" | Soil Description | Sample Dia. (in.) | Sample Length (in.) | Sample Vol. ($ft^3$) | Sample Wgt. (g) | Sample Wgt. (lbs) | $\gamma$ (psf) |
|---|---|---|---|---|---|---|---|---|---|---|
| S-1 | 0.0 | 8.4 | 6" asphalt-9-9-12 | loose, dry pale yellow brown f sand | 1.5 | 3.0 | 0.00307 | 160.0 | 0.353 | 115.0 |
| | 2.0 | 6.4 | | | | | | | | |
| S-3 | 9.0 | -0.6 | 8-8-11-8 | loose, wet pale brown f-c sand | 1.5 | 3.0 | 0.00307 | 150 | 0.331 | 107.8 |
| | 11.0 | -2.6 | | | | | | | | |
| S-7 | 29.0 | -20.6 | 25-23-50-20 | wet, pale brown f-m sand w/tr. fine gravel | 1.5 | 3.0 | 0.00307 | 155 | 0.342 | 111.4 |
| | 31.0 | -22.6 | | | | | | | | |

**Boring No. 3**
**Ex. Grade EL. 8.44**

| Sample No. | Depth Interval Below Ex. Grade (feet) | EL. Below Ex. Grade (feet) | Blows per 6" | Soil Description | Sample Dia. (in.) | Sample Length (in.) | Sample Vol. ($ft^3$) | Sample Wgt. (g) | Sample Wgt. (lbs) | $\gamma$ (psf) |
|---|---|---|---|---|---|---|---|---|---|---|
| S-2 | 4.0 | 4.4 | 24-29-120/1" | med. dense, wet f-m sand | 1.5 | 3.0 | 0.00307 | 209 | 0.461 | 150.2 |
| | 6.0 | 2.4 | | | | | | | | |
| S-3 | 9.0 | -0.6 | 6-3-4-5 | loose, wet dark gray f-m sand | 1.5 | 3.0 | 0.00307 | 160 | 0.353 | 115.0 |
| | 11.0 | -2.6 | | | | | | | | |
| S-4 | 14.0 | -5.6 | 40-41-33-38 | dense, wet pale brown f-m sand | 1.5 | 3.0 | 0.00307 | 198 | 0.437 | 142.3 |
| | 16.0 | -7.6 | | | | | | | | |
| S-5 | 19.0 | -10.6 | 60-35-32-30 | very dense, wet f-m sand; tr. fine gravel | 1.5 | 3.0 | 0.00307 | 230 | 0.507 | 165.3 |
| | 21.0 | -12.6 | | | | | | | | |
| S-6 | 24.0 | -15.6 | 34-28-45-35 | dense, wet f-c sand; tr. fine gravel | 1.5 | 3.0 | 0.00307 | 233 | 0.514 | 167.4 |
| | 26.0 | -17.6 | | | | | | | | |
| S-8 | 34.0 | -25.6 | 67-120/3" | very dense, wet m-c sand; little m-c gravel | 1.5 | 3.0 | 0.00307 | 156 | 0.344 | 112.1 |
| | 36.0 | -27.6 | | | | | | | | |

**Boring No. 4**
**Ex. Grade EL. 8.44**

| Sample No. | Depth Interval Below Ex. Grade (feet) | EL. Below Ex. Grade (feet) | Blows per 6" | Soil Description | Sample Dia. (in.) | Sample Length (in.) | Sample Vol. ($ft^3$) | Sample Wgt. (g) | Sample Wgt. (lbs) | $\gamma$ (psf) |
|---|---|---|---|---|---|---|---|---|---|---|
| S-1 | 0.5 | 7.9 | 9-14-22 | loose, damp pale yellow f-m sand | 1.5 | 3.0 | 0.00307 | 178 | 0.392 | 127.9 |
| | 2.0 | 6.4 | | | | | | | | |
| S-3 | 9.0 | -0.6 | 3-4-12-13 | loose ,wet pale gray f-m sand;tr. fine gravel | 1.5 | 3.0 | 0.00307 | 180 | 0.397 | 129.3 |
| | 11.0 | -2.6 | | | | | | | | |
| S-4 | 14.0 | -5.6 | 29-25-26-22 | med. dense, wet pale gray f-m sand; little fine gravel | 1.5 | 3.0 | 0.00307 | 151 | 0.333 | 108.5 |
| | 16.0 | -7.6 | | | | | | | | |
| S-6 | 24.0 | -15.6 | 44-37-40-36 | med. dense, wet pale gray f-c sand; little fine gravel | 1.5 | 3.0 | 0.00307 | 164 | 0.362 | 117.8 |
| | 26.0 | -17.6 | | | | | | | | |
| S-7 | 29.0 | -20.6 | 44-40-22-15 | med. dense, wet gray f-m sand; little f-m gravel | 1.5 | 3.0 | 0.00307 | 213 | 0.470 | 153.1 |
| | 31.0 | -22.6 | | | | | | | | |
| S-8 | 34.0 | -25.6 | 54-87-53-34 | dense, wet deep yellow/brown f-m sand; tr. fine gravel w/ little silt | 1.5 | 3.0 | 0.00307 | 194 | 0.428 | 139.4 |
| | 36.0 | -27.6 | | | | | | | | |

**Shuster Site - Geotechnical Investigations**
**Evaluation of In-situ Soil Unit Weight**

**Boring No. 5**
**Ex. Grade EL. 8.44**

| Sample No. | Depth Interval Below Ex. Grade (feet) | EL. Below Ex. Grade (feet) | Blows per 6" | Soil Description | Sample Dia. (in.) | Sample Length (in.) | Sample Vol. ($ft^3$) | Sample Wgt. (g) | Sample Wgt. (lbs) | $\gamma$ (psf) |
|---|---|---|---|---|---|---|---|---|---|---|
| S-2 | 2.0 | 6.4 | 68-78-46-94 | dry, dense f-m sand tr. small gravel | 1.5 | 3.0 | 0.00307 | 158.0 | 0.348 | 113.5 |
| | 4.0 | 4.4 | | | | | | | | |
| | | | | | | | | | | |
| S-5 | 8.0 | 0.4 | 4-8-11-19 | loose, wet pale yellowish gray, med. sand, tr. fine gravel | 1.5 | 3.0 | 0.00307 | 137 | 0.302 | 98.4 |
| | 10.0 | -1.6 | | | | | | | | |
| | | | | | | | | | | |
| S-8 | 14.0 | -5.6 | 38-86-80-64 | very dense, wet pale brown f-m sand w/tr. fine gravel | 1.5 | 3.0 | 0.00307 | 164 | 0.362 | 117.8 |
| | 16.0 | -7.6 | | | | | | | | |
| | | | | | | | | | | |
| S-11 | 20.0 | -11.6 | 5-6-13-29 | med. dense, wet dark gray f-m sand | 1.5 | 3.0 | 0.00307 | 179 | 0.395 | 128.6 |
| | 22.0 | -13.6 | | | | | | | | |
| | | | | | | | | | | |
| S-16 | 30.0 | -21.6 | 53-96-120/5" | very dense, wet olive/tan f-m sand, little silt w/tr. fine gravel | 1.5 | 3.0 | 0.00307 | 219 | 0.483 | 157.4 |
| | 32.0 | -23.6 | | | | | | | | |

**PERFORMED BY APEX COMPANIES LLC (2010-2011)**

GeoTesting EXPRESS

| | | | | | |
|---|---|---|---|---|---|
| Client: | Apex Companies, LLC | | | | |
| Project: | South Terminal Extension | | | | |
| Location: | New Bedford, MA | | | Project No: | GTX-10697 |
| Boring ID: | --- | Sample Type: | --- | Tested By: | jef |
| Sample ID: | --- | Test Date: | 05/17/11 | Checked By: | jdt |
| Depth : | --- | Sample Id: | --- | | |

# Moisture Content of Soil - ASTM D 2216-05

| Boring ID | Sample ID | Depth | Description | Moisture Content,% |
|---|---|---|---|---|
| B-16 | --- | 5-7 ft | Moist, dark gray clayey sand | 36.5 |
| B-16 | --- | 10-12 ft | Moist, olive gray sand with gravel | 12.4 |
| B-16 | --- | 15-17 ft | Moist, gray sand with gravel | 12.5 |
| B-16 | --- | 20-22 ft | Moist, olive gray silty sand with gravel | 11.1 |
| B-16 | --- | 25-27 ft | Moist, yellowish brown clayey sand with gravel | 13.5 |
| B-18 | --- | 0-2 ft | Moist, olive silty sand | 26.2 |
| B-18 | --- | 5-6.5 ft | Moist, yellowish brown sand with gravel | 9.9 |
| B-18 | --- | 6.5-7 ft | Moist, reddish brown silty sand with gravel | 24.9 |
| B-18 | --- | 10-12 ft | Moist, yellowish brown silty sand with gravel | 15.9 |

Notes: Temperature of Drying : 110° Celsius

GeoTesting EXPRESS

| | |
|---|---|
| Client: | Apex Companies, LLC |
| Project Name: | South Terminal Extension |
| Project Location: | New Bedford, MA |
| GTX #: | 10697 |
| Test Date: | 05/16/11 |
| Tested By: | jef |
| Checked By: | jdt |

# Density (Unit Weight) of Soil by ASTM D 7263

| Boring ID | Sample ID | Depth, ft | Visual Description | Bulk Density, lb/ft$^3$ | Moisture Content, % | Dry Density, lb/ft$^3$ |
|---|---|---|---|---|---|---|
| B-13 | --- | 0-2 | Moist, olive green silty sand | 79.2 | 32.3 | 59.8 |
| B-13 | --- | 20-22 | Moist, gray gravel with sand | 130 | 4.8 | 124 |
| B-14 | --- | 5-7 | Moist, light olive silty sand | 123 | 14.0 | 108 |
| B-14 | --- | 0-2 | Moist, olive green clay | 112 | 40.6 | 79.6 |
| B-14 | --- | 15-17 | Wet, gray sand with gravel | 138 | 25.3 | 110 |
| B-14 | --- | 10-12 | Moist, olive gray sand with gravel | 128 | 15.0 | 112 |
| B-15 | --- | 0-2 | Moist, olive green clay | 93.7 | 75.6 | 53.4 |
| B-15 | --- | 5-7 | Moist, olive green clay | 95.3 | 76.7 | 54.0 |
| B-15 | --- | 20-22 | Moist, Olive green silty sand | 105 | 23.7 | 84.6 |
| B-15 | --- | 15-17 | Moist, olive gray silty sand | 124 | 13.8 | 109 |
| B-15 | --- | 10-12 | Moist, silty sand with gravel | 139 | 16.8 | 119 |
| B-16 | --- | 0-2 | Wet, olive gray sand | 126 | 19.8 | 105 |
| B-16 | --- | 5-4 | Moist, dark gray sand with silt | 116 | 36.5 | 85.0 |
| B-16 | --- | 15-17 | Moist, gray sand with gravel | 135 | 25.4 | 108 |
| B-16 | --- | 20-22 | Moist, olive gray silty sand with gravel | 142 | 11.1 | 128 |
| B-16 | --- | 10-12 | Moist, dark grayish brown sand with gravel | 147 | 12.4 | 131 |
| B-16 | --- | 25-27 | Moist, yellowish brown sand with gravel | 141 | 13.1 | 125 |
| B-18 | --- | 6.5-7 | Moist, reddish brown silty sand with gravel | 121 | 24.9 | 96.9 |
| B-18 | --- | 0-2 | Moist, olive silty sand | 86.6 | 26.2 | 68.6 |

GeoTesting EXPRESS

| | |
|---|---|
| Client: | Apex Companies, LLC |
| Project Name: | South Terminal Extension |
| Project Location: | New Bedford, MA |
| GTX #: | 10697 |
| Test Date: | 05/16/11 |
| Tested By: | jef |
| Checked By: | jdt |

# Density (Unit Weight) of Soil by ASTM D 7263

| Boring ID | Sample ID | Depth, ft | Visual Description | Bulk Density, lb/ft$^3$ | Moisture Content, % | Dry Density, lb/ft$^3$ |
|---|---|---|---|---|---|---|
| B-18 | --- | 10-12 | Moist, yellowish brown silty sand with gravel | 132 | 15.9 | 114 |
| B-18 | --- | 5-6.5 | Moist, yellowish brown sand with gravel | 131 | 15.5 | 113 |

Notes: Density determined on disturbed samples by hand compacting into a container of known volume, measuring mass of soil and calculating.
Moisture content determined by ASTM D 2216 at 110° C

**ATTACHMENT 15: LETTER - GEOTECHNICAL ADDENDUM FOR PROPOSED SHUSTER BULKHEAD (CIVIL & ENVIRONMENTAL CONSULTANTS, INC., MAY 21, 2025)**

May 21, 2025

Mr. Douglas Ernst, P.E.
Foth Infrastructure & Environment, LLC
8191 Birchwood Court, Suite L
Johnston, IA 50131

Subject: Geotechnical Addendum – Proposed Shuster Bulkhead
4 Wright Street
New Bedford, MA 02740
CEC Project 332-344

Dear Mr. Ernst:

Civil & Environmental Consultants, Inc. (CEC) is pleased to present this geotechnical addendum to Foth Infrastructure Environment, LLC (Foth) regarding the stability of the proposed slope on the harbor side of the proposed Shuster Bulkhead at 4 Wright Street in New Bedford, MA. This Memo has been prepared per your request in an email on April 24, 2025.

## Background

CEC has been providing ongoing geotechnical support for the proposed Massachusetts Clean Energy Counsel (MassCEC) terminal expansion project. A portion of this project will include the construction of a new marine bulkhead and concrete platform in place of the existing cellular cofferdam bulkhead. CEC was selected by Foth to provide geotechnical data to support Foth's design of the new marine structures in this area, which is presented in a Data Report last revised on April 4, 2025. As part of the proposed bulkhead, the existing cellular cofferdam bulkhead will be removed and the infill material will be partially dredged. Based on Draft 30% design drawings provided to us by Foth dated October 8, 2024, the dredge line left in place will be sloped at a maximum 2.5 horizontal to 1 vertical (H:V) orientation and will be about 24 feet high. The proposed concrete platform will be above the slope and will be supported by pipe piles that extend through the slope and into the underlying bedrock. The dredge line will also contain scour protection which may consist of Fabriform concrete liner or similar. On April 24, 2025, CEC was requested by you to evaluate the stability of the final slope conditions. This addendum provides the results of the requested analysis.

## Slope Stability Analysis

CEC utilized the software program SLIDE2 by Rocscience to estimate the factor of safety (FS) of the proposed 2.5H:1V slope. SLIDE2 utilizes two-dimensional (2D) limit equilibrium slope stability techniques to determine an overall FS. The program calculates the FS based upon surface geometry, groundwater surfaces, soil unit weights, and shear strength parameters. The surface geometry for the section was determined using Drawing MR303 "Structural Section Without Ex.

Structure", as part of the above noted 30% design drawing set. The subsurface layering, soil unit weight, and shear strength parameters of the section were developed using test boring and laboratory test data from the previously provided data report. The test borings that were included in this analysis are Test Borings CEC-2A, CEC-6A, CEC-11A, and SB-3 which are generally along Subsurface Cross Section 4 in the Data Report. CEC also conservatively omitted the increased stability due to the proposed pipe piles from the stability analysis. Based on the test boring and laboratory test data, CEC developed the following strength parameters of each subsurface layer:

| SOIL DESCRIPTION | SATURATED UNIT WEIGHT (pcf) | SHEAR STRENGTH PARAMETERS | |
|---|---|---|---|
| | | c (psf) | φ' (degrees) |
| **Fabriform** | 135 | 0 | 45 |
| **Dredge Fill** | 120 | 0 | 30 |
| **Glacial Outwash** | 120 | 0 | 32 |
| **Glacial Till** | 140 | 100 | 36 |
| **Bedrock** | 170 | 400,000 | 0 |

## Conclusions

Based on the slope stability analysis output denoted as Figure 1, the FS of the proposed slope is **1.52**. This FS is greater than the industry standard for permanent slopes, which is typically 1.5. In addition, this FS is conservative due to the omission of the proposed pipe piles in our analysis, which will provide additional lateral resistance to the slope mass.

## Closing

CEC appreciates the opportunity to continue providing services to you on this project. Please call if you have any questions or comments.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

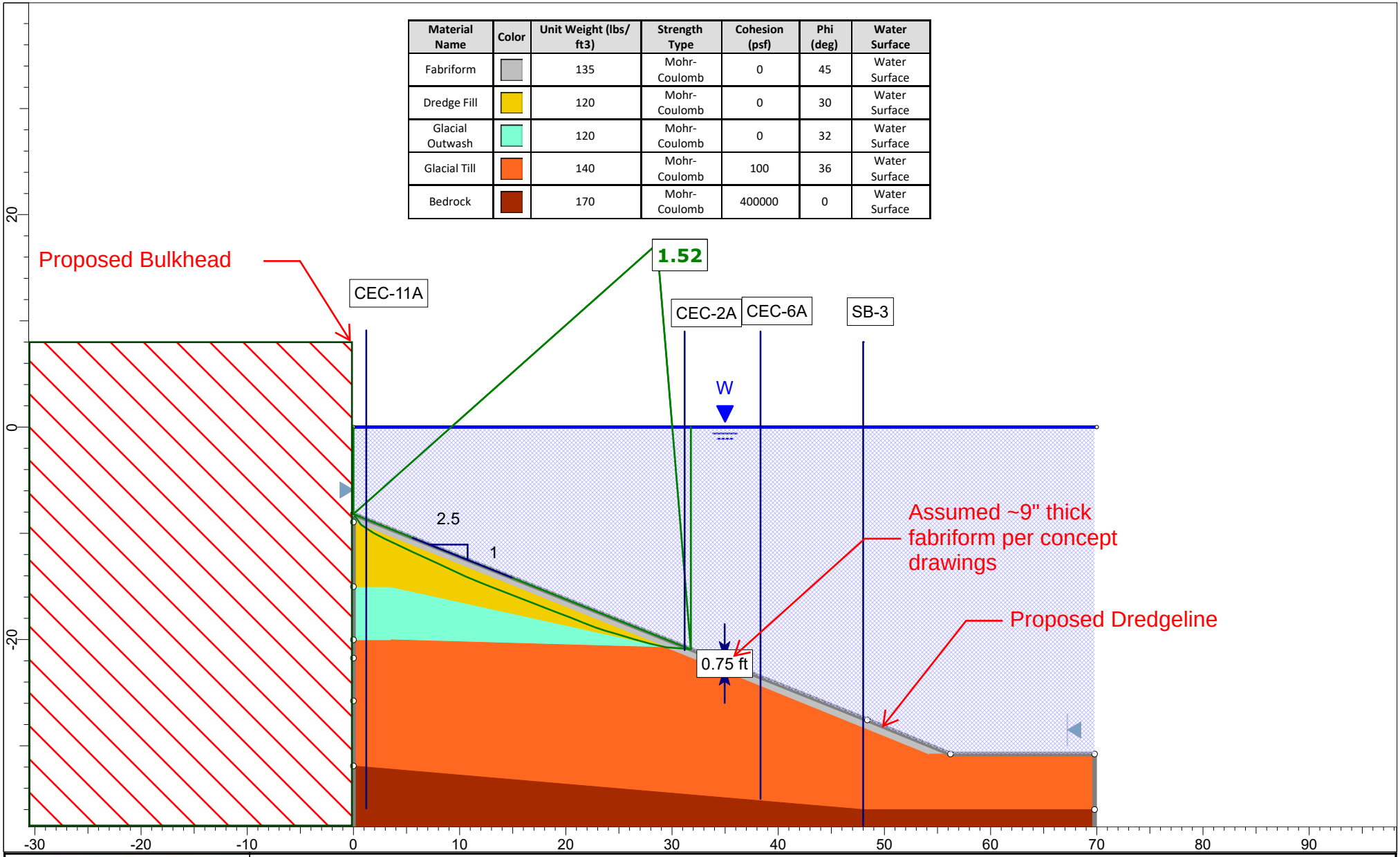
Antonio E. Sousa, P.E.
Project Manager

Jeffrey C. Woodcock
Vice President

Attachments: Figure 1 – Slope Stability Analysis Output

**FIGURE 1 – SLOPE STABILITY ANALYSIS OUTPUT**

| Material Name | Color | Unit Weight (lbs/ ft3) | Strength Type | Cohesion (psf) | Phi (deg) | Water Surface |
|---|---|---|---|---|---|---|
| Fabriform | | 135 | Mohr-Coulomb | 0 | 45 | Water Surface |
| Dredge Fill | | 120 | Mohr-Coulomb | 0 | 30 | Water Surface |
| Glacial Outwash | | 120 | Mohr-Coulomb | 0 | 32 | Water Surface |
| Glacial Till | | 140 | Mohr-Coulomb | 100 | 36 | Water Surface |
| Bedrock | | 170 | Mohr-Coulomb | 400000 | 0 | Water Surface |




Civil & Environmental Consultants, Inc.

SLIDEINTERPRET 9.026

| | | | |
|---|---|---|---|
| *Project* | MassCEC - Proposed Shuster Bulkhead | | |
| *Analysis Description* | 2.5H:1V Slope | *Figure* | 1 |
| *Drawn By* | JDV/TES | *Company* | CEC |
| *Date* | 5/20/2025 | *File Name* | Bulkhead 2.5 to1 Slope.slmd |

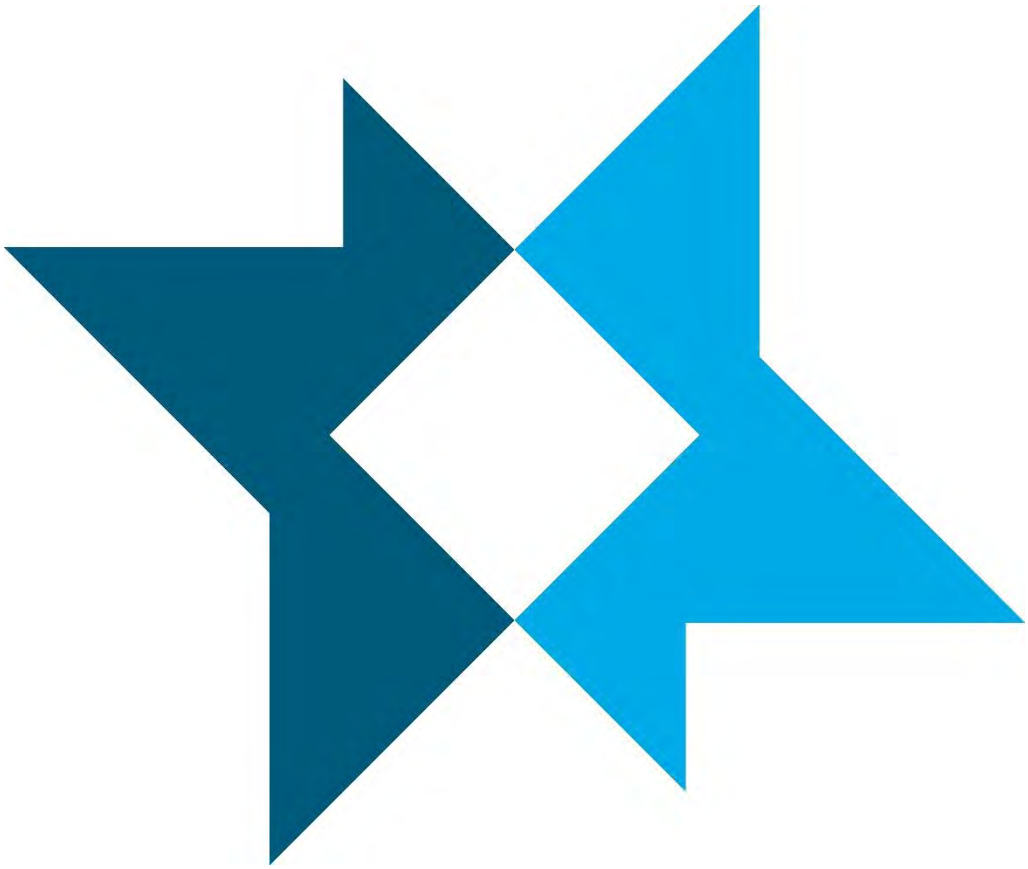
**ATTACHMENT 16: WATERFRONT FACILITIES INSPECTION AND ASSESSMENT REPAIR OR UPGRADE DESIGN – 4 WRIGHT STREET (FOTH INFRASTRUCTURE & ENVIRONMENT, LLC, NOVEMBER 4, 2025)**

Report

# Waterfront Facilities Inspection and Assessment

## *Repair or Upgrade Design*

## 4 Wright Street



**Massachusetts Clean Energy Center**
New Bedford, MA

November 2025

Project ID: 24M070.04

**Solving our clients' toughest science and engineering challenges.**

15 Creek Road
Marion, MA 02738
(508) 748-0937
foth.com

November 4, 2025

Tim Griffin
Terminal Director
Massachusetts Clean Energy Center
New Bedford Marine Commerce Terminal
4 Wright Street
New Bedford, MA 02740

Re: Waterfront Facilities Inspection and Assessment Report
Repair or Upgrade Design
4 Wright Street, New Bedford, MA 02740

Foth Infrastructure & Environment, LLC (Foth) is pleased to provide the attached Shuster Waterfront Facilities Inspection and Assessment (WFIA) Report for Massachusetts Clean Energy Center (MassCEC) for the Shuster facility located at 4 Wright Street, New Bedford, MA. The purpose of the Repair or Upgrade Design level inspection is to report on the existing condition of the cellular cofferdam bulkhead and upland mooring dolphin. This report provides the results of the observed conditions for recording purposes only.

At Foth, we believe in doing quality work and creating strong relationships. We look forward to the opportunity to work with you on this project. Please contact Scott Skuncik at (401) 206-2422 or Scott.Skuncik@foth.com, if you have questions or to discuss our proposal.

Sincerely,

Foth Infrastructure & Environment, LLC

Scott R. Skuncik, P.E.
Ports and Harbors Market Leader
Licensed in CT, FL, KY, ME, MD, MA, MI, NY, RI, TN

Timothy J. Magalhaes, E.I.T.
Project Manager

cc: Doug Ernst, P.E. (Foth)
Mike Campagnone, P.E. (Foth)
Cody Flynn, P.E. (Foth)
Jeannie Houde (MassCEC)

# Waterfront Facilities Inspection and Assessment
# Repair or Upgrade Design
# 4 Wright Street

Project ID: 0024M070.04

Prepared for
**Massachusetts Clean Energy Center**
4 Wright Street
New Bedford, MA

Prepared by
**Foth Infrastructure & Environment, LLC**

November 2025

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# Waterfront Facilities Inspection and Assessment
# Repair or Upgrade Design
# 4 Wright Street

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Appendix E Drone Survey, Bentley iTwin Capture Modeler
Appendix F Historical Documentation

# Waterfront Facilities Inspection and Assessment
# Repair or Upgrade Design
# 4 Wright Street

## Executive Summary

Foth Infrastructure & Environment, LLC (Foth), in partnership with J.F. Brennan Company (Brennan), conducted a comprehensive inspection and assessment of the waterfront structures and upland building of 4 Wright Street Facility in New Bedford, Massachusetts. This effort was performed in accordance with ASCE Manual of Practice No. 130, Second Edition, as part of a Repair or Upgrade Design-level evaluation supporting the planned redevelopment of the Facility.

The inspection focused on the existing cellular cofferdam bulkhead system and upland mooring dolphin within the facility limits. The bulkhead is partially owned and maintained by the New Bedford Port Authority (NBPA). The cofferdam system, comprising four major cells (Cells #1, 2, 3, and 4) and three minor cells (Cells #1A, 2A and 3A), forms a critical segment of the shoreline infrastructure and is scheduled for demolition and replacement with a new pile supported loading platform.

To establish a baseline condition record and support future planning, Foth performed visual topside and underwater inspections, supplemented by additional surveying. This included a bathymetric survey, sector scan imaging, and aerial drone survey.

The inspection documented observable and repeatable conditions across key structural elements. Notable findings include:

- General scour along the cofferdam cells, with bathymetric comparisons indicating up to 4 feet 2 inches of material loss in some areas.
- Undermining of the steel sheet piles at Cell #4A resulting in a sinkhole that measured up to 17 feet long by 13 feet wide.
- Localized spalling and cracking on the reinforced concrete wall and platform, particularly near mooring hardware.
- Significant surface corrosion, pitting and coating loss on the single bitt bollards and cleats within the Cellular Cofferdam Bulkhead structure.
- Signage stating “No Mooring” located behind each mooring bollard indicating restricted use or decommissioning of the mooring points.
- Limited to no defects observed on the Upland Mooring Dolphin.

Based on these observations, Foth evaluated and assessed the condition of each component. The Cellular Cofferdam Bulkhead is generally in **Poor** condition, primarily due to continued scouring and undermining along the steel sheet pile toe resulting in a large sinkhole at Cell #4A. The Upland Mooring Dolphin is generally in **Good** condition with limited to no significant defects observed.

# List of Abbreviations, Acronyms, and Symbols

| | |
|---|---|
| ASCE | American Society of Civil Engineers |
| Brennan | J.F. Brennan Company |
| E.I.T. | Engineer in Training |
| Foth | Foth Infrastructure & Environment, LLC |
| MassCEC | Massachusetts Clean Energy Center |
| MOP | Manual of Practice |
| NBMCT | New Bedford Marine Commerce Terminal |
| NBPA | New Bedford Port Authority |
| P.E. | Professional Engineer |
| UT | Ultrasonic Thickness |
| WFIA | Waterfront Facilities Inspection and Assessment |

# 1. Introduction

Foth Infrastructure & Environment, LLC (Foth) performed a comprehensive waterfront facilities inspection and assessment in accordance with ASCE Manual of Practice (MOP) No. 130, Second Edition of the Facility located at 4 Wright Street, New Bedford, MA. The Facility is currently owned by Massachusetts Clean Energy Commerce (MassCEC), however the bulkhead line and a portion of the structures are owned and maintained by the New Bedford Port Authority (NBPA).

This inspection was conducted as part of a Repair or Upgrade Design level effort per ASCE MOP 130 that is associated with the planned redevelopment of the existing bulkhead structure. The bulkhead structure is scheduled for partial demolition and replacement with a new pile-supported loading and offloading platform.

Because the existing bulkhead structure extends beyond the Shuster property limits and into adjacent parcels, a portion of the structure will remain in place to maintain shoreline continuity. To support project planning and provide a clear record of existing conditions, Foth performed a detailed inspection of the structures within the 4 Wright Street Facility limits. The inspection included documentation of observed deficiencies and structural anomalies for informational purposes and to establish a baseline condition record for both the facility owner and neighboring stakeholders.

Foth partnered with JF Brennan (Brennan) to perform the underwater inspection, including all dive operations and diver support. In addition to the above, Foth conducted a bathymetric survey and drone survey of the Facility to supplement the inspection and provide additional records of existing conditions. Brennan also performed a sector scan of the cofferdam cells for further documentation. These supplemental efforts are included as appendices to this report.

| | |
|---|---|
| Underwater (Dive) Inspection: | September 25, 2025 |
| Field Team: | Timothy Magalhaes, E.I.T. (Foth), 3 Divers (Brennan) |
| Topside (Above Water) Inspection: | September 26, 2025 |
| Field Team: | Timothy Magalhaes, E.I.T. (Foth), |
| | Mike Campagnone, P.E. (Foth) |
| Sector Scanning: | October 3, 2025 |
| Field Team: | 2 Crew Members (Brennan) |
| Drone Survey: | October 17, 2025 |
| Field Team: | Mike Campagnone, P.E. (Foth) |
| | Chase Rynkowski, E.I.T. (Foth) |

## 1.1 Purpose and Scope of Work

The purpose of this inspection and assessment is to document the existing conditions of the waterfront cellular cofferdam structures located along the 4 Wright Street Facility. These structures are planned for partial demolition and replacement with a new pile-supported loading and offloading platform. However, because the existing cofferdams extend beyond the property limits, a portion of the adjacent cofferdam system will remain in place. To ensure transparency and provide a record for both property owners, Foth performed a Repair or Upgrade Design level inspection in accordance with ASCE Manual of Practice No. 130, Second Edition.

This report specifically addresses the 4 Wright Street facility limits, which include:

- Major Cells: Cells #1, #2, and #3
- Minor Cells: Cells 1A, 2A, and 3A
- Upland Mooring Dolphin

The inspection focused on identifying and recording any visible deficiencies, structural anomalies, or deterioration within these cells. Findings are intended for informational purposes only and will serve as a baseline record for the facility owner and neighboring property stakeholders. A separate report will be prepared for the adjacent facility, which encompasses the remaining portion of the Cellular Cofferdam.

## 1.2 Description of Structures

The New Bedford Marine Commerce Terminal, located at 4 Wright Street in the southern waterfront industrial zone of New Bedford, Massachusetts, is a purpose-built heavy-lift facility supporting offshore wind and marine cargo operations. Positioned along the western bank of the New Bedford Harbor at approximately 41.624413° N, 70.915973° W, the site includes a Cellular Cofferdam bulkhead, upland laydown areas, and a single-story industrial structure.

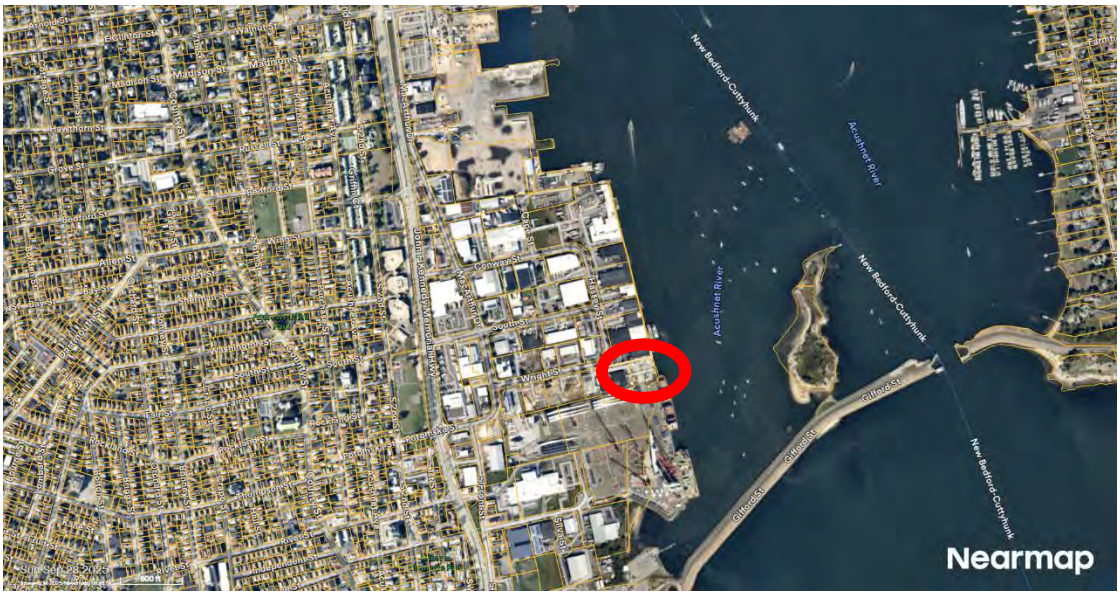



**Figure 1: Site Location Map**

### 1.2.1 Cellular Cofferdam Bulkhead

The Facility is constructed of a Cellular Cofferdam Bulkhead that consists of the following elements: steel sheet piles, reinforced concrete wall and platform, timber curb, cast steel single bitt mooring bollards, steel mooring cleats, fender system, and asphalt pavement upland surface.

There is a total of four (4) major Cells #1, 2, 3, and 4 in addition to three (3) minor Cells #1A, 2A, and 3A. Note that the Cells were labeled differently in previous inspection and repair drawings and were numbered continuously in lieu of minor Cells labeled as "A". Therefore Cell #1A would be Cell #2 and so forth.

These Cells extend approximately 195-linear feet along the existing bulkhead line. Each Cell is 54.11 feet in diameter with approximately 136 piles. The center to center of the Cells are approximately 62.92 feet. The center to center of the primary Cells to the intermediate Cells is half, 31.46 feet. The steel sheet piles are MP101, similar to PS27.5 flat sheet piles, driven to bedrock with an approximate top of sheet pile elevation of +1.5 feet Mean Lower Low Water (MLLW). Connected to the cellular cofferdam sheet piles is a set of MZ27 sheet piles that ties into the southern part of the facility. The more recently constructed South Terminal is also connected and tied into the south face of the MZ27 sheet piles. The weathered bedrock elevation varies and is estimated at approximately -32 feet MLLW.

Along the upland face of the Cells, approximately 10 feet from the interior face of the sheet piles lies a row of HP14x73 steel piles driven to bedrock. This element is fully buried. Atop of the HP, MP and MZ piles is a continuous reinforced concrete wall and platform that spans the full length of the bulkhead line. Per the original design drawings, the "L" shaped wall and platform is in total 12 feet wide by 8 feet high with gravel fill. The wall section is 2 feet wide at the top down to 3 feet wide at the bottom with various sizes of reinforcement. The platform section is 12 feet wide by 3 feet deep with various sizes of reinforcement. Reference Appendix F for additional details on the reinforced concrete wall and platform.

Along the perimeter of the reinforced concrete wall and platform is a 12-inch by 10-inch log curb. There is also a total of two (2) 35-ton single bitt cast steel bollards, and seven (7) cast steel cleats. The 35-ton bollards are 2 feet in diameter and approximately 3 feet 8.5 inches tall with four foundation bolts. The cleats are approximately 30 inches long by up to 5 inches wide with a 16.75 inch long by 6.5-inch-wide base plate anchored with two bolts.

The original design drawings indicate a timber fender system, however only a small portion of that system remains along the south face of the bulkhead. Otherwise, it has been replaced with rubber tire fenders. The rubber tires are connected to the face of the reinforced concrete wall with chains and anchors. The upland surface of the facility is constructed of asphalt pavement.

### 1.2.2 Upland Mooring Dolphin

An Upland Mooring Dolphin was installed during the South Terminal expansion and consists of 50-ton bollard supported by four (4) 9.625-inch diameter steel pipe micropiles. There are two plumb micropiles that are driven to bedrock and two battered micropiles that are driven into bedrock up to 7 feet. The bollard and micropiles are connected by a 12 feet 8 inches long by

6 feet wide up to 5 feet deep reinforced concrete cap. The concrete cap sits atop of the reinforced concrete platform associated with the Cellular Cofferdam Bulkhead.

## 1.3 Inspection and Repair History

There is a long history of inspections and repairs at this facility. Here is a timeline of the inspection and repairs:

**June 2021:** **Structural Inspection: Commercial Fishing Piers**

This report documents the inspection and assessment of marine infrastructure at municipally-owned piers in New Bedford and Fairhaven, as well as New Bedford's South Terminal. The purpose was to evaluate structural conditions in relation to projected sea level rise and flooding events.

The scope included Level 1–3 inspections of waterfront structures such as steel sheet pile bulkheads, cellular sheet pile cells, steel and timber piles, concrete piles, and timber fender systems. Underwater inspections were completed by Fathom Resources, LLC during December 2020 through February 2021, with topside inspections conducted in the same period. The report reflects observed conditions at the time of inspection and does not include repair recommendations.

More specifically Section 7. South Terminal Fish Houses was rated as Fair condition. The South Terminal bulkhead was found to have 73 through-holes in the steel sheet piling. The structure exhibited localized advanced deterioration but no immediate safety concerns. Sinkholes were observed behind the bulkhead, and areas adjacent to buildings were recommended to be investigated for potential subsurface voids that could affect structural integrity. Two specific areas required monitoring: Cell 44 (sheet separation at mudline) and Cells 5 through 7 (exposed sheet toes). Note these cells are labeled continuously and do not follow the major to minor cell labeling.

**September 2022:** **New Bedford Municipal Piers Fendering and Repairs**

The Cellular Cofferdams were repaired; specifically new rubber fenders were installed in addition to plate repairs to the steel sheet piles. The fender replacement was not performed along the Shuster Facility. See Appendix F for further information.

**January 2022:** **Shuster Bulkhead Conceptual Design**

At the request of the Massachusetts Clean Energy Center (MassCEC), Foth conducted a structural conceptual design to improve the loading capacity of the existing Shuster Bulkhead. Three design alternatives were evaluated for loading capacities of 500 psf, 2000 psf, and 4100 psf. Foth also performed a structural analysis of the existing cellular cofferdam for

a dredged elevation of -32 feet MLLW and a surcharge of 500 psf. The analysis addressed sliding, overturning, internal stability, interlock tension, and slipping between the cell and fill, using data from earlier field investigations.

The analysis concluded that the existing cofferdam could support a 500 psf surcharge with targeted rehabilitation, although the interlock safety factor at the junction piles was below the acceptable threshold and required improvement. Due to the proximity of the cofferdam's front face to the harbor line, oversheeting was deemed infeasible. Cell #4, located between the Shuster site and the adjacent property, was assumed to remain in all design scenarios.

For the higher loading scenarios of 2000 psf and 4100 psf, Foth recommended installing a combi-wall with rock anchors behind the cells, combined with a pile-supported concrete platform. This solution was determined to be the most cost-effective and constructable option to enhance the bulkhead's capacity to support increased loads.

**April 2022:** **Bollards and Cleats Evaluation**

Determined the remaining capacities of existing bollards and cleats are conservatively estimated to be within 60% to 70% of their original capacities. Therefore, the bollards have a remaining working capacity of 25 tons. It was also recommended that the existing bollards be replaced with 50-ton bollards. Additional evaluation of the concrete design, remaining capacity and quality of the concrete deck, and patching and repair of spalled and damaged concrete near the bollards were also recommended.

**September 2022:** **New Bedford Municipal Piers Fendering and Repairs**

The Cellular Cofferdams were repaired; specifically new rubber fenders were installed in addition to plate repairs to the steel sheet piles. These repairs were not performed along the Shuster Facility. See Appendix F for further information.

**December 2023:** **Shuster Sinkhole Inspection**

Foth completed an assessment of the bulkhead and determined it was in Poor condition, exhibiting significant deterioration and undermining of the steel sheet pile cells. The presence of holes and advanced corrosion indicated that the structure was nearing the end of its service life. A comparison of historical bathymetric data showed a loss of mudline elevation adjacent to the steel cells. This loss was likely caused by prop wash or subsidence, which appeared to have contributed to the formation of a sinkhole behind the bulkhead.

To mitigate further loss of fill material from within the steel cells, Foth recommended installing grout bags at the toe of the bulkhead and placing clear crushed stone within the sinkhole. These measures were intended to stabilize the area and prevent additional structural degradation.

**February 2024:** **Shuster Bulkhead Maintenance & Repairs**

Foth designed a repair package for the undermining and deterioration of the steel sheet pile cells. There were two repair area, one located between Cell#2 and #2A, and the other repair located between Cell #3 and #3A. The repairs included two types of repairs. Repair Type 1 was a steel plate formwork welded to the cells and interlocks extending to the bedrock then pumped with concrete through a pump port. Repair Type 2 included a continuous concrete bag block that was connected to the steel sheet piles with a pad eye welded to the sheet. The repairs were performed by Brennan.

**Ongoing - Routine:** **Bathymetric Surveys**

Foth has performed routine bathymetric surveys at the facility. The surveys indicate prop wash and loss of material along the toe of the Cells due to the tugboats berthing along the face of the bulkhead.

## 1.4 Methodology

The above and underwater inspection and assessment was performed in accordance with the scope of work and MOP 130, for a Repair or Upgrade Design Inspection. All commercial diving was conducted by a three-person dive team consisting of a dive supervisor, diver, and tender/backup diver in accordance with applicable Occupational Safety and Health Administration (OSHA), United States Coast Guard (USCG) regulations (29 CFR 1910 Subpart T and 46CFR197 Subpart B), and Association of Diving Contractors International (ADCI). In general, the dive inspection consisted of an in-water diver communicating to the Foth engineer who was stationed topside via two-way radio. The Foth engineer was able to view the underwater portion of the structure in real-time via closed-circuit video and direct the in-water diver during the investigations.

### 1.4.1 Levels of Inspection

According to MOP 130, there are three levels of inspection. Specifically for this routine inspection a Level I and Level II were performed. Levels of inspection are outlined below.

- Level I Effort: Includes a close visual examination above and underwater or a tactile examination using large sweeping motions of the hands where visibility is limited underwater. Although the Level I effort is often referred to as a swim by inspection, it must be detailed enough to detect obvious major damage or deterioration due to overstress or other severe deterioration. It should confirm the continuity of the full length of all members and system components and detect undermining or exposure of normally buried elements. A Level I effort may also include limited probing of the substructure and sounding of the adjacent mudline.

- Level II Effort: A detailed inspection above and underwater may require the removal of corrosion and/or marine growth from portions of the structure. Underwater marine growth removal is costly; hence, the inspection must be based on a representative sample of components. For piles, a 12-inch-high band should be cleaned at designated locations, generally near the low waterline, at the mudline, and midway between the low waterline and the mudline. On a rectangular pile, the marine growth removal should include at least three sides; on an octagonal pile, at least six sides; and on a round pile, at least three-fourths of the perimeter. On large-diameter piles, 3 ft or greater, 1 ft × 1 ft areas should be cleaned at four locations approximately equally spaced around the perimeter, at each elevation. On large solid-faced elements, such as retaining structures, 1 ft × 1 ft areas should be cleaned at these three elevations. The Level II effort should also focus on typical areas of weakness such as connections, attachment points, and welds. The Level II effort is intended to detect and identify damaged and deteriorated areas that may be hidden by surface biofouling, coating, or corrosion, or not be readily accessible for a Level I inspection effort. Marine growth removal should be governed by what is necessary to discern the condition of the underlying material. Removal of all biofouling staining is generally not required. Means and methods for the removal of biofouling growth are not typically defined in the scope of work. It may be appropriate for owners to specify particular methods on the basis of environmental and site conditions or concerns about maintaining the integrity of coating materials. Methods may include hand scrapers or mechanical systems ranging from high-pressure water blasters to barnacle busters and pressurized air bubble devices.
- Level III Effort: A detailed inspection above and underwater typically involving nondestructive or partially destructive testing conducted to detect hidden or interior damage or to evaluate material homogeneity. Typical inspection and testing techniques include the use of ultrasonic, coring, boring or resistance drilling, physical material sampling, and in situ hardness testing. Level III testing is generally limited to key structurally suspect areas or areas representative of the structure or system.

### 1.4.2 Element Level Damage Ratings

An element level damage rating was assigned to each structural element inspected during the investigation. The rating reflects the condition of the individual element only and is independent of the element's structural importance and the type of inspection being conducted. The damage rating varies per element, the general rating terms are as follows: (NI) Not Inspected, (ND) No Defects, (MN) Minor, (MD) Moderate, (MJ) Major, (SV) Severe. These ratings are based on MOP 130 element level ratings.

It is important to note that MOP 130 covers many elements, however if any specialty elements that are not outlined in MOP 130 and that fall within this inspection are up to the engineer's interpretation. The following elements were specifically referenced for this Repair or Upgrade Design Inspection based on the elements seen in the field.

- Timber Elements (MOP 130 Table 2-4 and Figure 2-2)
- Steel Elements (MOP 130 Table 2-5 and Figure 2-3)
- Reinforced Concrete Elements (MOP 130 Table 2-6 and Figure 2-4)

- Mooring System Elements (MOP 130 Tables 2-8 & 2-9 and Figures 2-6 through 2-9)
- Fender System Elements (MOP 130 Tables 2-10 through 2-13 and Figures 2-19 through 2-14)

### 1.4.3 Condition Assessment Ratings

Upon completion of the Repair or Upgrade Design Inspection and review of element level damage ratings post data processing, a condition assessment rating was assigned to the structural unit, groups of units, and overall facility. The condition assessment ratings are outlined below.

- **Good (6):** No visible or only minor damage was noted. Structural elements may show very minor deterioration, but no overstressing was observed. No repairs are required.
- **Satisfactory (5):** Limited minor to moderate defects or deterioration are observed, but no overstressing was observed. No repairs are required.
- **Fair (4):** All primary structural elements are sound, but minor to moderate defects or deterioration was observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure. Repairs recommended, but the priority of the recommended repairs are low.
- **Poor (3):** Advanced deterioration or overstressing was observed on the widespread portions of the structure but does not significantly reduce the load-bearing capacity of the structure. Repairs may need to be carried out with moderate urgency.
- **Serious (2):** Advanced deterioration overstressing, or breakage may have significantly affected the load- bearing capacity of primary structural components. Local failures are possible and loading restrictions may be necessary. Repairs may be carried out on a high-priority basis with urgency.
- **Critical (1):** Very advanced deterioration, overstressing or breakage has resulted in localized failure(s) of primary structure components. More widespread failures are possible or likely to occur, and load restrictions should be implemented as necessary. Repairs may need to be carried out on a very high priority basis with strong urgency.

### 1.4.4 Recommended Action Guidelines

Given this was a pre-construction and Repair or Upgrade Design Inspection for recording purposes only, recommendations were not included per ASCE MOP 130 Table 2-16, which outlines standardized action options based on observed conditions. These categories help prioritize response efforts and guide the client in planning appropriate follow-up actions:

- **Emergency Action:** Recommended when unsafe conditions are observed that pose immediate risks to life, property, or the environment. Actions may include closing access, unloading, or placing load restrictions.

- **Engineering Evaluation:** Recommended when significant damage or defects are identified that require further structural analysis to assess capacity or determine appropriate repair methods.
- **Structural Repair or Upgrade Design Inspection:** Recommended when repairs are clearly needed based on inspection findings. This may follow routine, special purpose, or post-event inspections.
- **Special Purpose Inspection:** Recommended to investigate unusual or advanced deterioration. May involve specialized testing, monitoring, or nonstandard techniques.
- **Repair Plans Development:** Recommended once sufficient field data has been collected and the structure is ready for repair design documentation.
- **No Action:** Recommended when the structure is in satisfactory condition and no further action is needed until the next scheduled inspection.

These action categories were not provided given the purpose of this inspection.

## 1.5 Methodology for Supplemental Activities

In addition to the visual and underwater inspections, several supplemental activities were performed to provide a comprehensive record of existing conditions. These activities included a bathymetric survey, sector scan imaging, and aerial drone survey. Each activity is summarized below:

### 1.5.1 Bathymetric Survey

Foth conducted a high-resolution bathymetric survey using a vessel-mounted multibeam echosounder system integrated with RTK GPS positioning and motion compensation sensors. The multibeam system provided full-bottom coverage of the nearshore area adjacent to the Shuster facility, capturing detailed depth data and bottom morphology. The survey was performed from a dedicated survey vessel equipped with a Teledyne Reson multibeam echosounder, Trimble RTK GNSS receiver for positioning, and an Applanix motion reference unit for heave, pitch, and roll corrections. Raw sonar data were processed using industry-standard hydrographic software such as Hypack and QPS Qimera to generate depth grids and contour maps referenced to Mean Lower Low Water (MLLW). The processed bathymetric data are presented in plan view and included in Appendix C.

### 1.5.2 Sector Scan Imaging

Brennan performed sector scan imaging from a dedicated survey vessel, independent of dive operations. The sector scan utilized a high-frequency scanning sonar system, such as the Kongsberg MS1000, mounted on a vessel-deployed tripod with controlled rotation to capture detailed imagery of the submerged cofferdam structures. This method produced high-resolution mosaics of the sheet pile walls, interlocks, and cell geometry, providing enhanced visualization in areas where water clarity limited diver observations. The sonar mosaics offer a baseline for future comparison and are included in Appendix D.

### 1.5.3 Aerial Drone Survey

Foth conducted an aerial drone survey to capture high-resolution imagery and video of the cofferdam structures and surrounding facility. The survey was conducted using a DJI Phantom 4 RTK drone equipped with a 20-megapixel camera and 4K video capability. RTK GNSS positioning ensured accurate georeferencing of all imagery. The drone survey provided an overhead perspective of the shoreline alignment, cofferdam geometry, and adjacent property interfaces. Imagery was processed to create orthomosaic maps and archived for record purposes. Drone survey results are included in Appendix E

# 2. Existing Conditions

The following section presents the observed existing conditions of the inspected structures. These observations are based on above- and underwater inspections conducted in accordance with the procedures outlined in ASCE MOP 130. All findings are presented factually and without interpretation or analysis. This section serves as the foundation for subsequent assessment and evaluation and includes only repeatable, observable data that would be verifiable by another qualified engineer. Documentation includes field notes, photographs, sketches, and video recordings where applicable.

The structure and sub-elements inspected include:

- Cellular Cofferdam
  - Steel Sheet Piles
  - Steel H-Piles
  - Reinforced Concrete Wall and Platform
  - Timber Curb
  - Cast Steel Single Bitt Mooring Bollards
  - Steel Mooring Cleats
  - Fender System
  - Asphalt Pavement and Backfill
- Upland Mooring Dolphin
  - Steel Pipe Micropiles
  - Reinforced Concrete Cap
  - Cast Steel Single Bitt Mooring Bollard

Each of these structures is presented in a dedicated subsection below, with observations organized by structural element and location.

## 2.1 Cellular Cofferdam Bulkhead

The following deficiencies were observed along the Cellular Cofferdam Bulkhead structure.

### 2.1.1 Steel Sheet Piles

The steel sheet piles generally exhibit typical deterioration found on steel sheet piles submerged in saltwater conditions.

Plate repair patches were observed throughout with no significant defects. All welds were intact, and signs of fill loss were not observed around the plate repairs. The toe of the sheets exhibit a layer of material with weathered stone or rock. The toe of the sheet piles is unknown unless explicitly stated. At the Cell junctions, there was a slight gap between the junction plates.

At Cell #2A, the toe of the sheet piles was exposed with undermining measuring up to 2 feet long by 14 inches high by up to 16 inches deep. The undermining was observed just beyond the previous steel plate toe repairs performed by Brennan.

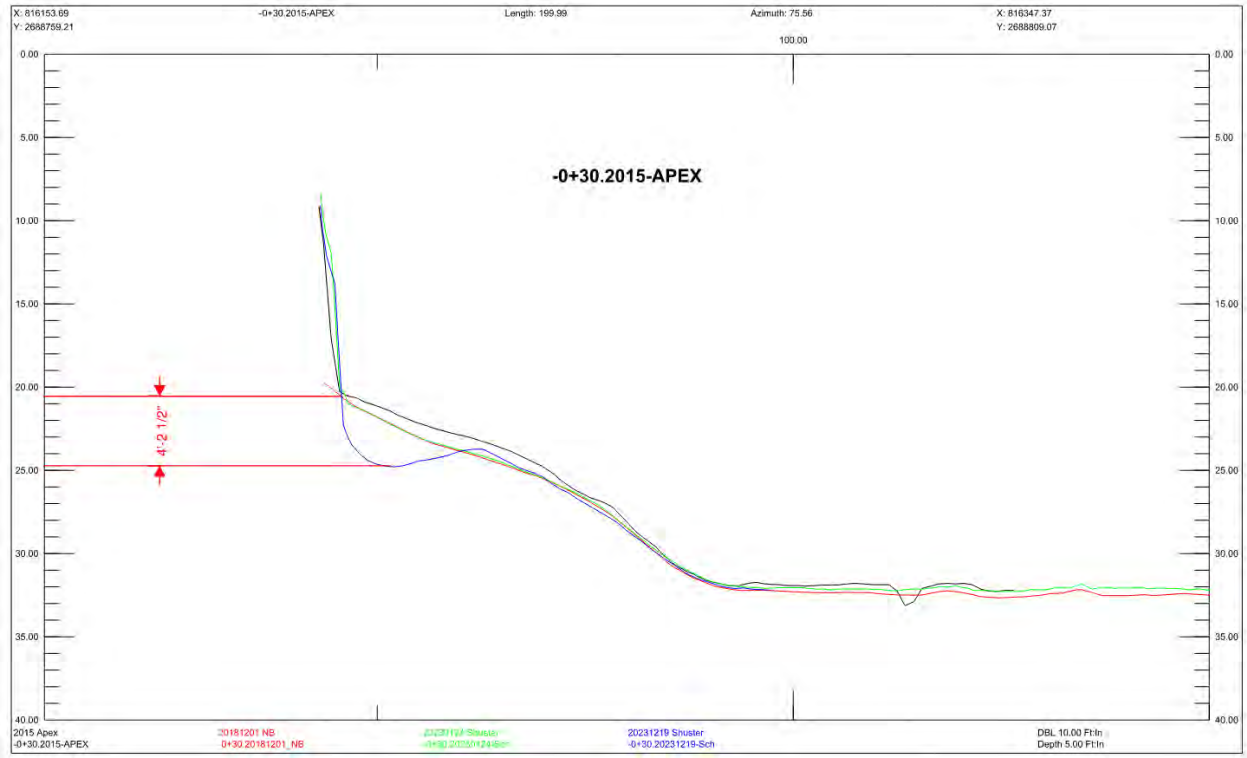



**Figure 2: 2023 Inspection Survey Comparison STA -0+30, Cell #4**

UT measurements were performed on the steel sheet piles using a Cygnus gauge. Due to equipment issues during the inspection, reliable readings could not be obtained at multiple elevations. Only one valid measurement was recorded at the mudline elevation. No readings were captured at mid-water or tidal zone levels.

**Table 1**
**UT Measurements, Cell #4**

| Location | Thickness (in.) | Recording (in.) | Section Loss (%) | Notes |
|---|---|---|---|---|
| **Cell #4, Sheet #13** | | | | |
| Tidal Zone | 0.40 | NR | N/A | Not recorded due to equipment issues. |
| Mid-Water | 0.40 | NR | N/A | Not recorded due to equipment issues. |
| Mudline | 0.40 | 0.38 | 5.0 | Taken at 31-ft below the water surface at the time of inspection. |

### 2.1.2 Steel H-Piles

The steel H-piles were fully buried and were not visible at the time of inspection.

### 2.1.3 Reinforced Concrete Wall and Platform

The reinforced concrete wall and platform exhibited general concrete weathering with localized areas of mechanical corner spalling that measured up to 12 inches long by 6 inches wide and up to 3 inches deep on the exposed faces. Hairline cracking was observed throughout. The spalls and cracks were typically seen near the cleats and fenders.

### 2.1.4 Timber Curb

The timber curb exhibits typical timber weathering with section loss up to 25 percent. No significant structural defects were observed.

### 2.1.5 Cast Steel Single Bitt Mooring Bollards

The single bitt mooring bollards exhibit typical signs of wear consistent with prolonged marine exposure. No protective coating was observed on the bollards, and scaling is present across the surface, particularly on the upper portions and around the base plate, leaving bare steel exposed. General surface corrosion is evident, with pitting throughout. The anchor bolts show signs rusting where visible. Additionally, signage located behind the bollard's states "No Docking," indicating restricted use or decommissioning of these mooring points.

### 2.1.6 Steel Mooring Cleats

The mooring cleats exhibit typical signs of wear consistent with prolonged marine exposure. No protective coating was observed on the bollards, and scaling is present across the surface, particularly on the upper portions and around the base plate, leaving bare steel exposed. General surface corrosion is evident, with pitting throughout. The anchor bolts show signs

rusting where visible. Additionally, signage located behind the bollard's states "No Docking," indicating restricted use or decommissioning of these mooring points.

### 2.1.7 Fender System

The fender system consists of multiple vertically suspended tires affixed to the bulkhead via chain assemblies. The majority of tires exhibit surface wear and abrasion consistent with routine berthing operations. Overall, the tires remain intact and in functional alignment.

A limited number of tires were observed with sagging chain connections. No visible signs of chain detachment, fracture, or loss of connection hardware were noted during the inspection.

There were no significant defects observed on the timber fendering locating along the south face of the bulkhead.

### 2.1.8 Asphalt Pavement

The asphalt pavement exhibited a pronounced surface depression, forming a sinkhole approximately 17 feet in length and 13 feet in width. The depth of the void could not be determined at the time of inspection. The affected area was cordoned off with temporary fencing. The sinkhole is in alignment with Cell #4A and corresponds with the position of previously documented undermining along the adjacent steel sheet pile wall.

Extensive surface water accumulation was observed across the upland area, encompassing the full pavement area. The pooling occurred during a heavy rainfall event and covered a substantial portion of the upland area.

## 2.2 Upland Mooring Dolphin

The following deficiencies were observed along the Upland Mooring Dolphin structure.

### 2.2.1 Steel Pipe Micropiles

The steel pipe micropiles were fully buried and were not visible at the time of inspection.

### 2.2.2 Reinforced Concrete Cap

The reinforced concrete cap exhibited no significant signs of cracking, spalling, delamination, or other surface-level deterioration. No structural defects were observed on the accessible top surface during the site visit.

### 2.2.3 Cast Steel Single Bitt Mooring Bollard

The single bitt mooring bollard exhibited no significant defects. Minor coating loss was noted along the lower portion of the bollard body. A vessel was actively moored to the bollard at the time of inspection.

# 3. Evaluation and Assessment

In accordance with the ASCE MOP 130; this section provides an engineering evaluation of the structures based on observed conditions. While the previous section documented physical deficiencies, this portion interprets those findings to assess the structural performance, functional reliability, and overall condition of each facility component.

The evaluation considers the severity, extent, and location of deterioration, as well as the potential implications for structural integrity, serviceability, and safety. This assessment forms the basis for prioritizing maintenance and repair needs and supports informed decision-making for asset management and capital planning.

## 3.1 Cellular Cofferdam

The Cellular Cofferdam is in overall **Poor** condition due to continued undermining of the sheet pile cells, which has resulted in recurring sinkholes along the upland side. Although previous repairs were made to address this undermining, the condition has continued to deteriorate, indicating that erosion and sinkhole formation will persist unless the full length of the cofferdam is repaired along the toe.

Recent bathymetric data also suggest that the ongoing propwash has caused an increase in erosion and segregation of sediment along the toe of the sheet pile cells consistent with the previous inspection.

Given that this section of the bulkhead is scheduled for demolition and replacement with a new pile-supported loading and offloading platform, the undermining and sinkhole have not been repaired. In the interim, the affected area is being monitored daily, and access has been restricted with fencing.

### 3.1.1 Steel Sheet Piles

The steel sheet piles are generally in **Poor** condition due to the observed undermining and scouring of the toes. The scour may be a result of prop wash and continuation of the scour may result in exposure of the steel sheet pile toes and potential continuation of undermining.

### 3.1.2 Steel H-Piles

A rating was not provided for the steel H-piles, given that they were fully buried and not observed during the inspection.

### 3.1.3 Reinforced Concrete Wall and Platform

The reinforced concrete wall and platform is generally in **Satisfactory** condition with minor to moderate rated cracking and mechanical spalling.

### 3.1.4 Timber Curb

The timber curb is generally in **Fair** condition due to moderate weathering of the timber with section loss up to 25 percent.

### 3.1.5 Cast Steel Single Bitt Mooring Bollards

The mooring bollards are generally in **Poor** condition due to the extensive corrosion and pitting, in addition to the signage located behind the bollard's stating "No Docking." This indicates restricted use or decommissioning of these mooring points.

### 3.1.6 Steel Mooring Cleats

The mooring cleats are generally in **Poor** condition due to the extensive corrosion and pitting, in addition to the signage located behind the bollard's stating "No Docking." This indicates restricted use or decommissioning of these mooring points.

### 3.1.7 Fender System

The rubber tire fenders are generally in **Fair** condition with moderate surface wear and sagging of chains. The timber fendering exhibited limited to no significant defects.

### 3.1.8 Asphalt Pavement

The asphalt pavement is generally in **Poor** condition due to the extensive sink hole located near Cell #4A and pooling of surface water.

## 3.2 Upland Mooring Dolphin

The Upland Mooring Dolphin was found to be in overall **Good** condition, with only minor coating loss on the bollard. At the time of inspection, the micropiles were buried and therefore could not be visually assessed.

This structure is scheduled for demolition, consistent with the planned removal of the adjacent cellular cofferdam.

### 3.2.1 Steel Pipe Micropiles

A rating was not provided for the steel pipe micropiles, given that they were fully buried and not observed during the inspection.

### 3.2.2 Reinforced Concrete Cap

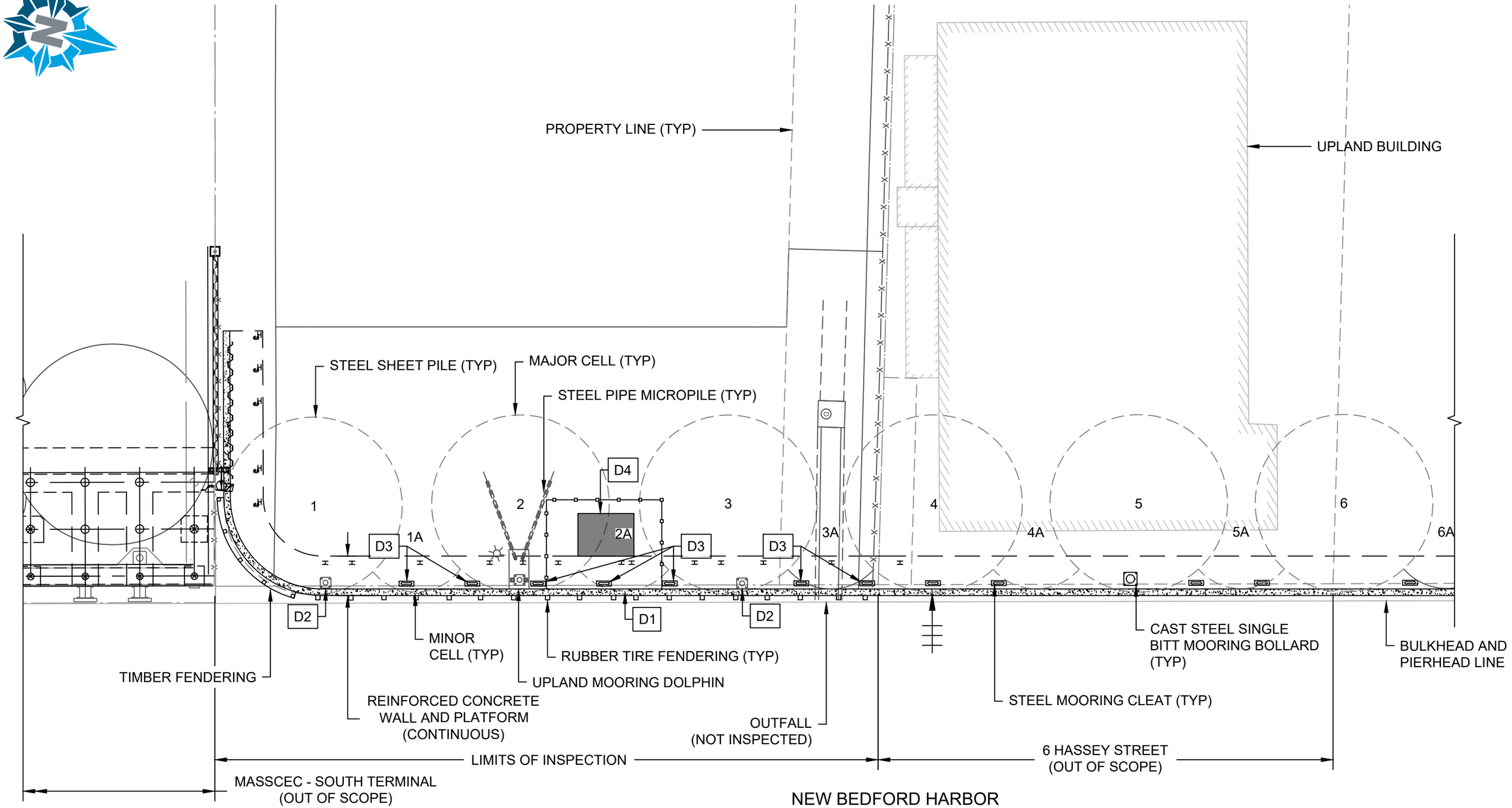
The reinforced concrete cap is generally in **Good** condition with no significant defects observed.

### 3.2.3 Cast Steel Single Bitt Mooring Bollard

The mooring bollard is generally in **Satisfactory** condition with only minor coating loss observed along the neck of the bollard.

# Appendix A

# Inspection Figures




NEW BEDFORD HARBOR

EBB

FLOOD

## LEGEND

D1 DEFECT NO. 1

LEVEL III (UT READING)

## INSPECTION NOTES

1. THIS INSPECTION WAS LIMITED TO 6 HASSEY STREET.
2. DIVE INSPECTION WAS PERFORMED ON SEPTEMBER 25, 2025.
3. TOPSIDE INSPECTION WAS PERFORMED ON SEPTEMBER 26, 2025.
4. D1 - UNDERMINING OF STEEL SHEET PILES.
5. D2 - COATING LOSS, CORROSION, AND PITTING OF MOORING BOLLARDS.
6. D3 - COATING LOSS, CORROSION, AND PITTING OF MOORING CLEATS.
7. D4 - SINKHOLE WITHIN ASPHALT SURFACE.

Foth

0 15 30

SCALE

# MASSCEC - 4 WRIGHT STREET

FIGURE 1

WATERFRONT FACILITIES INSPECTION AND ASSESSMENT
REPAIR OR UPGRADE DESIGN

| | | | |
|---|---|---|---|
| Date Completed: OCT. 2025 | | Revision Date: # | |
| Drawn By: TJM | Checked By: SRS | Project No: 24M070.04 | |

Wednesday, October 22, 2025 12:14:19 PM
DWG Filename: 0024m070.04_4 wright street_inspection.dwg Layout: figure 2
DWG Folder Location:

# Appendix B

# Photographic Log

# Photographic Log

| Client's Name: | Site Location: | Project No. |
|---|---|---|
| MassCEC | 4 Wright Street, New Bedford, MA | 0024M070.04 |

| Photo No. 1 | Date: 9/26/2025 |
|---|---|

**Direction Photo Taken:**
South

**Photo Taken By:**
T. Magalhaes

**Description:**

Overview of facility.



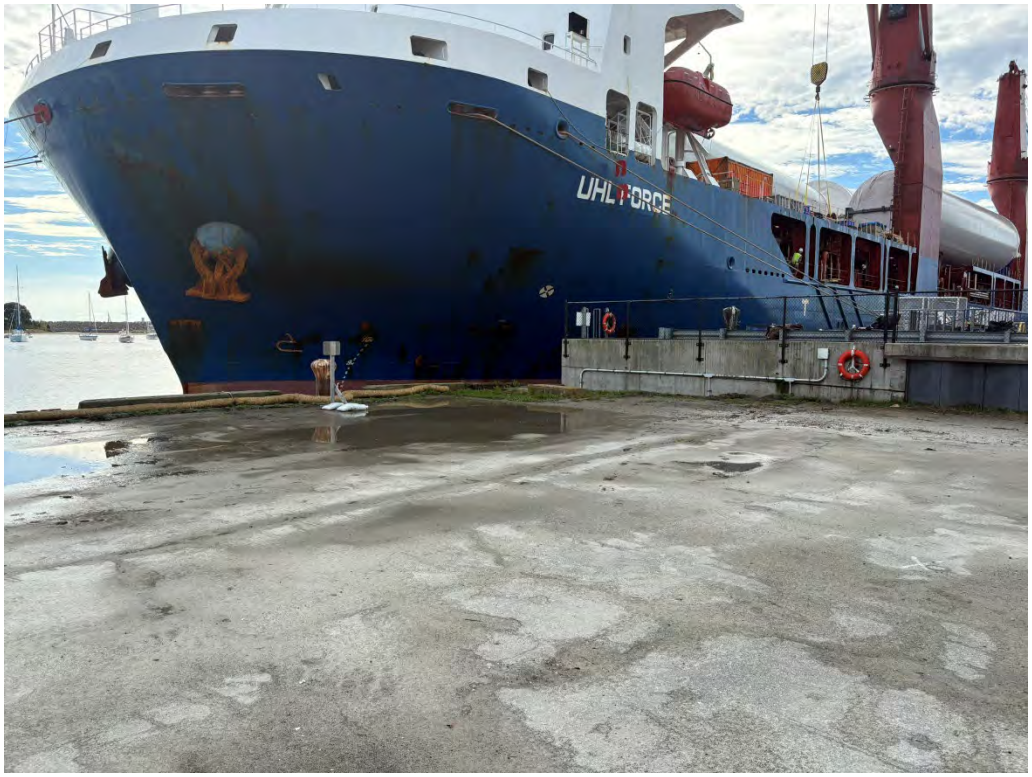
| Photo No. 2 | Date: 9/26/2025 |
|---|---|

**Direction Photo Taken:**
Southeast

**Photo By:**
T. Magalhaes

**Description:**

Typical pooling of water and overview of southeast corner of facility.



Foth

# Photographic Log

| Client's Name: | Site Location: | Project No. |
|---|---|---|
| MassCEC | 4 Wright Street, New Bedford, MA | 0024M070.04 |

| Photo No. 3 | Date: 9/26/2025 |
|---|---|

**Direction Photo Taken:**
Northeast

**Photo Taken By:**
T. Magalhaes

**Description:**

Overview of facility and sinkhole.



| Photo No. 4 | Date: 9/25/2025 |
|---|---|

**Direction Photo Taken:**
Southwest

**Photo By:**
T. Magalhaes

**Description:**

Overview of southeast corner of reinforced concrete wall and fendering, with mooring bollard and cleat. Water pooling upland.



# Photographic Log

| Client's Name: | Site Location: | Project No. |
|---|---|---|
| MassCEC | 4 Wright Street, New Bedford, MA | 0024M070.04 |

| Photo No. 5 | Date: 9/25/2025 |
|---|---|

**Direction Photo Taken:**
Northwest

**Photo Taken By:**
T. Magalhaes

**Description:**

Overview of water pooling throughout facility site.



| Photo No. 6 | Date: 9/25/2025 |
|---|---|

**Direction Photo Taken:**
South

**Photo By:**
T. Magalhaes

**Description:**

Overview of fendering system, rubber tires throughout.



Foth

# Photographic Log

| Client's Name: | Site Location: | Project No. |
|---|---|---|
| MassCEC | 4 Wright Street, New Bedford, MA | 0024M070.04 |

| Photo No. 7 | Date: 9/26/2025 |
|---|---|

**Direction Photo Taken:**
Southeast

**Photo Taken By:**
T. Magalhaes

**Description:**

Southeast corner of recently constructed South Terminal loading platform.



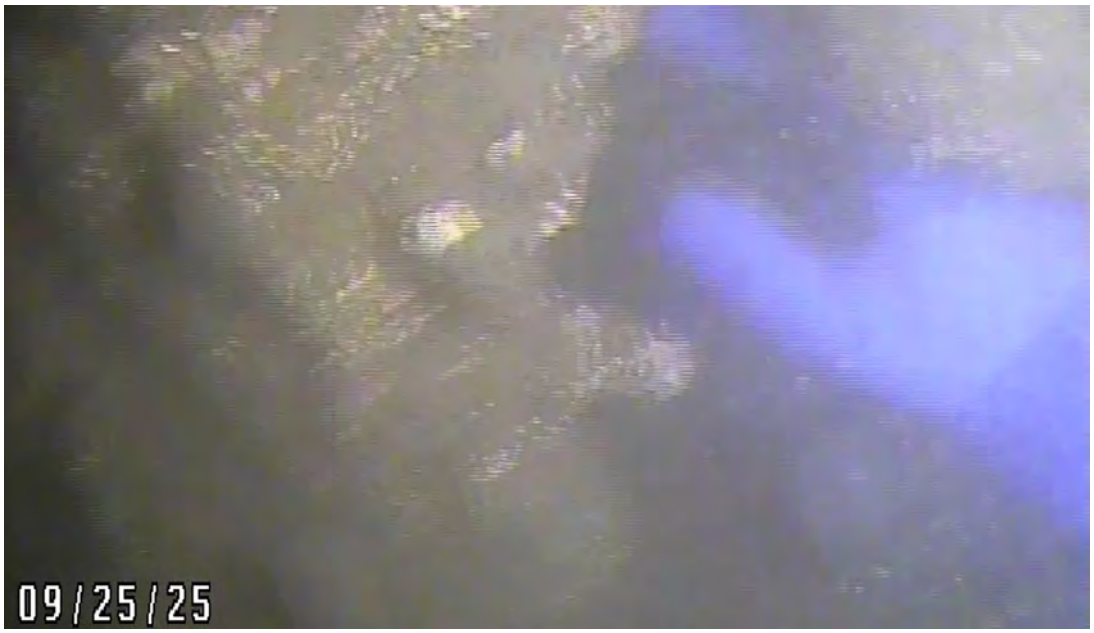
| Photo No. 8 | Date: 9/25/2025 |
|---|---|

**Direction Photo Taken:**
West

**Photo By:**
JF Brennan

**Description:**

Undermining of Cell #4A.



Foth

# Photographic Log

| Client's Name: | Site Location: | Project No. |
|---|---|---|
| MassCEC | 4 Wright Street, New Bedford, MA | 0024M070.04 |

| Photo No. 9 | Date: 9/25/2025 |
|---|---|

**Direction Photo Taken:**
West

**Photo Taken By:**
JF Brennan

**Description:**

Undermining of Cell #4A.




| Photo No. 10 | Date: 9/25/2025 |
|---|---|

**Direction Photo Taken:**
West

**Photo By:**
JF Brennan

**Description:**

Undermining of Cell #4A.



Foth

# Photographic Log

| Client's Name: | Site Location: | Project No. |
|---|---|---|
| MassCEC | 4 Wright Street, New Bedford, MA | 0024M070.04 |

| Photo No. 11 | Date: 9/26/2025 |
|---|---|

**Direction Photo Taken:**
East

**Photo Taken By:**
T. Magalhaes

**Description:**

Overview of sinkhole located at Cell #4A.



| Photo No. 12 | Date: 9/26/2025 |
|---|---|

**Direction Photo Taken:**
Southeast

**Photo By:**
T. Magalhaes

**Description:**

Southeast mooring bollard with coating loss, corrosion and pitting throughout. Sign indicating "No Mooring."



Foth

# Photographic Log

| Client's Name: | Site Location: | Project No. |
|---|---|---|
| MassCEC | 4 Wright Street, New Bedford, MA | 0024M070.04 |

| Photo No. 13 | Date: 10/15/2025 |
|---|---|

**Direction Photo Taken:**
West

**Photo Taken By:**
C. Flynn

**Description:**

Typical mooring cleat with coating loss, corrosion and pitting throughout.



| Photo No. 14 | Date: 10/15/2025 |
|---|---|

**Direction Photo Taken:**
Southeast

**Photo By:**
C. Flynn

**Description:**

Overview of timber curb with minor to moderate weathering.



Foth

# Photographic Log

| Client's Name: | Site Location: | Project No. |
|---|---|---|
| MassCEC | 4 Wright Street, New Bedford, MA | 0024M070.04 |

| Photo No. 15 | Date: 9/26/2025 |
|---|---|

**Direction Photo Taken:**
West

**Photo Taken By:**
T. Magalhaes

**Description:**

Typical timber fendering with minor weathering and deterioration along south face of cellular cofferdam bulkhead.



| Photo No. 16 | Date: 10/15/2025 |
|---|---|

**Direction Photo Taken:**
East

**Photo By:**
C. Flynn

**Description:**

Overview of Upland Mooring Dolphin and signage.

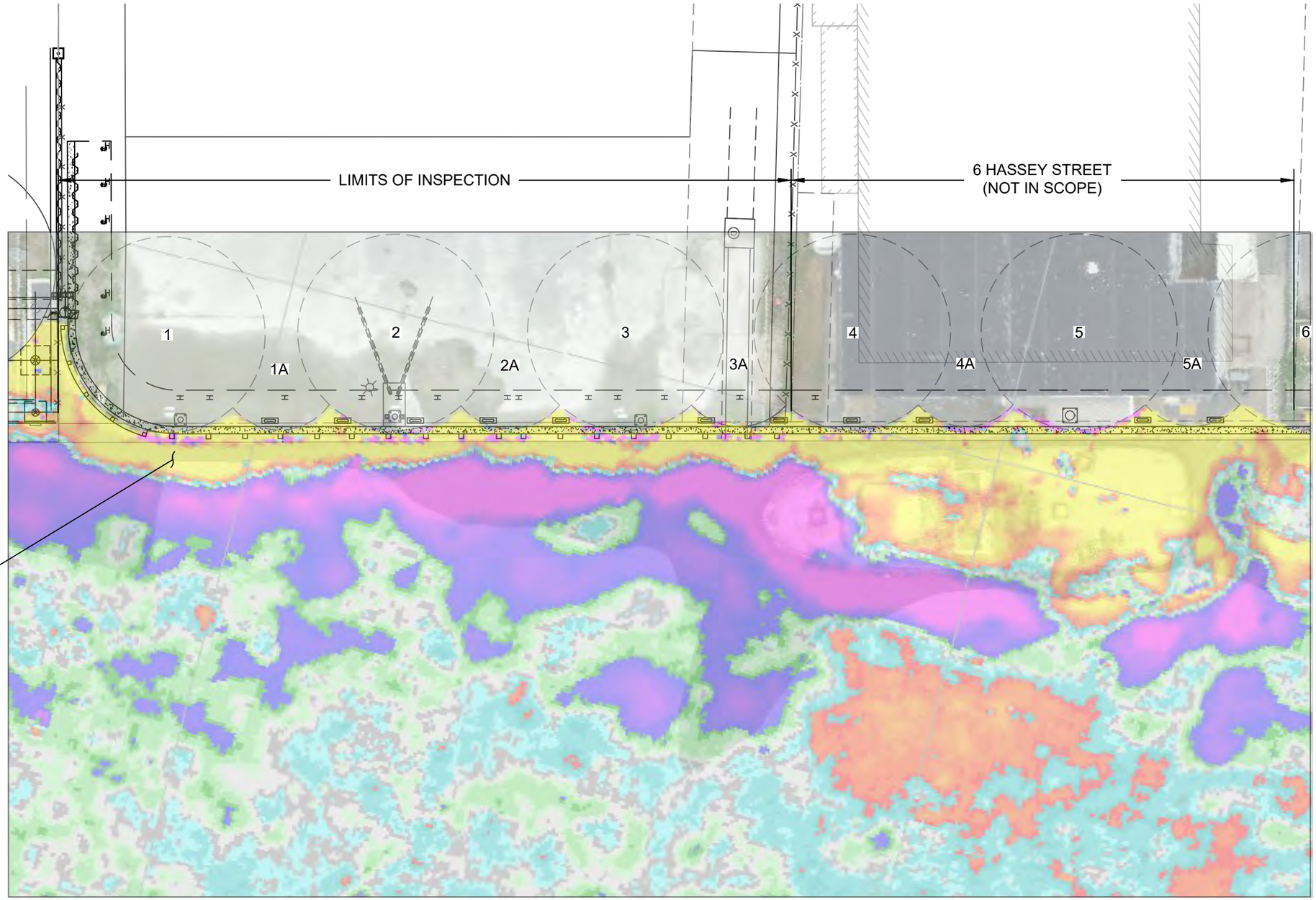


# Appendix C

# Bathymetric Survey Difference Plot, 2023 vs 2025

LEGEND

- < -1.00 (CUT)
- -0.90 TO -0.81
- -0.70 TO -0.61
- -0.50 TO -0.41
- -0.30 TO -0.26
- -0.20 TO -0.11
- -0.05 TO -0.01
- 0.05 TO 0.09
- 0.20 TO 0.24
- 0.30 TO 0.39
- 0.50 T0 0.59
- 0.70 TO 0.79
- 0.90 TO 0.99 (FILL)




NOTE

This bathymetric difference plot is based on comparative analysis of hydrographic survey data collected in January 2023 and September 2025. The data sets were acquired under differing environmental and operational conditions, and may be subject to inherent variability in positioning, tide correction, and sounding density. Apparent changes in elevation may reflect actual seabed movement (e.g., scour or deposition), survey tolerances, or a combination thereof. This plot is intended for general assessment purposes only and should not be used as the sole basis for design, construction, or navigation decisions. Further site-specific investigation is recommended to confirm critical findings.

NEW BEDFORD HARBOR

EBB

FLOOD

Foth

0 15 30

SCALE

**MASSCEC - 4 WRIGHT STREET**

FIGURE 1

BATHYMETRIC SURVEY DIFFERENCE PLOT
2023 VS 2025

| | | | |
|---|---|---|---|
| Date Completed: OCT. 2025 | | Revision Date: # | |
| Drawn By: TJM | Checked By: MC | Project No: 24M070.04 | |

Wednesday, October 22, 2025 12:18:13 PM
DWG Filename: 0024m070.04_4 wright street_survey difference plot.dwg Layout: figure 1
DWG Folder Location:

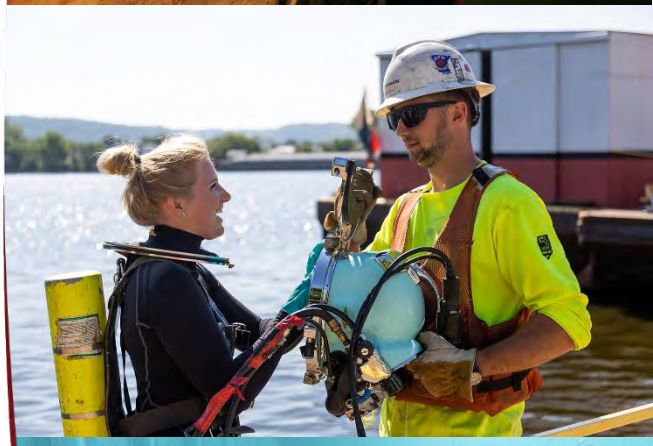
# Appendix D

# Sector Scanning Mosaic Images, Prepared by JF Brennan

Marine Professionals Since 1919
BRENNAN



# UNDERWATER DIVE INSPECTION REPORT



Prepared for:

Foth



Owner: **Marine Commerce Terminal (MCT)**
Structure: **Sheet Pile Cell Dock Wall**
Location: **New Bedford, Massachusetts**
Waterway: **Acushnet River**
Inspection Date: **September 25 & October 3, 2025**




Prepared by:
**J.F. Brennan Company, Inc.**
818 Bainbridge Street
La Crosse, WI 54603
Phone: 608.784.7173
jfbrennan.com


ADCI

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bsi
ISO 9001 Quality Management Systems CERTIFIED FS 719120
ISO 14001 Environmental Management CERTIFIED EMS 719118
ISO 45001 Occupational Health and Safety Management CERTIFIED OHS 719119

# Table of Contents

Project Recap ..... 1
Appendix A – Sector Scans ..... A1
Appendix B – Photographs ..... B1

**Disclaimer:** The information provided herein is for the limited administrative and operational use of Foth and their contractors. Other requests for this document shall be referred to J.F. Brennan Company, Inc. The accuracy of the information provided is limited by the conditions of the site during the day of the inspection.

# Project Recap

| | |
|---|---|
| *Project:* | New Bedford Dock Wall underwater Dive and Sector Scan Inspection. |
| *Scope of Work:* | Brennan will provide commercial diving services to inspect approximately 340 LF of steel sheet pile cells extending to a depth of 30 FSW. The objective of this Level I inspection is to assess the overall condition of the sheet pile walls and identify any areas of deterioration, section loss, or damage requiring further attention. |
| *1. Dive Inspection Team: (09/25/2025)* | Dive Supervisor: Tony Ramella<br>Diver/Tender: Chris Drozell<br>Diver/Tender: Glenn Hutchins<br>Diver/Tender: Steve Bennett<br>Project Manager: Nathan Fontaine |
| *2. Sector Scan Inspection Team: (10/03/25)* | Sector Scan Operator: Sean McMullen<br>Boat Operator/Tender: Tony Ramella<br>Project Manager: Nathan Fontaine |
| *Foth Contacts:* | Scott Skuncik<br>Tim Magalhaes |
| *Weather:* | 9/25: Cloudy, HI 72°F Lo: 70°F, 13.05 mph S winds.<br>10/3: Sunny, Hi: 70°F Lo: 63°F, 10.56 mph SW winds. |
| *Water Visibility:* | Good, 5-feet +. |
| *Site Location:* | Marine Commerce Terminal<br>6 Hassey St.<br>New Bedford, MA 06057 |
| *Access:* | Embankment. |
| *Dive Mode:* | Surface supplied, via mobile station. All dives were conducted in accordance with Brennan's Safe Diving Practices Manual as well as all pertinent ADCI, OSHA, and USCG regulations. Additionally, all dives adhered to the dive schedules and decompression tables outlined in the U.S. Navy Dive Manual, Rev. 7. |
| *Sector Scan Type:* | Kongsberg Single Beam 1171 Sonar. The scanning sonar transmits sound waves through the water column that are then reflected to the sensor and are then processed into the images you will see in this report. The sonar waves also reflect off air bubbles and sediment in the water column which the computer cannot differentiate from the item being imaged, this may cause the image to appear cloudy. Additionally, high flows have a higher than usual amount of air bubbles and sediment in the water column which may magnify this issue. Through the operation of the system and post-processing the effects are minimized to the extent possible but may still be visible. |
| *Gage Height:* | N/A, there was no USGS River Gauge in New Bedford, MA. |
| *Discharge:* | N/A, there was no USGS River Gauge in New Bedford, MA. |
| *Condition Assessment:* | Satisfactory. |
| *Brennan Repair Rating:* | Low. |

*Summary of Findings:*

- Dive Inspection:
  - The dive inspection was performed with a Foth representative onboard the dive boat. This individual directed and took notes for the underwater inspection. All notes were retained with that individual. However, the dive videos from that inspection can be found here (please see below).
    - *To view/download the footage from the inspection, please follow the instructions below. The SharePoint site will remain active for 30 days, during this period please download the files if you want to keep them for your records. After the 30-day period, the site will be removed, and you will no longer be able to access the videos through the SharePoint link.
      - Foth, New Bedford Dock Wall (Click and follow link directly. Your email address must have been given access for you to open the folder. If you do not have access and need it, please reach out so we can get your email address added.).

- Sector Scan:
  - Please see 'Appendix A, Sector Scan 1', for an overall view of the Dock Wall.
  - Please see 'Appendix A, Sector Scan 2' for water depths throughout the New Bedford Dock Wall.
  - Please see 'Appendix B, Figures 1 – 3' for a typical view of the sheeting.
    - Moderate to heavy marine growth was observed throughout, along with minor surface rust.
  - Please see 'Appendix B, Figures 4 & 5' for a typical view of the adherent material.
    - Prop wash appears to have exposed more of the adherent material on which the Cells sheeting was driven.
  - Overall:
    - The Sector Scan inspection showed no evidence of any major holes, splits, and/or broken knuckles throughout the Cells.
      - Please consult the dive inspection report for a more in-depth inspection of the structures that made up the New Bedford Dock Wall.
    - The Sector Scan inspection showed no evidence of any major undermining or not fully driven sheets to the Cells.
      - Please consult the dive inspection report for a more in-depth inspection of the structures that made up the New Bedford Dock Wall.
  - Cell 1: See 'Appendix A, Sector Scan 3'.
    - There were no signs of undermining to the sheets.
    - Adherent Material Height, Location 1: 8.5-feet.
    - Adherent Material Height, Location 2: 7.6-feet.
  - Cell 1A: See 'Appendix A, Sector Scan 4'.
    - There were no signs of any split and/or broken knuckles.
    - There were no signs of undermining to the sheets.
    - Adherent Material Height, Location 1: 8.9-feet.
    - Adherent Material Height, Location 2: 7.4-feet.
  - Cell 2: See 'Appendix A, Sector Scan 5'.
    - There were no signs of any split and/or broken knuckles.
    - There were no signs of undermining to the sheets.
    - Adherent Material Height, in General: 3.0-feet.
  - Cell 2A: See 'Appendix A, Sector Scan 6'.
    - There were no signs of any split and/or broken knuckles.
    - There were no signs of undermining to the sheets.
    - Adherent Material Height, in General: 7.1-feet.
  - Cell 3: See 'Appendix A, Sector Scan 7'.
    - There were no signs of any split and/or broken knuckles.
    - There were no signs of undermining to the sheets.
    - Adherent Material Height, in General: 11.1-feet.
    - Adherent Material Height, Location 1: 8.2-feet tall by 7.0-feet wide.
  - Cell 3A: See 'Appendix A, Sector Scan 8'.

        - There were no signs of any split and/or broken knuckles.
        - There were no signs of undermining to the sheets.
        - Adherent Material Height, in General: 11.8-feet.
    - Cell 4: See 'Appendix A, Sector Scan 9'.
        - There were no signs of any split and/or broken knuckles.
        - There were no signs of undermining to the sheets.
        - Adherent Material Height, in General: There was not a significant amount of adherent material at this location.
    - Cell 4A: See 'Appendix A, Sector Scan 10'.
        - There were no signs of any split and/or broken knuckles.
        - There were no signs of undermining to the sheets.
        - Adherent Material Height, in General: 9.9-feet.
        - Adherent Material Height, Location 1: 8.7-feet tall by 9.9-feet wide.
    - Cell 5: See 'Appendix A, Sector Scan 11'.
        - There were no signs of any split and/or broken knuckles.
        - There were no signs of undermining to the sheets.
        - Adherent Material Height, in General: 7.4-feet.
        - Adherent Material Height, Location 1: 5.2-feet tall by 14.3-feet wide.
    - Cell 5A: See 'Appendix A, Sector Scan 12'.
        - There were no signs of any split and/or broken knuckles.
        - There were no signs of undermining to the sheets.
        - Adherent Material Height, in General: 6.7-feet.
    - Cell 6: See 'Appendix A, Sector Scan 13'.
        - There were no signs of any split and/or broken knuckles.
        - There were no signs of undermining to the sheets.
        - Adherent Material Height, in General: 4.6-feet.

*Summary of Recommendation:*

- Continue to inspect the New Bedford Dock Wall, by use of ROV and/or Sector Scan, on a regularly scheduled basis. We then recommend inspecting the Dock Wall, using a Diver, if we notice any of the following situations: new deficiencies, the growth of deterioration to previously found deficiencies, debris buildup, and/or on the regularly scheduled intervals directed by the PM's schedule.

## Brennan Condition Assessment

**Good:** No visible or only minor sporadic defects or deterioration. The “Brennan Repair Rating” is low.

**Satisfactory:** Limited minor to moderate defects or deterioration. The “Brennan Repair Rating” is low.

**Fair:** Minor to moderate defects or deterioration on widespread portions. Localized areas of moderate to advanced defects or deterioration may be present. The “Brennan Repair Rating” is low to moderate.

**Poor:** Moderate to advanced defects or deterioration on widespread portions. The “Brennan Repair Rating” is moderate.

**Serious:** Advanced defects or deterioration on widespread portions. Localized failures are possible. The “Brennan Repair Rating” is moderate to major.

**Critical:** Heavily advanced defects or deterioration have resulted in localized failure(s). More widespread failures are possible if corrective action is not taken. The “Brennan Repair Rating” is major.

## Brennan Repair Rating

Low: Repairs may have been recommended, but repair priority is low. At a minimum, we recommend continuing to monitor these defects or deteriorated areas within their upcoming routine inspections.

Moderate: We recommend repair talks begin and executed when possible. The observed defects or deterioration could affect the overall functionality of the structure(s).

Major: We consider the repair priority to be urgent, and repairs should be made as soon as possible.

*The Brennan Condition Assessment and Repair Ratings are considered opinions based on inspection findings of the specific inspected structure(s) and at the time of inspection. Company safety plans and/or any applicable industry regulations regarding these structure(s) should always be followed.

We appreciate the opportunity to work with Foth on this project. If you have any questions or concerns regarding the information in this report or if Brennan can be of any further assistance, please do not hesitate to reach out using the contact information below.

Respectfully submitted,

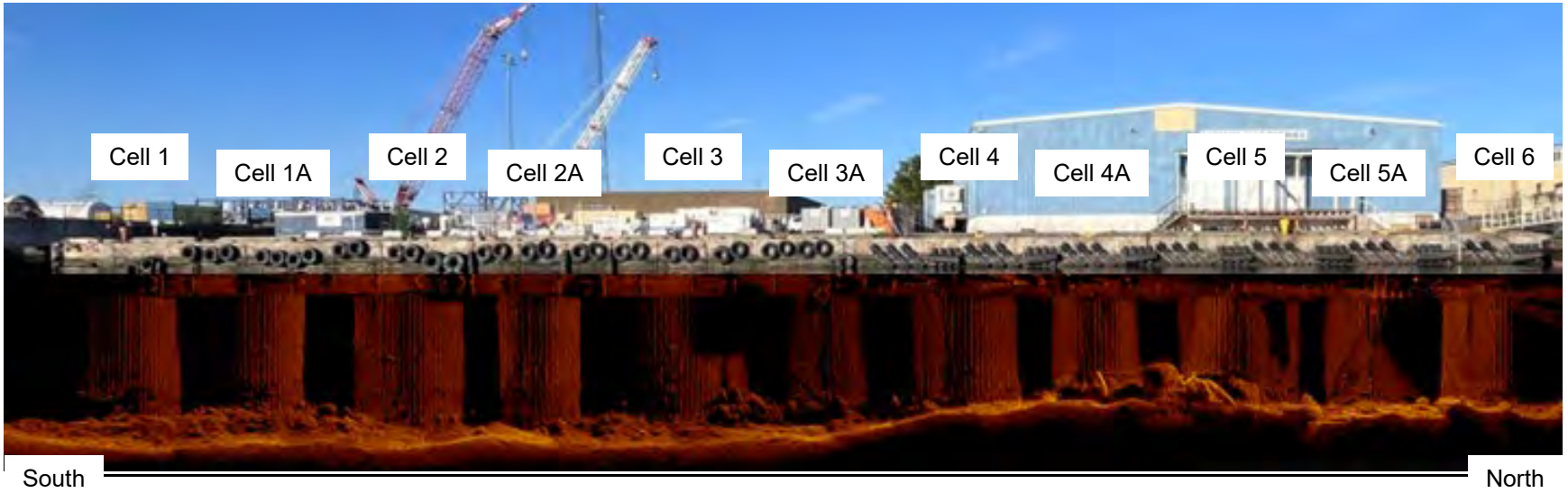


**Joe Baldoni**
Underwater Services- Underwater Inspection Program Supervisor
*cell* 608.799.5952
jbaldoni@jfbrennan.com

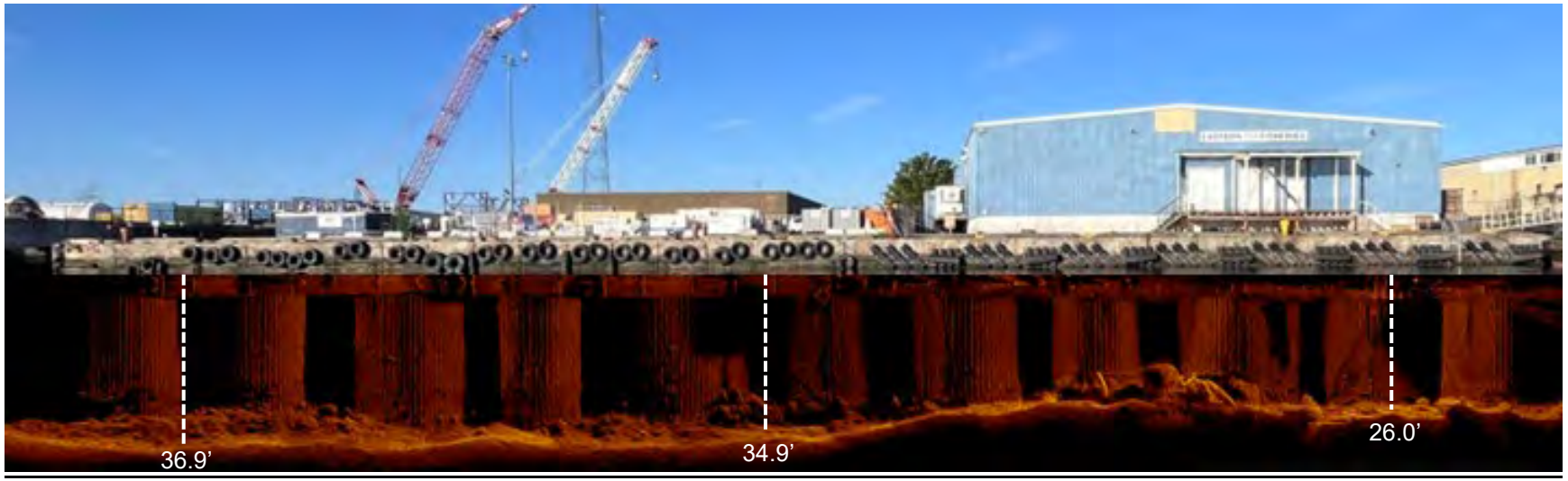
# Appendix A – Sector Scans

## List of Sector Scans

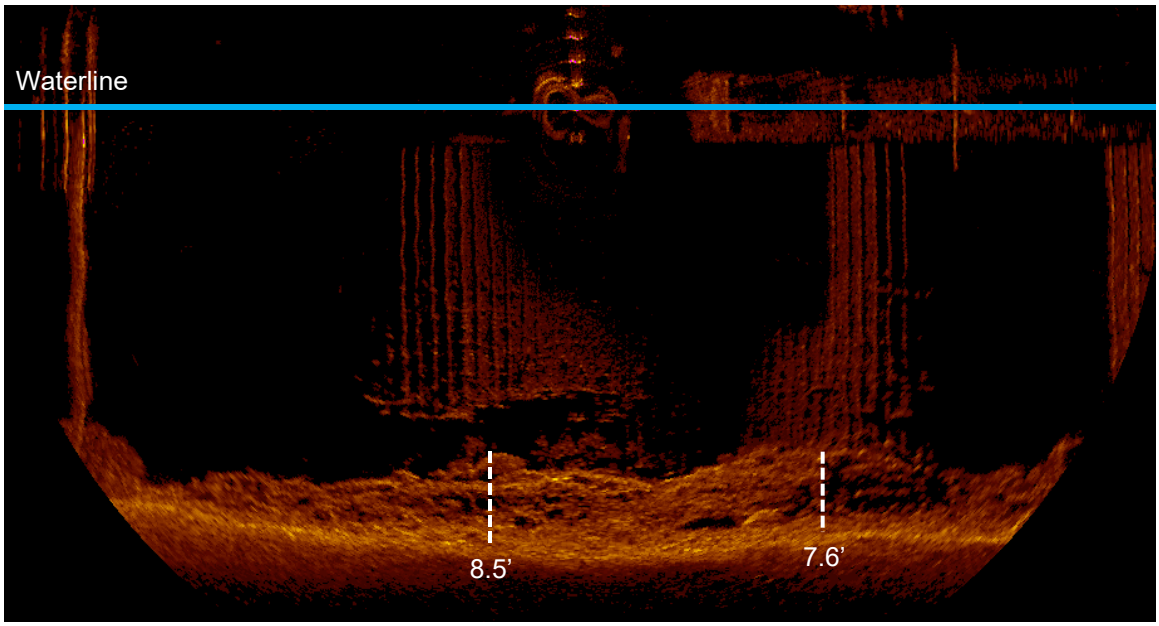
Sector Scan 1 – New Bedford Dock Wall: Overall ..... A2
Sector Scan 2 – New Bedford Dock Wall: Water Depths ..... A2
Sector Scan 3 – Cell 1: Adherent Material Measurements ..... A3
Sector Scan 4 – Cell 1A: Adherent Material Measurements ..... A3
Sector Scan 5 – Cell 2: Adherent Material Measurements ..... A4
Sector Scan 6 – Cell 2A: Adherent Material Measurements ..... A4
Sector Scan 7 – Cell 3: Adherent Material Measurements ..... A5
Sector Scan 8 – Cell 3A: Adherent Material Measurements ..... A5
Sector Scan 9 – Cell 4: Adherent Material Measurements ..... A6
Sector Scan 10 – Cell 4A: Adherent Material Measurements ..... A6
Sector Scan 11 – Cell 5: Adherent Material Measurements ..... A7
Sector Scan 12 – Cell 5A: Adherent Material Measurements ..... A7
Sector Scan 13 – Cell 6: Adherent Material Measurements ..... A8



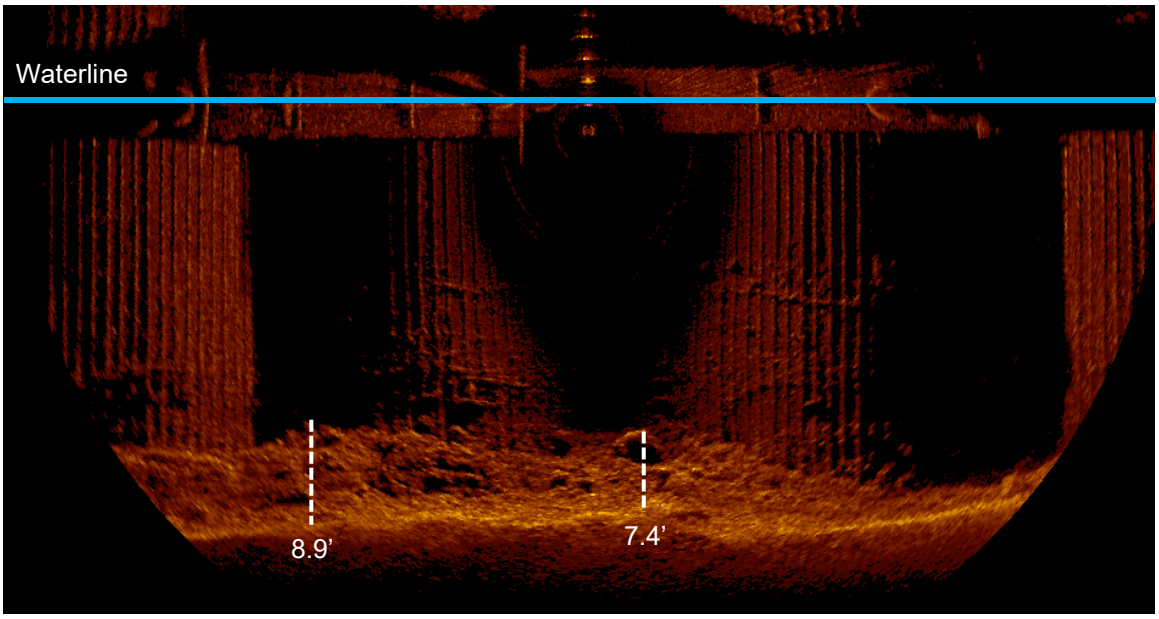

*Sector Scan 1 – New Bedford Dock Wall: Overall*



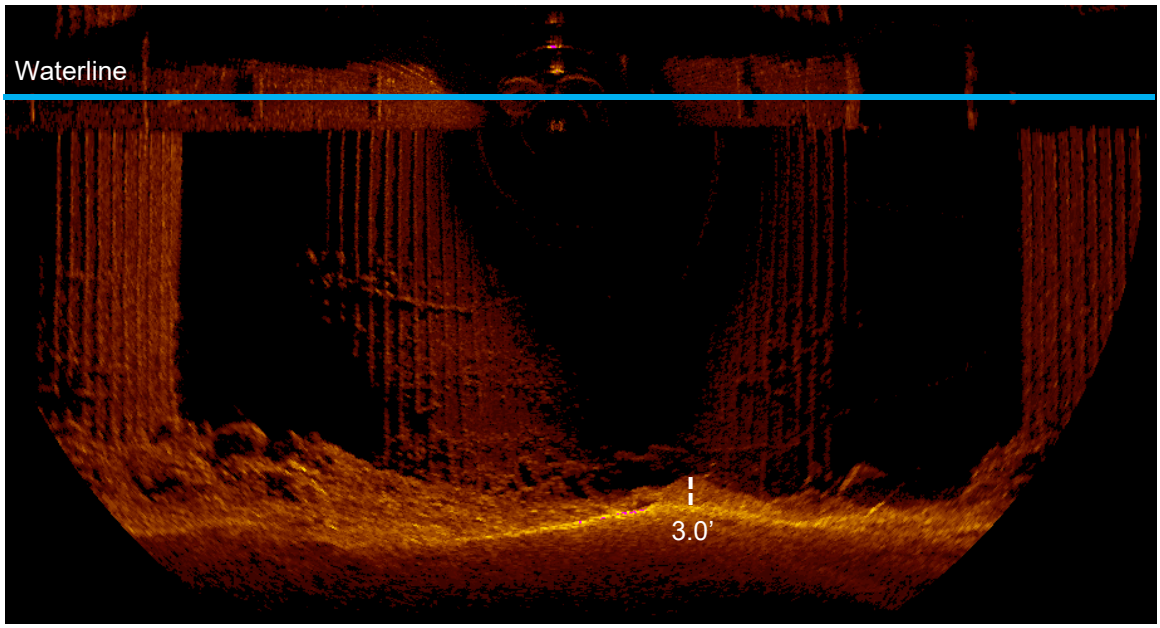

*Sector Scan 2 – New Bedford Dock Wall: Water Depths*



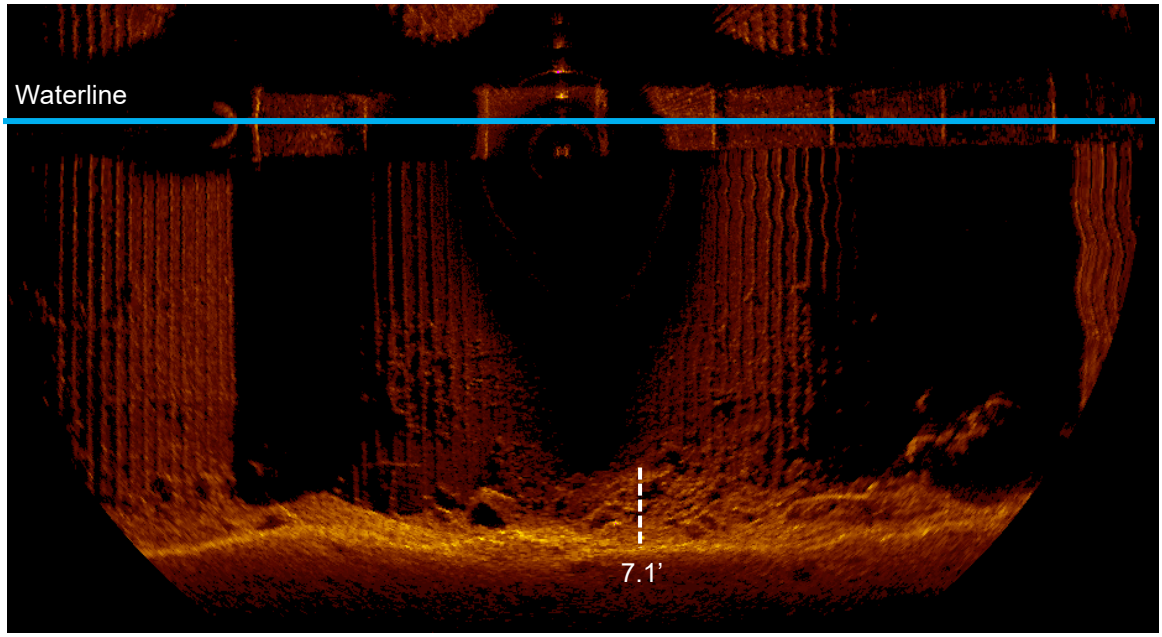

*Sector Scan 3 – Cell 1: Adherent Material Measurements*



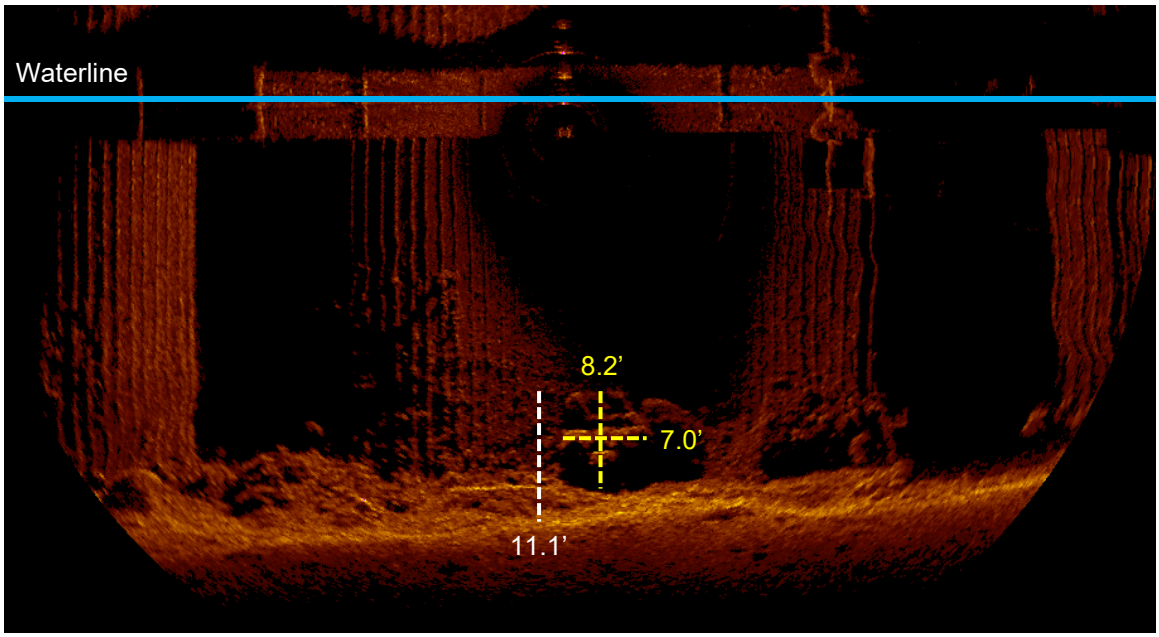

*Sector Scan 4 – Cell 1A: Adherent Material Measurements*



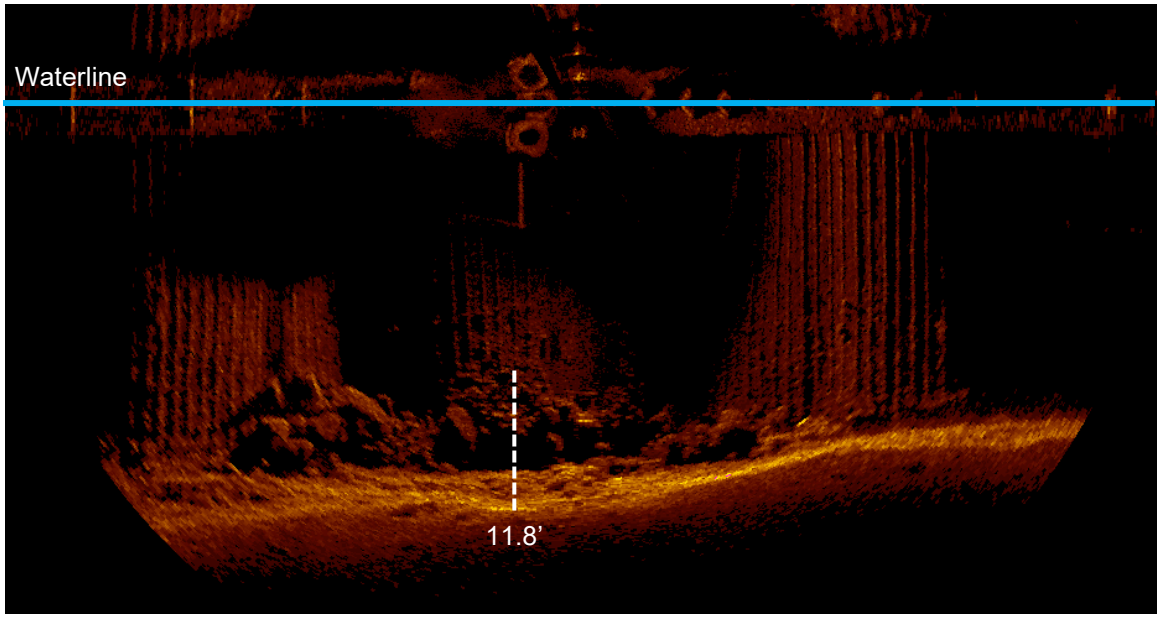

*Sector Scan 5 – Cell 2: Adherent Material Measurements*



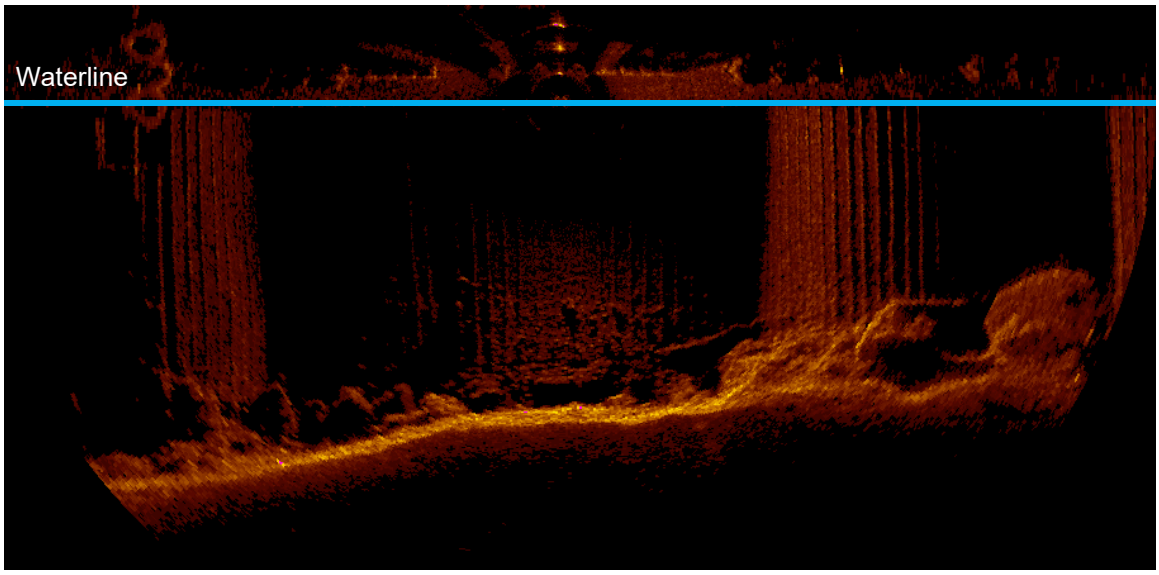

*Sector Scan 6 – Cell 2A: Adherent Material Measurements*



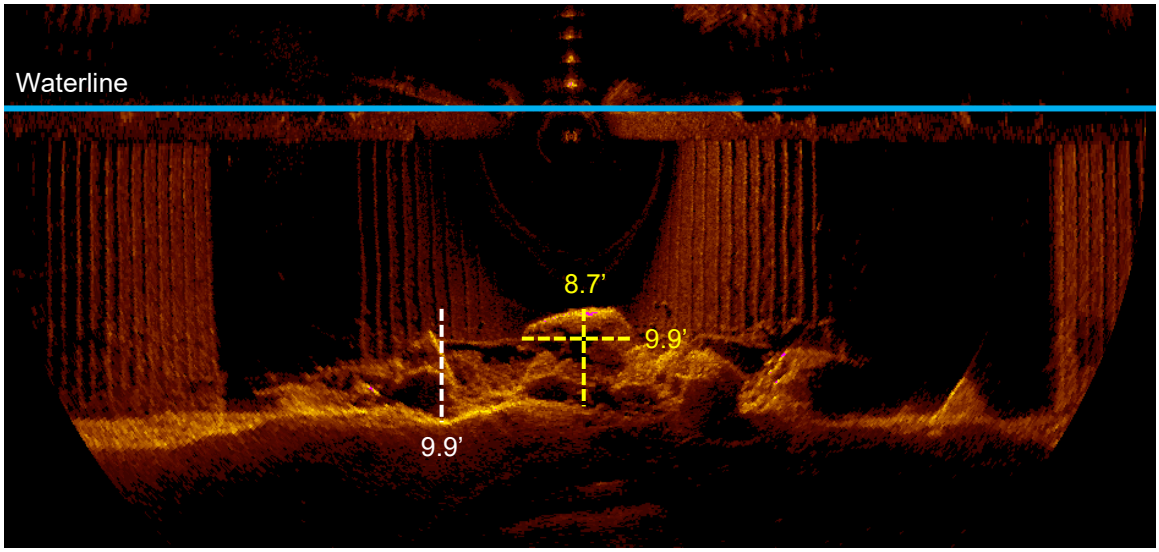

*Sector Scan 7 – Cell 3: Adherent Material Measurements*



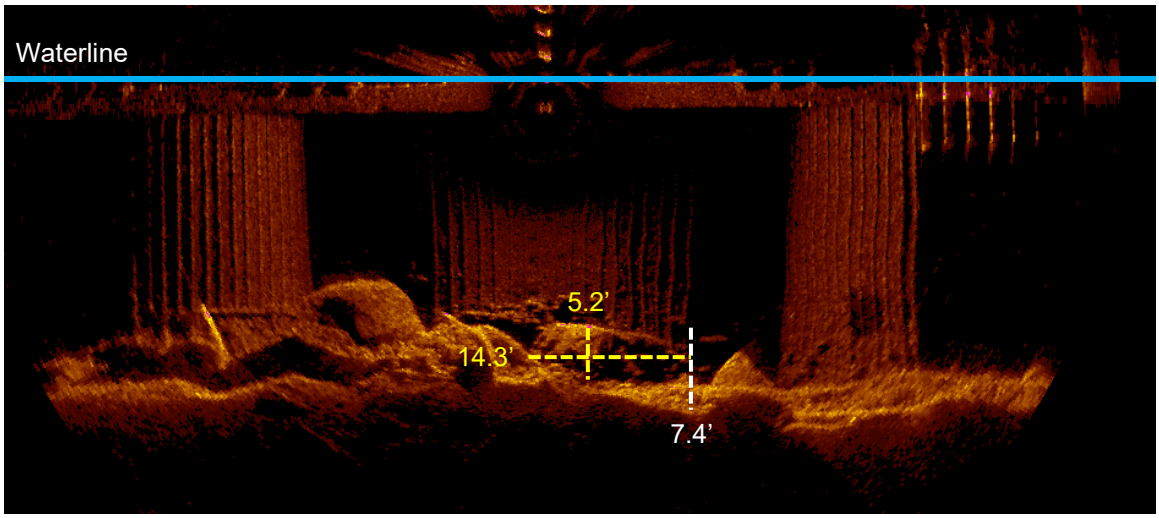

*Sector Scan 8 – Cell 3A: Adherent Material Measurements*



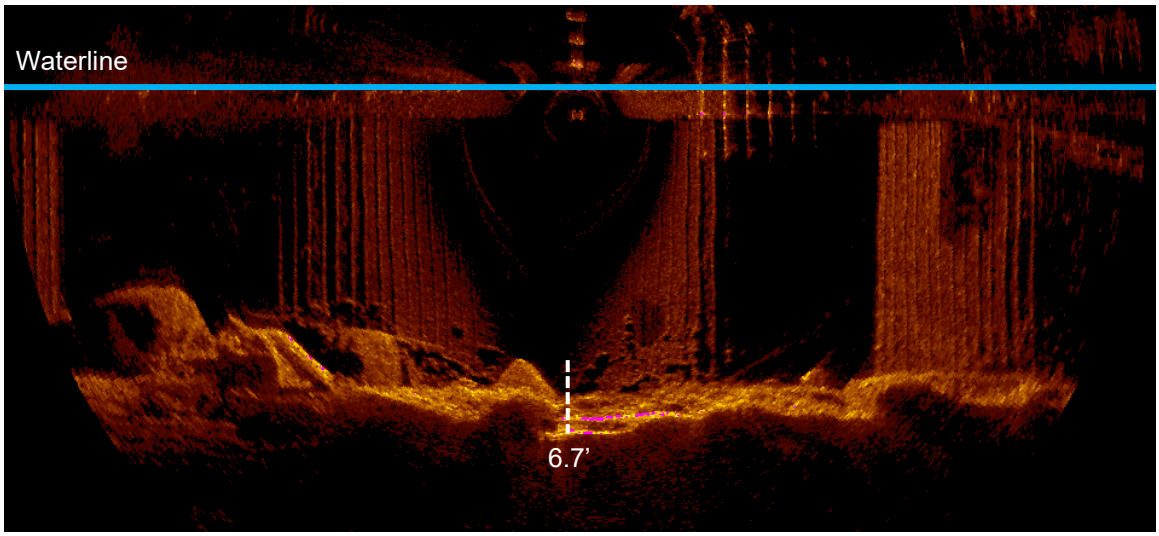

*Sector Scan 9 – Cell 4: Adherent Material Measurements*



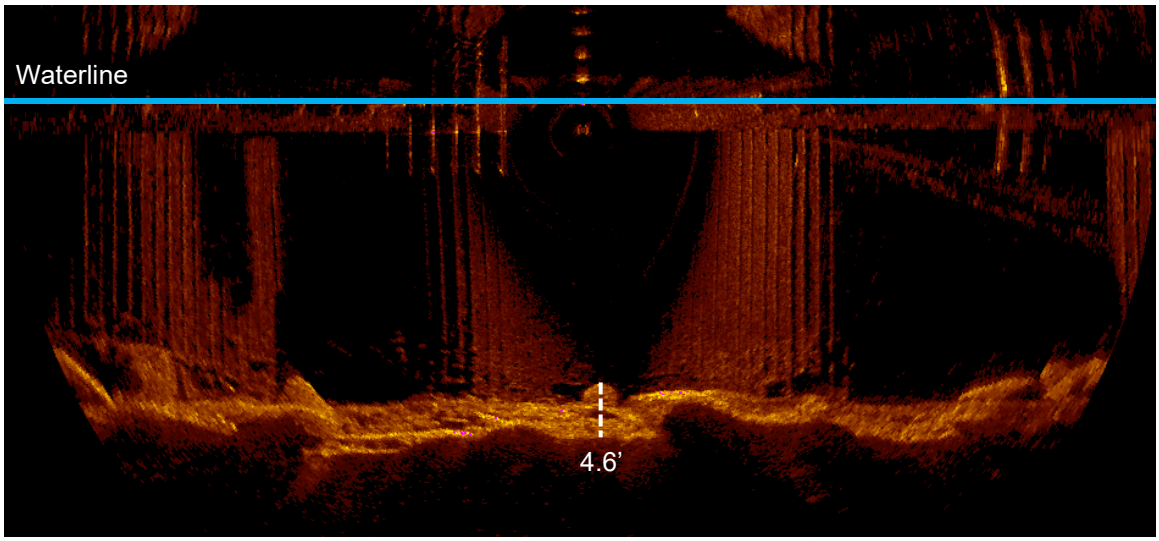

*Sector Scan 10 – Cell 4A: Adherent Material Measurements*




*Sector Scan 11 – Cell 5: Adherent Material Measurements*




*Sector Scan 12 – Cell 5A: Adherent Material Measurements*




*Sector Scan 13 – Cell 6: Adherent Material Measurements*

# Appendix B – Photographs

## List of Figures

Figure 1 – Typical Sheeting Condition..... B2
Figure 2 – Typical Sheeting Condition..... B2
Figure 3 – Typical Sheeting Condition & Interface with Adherent Material..... B3
Figure 4 – Typical Adherent Material..... B3
Figure 5 – Typical Adherent Material..... B4




*Figure 1 – Typical Sheeting Condition*




*Figure 2 – Typical Sheeting Condition*




*Figure 3 – Typical Sheeting Condition & Interface with Adherent Material*




*Figure 4 – Typical Adherent Material*




*Figure 5 – Typical Adherent Material*

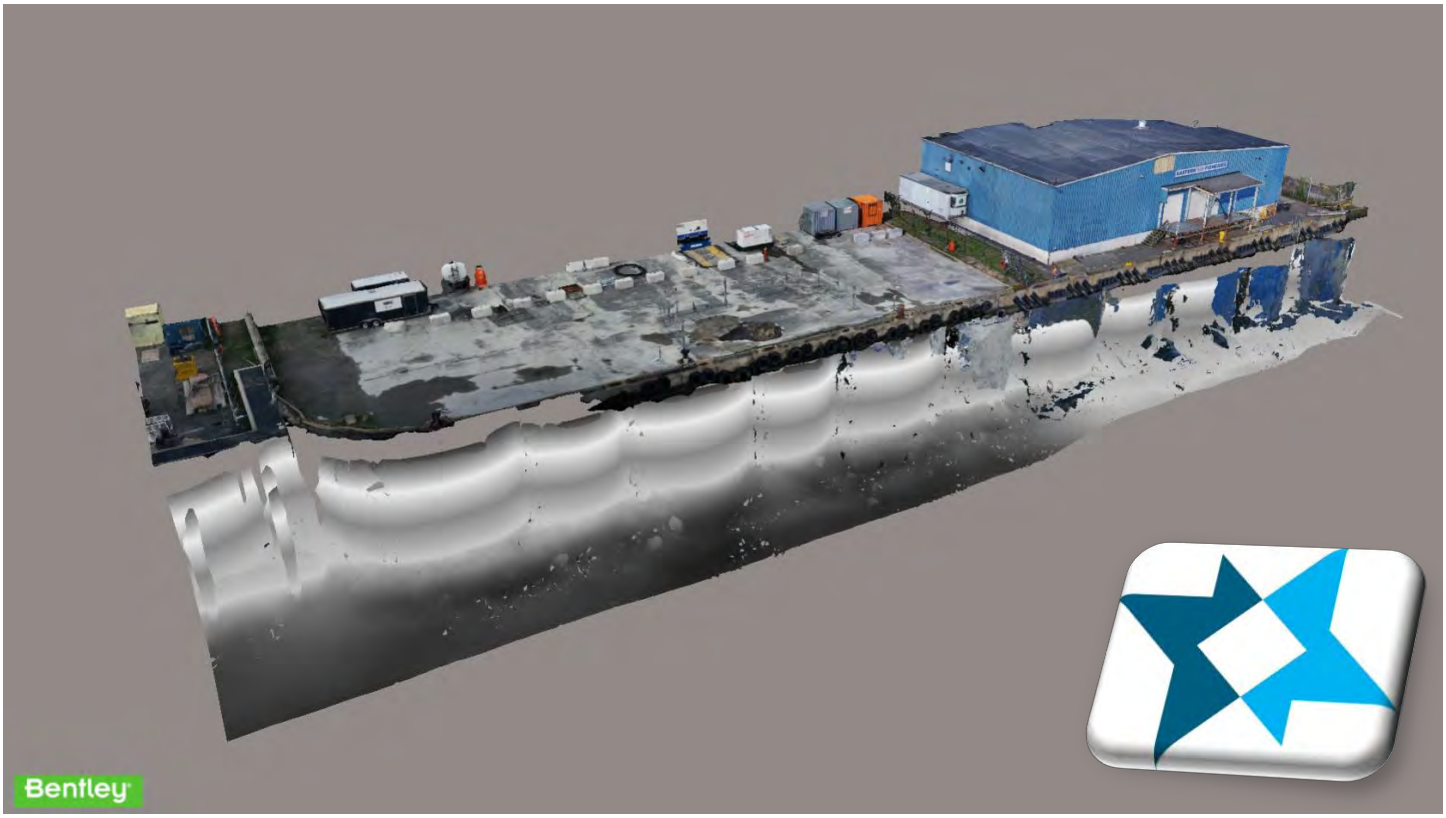
# Appendix E

# Drone Survey, Bentley iTwin Capture Modeler

# Drone Survey
## *Bentley iTwins Capture Model*

## 4 Wright Street & 6 Hassey Street

November 2025




Model Link: https://3d.foth.com/20251023_MassCEC_Schuster_Final/App/index.html#%2F

Prepared By: Mike Campagnone, P.E.

**Disclaimer Regarding iTwin Capture Model Access**

The Bentley iTwin Capture Model provided via the link above is intended for informational and visualization purposes only. It represents data collected during the aerial drone survey conducted by Foth in accordance with ASPRS Positional Accuracy Standards for Digital Geospatial Data (2024). While reasonable efforts have been made to ensure the accuracy and completeness of the model, it should not be relied upon for engineering design, construction, or legal boundary determination without further validation. Access to the model is provided "as-is," and Foth makes no warranties, express or implied, regarding its fitness for a particular purpose. Users are responsible for verifying any measurements or interpretations derived from the model. Foth assumes no liability for any decisions made or actions taken based on this data.

**Solving our clients' toughest**
**science and engineering challenges.**

# Appendix F

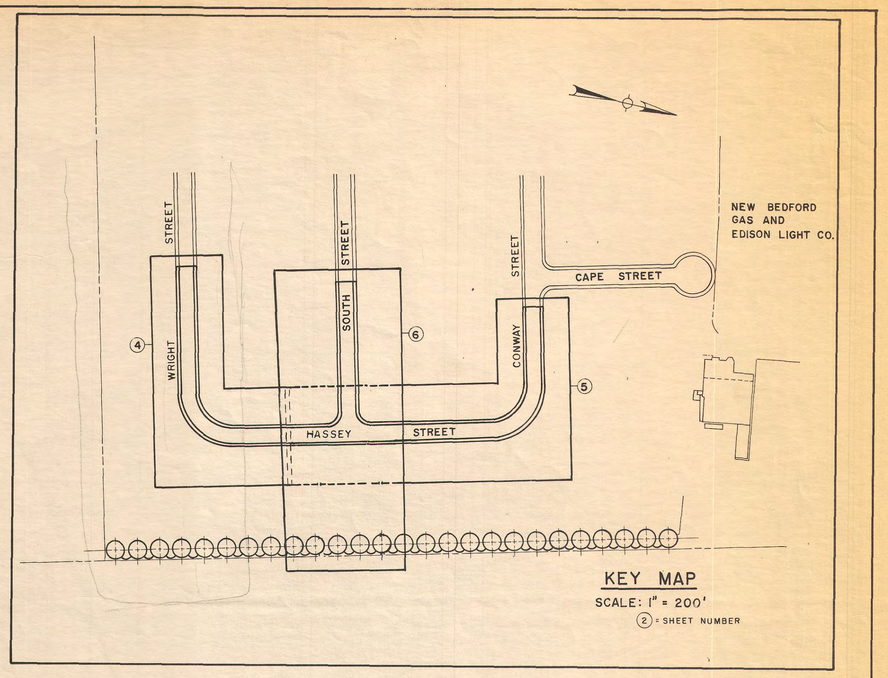
# Historical Documentation

## EXISTING TOPOGRAPHY & ABBREVIATIONS:

| | |
|---|---|
| T | Underground **Telephone** Duct N.E.T. & T. |
| 9 duct E | Underground **Electric** Duct N.B.G. & E.L. Co. |
| 6" G | 6" Gas Main N.B.G. & E.L. Co. |
| P | Underground Police Line |
| B △#21 | Baseline and Angle Point No. 21 |
| 8" S | 8" Sanitary Sewer |
| B Line 19 20 | Stationing Line |
| P | Profile Line |
| F | Underground Fire Alarm Line |
| | Easement Line or R.O.W. Line |
| 4" Steam | 4" Steam Pipe |
| 4" H.W. | 4" Hot Water |
| | Anticipated Rock Line |
| | Stone Wall |
| | Tree |
| | Curb Inlet |
| | Manhole |
| | Water Gate Valve |
| | Hydrant |
| | Street Light or Utility Pole with Street Light |
| | Utility Pole without Street Light |
| Pvt. Pole | Private Utility Pole |
| △F | Fire Alarm Box |
| △P | Police Call Box |
| N.B.G. & E.L. Co. | New Bedford Gas and Edison Light Company |
| N.B.W.W. | New Bedford Water Works |
| N.E.T. & T. or A.T. & T. | New England Telephone and Telegraph |
| Conc. Sdwk. | Portland Cement Concrete Sidewalk |
| Bit. Conc. | Bituminus Concrete |
| P.V.R.C. | Point of Reversing Vertical Curve |
| P.R.C. | Point of Reversing Horizontal Curve |
| P.V.I. | Point of Intersection (Vertical Curve) |
| P.I. | Point of Intersection (Horizontal) |
| L.V.C. | Length of Vertical Curve |
| M.H.W. | Mean High Water |
| M.L.W. | Mean Low Water |
| R.O.W. | Right of way |
| B.O.W. | Back of Walk |
| Inv. | Invert |
| M.H. | Manhole |
| C.B. | Catch Basin |
| R.C. | Reinforced Concrete |
| C.C. | Center to Center |
| B.C. | Beginning of Horizontal Curve |
| E.C. | End of Horizontal Curve |
| E.P. | Edge of Pavement |
| S.B. | Stone Bound |

## PROPOSED CONSTRUCTION: (See Note 1)

| | |
|---|---|
| 12" V.C.P. | New 12" Vitrified Clay Sanitary Sewer Pipe. (See Note 10) |
| 24" R.C.P. | New 24" Reinforced Concrete Storm Drain Pipe. (See Note 9) |
| 16" C.I.P. | New 16" Cast Iron Pipe. (Water pipe except where noted otherwise.) |
| | New Manhole. (4' or 5' diameter.) |
| | New Special Manhole. |
| CB 13 | New Catch Basin. (Number 13) |
| | New Water Gate Valve. |
| | New Hydrant & Valve Assembly. (See Water Details Sht.) |
| | Existing Pipe to be Plugged & Abandoned or Removed. (Removal req'd only where indicated on Drawings) |
| | Existing Manhole to be Removed. |
| | New Street Light Foundation and Conduit |
| △P | New Police Alarm Foundation & Pedestal |
| △F | New Fire Alarm Foundation & Pedestal |
| | New Chain Link Fence |
| 8.50 | New Sign (See Note 14) |
| | Finished Pavement Grade (See Note 5) |
| | New Retaining Wall |
| | New Granite Block Paving |
| M 19 | New Property Monument (Number 19) |
| | New Tree or Shrub — Deciduous (See Note 12) |
| | New Tree or Shrub — Evergreen (See Note 12) |
| | Conform to Existing Surface |
| Pavement — Curb (Granite or Bit. Conc.) — Sdwk (Conc. or Bit. Conc.) | |
| | New Reinforced Concrete Box Culvert (Twin 13' x 7' Shown) |
| | Top of Fill (See Fill & Grading Sheet) |
| | Toe of Slope |



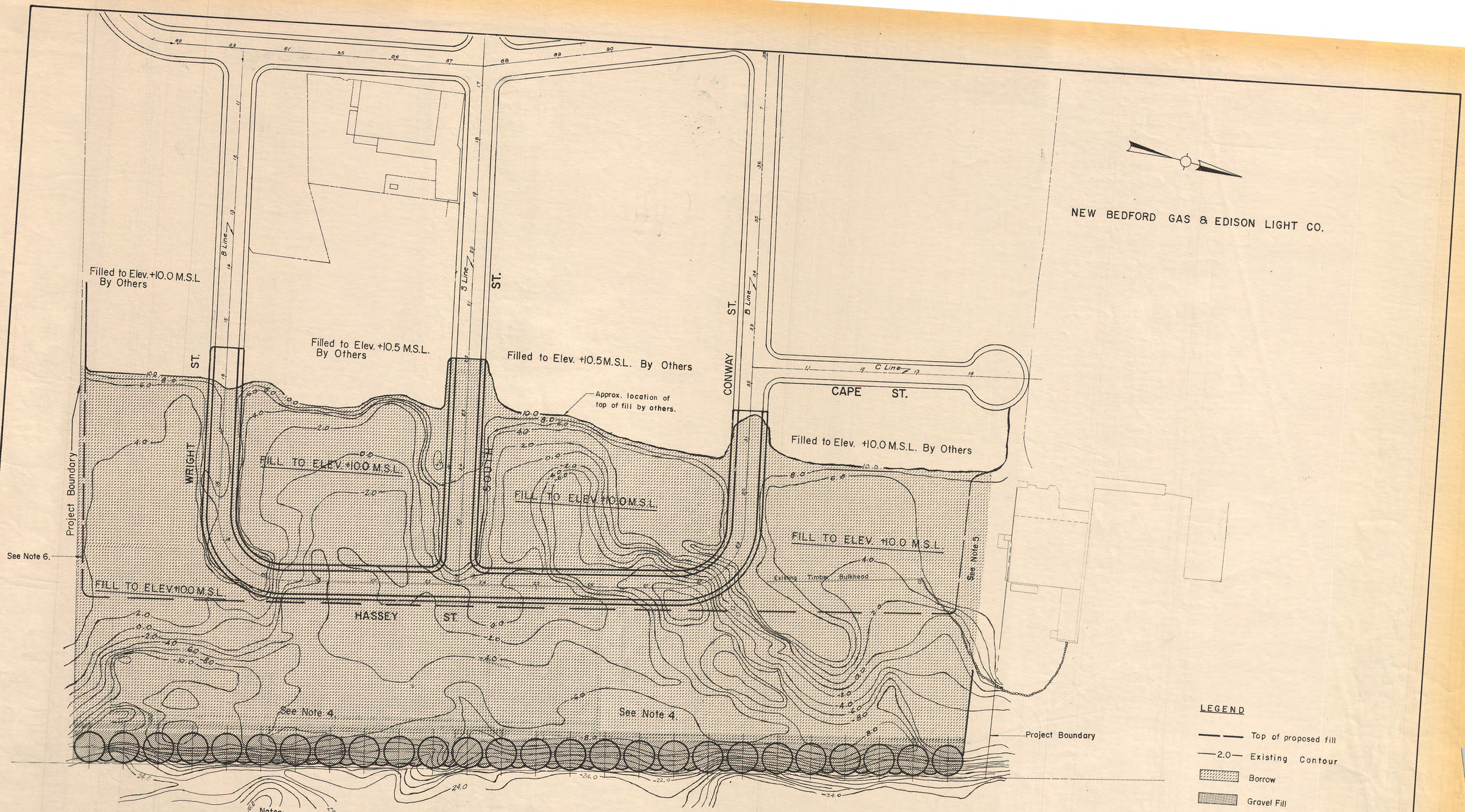

KEY MAP
SCALE: 1" = 200'
(2) = SHEET NUMBER

## GENERAL NOTES:

1. Symbols listed under "Proposed Construction" (at left) refer to work to be done by Contractor under the terms of the contract. These symbols and other specific instructions on the Drawings and in the Specifications will be used to indicate the work to be done by the Contractor.
2. Elevations are referenced to United States Coast and Geodetic Mean Sea Level (M.S.L.) datum.
   Mean high tide = 1.70'
   Spring tide = +3.0'±
   New Bedford city datum = +2.55'
3. Coordinates are referenced to Mass. Geodetic System.
4. Location of existing utilities is approximated, and is based on the best information available. Local connections are not shown. The Contractor is fully responsible for locating all utilities, whether shown on the Drawings or not, and is fully liable for any damage thereto. Additional compensation for errors and omissions in the location of utilities as shown on the Drawings will be allowed only as specified in the Specifications.
5. All elevations refer to finished pavement grade unless otherwise noted.
6. Catch Basin grate elevations are measured at center of grate and at face of curb. Elevations include 1-3/8" gutter depression. (See Catch Basin Details)
7. Curb radii are to face of curb.
8. Location of demolished buildings are not shown.
9. All proposed storm drainage pipes not labeled are 15" R.C.P.
10. All proposed sanitary sewer pipes not labeled are 8" V.C.P.
11. Modification, abandonment and/or addition to gas, electric & telephone utilities are not shown on the Drawings, but are shown on the Information Sheets only.
12. See Landscaping Detail Sheet for other landscaping work to be done by the Contractor.
13. Place 2 vitrified clay "y"s (one aimed at each side of street), with vitrified clay stoppers jointed in place, on V.C.P. sanitary sewer lines every 50' measured upgrade from the last preceeding manhole.

NEW BEDFORD REDEVELOPMENT AUTHORITY
PROJECT - MASS. R-96
SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | LEGEND & GENERAL NOTES | CONTRACT NO. 2 |
| DESIGNED BY E.L. | | SHEET NO. 2 OF 37 |
| CHECKED BY W.D. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G.R.C. | | DRW NO. 371-02-02 |




LEGEND

- Top of proposed fill
- 2.0 Existing Contour
- Borrow
- Gravel Fill

Notes:

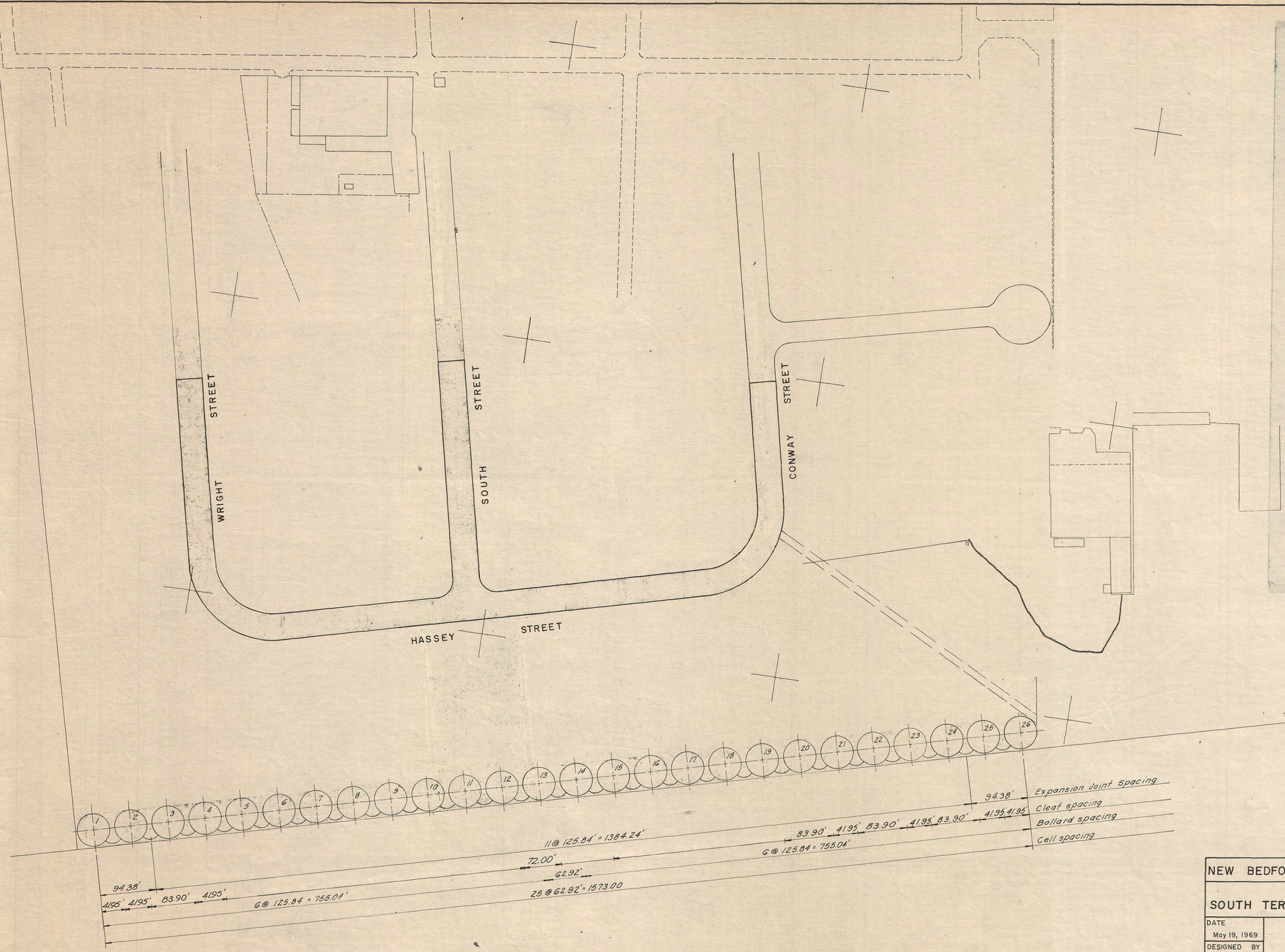
1. Existing contours as per field survey performed March 1969.
2. The entire area in which fill is to be placed shall be cleared and grubbed.
3. Material shall not be removed from areas in which fill is not required, all fill shall be obtained from beyond the Project Boundary.
4. Fill & Grade uniformily from elev. 10.0 M.S.L. to elev. 6.5 M.S.L. at Bulkhead Wall.
5. Grade from elev. 10.0 M.S.L. to existing ground at 10:1 or as directed by the Engineer.
6. Grade from elev. 10.0 M.S.L. to existing ground at Project Boundary at 2:1, or as directed by the Engineer.
7. Dust control shall be performed throughout the entire area of work. (See Specs.)
8. See sheet No. 34 for additional detail on fill & excavation.

NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT - MASS. R-96

SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | FILL & GRADING PLAN | CONTRACT NO. 2 |
| DESIGNED BY: P.L. | | SHEET NO. 14 OF 37 |
| CHECKED BY: W.D. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE 1"=80' |
| APPROVED BY: G.R.C. | | DRW. NO. 371-02-14 |




## DESIGN NOTES

1. General
   a. Elevations are based on mean sea level datum.
   b. Mean tide range is 3.7 feet.

2. Live Load Surcharge - 1,000 psf

3. Earthwork
   a. Unit dry weight = 106 pcf
   b. Unit moist weight = 120 pcf
   c. Unit submerged weight = 60 pcf
   d. Angle of friction, $\phi$ = 35°

4. Concrete
   a. All concrete shall have 4,000 psi ultimate.
   b. Concrete below water shall be tremie concrete.
   c. Reinforcing steel shall have a minimum yield strength of 30,000 psi and shall conform to ASTM A-615.
   d. Lap all splices 30 bar diameters.
   e. All reinforcement to have protection shown on all faces exposed to salt water action protect with 4" Concrete cover.

5. Structural Steel
   a. All material to be ASTM A36 except as noted.
   b. All hardware, anchor bolts, etc., shall be hot dipped galvanized steel.

6. Timber
   a. All timber shall be Douglas fir or Southern Yellow Pine pressure creosoted.

7. Cathodic Protection
   a. Cathodic protection shall be an impressed current system.

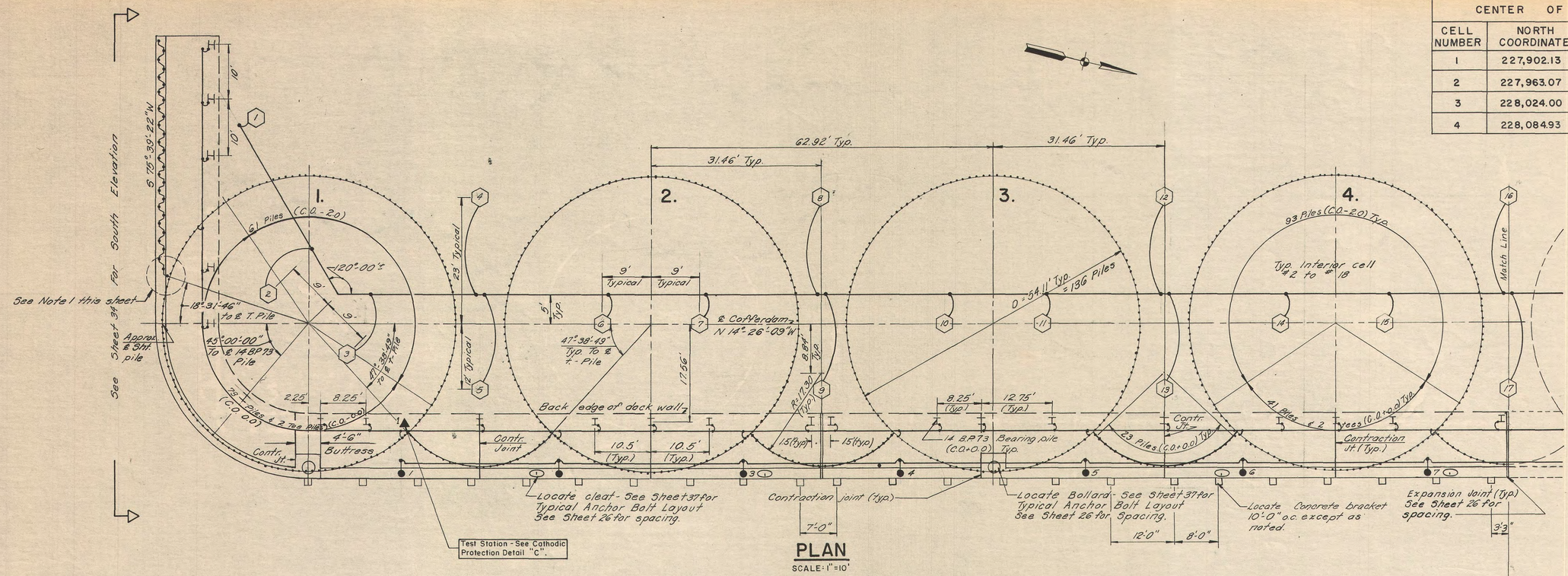
NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT – MASS. R-96

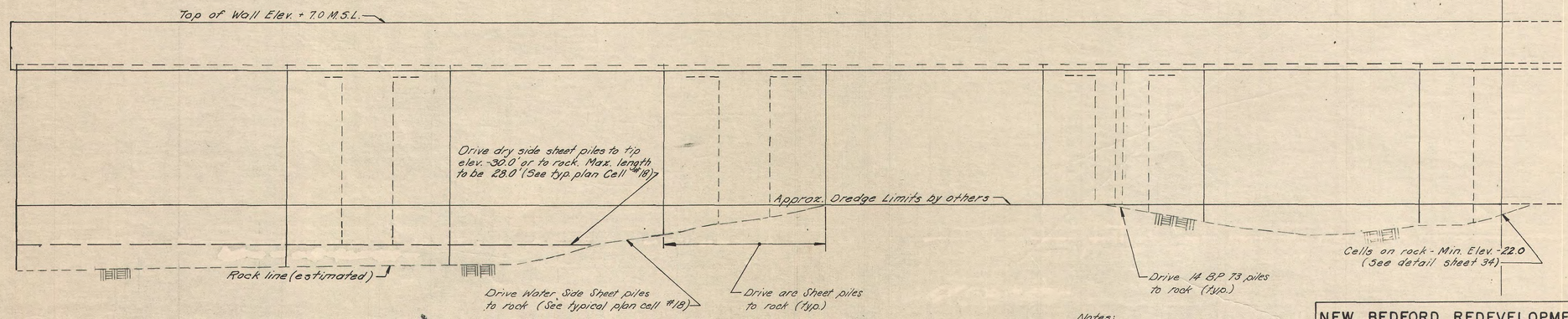
SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE May 19, 1969 | BULKHEAD GENERAL PLAN | CONTRACT NO. 2 |
| DESIGNED BY R.C.S. | | SHEET NO. 26 OF 37 |
| CHECKED BY E.P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE 1" = 80' |
| APPROVED BY G.R.C. | | DRW. NO. 371-02-26 |

| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 1 | 227,902.13 | 759,919.33 |
| 2 | 227,963.07 | 759,903.64 |
| 3 | 228,024.00 | 759,887.96 |
| 4 | 228,084.93 | 759,872.27 |




## PLAN
SCALE: 1"=10'




## PROFILE
SCALE: 1"= 10'

Notes:
1. The Contractor shall furnish details of connection for approval of the Engineer.

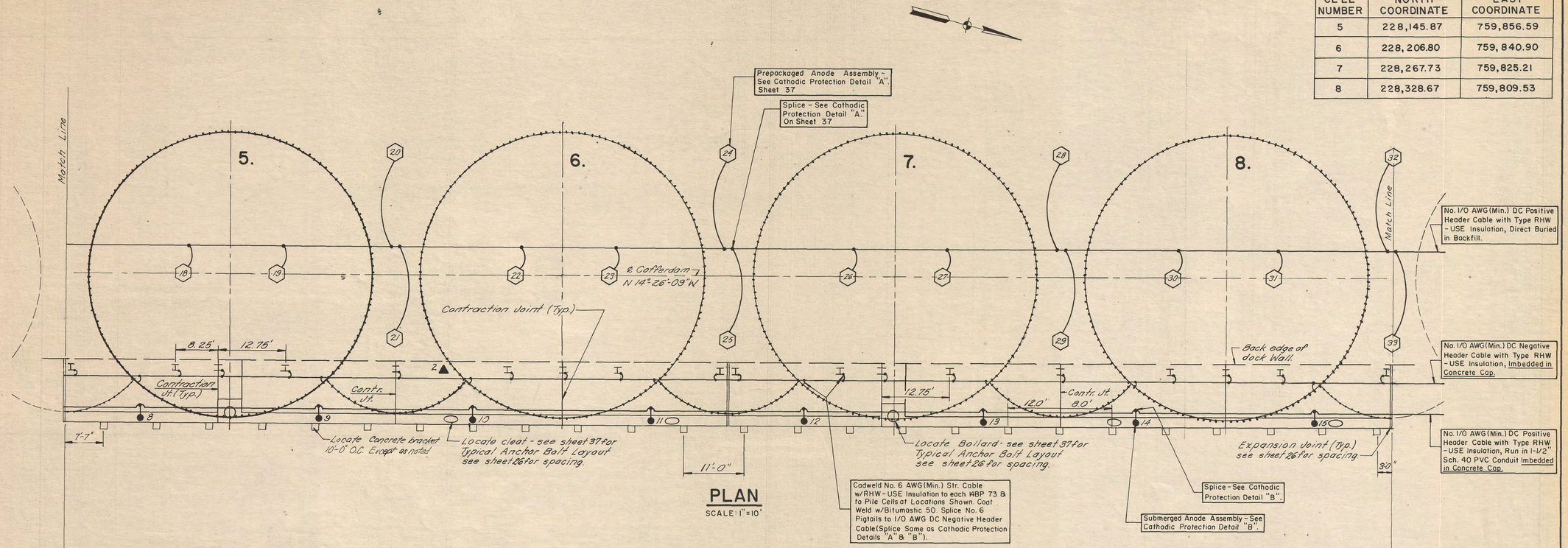
NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT - MASS R-96

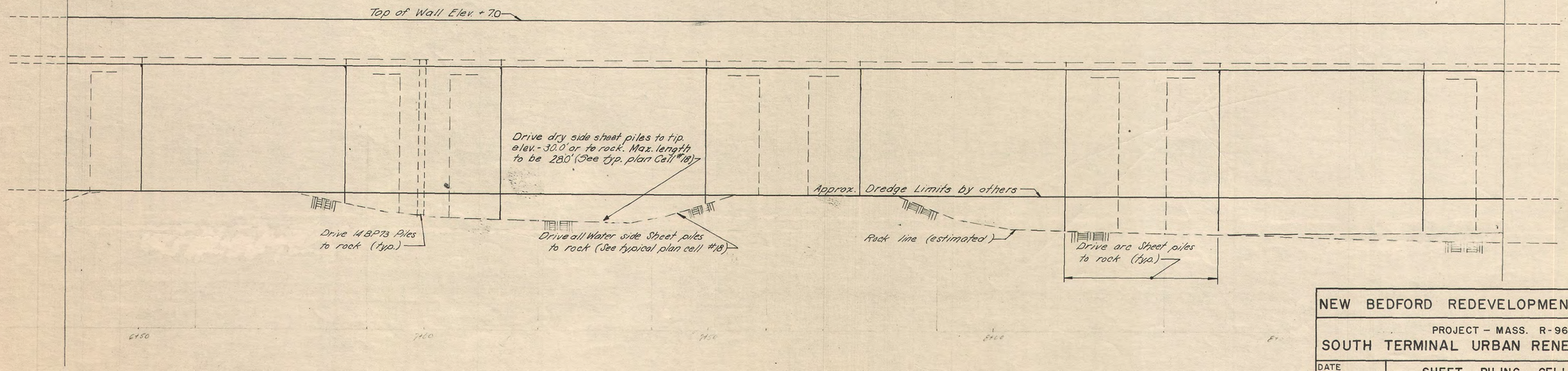
SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | SHEET PILING CELLS 1 THRU 4 PLAN AND PROFILE | CONTRACT NO. 2 |
| DESIGNED BY: R.C.S. | | SHEET NO. 27 OF 37 |
| CHECKED BY: P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE: AS SHOWN |
| APPROVED BY: G.R.C. | | DRW NO. 371-02-27 |

| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 5 | 228,145.87 | 759,856.59 |
| 6 | 228,206.80 | 759,840.90 |
| 7 | 228,267.73 | 759,825.21 |
| 8 | 228,328.67 | 759,809.53 |



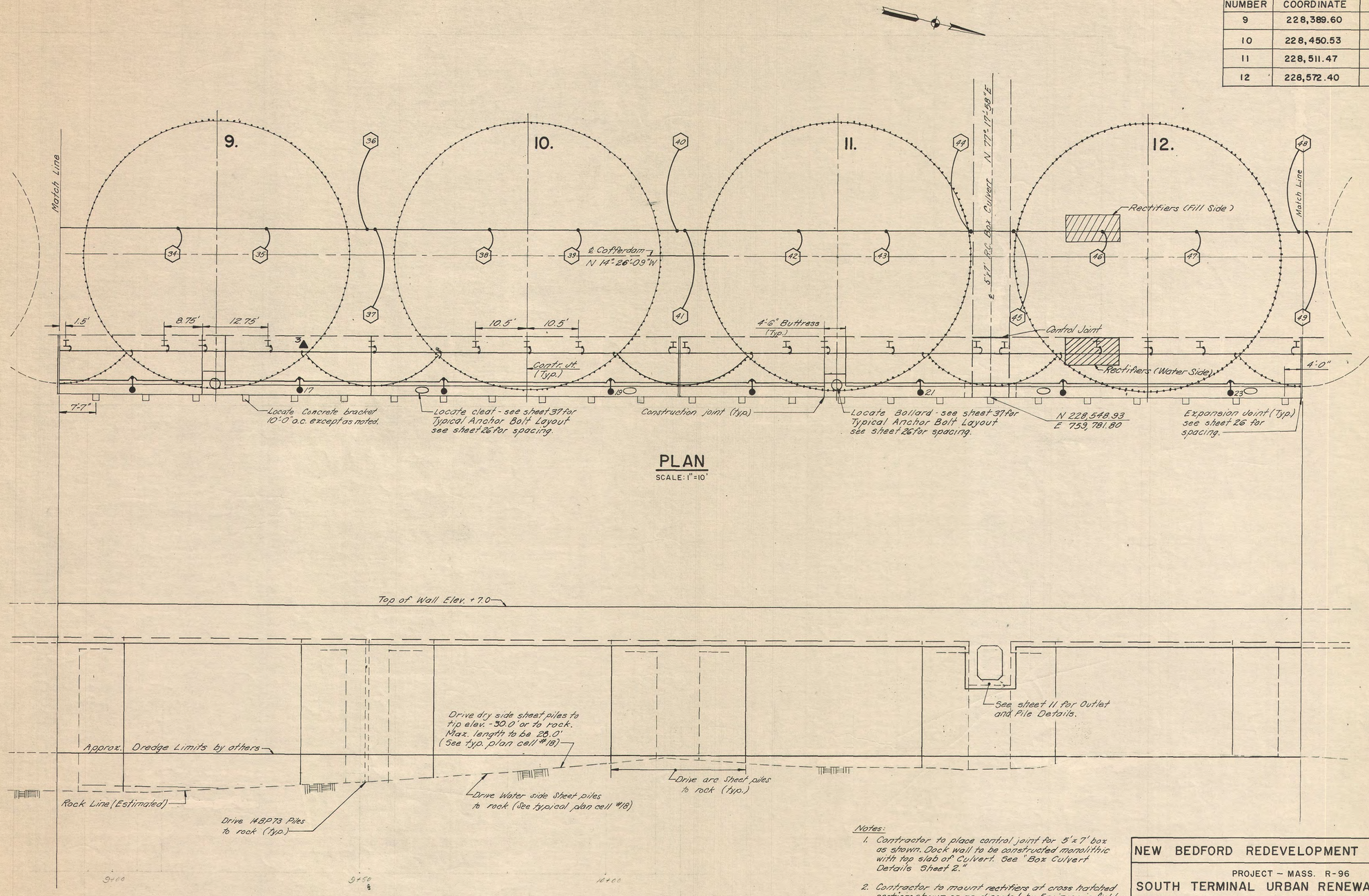

## PLAN
SCALE: 1" = 10'




## PROFILE
SCALE: 1" = 10'

| | | |
|---|---|---|
| NEW BEDFORD REDEVELOPMENT AUTHORITY | | |
| PROJECT – MASS. R-96<br>SOUTH TERMINAL URBAN RENEWAL PROJECT | | |
| DATE: May 19, 1969 | SHEET PILING CELLS 5 THRU 8 PLAN AND PROFILE | CONTRACT NO. 2 |
| DESIGNED BY R.C.S. | | SHEET NO. 28 OF 37 |
| CHECKED BY P. L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G.R.C. | | DRW. NO. 371-02-28 |

| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 9 | 228,389.60 | 759,793.84 |
| 10 | 228,450.53 | 759,778.16 |
| 11 | 228,511.47 | 759,762.47 |
| 12 | 228,572.40 | 759,746.78 |




PLAN
SCALE: 1"=10'




PROFILE
SCALE: 1"= 10'

Notes:

1. Contractor to place control joint for 5'x 7' box as shown. Dock wall to be constructed monolithic with top slab of Culvert. See "Box Culvert Details Sheet 2."
2. Contractor to mount rectifiers at cross hatched sections shown or as directed by Engineer in field. Provision for Concrete Anchors must be made in slab of dock wall in accordance with Manufactuers requirements.
3. A.C. power to rectifier provided by others.

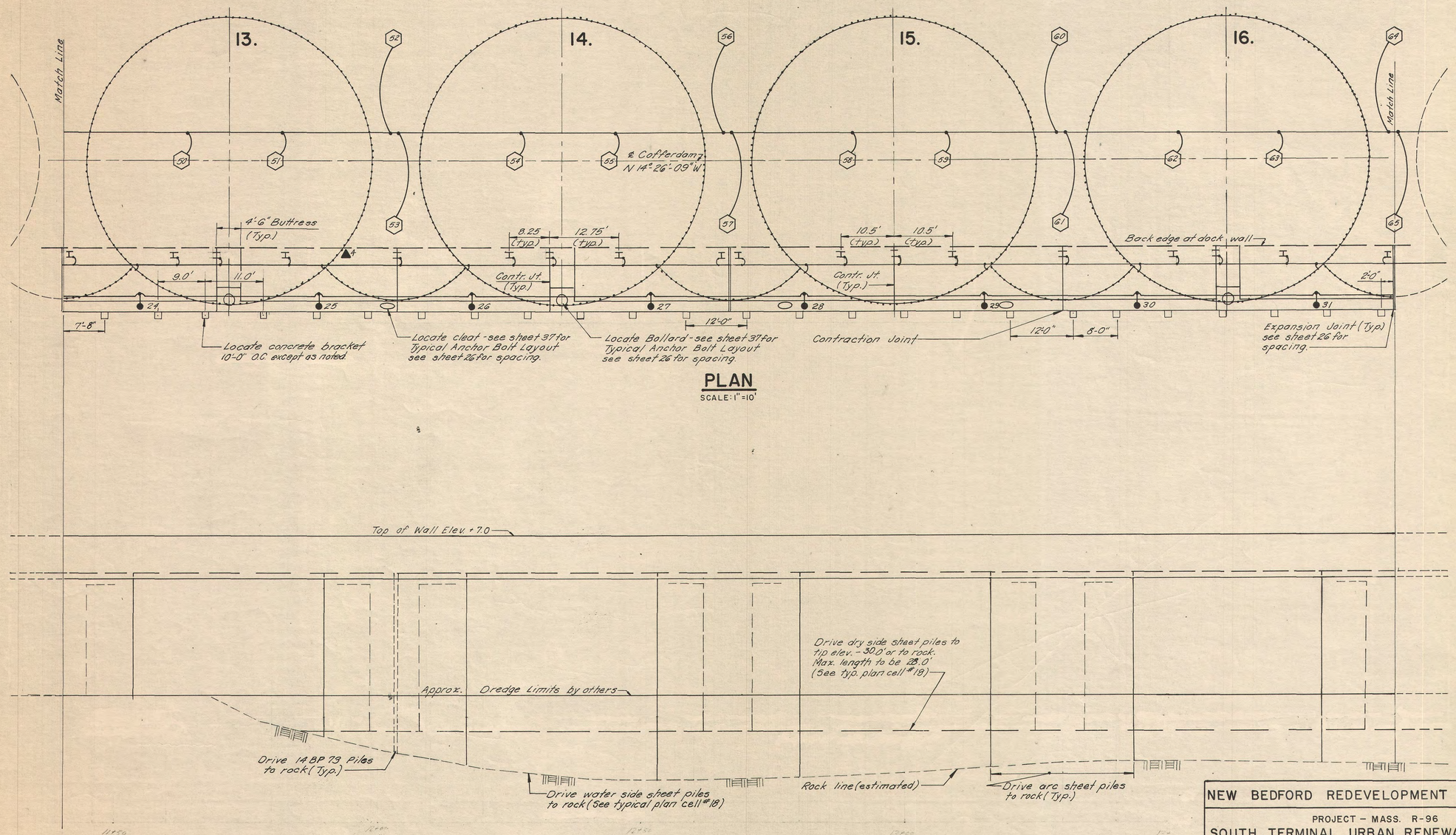
NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT – MASS. R-96

SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | SHEET PILING CELLS 9 THRU 12 PLAN AND PROFILE | CONTRACT NO. 2 |
| DESIGNED BY R.C.S. | | SHEET NO. 29 OF 37 |
| CHECKED BY P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G.R.C. | | DRW. NO. 371-02-29 |

| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 13 | 228,633.34 | 759,731.10 |
| 14 | 228,694.27 | 759,715.41 |
| 15 | 228,755.20 | 759,699.73 |
| 16 | 228,816.14 | 759,684.04 |




## PLAN
SCALE: 1" = 10'




## PROFILE
SCALE: 1" = 10'

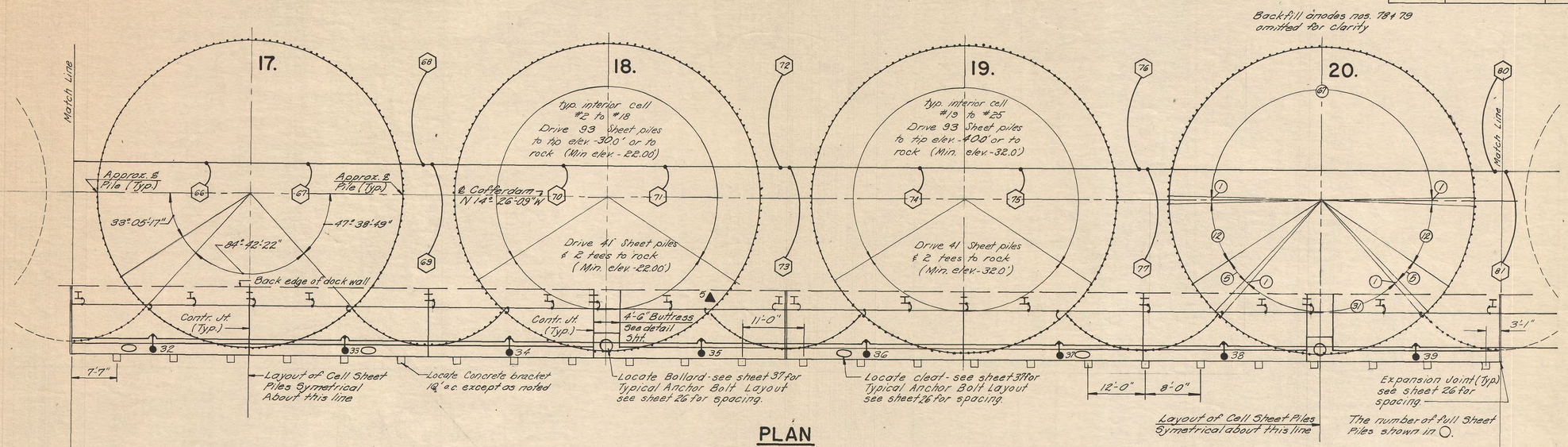
NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT – MASS. R-96

SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE May 19, 1969 | SHEET PILING CELLS 13 THRU 16 PLAN AND PROFILE | CONTRACT NO. 2 |
| DESIGNED BY R.C.S. | | SHEET NO. 30 OF 37 |
| CHECKED BY P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G.R.C. | | DRW. NO. 371-02-30 |

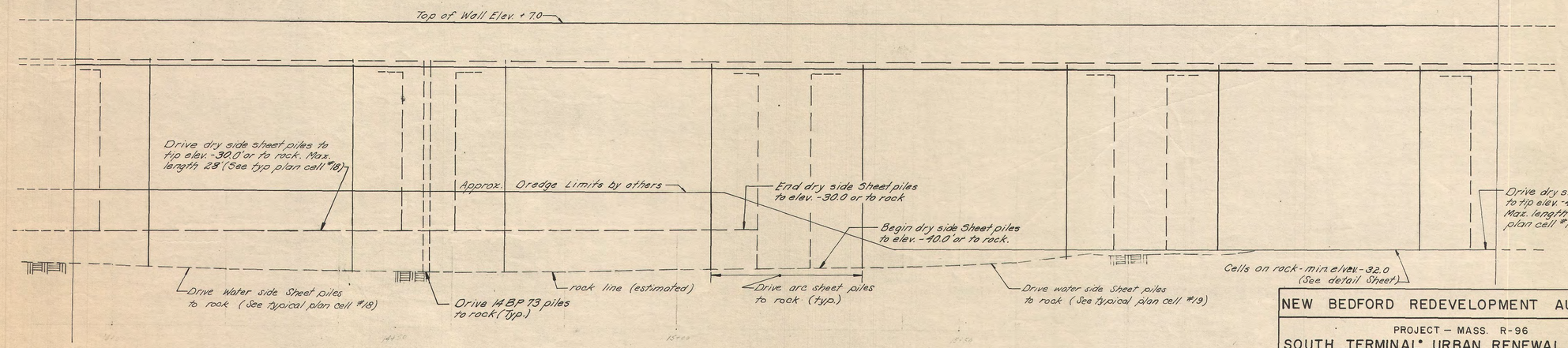
| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 17 | 228,877.07 | 759,668.36 |
| 18 | 228,938.00 | 759,652.67 |
| 19 | 228,998.94 | 759,636.98 |
| 20 | 229,059.87 | 759,621.30 |




## PLAN
SCALE: 1" = 10'

Notes:

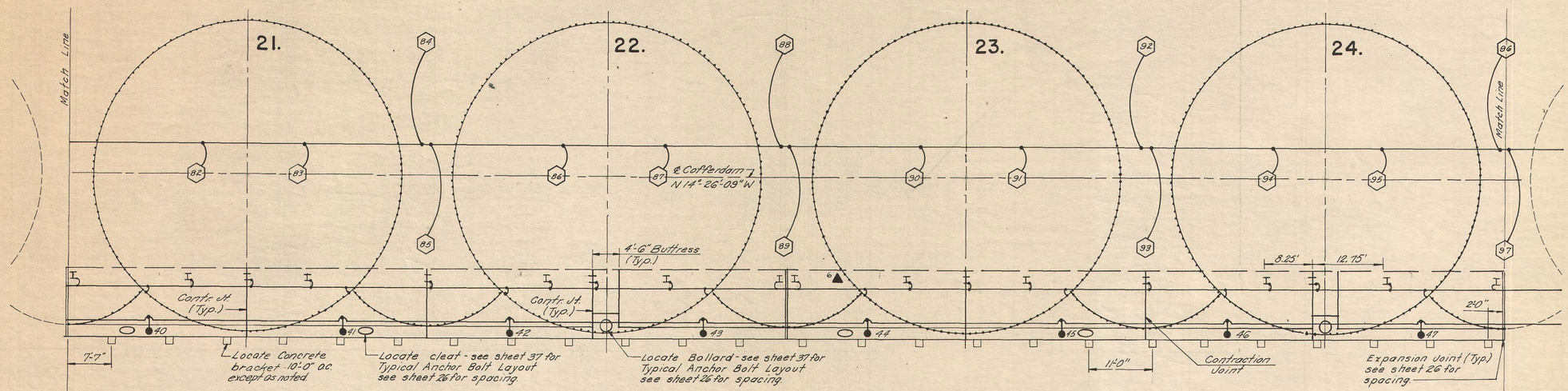
1. See Cell No. 17 for layout of typical interior cells No. 2 thru 25.
2. See Cell No. 18 for tip elev. of typical interior cells No. 2 thru 18.
3. See Cell No. 19 for tip elev. of typical interior cells No. 19 thru 25.
4. See Cell No. 20 for layout of typical interior cells No. 2 thru 25 by no. of full sheet piles.



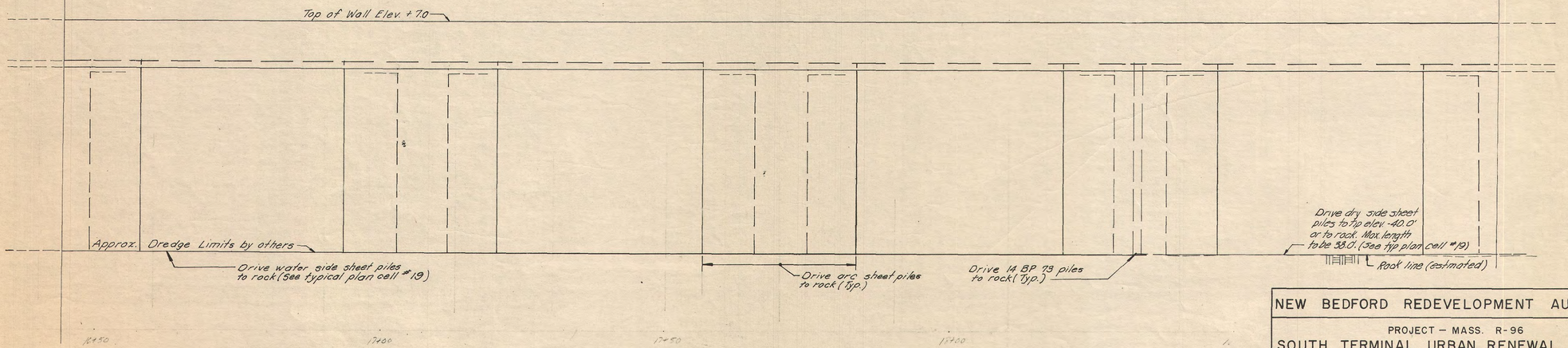

## PROFILE
SCALE: 1" = 10'

| NEW BEDFORD REDEVELOPMENT AUTHORITY | | |
|---|---|---|
| PROJECT – MASS. R-96<br>SOUTH TERMINAL URBAN RENEWAL PROJECT | | |
| DATE<br>May 19, 1969 | SHEET PILING CELLS<br>17 THRU 20<br>PLAN AND PROFILE | CONTRACT NO.<br>2 |
| DESIGNED BY<br>R.C.S. | | SHEET NO.<br>31 OF 37 |
| CHECKED BY<br>P.L. | GOODKIND & O'DEA, INC.<br>CONSULTING ENGINEERS<br>SPRINGFIELD, MASSACHUSETTS | SCALE<br>AS SHOWN |
| APPROVED BY<br>G.R.C. | | DRW NO.<br>371-02-31 |

| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 21 | 229,120.80 | 759,605.61 |
| 22 | 229,181.74 | 759,589.93 |
| 23 | 229,242.67 | 759,574.24 |
| 24 | 229,303.60 | 759,558.56 |




PLAN
SCALE: 1" = 10'




PROFILE
SCALE: 1" = 10'

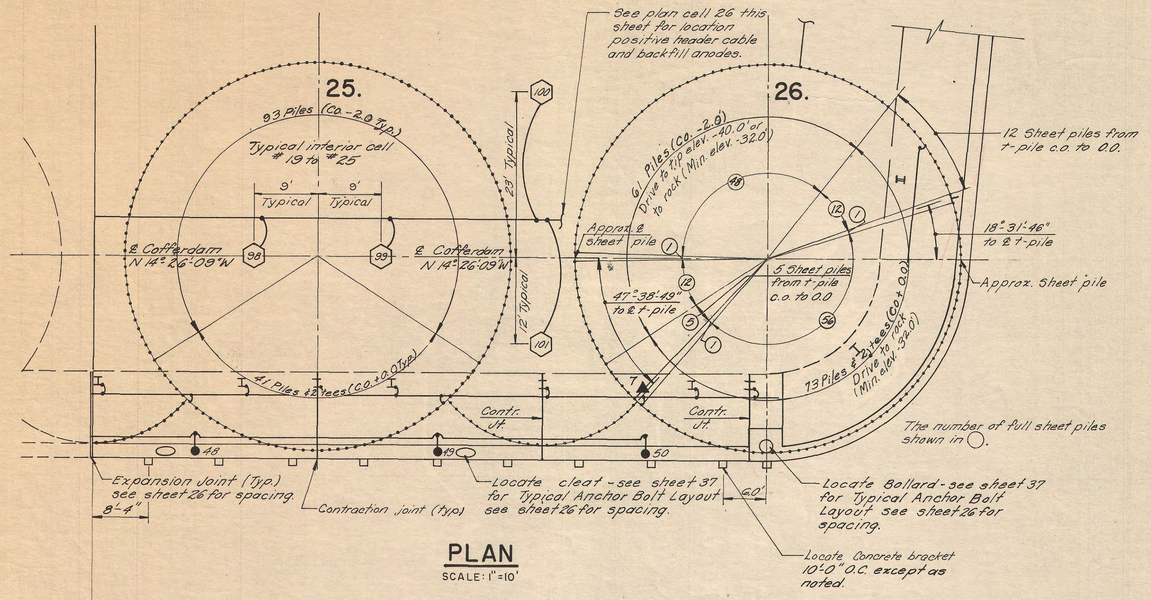
NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT – MASS. R-96

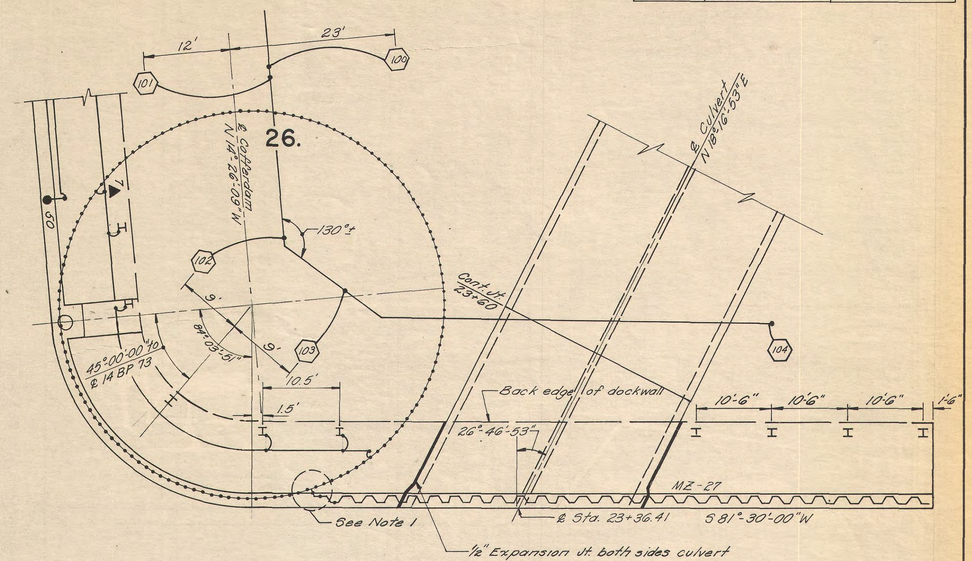
SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | SHEET PILING CELLS 21 THRU 24 PLAN AND PROFILE | CONTRACT NO. 2 |
| DESIGNED BY: R.C.S. | | SHEET NO. 32 OF 37 |
| CHECKED BY: P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY: G.R.C. | | DRW. NO. 371-02-32 |

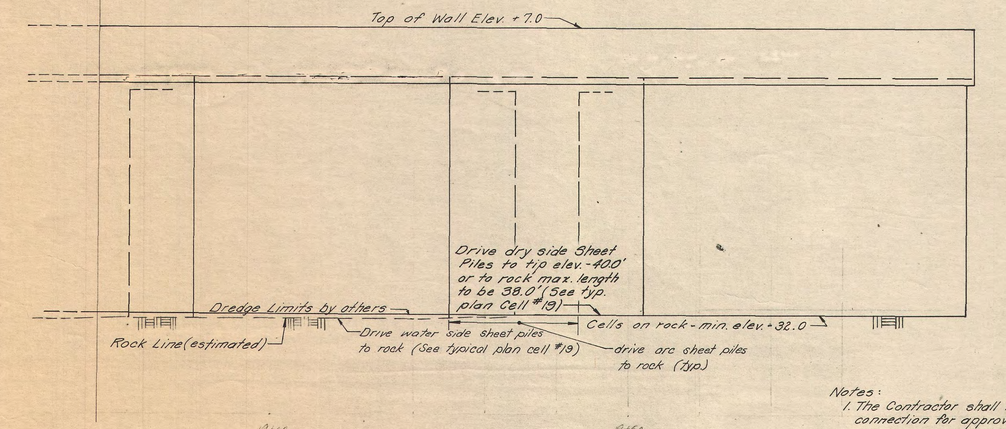
| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 25 | 229,364.87 54 | 759,542.87 |
| 26 | 229,425.47 | 759,527.18 |




PLAN
SCALE: 1"=10'

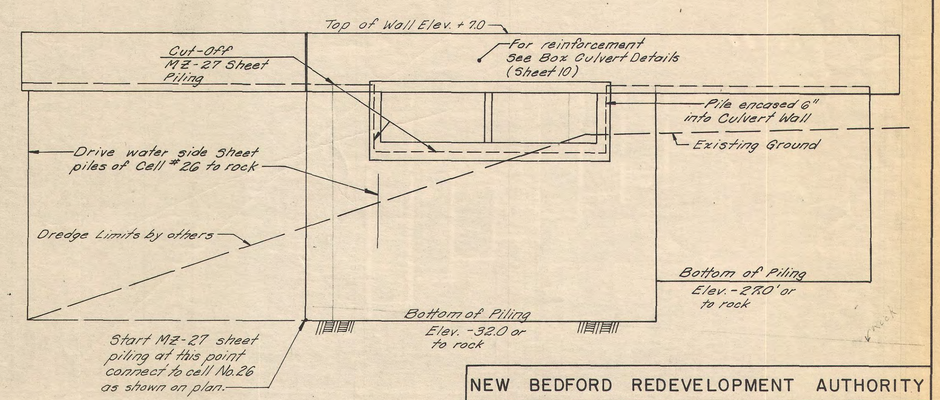



PLAN
SCALE: 1"=10'




Notes:
1. The Contractor shall furnish details of connection for approval of the Engineer.

PROFILE
SCALE: 1"= 10'



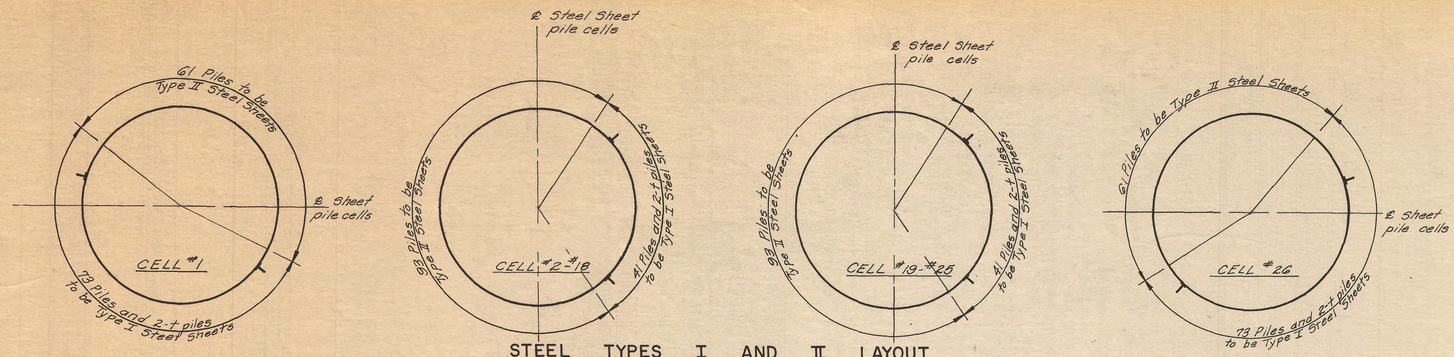

PROFILE
SCALE: 1"= 10'

NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT – MASS. R-96

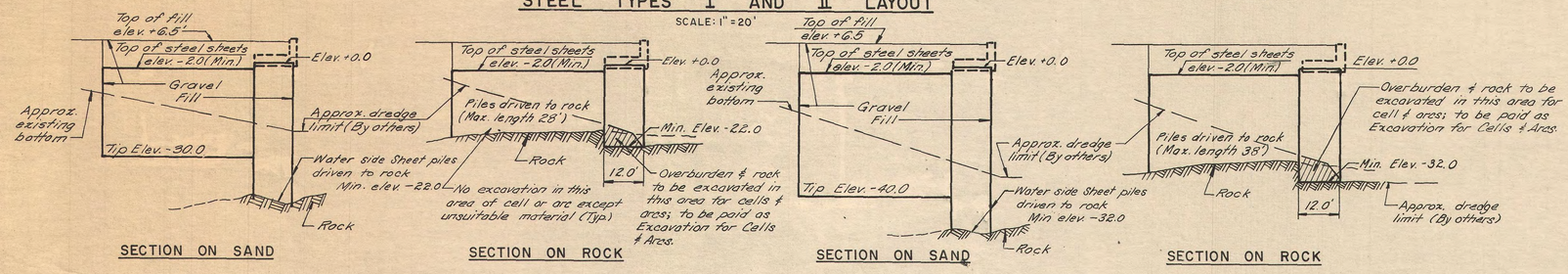
SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | SHEET PILING CELLS 25 & 26 PLAN AND PROFILE | CONTRACT NO. 2 |
| DESIGNED BY: R.C.S. | | SHEET NO. 33 OF 37 |
| CHECKED BY: P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE: AS SHOWN |
| APPROVED BY: G.R.C. | | DRW. NO. 371-02-33 |




## STEEL TYPES I AND II LAYOUT

SCALE: 1" = 20'

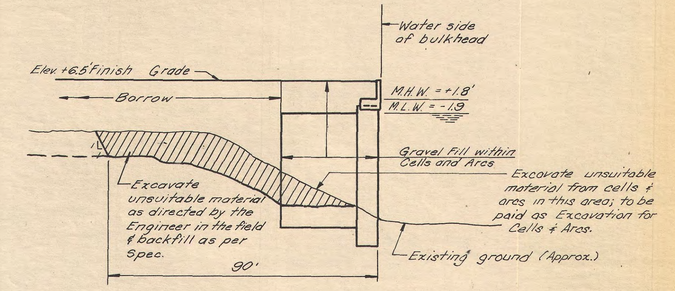



**CELLS 1-18**
(20 FT. DRAFT)

**CELLS 19-26**
(30 FT. DRAFT)

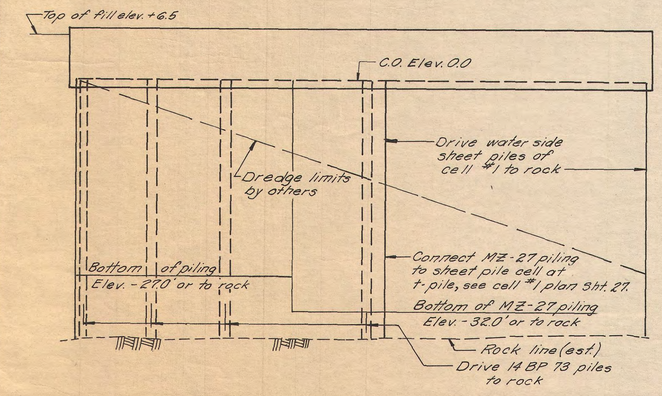
## TYPICAL CELL SECTIONS

SCALE: 1" = 20'



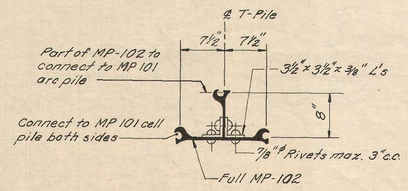

## TYPICAL SECTION SHOWING LIMITS OF REMOVAL OF UNSUITABLE MATERIAL

NOT TO SCALE




## SOUTH ELEVATION

SCALE: 1" = 10'




## TYPICAL "TEE" PILE

NOT TO SCALE

Notes:

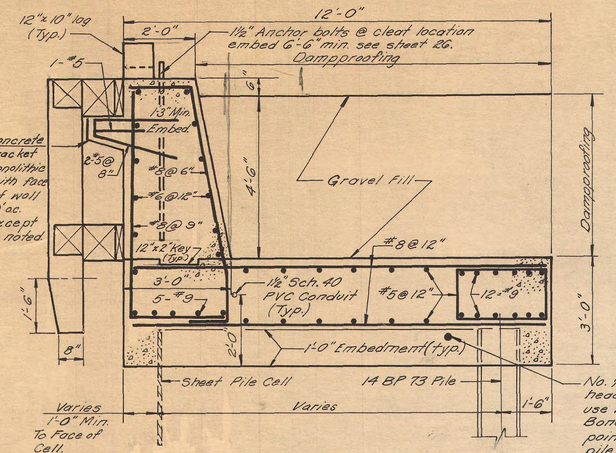
1. Unsuitable material to be disposed of as per specifications.
2. Minimum length of dry side steel sheets in cells to be 15' in 20' draft, and 20' in 30' draft.
3. All steel sheet piling for cells and arcs to have section properties of U.S. Steel MP-101 except as otherwise noted.
4. All arc piles, and all MZ-27 sheet piles to be type-I steel sheets.
5. Gravel fill to be placed within cells and arcs insuring no segregation of particle sizes, uncontrolled dumping will not be allowed.
6. No welding of "tee" pile or fabricated connections will be permitted.
7. Protective Coating to be applied in accordance with Specifications to all type-I steel sheets.

NEW BEDFORD REDEVELOPMENT AUTHORITY

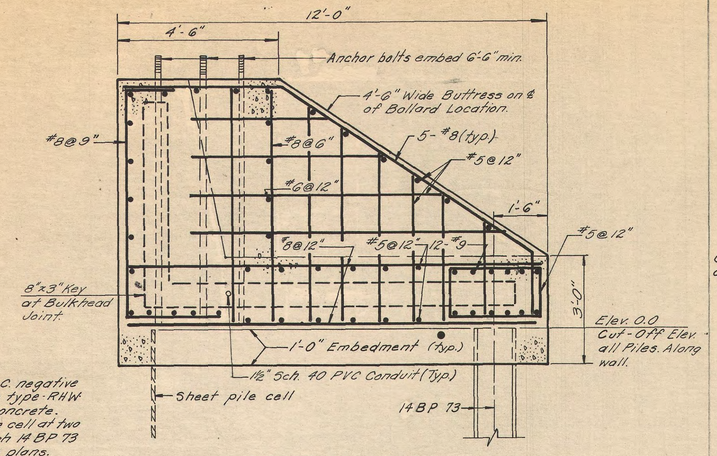
PROJECT MASS. R-96

SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | DETAILS (SHEET PILING CELLS) | CONTRACT NO. 2 |
| DESIGNED BY: R.C.S. | | SHEET NO. 34 OF 37 |
| CHECKED BY: P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE: AS SHOWN |
| APPROVED BY: G.R.C. | | DRW NO. 371-02-34 |

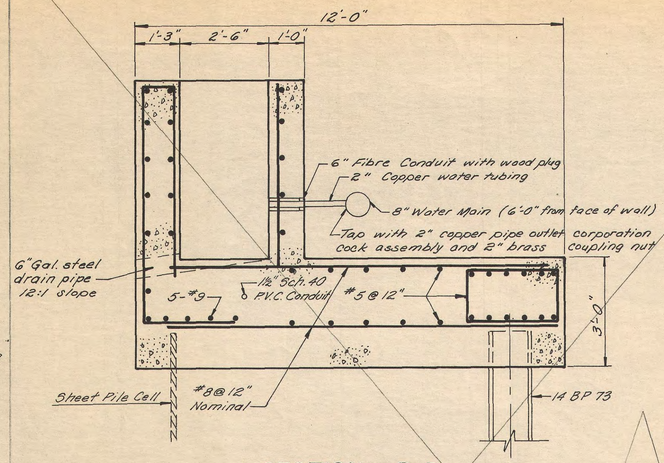



## TYPICAL WALL SECTION




## SECTION A-A

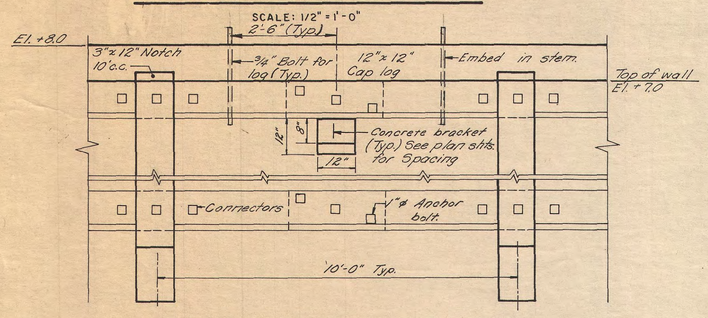
SCALE: 1/2"=1'-0"




## SECTION B-B

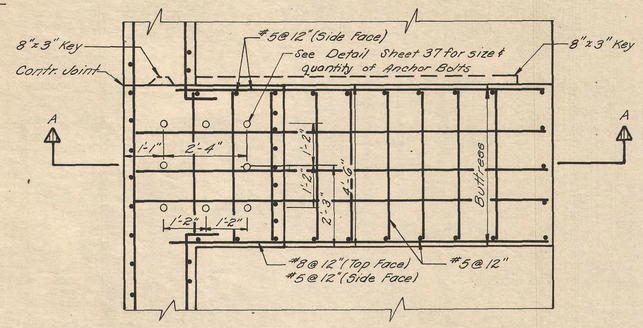
SCALE: 1/2"=1'-0"

N.I.C.



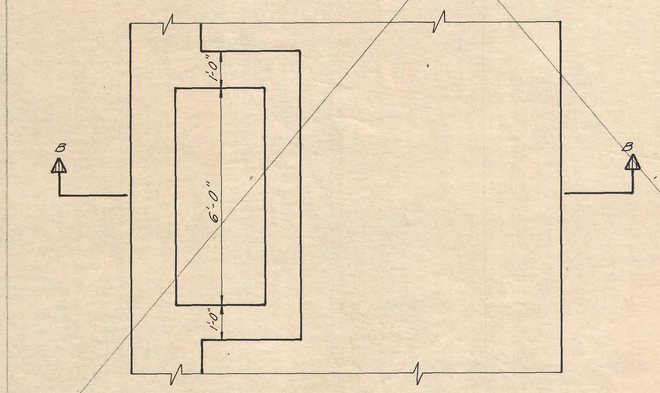

## TYPICAL FRONT ELEVATION

SCALE: 1/2"=1'-0"



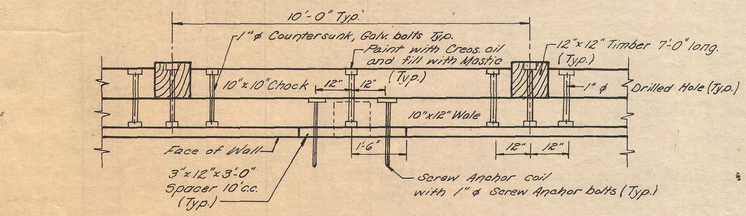

## PLAN AT BOLLARD LOCATION

SCALE: 1/2"=1'-0"



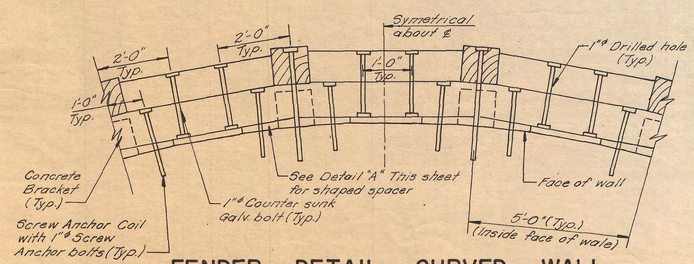

## UTILITY PIT PLAN

SCALE: 1/2"=1'-0"



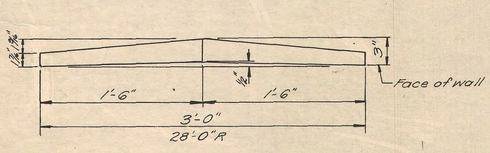

## FENDER DETAIL

SCALE: 1/2"=1'-0"



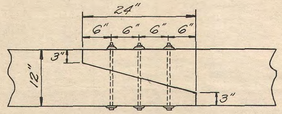

## FENDER DETAIL CURVED WALL

SCALE: 1/2"=1'-0"




## DETAIL "A"

NOT TO SCALE




## WALE SPLICE

NOT TO SCALE

### Notes:

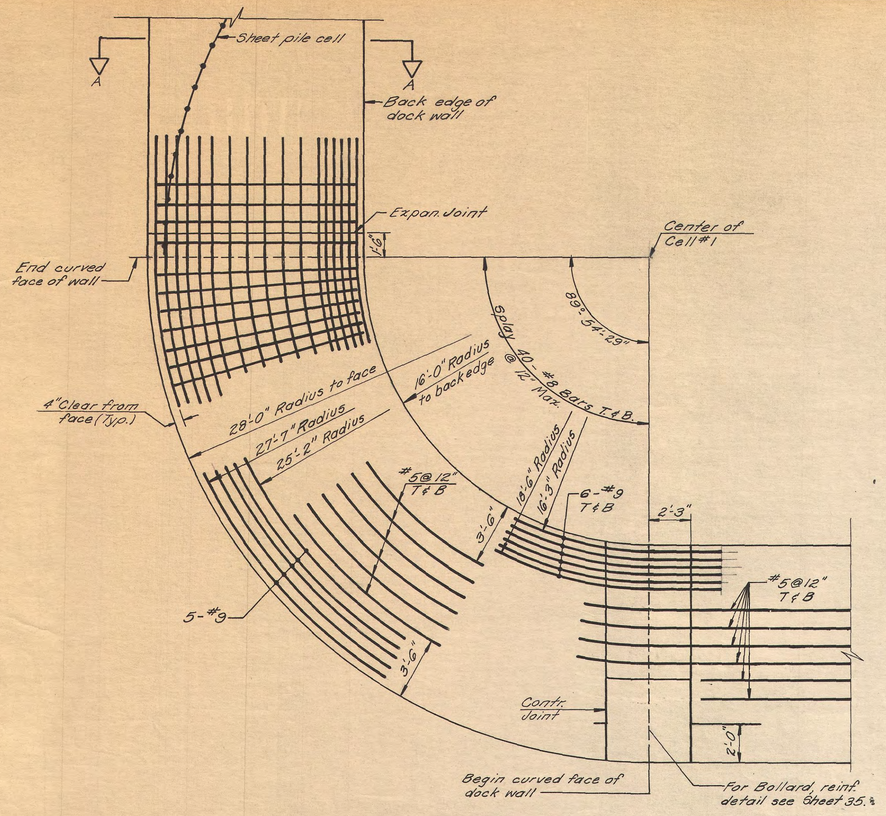
1. All exposed edges of Concrete Dock Wall to have 1"x1" chamfer.
2. Fender System to be pressure creosoted Douglas Fir conforming to details shown. The Contractor is to submit Shop Drawings of Fender System for approval of Engineer prior to fabrication.
3. Upper and lower wale splices to be staggered 10'-0" c.c. minimum.
4. All piles are to be driven prior to placing Dock Wall.
5. Cap log to be discontinued at Bollard and cleat locations to allow for tie-up lines.

NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT – MASS. R-96

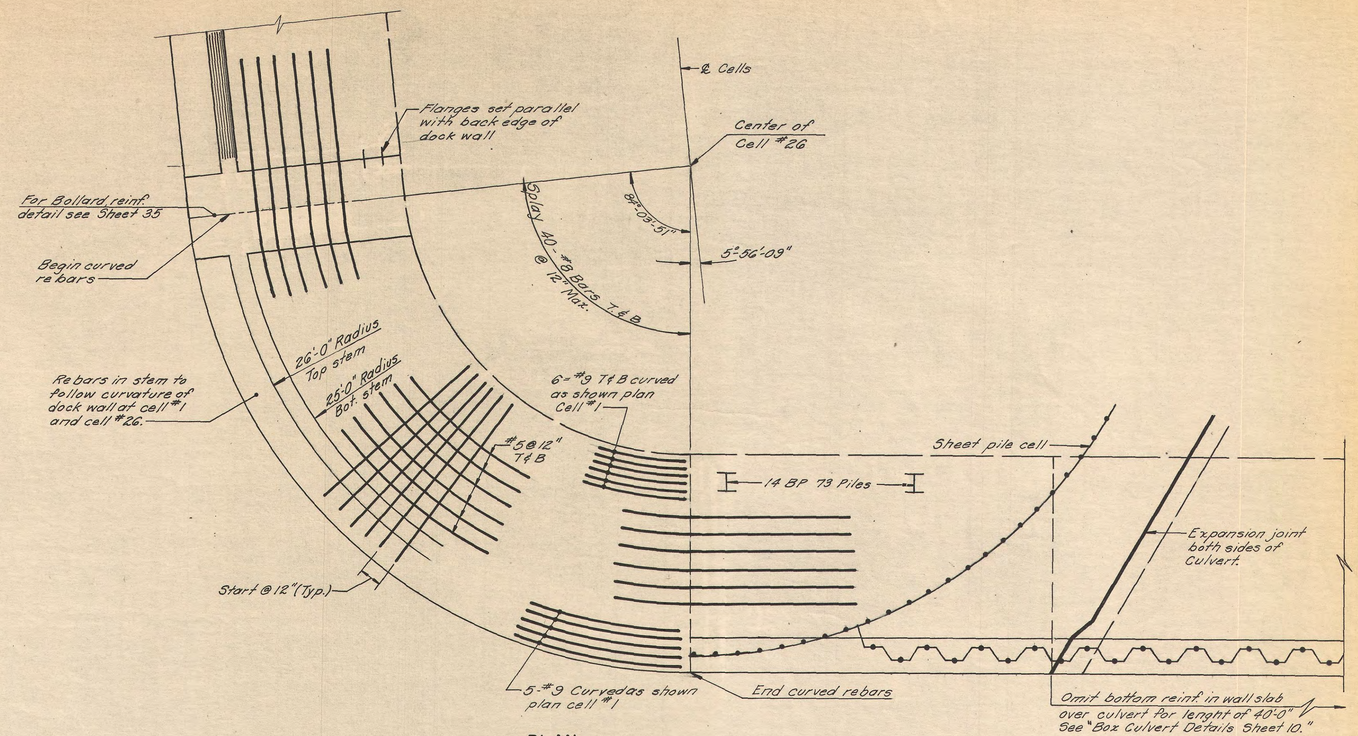
SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE May 19, 1969 | CONCRETE DOCK WALL & FENDER SYSTEM | CONTRACT NO. 2 |
| DESIGNED BY R.C.S. | | SHEET NO. 35 OF 37 |
| CHECKED BY P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G.R.C. | | DRW. NO. 371-02-35 |



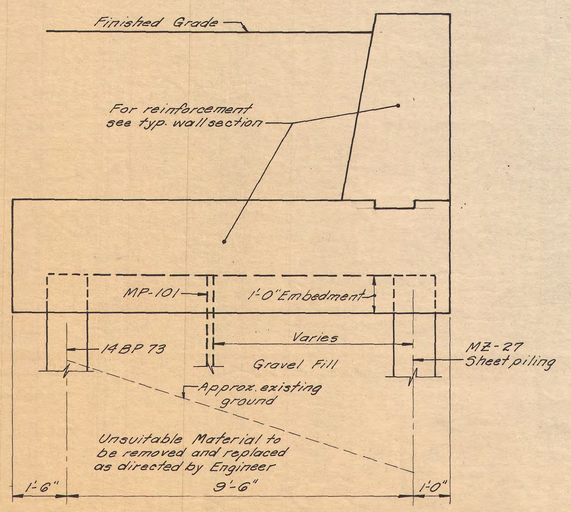

**PLAN**

SCALE: 1/4" = 1'-0"



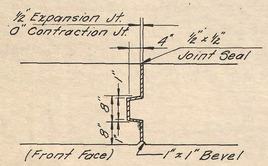

**PLAN**

SCALE: 1/4" = 1'-0"

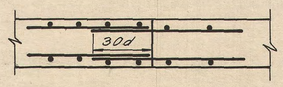



**SECTION A-A**

SCALE: 1/2" = 1'-0"




**WALL JOINT DETAILS**



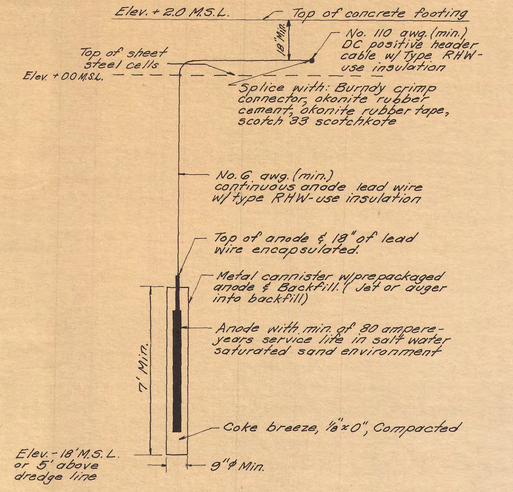

**CONSTRUCTION JOINT**

## DOCK WALL JOINT DETAILS

NOT TO SCALE

Notes:
1. Joint filler to extend to top of wall.
2. No reinforcement to pass through expansion joint.

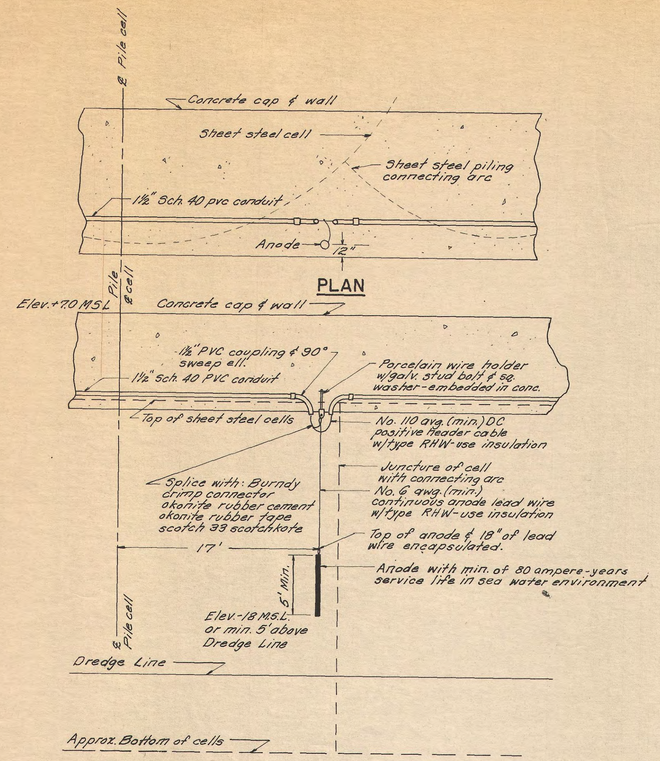
| | | |
|---|---|---|
| NEW BEDFORD REDEVELOPMENT AUTHORITY | | |
| PROJECT - MASS. R-96 | | |
| SOUTH TERMINAL URBAN RENEWAL PROJECT | | |
| DATE: May 19, 1969 | DOCK WALL DETAILS | CONTRACT NO. 2 |
| DESIGNED BY R.C.S. | | SHEET NO. 36 OF 37 |
| CHECKED BY P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G.R.C. | | DRW. NO. 371-02-36 |




## DETAIL "A"

NOT TO SCALE

TYPICAL ANODE INSTALLATION IN BACKFILL SAND

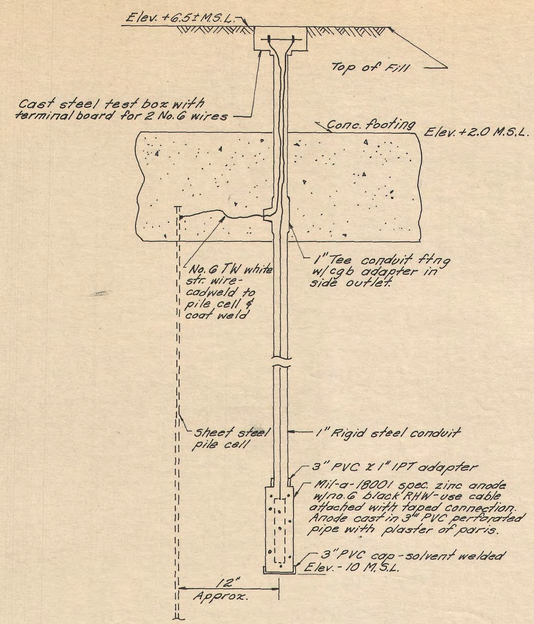



ELEVATION

## DETAIL "B"

NOT TO SCALE

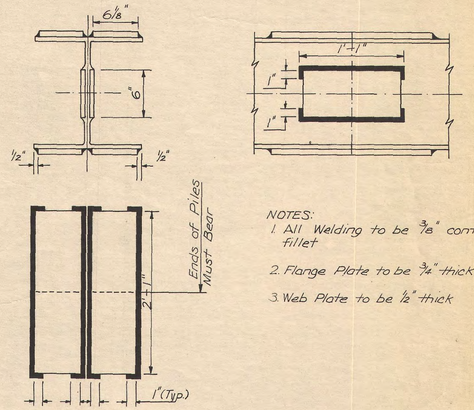
TYPICAL ANODE INSTALLATION ON WATER SIDE OF BULKHEAD




## DETAIL "C"

NOT TO SCALE

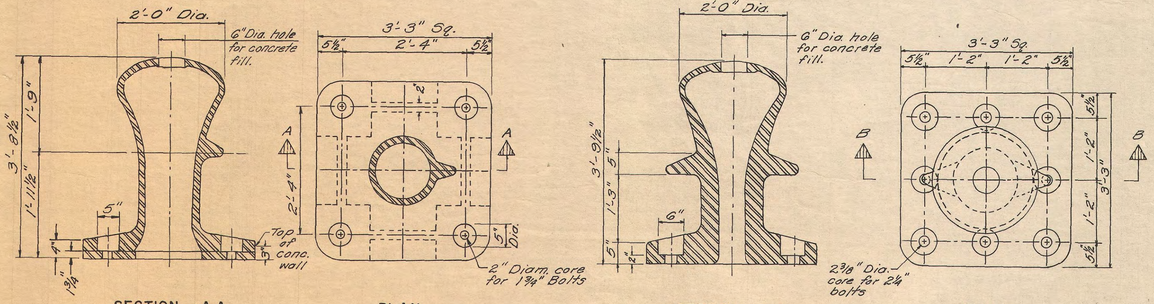
TYPICAL TEST STATION FOR CATHODIC PROTECTION




NOTES:
1. All Welding to be ⅜" continuous fillet
2. Flange Plate to be ¾" thick
3. Web Plate to be ½" thick

## 14 BP 73 SPLICE DETAIL

NOT TO SCALE



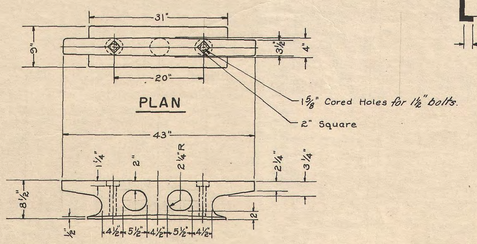

## CAST STEEL BOLLARDS

SCALE: 3/4" = 1'-0"

Type "A" Bollard to have 70,000 lbs. capacity for use in 20' Draft.

Type "B" Bollard to have 300,000 lbs. capacity for use in 30' Draft.

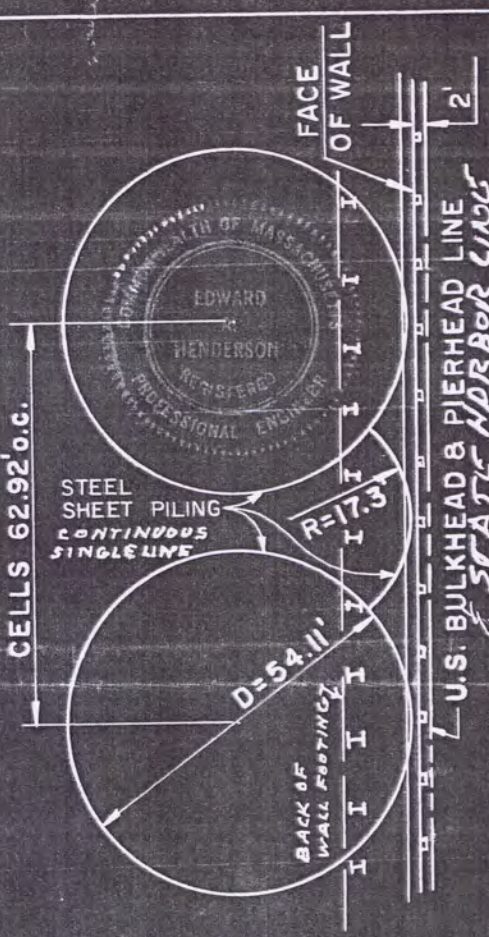
Notes:
1. See Sheet 35 for Anchor bolt embedment lengths.
2. No anchor bolt for bollard or cleats shall come within 3 inches of reinforcing steel.




## CLEAT DETAIL

SCALE: 3/4" = 1'-0"

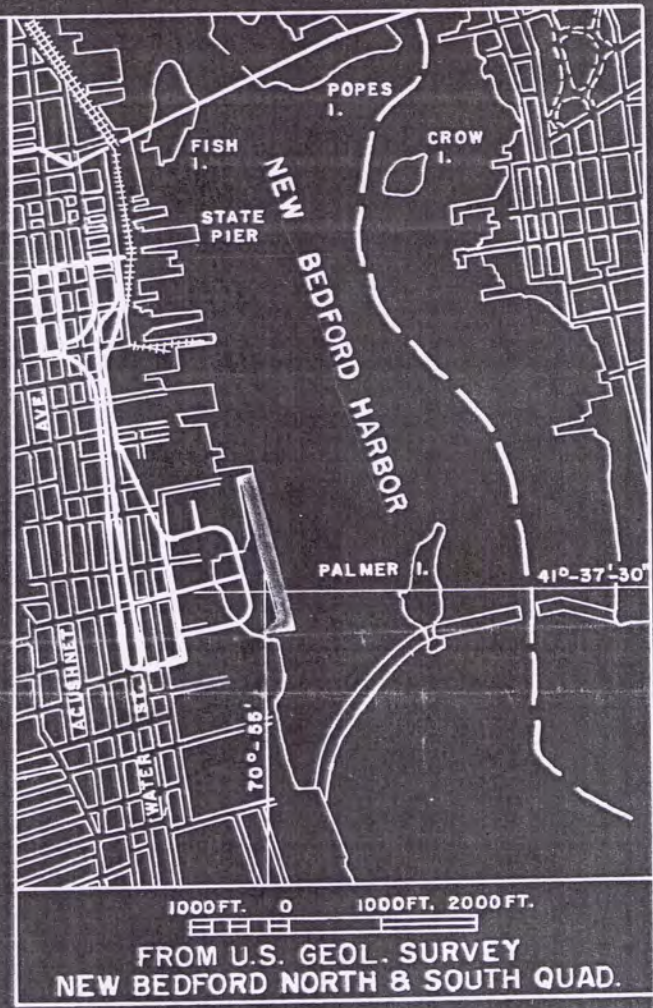
| | | |
|---|---|---|
| NEW BEDFORD REDEVELOPMENT AUTHORITY | | |
| PROJECT - MASS. R-96 | | |
| SOUTH TERMINAL URBAN RENEWAL PROJECT | | |
| DATE: May 19, 1969 | MISCELLANEOUS BULKHEAD DETAILS | CONTRACT NO. 2 |
| DESIGNED BY R. C. S. | | SHEET NO. 37 OF 37 |
| CHECKED BY P. L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G. R. C. | | DRW. NO. 371-02-37 |



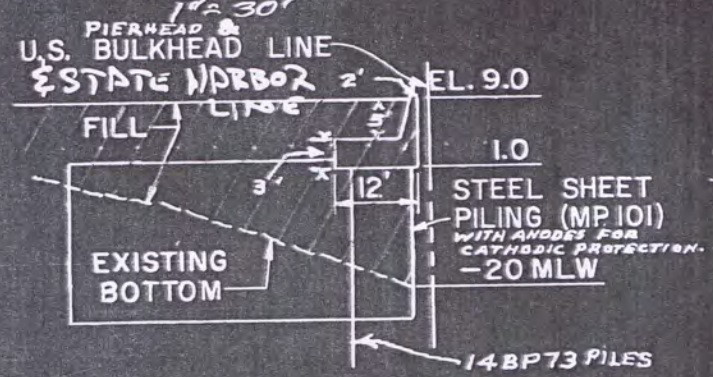

TYPICAL CELL PLAN

10 0 10 20

1" = 30'



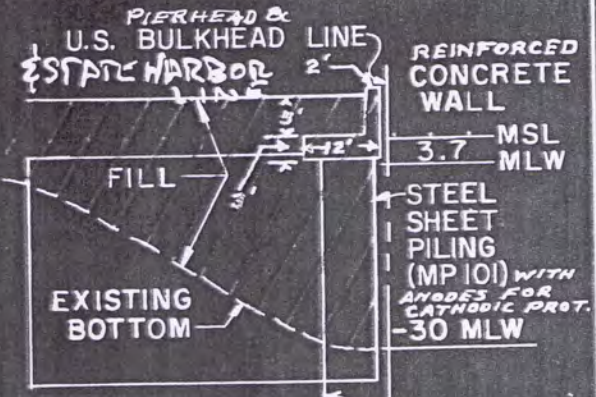

FROM U.S. GEOL. SURVEY
NEW BEDFORD NORTH & SOUTH QUAD.




SECTION A-A

20' DRAFT

SCALE 1" = 30'




SECTION B-B

30' DRAFT

PLAN TO ACCOMPANY PETITION
OF
NEW BEDFORD
REDEVELOPMENT AUTHORITY
TO BUILD SHEET PILE & CONCRETE
BULKHEAD, & FILL
IN
NEW BEDFORD HARBOR
NEW BEDFORD

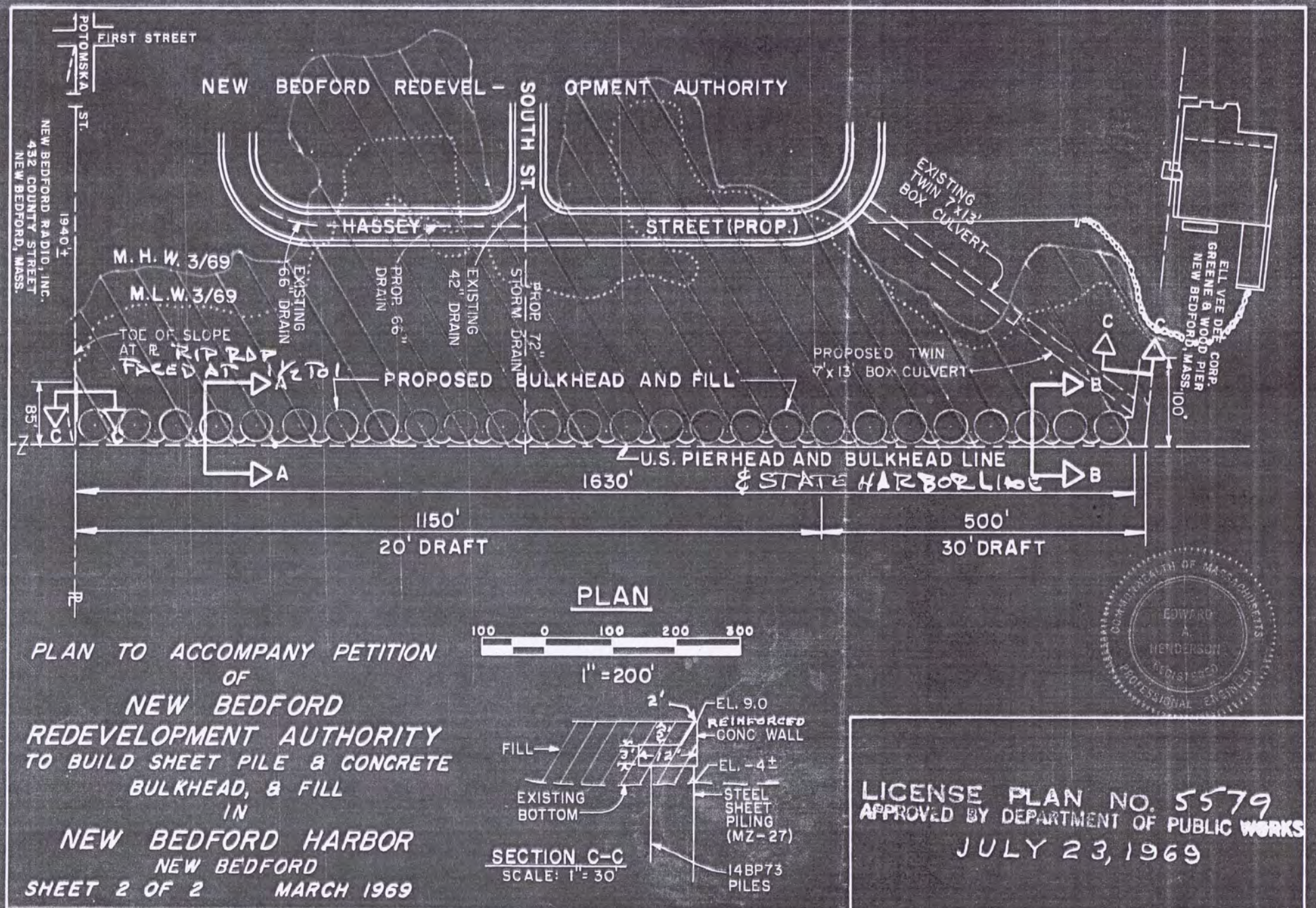
SHEET 1 OF 2 MARCH, 1969

LICENSE PLAN NO. 5579
APPROVED BY DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
JULY 23, 1969

Richard [illegible]
Charles A. Parker
Edgar Gonsalves
John P. Kenney
Robert S. Foster

COMMISSIONER - DEPT. OF PUBLIC WORKS

ASSOCIATE COMMISSIONERS




PLAN

100 0 100 200 300

1" = 200'




SECTION C-C
SCALE: 1" = 30'

PLAN TO ACCOMPANY PETITION
OF
NEW BEDFORD
REDEVELOPMENT AUTHORITY
TO BUILD SHEET PILE & CONCRETE
BULKHEAD, & FILL
IN
NEW BEDFORD HARBOR
NEW BEDFORD
SHEET 2 OF 2 MARCH 1969

COMMONWEALTH OF MASSACHUSETTS
EDWARD A. HENDERSON
REGISTERED
PROFESSIONAL ENGINEER

LICENSE PLAN NO. 5579
APPROVED BY DEPARTMENT OF PUBLIC WORKS
JULY 23, 1969

ISSUED FOR CONSTRUCTION

# NEW BEDFORD MUNICIPAL PIERS FENDERING AND REPAIRS

## (EDA AWARD NO. 01-79-15040)

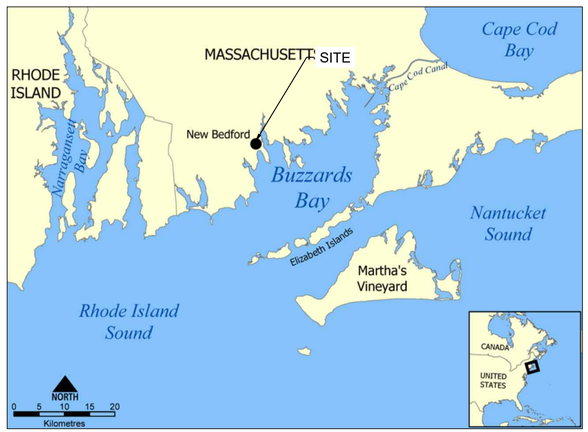
NEW BEDFORD, MASSACHUSETTS
PROJECT NO. 21N007
SEPTEMBER 2022

Prepared for:
NEW BEDFORD PORT AUTHORITY

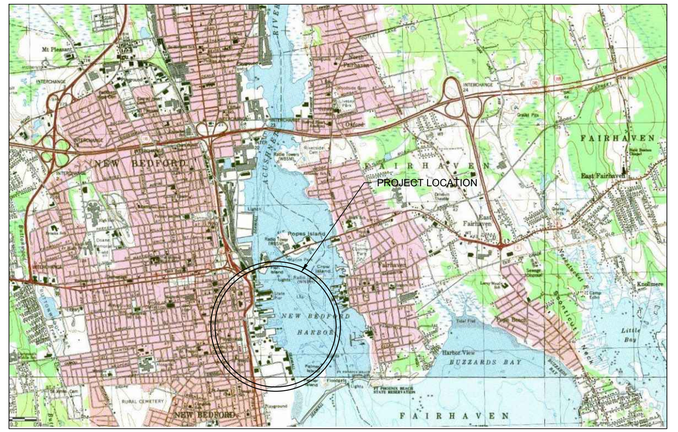
Prepared by:
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC

DRAWING INDEX

| SHEET NUMBER | TITLE |
|---|---|
| G-001 | COVER SHEET |
| G-002 | GENERAL NOTES, LEGEND, & ABBREVIATIONS |
| C-001 | SITE LOCATION, STAGING, & VESSEL MOVEMENT PLAN |
| C-002 | PIER 3 SITE PLAN |
| C-003 | STEAMSHIP PIER SITE PLAN |
| C-004 | SOUTH TERMINAL SITE PLAN |
| S-001 | TYPICAL SECTIONS - SHEET 1 OF 1 |
| S-002 | TYPICAL DETAILS - SHEET 1 OF 1 |




VICINITY MAP




LOCATION MAP

ALEX L MORA
CIVIL
NO. 55309
REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
14 September 2022

SHEET TITLE
COVER SHEET

SHEET NUMBER
**G-001**

GENERAL NOTES:

1. NOTES BELOW ARE NOT INTENDED TO REPLACE SPECIFICATIONS. SEE SPECIFICATIONS FOR REQUIREMENTS IN ADDITIONAL INFORMATION.
2. THE CONTRACTOR IS ADVISED THAT THE DRAWINGS AND SPECIFICATIONS FORM A PART OF THE CONTRACT DOCUMENTS. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL KEEP A COPY OF THE DRAWINGS AND SPECIFICATIONS ONSITE AT ALL TIMES DURING THE PROJECT.
3. THE CONTRACTOR SHALL MAINTAIN ADEQUATE SURVEY CONTROL AT ALL TIMES TO ESTABLISH AND MAINTAIN ALL LINES AND ELEVATIONS SHOWN ON THE CONTRACT DRAWINGS.
4. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES AND SUBMERGED UTILITIES WITHIN THE LIMITS OF THE WORK PRIOR TO COMMENCING ANY EXCAVATION OR GROUND PENETRATING WORK. THE CONTRACTOR SHALL NOTIFY "DIG SAFE" (1-888-344-7223) AT LEAST 3 BUSINESS DAYS PRIOR TO COMMENCEMENT OF THE EXCAVATION OR GROUND PENETRATING ACTIVITY.
5. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE AND MAINTAIN ENVIRONMENTAL CONTROLS AS REQUIRED BY STATE, LOCAL, AND FEDERAL REGULATION AND LAW, AS WELL AS REQUIRED WITHIN EXISTING PERMITS AND APPROVALS.
6. ALL APPLICABLE FEDERAL AND STATE REGULATION AND PERMITS SHALL BE FOLLOWED, INCLUDING BUT NOT LIMITED TO, THE CLEAN WATER ACT, THE FEDERAL DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY, HEALTH ACT, 401 WATER QUALITY CERTIFICATION, CHAPTER 91 LICENSE, AND U.S. ARMY CORP OF ENGINEERS PERMIT.
7. THE CONTRACTOR IS TO VERIFY THAT THERE ARE NO EXISTING HAZARDS OR OBSTRUCTIONS IN THE SILT CURTAIN AREA SHOWN HEREON.
8. BASE PLAN COMPILED BY FOTH USING AVAILABLE MAGIS DATA AND INFORMATION PROVIDED BY USACE AND NBPA.
9. THE CONTRACTOR, PRIOR TO CONSTRUCTION AND FABRICATION OF CONSTRUCTION MATERIALS, SHALL VERIFY EXISTING CONDITIONS AND DIMENSIONS.
10. IF, DURING THE PERFORMANCE OF THE WORK, THE CONTRACTOR FINDS A CONFLICT, ERROR, OR DISCREPANCY IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL SO REPORT TO THE ENGINEER IN WRITING AT ONCE BEFORE PROCEEDING WITH THE WORK AFFECTED THEREBY. THE CONTRACTOR SHALL OBTAIN A WRITTEN INTERPRETATION OR CLARIFICATION FROM THE ENGINEER. WORK DONE BEFORE THE ENGINEER RENDERS HIS/HE DECISION IS AT THE CONTRACTOR'S SOLE RISK.
11. THE CONTRACTOR SHALL TAKE HIS OWN MEASUREMENTS AT THE SITE, VERIFYING THE SAME WITH THE CONTRACT DRAWINGS AND EXISTING FACILITIES, AND WILL BE HELD RESPONSIBLE FOR THE PROPER FIT AND ALIGNMENT OF COMPLETED WORK IN POSITION.
12. LENGTHS SHOWN ON THE DRAWINGS ARE CONSIDERED APPROXIMATE, AND THE ACTUAL LENGTHS MAY VARY WHEN SO ACCEPTED BY THE ENGINEER.
13. EXISTING SITE CONDITION PLAN TAKEN FROM PLAN ENTITLED "NEW BEDFORD WATERFRONT FACILITIES INSPECTIONS" BY PARE CORPORATION DATED NOVEMBER 2008.
14. PROPERTY LINES OBTAINED FROM THE MA GIS DATABASE.
15. CONTRACTOR SHALL MAINTAIN A 6-FOOT SETBACK FROM THE EXISTING BULKHEAD FOR LOAD RESTRICTION. CRANE MATTS SHALL BE UTILIZED FOR ANY CRANE OR HEAVY EQUIPMENT LOADS. A STAGING PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO START OF WORK.

TOPOGRAPHIC SURVEY NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW A TOPOGRAPHIC SURVEY AS THE RESULT OF AN ON-THE-GROUND INSTRUMENT SURVEY WHICH OCCURRED BETWEEN 6-20-2020 TO 6-27-2020.
2. HORIZONTAL COORDINATES REFER TO MASSACHUSETTS STATE PLANE, MAINLAND ZONE, US SURVEY FEET BASED ON GPS RTK OBSERVATIONS.
3. ELEVATION REFERS TO MEAN LOW WATER MARK (MLW) VERTICAL BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008.
4. THE ENTIRE PROJECT SITE WORK AREA IS WITHIN LAND SUBJECT TO COASTAL STORM FLOWAGE. FEMA FLOOD ZONE AE (EL 6) REFERENCED FROM MAP# 25005C0393G & 25005C0481G DATED 7/16/14.
5. WATER BOUNDARIES ARE SUBJECT TO CHANGE DUE TO NATURAL CAUSES AND THE WATER BOUNDARIES SHOWN HEREON MAY OR MAY NOT REPRESENT THE ACTUAL LOCATION OF THE LIMIT OF TITLE.
6. THE MEAN HIGH WATER ELEVATION (3.75') BASED ON VDATUM CONVERSION FROM MEAN LOWER LOW WATER TO MEAN HIGH WATER.

HYDROGRAPHIC SURVEY NOTE:

1. COORDINATES SHOWN ARE IN STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE 2001, REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83), EXPRESSED IN US SURVEY FEET.
2. INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF SURVEYS MADE ON DATES INDICATED BELOW AND CAN ONLY BE CONSIDERED TO REPRESENT THE CONDITION AT THE TIME OF THE SURVEY AND AT SOUNDING POINTS NOTED ON THE PLAN. HYDROGRAPHIC SURVEY OF NEW BEDFORD HARBOR WAS PERFORMED BY FOTH INFRASTRUCTURE & ENVIRONMENTAL, LLC. SURVEY DATED NOVEMBER 2018.
3. ELEVATIONS & SOUNDINGS SHOWN ARE DEPTHS IN FEET BELOW MEAN LOW WATER (MLW) FOR CLARK'S POINT NOAA STATION 8447712. THE MLW ELEVATION FOR THE NEW BEDFORD HARBOR AREA IS -1.78 FEET NAVD88. SEE GRAPHIC REPRESENTATION OF DATUM SEPARATION FOR MORE INFORMATION.
4. ELEVATION REFERS TO THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL
5. 2008. SEE SPECIFICATIONS SECTION 00800 - SUPPLEMENTAL CONDITIONS FOR BENCHMARK INFORMATION.
6. SOUNDINGS SHOWN AS NEGATIVE ARE ABOVE THE REFERENCE PLANE.
7. THE SOUNDING INFORMATION SHOWN ON THIS PLAN REPRESENTS THE AVERAGE SOUNDINGS OBTAINED FROM HYDROGRAPHIC SURVEYS. SOUNDINGS ARE GENERATED FROM A 25' X 25' AVERAGE. VALUE DATA SET.
8. THE SOUNDING INFORMATION DEPICTED ON THIS PLAN SHOULD NOT BE USED FOR THE DETERMINATION OF VOLUMES. VOLUMES ARE TO BE DETERMINED FROM A SEPARATE AVERAGE VALUE DATA SET.
9. CONTOURS SHOWN FOR NEW BEDFORD HARBOR ARE BASED ON A 3'X3' AVERAGE VALUE DATA SET. CONTOURS ARE SHOWN AT 1' INTERVALS UNLESS OTHERWISE NOTED.

UTILITY NOTES:

1. THE SUB-SURFACE UTILITY INFORMATION SHOWN HEREON IS COMPILED BASED ON FIELD SURVEY INFORMATION, RECORD INFORMATION AS SUPPLIED BY THE APPROPRIATE UTILITY COMPANIES, AND PLAN INFORMATION SUPPLIED BY THE NEW BEDFORD PORT AUTHORITY, IF ANY; THEREFORE WE CANNOT GUARANTEE THE ACCURACY OF SAID COMPILED SUB-SURFACE INFORMATION TO ANY CERTAIN DEGREE OF STATED TOLERANCE. ONLY PHYSICALLY LOCATED SUB-SURFACE UTILITY FEATURES FALL WITHIN NORMAL STANDARD OF CARE ACCURACIES.
2. THE LOCATIONS OF UNDERGROUND PIPES, CONDUITS, AND STRUCTURES HAVE BEEN DETERMINED FROM SAID INFORMATION, AND ARE APPROXIMATE ONLY. COMPILED LOCATIONS OF ANY UNDERGROUND STRUCTURES, NOT VISIBLY OBSERVED AND LOCATED, CAN VARY FROM THEIR ACTUAL LOCATIONS.
3. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED.
4. THE STATUS OF UTILITIES, WHETHER ACTIVE, ABANDONED, OR REMOVED, IS AN UNKNOWN CONDITION AS FAR AS OUR COMPILATION OF THIS INFORMATION.
5. IT IS INCUMBENT UPON INDIVIDUALS USING THIS INFORMATION TO UNDERSTAND THAT COMPILING UTILITY INFORMATION IS NOT EXACT, AND IS SUBJECT TO CHANGE BASED UPON VARYING PLAN INFORMATION RECEIVED AND ACTUAL LOCATIONS.
6. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES IS SUBJECT TO FIELD CONDITIONS, THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS AND OTHER MATTERS.
7. THE PROPER UTILITY ENGINEERING/COMPANY SHOULD BE CONSULTED AND THE ACTUAL LOCATIONS OF SUBSURFACE STRUCTURES SHOULD BE VERIFIED IN THE FIELD (V.I.F.) BEFORE PLANNING FUTURE CONNECTIONS. CONTACT THE DIG SAFE CALL CENTER AT 1-888-344-7233, SEVENTY-TWO HOURS PRIOR TO EXCAVATION, BLASTING, GRADING, AND/OR PAVING.

STRUCTURAL NOTES:

1. SHOP DRAWINGS SHALL SHOW IN DETAIL ALL SIZES, SHAPES, MATERIALS, FINISHES AND METHODS OF ATTACHING MISCELLANEOUS METAL ITEMS TO ONE ANOTHER, AND WORK OF OTHER TRADES.
2. THE WORK SHALL BE PERFORMED IN A GENERAL SEQUENCE DEVELOPED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR REVIEW, IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR THE SEQUENCES AND PROCEDURES TO BE USED.

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LIST OF ABBREVIATIONS:

| | | | | | |
|---|---|---|---|---|---|
| ALTERNATE | - | ALT | LENGTH | - | L |
| AMERICAN ASSOCIATION OF STATE & HIGHWAY TRANSPORTATION OFFICIALS | - | AASHTO | LINEAR FOOT | - | LF |
| | | | LOWER HARBOR CAD CELL | - | LHCC |
| APPROXIMATE | - | APPROX | MANHOLE | - | MH |
| BENCHMARK | - | BM | MASS HIGHWAY DEPARTMENT | - | MHD |
| BOTTOM OF SLOPE | - | BOS | MAXIMUM | - | MAX |
| BOTTOM OF CURB | - | BOC | MEAN HIGH WATER | - | MHW |
| BUILDING | - | BLDG | MEAN LOWER LOW WATER | - | MLLW |
| CATCH BASIN | - | CB | MISCELLANEOUS | - | MISC. |
| CAST IN PLACE | - | C.I.P. | NEW BEDFORD PORT AUTHORITY | - | NBPA |
| CELLULAR COFFERDAM | - | CELL | NOT TO SCALE | - | NTS |
| CENTERLINE | - | CL | ORGANIC MATERIAL | - | OL |
| CENTER TO CENTER | - | C-C | OUTSIDE DIAMETER | - | OD |
| CHAIN LINK FENCE | - | CLF | OVERDREDGE | - | OD |
| CONTROLLED LOW-STRENGTH MATERIAL | - | CLSM | POORLY GRADED SAND | - | SP |
| CONFINED AQUATIC DISPOSAL | - | CAD | POUNDS PER SQUARE INCH | - | PSI |
| CONTROL POINT | - | CP | PROPOSED | - | PROP. |
| CUBIC FEET PER SECOND | - | CFS | SILTY SAND | - | SM |
| CUBIC YARDS | - | CY | SPECIFICATION | - | SPEC |
| ELEVATION | - | EL. ELEV. | SPLIT SPOON TEST | - | SPT |
| EDGE OF PAVEMENT | - | EOP | STATION | - | STA |
| ENVIRONMENTAL PROTECTION AGENCY | - | EPA | SQUARE FOOT | - | SF |
| EXISTING | - | EXIST | TOP OF CURB | - | TOC |
| FEET | - | FT | TOP OF SLOPE | - | TOS |
| GALVANIZED | - | GALV | TYPICAL | - | TYP |
| HIGH DENSITY POLYETHYLENE | - | HDPE | UNDERGROUND ELECTRICAL | - | UGE |
| HOT DIPPED GALVANIZED | - | HDG | WALL THICKNESS | - | WT |
| INCHES | - | IN | WELL GRADED SAND | - | SW |
| KIPS PER SQUARE INCH | - | KSI | | | |

GENERAL MATERIAL SPECIFICATIONS

STEEL:

1. STRUCTURAL STEEL SHALL COMPLY WITH THE "STEEL CONSTRUCTION MANUAL" FIFTEENTH EDITION PUBLISHED BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
2. MISC STEEL OR STEEL NOT SPECIFIED TO BE GRADE 50.
3. WELDING SHALL CONFORM TO THE 'STRUCTURAL WELDING CODE - STEEL', PUBLISHED BY THE AMERICAN WELDING SOCIETY (AWS D1.1). A WELDER CERTIFIED IN ACCORDANCE WITH AWS STANDARDS SHALL PERFORM WELDING.
4. WELDING ELECTRODES SHALL BE E70XX AND COMPLY WITH AWS A5.1 AND AWS A5.5 UNLESS NOTED OTHERWISE.
5. STRUCTURAL STEEL SHAPES/PILES SHALL CONFORM TO ASTM A588, GRADE 50. STEEL PLATES SHALL CONFORM TO ASTM A588 WITH 50 KSI YIELD.
6. STEEL HARDWARE: ANCHOR AND CARRIAGE BOLTS: ASTM F 1554 GRADE 55 AND ASTM A307, HIGH STRENGTH STRUCTURAL BOLTS: ASTM F3125 GR. A325, W/ HEXAGONAL OR CARRIAGE HEADS NUTS: ASTM A563, WASHERS (EXCEPT AGAINST TIMBER): ASTM F436, WASHERS AGAINST TIMBER SHALL BE COMMON DOCK WASHERS.
7. STEEL HARDWARE ABOVE GRADE SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153.
8. CONNECTIONS SHALL BE DESIGNED AND DETAILED BY THE STEEL FABRICATOR EXCEPT FOR THOSE SPECIFICALLY DETAILED IN THE CONTRACT DOCUMENTS.
9. PREFABRICATED PILE CAP ASSEMBLIES SHALL BE HOT DIP GALVANIZED.

STEEL PROTECTIVE COATING:

1. MATERIAL USED FOR FACTORY EPOXY COATING OF ALL SCHEDULED SURFACES SHALL BE AMERCOAT 240 OR APPROVED EQUAL ACCEPTED BY THE ENGINEER.
2. COATING SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATION WITH SURFACE PREPARATION FOR IMMERSION SERVICE WITH MINIMUM GRIT BLASTING TO NEAR WHITE FINISH (SSPC-SP10 OR NACE).
3. FIELD TOUCH-UP COATING SHALL BE AMERCOAT 240 FOR AREAS ABOVE MEAN HIGH WATER AND DENSO SPLASHZONE UNDERWATER EPOXY FOR AREAS BELOW MEAN HIGH WATER, OR APPROVED EQUAL, AND SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
4. THE PROTECTIVE COATING SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
5. ALL IMPERFECTIONS IN THE COATING SHALL BE REMOVED OR REPAIRED AT THE CONTRACTORS EXPENSE PRIOR TO FINAL ACCEPTANCE OF THE WORK.

CONCRETE:

1. CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF ACI-318 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE", AS ADOPTED BY THE AMERICAN CONCRETE INSTITUTE.
2. CONCRETE SHALL BE NORMAL WEIGHT WITH COMPRESSIVE STRENGTH OF 5000 PSI AT 28 DAYS. PORTLAND CEMENT SHALL BE TYPE II. CONCRETE SHALL CONTAIN 6% (+/- 1.5%) ENTRAINED AIR AND HAVE A MAXIMUM WATER TO CEMENT RATIO OF 0.40.
3. USE ACCELERATORS/ADMIXTURES TO IMPROVE WORKABILITY AND REDUCE WATER/CEMENT RATIO TO CONTROL SHRINKAGE. SUBMIT PROPOSED CONCRETE MIX TO THE ENGINEER FOR REVIEW. NO WATER SHALL BE ADDED TO THE MIX AT THE JOB SITE.
4. CONCRETE SHALL BE CONTROLLED CONCRETE, MIXED AND PLACED IN THE PRESENCE OF THE APPROVED TESTING AGENCY.
5. DO NOT PLACE CONCRETE UNTIL REINFORCEMENT AND EMBEDDED ITEMS HAVE BEEN APPROVED BY THE ENGINEER AND/OR THE APPROVED TESTING AGENCY (IF/WHEN DIRECTED). PROVIDE A MINIMUM OF 24 HOURS NOTIFICATION TO THE ENGINEER.
6. A MINIMUM OF 72 HOURS SHALL ELAPSE BETWEEN ADJACENT CONCRETE PLACEMENTS.

REINFORCEMENT:

1. REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615 GRADE 60, OR 75 AS CALLED FOR.
2. DETAILING, FABRICATION, AND ERECTION OF REINFORCING STEEL SHALL BE EPOXY COATED AND CONFORM TO THE REQUIREMENTS OF ACI-318 AND ACI-315 'DETAILS AND DETAILING OF CONCRETE REINFORCEMENT'.
3. REINFORCEMENT SHALL CONFORM TO BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318), ACI DETAILING MANUAL (SP-66), CRSI MANUAL OF STANDARD PRACTICE (MSP), AND THE STRUCTURAL WELDING CODE-REINFORCING STEEL (AWS D1.4). ELECTRODES TO BE E-8018.
4. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185
5. PROVIDE SUPPLEMENTAL BARS AND ACCESSORIES AS REQUIRED TO HOLD REINFORCEMENT SECURELY IN POSITION.
6. MINIMUM CONCRETE PROTECTIVE COVER, UNLESS NOTED OTHERWISE, SHALL BE AS FOLLOWS:
   - 6.1. CONCRETE EXPOSED TO WEATHER 3 INCHES
   - 6.2. CONCRETE AT ADJACENT POURS 2 INCHES
   - 6.3. CONCRETE PLACED AGAINST EARTH 3 INCHES
7. ALL CONTINUOUS REINFORCEMENT SHALL BE EXTENDED AROUND CORNERS AND LAPPED AT NECESSARY SPLICES OR HOOKED AT DISCONTINUOUS ENDS. USE STANDARD HOOKS UNLESS OTHERWISE INDICATED.
8. LAPS SHALL BE CLASS B TENSION LAP SPLICES, UNLESS NOTED OTHERWISE.
9. REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS. PROVIDE MECHANICAL COUPLERS WHERE REQUIRED CONTINUOUS REINFORCEMENT EXCEEDS AVAILABLE LENGTHS.

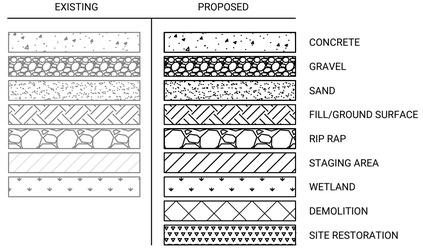
COMPOSITE FENDER SYSTEM:

1. FENDER PILES SHALL BE 13" DIAMETER PILE W/ 8x11 FG REBAR OR APPROVED EQUAL.
2. WALERS SHALL BE 12x12 TIMBER W/ 4x08 FG REBAR OR APPROVED EQUAL.
3. CHOCKS SHALL BE 8x12 TIMBER W/ 4x08 FG REBAR OR APPROVED EQUAL.
4. MATERIAL COLOR SHALL BE BLACK.
5. FENDER PILES SHALL BE DRIVEN STRAIGHT AND TRUE AT INDICATED LOCATIONS, WITH DEVIATION FROM THE LONGITUDINAL AXIS OF NOT MORE THAN 1/8 INCH PER FOOT.
6. WALERS SHALL BE CONTINUOUSLY EXTRUDED.
7. CONTRACTOR SHOULD COORDINATE WALE LENGTHS TO THE MAXIMUM EXTENT POSSIBLE IN ORDER TO MINIMIZE OVERLAP AREAS.

FIBERGLASS PILE JACKET REPAIRS:

1. FIBERGLASS PILE JACKETS SHALL BE DENSO FIBER-FORM PILE JACKETS OR APPROVED EQUAL.
2. GROUT FOR PILE JACKET REPAIRS SHALL BE DENSO SEASHIELD 550 EPOXY GROUT OR APPROVED EQUAL.
3. FIBERGLASS JACKETS AND EPOXY GROUT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATIONS.

HATCHING




Pier 3 / Fisherman's Wharf Plating Repair Schedule

| Station | Description |
|---|---|
| 0+04 | Hole 4" DIA outer sheet flange |
| 0+18 | Hole 3" DIA on web |
| 0+20 | Hole 3" DIA outer flange behind fender |
| 0+30 | Hole 3" DIA outer flange behind fender |
| 0+40 | Hole 3" DIA outer flange behind fender |
| 0+78 | Hole 5" DIA outer flange behind fender |
| 0+90 | Hole 5" DIA outer flange behind fender |
| 1+00 | Hole 5"x18" on web & outside flange |
| 1+10 | Hole 2"x3" outer flange behind fender |
| 1+12 | Hole 3" DIA outer flange behind fender |
| 1+55 | Hole 3" DIA outer flange behind fender |
| 1+60 | Hole 3" DIA outer flange behind fender |
| 1+65 | Hole 3" DIA outer flange behind fender |
| 1+72 | Hole 1" DIA inside flange behind fender |
| 2+00 | Hole 3" DIA outer flange behind fender |
| 2+50 | Hole 3" DIA on web behind fender |
| 3+00 | Hole 4" DIA inside flange |
| 3+10 | Hole 3"x3" outside flange |
| 3+40 | Hole 1"x1" outside flange |
| 4+40 | (2) Holes 1"x1" outside flange |
| 4+54 | Hole 3"x3" outside flange |
| 4+62 | Hole 4"x4" outside flange |
| 4+65 | Hole 4"x4" outside flange |
| 4+72 | Hole 2"x2" and 1"x1" outside flange |
| 4+75 | Hole 1"x3" outside flange |
| 4+77 | Hole 3"x3" outside flange |
| 4+81 | Hole 3"x3" outside flange |
| 4+85 | (2) Holes 4"x4" outside flange |
| 4+85 | Hole 1"x3" outside flange |
| 4+87 | Hole 2"x2" outside flange |
| 4+94 | Hole 3"x3" outside flange |
| 4+96 | Hole 2"x2" outside flange |
| 5+00 | Hole 2"x2" outside flange |
| 5+05 | (2) Holes 1"x1" outside flange |
| 5+10 | Hole 1"x1" outside flange of corner sheet |
| 5+12 | Hole 2"x3" behind ladder |
| 5+14 | Hole 2"x2" outside flange |
| 5+17 | Hole 2"x2" outside flange |
| 5+30 | Hole 1"x1" outside flange |
| 5+35 | Hole 3"x3" and Hole 1"x1" outside flange |
| 5+42 | Hole 4"x4" and Hole 1"x1" outside flange behind fender |
| 5+45 | Hole 2"x2" inside flange below waler bolt |
| 5+50 | Hole 1"x2" and Hole 2"x2" outside flange |
| 5+60 | (3) Holes 2"x2" outside flange |
| 5+75 | (2) Hole 2"x2" outside flange |
| 5+80 | Hole 2"x2" outside flange at waler level |
| 5+90 | Hole 2"x2" outside flange at waler level |
| 6+15 | Hole 2"x2" behind ladder |
| 6+25 | Hole 1"x1" outside flange |
| 6+30 | Hole 2"x2" and Hole 1"x1" outside flange |
| 6+40 | Hole 1"x1" outside flange |
| 6+62 | Hole 1"x1" outside flange |
| 6+80 | Hole 2"x2" outside flange |
| 6+85 | Hole 2"x2" outside flange |
| 6+92 | Hole 1"x1" outside flange |
| 7+00 | Hole 2"x2" outside flange |
| 7+72 | Hole 1"x1" outside flange |
| 10+28 through 10+35 | Hole 2"x2" outside flange at Mud Line |

South Terminal Plating Repair Schedule

Note: Sheets at each cell are numbered from south to north with sheet #1 adjacent to the Y junction sheet

| Cell No. | Sheet No. | Description |
|---|---|---|
| 7 | 1 | Hole 3'x6' at top of sheet |
| 7 | 1 - 9 | Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below |
| 8 | 10 | Hole 6"x6" at top of sheet |
| 8 | 11 | Hole 2"x4" at top of sheet near expansion joint |
| 9 | 15 | Hole 6"x10" at top of sheet |
| 9 | 28 | Hole 6"x6" at top of sheet |
| 10 | 12 | Hole 4"x6" & 1.5"x2" at top of sheet |
| 12 | 12 | Hole/Crack 2"x240" at top of sheet near expansion joint |
| 12 | 15 | Hole 3"x4" at top of sheet |
| 13 | 2 | Hole 1"x1" at top of sheet |
| 15 | 30 | Hole 4"x6" at top of sheet |
| 16 | 11 | Hole 6"x12" at top of sheet near expansion joint |
| 16 | 12 | Hole 12"x36" at top of sheet |
| 16 | 22 | Hole 1"x2" at top of sheet |
| 17 | 30 | Hole 4"x6" at top of sheet |
| 18 | 19 | Hole 6"x12" at top of sheet |
| 19 | 23 | Hole 1"x2" at top of sheet |
| 19 | 30 | Hole 3"x5" at top of sheet |
| 20 | 12 | Hole 6"x20" at top of sheet |
| 20 | 13 | Hole 8"x36" at top of sheet near expansion joint |
| 20 | 14 | Hole 12"x36" at top of sheet |
| 22 | 6 | Hole 2"x2" at top of sheet by diver |
| 23 | 4 | Hole 1"x1" at top of sheet by diver |
| 23 | 10 | Hole 2"x3" mid water |
| 24 | 12 | Hole 8"x24" w/ 24" long crack at top of sheet |
| 24 | 13 | Hole 8"x36" at top of sheet near expansion joint |
| 24 | 14 | Hole 12"x48" at top of sheet |
| 25 | 27 | Hole 1"x2" at top of sheet |
| 27 | 10 | Hole 4"x6" at top of sheet |
| 28 | 12 | Hole 3"x4" at top of sheet |
| 28 | 13 | Hole 8"x8" at top of sheet near expansion joint |
| 28 | 14 | Hole 8"x12" at top of sheet |
| 29 | 19 | Hole 2"x3" at top of sheet |
| 30 | 13 | Hole 6"x8" at top of sheet |
| 31 | 12 | Hole 2"x2" at top of sheet |
| 32 | 13 | Hole 12"x24" at top of sheet |
| 32 | 14 | Hole 12"x36" w/ 24" long crack at top of sheet near expansion joint |
| 32 | 15 | Hole 10"x24" w/ 24" long crack at top of sheet |
| 32 | 18 | Hole 3"x4" at top of sheet |
| 35 | 2 | Hole 2"x4" at top of sheet |
| 36 | 12 | Hole 6"x24" at top of sheet |
| 36 | 13 | Hole 12"x36" at top of sheet near expansion joint |
| 36 | 14 | Hole 10"x24" at top of sheet |
| 36 | 15 | Hole 4"x10" at top of sheet |
| 36 | 16 | Hole 4"x4" at top of sheet |
| 40 | 12 | Hole 3"x3" at top of sheet |
| 40 | 13 | Hole 4"x18" w/ 12" long crack at top of sheet near expansion joint |
| 40 | 23 | Hole 2"x6" at top of sheet |
| 41 | 2 | Hole 2"x6" at top of sheet |
| 41 | 30 | Hole 1"x3" at top of sheet |
| 42 | 10 | Hole 1"x1" at top of sheet |
| 42 | 15 | Hole 2"x2" at top of sheet |
| 44 | 5 & 6 | Bowed outward with interlock separation at bottom 12" of sheets at mud line |
| 44 | 13 | Hole 6"x12" w/ 12" long crack at top of sheet near expansion joint |
| 44 | 16 | Hole 12"x42" at top of sheet |
| 46 | 4 | Hole 3"x3" at top of sheet |
| 46 | 22 | Hole 6"x24" at top of sheet |
| 47 | 15 | Hole 2"x3" at top of sheet |
| 48 | 13 | Hole 8"x24" at top of sheet near expansion joint |
| 49 | 16 | Hole 2"x2" at top of sheet |
| 51 | 15 | Hole 4"x4" at top of sheet |
| 51 | 53 | Hole 12"x24" at top of sheet |
| Z-Sheets (Northern End of Bulkhead) | 2 | Large Hole that goes through & through on the web from both sides |
| Z-Sheets (Northern End of Bulkhead) | 3 | Large Hole that goes through & through on the web from both sides |
| Z-Sheets (Northern End of Bulkhead) | 4 | Large Hole that goes through & through on the web from both sides |

GENERAL SYMBOLS

| EXISTING | PROPOSED | |
|---|---|---|
| | | CONTOURS (MAJOR) |
| | | CONTOURS (MINOR) |
| | | CONDUIT |
| E | E | ELECTRIC |
| GAS | GAS | GAS |
| SS | SS | STORM SEWER (DRAINAGE) |
| SAN | SAN | SANITARY SEWER |
| W | W | WATER (POTABLE / IRRIGATION) |
| OHE | OHE | OVERHEAD UTILITY |
| FO | FO | FIBER OPTICS |
| COMM | COMM | COMMUNICATIONS |
| CA | CA | COMPRESSED AIR |
| | | EROSION CONTROL |
| X X X X | X X X X | FENCE |
| | | ANNUAL HIGH TIDE LINE (AHTL) |
| | | MEAN HIGH WATER (MHW) |
| | | MEAN LOW WATER (MLW) |
| | | PROPERTY LINE |
| | | FEMA FLOOD LIMIT |
| | | HISTORIC HIGH WATER LINE |
| | | SHELLFISH SUITABILITY LIMIT |
| | | HARBOR LINE |
| | | ACOE CHANNEL LIMIT |
| | | WATER SUPPLY |
| | | CONTROL POINT |
| | | BENCHMARK |
| | | VALVE |
| | | WATER VALVE |
| | | GAS WELL |
| D | D | DRAIN MANHOLE |
| E | E | ELECTRIC MANHOLE |
| M | M | MISC MANHOLE |
| S | S | SEWER MANHOLE |
| W | W | WATER MANHOLE |
| C | C | COMMUNICATIONS MANHOLE |
| GG | GG | GAS GATE |
| WG | WG | WATER GATE |
| | | HYDRANT |
| | | UTILITY POLE |
| HH | HH | HANDHOLE |
| | | LIGHT POLE |
| | | PILE (TIMBER OR STEEL) |
| | | SHEET PILE |
| | | TRAFFIC SIGN |
| | | W BEAM |
| | | CATCH BASIN |
| | | LOCATION OF STEEL PLATING REPAIRS |

DATUM OFFSETS

| MLW | | NAVD 88 | |
|---|---|---|---|
| 4.85 | 3.07 | | HTL |
| 3.57 | 1.79 | | MHW |
| 1.78 | 0.00 | | NAVD 88 |
| 0.00 | -1.78 | | MLW |
| -0.14 | -1.92 | | MLLW |

OFFSETS PROVIDED BY THE USACE IN MEMO DATED 2/18/15 BY JACOBS AND NOAA TIDAL STATION "CLARKS POINT" #8447712 TIDAL EPOCH 1983-2001

COMMONWEALTH OF MASSACHUSETTS
ALEX L MORA
CIVIL
NO. 65309
REGISTERED PROFESSIONAL ENGINEER
14 September 2022

Foth

NEW BEDFORD PORT AUTHORITY
123 MACARTHUR DRIVE
NEW BEDFORD, MA 02740

NEW BEDFORD MUNICIPAL PIERS
FENDERING AND REPAIRS

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | DESCRIPTION |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

SHEET TITLE:

GENERAL NOTES, LEGEND, & ABBREVIATIONS

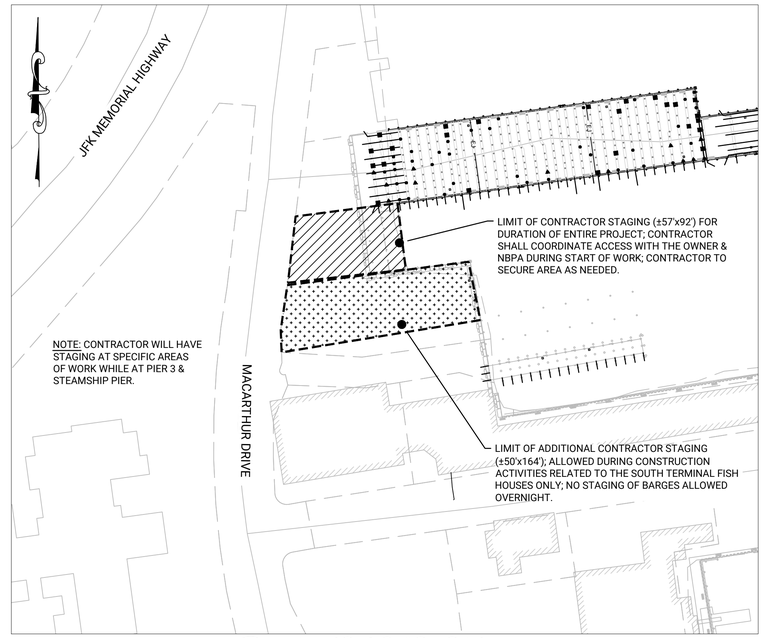
ISSUANCE: ISSUED FOR CONSTRUCTION

PROJECT NO: 21N007

SHEET NUMBER

G-002




ENLARGED STAGING AREA
SCALE: 1" = 60'

ALEX L MORA
CIVIL
NO. 55309
REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS

14 September 2022

GRAPHIC SCALE
0 30 60 120
(IN FEET)
1 INCH = 60 FEET

GRAPHIC SCALE
0 100 200 400
(IN FEET)
1 INCH = 200 FEET

Foth

**NEW BEDFORD PORT AUTHORITY**
**123 MACARTHUR DRIVE**
**NEW BEDFORD, MA 02740**

**NEW BEDFORD MUNICIPAL PIERS**
**FENDERING AND REPAIRS**

| REVISIONS | | | |
|---|---|---|---|
| NO. | DESCRIPTION | DATE | BY |
| | | | |

DATE OF PREPARATION

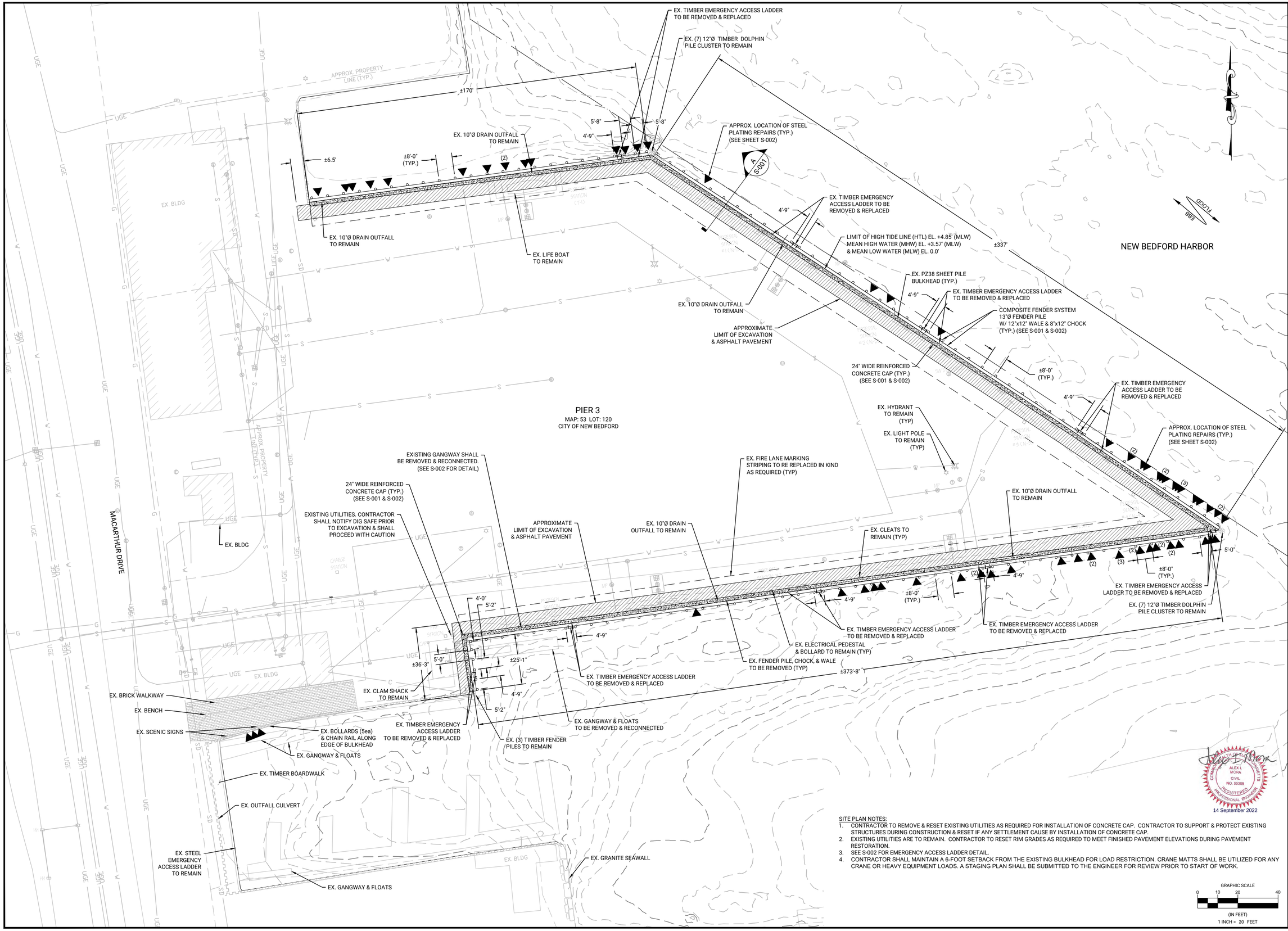
| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

SHEET TITLE:
SITE LOCATION, STAGING, & VESSEL MOVEMENT PLAN

ISSUANCE: **ISSUED FOR CONSTRUCTION**

PROJECT NO: 21N007

SHEET NUMBER
C-001




SITE PLAN NOTES:

1. CONTRACTOR TO REMOVE & RESET EXISTING UTILITIES AS REQUIRED FOR INSTALLATION OF CONCRETE CAP. CONTRACTOR TO SUPPORT & PROTECT EXISTING STRUCTURES DURING CONSTRUCTION & RESET IF ANY SETTLEMENT CAUSE BY INSTALLATION OF CONCRETE CAP.
2. EXISTING UTILITIES ARE TO REMAIN. CONTRACTOR TO RESET RIM GRADES AS REQUIRED TO MEET FINISHED PAVEMENT ELEVATIONS DURING PAVEMENT RESTORATION.
3. SEE S-002 FOR EMERGENCY ACCESS LADDER DETAIL.
4. CONTRACTOR SHALL MAINTAIN A 6-FOOT SETBACK FROM THE EXISTING BULKHEAD FOR LOAD RESTRICTION. CRANE MATTS SHALL BE UTILIZED FOR ANY CRANE OR HEAVY EQUIPMENT LOADS. A STAGING PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO START OF WORK.

ALEX L MORA
CIVIL
NO. 55309
REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
14 September 2022

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

Foth

**NEW BEDFORD PORT AUTHORITY**
**123 MACARTHUR DRIVE**
**NEW BEDFORD, MA 02740**

**NEW BEDFORD MUNICIPAL PIERS**
**FENDERING AND REPAIRS**

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

SHEET TITLE:

PIER 3
SITE PLAN

ISSUANCE: **ISSUED FOR CONSTRUCTION**

PROJECT NO: 21N007

SHEET NUMBER

C-002

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

MACARTHUR DRIVE

STEAMSHIP PIER

NEW BEDFORD HARBOR
EBB
FLOOD

COMPOSITE FENDER SYSTEM
13"Ø FENDER PILE
W/ 2"x12" WALE & 8"x12" CHOCK
(TYP.)

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. STEEL PIPE PILES
(TYP. ON EASTERN
SECTION)

SEE BELOW

MATCHLINE

EX. GRANITE
SEAWALL

LIMIT OF HIGH TIDE LINE (HTL) EL. +4.85'
MEAN HIGH WATER (MHW) EL. +3.57'
& MEAN LOW WATER (MLW) EL. 0.0'
ALONG EXISTING GRANITE SEAWALL

EX. TIMBER BOARDWALK

EX. TIMBER PILES
W/ CONCRETE AND/OR
FIBERGLASS JACKETS
(TYP. ON WESTERN SECTION)

EX. TIMBER FENDER PILES, WALE, & CHOCK
(TO BE REMOVED & REPLACED)

FIBERGLASS PILE
JACKET REPAIRS
(TYP. OF 73)

DEBRIS CONTAINMENT BOOM
TO BE USED DURING
PILE JACKETING ACTIVITIES

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

±260'
±384'
±8'-0" (TYP.)
4'-9"
6'-0"
3'-0"
±25'
±138'
4.75'
5'-2"
4'-0"

C S-001
D S-001

APPROX. PROPERTY LINE (TYP.)

SEWERAGE

SD
UGE
W
S

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

NEW BEDFORD HARBOR
EBB
FLOOD

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

13"Ø COMPOSITE
FENDER PILE W/ 2"x12" COMPOSITE
WALER & 8"x12" COMPOSITE CHOCK
FENDER SYSTEM (TYP.)

EX. (7) 12"Ø TIMBER DOLPHIN
PILE CLUSTER
TO REMAIN

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

MATCHLINE

STEAMSHIP PIER

SEE ABOVE

EX. STEEL PIPE PILES
(TYP. ON EASTERN
SECTION)

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

DEBRIS CONTAINMENT TO BE USED IN WAY OF
PILE JACKETING ACTIVITIES (TYP)

±243.50'
±167'
±74'-6"
±25'
±59.75'
±33.08'
±8'-0" (TYP.)
4'-9"
1'-8"
6'-0"

ALEX L MORA
CIVIL
NO. 55309
REGISTERED
PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
14 September 2022

PILE RATINGS KEY:
- ● CATEGORY 1 (36 TOTAL)
- ■ CATEGORY 2 (25 TOTAL)
- ▲ CATEGORY 3 (12 TOTAL)

Foth

NEW BEDFORD PORT AUTHORITY
123 MACARTHUR DRIVE
NEW BEDFORD, MA 02740

NEW BEDFORD MUNICIPAL PIERS
FENDERING AND REPAIRS

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

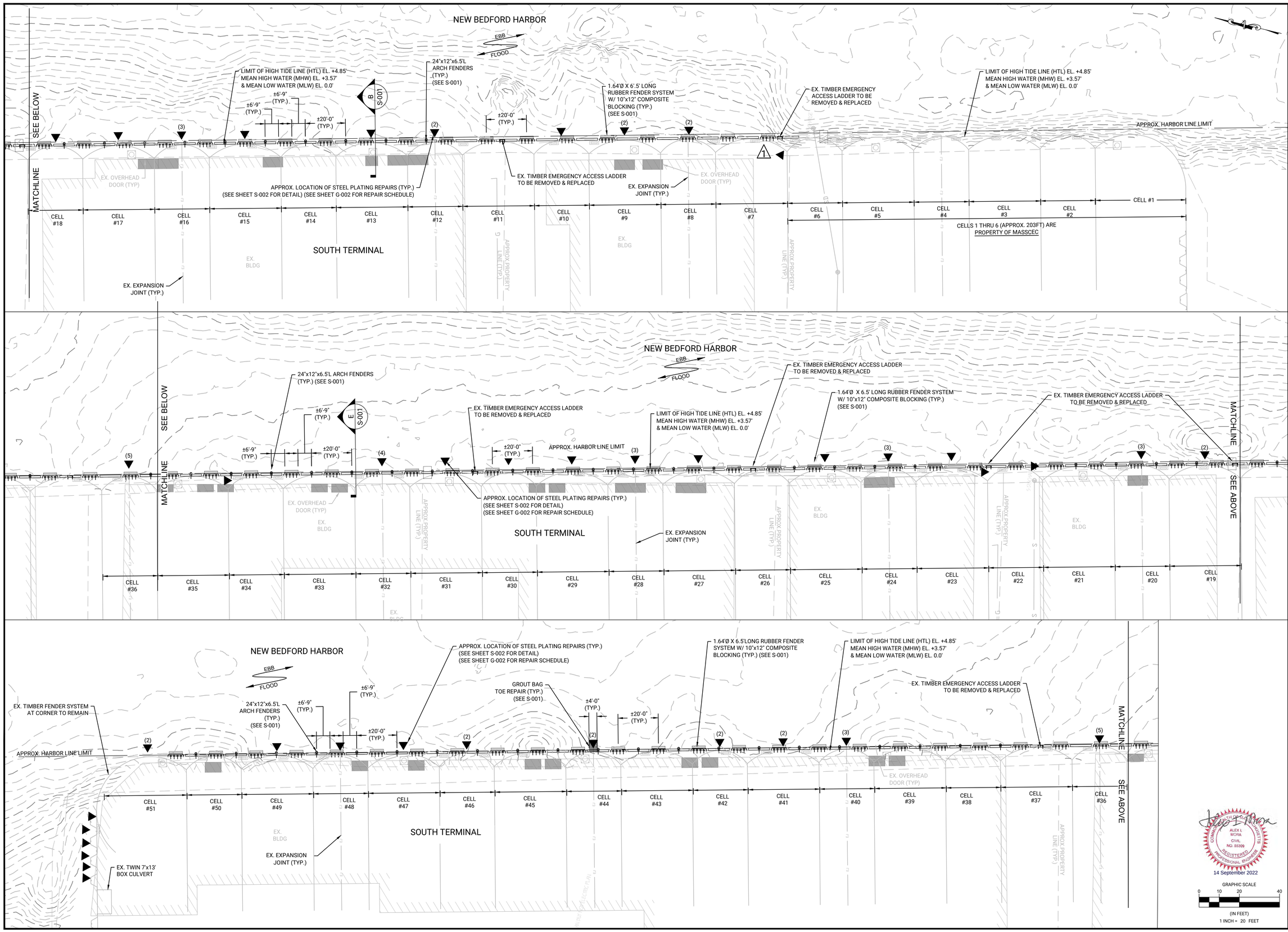
SHEET TITLE:

STEAMSHIP
PIER
SITE PLAN

ISSUANCE:
**ISSUED FOR CONSTRUCTION**

PROJECT NO: 21N007

SHEET NUMBER
C-003




Foth

**NEW BEDFORD PORT AUTHORITY**
**123 MACARTHUR DRIVE**
**NEW BEDFORD, MA 02740**

**NEW BEDFORD MUNICIPAL PIERS**
**FENDERING AND REPAIRS**

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | DTHA | 6/22/2022 | GROUT BAGS REMOVED FROM CELL #7 |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

SHEET TITLE:

SOUTH TERMINAL SITE PLAN

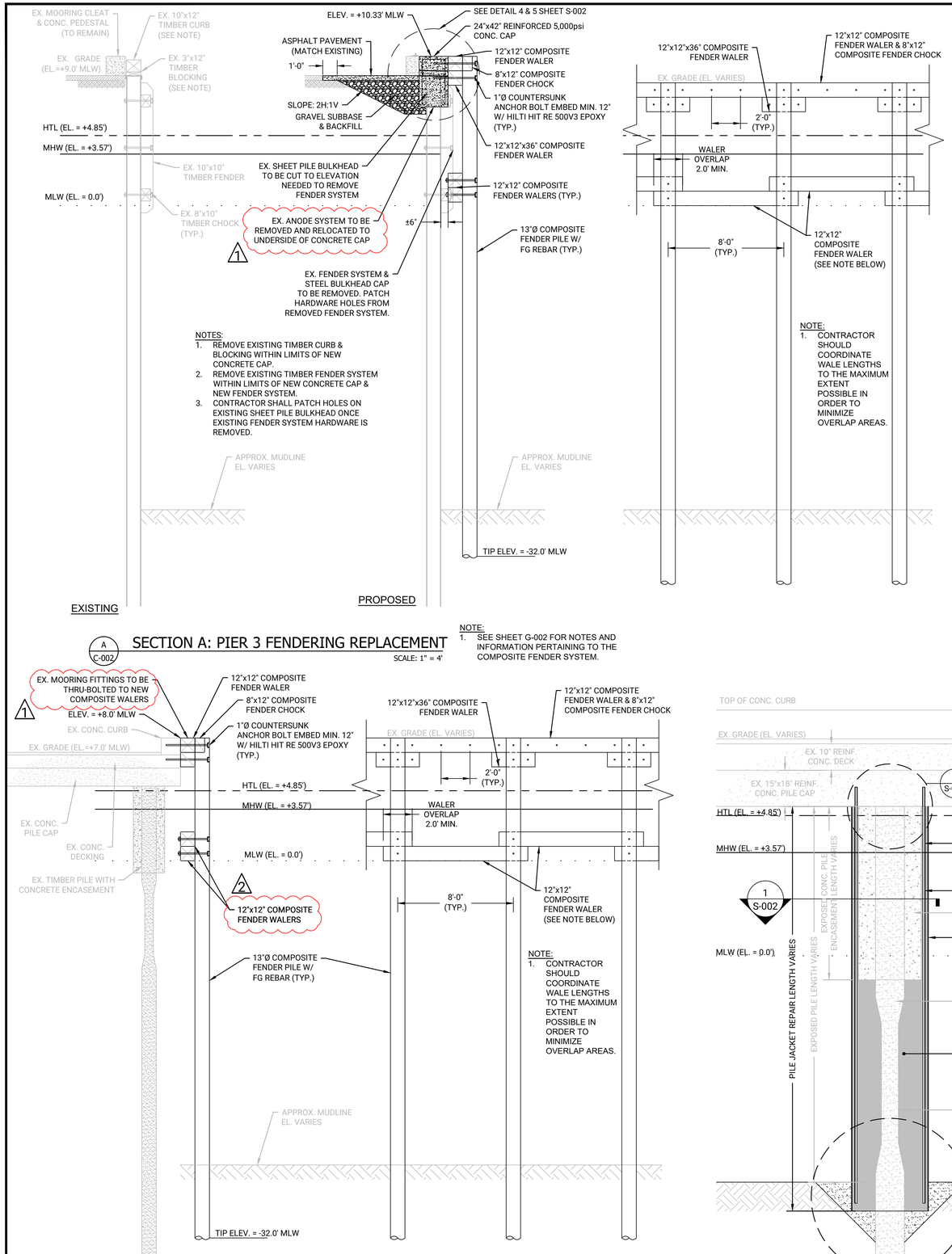
ISSUANCE: **ISSUED FOR CONSTRUCTION**

ALEX I. MORA
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REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
14 September 2022

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

PROJECT NO: 21N007

SHEET NUMBER
C-004




NOTES:
1. REMOVE EXISTING TIMBER CURB & BLOCKING WITHIN LIMITS OF NEW CONCRETE CAP.
2. REMOVE EXISTING TIMBER FENDER SYSTEM WITHIN LIMITS OF NEW CONCRETE CAP & NEW FENDER SYSTEM.
3. CONTRACTOR SHALL PATCH HOLES ON EXISTING SHEET PILE BULKHEAD ONCE EXISTING FENDER SYSTEM HARDWARE IS REMOVED.

NOTE:
1. CONTRACTOR SHOULD COORDINATE WALE LENGTHS TO THE MAXIMUM EXTENT POSSIBLE IN ORDER TO MINIMIZE OVERLAP AREAS.

## A C-002 SECTION A: PIER 3 FENDERING REPLACEMENT

SCALE: 1" = 4'

NOTE:
1. SEE SHEET G-002 FOR NOTES AND INFORMATION PERTAINING TO THE COMPOSITE FENDER SYSTEM.

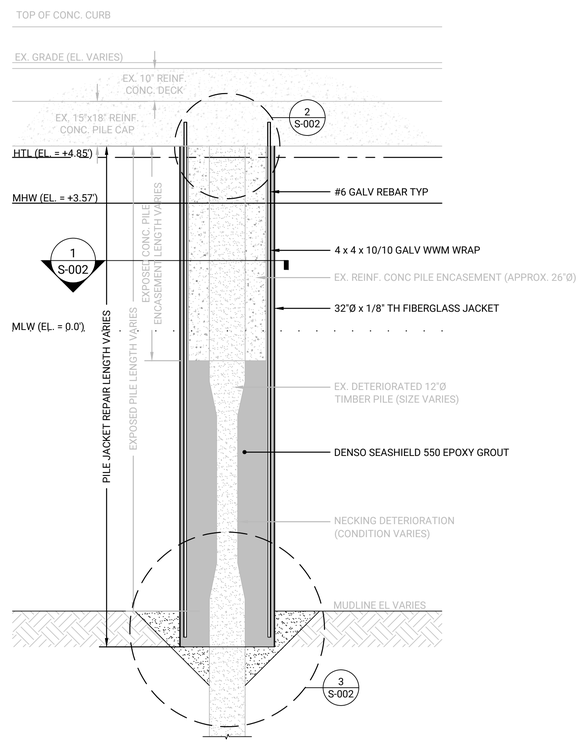



NOTE:
1. CONTRACTOR SHOULD COORDINATE WALE LENGTHS TO THE MAXIMUM EXTENT POSSIBLE IN ORDER TO MINIMIZE OVERLAP AREAS.

## C C-003 SECTION C: STEAMSHIP PIER FENDERING REPLACEMENT

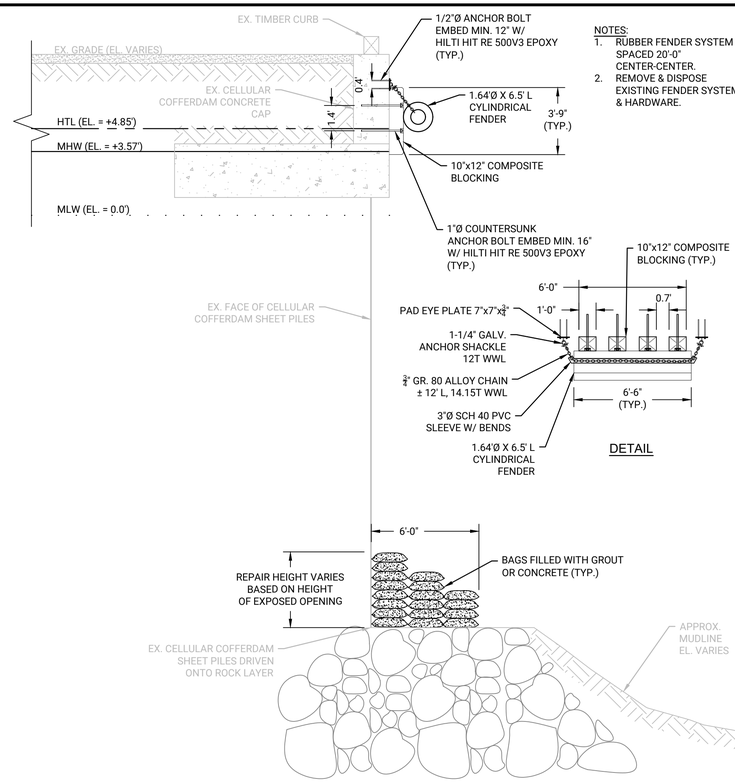
SCALE: 1" = 4'

NOTE:
1. SEE SHEET G-002 FOR NOTES AND INFORMATION PERTAINING TO THE COMPOSITE FENDER SYSTEM.




## D C-003 SECTION D: TYPICAL FIBERGLASS JACKET REPAIR

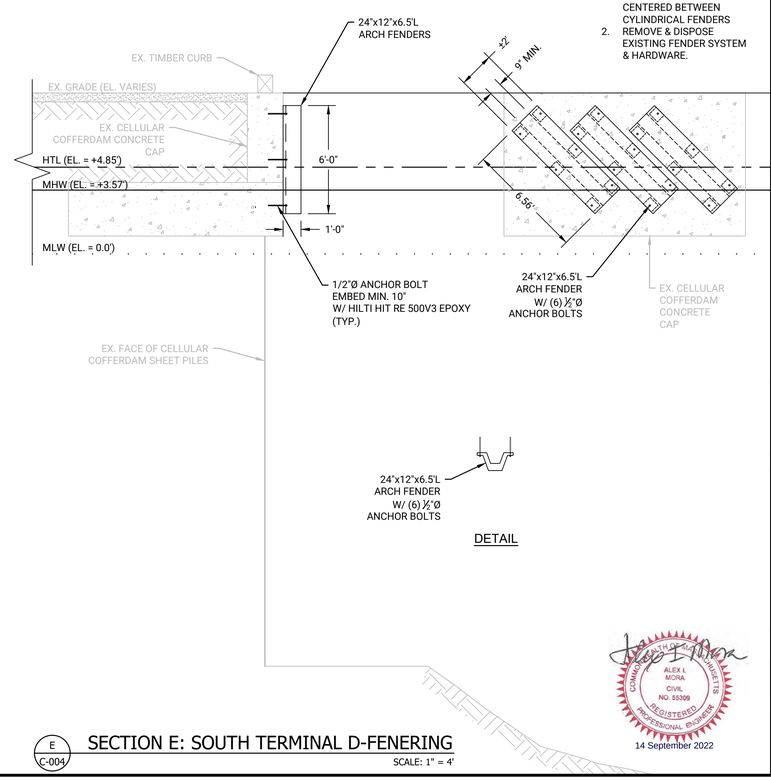
SCALE: 1" = 2'




NOTES:
1. RUBBER FENDER SYSTEM SPACED 20'-0" CENTER-CENTER.
2. REMOVE & DISPOSE EXISTING FENDER SYSTEM & HARDWARE.

## B C-004 SECTION B: SOUTH TERMINAL FENERING & GROUT BAG TOE REPAIR

SCALE: 1" = 4'




NOTES:
1. ARCH FENDER SYSTEM CENTERED BETWEEN CYLINDRICAL FENDERS
2. REMOVE & DISPOSE EXISTING FENDER SYSTEM & HARDWARE.

## E C-004 SECTION E: SOUTH TERMINAL D-FENERING

SCALE: 1" = 4'

GRAPHIC SCALE
0 0.5 1 2
(IN FEET)
1 INCH = 1 FEET

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

Foth

**NEW BEDFORD PORT AUTHORITY**
**123 MACARTHUR DRIVE**
**NEW BEDFORD, MA 02740**

**NEW BEDFORD MUNICIPAL PIERS**
**FENDERING AND REPAIRS**

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | DTHA | 6/27/2022 | NOTES RE MOORING FITTINGS ON STEAMSHIP PIER AND ANODES ON PIER 3 |
| 2 | DTHA | 7/7/2022 | CLARIFICATION ON CHOCK/WALER INSTALLATION FOR STEAMSHIP PIER |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

SHEET TITLE:

TYPICAL SECTIONS
SHEET 1 OF 1

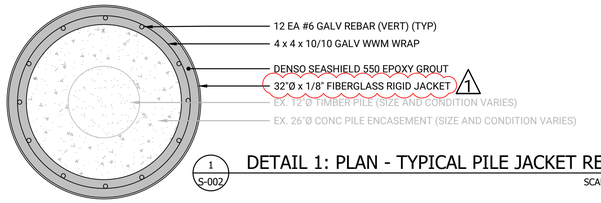
ISSUANCE: **ISSUED FOR CONSTRUCTION**

PROJECT NO: 21N007

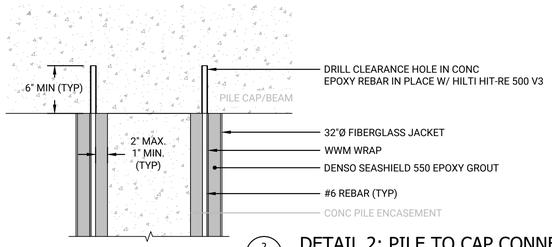
SHEET NUMBER

S-001

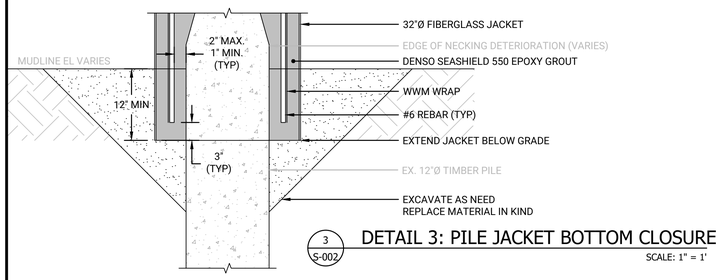
ALEX I. MORA
COMMONWEALTH OF MASSACHUSETTS
CIVIL
NO. 55309
REGISTERED
PROFESSIONAL ENGINEER
14 September 2022



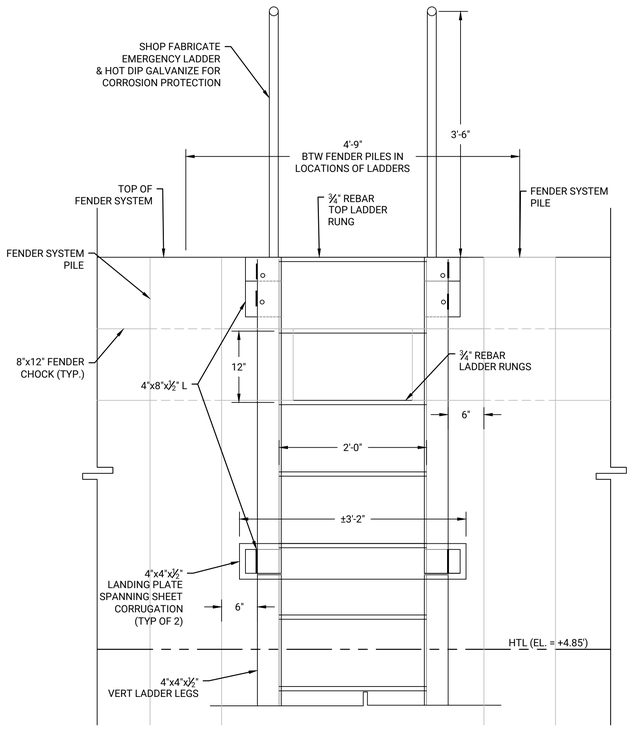

1 S-002 **DETAIL 1: PLAN - TYPICAL PILE JACKET REPAIR**
SCALE: 1" = 1'



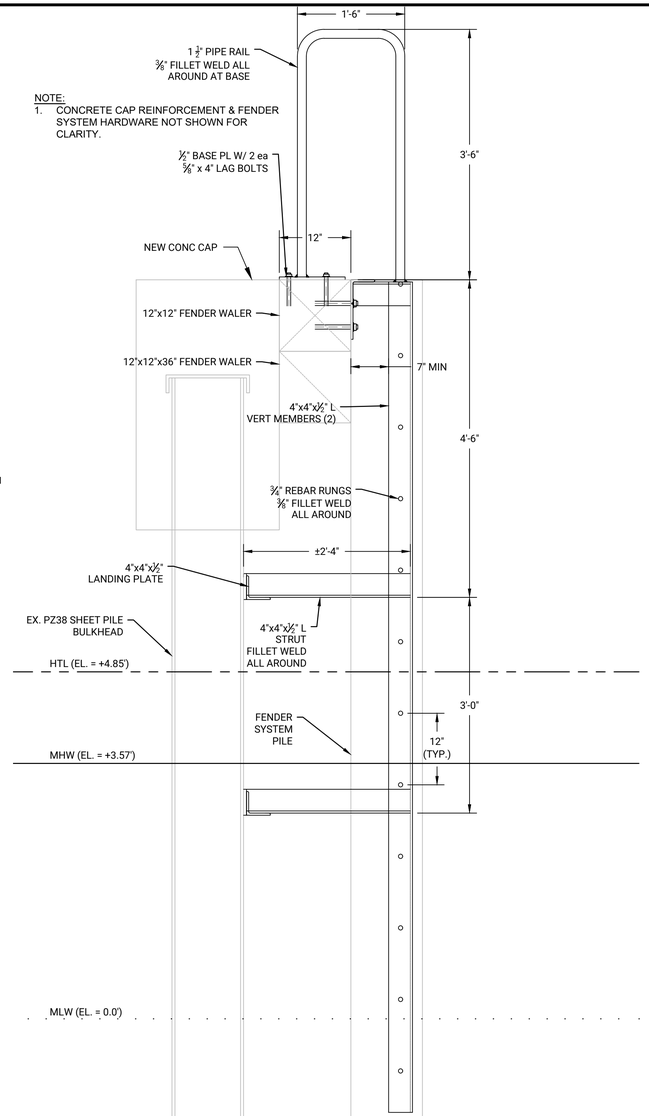

2 S-002 **DETAIL 2: PILE TO CAP CONNECTION**
SCALE: 1" = 1'



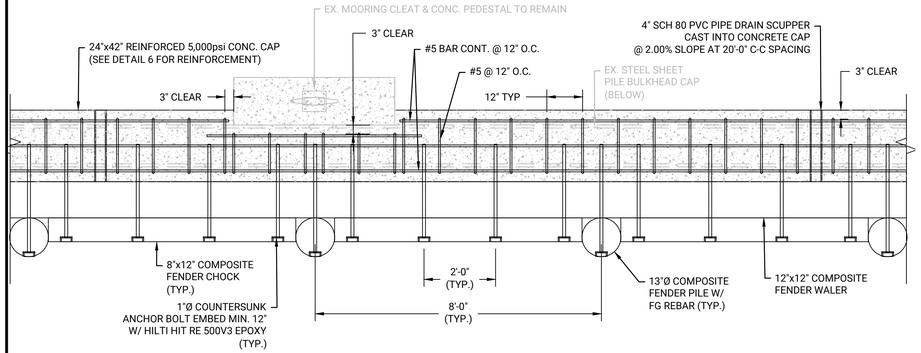

3 S-002 **DETAIL 3: PILE JACKET BOTTOM CLOSURE**
SCALE: 1" = 1'



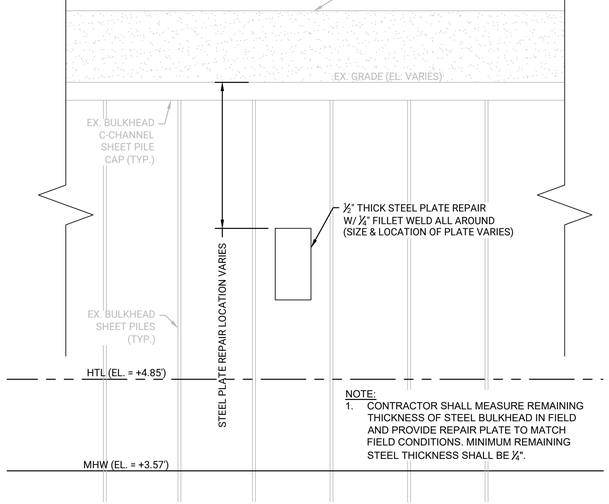

6 S-002 **DETAIL 6: EMERGENCY ACCESS LADDER REPLACEMENT**
SCALE: 1" = 1'




7 S-002 **DETAIL 7: EMERGENCY ACCESS LADDER REPLACEMENT**
SCALE: 1" = 1'

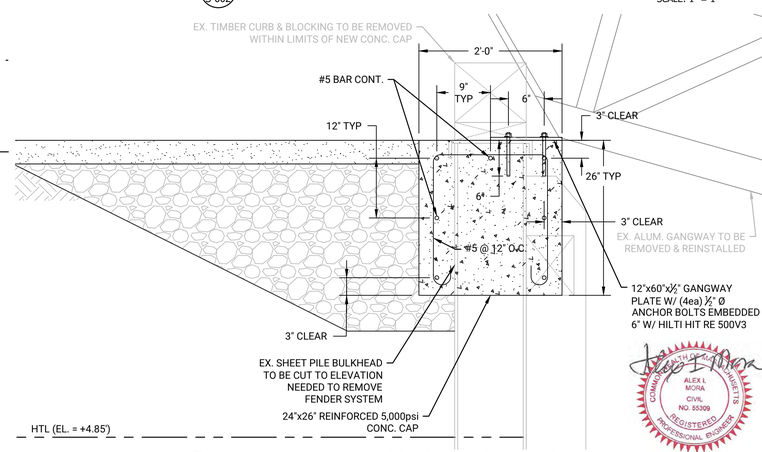



4 S-002 **DETAIL 4: PIER 3 CONCRETE CAP**
SCALE: 1" = 2'

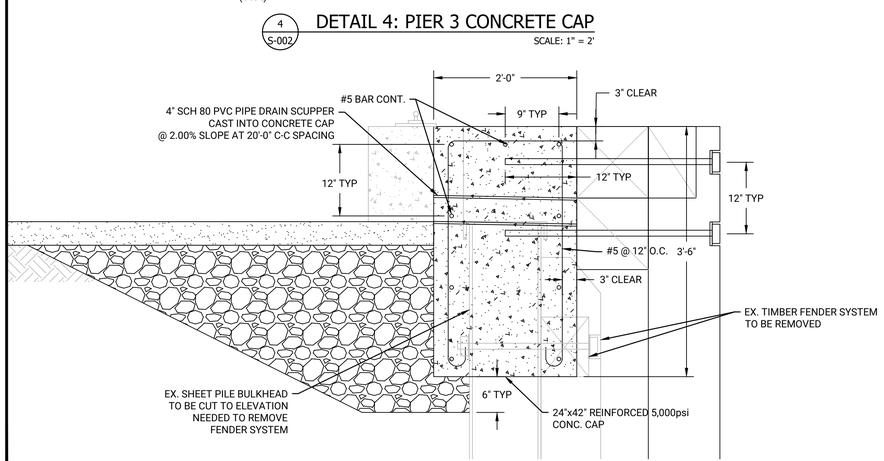



NOTE:
1. CONTRACTOR SHALL MEASURE REMAINING THICKNESS OF STEEL BULKHEAD IN FIELD AND PROVIDE REPAIR PLATE TO MATCH FIELD CONDITIONS. MINIMUM REMAINING STEEL THICKNESS SHALL BE ¼".

8 ALL **DETAIL 8: STEEL PLATING REPAIR**
SCALE: 1" = 1'




9 S-002 **DETAIL 9: PIER 3 CONCRETE CAP AT GANGWAY**
SCALE: 1" = 1'




5 S-002 **DETAIL 5: PIER 3 CONCRETE CAP REINFORCEMENT**
SCALE: 1" = 1'

GRAPHIC SCALE 0 0.5 1 2 (IN FEET) 1 INCH = 1 FEET

GRAPHIC SCALE 0 1 2 4 (IN FEET) 1 INCH = 2 FEET

GRAPHIC SCALE 0 2 4 8 (IN FEET) 1 INCH = 4 FEET

Foth

**NEW BEDFORD PORT AUTHORITY**
**123 MACARTHUR DRIVE**
**NEW BEDFORD, MA 02740**

**NEW BEDFORD MUNICIPAL PIERS**
**FENDERING AND REPAIRS**

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | DTHA | 6/29/2022 | CORRECTIONS TO PILE JACKET DIAMETER REQUIRED |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

SHEET TITLE:

TYPICAL
DETAILS
SHEET 1 OF 1

ISSUANCE: **ISSUED FOR CONSTRUCTION**

PROJECT NO: 21N007

SHEET NUMBER
S-002

COMMONWEALTH OF MASSACHUSETTS
ALEX I. MORA
CIVIL
NO. 55309
REGISTERED PROFESSIONAL ENGINEER
14 September 2022

# 7. South Terminal Fish Houses

## 7.1 Description of Site

### 7.1.1 Site Location

South Terminal is located off of Hassey Street, south of Leonard's Wharf and north of the Hurricane Barrier along the New Bedford waterfront on Buzzards Bay as shown on ***Figure 6***. The parcel is referenced by the City of New Bedford Assessor's Office as Map 31, 37-2, and 42, Lot 47 and 302. The project site is located within a Designated Port Area and Shellfish Suitability Area as regulated under the MA WPA.




Figure 6: Location of South Terminal Fish Houses

### 7.1.2 Facility Description

South Terminal is believed to have been constructed in the 1960s. It is divided into several marine industrial parcels and ship berths, and is constructed of an approximate 1,800-foot long steel cellular bulkhead with a reinforced concrete cap wall. The cellular bulkhead retains solid fill material and provides support for vessel berthing and adjacent building structures. South Terminal is constructed of twenty-six 54-foot diameter cofferdams and twenty-five 17-foot radius cofferdams that make up the total 51 steel cellular cofferdams which are built with MP-101 steel sheet piles. A bulkhead also spans the northern and southern portions of the site which connect the northern and southern most cofferdams to the landside shoreline. The northern bulkhead is constructed of approximately 100 feet of MZ-27 steel sheet piles and the southern bulkhead is constructed of approximately 85 feet of MZ-27 steel sheet piles. Supported by the cellular cofferdam cells is an L-shaped reinforced concrete cap wall that is 2-foot wide by 5-foot thick on the stem and 12-foot wide by 3-foot thick at the base. Additionally, 148 P73 H-piles were driven approximately 10-feet landward of the face of the cellular bulkhead. The cellular cofferdam cells and bulkhead are numbered, for reference, as shown on the attached plans in **Appendix A – Condition Plans**. Structures extend over the cells for the majority of the 1,800 linear feet. The first 203 feet of the bulkhead are owned and maintained by the MA Clean Energy Center (MassCEC), while the remaining ~1,597 feet are owned and maintained by the New Bedford Port Authority (NBPA). (The full extent of the bulkhead was inspected, as the bulkhead had been previously owned by NBPA in its entirety.) The fender system along South Terminal consists of a combination of large diameter tires and D-Fenders hung from the concrete deck cap. The fenders are secured by chains which are connected to eye bolts anchored to the concrete deck cap.

## 7.2 Observed Conditions - 2020

The underwater inspection of South Terminal, executed with Fathom, was performed on February 3, 4, and 5, 2021. The topside inspection was performed on January 8, 2021 by Foth. Assessment of the bituminous pavement and utilities will be stated in a later section of this report. Assessment of the adjacent buildings, loading platforms, fencing, and stairways are not included in the scope of work and therefore were not inspected. For reference, as shown on the attached plans in **Appendix E – South Terminal 2020 Condition Plan**, a baseline stationing was established along the top of the bulkhead during the inspection. Station 0+00 is located at the southern end of the project site adjacent to the Marine Commerce Terminal and extends north terminating at Station 18+15. (Stations 0+00 thru 2+60 are not the property of NBPA, but conditions have been noted since they had been previously owned by NBPA and therefore included in historic reports.) Observations were made in relation to their stationing and cofferdam cell location along the baseline as appropriate, and as noted herein and in the plans. Overall, the condition of South Terminal was found to be in *Fair* condition.

The steel sheet pile cells are of varying diameters alternating between major and minor cells and are exposed from the mud line up to the concrete cap. The flat steel sheets which comprise the cells, exhibit signs of heavy corrosion with pitting of the steel and no evidence of a passive or active cathodic protection system.

### 7.2.1 Appurtenances

Appurtenances such as the life rings were typically given a condition rating of *Minor*. Life rings were observed either bolted to the timber curb along the bulkhead or placed on the adjacent buildings at Station 2+92, Station 6+10, and Station 10+35, with no major deficiencies noted. The Life Ring at Station 14+70 was observed to be loose due to the loose and compromised timber curb, therefore was given a condition rating of *Severe*.

Similarly, the mooring cleats and mooring bollards located throughout the pier were given a condition rating ranging from *Minor* to *Severe*. Typically the mooring cleats and bollards were given condition ratings of *Minor* with typical observations consisting of coating loss, minor surface corrosion, minor wearing marks or pitting, and in-tact epoxy on hardware. (Refer to Photographs 1 through 3 of Appendix B.) Corrosion of the mooring cleats and bollards will lead to loss of section and, therefore, a reduction of strength. Mooring cleats and bollards with typical observations consisting of missing hardware epoxy, significant surface wear marks and pitting, moderate surface corrosion, delamination, scaling, and corroded hardware less than 25% loss of section were given a condition rating of *Moderate*. (Refer to Photographs 4 through 6 of Appendix B.) Several mooring cleats were observed to have corroded hardware greater than 25% loss of section and advanced corrosion and scaling with surface wear marks and pitting, resulting in a *Major* condition rating. (Refer to Photographs 7 and 8 of Appendix B.) These mooring cleats are identified as #17, #23, #27, #29, #38, and #44, as well as, mooring bollards #4, #5, and #12. Additionally, mooring bollard #13 was observed to be broken and therefore was given a condition rating of *Severe*. (Refer to Photograph 9 of Appendix B.) Refer to **Table 17** for a list of deficiencies encountered related to the mooring cleats and mooring bollards.

Additional appurtenances, such as the access ladders, are located along the bulkhead to provide access to and from the deck to the water below. The construction of the access ladders vary between timber and steel throughout the pier. The access ladders were given condition ratings of either *Minor* or *Severe*. Typical observations which attributed to these ratings were missing ladder rungs, heavily cracked/split vertical legs, damaged or broken components, impact damage, and heavy corrosion and deterioration of the hardware. Foth noted that it had appeared as though the majority of damage observed on the access ladders is likely a result of impact from vessels causing damage to the rungs and the vertical legs. The steel access ladder at Station 2+88 was given a condition rating of *Severe* and was observed to have bent/deformed vertical legs at the top of the ladder, likely from impact, as well as broken step rungs at the top of the ladder and broken connection to the reinforced concrete bulkhead cap. (Refer to Photograph 10 of Appendix B.) Timber access ladders at Station 6+65, Station 9+00, and Station 10+40

were all given condition ratings of *Severe* and were observed to have corroded connection hardware, broken step rungs, and/or broken vertical legs compromising its connection to the concrete cap. (Refer to Photographs 11 through 13 of Appendix B.) The timber access ladder at Station 4+26 was observed to have corroded connections to the reinforced concrete bulkhead cap and was given a condition rating of *Minor*. The timber access ladders at Station 7+90 and Station 12+45 had no deficiencies observed and therefore were also given condition ratings of *Minor*.

## Table 17

## South Terminal Observed Mooring Cleat and Mooring Bollard Deficiencies

| Station | Structure | Deficiency |
|---|---|---|
| **1+20 [MassCEC]** | Mooring Bollard #1 | Moderate Condition |
| **1+40 – 2+20 [MassCEC]** | Mooring Cleats #1 - #5 | Moderate Condition; Delamination and Scaling |
| **2+40 [MassCEC]** | Mooring Bollard #2 | Moderate Condition |
| **2+60 [MassCEC]** | Mooring Cleat #6 | Moderate Condition |
| **2+80** | Mooring Cleat #7 | Moderate Condition |
| **3+00** | Mooring Cleat #8 | Minor Condition |
| **3+20** | Mooring Cleat #9 | Minor Condition |
| **3+60** | Mooring Bollard #3 | Minor Condition |
| **3+80** | Mooring Cleat #10 | Minor Condition |
| **4+00** | Mooring Cleat #11 | Moderate Condition |
| **4+45** | Mooring Cleat #12 | Moderate Condition |
| **4+70** | Mooring Cleat #13 | Minor Condition |
| **4+90** | Mooring Bollard #4 | Major Condition; Heavily Corroded Fasteners |
| **5+10** | Mooring Cleat #14 | Minor Condition |
| **5+30** | Mooring Cleat #15 | Moderate Condition |
| **5+50** | Mooring Cleat #16 | Minor Condition |
| **5+70** | Mooring Cleat #17 | Major Condition |
| **5+90** | Mooring Cleat #18 | Minor Condition |
| **6+10** | Mooring Bollard #5 | Major Condition |
| **6+60** | Mooring Cleat #19 | Moderate Condition |
| **6+80** | Mooring Cleat #20 | Minor Condition |
| **7+00** | Mooring Cleat #21 | Moderate Condition |
| **7+20** | Mooring Cleat #22 | Minor Condition; Missing Hardware Epoxy |
| **7+40** | Mooring Bollard #6 | Moderate Condition |
| **7+80** | Mooring Cleat #23 | Major Condition |
| **8+00** | Mooring Cleat #24 | Minor Condition |
| **8+20** | Mooring Cleat #25 | Moderate Condition |
| **8+60** | Mooring Cleat #26 | Moderate Condition |
| **8+65** | Mooring Bollard #7 | Moderate Condition |
| **8+95** | Mooring Cleat #27 | Major Condition |
| **9+30** | Mooring Bollard #8 | Moderate Condition |
| **9+55** | Mooring Cleat #28 | Minor Condition |
| **9+70** | Mooring Cleat #29 | Major Condition |
| **9+90** | Mooring Cleat #30 | Minor Condition; On Expansion Joint |
| **10+10** | Mooring Cleat #31 | Minor Condition |
| **10+35** | Mooring Cleat #32 | Minor Condition |
| **10+55** | Mooring Bollard #9 | Moderate-Major Condition |
| **10+80** | Mooring Cleat #33 | Minor Condition |
| **11+00** | Mooring Cleat #34 | Moderate Condition |

| Station | Structure | Deficiency |
|---|---|---|
| **11+40** | Mooring Cleat #35 | Moderate Condition |
| **11+60** | Mooring Cleat #36 | Minor Condition |
| **11+90** | Mooring Bollard #10 | Minor Condition |
| **12+20** | Mooring Cleat #37 | Minor Condition |
| **12+40** | Mooring Cleat #38 | Moderate-Major Condition |
| **12+80** | Mooring Cleat #39 | Moderate Condition |
| **13+00** | Mooring Cleat #40 | Minor Condition |
| **13+20** | Mooring Bollard #11 | Minor Condition |
| **13+60** | Mooring Cleat #41 | Moderate Condition |
| **13+80** | Mooring Cleat #42 | Moderate Condition |
| **14+00** | Mooring Cleat #43 | Minor Condition |
| **14+40** | Mooring Cleat #44 | Major Condition |
| **14+70** | Mooring Bollard #12 | Major Condition |
| **15+00** | Mooring Cleat #45 | Moderate Condition |
| **15+20** | Mooring Cleat #46 | Moderate Condition |
| **15+40** | Mooring Cleat #47 | Moderate Condition |
| **15+60** | Mooring Bollard #13 | Severe Condition; Broken |
| **16+00** | Mooring Cleat #48 | Minor Condition |
| **16+20** | Mooring Cleat #49 | Moderate Condition |
| **16+40** | Mooring Cleat #50 | Moderate Condition |
| **16+60** | Mooring Cleat #51 | Moderate Condition |
| **16+80** | Mooring Bollard #14 | Minor Condition |
| **17+20** | Mooring Cleat #52 | Moderate Condition |

### 7.2.2 Timber Curb

The timber curb was generally found to be in ***Fair - Poor*** condition. Condition ratings for the timber curb were given ranging from ***Minor*** to ***Severe***. (Refer to Photographs 14 through 23 of Appendix B.) Typical observations which attributed to a ***Minor*** condition rating consisted primarily of rot, fungal decay, and checking typically found given the age of the timber elements. Typical observations which attributed to the ***Moderate*** condition rating were moderate fungal decay/rotting, section loss up to 25%, checking or splitting wider than ½", and dislodged sections. Typical observations which attributed to the ***Major*** condition rating were section loss 25% to 50%, heavily corroded hardware, checking or splitting through full section, and displacement or loss of bearing connections. Typical observations which attributed to the ***Severe*** condition rating were section loss greater than 50%, loss of connection or full bearing, and partial or full breakage. In addition, there are several areas along the bulkhead were the timber curb was observed to be missing.

### 7.2.3 Rubber Fender System

The fender system primarily consists of D-Fenders and non-engineered rubber elements (tires, cylinders, etc.). Minor oxidation was observed on the hardware of the fender system. Overall, the fender system was generally given a condition rating of ***Minor-Moderate*** with gouges/wears less than 25% nominal depth, surface cracking of rubber components, and intact connections. (Refer to Photograph 24 of Appendix B.) However, several areas of the fender system along the bulkhead were given a condition rating of ***Severe***. This rating was generally given for sections where the fender system was observed to be missing, which indicates that the connections had failed. One particular section of the fender system which was missing is between Station 9+30 through 10+30 (refer to Photograph 25 Appendix B), and the other area is between Station 1+60 through Station 2+00. (Refer to Photograph 26 Appendix B.) Additionally, several D-Fenders were observed to be torn through the rubber. (Refer to Photographs 27 to 29 of Appendix B.)

### 7.2.4 Concrete Bulkhead Cap

The concrete deck was given a condition rating of *Moderate* with typical surface cracking and spalling. (Refer to Photographs 30 through 35 of Appendix B.) Vertical hairline cracks were observed along the face of the concrete deck cap, along with spalling on the topside leading edge of the concrete deck throughout the entire length of the project site. Occasionally, these areas of spalling and cracking coincided with areas where the mooring bollards or mooring cleats are located. (Refer to Photographs 33 through 35 of Appendix B.) This has a potential of compromising the structural integrity of their fasteners. Lastly, multiple areas of isolated spalling resulting in loss of section, along with exposed reinforcement were also observed during the inspection and were subsequently given a condition rating of *Severe*.

### 7.2.5 Sheet Pile Cofferdam Bulkhead

The sheet pile cellular cofferdam bulkhead at South Terminal is comprised of 51 sheet pile cells is constructed over 1,630 linear feet (the first~200 linear feet of which are not owned by NBPA) with a northern bulkhead comprised of approximately 100 feet of MZ-27 steel sheet piles and the southern bulkhead comprised of approximately 85 feet of MZ-27 steel sheet piles. The sheet pile cofferdams and bulkheads at South Terminal were given an overall condition rating of *Severe*. (Refer to Photographs 36 through 48 of Appendix B.) Typical observations which attributed to this are holes in the sheet piles, structural deformation, loss of thickness and section, and washout. During the underwater inspection, the divers encountered holes on the sheet piles at 38 out of a total of 51 cellular cofferdams. The holes range in size and diameter or length from one to two inches to greater than 30 inches and also range in location from between the tidal zone to the top of the sheets. (Refer to Photographs 36 through 41 of Appendix B.) Coincidentally, a majority of the holes observed on the cells coincided with locations of the concrete cap expansion joints. **Table 18** indicates the size and location of each hole observed during the inspection. Refer to **Table 19**for UT readings.

In addition to the observed holes, the divers also indicated a section of the sheet piles from Cell #5 through Cell #7 to be washing out from below the sheets. (Refer to Photographs 42 and 43 of Appendix B.) It appeared as though the harbor was dredged sometime after the 2016 inspection, indicated by a layer of old mudline material on the sheet piles, which has exposed the bottom of the sheets at this location. It was noted that the sheet piles appeared to have been driven to a rock layer, which may have been mistaken as refusal or bedrock during the time of installation, and therefore did not extend to the depths required. Since the previous dredge limit was higher than the current elevation and above this deficiency, it was not observed during the previous inspection in 2016. Similarly, an additional area of washout was encountered at Cell #44. The divers indicated that two of the sheet piles at this location were separated from the interlocks approximately 12 inches from the mudline where they continued to bow outward. (Refer to Photographs 44 and 45 of Appendix B.) Therefore, washout was observed at this location due to the separation of the interlocks from the adjacent sheet piles.

Lastly, during the inspection, the divers observed the sheet piles of the northern bulkhead to be in *Critical* condition. Large holes were encountered that extended through the webs of the sheet piles essentially leaving the inner and outer flanges to remain. (Refer to Photographs 46 through 48 of Appendix B.)

# Table 18

## South Terminal Cellular Cofferdam Deficiencies:

| Cell # | Sheet # | Deficiency |
|---|---|---|
| 1 [Mass CEC] | 3 | Hole 4"x6" near concrete cap |
| 2 [Mass CEC] | 25 | Hole 2"x5" at top of sheet |
| 3 [Mass CEC] | 3 | Hole 12"x24" at top of sheet |
| 3 [Mass CEC] | 6 | Hole 6"x30" at top of sheet |
| 4 [Mass CEC] | 12 | Hole 6"x10" at top of sheet near expansion joint |
| 5 [Mass CEC] | 15 | Hole 2"x2" at top of sheet by diver |
| 5 [Mass CEC] | 22-30 | Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below |
| 6 [Mass CEC] | 1-24 | Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below |
| 6 [Mass CEC] | 9-14 | Large Hole - 5 sheets wide by 48" long (assumed for drainage; not for repair) |
| 7 [Mass CEC] | 1 | Hole 3"x6" at top of sheet |
| 7 [Mass CEC/ NBPA] | 1-9 | Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below |
| 7 | 9-30 | Go into mud line, mud line jogs out away from cell 3', then rocks continue below |
| 8 | 10 | Hole 6"x6" at top of sheet |
| 8 | 11 | Hole 2"x4" at top of sheet near expansion joint |
| 9 | 15 | Hole 6"x10" at top of sheet |
| 9 | 28 | Hole 6"x6" at top of sheet |
| 10 | 12 | Hole 4"x6" and 1.5"x2" at top of sheet |
| 12 | 12 | Hole/Crack 2"x240" at top of sheet near expansion joint |
| 12 | 15 | Hole 3"x4" at top of sheet |
| 13 | 2 | Hole 1"x1" at top of sheet |
| 15 | 30 | Hole 4"x6" at top of sheet |
| 16 | 11 | Hole 6"x12" at top of sheet near expansion joint |
| 16 | 12 | Hole 12"x36" at top of sheet |
| 16 | 22 | Hole 1"x2" at top of sheet |
| 17 | 30 | Hole 4"x6" at top of sheet |
| 18 | 19 | Hole 6"x12" at top of sheet |
| 19 | 23 | Hole 1"x2" at top of sheet |
| 19 | 30 | Hole 3"x5" at top of sheet |
| 20 | 12 | Hole 6"x20" at top of sheet |
| 20 | 13 | Hole 8"x36" at top of sheet near expansion joint |
| 20 | 14 | Hole 12"x36" at top of sheet |
| 22 | 6 | Hole 2"x2" at top of sheet by diver |
| 22 | 12 | Large Hole (assumed for drainage; not for repair) |
| 23 | 4 | Hole 1"x1" at top of sheet by diver |
| 23 | 10 | Hole 2"x3" mid water |
| 24 | 12 | Hole 8"x24" w/ 24" long crack at top of sheet |
| 24 | 13 | Hole 8"x36" at top of sheet near expansion joint |

| Cell # | Sheet # | Deficiency |
|---|---|---|
| 24 | 14 | Hole 12"x48" at top of sheet |
| 25 | 27 | Hole 1"x2" at top of sheet |
| 27 | 10 | Hole 4"x6" at top of sheet |
| 28 | 12 | Hole 3"x4" at top of sheet |
| 28 | 13 | Hole 8"x8" at top of sheet near expansion joint |
| 28 | 14 | Hole 8"x12" at top of sheet |
| 29 | 19 | Hole 2"x3" at top of sheet |
| 30 | 13 | Hole 6"x8" at top of sheet |
| 31 | 12 | Hole 2"x2" at top of sheet |
| 32 | 13 | Hole 12"x24" at top of sheet |
| 32 | 14 | Hole 12"x36" w/ 24" long crack at top of sheet near expansion joint |
| 32 | 15 | Hole 10"x24" w/ 24" long crack at top of sheet |
| 32 | 18 | Hole 3"x4" at top of sheet |
| 35 | 2 | Hole 2"x4" at top of sheet |
| 36 | 12 | Hole 6"x24" at top of sheet |
| 36 | 13 | Hole 12"x36" at top of sheet near expansion joint |
| 36 | 14 | Hole 10"x24" at top of sheet |
| 36 | 15 | Hole 4"x10" at top of sheet |
| 36 | 16 | Hole 4"x4" at top of sheet |
| 40 | 12 | Hole 3"x3" at top of sheet |
| 40 | 13 | Hole 4"x18" w/ 12" long crack at top of sheet near expansion joint |
| 40 | 23 | Hole 2"x6" at top of sheet |
| 41 | 2 | Hole 2"x6" at top of sheet |
| 41 | 30 | Hole 1"x3" at top of sheet |
| 42 | 10 | Hole 1"x1" at top of sheet |
| 42 | 15 | Hole 2"x2" at top of sheet |
| 44 | 5 and 6 | Bowed outward with interlock separation at bottom 12" of sheets at mud line |
| 44 | 13 | Hole 6"x12" w/ 12" long crack at top of sheet near expansion joint |
| 44 | 16 | Hole 12"x42" at top of sheet |
| 46 | 4 | Hole 3"x3" at top of sheet |
| 46 | 22 | Hole 6"x24" at top of sheet |
| 47 | 15 | Hole 2"x3" at top of sheet |
| 48 | 13 | Hole 8"x24" at top of sheet near expansion joint |
| 49 | 16 | Hole 2"x2" at top of sheet |
| 51 | 15 | Hole 4"x4" at top of sheet |
| 51 | 53 | Hole 12"x24" at top of sheet |
| Z-Sheets | 2 | Large Hole that goes through and through on the web from both sides |
| Z-Sheets | 3 | Large Hole that goes through and through on the web from both sides |
| Z-Sheets | 4 | Large Hole that goes through and through on the web from both sides |

# Table 19

## UTM Readings South Terminal

| Sheet No. | Cell # | Elevation | 2020 UT *Outer Face* |
|---|---|---|---|
| 23 | 2 | Mud Line | 0.395 |
| | | Mid Water | 0.295 |
| | | Tidal Zone | 0.350 |
| 15 | 5 | Mud Line | 0.385 |
| | | Mid Water | 0.350 |
| | | Tidal Zone | To Pitted |
| 18 | 9 | Mud Line | 0.310 |
| | | Mid Water | 0.290 |
| | | Tidal Zone | 0.220 |
| 12 | 12 | Mud Line | 0.385 |
| | | Mid Water | 0.280 |
| | | Tidal Zone | 0.130 |
| 12 | 16 | Mud Line | 0.300 |
| | | Mid Water | 0.320 |
| | | Tidal Zone | Hole |
| 15 | 23 | Mud Line | 0.360 |
| | | Mid Water | 0.275 |
| | | Tidal Zone | 0.125 |
| 11 | 28 | Mud Line | 0.340 |
| | | Mid Water | 0.285 |
| | | Tidal Zone | 0.275 |
| 12 | 32 | Mud Line | 0.340 |
| | | Mid Water | 0.270 |
| | | Tidal Zone | 0.130 |
| 11 | 36 | Mud Line | 0.315 |
| | | Mid Water | 0.295 |
| | | Tidal Zone | 0.280 |
| 11 | 40 | Mud Line | 0.345 |
| | | Mid Water | 0.375 |
| | | Tidal Zone | 0.145 |
| 12 | 43 | Mud Line | 0.305 |
| | | Mid Water | 0.300 |
| | | Tidal Zone | 0.245 |
| 12 | 47 | Mud Line | 0.340 |
| | | Mid Water | 0.325 |
| | | Tidal Zone | 0.280 |
| 16 | 51 | Mud Line | 0.310 |
| | | Mid Water | 0.325 |
| | | Tidal Zone | 0.250 |

## 7.3 Structural Condition Assessment

South Terminal was observed to have 73 holes through the steel bulkhead however, due to the original design these have a lesser impact to overall capacity of the system. Overall the structure is in Fair condition with localized areas of advanced deterioration but no significant reduction in capacity.

Due to the number of sinkholes observed, the interiors and areas adjacent to the buildings should be thoroughly investigated for additional sinkholes, which may compromise their structural integrity.

Two areas should be monitored periodically – Cell 44 with the separated sheets at the mudline and the exposed toes of the sheets within Cells 5 to 7.

**Immediate Needs:**

No immediate needs identified, repairs can be completed within the 0-5 year timeframe.

**Short Term (0-5 years):**

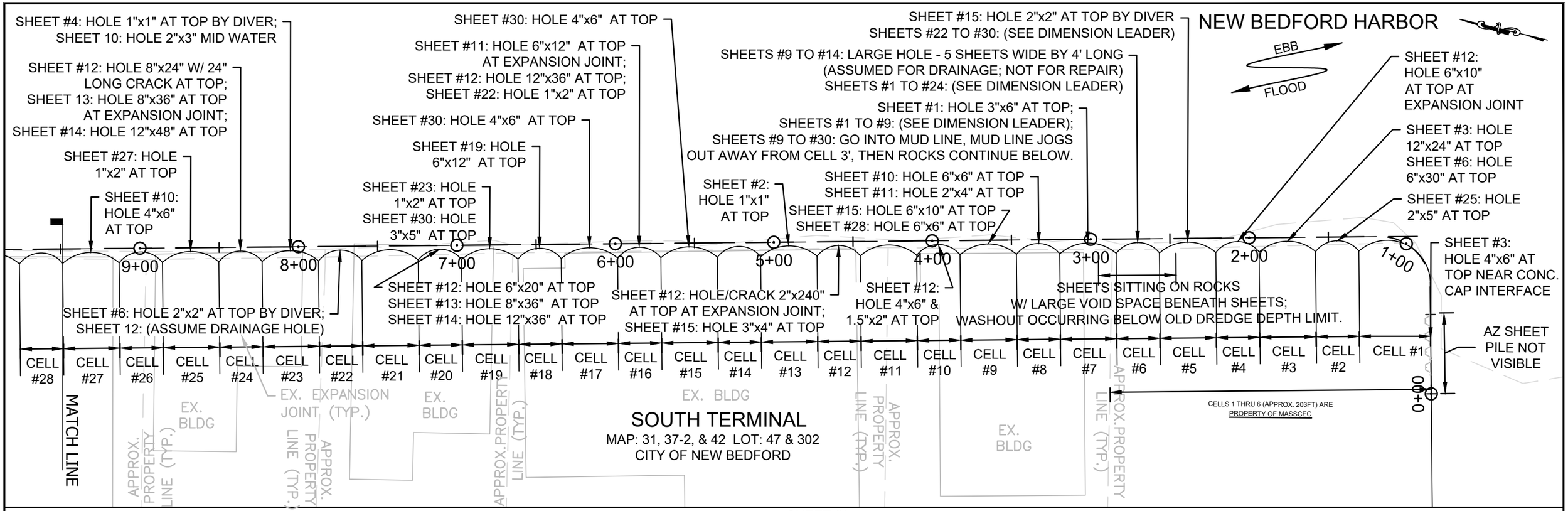
Localized repair of holes in steel plating at 73 locations.

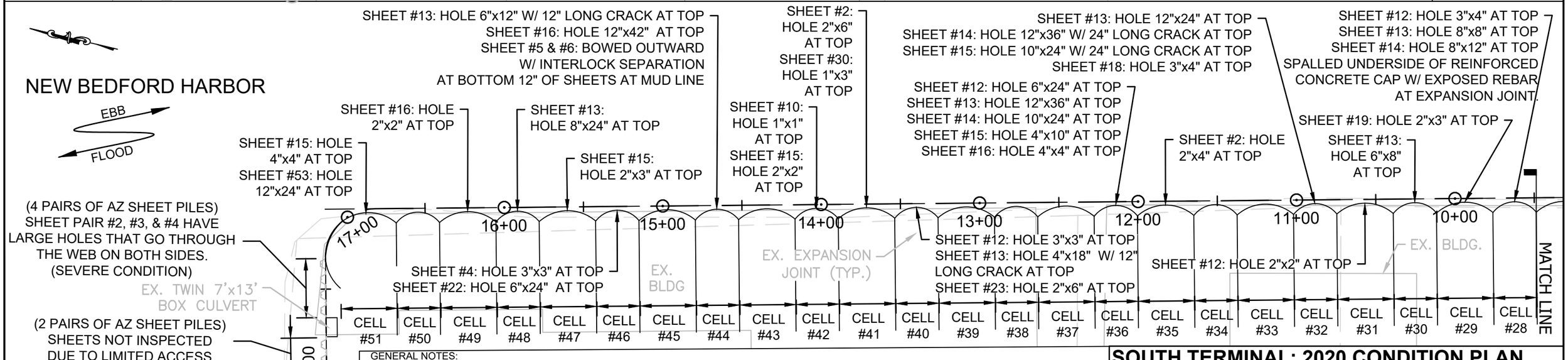
**Medium Term (5-15 years):**

Toe repairs will be required along a portion of cell 7, grout bags recommended.

**Long Term (15-50 years):**

- Plan for a full replacement of the South Terminal bulkhead within 30 years
- Requirements for replacement are dependent on the loading from the building located at the site




GRAPHIC SCALE
0 30 60 120
(IN FEET)
1 INCH = 60 FEET

GENERAL NOTES:

1. TOPSIDE SITE INSPECTION PERFORMED ON 01/08/2021 BY FOTH. UNDERWATER INSPECTION PERFORMED ON 02/03/2021, 02/04/2021, & 02/05/2021 BY FATHOM RESOURCES, INC.
2. ALL MEASUREMENTS DEPICTED ON THE DRAWINGS CAN ONLY BE CONSIDERED FOR INSPECTION PURPOSES AND NOT USED FOR CONSTRUCTION. FOTH DOES NOT WARRANT THE ACCURACY OF SAID PHYSICAL FEATURES.
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# SOUTH TERMINAL: 2020 CONDITION PLAN

**NEW BEDFORD HARBOR DEVELOPMENT COMMISSION**
**CZM GRANT**
**SOUTH TERMINAL, NEW BEDFORD, MA 02740**
**SHEET 1 OF 2**

| | |
|---|---|
| DATE: 01/29/2021 | REV. DATE: |
| DRAWN BY: JSD | CHECKED BY: SRS |
| PROJECT NO: 20N010.00 | |

Foth

TIMBER CURB: MODERATE CONDITION;
MOORING CLEAT #23: MAJOR CONDITION
TIMBER ACCESS LADDER: MINOR CONDITION
TIMBER CURB: SEVERE CONDITION
MOORING CLEAT #25 & #26: MODERATE CONDITION
MOORING BOLLARD #7: MODERATE CONDITION; ALSO SIGNIFICANT SPALLING ON CONC. CAP
TIMBER CURB: SEVERE CONDITION; LOSS OF CONNECTION
TIMBER ACCESS LADDER: SEVERE CONDITION
MOORING BOLLARD #8: MODERATE CONDITION
TIMBER CURB: MAJOR CONDITION
MOORING CLEAT #27: MAJOR CONDITION
TIMBER CURB: SEVERE CONDITION; MISSING
MOORING BOLLARD #6: MODERATE CONDITION; ALSO LARGE SPALL ON CONC. CAP
SPLIT D-FENDER
MOORING CLEAT #21: MODERATE CONDITION
SIGNIFICANT SPALL W/ EXPOSED REBAR ON CONC. CAP
TIMBER ACCESS LADDER: SEVERE CONDITION
MOORING CLEAT #19: MODERATE CONDITION
TIMBER CURB: MAJOR CONDITION; SPLIT FULL SECTION
TIMBER CURB: SEVERE CONDITION; MISSING
TIMBER CURB: MODERATE CONDITION
MOORING BOLLARD #5: MAJOR CONDITION
MOORING CLEAT #17: MAJOR CONDITION
SIGNIFICANT SPALL W/ REBAR ON CONC. CAP
TIMBER CURB: MODERATE CONDITION; END ROT BOTH ENDS
MOORING CLEAT #15: MAJOR CONDITION; ALSO VERTICAL HAIRLINE CRACK ON CONC. CAP
MOORING BOLLARD #4: MAJOR CONDITION; ALSO LARGE SPALL ON CONC. CAP
TIMBER CURB: MODERATE CONDITION; LARGE SPLIT & ROTTING
MOORING CLEAT #12: MODERATE CONDITION
TIMBER ACCESS LADDER: MINOR CONDITION
TIMBER CURB: MODERATE CONDITION; DISLODGED
MOORING CLEAT #11: MODERATE CONDITION
TIMBER CURB: SEVERE CONDITION; MISSING
MOORING CLEATS #6 & #7 MODERATE CONDITION
STEEL ACCESS LADDER: SEVERE CONDITION
MOORING BOLLARD #2: MODERATE CONDITION
MOORING CLEATS #1-#5 MODERATE CONDITION
FENDER SYSTEM: SEVERE CONDITION; MISSING
MOORING BOLLARD #1: MODERATE CONDITION

10+00 9+00 8+00 7+00 6+00 5+00 4+00 3+00 2+00 1+00 0+00

CELL #28 CELL #27 CELL #26 CELL #25 CELL #24 CELL #23 CELL #22 CELL #21 CELL #20 CELL #19 CELL #18 CELL #17 CELL #16 CELL #15 CELL #14 CELL #13 CELL #12 CELL #11 CELL #10 CELL #9 CELL #8 CELL #7 CELL #6 CELL #5 CELL #4 CELL #3 CELL #2 CELL #1

MATCH LINE

EX. BLDG
APPROX. PROPERTY LINE (TYP.)
EX. EXPANSION JOINT (TYP.)
EX. BLDG
APPROX. PROPERTY LINE (TYP.)
EX. BLDG
APPROX. PROPERTY LINE (TYP.)
EX. EXPANSION JOINT (TYP.)
EX. BLDG
APPROX. PROPERTY LINE (TYP.)

# SOUTH TERMINAL

MAP: 31, 37-2, & 42 LOT: 47 & 302
CITY OF NEW BEDFORD

TIMBER CURB: SEVERE CONDITION
MOORING CLEAT #29: MAJOR CONDITION
FENDER SYSTEM: SEVERE CONDITION; MISSING
TIMBER CURB: MODERATE CONDITION
TIMBER CURB: SEVERE CONDITION
TIMBER CURB: MODERATE CONDITION
TIMBER ACCESS LADDER: MINOR CONDITION
TIMBER CURB: MODERATE CONDITION; DISLODGED
MOORING CLEAT #44: MAJOR CONDITION
MOORING BOLLARD #12: MAJOR CONDITION
TIMBER CURB: MODERATE CONDITION; DISLODGED
MOORING CLEATS #45, #46 & #47: MODERATE CONDITION
MOORING CLEATS #49, #50 & #51: MODERATE CONDITION
MOORING BOLLARD #13: SEVERE CONDITION
MOORING CLEATS #41 & #42: MODERATE CONDITION
SPLIT D-FENDER
TIMBER CURB: MODERATE CONDITION; END ROT BOTH ENDS
MOORING CLEAT #39: MODERATE CONDITION
TIMBER CURB: MODERATE CONDITION; DISLODGED
SPLIT D-FENDER
MOORING CLEAT #38: MAJOR CONDITION
TIMBER CURB: MODERATE CONDITION
TIMBER CURB: MAJOR CONDITION
MOORING CLEATS #34 & #35: MODERATE CONDITION
MOORING BOLLARD #9: MAJOR CONDITION
TIMBER ACCESS LADDER: SEVERE CONDITION
SPLIT D-FENDER
FENDER SYSTEM: MAJOR CONDITION; HEAVY ROT & DETERIORATION
MOORING CLEAT #52: MODERATE CONDITION
EX. TWIN 7'x13' BOX CULVERT
TIMBER CURB: MODERATE CONDITION; END ROT BOTH ENDS
TIMBER CURB: MODERATE CONDITION; END ROT BOTH ENDS
SIGNIFICANT SPALL W/ EXPOSED REBAR ON CONC. CAP

17+00 16+00 15+00 14+00 13+00 12+00 11+00 10+00

18+00 18+15

CELL #51 CELL #50 CELL #49 CELL #48 CELL #47 CELL #46 CELL #45 CELL #44 CELL #43 CELL #42 CELL #41 CELL #40 CELL #39 CELL #38 CELL #37 CELL #36 CELL #35 CELL #34 CELL #33 CELL #32 CELL #31 CELL #30 CELL #29 CELL #28

MATCH LINE

EX. BLDG

NEW BEDFORD HARBOR

EBB
FLOOD

NOTE:
1. EXPANSION JOINT LOCATED ON REINFORCED CONCRETE CAP AT CELLS #4, #8, #12, #16, #20, #24, #28, #32, #36, #40, #44, & #48.

GRAPHIC SCALE
0 30 60 120
(IN FEET)
1 INCH = 60 FEET

GENERAL NOTES:
1. TOPSIDE SITE INSPECTION PERFORMED ON 01/08/2021 BY FOTH. UNDERWATER INSPECTION PERFORMED ON 02/03/2021, 02/04/2021, & 02/05/2021 BY FATHOM RESOURCES, INC.
2. ALL MEASUREMENTS DEPICTED ON THE DRAWINGS CAN ONLY BE CONSIDERED FOR INSPECTION PURPOSES AND NOT USED FOR CONSTRUCTION. FOTH DOES NOT WARRANT THE ACCURACY OF SAID PHYSICAL FEATURES.
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**SOUTH TERMINAL: 2020 CONDITION PLAN**
**NEW BEDFORD HARBOR DEVELOPMENT COMMISSION**
**CZM GRANT**
**SOUTH TERMINAL, NEW BEDFORD, MA 02740**
**SHEET 2 OF 2**

| | |
|---|---|
| DATE: 01/29/2021 | REV. DATE: |
| DRAWN BY: JSD | CHECKED BY: SRS |
| PROJECT NO: 20N010.00 | |

Foth

15 Creek Road • Marion, MA 02738
(508) 748-0937 • (800) 668-3220
www.foth.com

| | | | |
|---|---|---|---|
| **TO:** | **Tim Griffin**<br>**Terminal Director**<br>**New Bedford Marine Commerce Terminal** | **DATE:** | **January 17, 2024** |
| | | **RE:** | **MassCEC Shuster Sinkhole** |
| **FROM:** | **Jonathan Delgado**<br>**Jack Tabares**<br>**Scott Skuncik, P.E.** | **SUBJ.:** | **Shuster Sinkhole Inspection**<br>**December 27, 2023** |

## Summary of Evaluation:

At the request of the Massachusetts Clean Energy Commission, On December 27, 2023, Foth Infrastructure & Environmental, LLC. (Foth) performed a routine condition assessment/inspection of the Shuster Bulkhead in order to identify the probably causation of a sinkhole which was observed along the bulkhead. The condition assessment was limited to a visual, non-destructive inspection of the Shuster steel cellular bulkhead. Foth teamed with Fathom Diving (Fathom) to perform the underwater portion of the inspection. The scope of work included a LEVEL 1 inspection of the cellular steel sheet pile bulkhead. The inspection did not include the assessment of the concrete deck/cap, fendering system, mooring components, utilities, or other cellular sheet piles beyond the Shuster property limit.

## Shuster Bulkhead Observed Conditions:

The steel cellular bulkhead is comprised of 6 steel sheet pile cells running north to south which are numbered, for reference, as shown on the attached plans in Appendix A. Structures extend over the cells for the majority of the +/- 200 linear feet.

The steel sheet pile cells are of varying diameters, alternating between major and minor cells and are exposed from the mud line to the concrete deck/cap. The flat steel sheets which comprise the cells, exhibit signs of heavy corrosion with pitting of the steel and no evidence of a passive or active cathodic protection system. In several locations, Foth observed holes in the steel sheet piles with washout of backfill material present. The holes range in diameter or length from one to two inches to greater than 24 inches *(Refer to Photographs #1 through #18 below)*. Table 1 below indicates the size and location of each hole observed during the inspection.

Table 1: Underwater Inspection Notes

| Cell # | Sheet # | Comment / Condition |
|---|---|---|
| Topside | | Sinkhole: 16'L x 13'W x 6'D; located approx. 100' north of South Terminal concrete face and 10'-4" west of Shuster bulkhead concrete face. |
| 1 | 1-5, 15-20, 25, 27, 28, 33, 34 | Grout Protrusions observed on sheet piles. |
| 1 | 5 | Plate Repair Patch +/- 6"x4" at top of sheet pile. |
| 1 | 36-43 | Stones in front of sheet piles along mud-line. |
| 1 | 38 | N/A |
| 1-2 | Junction Plate | Gap at top of junction plate sheet between sheet and concrete cap. |
| 2 | 13-14 | Stones in front of sheet piles along mud-line. |
| 2 | 19-20 | N/A |
| 2 | 22 | Plate Repair Patch +/- 8"x4" at top of sheet pile. |
| 2-3 | Junction Plate | Gap at top of junction plate sheet between sheet and concrete cap. Gap at bottom of junction plate sheet between sheet and mud-line. Junction plate does not continue below mud-line. |
| 3 | 3 | Plate Repair Patch +/- 24"x13" at top of sheet pile. |
| 3 | 5 | Plate Repair Patch +/- 30"x12" & +/- 8"x8" at top of sheet pile. |
| 3 | 10-12 | Stones & grout in front of sheet piles along mud-line. |
| 3 | 12 | N/A |
| 3 | 29-30 | Stones & grout in front of sheet piles along mud-line. |
| 3 | 31-32 | Gap between bottom of sheet pile and mud-line; Hole on sheet pile (2) sheets wide at mud-line (depth unknown due to washout material covering area); Hole on sheet pile #32 +/- 2"x2" approx. 12-inches above larger hole near mud-line. |
| 3-4 | Junction Plate | N/A |
| 4 | 4 | 5'x5' Stone w/ grout in front of sheet pile along mud-line; Hole on sheet pile +/- 10"x24" at mud-line. |
| 4 | 4-12 | Stones w/ grout in front of sheet piles along mud-line; Hole on sheet piles (8) sheets wide at mud-line (depth unknown due to washout material covering area). |
| 4 | 12 | Plate Repair Patch +/- 24"x15" at top of sheet pile. |
| 4 | 13-14 | Stones w/ grout in front of sheet piles along mud-line; Hole on sheet piles (2) sheets wide at mud-line (depth unknown due to washout material covering area). |
| 4 | 15-20 | Granite stones w/ grout in front of sheet piles along mud-line. |
| 4-5 | Junction Plate | Gap (+/- 10") at bottom of junction plate sheet between sheet and mud-line. Junction plate does not continue below mud-line. |
| 5 | 16 | Plate Repair Patch +/- 8"x8" at top of sheet pile. |
| 5 | 24-29 | Sheets sitting on rocks w/ large void space beneath sheets, height ranges from 8' to 3'; Washout occurring below old dredge depth limit. |
| 5-6 | Junction Plate | Gap at bottom of junction plate sheet between sheet and mud-line. Junction plate does not continue below mud-line. |

| | | |
|---|---|---|
| 6 | 1-6 | Granite stones w/ grout in front of sheet piles along mud-line. |
| 6 | 10-14 | Limits of existing drainage culvert. |
| 6 | 9-14 | Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below old dredge depth limit. |
| 6 | 9-10 | Approx. 12" void space between sheet piles and grout bag repair. |
| 6 | 13-14 | Approx. 8" void space between sheet piles and grout bag repair. |
| 6 | 19-20 | Approx. 6"x12" void space between sheet piles and grout bag repair. |
| 6 | 21 | Large granite stones w/ grout in front of sheet piles along mud-line, along with protruding through sheet piles. |
| 6-7 | Junction Plate | Gap at bottom of junction plate sheet between sheet and mud-line. Junction plate does not continue below mud-line. Large pile of granite stones at this junction corner. |

**Photo 1:**
Shuster Bulkhead
Cell #3 Sheets #31 & #32:
Gap between bottom of sheet pile and mud-line; Hole on sheet pile (2) sheets wide at mud-line (depth unknown due to washout material covering area). Hole on sheet pile #32 +/- 2"x2" approx. 12-inches above larger hole near mud-line.

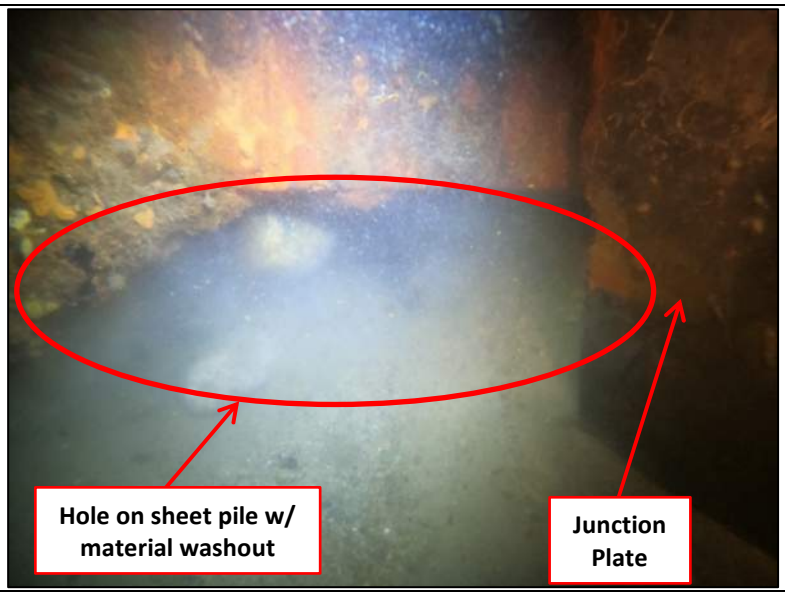
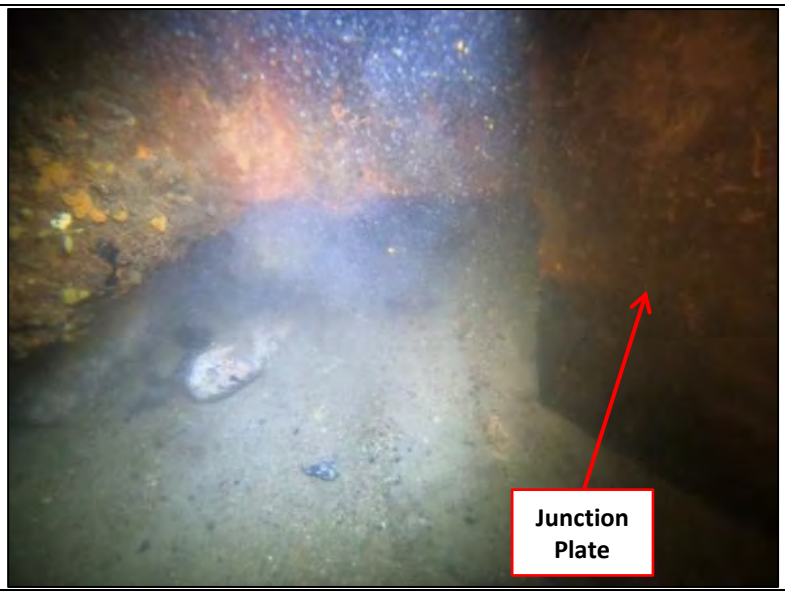
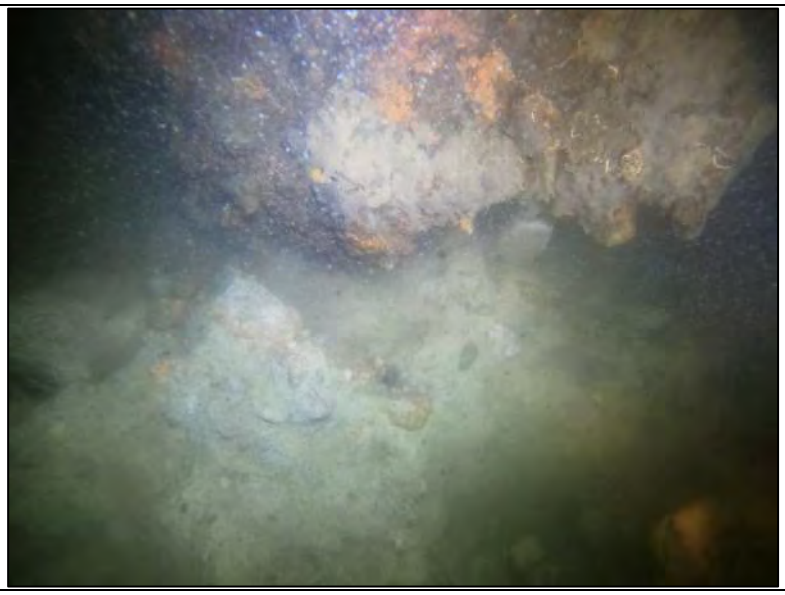



**Photo 2:**
Shuster Bulkhead
Cell #3 Sheets #31 & #32:
Gap between bottom of sheet pile and mud-line; Hole on sheet pile (2) sheets wide at mud-line (depth unknown due to washout material covering area). Hole on sheet pile #32 +/- 2"x2" approx. 12-inches above larger hole near mud-line.



| | |
|---|---|
| **Photo 3:**<br>Shuster Bulkhead<br>Cell #4 Sheet #4:<br>5'x5' Stone w/ grout in front of sheet pile along mud-line; Hole on sheet pile +/- 10"x24" at mud-line. |  |

| | |
|---|---|
| **Photo 4:**<br>Shuster Bulkhead<br>Cell #4 Sheets #4 through #12:<br>Stones w/ grout in front of sheet piles along mud-line; Hole on sheet piles (8) sheets wide at mud-line (depth unknown due to washout material covering area). |  |

| | |
|---|---|
| **Photo 5:**<br>Shuster Bulkhead<br>Cell #4 Sheets #4 through #12: Stones w/ grout in front of sheet piles along mud-line; Hole on sheet piles (8) sheets wide at mud-line (depth unknown due to washout material covering area). |  |

| | |
|---|---|
| **Photo 6:**<br>Shuster Bulkhead<br>Cell #4 Sheets #4 through #12: Stones w/ grout in front of sheet piles along mud-line; Hole on sheet piles (8) sheets wide at mud-line (depth unknown due to washout material covering area). |  |

| | |
|---|---|
| **Photo 7:**<br>Shuster Bulkhead<br>Cell #4 Sheets #4 through #12: Stones w/ grout in front of sheet piles along mud-line; Hole on sheet piles (8) sheets wide at mud-line (depth unknown due to washout material covering area). |  |

| | |
|---|---|
| **Photo 8:**<br>Shuster Bulkhead<br>Cell #4 Sheets #4 through #12: Stones w/ grout in front of sheet piles along mud-line; Hole on sheet piles (8) sheets wide at mud-line (depth unknown due to washout material covering area). |  |

| | |
|---|---|
| **Photo 9:**<br>Shuster Bulkhead<br>Cell #5 Sheet #24 through #29:<br>Sheets sitting on rocks w/ large void space beneath sheets, height ranges from 8' to 3';<br>Washout occurring below old dredge depth limit. |  |

| | |
|---|---|
| **Photo 10:**<br>Shuster Bulkhead<br>Cell #5 Sheet #24 through #29:<br>Sheets sitting on rocks w/ large void space beneath sheets, height ranges from 8' to 3';<br>Washout occurring below old dredge depth limit. |  |

| | |
|---|---|
| **Photo 11:**<br>Shuster Bulkhead<br>Cell #5 Sheet #24 through #29:<br>Sheets sitting on rocks w/ large void space beneath sheets, height ranges from 8' to 3';<br>Washout occurring below old dredge depth limit. |  |

| | |
|---|---|
| **Photo 12:**<br>Shuster Bulkhead<br>Cell #5 Sheet #24 through #29:<br>Sheets sitting on rocks w/ large void space beneath sheets, height ranges from 8' to 3';<br>Washout occurring below old dredge depth limit. |  |

| | |
|---|---|
| **Photo 13:**<br>Shuster Bulkhead<br>Cell #5 Sheet #24 through #29: Sheets sitting on rocks w/ large void space beneath sheets, height ranges from 8' to 3'; Washout occurring below old dredge depth limit. |  |

| | |
|---|---|
| **Photo 14:**<br>Shuster Bulkhead<br>Cell #6 Sheet #9 through #20: Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below old dredge depth limit. Void space between sheet piles and grout bag repair. |  |

| | |
|---|---|
| **Photo 15:**<br>Shuster Bulkhead<br>Cell #6 Sheet #9 through #20: Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below old dredge depth limit. Void space between sheet piles and grout bag repair. |  |

| | |
|---|---|
| **Photo 16:**<br>Shuster Bulkhead<br>Cell #6 Sheet #9 through #20: Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below old dredge depth limit. Void space between sheet piles and grout bag repair. |  |

| | |
|---|---|
| **Photo 17:**<br>Shuster Bulkhead<br>Cell #6 Sheet #9 through #20: Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below old dredge depth limit. Void space between sheet piles and grout bag repair. |  |

| | |
|---|---|
| **Photo 18:**<br>Shuster Bulkhead<br>Cell #6 Sheet #9 through #20: Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below old dredge depth limit. Void space between sheet piles and grout bag repair. |  |

## Conclusion:

Overall the bulkhead is in Poor condition with significant deterioration as well as undermined steel cells. The presence of heavy deterioration and holes in the sheet pile cells indicate that the bulkhead is near the end of its service life. Appendix B provides a comparison of historical bathymetric data which does indicate a loss of mudline elevation immediately adjacent to the steel cells. This loss of elevation through "prop wash" or subsidence is the likely causation of the observed sinkhole.

Foth recommends that loss of fill from within the steel cells be mitigated through the use of grout bags at the toe of the bulkhead and the placement of clear crushed stone within the sinkhole.

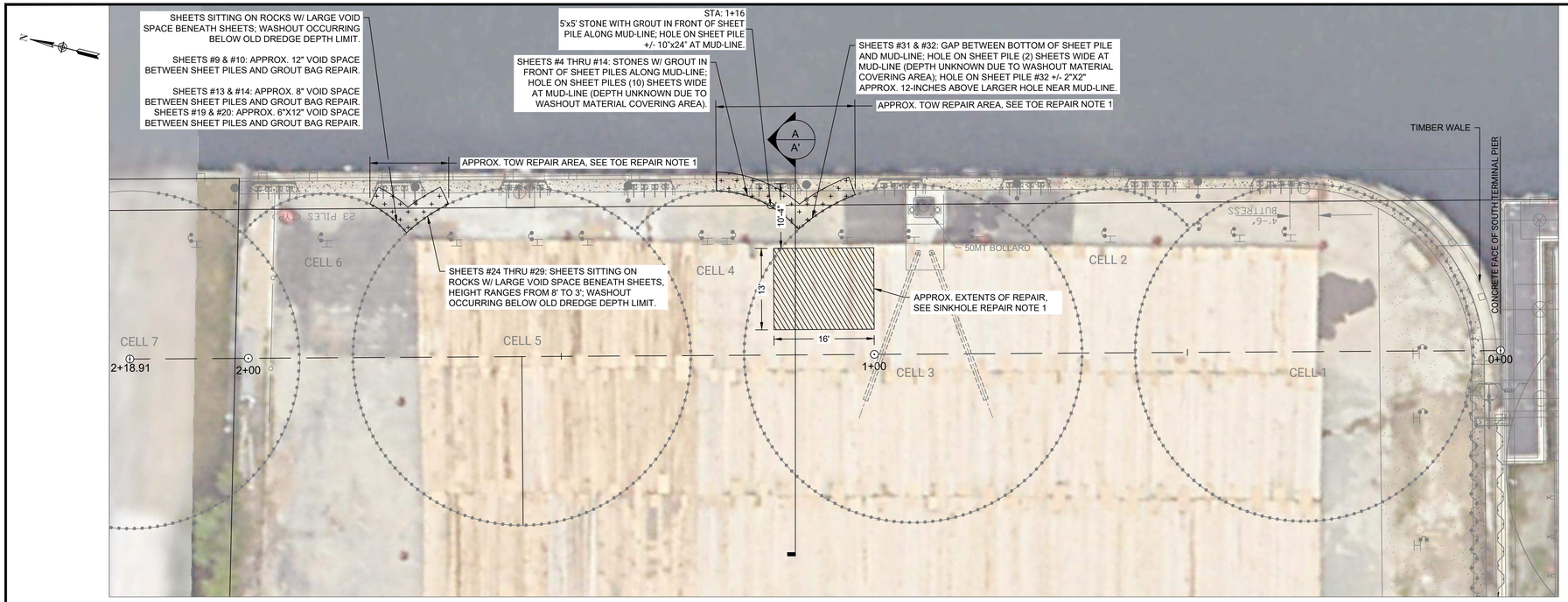
Foth looks forward in working with the Mass CEC in resolving the issues noted in this report. Questions or concerns regarding this report or the contents contained herein should be directed to Foth Infrastructure & Environmental, LLC. at (508) 748-0937.

Sincerely,
Foth Infrastructure & Environmental, LLC.

Scott R. Skuncik, P.E.
Market Leader

cc: Jonathan Delgado (Foth)

# Appendix A: Inspection Findings Plan







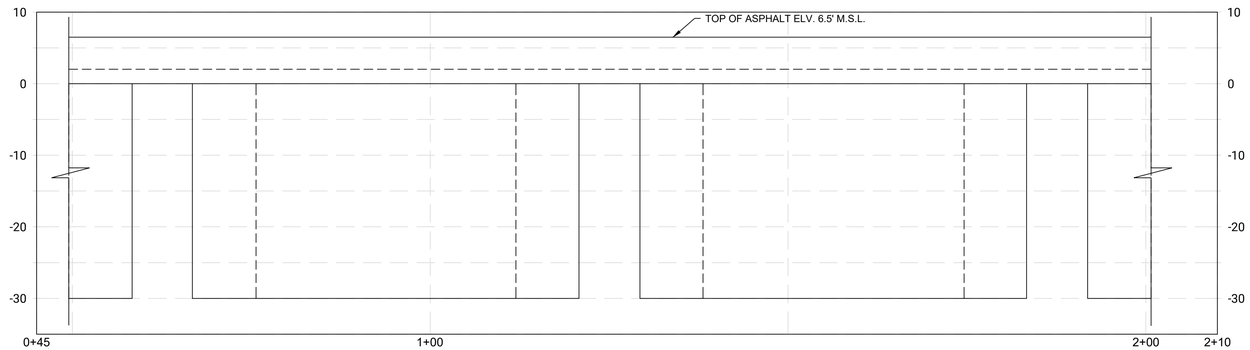
VICINITY MAP
SCALE: 1"=400'

TOE REPAIR NOTES:

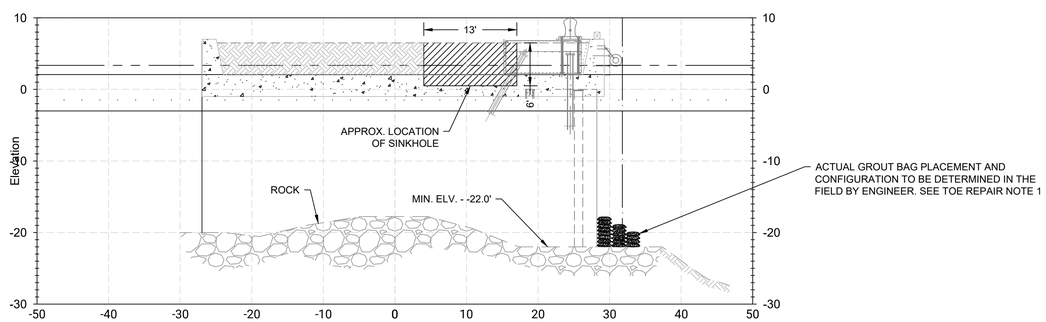
1. GROUT BAGS TO BE PLACED BETWEEN VOIDS IN BOULDERS AND FILLED WITH GROUT TO SEAL THE GAPS.

SINKHOLE REPAIR NOTES:

1. FILL SINKHOLE WITH 3/4" CLEAN CRUSHED AND COMPACTED STONE, MATCH EXISTING ELEVATION OF ADJACENT SURFACE.




PROFILE 1
VERTICAL SCALE - 1" = 10'
HORIZONTAL SCALE - 1" = 10'




SECTION A-A'
VERTICAL SCALE - 1" = 10'
HORIZONTAL SCALE - 1" = 10'

Foth

**MASSACHUSETTS CLEAN ENERGY CENTER**
**4 WRIGHT STREET,**
**NEW BEDFORD, MA 02740**

**SHUSTER BULKHEAD**
**EMERGENCY REPAIRS**

| REVISIONS | | | |
|---|---|---|---|
| NO | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | -- | -- |
| DRAWN | BAM | 12/20/2023 |
| DESIGNED | PR | 12/20/2023 |
| CHECKED | SRS | 12/20/2023 |

SHEET TITLE:

**EXHIBIT 1**

ISSUANCE:

**DRAFT**

PROJECT NO: 0022M091.00

SHEET NUMBER

**1**

Friday, January 12, 2024 9:28:28 AM Layout: bam
DWG Filename: so terminal - as-built 1 of 2.dwg
DWG Folder Location:

# Appendix B: Historical Bathymetric Data

Survey's Dated
2015
1 Dec 2018
24 Jan 2023
19 Dec 2023

DREDGE AREA 5B
MINIMUM DREDGE DEPTH
-32 MLLW

APPROX. LOCATION OF INTERLOCK (~9.0' FROM EDGE)

APPROX. LOCATION OF INTERLOCK (~9.2' FROM EDGE)

APPROX. LOCATION OF INTERLOCK (~10.8' FROM EDGE)

APPROX. LOCATION OF INTERLOCK (~10.6' FROM EDGE)

0 20 40
SCALE

**MassCEC**

Shuster Bulkhead survey cross sections, New Bedford, MA

| | | |
|---|---|---|
| Date Completed: 16 Jan 2024 | Revision Date: | |
| Drawn By: CJS | Checked By: | Project No: 022M091.00 |

Wednesday, 17 January, 2024 12:41:30
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DWG Folder Location:

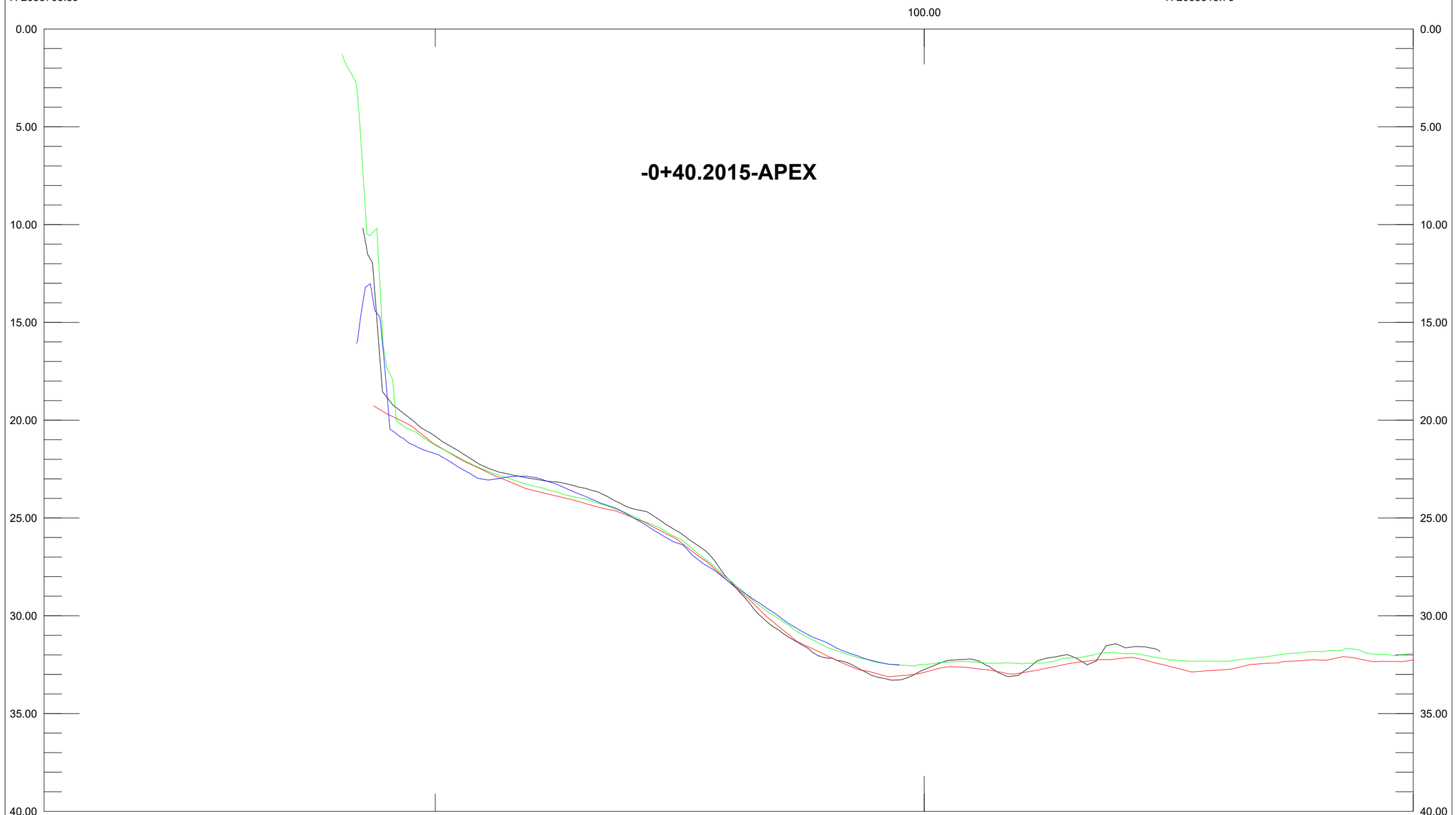
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Azimuth: 75.56

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Y: 2688818.75




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-0+40.20181201_NB

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-0+40.20230124-Sch

20231219 Shuster
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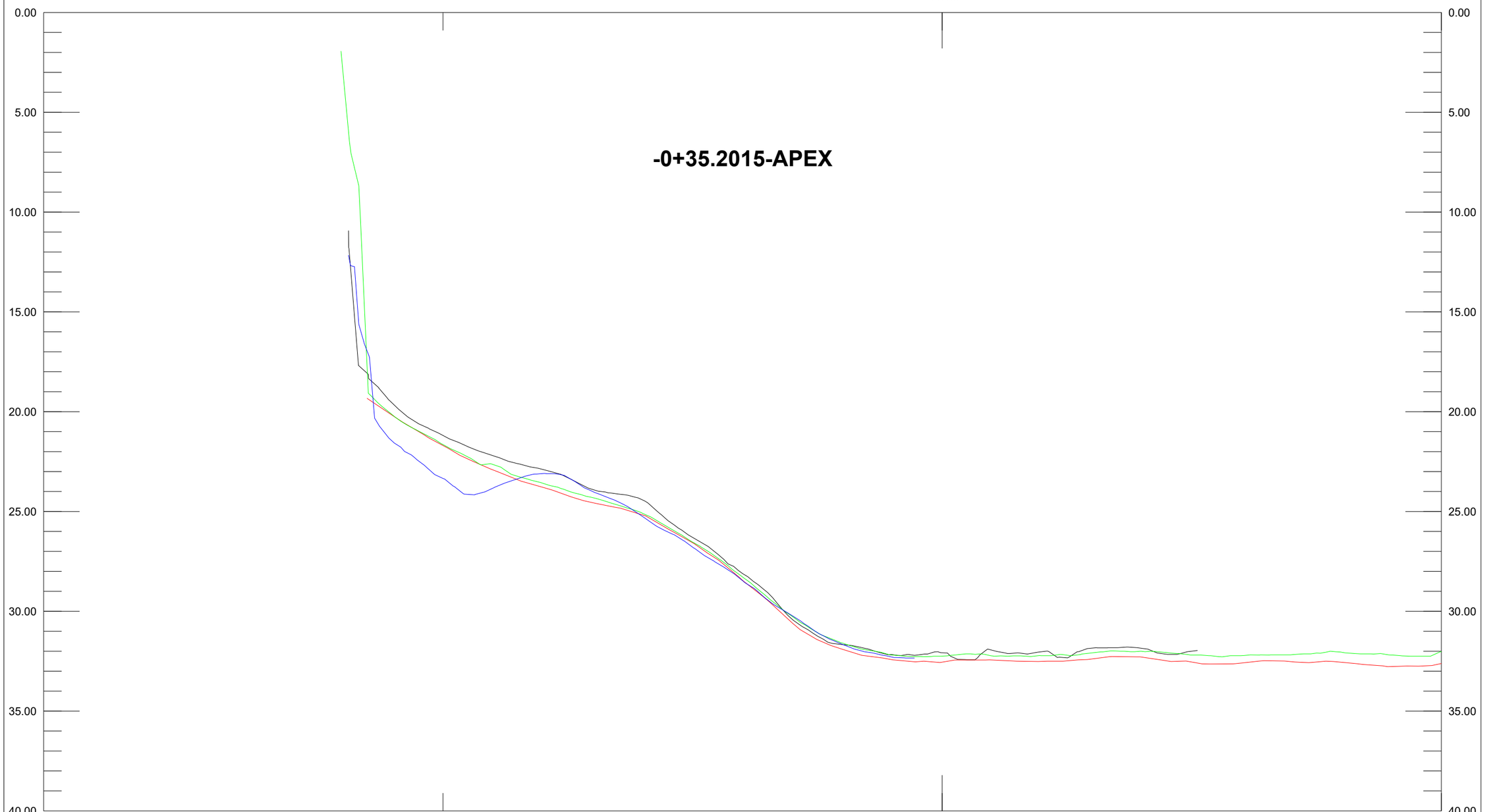
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20231219 Shuster
-0+35.20231219-Sch

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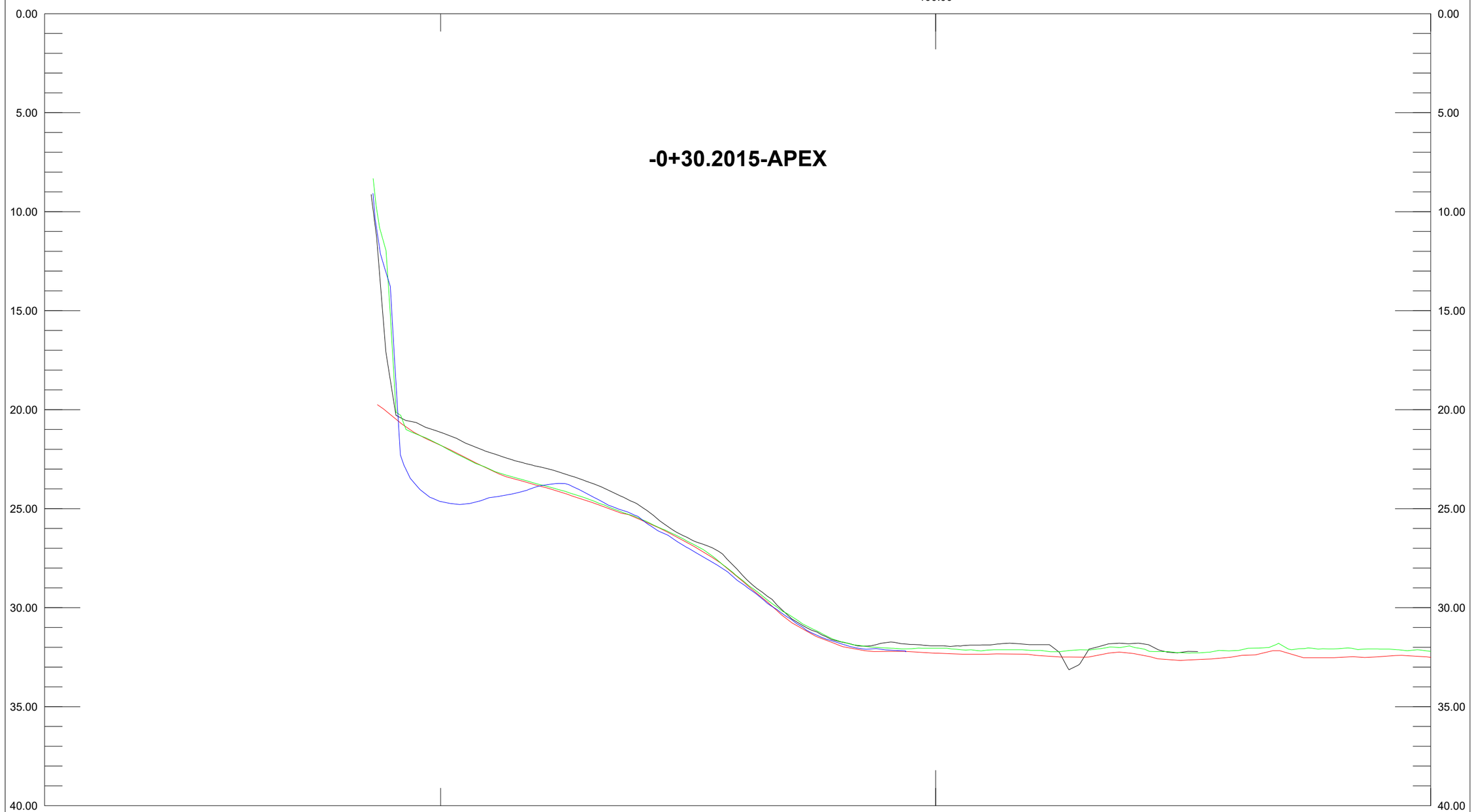
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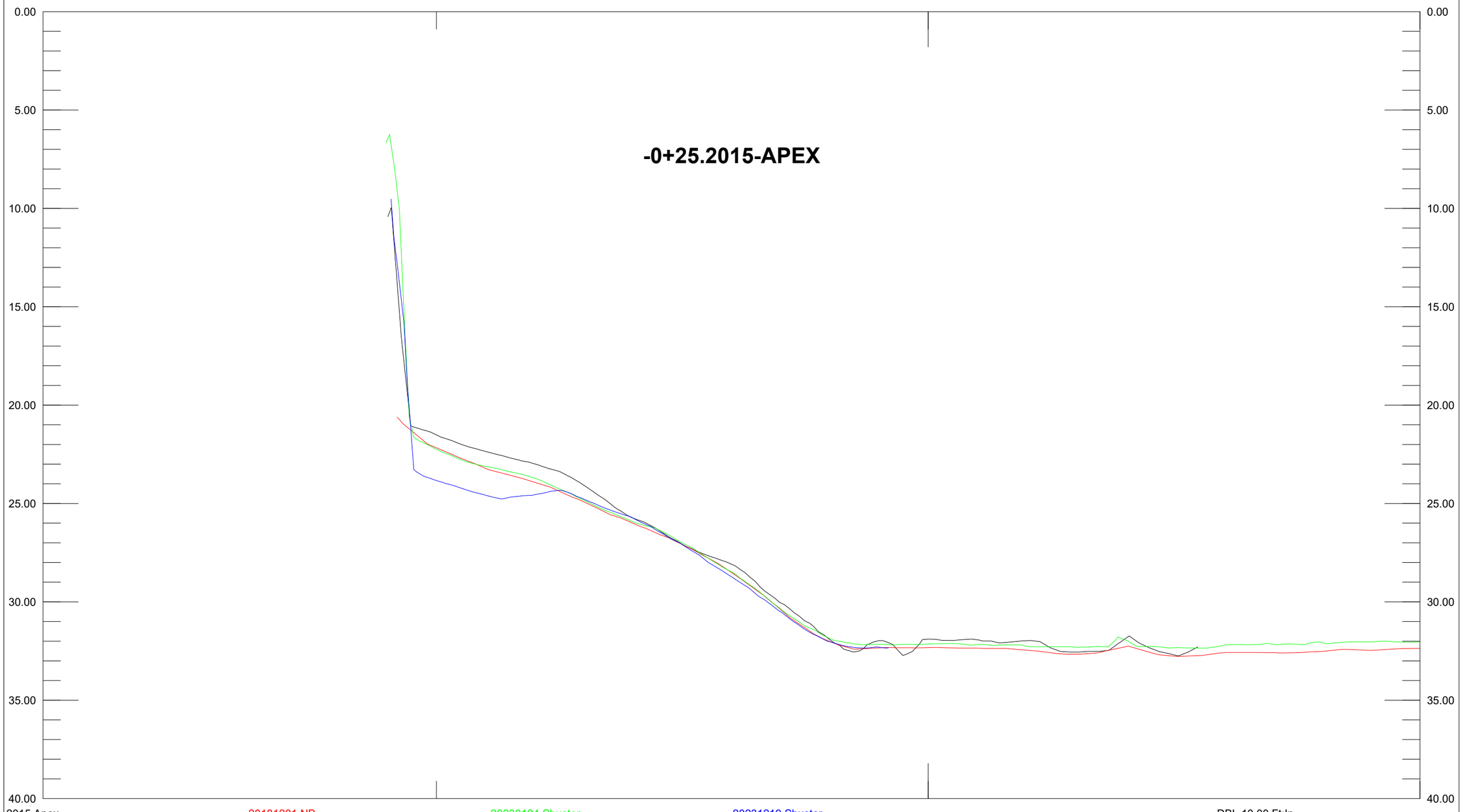
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20231219 Shuster
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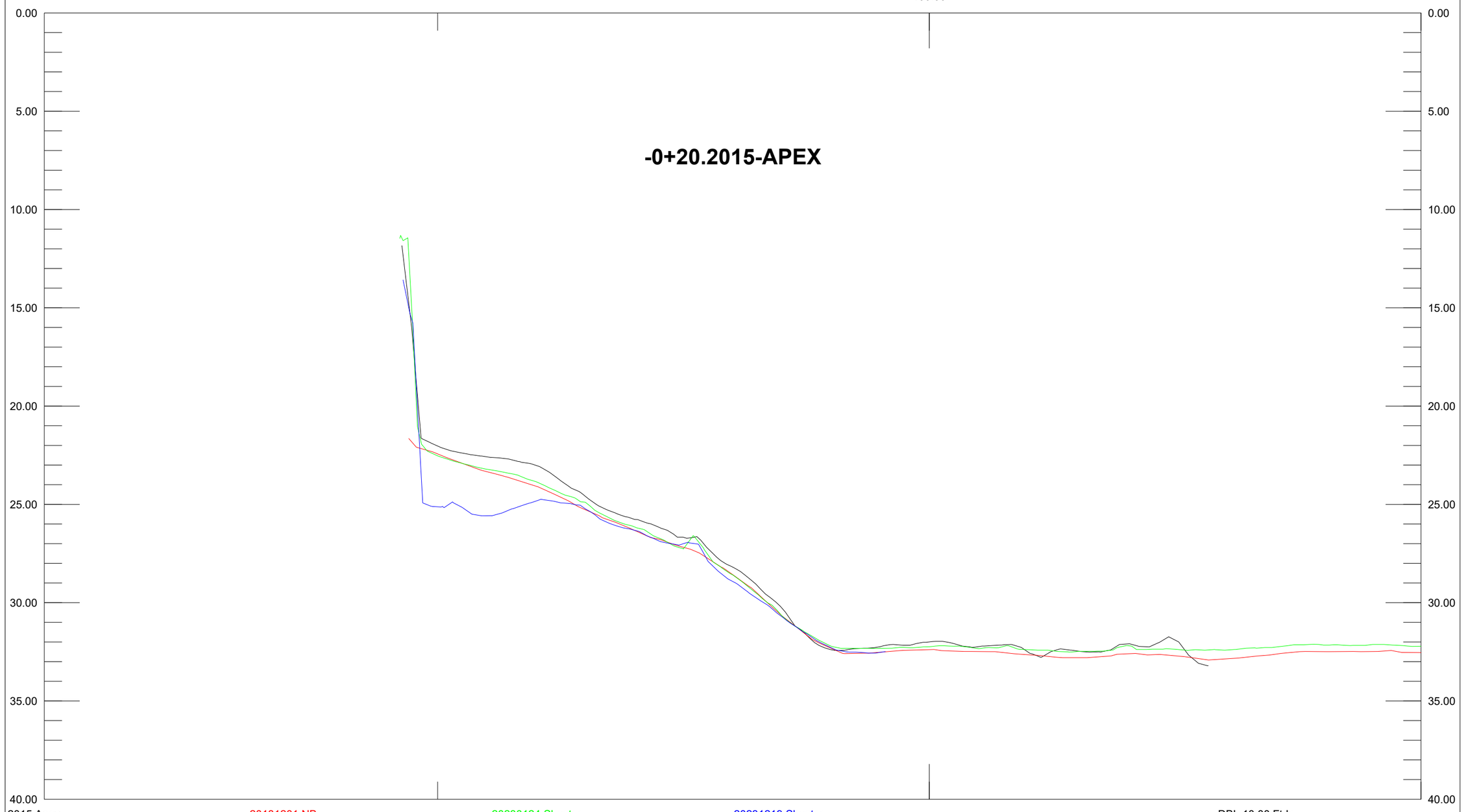
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20231219 Shuster
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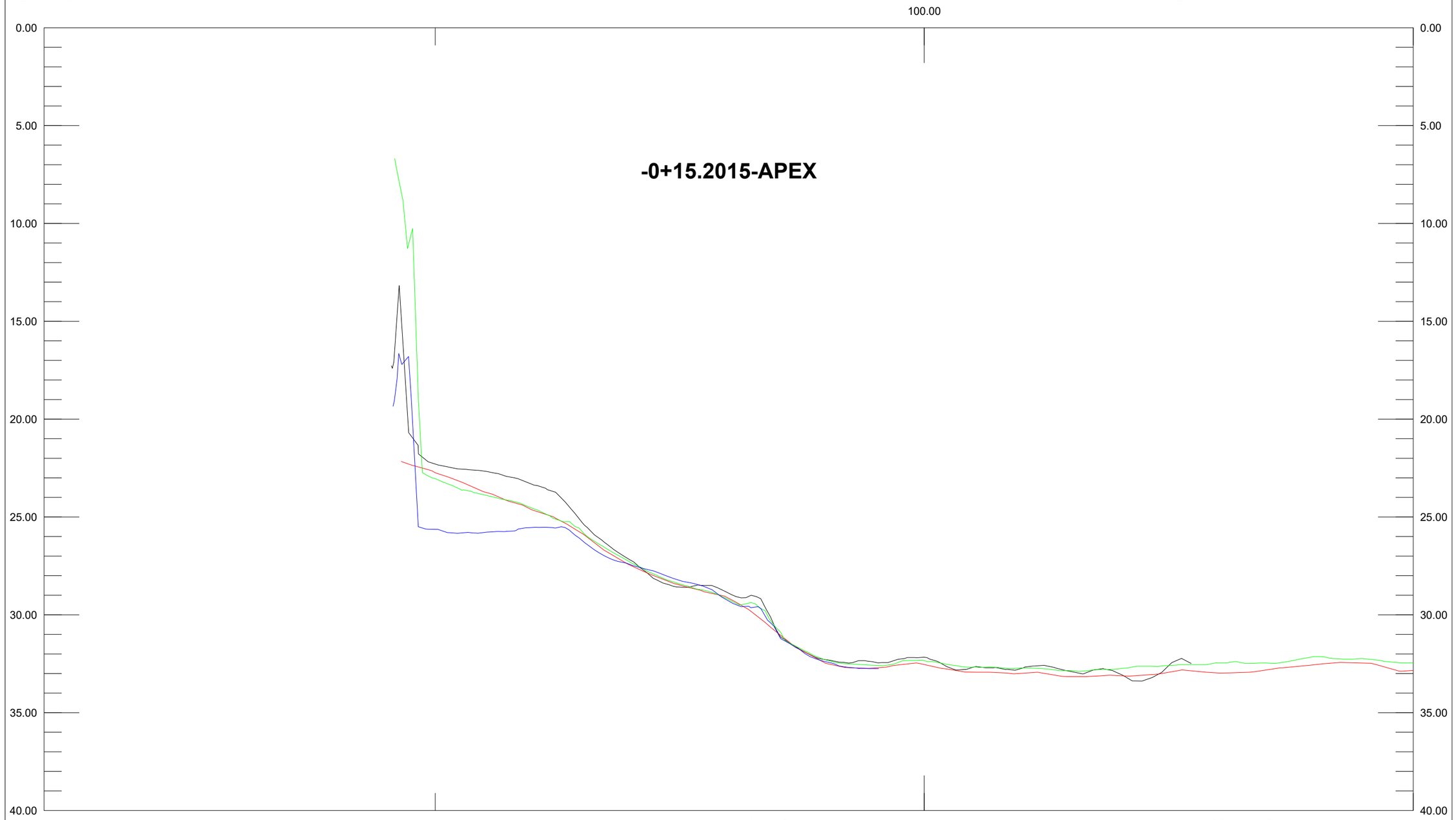
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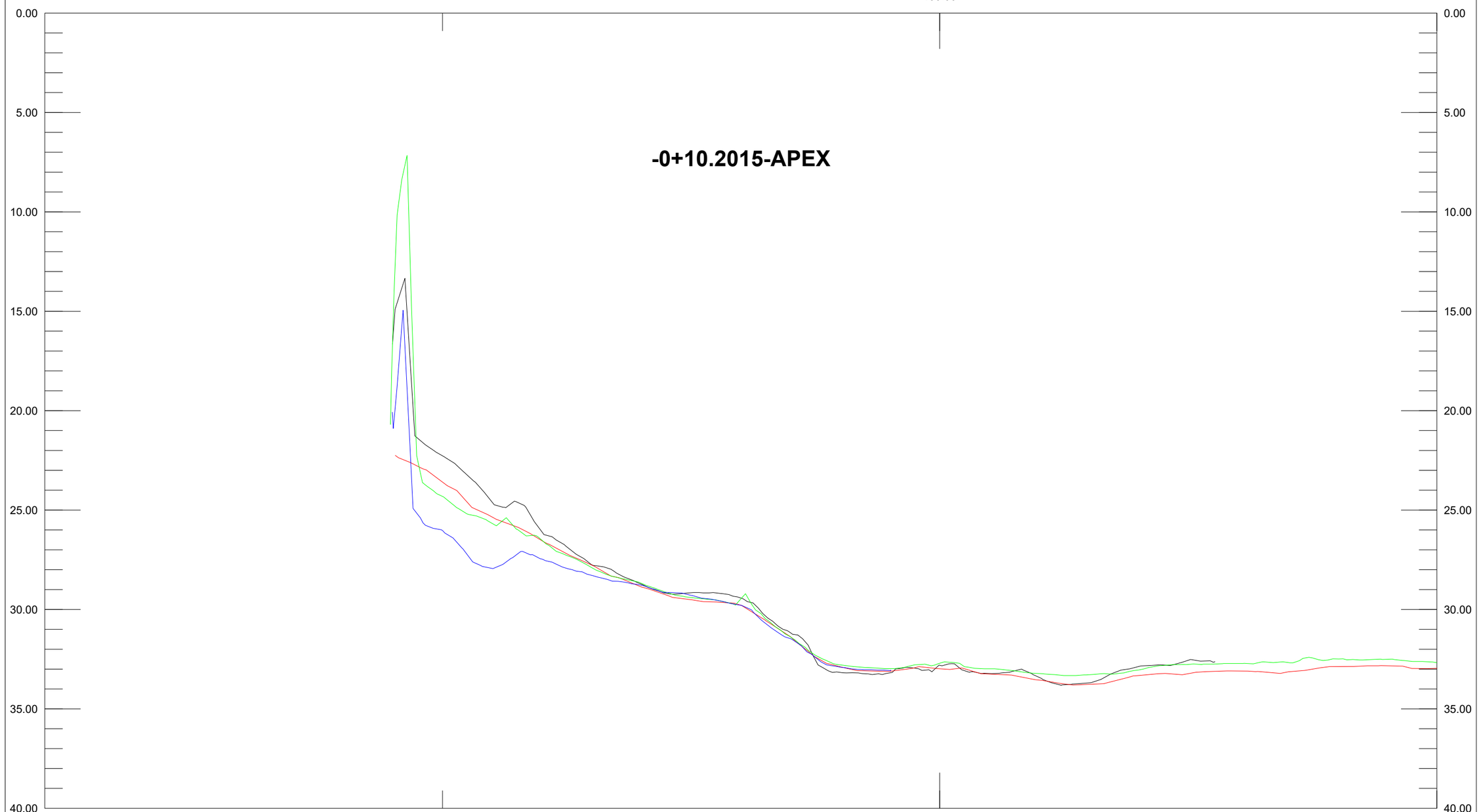
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20231219 Shuster
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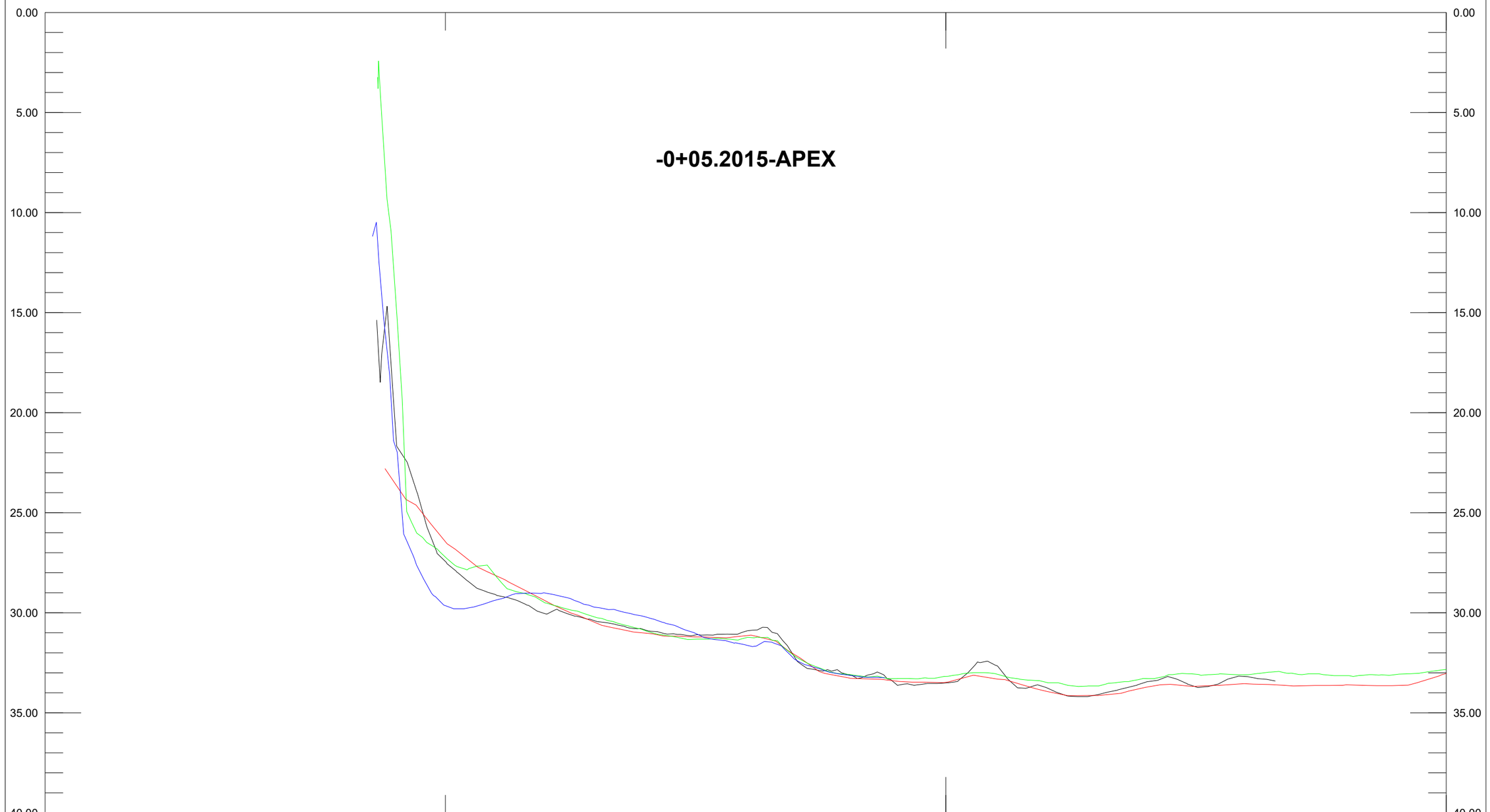
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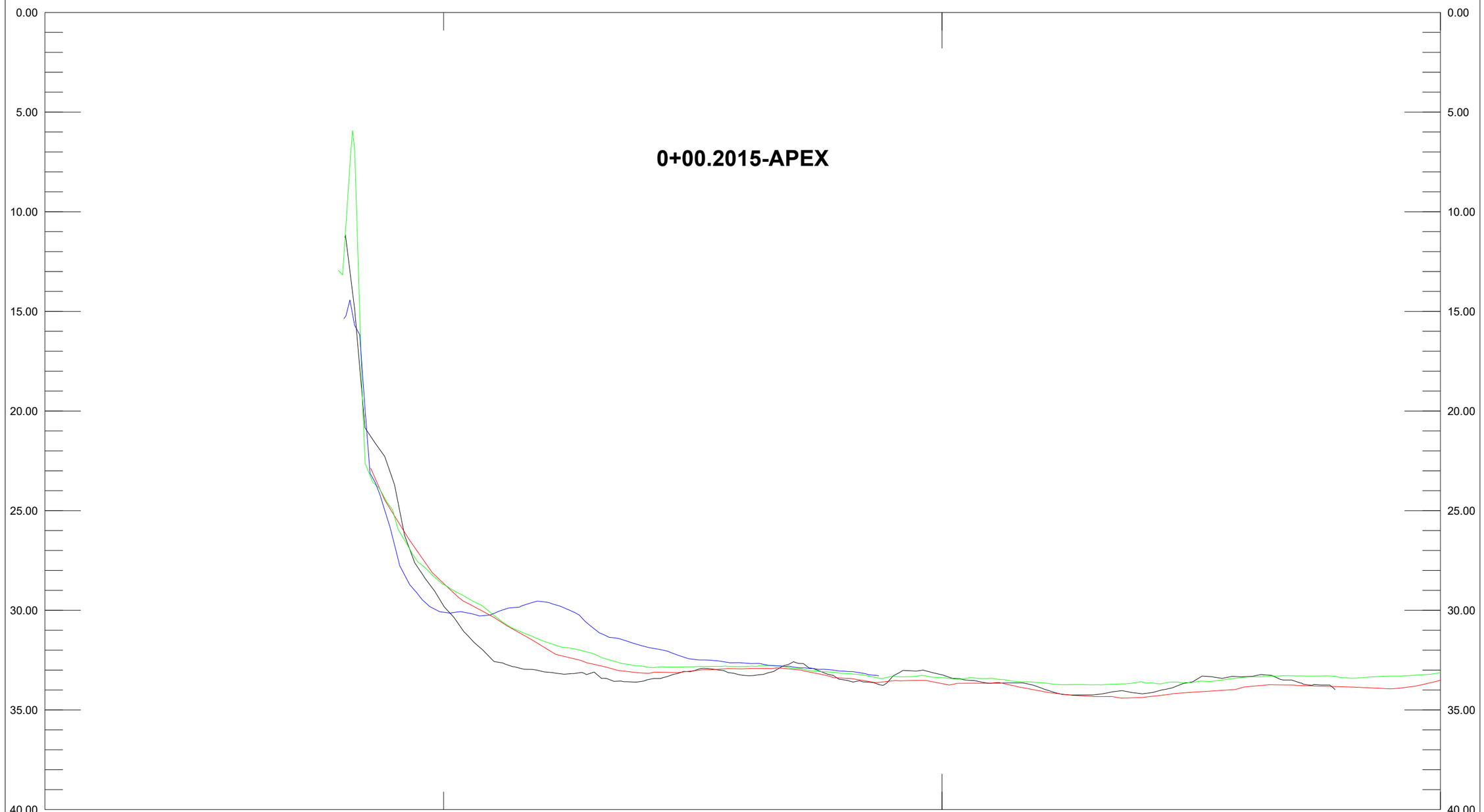
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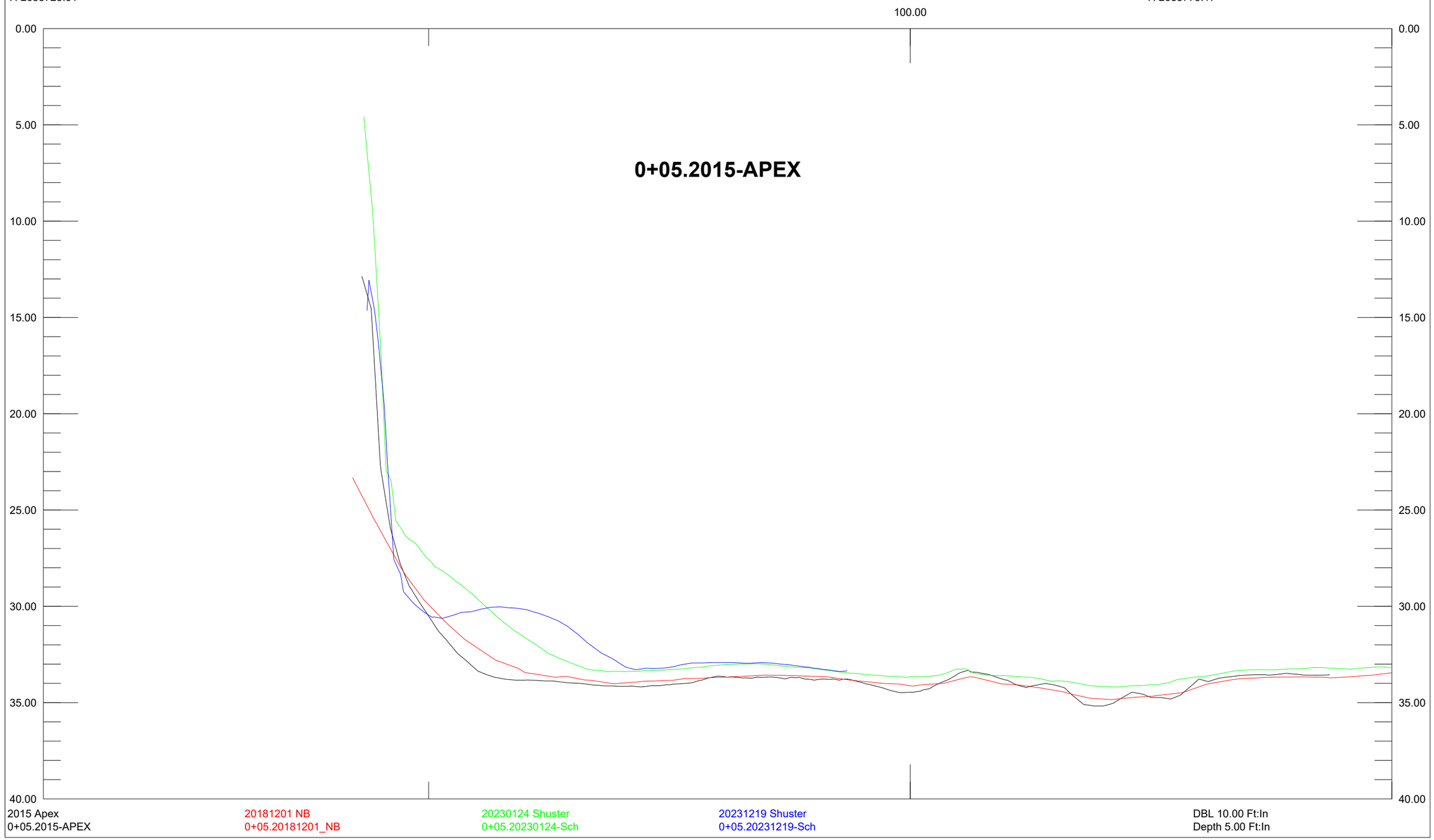
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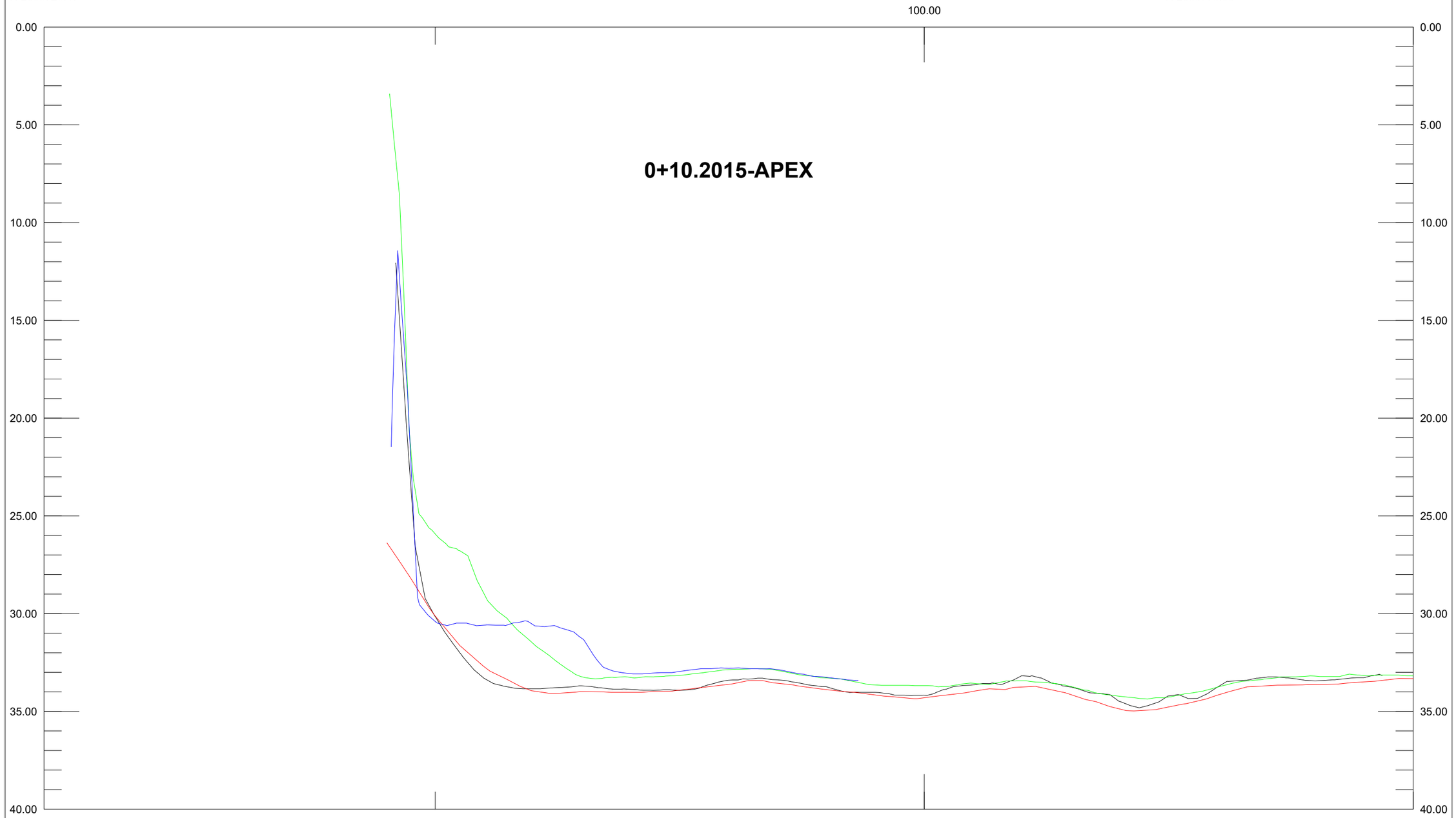
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20231219 Shuster
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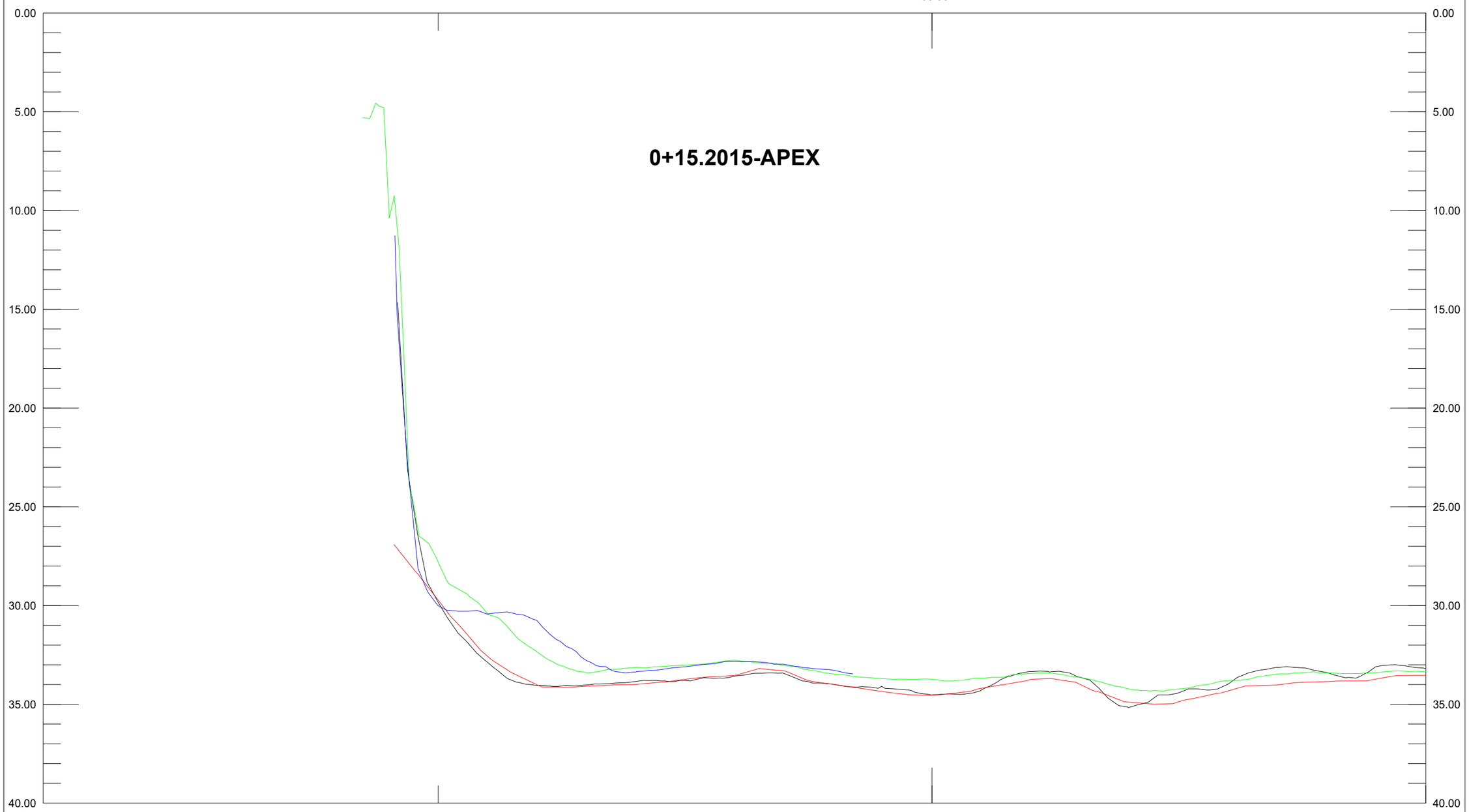
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20231219 Shuster
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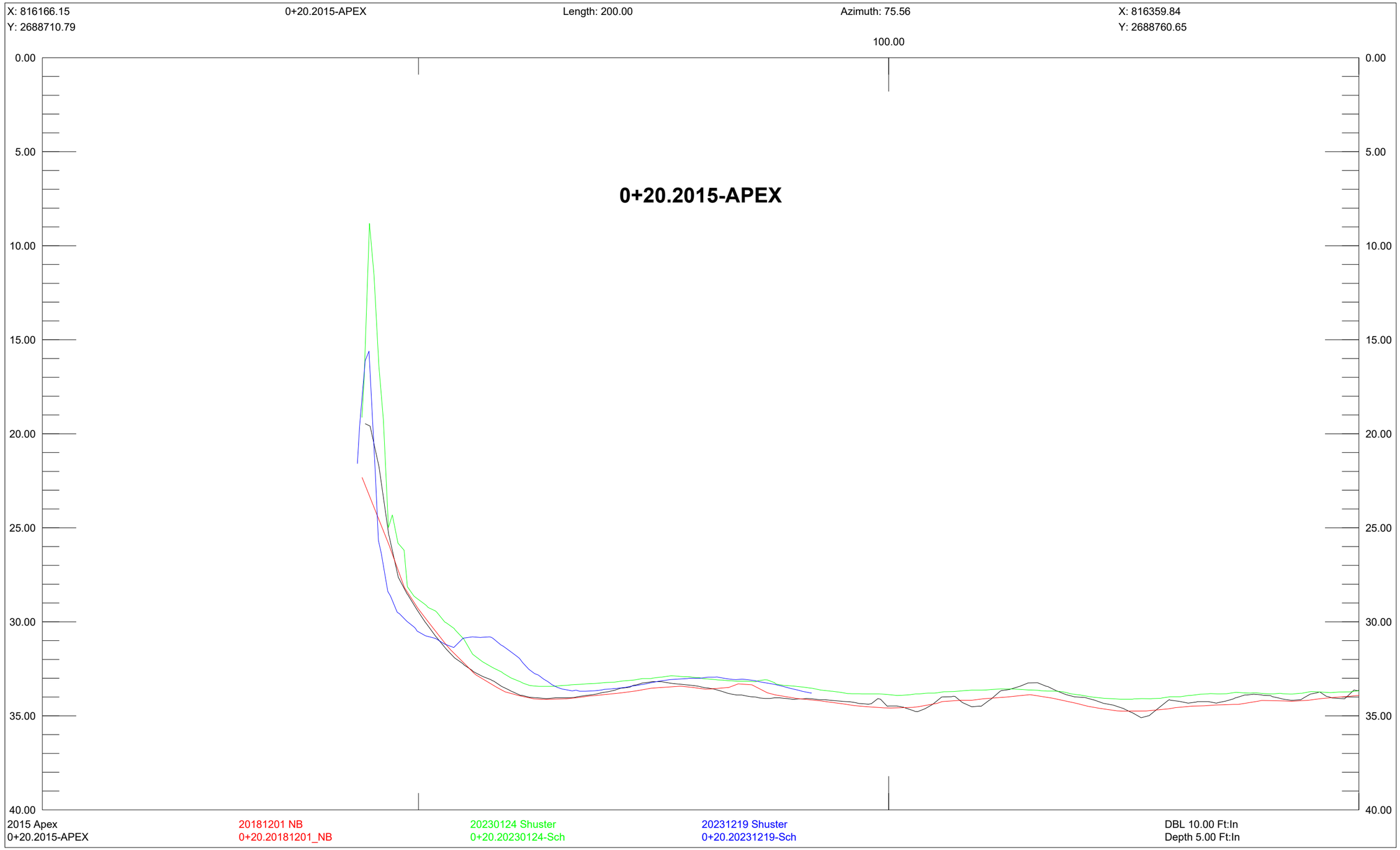
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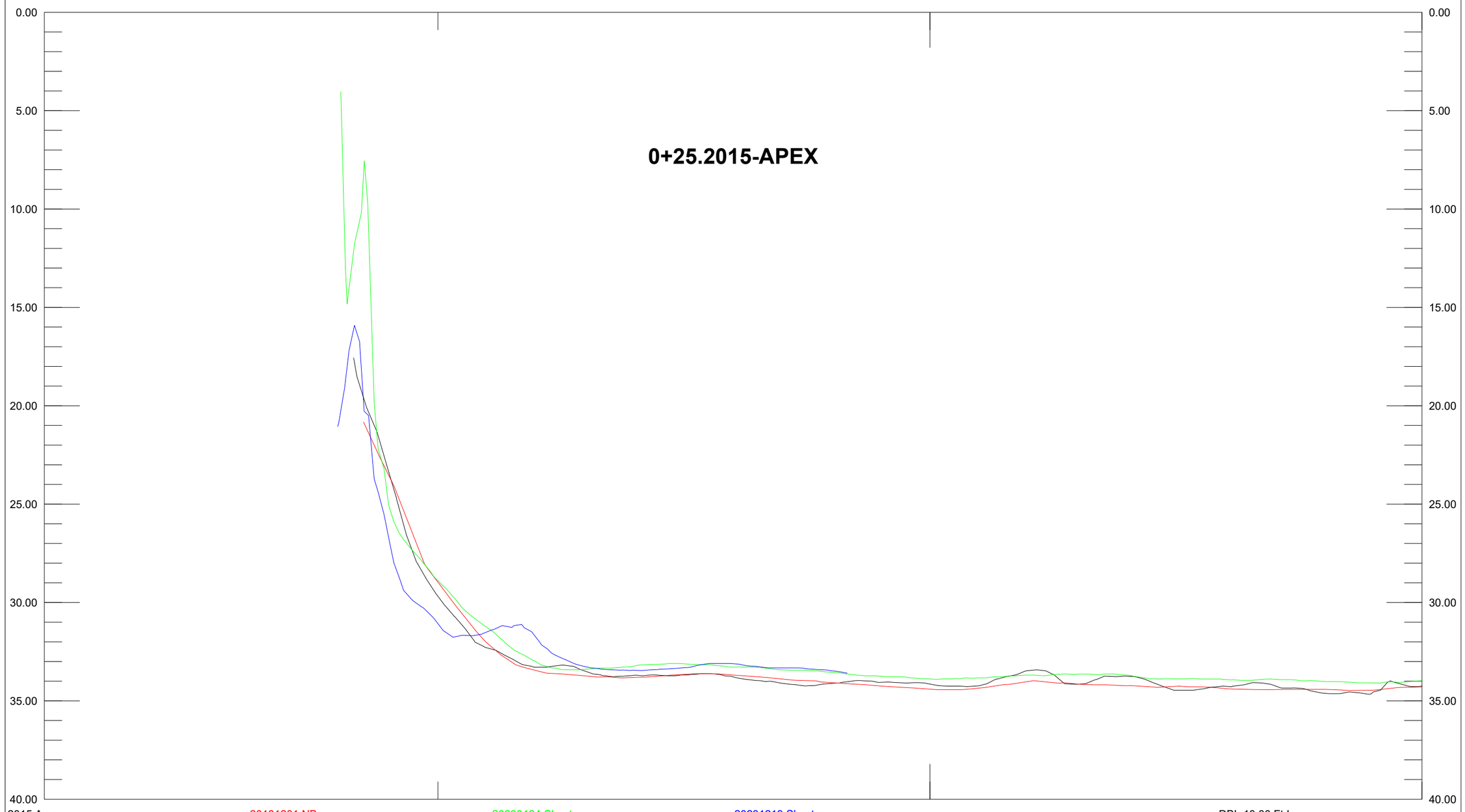
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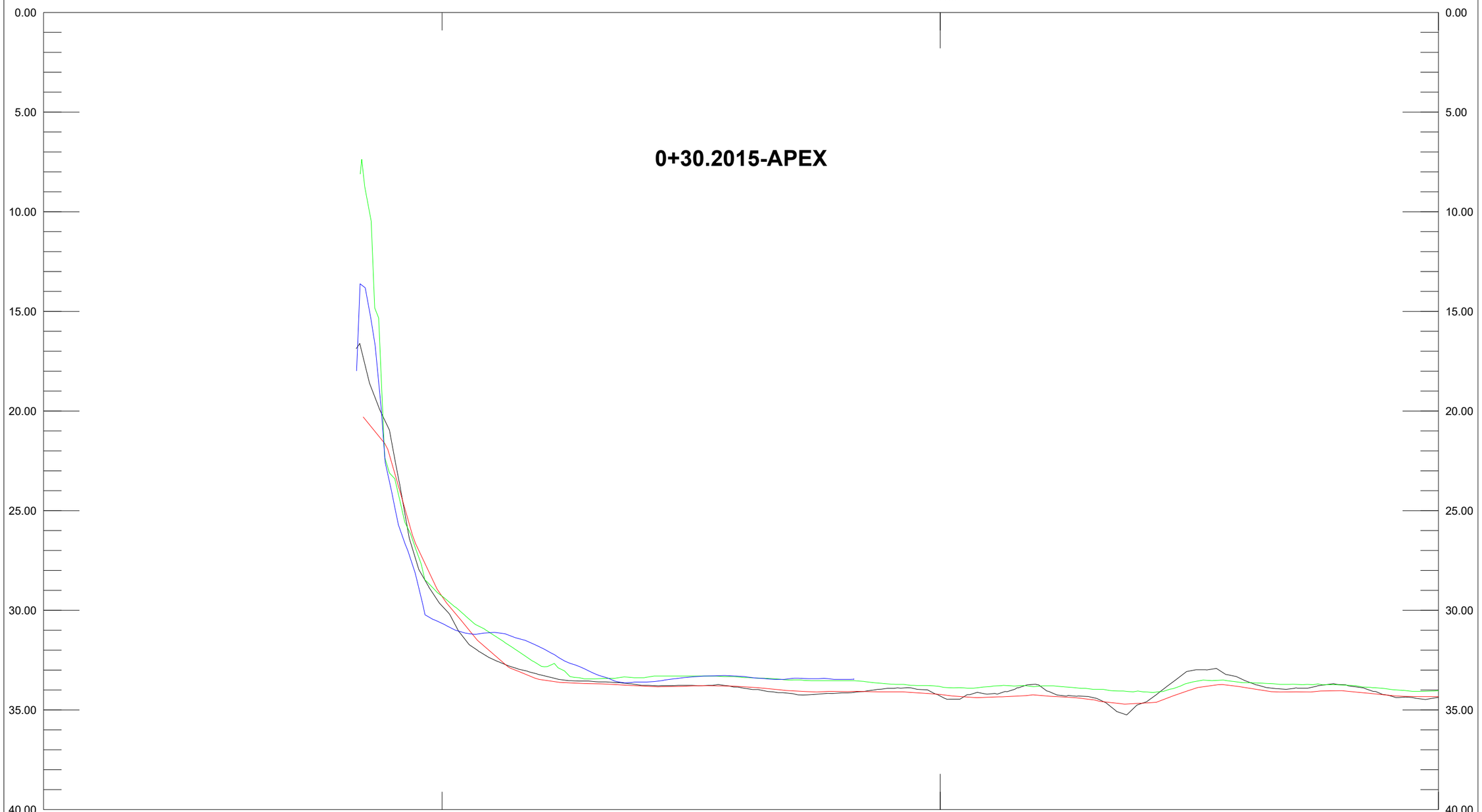
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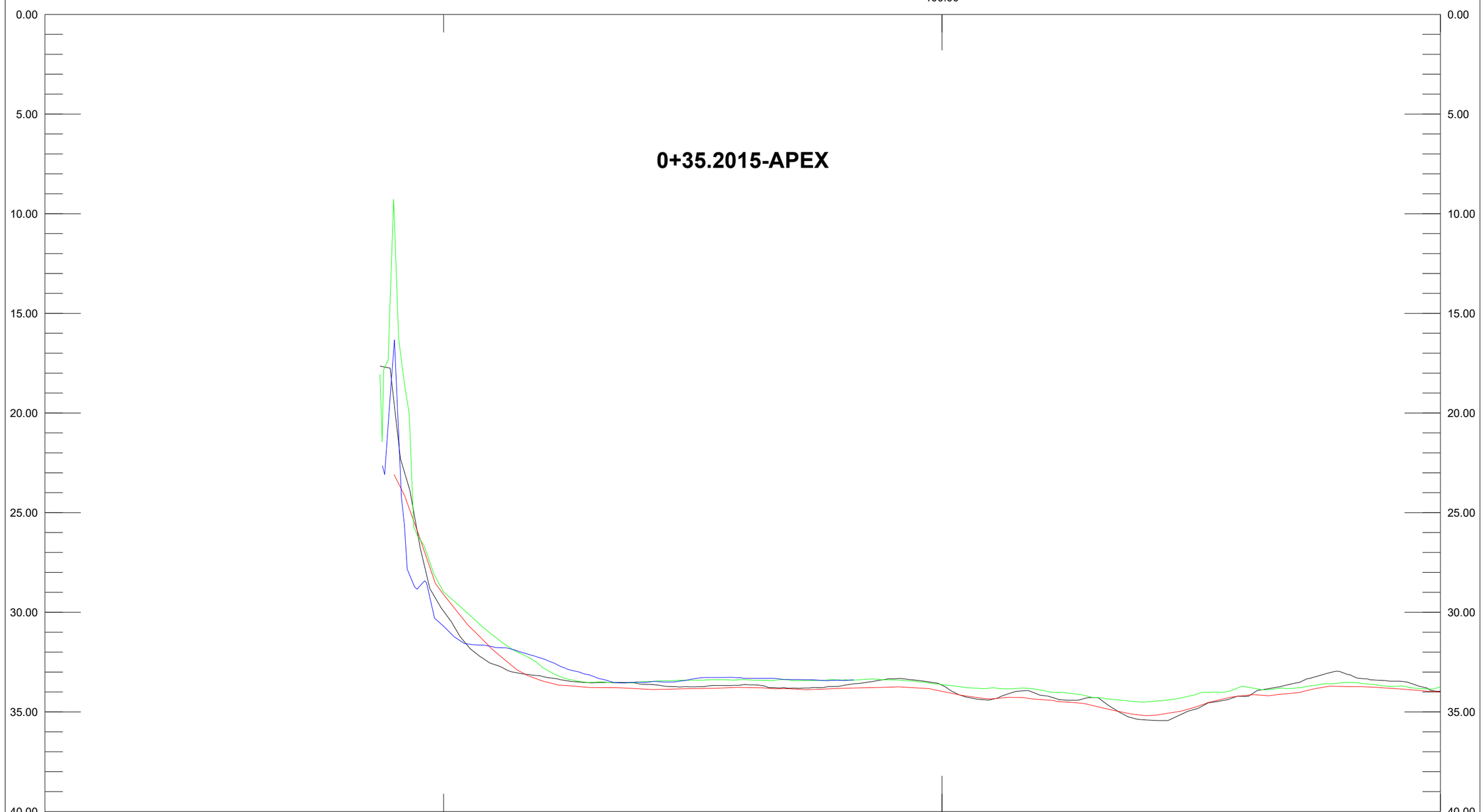
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20231219 Shuster
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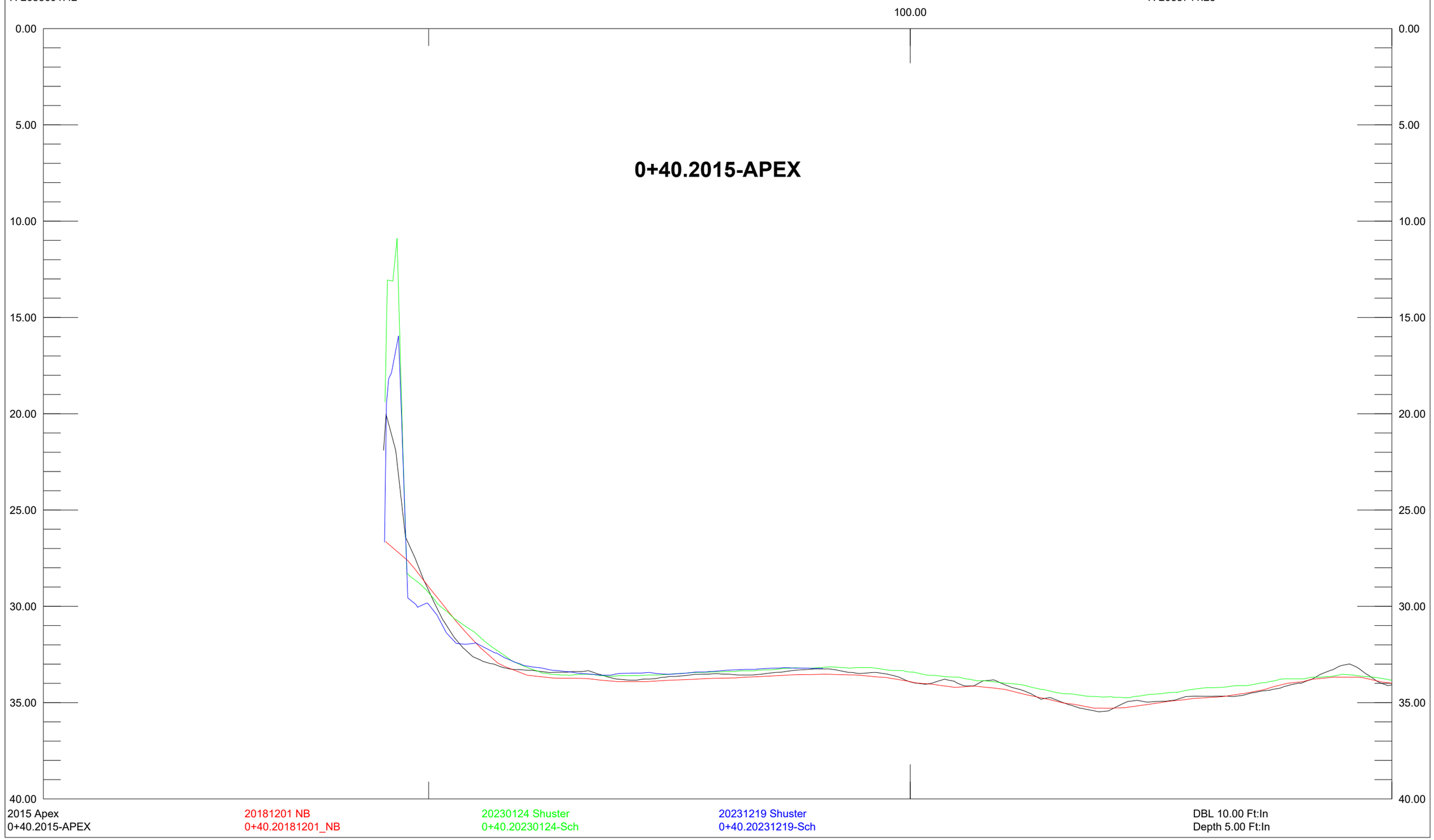
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Azimuth: 75.56

X: 816364.83
Y: 2688741.28




2015 Apex
0+40.2015-APEX

20181201 NB
0+40.20181201_NB

20230124 Shuster
0+40.20230124-Sch

20231219 Shuster
0+40.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

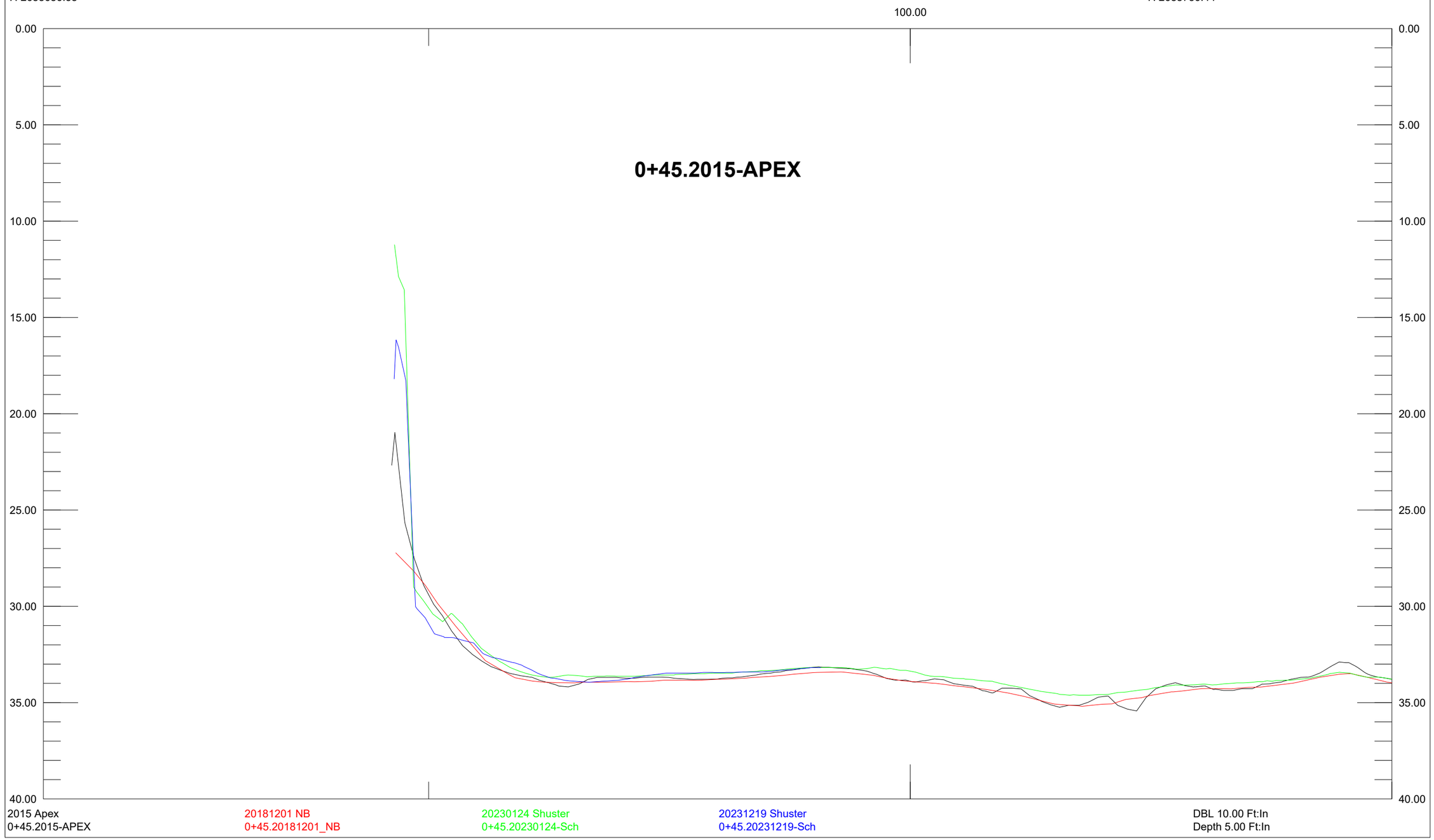
X: 816172.39
Y: 2688686.58

0+45.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816366.07
Y: 2688736.44




2015 Apex
0+45.2015-APEX

20181201 NB
0+45.20181201_NB

20230124 Shuster
0+45.20230124-Sch

20231219 Shuster
0+45.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816173.63
Y: 2688681.73

0+50.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816367.32
Y: 2688731.59

100.00

# 0+50.2015-APEX

0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00

2015 Apex
0+50.2015-APEX

20181201 NB
0+50.20181201_NB

20230124 Shuster
0+50.20230124-Sch

20231219 Shuster
0+50.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816174.88
Y: 2688676.89

0+55.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816368.57
Y: 2688726.75

100.00

# 0+55.2015-APEX

0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00

2015 Apex
0+55.2015-APEX

20181201 NB
0+55.20181201_NB

20230124 Shuster
0+55.20230124-Sch

20231219 Shuster
0+55.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

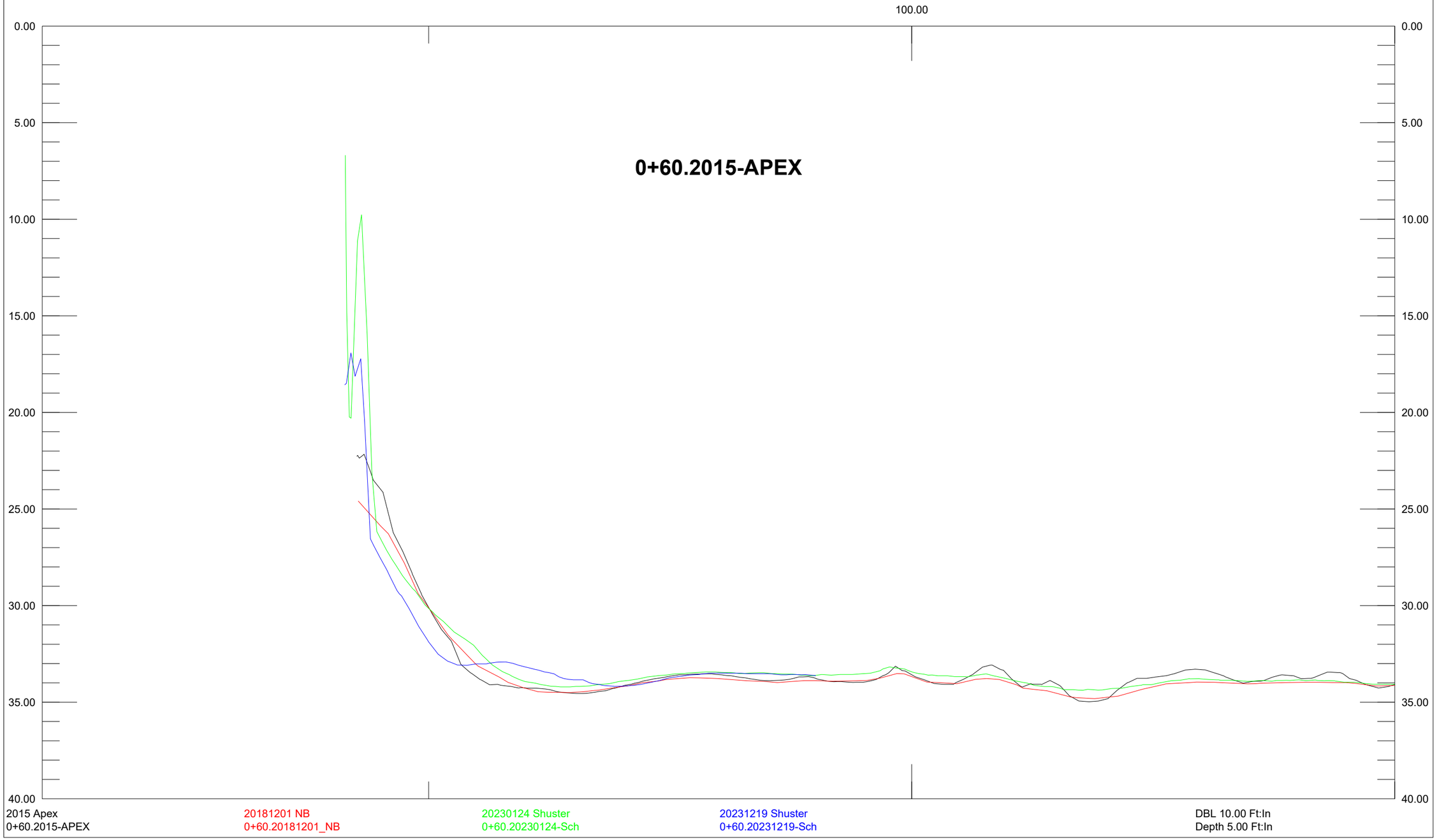
X: 816176.13
Y: 2688672.05

0+60.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816369.81
Y: 2688721.91




2015 Apex
0+60.2015-APEX

20181201 NB
0+60.20181201_NB

20230124 Shuster
0+60.20230124-Sch

20231219 Shuster
0+60.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816177.37
Y: 2688667.21

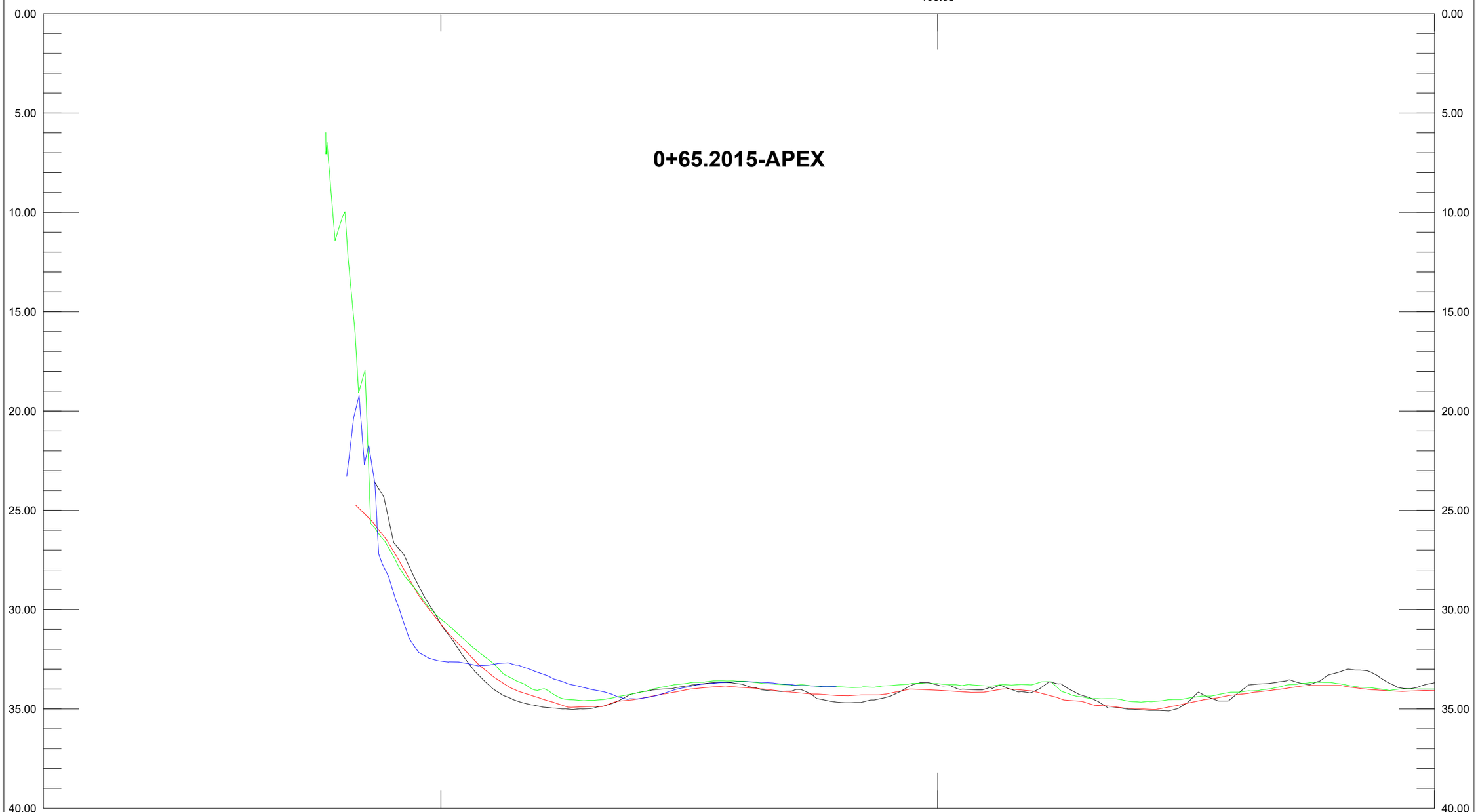
0+65.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816371.06
Y: 2688717.07

100.00




2015 Apex
0+65.2015-APEX

20181201 NB
0+65.20181201_NB

20230124 Shuster
0+65.20230124-Sch

20231219 Shuster
0+65.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

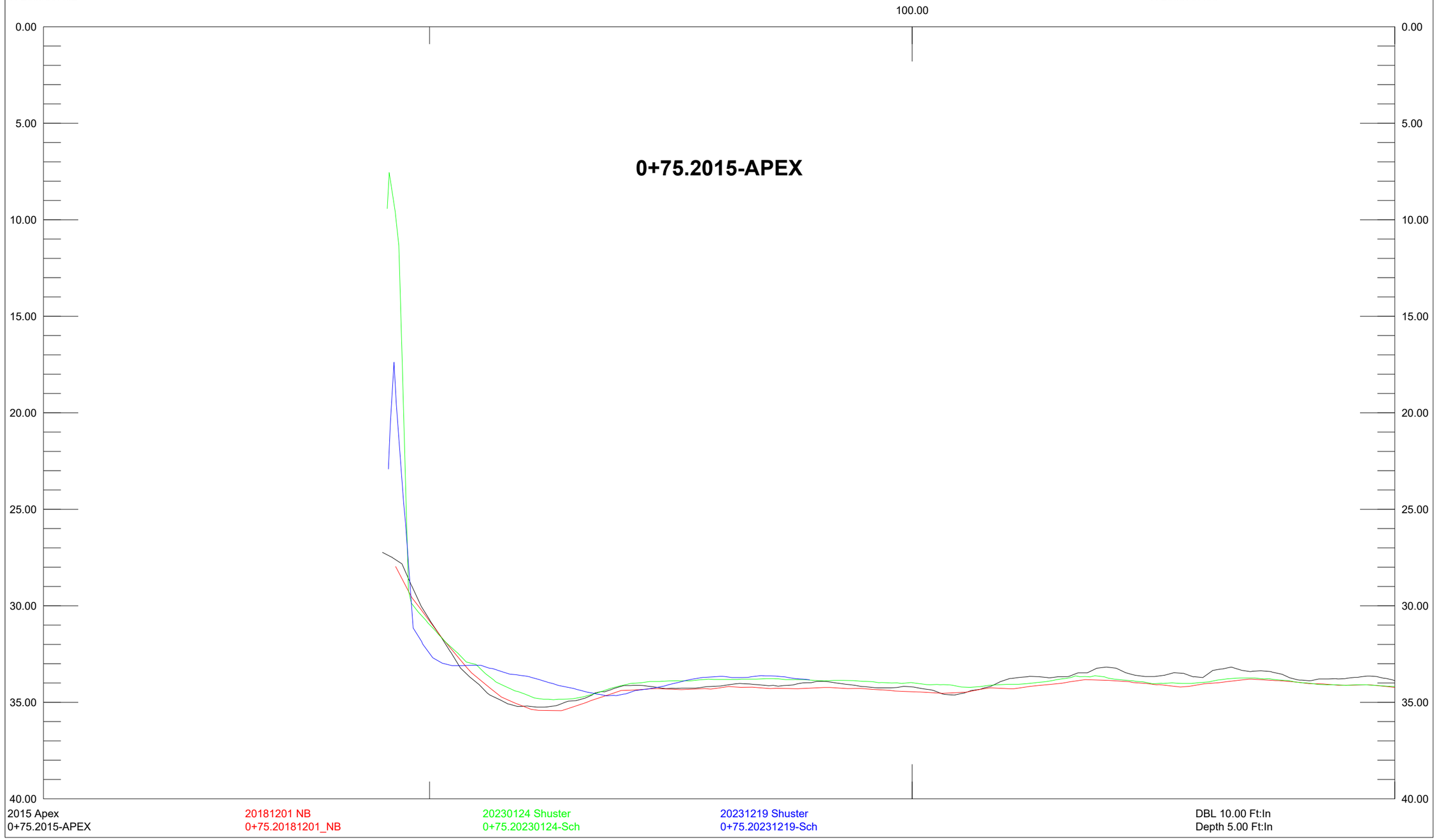
X: 816179.87
Y: 2688657.52

0+75.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816373.55
Y: 2688707.38




2015 Apex
0+75.2015-APEX

20181201 NB
0+75.20181201_NB

20230124 Shuster
0+75.20230124-Sch

20231219 Shuster
0+75.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

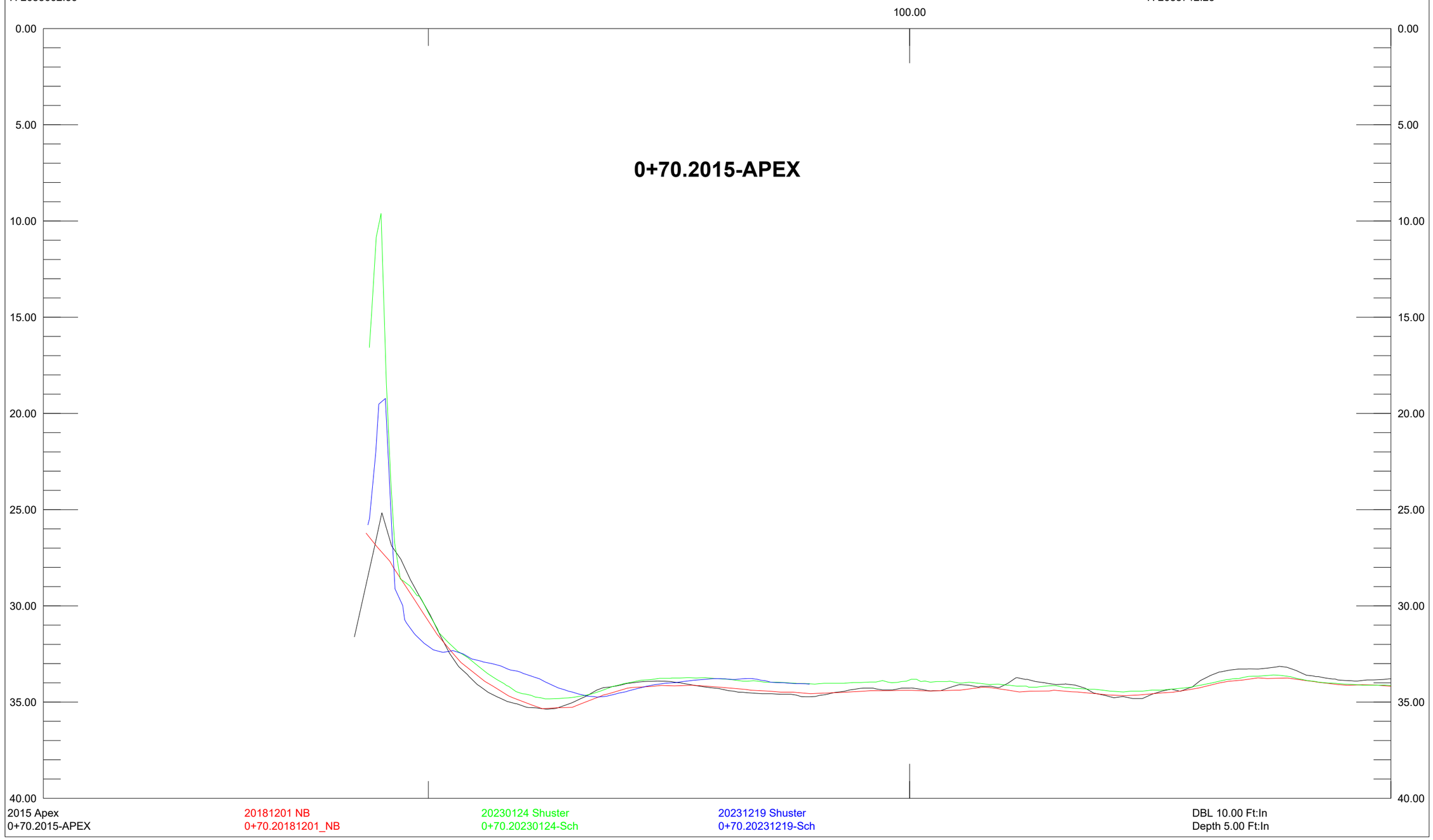
X: 816178.62
Y: 2688662.36

0+70.2015-APEX

Length: 200.01

Azimuth: 75.56

X: 816372.31
Y: 2688712.23




2015 Apex
0+70.2015-APEX

20181201 NB
0+70.20181201_NB

20230124 Shuster
0+70.20230124-Sch

20231219 Shuster
0+70.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

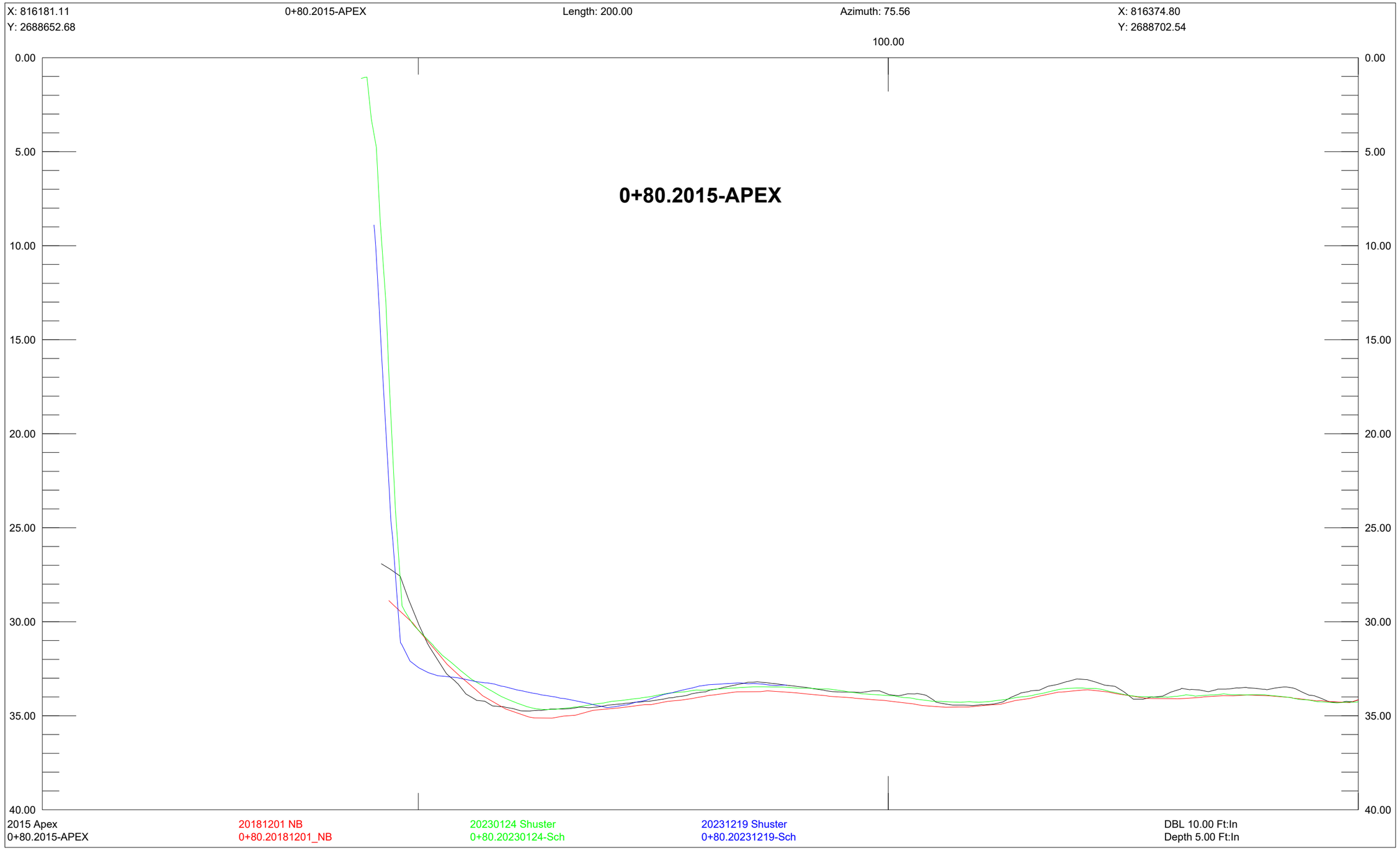
X: 816181.11
Y: 2688652.68

0+80.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816374.80
Y: 2688702.54




2015 Apex
0+80.2015-APEX

20181201 NB
0+80.20181201_NB

20230124 Shuster
0+80.20230124-Sch

20231219 Shuster
0+80.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816184.85
Y: 2688638.15

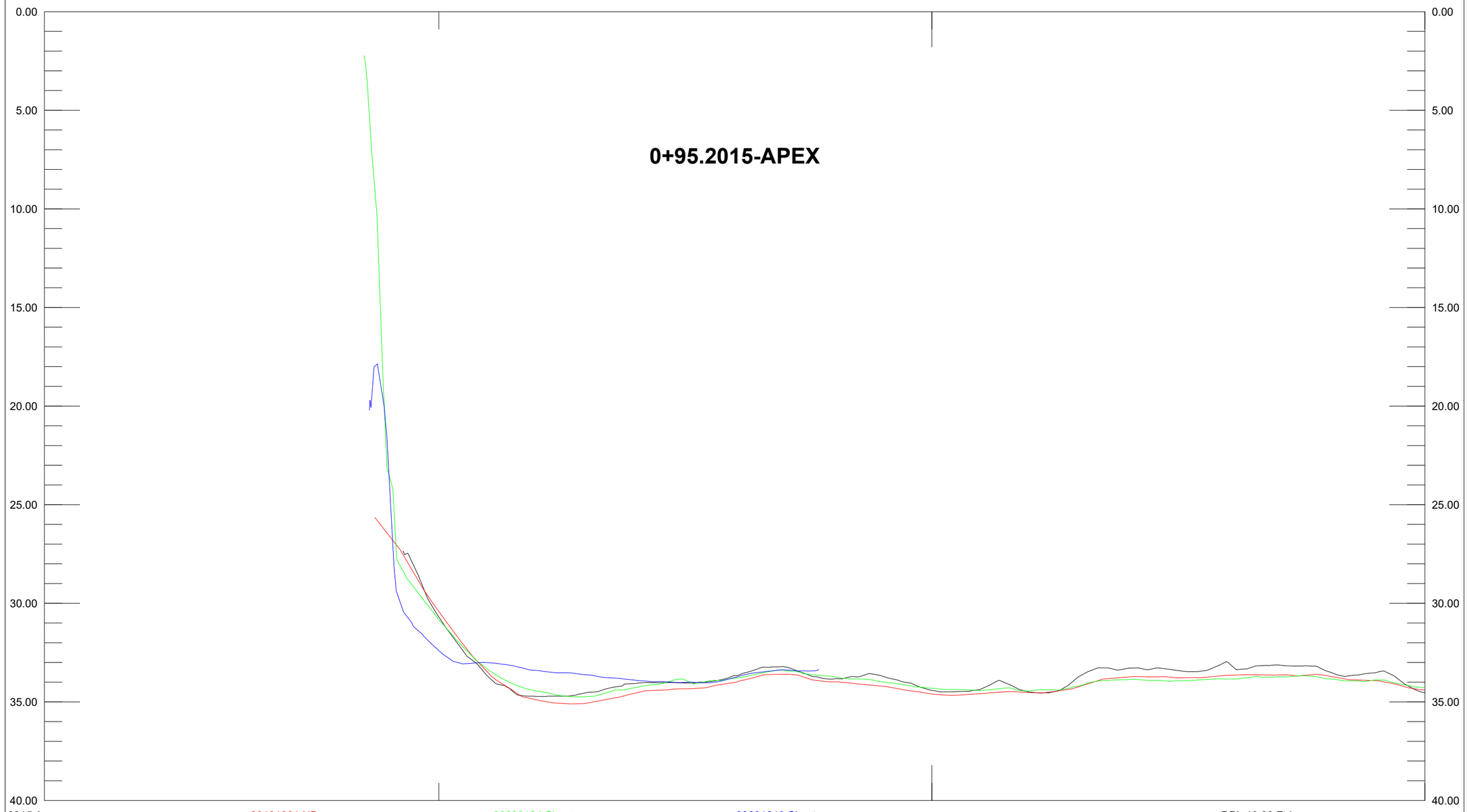
0+95.2015-APEX

Length: 200.01

Azimuth: 75.56

X: 816378.54
Y: 2688688.02

100.00




2015 Apex
0+95.2015-APEX

20181201 NB
0+95.20181201_NB

20230124 Shuster
0+95.20230124-Sch

20231219 Shuster
0+95.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

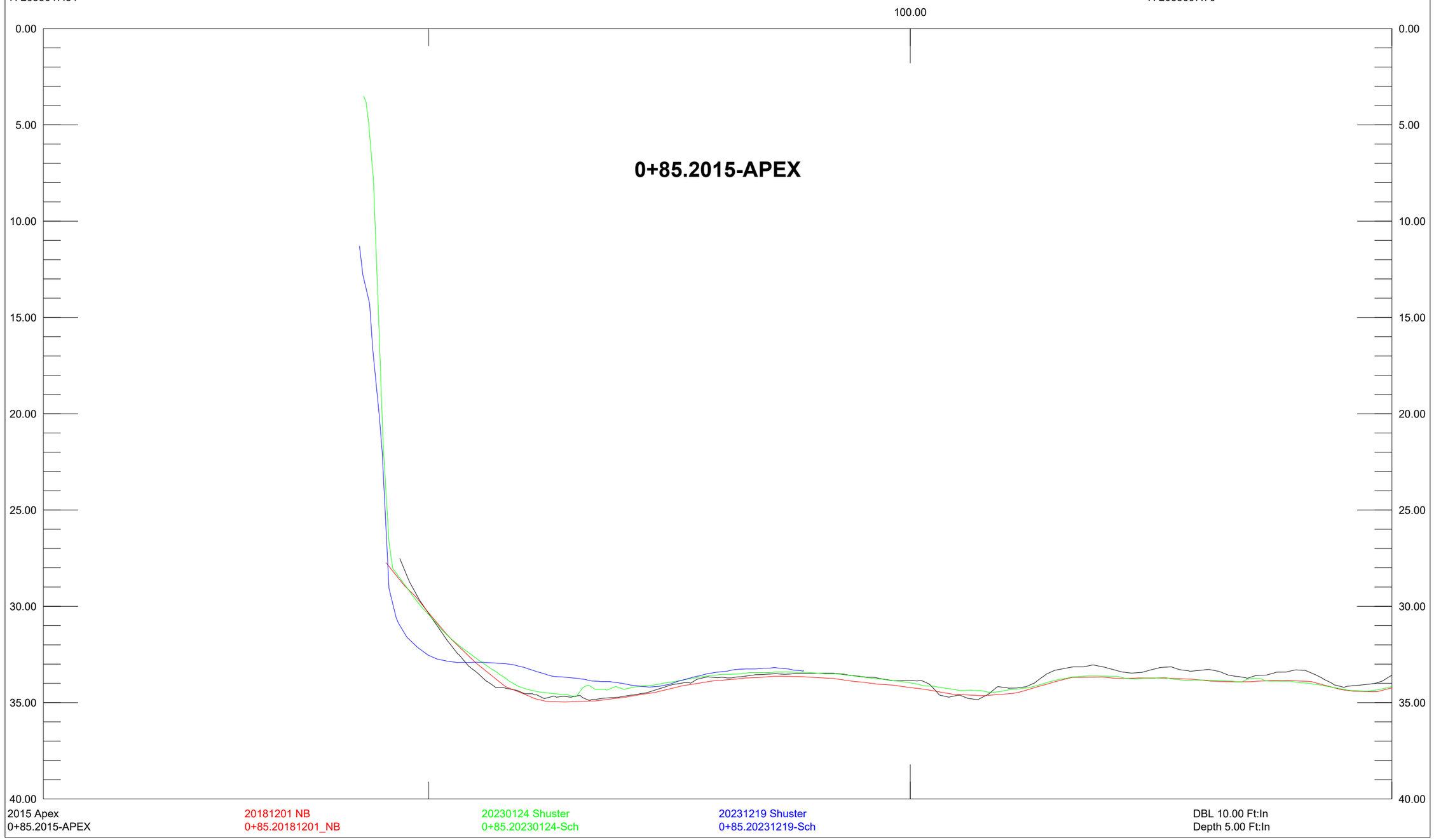
X: 816182.36
Y: 2688647.84

0+85.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816376.04
Y: 2688697.70




2015 Apex
0+85.2015-APEX

20181201 NB
0+85.20181201_NB

20230124 Shuster
0+85.20230124-Sch

20231219 Shuster
0+85.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

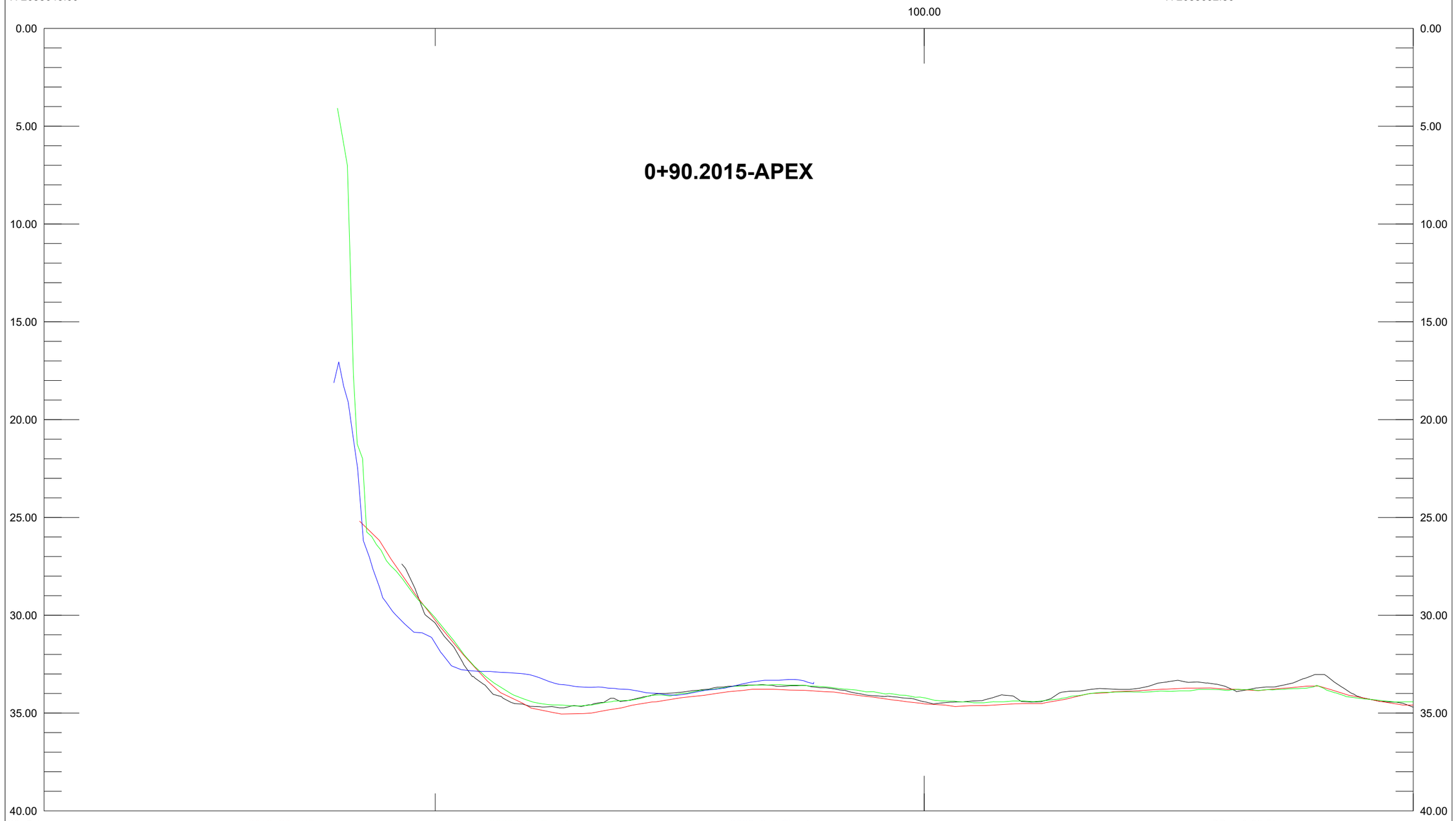
X: 816183.61
Y: 2688643.00

0+90.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816377.29
Y: 2688692.86




2015 Apex
0+90.2015-APEX

20181201 NB
0+90.20181201_NB

20230124 Shuster
0+90.20230124-Sch

20231219 Shuster
0+90.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816186.10
Y: 2688633.31

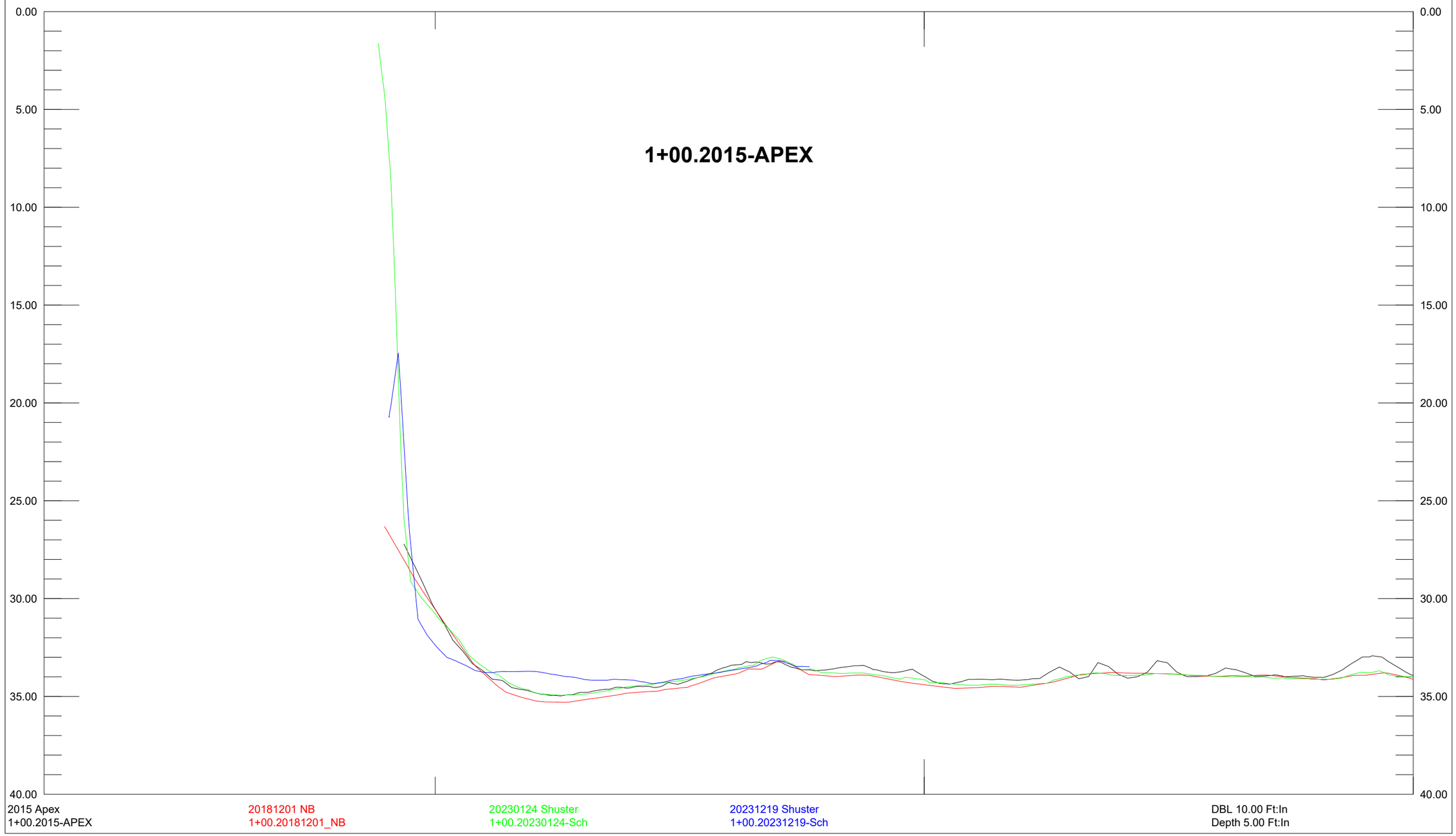
1+00.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816379.78
Y: 2688683.17

100.00




2015 Apex
1+00.2015-APEX

20181201 NB
1+00.20181201_NB

20230124 Shuster
1+00.20230124-Sch

20231219 Shuster
1+00.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816187.35
Y: 2688628.47

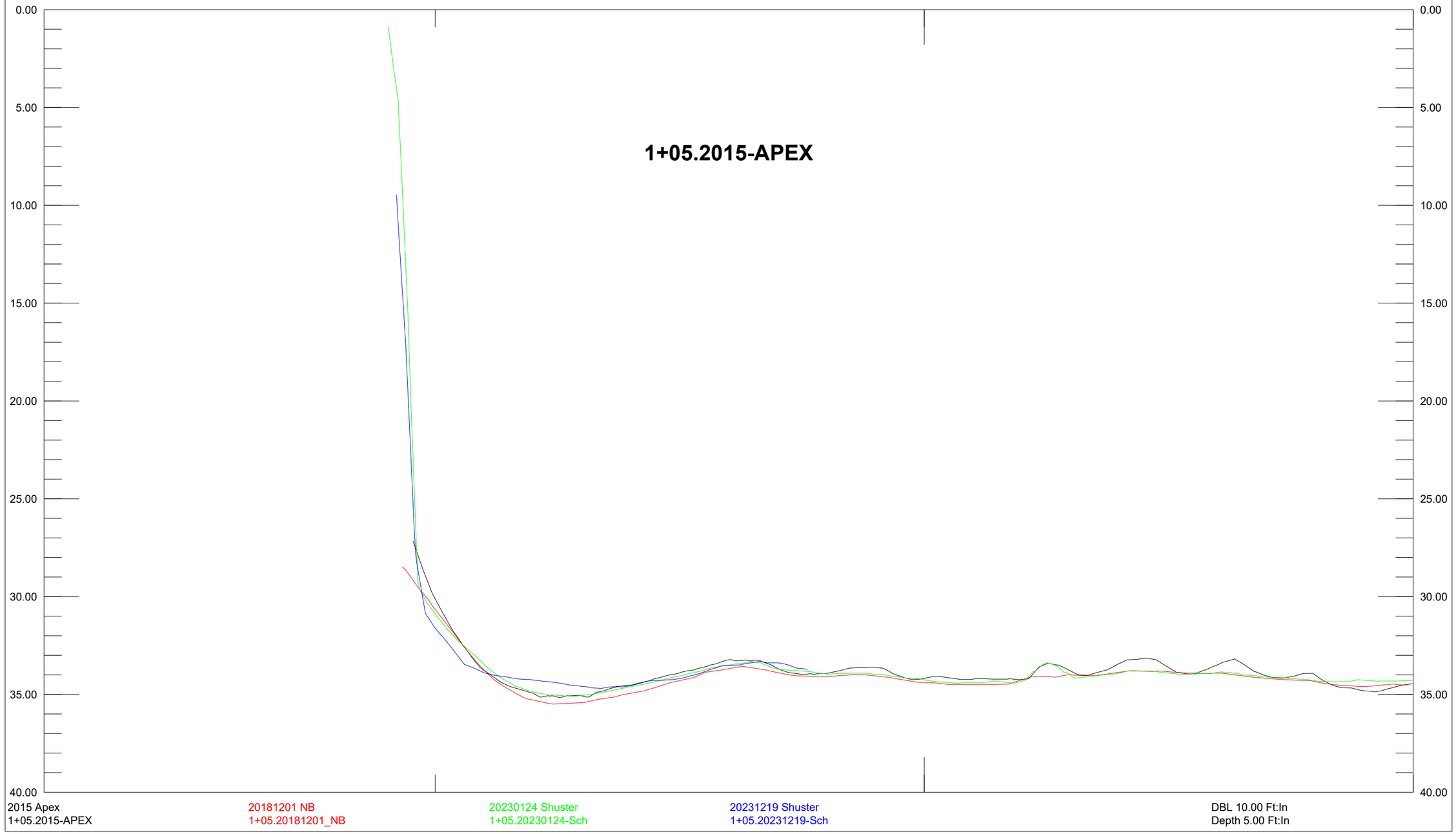
1+05.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816381.03
Y: 2688678.33

100.00




2015 Apex
1+05.2015-APEX

20181201 NB
1+05.20181201_NB

20230124 Shuster
1+05.20230124-Sch

20231219 Shuster
1+05.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816188.59
Y: 2688623.63

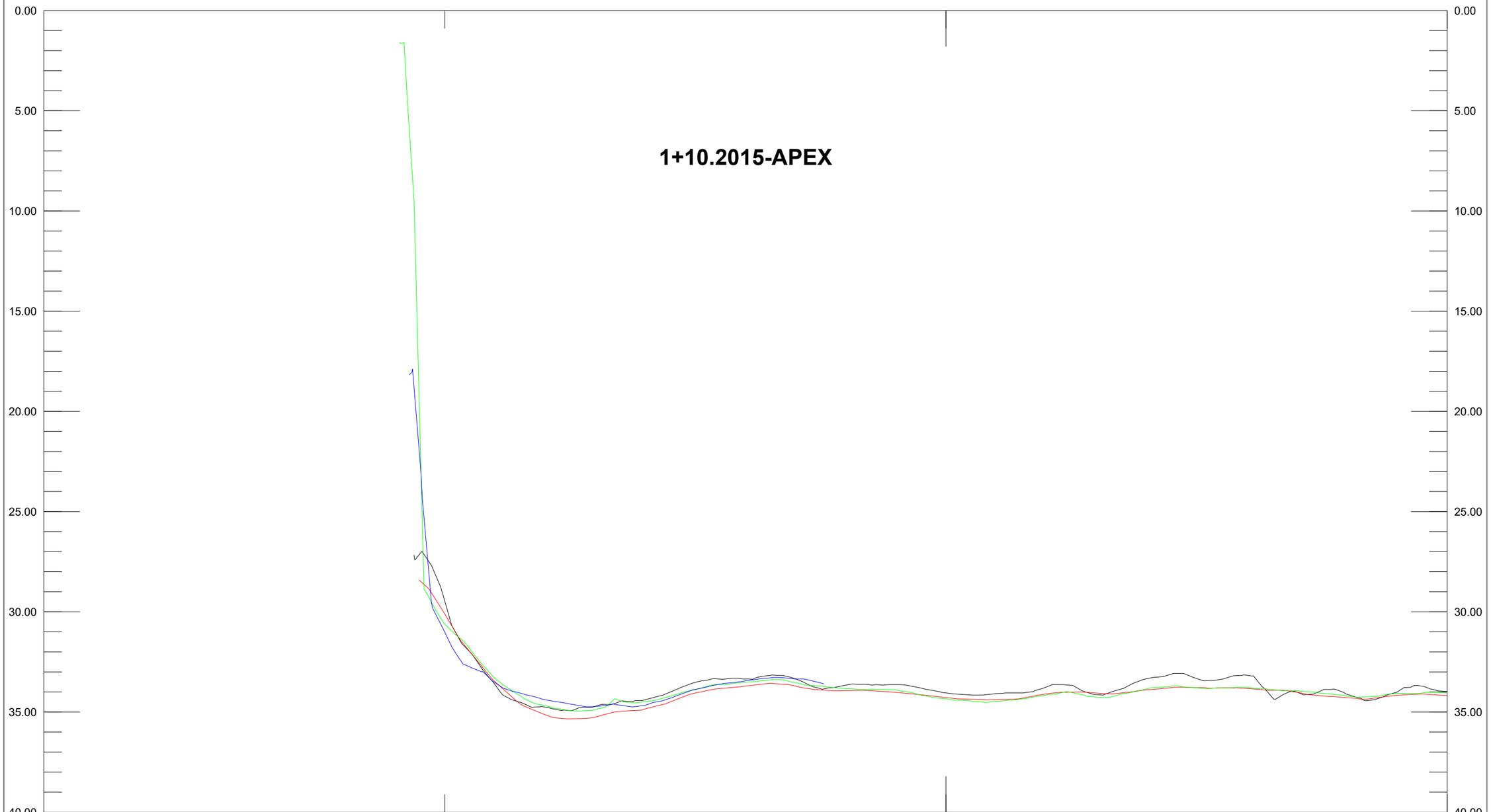
1+10.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816382.28
Y: 2688673.49

100.00




2015 Apex
1+10.2015-APEX

20181201 NB
1+10.20181201_NB

20230124 Shuster
1+10.20230124-Sch

20231219 Shuster
1+10.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816189.84
Y: 2688618.79

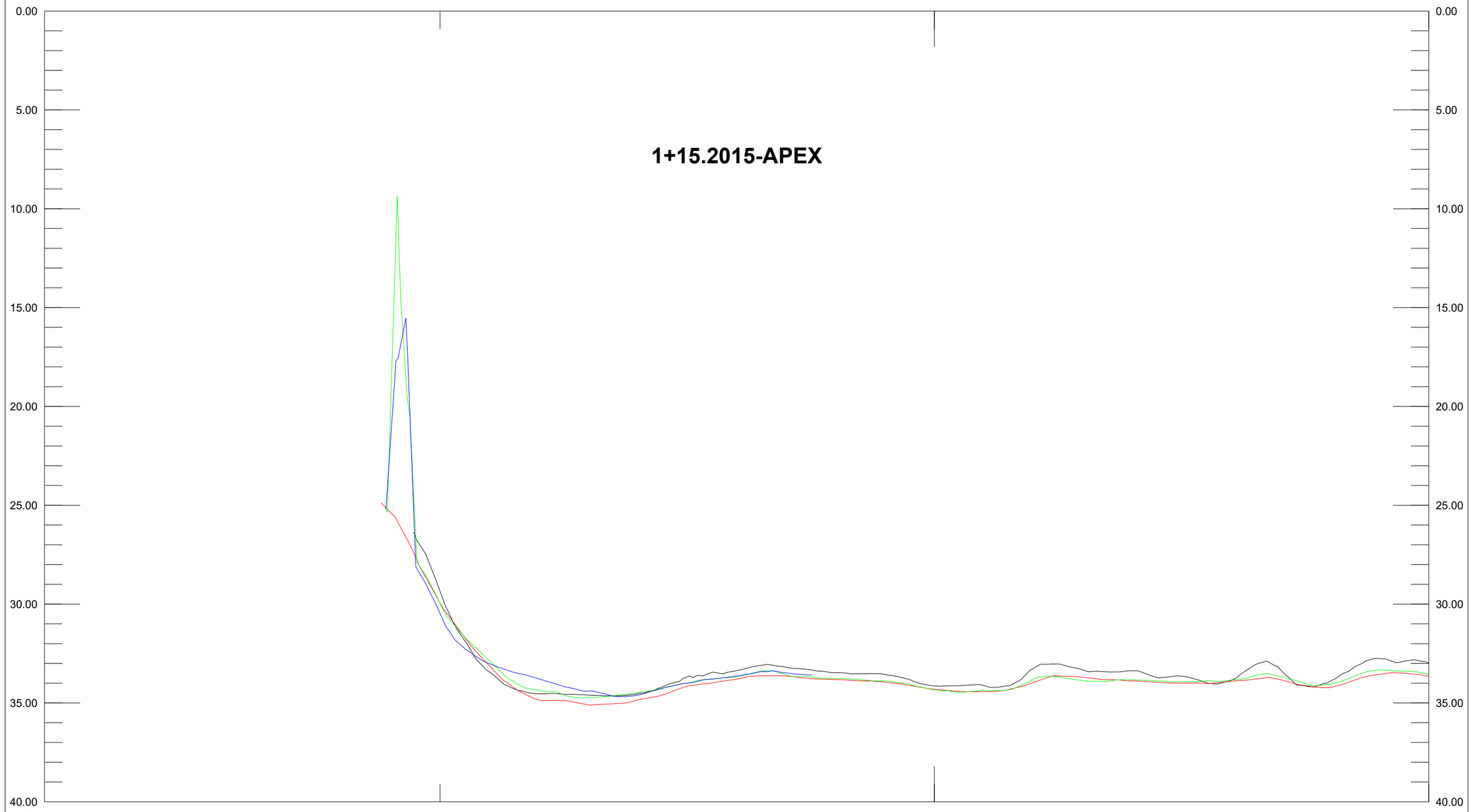
1+15.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816383.52
Y: 2688668.65

100.00




2015 Apex
1+15.2015-APEX

20181201 NB
1+15.20181201_NB

20230124 Shuster
1+15.20230124-Sch

20231219 Shuster
1+15.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816191.09
Y: 2688613.94

1+20.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816384.77
Y: 2688663.80

100.00

# 1+20.2015-APEX

0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00

2015 Apex
1+20.2015-APEX

20181201 NB
1+20.20181201_NB

20230124 Shuster
1+20.20230124-Sch

20231219 Shuster
1+20.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816192.33
Y: 2688609.10

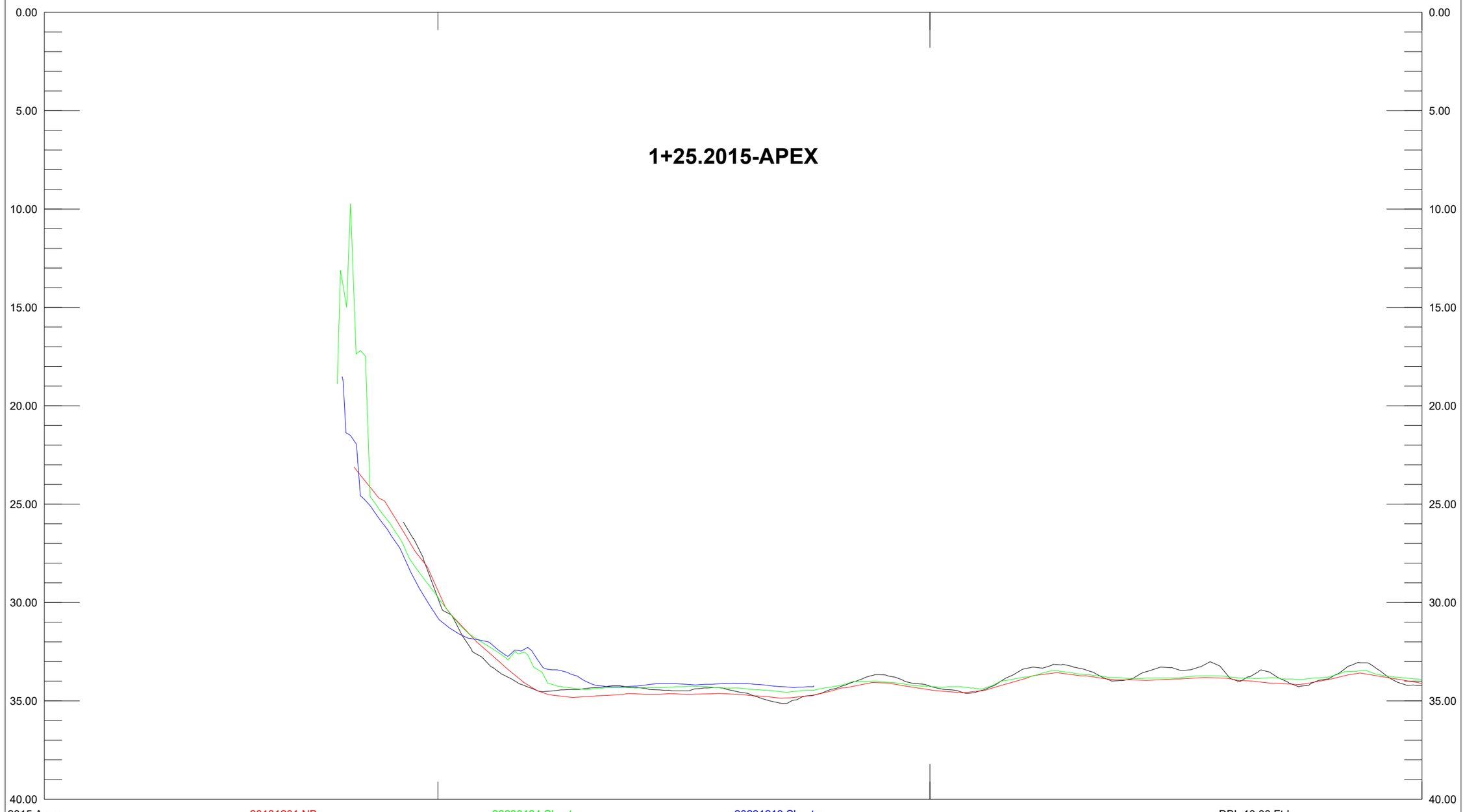
1+25.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816386.02
Y: 2688658.96

100.00




2015 Apex
1+25.2015-APEX

20181201 NB
1+25.20181201_NB

20230124 Shuster
1+25.20230124-Sch

20231219 Shuster
1+25.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816193.58
Y: 2688604.26

1+30.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816387.26
Y: 2688654.12

100.00

# 1+30.2015-APEX

0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00

2015 Apex
1+30.2015-APEX

20181201 NB
1+30.20181201_NB

20230124 Shuster
1+30.20230124-Sch

20231219 Shuster
1+30.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816194.83
Y: 2688599.42

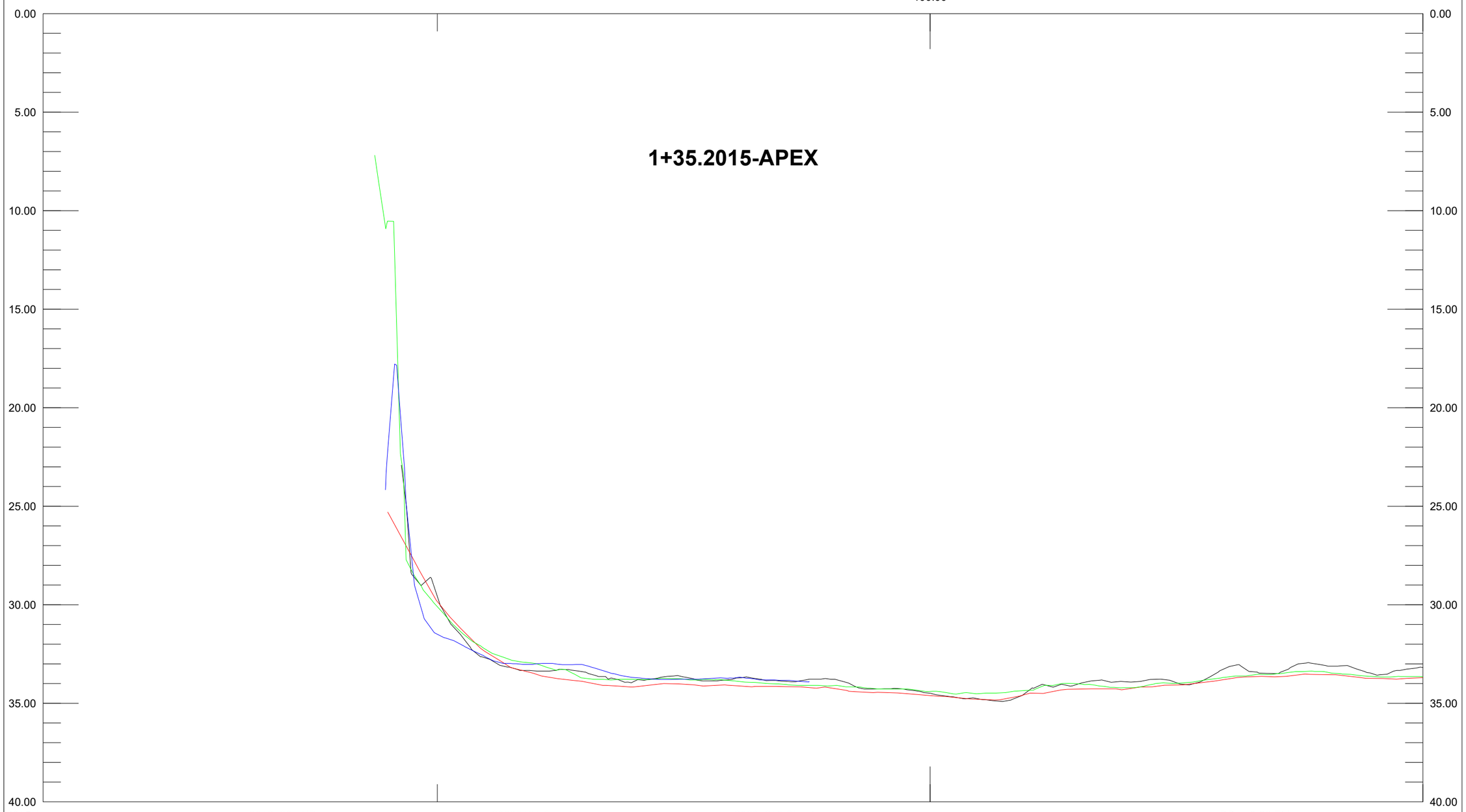
1+35.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816388.51
Y: 2688649.28

100.00




2015 Apex
1+35.2015-APEX

20181201 NB
1+35.20181201_NB

20230124 Shuster
1+35.20230124-Sch

20231219 Shuster
1+35.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816196.07
Y: 2688594.58

1+40.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816389.76
Y: 2688644.44

100.00

# 1+40.2015-APEX

0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00

2015 Apex
1+40.2015-APEX

20181201 NB
1+40.20181201_NB

20230124 Shuster
1+40.20230124-Sch

20231219 Shuster
1+40.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816197.32
Y: 2688589.73

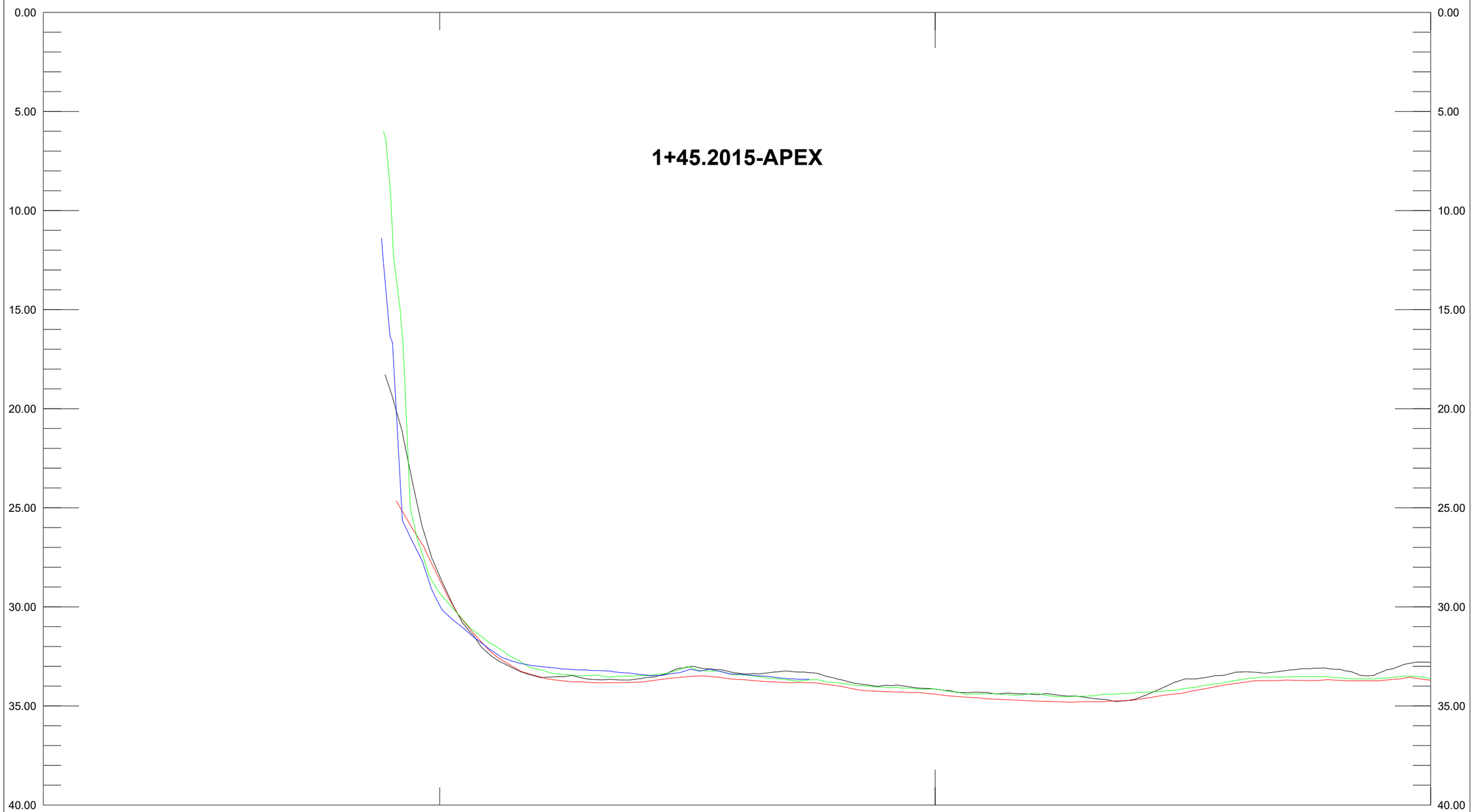
1+45.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816391.00
Y: 2688639.59

100.00




2015 Apex
1+45.2015-APEX

20181201 NB
1+45.20181201_NB

20230124 Shuster
1+45.20230124-Sch

20231219 Shuster
1+45.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816198.56
Y: 2688584.89

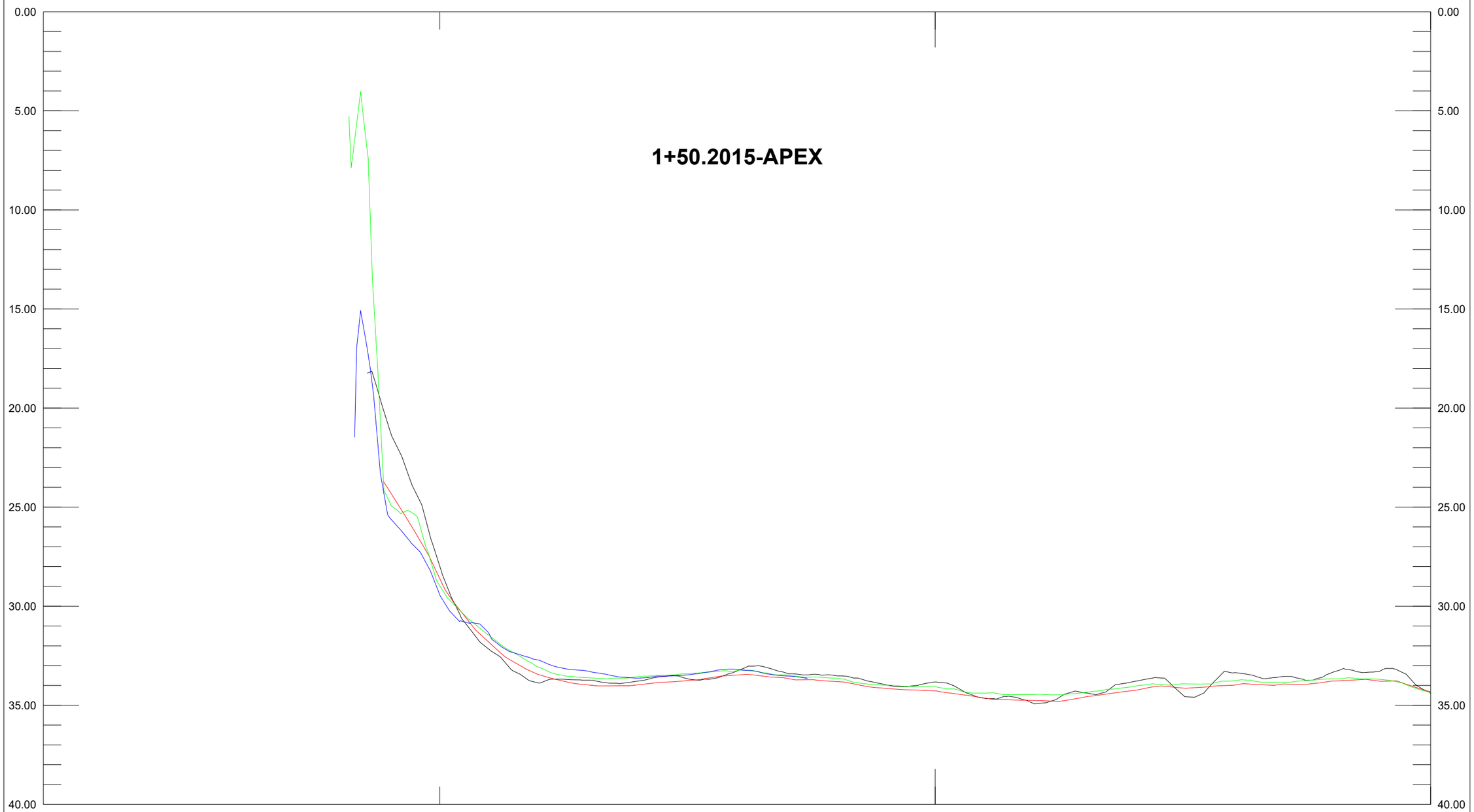
1+50.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816392.25
Y: 2688634.75

100.00




2015 Apex
1+50.2015-APEX

20181201 NB
1+50.20181201_NB

20230124 Shuster
1+50.20230124-Sch

20231219 Shuster
1+50.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816199.81
Y: 2688580.05

1+55.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816393.50
Y: 2688629.91

100.00

# 1+55.2015-APEX

0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00

2015 Apex
1+55.2015-APEX

20181201 NB
1+55.20181201_NB

20230124 Shuster
1+55.20230124-Sch

20231219 Shuster
1+55.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816201.06
Y: 2688575.21

1+60.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816394.74
Y: 2688625.07

100.00

# 1+60.2015-APEX

0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00

2015 Apex
1+60.2015-APEX

20181201 NB
1+60.20181201_NB

20230124 Shuster
1+60.20230124-Sch

20231219 Shuster
1+60.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816202.30
Y: 2688570.36

1+65.2015-APEX

Length: 200.01

Azimuth: 75.56

X: 816395.99
Y: 2688620.23

100.00

# 1+65.2015-APEX

0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00

2015 Apex
1+65.2015-APEX

20181201 NB
1+65.20181201_NB

20230124 Shuster
1+65.20230124-Sch

20231219 Shuster
1+65.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816203.55
Y: 2688565.52

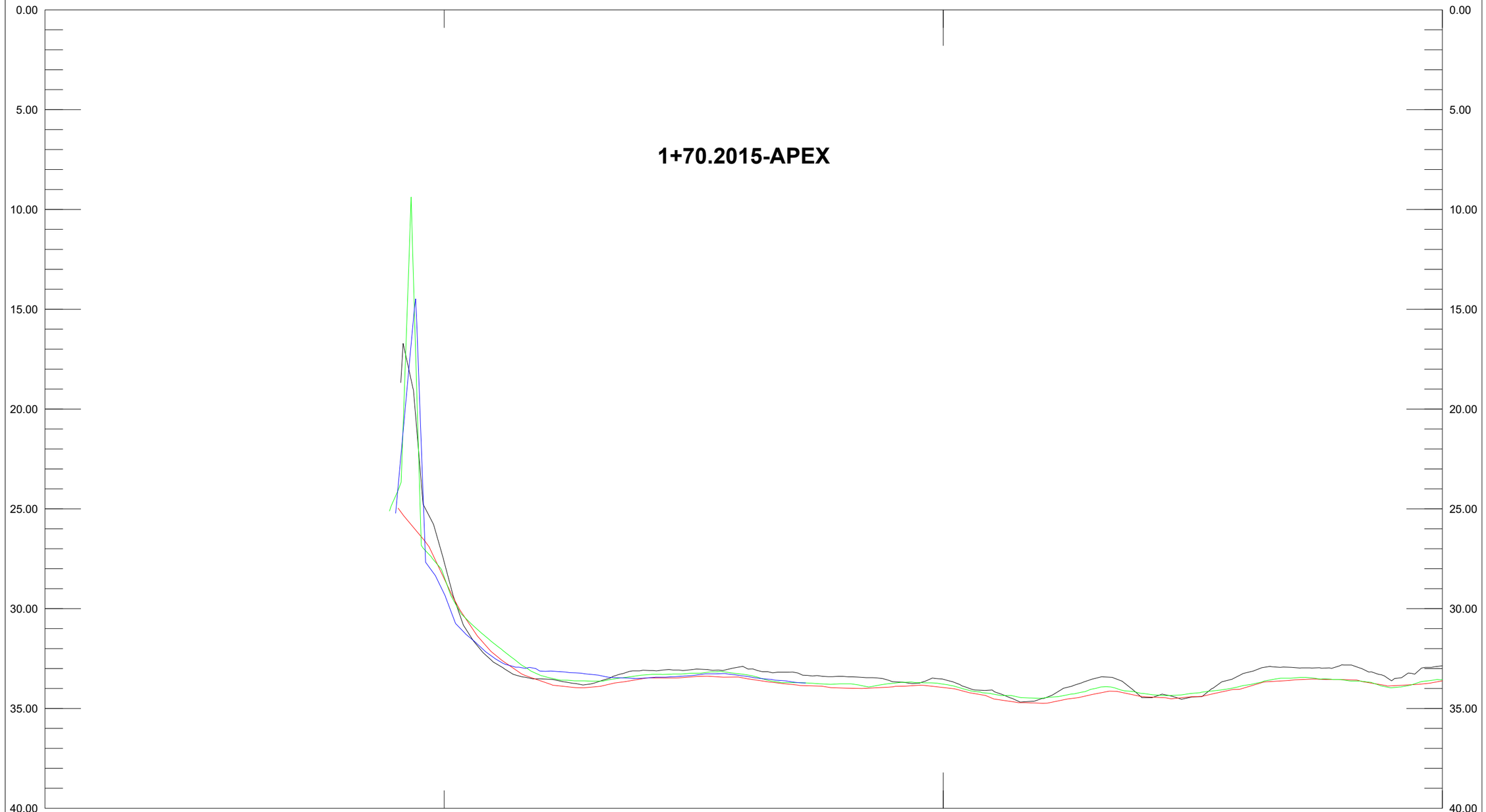
1+70.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816397.24
Y: 2688615.38

100.00




2015 Apex
1+70.2015-APEX

20181201 NB
1+70.20181201_NB

20230124 Shuster
1+70.20230124-Sch

20231219 Shuster
1+70.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

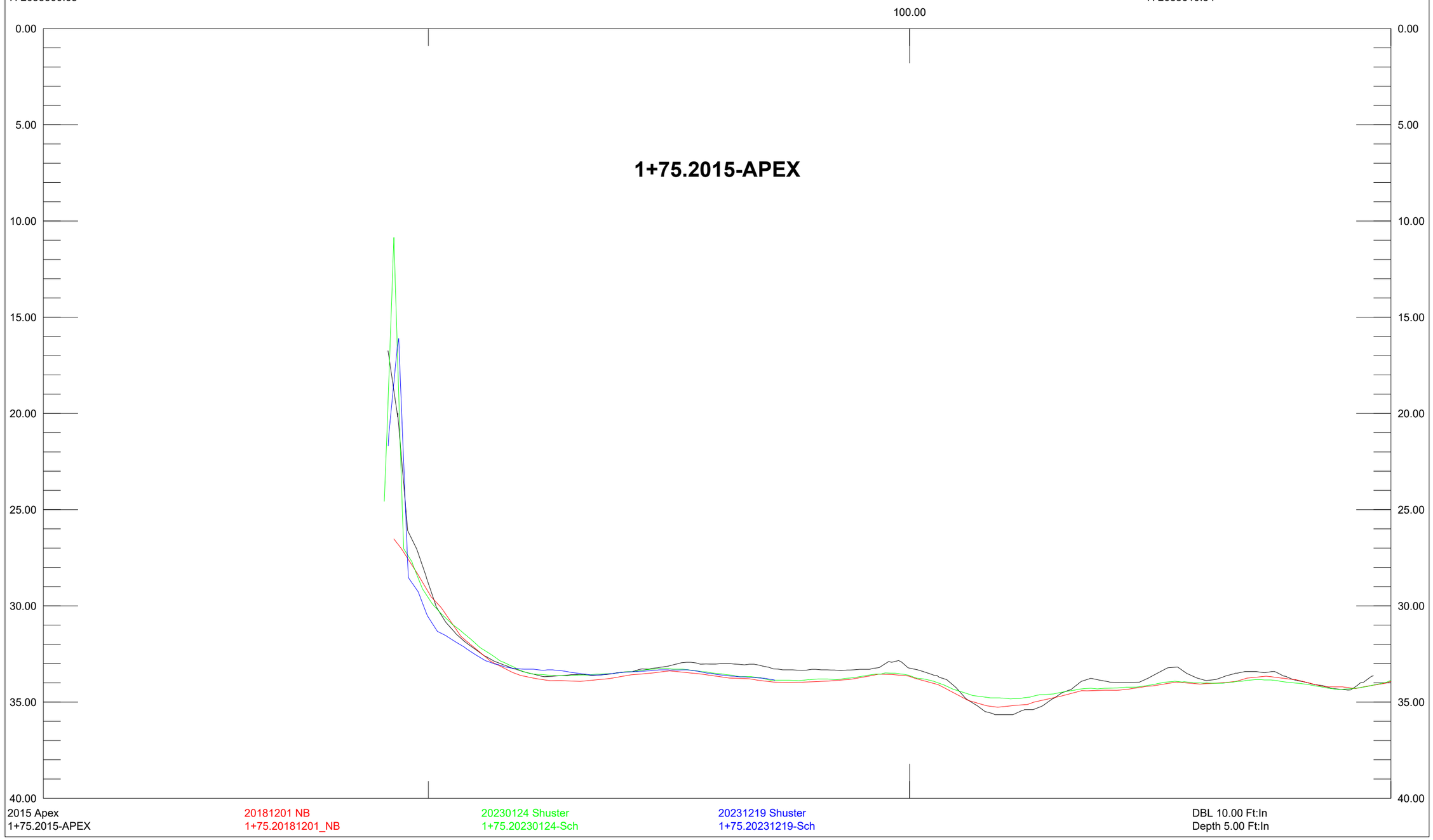
X: 816204.80
Y: 2688560.68

1+75.2015-APEX

Length: 199.99

Azimuth: 75.56

X: 816398.48
Y: 2688610.54




2015 Apex
1+75.2015-APEX

20181201 NB
1+75.20181201_NB

20230124 Shuster
1+75.20230124-Sch

20231219 Shuster
1+75.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816206.04
Y: 2688555.84

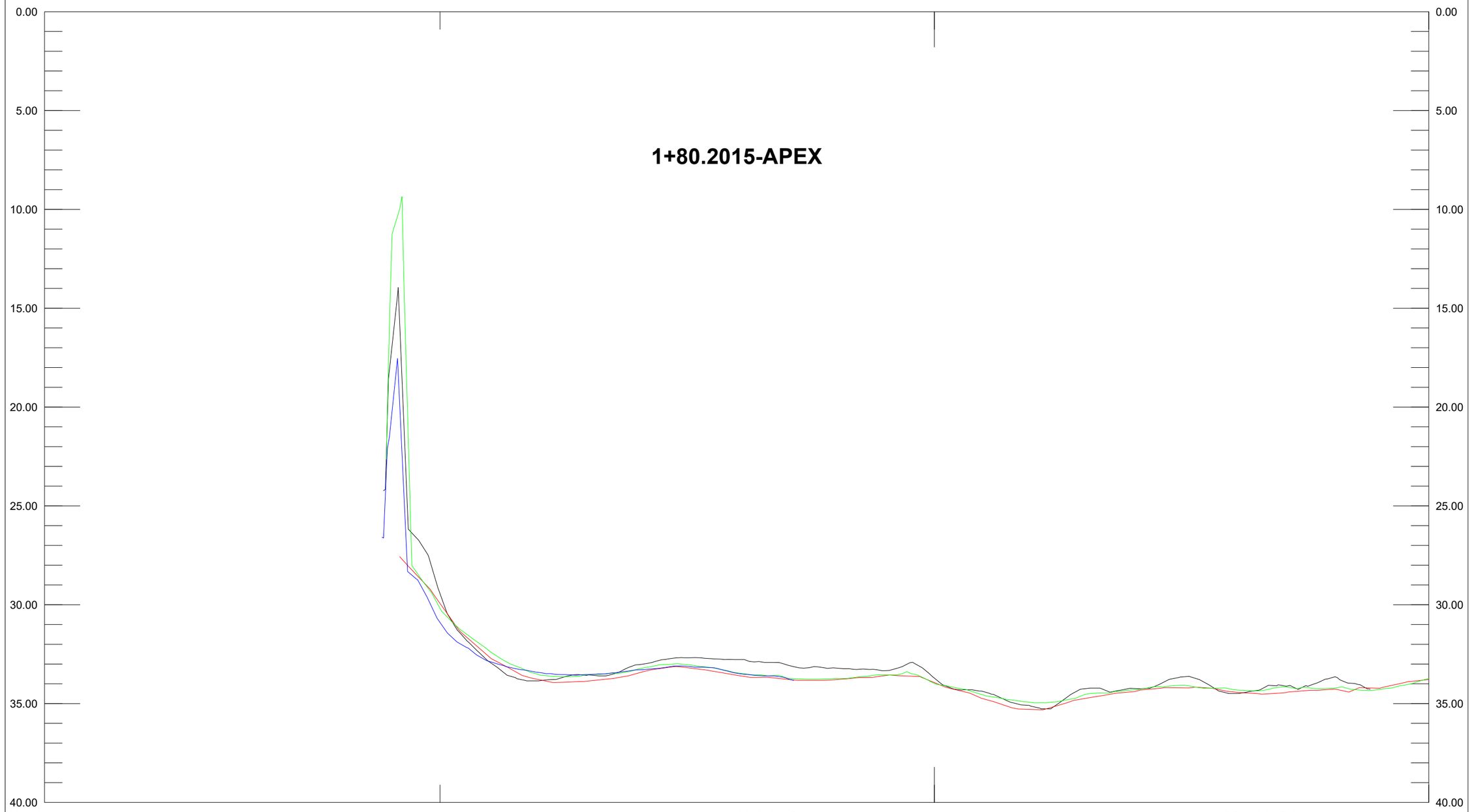
1+80.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816399.73
Y: 2688605.70

100.00




2015 Apex
1+80.2015-APEX

20181201 NB
1+80.20181201_NB

20230124 Shuster
1+80.20230124-Sch

20231219 Shuster
1+80.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816207.29
Y: 2688551.00

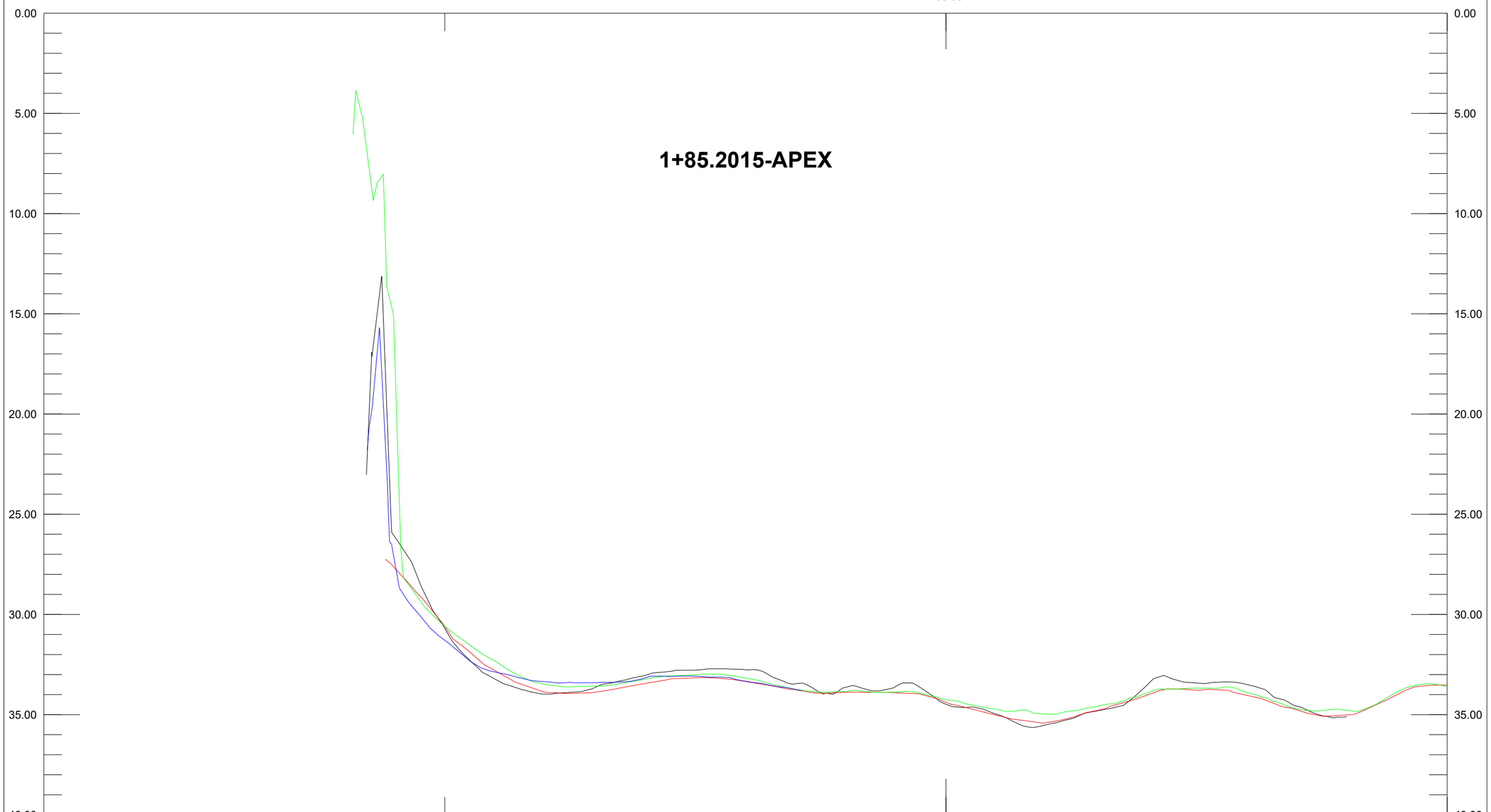
1+85.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816400.98
Y: 2688600.86

100.00




2015 Apex
1+85.2015-APEX

20181201 NB
1+85.20181201_NB

20230124 Shuster
1+85.20230124-Sch

20231219 Shuster
1+85.20231219-Sch

DBL 10.00 Ft:In
Depth 5.00 Ft:In

X: 816208.54
Y: 2688546.15

1+90.2015-APEX

Length: 200.00

Azimuth: 75.56

X: 816402.22
Y: 2688596.02

100.00

# 1+90.2015-APEX

0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00

2015 Apex
1+90.2015-APEX

20181201 NB
1+90.20181201_NB

20230124 Shuster
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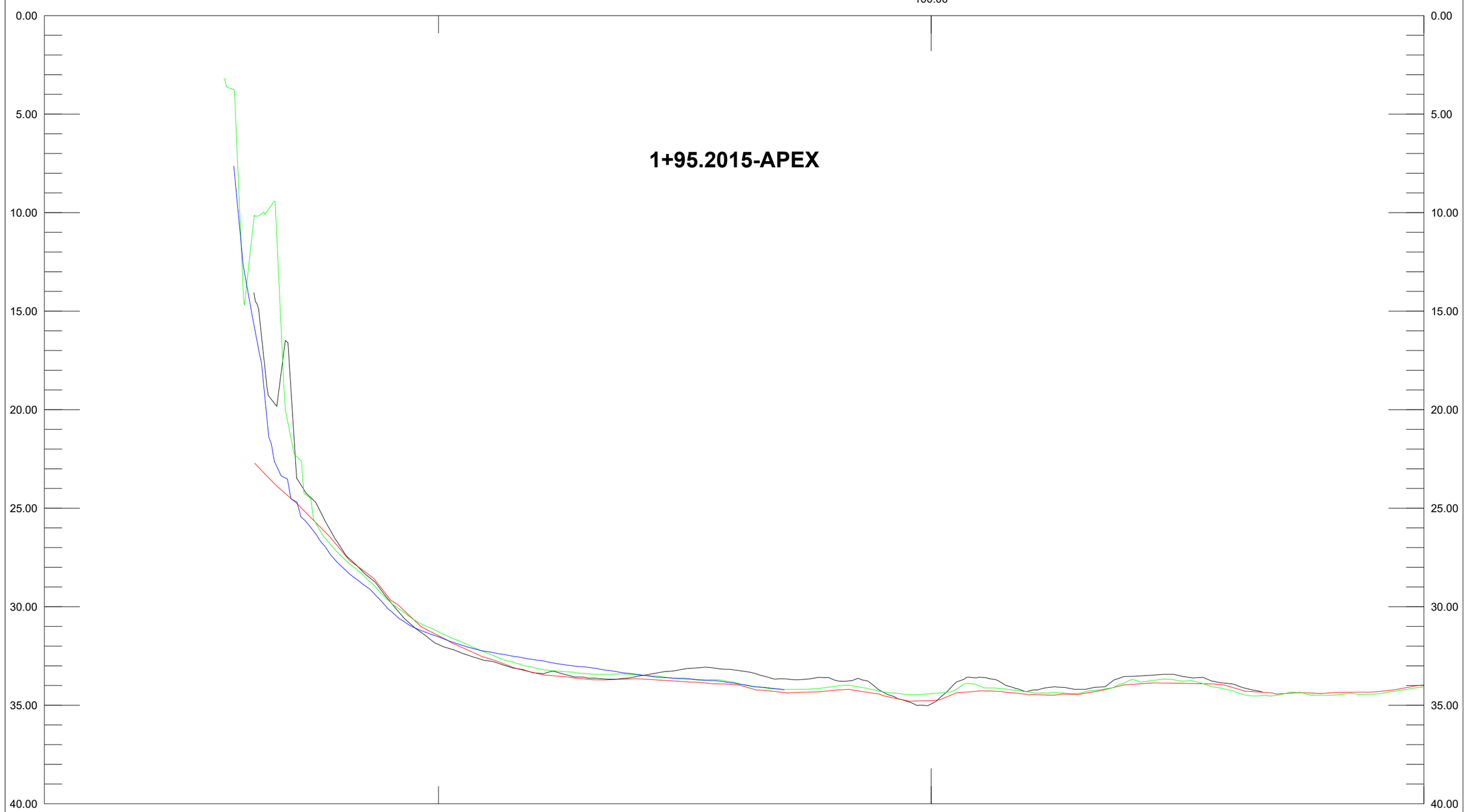
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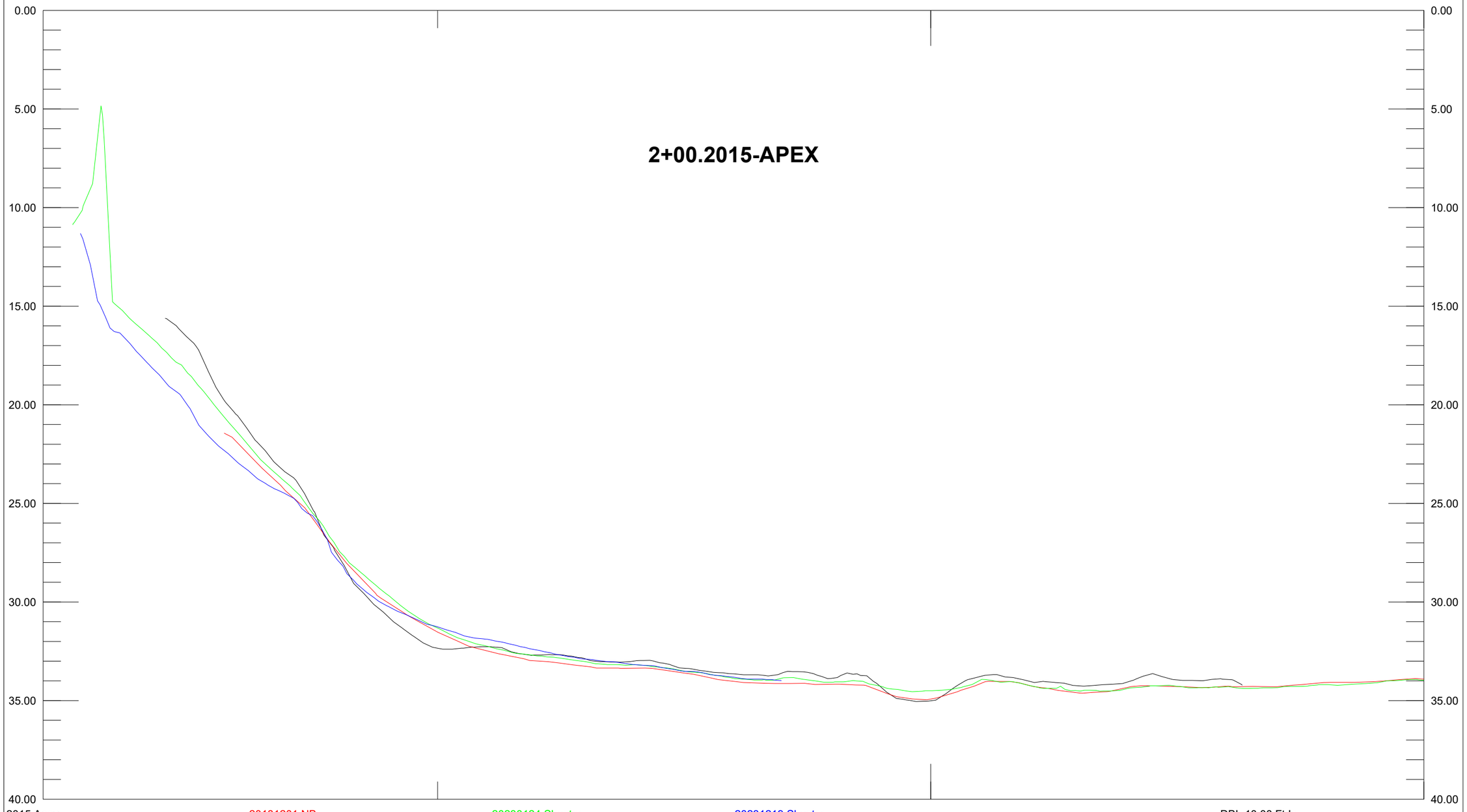
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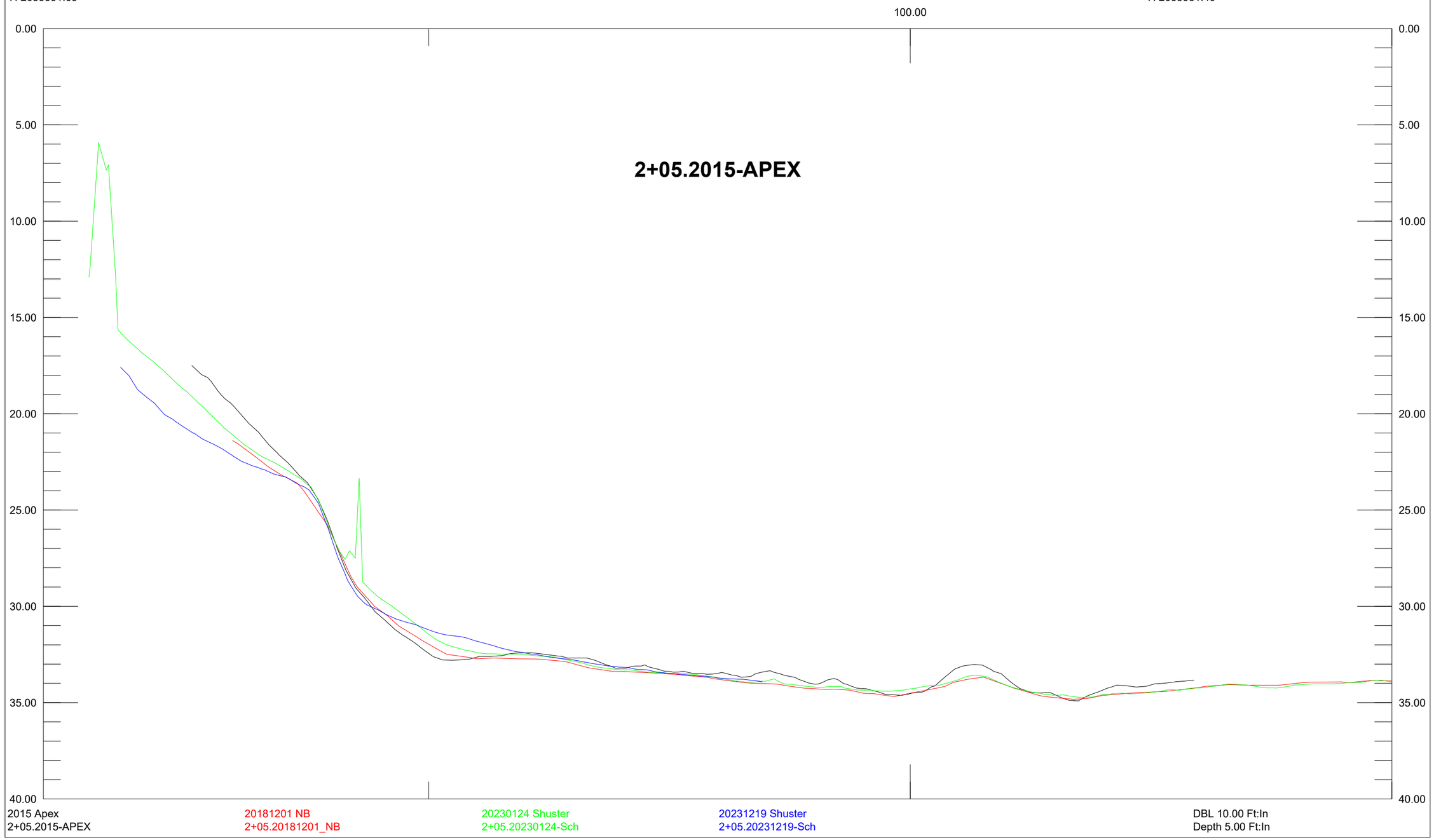
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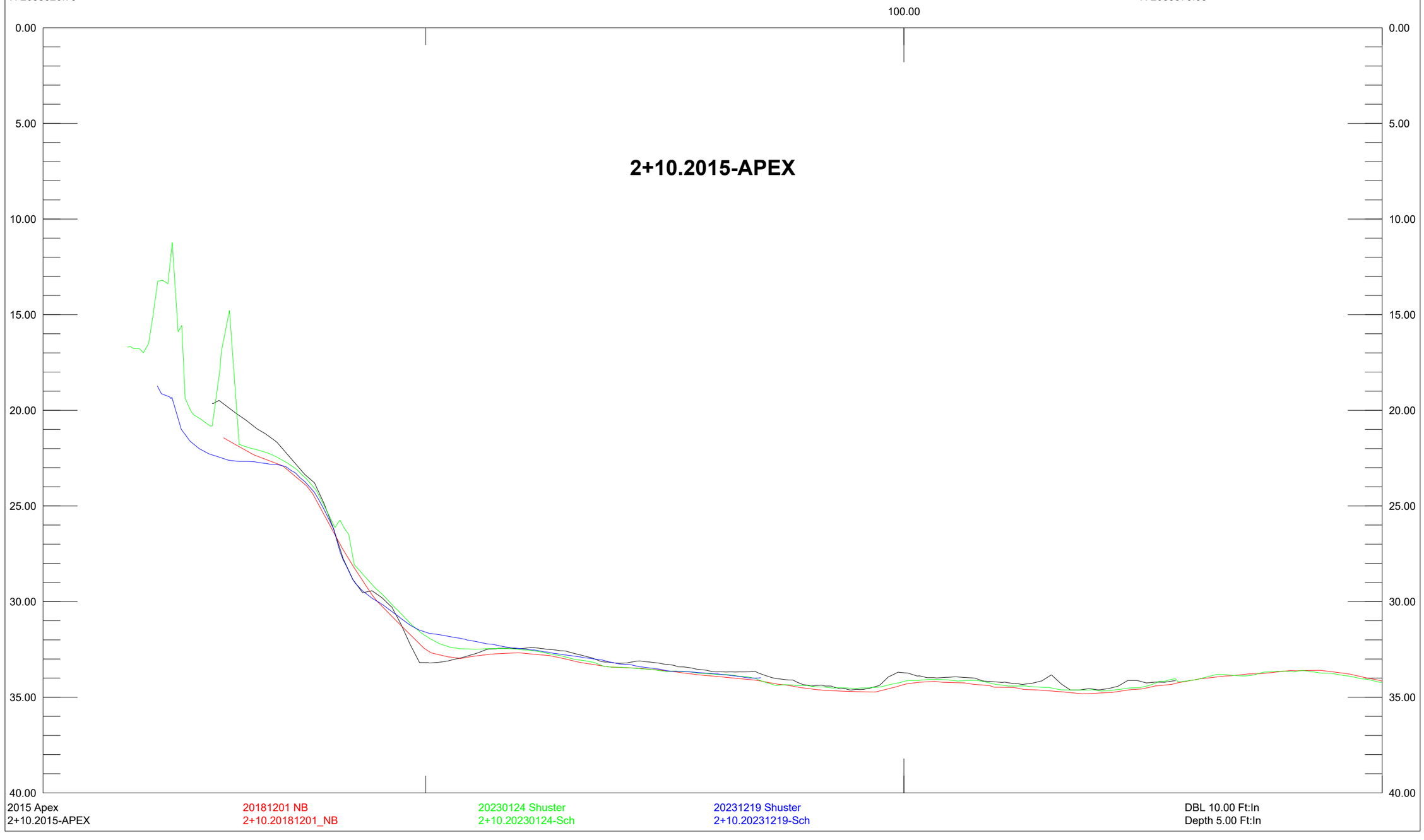
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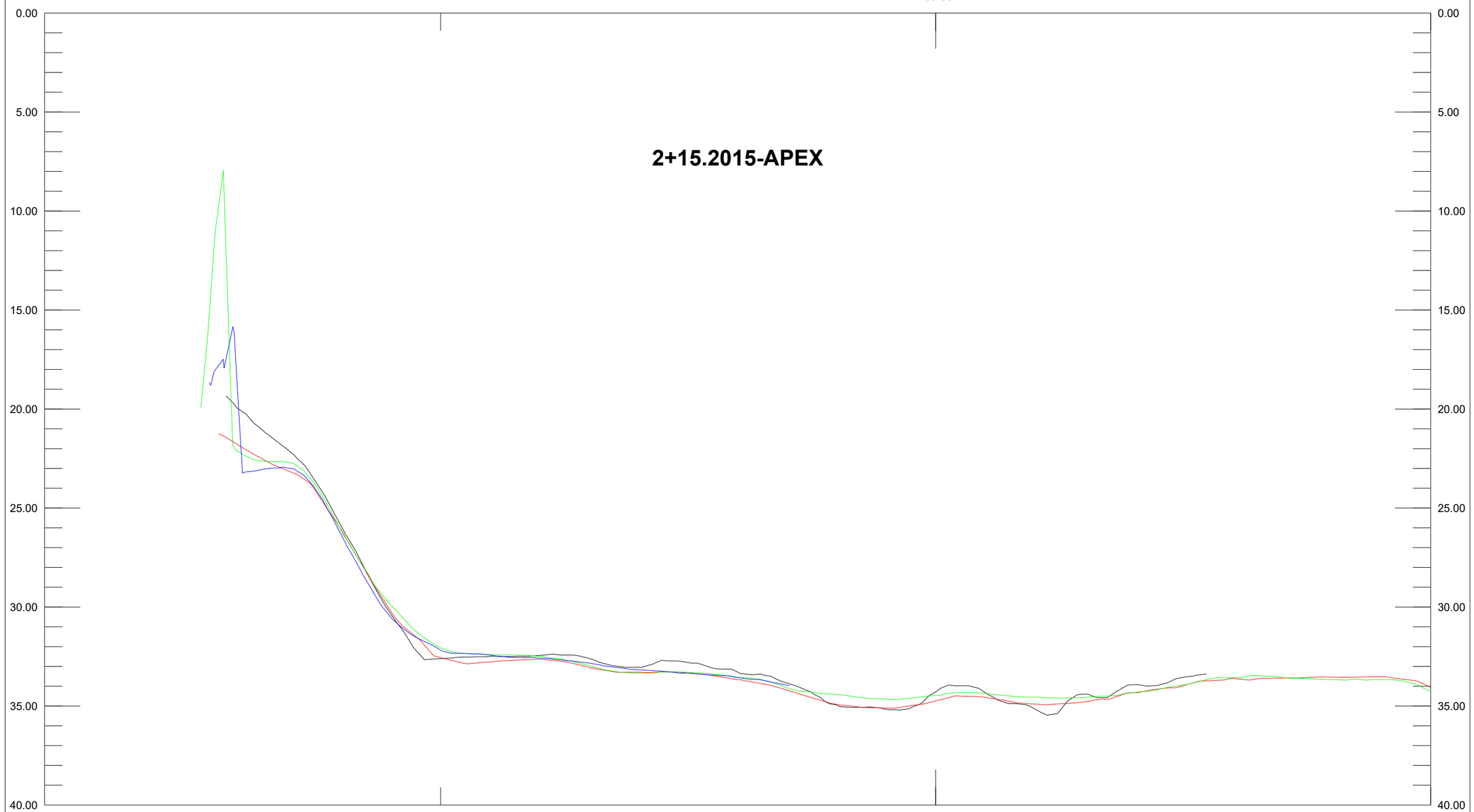
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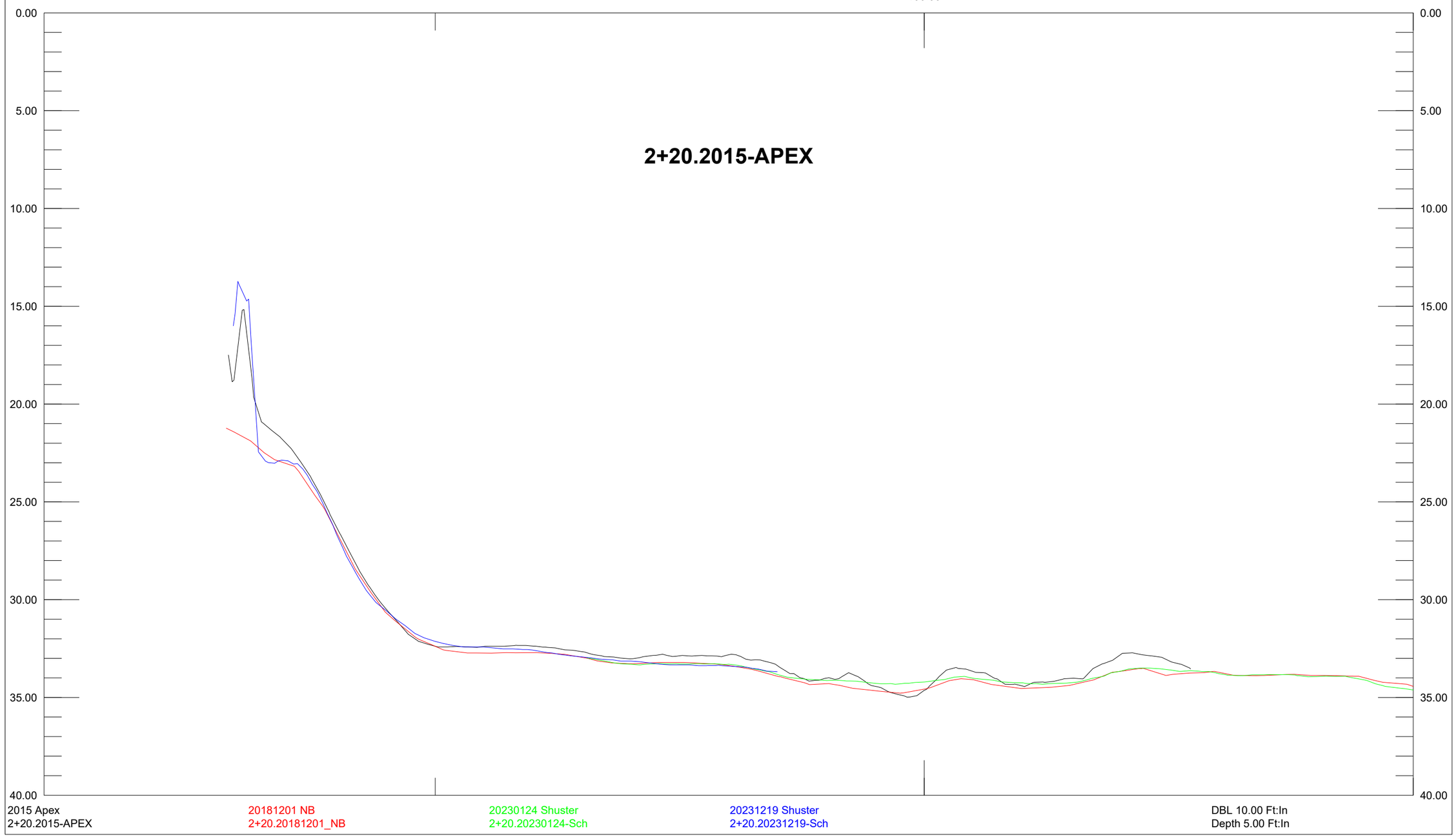
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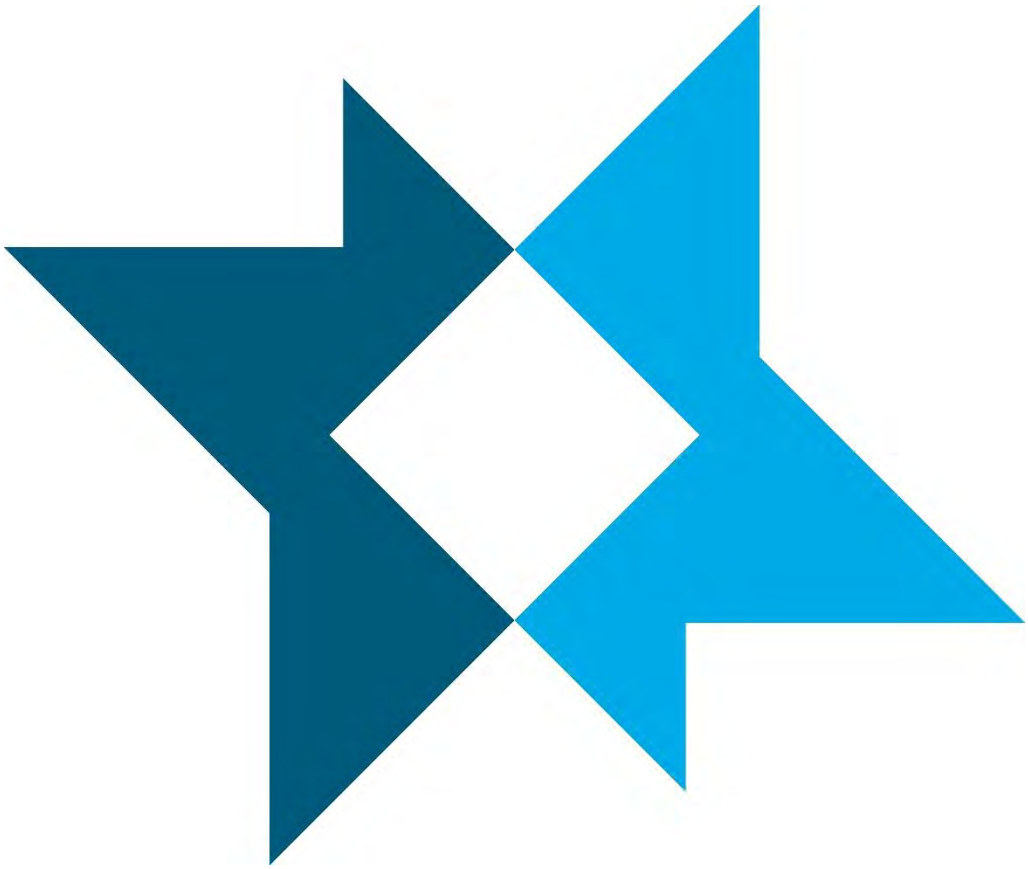
**ATTACHMENT 17: WATERFRONT FACILITIES INSPECTION AND ASSESSMENT REPAIR OR UPGRADE DESIGN – 6 HASSEY STREET (FOTH INFRASTRUCTURE & ENVIRONMENT, LLC, NOVEMBER 4, 2025)**

Report

# Waterfront Facilities Inspection and Assessment

## *Repair or Upgrade Design*

## 6 Hassey Street



**Massachusetts Clean Energy Center**
New Bedford, MA

November 2025

Project ID: 24M070.04

**Solving our clients' toughest science and engineering challenges.**

15 Creek Road
Marion, MA 02738
(508) 748-0937
foth.com

November 4, 2025

Tim Griffin
Terminal Director
Massachusetts Clean Energy Center
New Bedford Marine Commerce Terminal
4 Wright Street
New Bedford, MA 02740

Re: Waterfront Facilities Inspection and Assessment Report
Repair or Upgrade Design
6 Hassey Street, New Bedford, MA

Dear Mr. Griffin:

Foth Infrastructure & Environment, LLC (Foth) is pleased to provide the attached Waterfront Facilities Inspection and Assessment (WFIA) Report for Massachusetts Clean Energy Center (MassCEC) for the adjacent property located at 6 Hassey Street, New Bedford, MA. The purpose of the Repair or Upgrade Design level inspection is to report on the existing condition of the cellular cofferdam bulkhead. This report provides the results of the observed conditions for recording purposes only.

At Foth, we believe in doing quality work and creating strong relationships. We look forward to the opportunity to work with you on this project. Please contact Scott Skuncik at (401) 206-2422 or Scott.Skuncik@foth.com if you have questions or to discuss our proposal.

Sincerely,

Foth Infrastructure & Environment, LLC

Scott Skuncik, P.E.
Ports and Harbors Market Leader
Licensed in CT, FL, KY, ME, MD, MA, MI, NY, RI, TN

Timothy Magalhaes, E.I.T.
Project Manager

cc: Doug Ernst, P.E. (Foth)
Mike Campagnone, P.E. (Foth)
Cody Flynn, P.E. (Foth)
Jeannie Houde (MassCEC)

# Waterfront Facilities Inspection and Assessment
# Repair or Upgrade Design
# 6 Hassey Street

Project ID: 0024M070.04

Prepared for
**Massachusetts Clean Energy Center**
4 Wright Street
New Bedford, MA

Prepared by
**Foth Infrastructure & Environment, LLC**

November 2025

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# Waterfront Facilities Inspection and Assessment
# Repair or Upgrade Design
# 6 Hassey Street

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# Waterfront Facilities Inspection and Assessment
# Repair or Upgrade Design
# 6 Hassey Street

## Executive Summary

Foth Infrastructure & Environment, LLC (Foth), in partnership with J.F. Brennan Company (Brennan), conducted a comprehensive inspection and assessment of the waterfront structures of 6 Hassey Street Facility in New Bedford, Massachusetts. This effort was performed in accordance with ASCE Manual of Practice No. 130, Second Edition, as part of a Repair or Upgrade Design-level evaluation supporting the planned redevelopment of the adjacent Shuster Facility.

The inspection focused on the existing cellular cofferdam bulkhead system within the facility limits. The bulkhead is partially owned and maintained by the New Bedford Port Authority (NBPA). The cofferdam system, comprising three major cells (Cells #4, 5, and 6) and two minor cells (Cells #4A and 5A), forms a critical segment of the shoreline infrastructure and is scheduled to remain in place during adjacent redevelopment to maintain shoreline continuity.

To establish a baseline condition record and support future planning, Foth performed visual topside and underwater inspections, supplemented by additional surveying. This included a bathymetric survey, sector scan imaging, and aerial drone survey. The upland building is not included in this report.

The inspection documented observable and repeatable conditions across key structural elements. Notable findings include:

- A significant defect at Cell #4A, where a 16-inch by 5-inch hole and extended cracking were observed, with a void depth exceeding 4 feet.
- General scour along the cofferdam cells, with bathymetric comparisons indicating up to 4 feet 2 inches of material loss in some areas.
- Localized spalling and cracking on the reinforced concrete wall and platform, particularly near mooring hardware.

Based on these observations, Foth evaluated and assessed the condition of each component. The Cellular Cofferdam Bulkhead is generally in **Poor** condition, primarily due to continued scouring and a severe hole in the sheet pile.

# List of Abbreviations, Acronyms, and Symbols

| | |
|---|---|
| ASCE | American Society of Civil Engineers |
| Brennan | J.F. Brennan Company |
| E.I.T. | Engineer in Training |
| Foth | Foth Infrastructure & Environment, LLC |
| MassCEC | Massachusetts Clean Energy Center |
| MOP | Manual of Practice |
| NBMCT | New Bedford Marine Commerce Terminal |
| NBPA | New Bedford Port Authority |
| P.E. | Professional Engineer |
| UT | Ultrasonic Thickness |
| WFIA | Waterfront Facilities Inspection and Assessment |

# 1. Introduction

Foth Infrastructure & Environment, LLC (Foth) performed a comprehensive waterfront facilities inspection and assessment in accordance with ASCE Manual of Practice (MOP) No. 130, Second Edition of the 6 Hassey Street Facility located in New Bedford, MA. A portion of the Facility, specifically the bulkhead structure, is owned and maintained by the New Bedford Port Authority (NBPA).

This inspection was conducted as part of a Repair or Upgrade Design level effort per ASCE MOP 130 that is associated with the planned redevelopment of the existing bulkhead structures at the abutting 4 Wright Street Facility.

Because the existing bulkhead structure extends beyond the property limits and into adjacent parcels, a portion of the structure will remain in place to maintain shoreline continuity. To support project planning and provide a clear record of existing conditions, Foth performed a detailed inspection of the structures within the Facilities' limits. The inspection included documentation of observed deficiencies and structural anomalies for informational purposes and to establish a baseline condition record for both the facility owner and neighboring stakeholders.

Foth partnered with J.F. Brennan (Brennan) to perform the underwater inspection, including all dive operations and diver support. In addition to the above, Foth conducted a bathymetric survey and drone survey of the facility to supplement the inspection and provide additional records of existing conditions. Brennan also performed a sector scan of the cofferdam cells for further documentation. These supplemental efforts are included as appendices to this report.

| | |
|---|---|
| Underwater (Dive) Inspection: | September 25, 2025 |
| Field Team: | Timothy Magalhaes, E.I.T. (Foth), 3 Divers (Brennan) |
| Topside Inspection: | October 15, 2025 |
| Field Team: | Cody Flynn, P.E. (Foth), |
| Sector Scanning: | October 3, 2025 |
| Field Team: | 2 Crew Members (Brennan) |
| Drone Survey: | October 17, 2025 |
| Field Team: | Mike Campagnone, P.E. (Foth), |
| | Chase Rynkowski, E.I.T. (Foth) |

## 1.1 Purpose and Scope of Work

The purpose of this inspection and assessment is to document the existing conditions of the cellular cofferdam bulkhead located along the 6 Hassey Street Facility. These structures are scheduled to remain during and post the 4 Wright Street upgrades that include demolition and replacement of the Cellular Cofferdam Bulkhead with a new pile supported loading and offloading platform. To ensure transparency and provide a record for the Facilities property owners, Foth performed a Repair or Upgrade Design level inspection in accordance with ASCE MOP No. 130, Second Edition.

This report specifically addresses the 6 Hassey Street Facility limits, which include:

- Major Cells: Cells #4, #5, and #6
- Minor Cells: Cells #4A and #5A

The inspection focused on identifying and recording any visible deficiencies, structural anomalies, or deterioration within these cells. Findings are intended for informational purposes only and will serve as a baseline record for the facility owner and neighboring property stakeholders. A separate report will be prepared for the adjacent facility, which encompasses the remaining section of the Cellular Cofferdam Bulkhead.

## 1.2 Description of Structures

6 Hassey Street is an industrial waterfront property located within the New Bedford Harbor commercial fishing district, approximately one mile inside the hurricane barrier. The site consists of a 14,580-square-foot building on a 1.12-acre parcel, historically used for seafood processing and distribution. It is adjacent to other marine-related facilities and offers direct access to port infrastructure supporting New Bedford's role as the largest commercial fishing port on the East Coast.

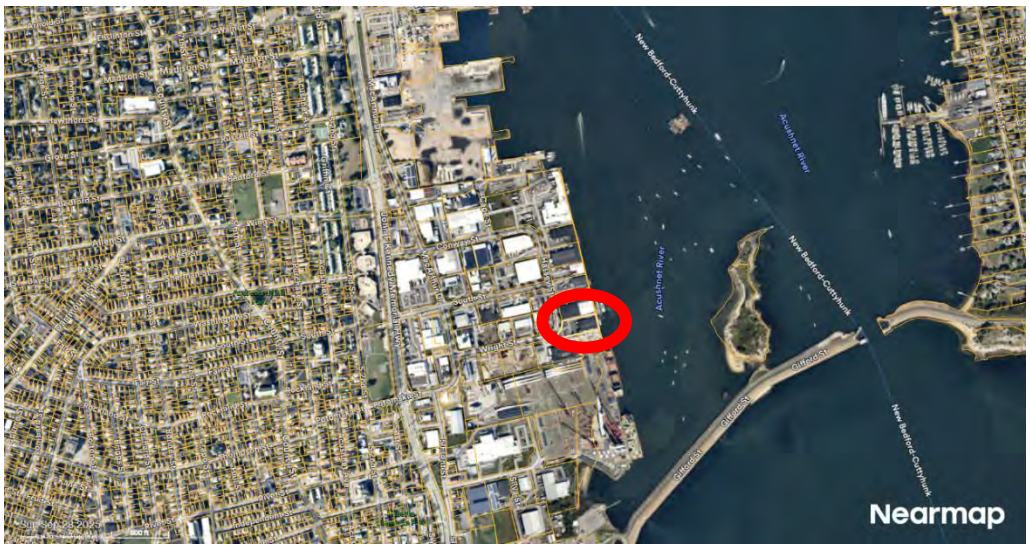



**Figure 1: Site Location Map**

### 1.2.1 Cellular Cofferdam Bulkhead

The Facility is constructed of a Cellular Cofferdam Bulkhead system that consists of the following elements: steel sheet piles, reinforced concrete wall and platform, timber curb, cast steel single bit bollards, steel mooring cleats, rubber fenders, and asphalt pavement upland surface.

There is a total of three (3) major Cells #4, #5, and #6 in addition to two (2) minor Cells #4A and #5A. Note that the Cells were labeled differently in previous inspection and repair drawings and were numbered continuously in lieu of minor Cells labeled as "A". Therefore Cell #1A would be Cell #2 and so forth. This report uses the labeling as shown on the original design drawings.

These Cells extend approximately 140-linear feet along the existing bulkhead line. Each Cell is 54.11 feet in diameter with approximately 136 piles. The center to center of the Cells are approximately 62.92 feet. The center to center of the major Cells to the minor Cells is half, 31.46 feet. The steel sheet piles are MP101, similar to PS27.5 flat sheet piles, driven to bedrock with an approximate top of sheet pile elevation of +1.5 feet Mean Lower Low Water (MLLW). The weathered bedrock elevation varies and is estimated at approximately -32 feet MLLW.

Along the upland face of the Cells, approximately 10 feet from the interior face of the sheet piles lies a row of HP14x73 steel piles driven to bedrock. This element is fully buried. Atop of the HP and MP piles is a continuous reinforced concrete wall and platform that spans the full length of the bulkhead line. Per the original design drawings, the "L" shaped Wall and Platform is in total 12 feet wide by 8 feet high with gravel fill. The wall portion is 2 feet wide at the top down to 3 feet wide at the bottom with various sizes of reinforcement. The platform section is 12 feet wide by 3 feet deep with various sizes of reinforcement. Reference Appendix F for additional details on the reinforced concrete wall and platform.

Along the perimeter of the reinforced concrete wall and platform is a 12-inch by 10-inch log curb. There is also one (1) 35-ton single bitt cast steel bollard, and four (4) cast steel cleats. The 35-ton bollard is 2 feet in diameter and approximately 3 feet 8.5 inches tall with four foundation bolts. The cleats are approximately 43 inches long by up to 4 inch wide with a 31 inch long by 9-inch-wide base plate anchored with two bolts.

The fender system was recently upgraded in 2022 to new rubber fenders. The rubber fenders are D-fenders that measure 6.5 feet long by 24 inches wide and up to 12 inches deep connected with six (6) 0.5-inch diameter bolts to the concrete wall and platform. The upland surface of the facility is constructed of asphalt pavement.

## 1.3 Inspection and Repair History

There is a long history of inspections and repairs at this facility. Here is a timeline of the inspection and repairs:

**June 2021:** **Structural Inspection: Commercial Fishing Piers**

This report documents the inspection and assessment of marine infrastructure at municipally-owned piers in New Bedford and Fairhaven, as well as New Bedford's South Terminal. The purpose was to evaluate

structural conditions in relation to projected sea level rise and flooding events.

The scope included Level 1–3 inspections of waterfront structures such as steel sheet pile bulkheads, cellular sheet pile cells, steel and timber piles, concrete piles, and timber fender systems. Underwater inspections were completed by Fathom Resources, LLC during December 2020 through February 2021, with topside inspections conducted in the same period. The report reflects observed conditions at the time of inspection and does not include repair recommendations.

More specifically Section 7. South Terminal Fish Houses was rated as Fair condition. The South Terminal bulkhead was found to have 73 through-holes in the steel sheet piling. The structure exhibited localized advanced deterioration but no immediate safety concerns. Sinkholes were observed behind the bulkhead, and areas adjacent to buildings were recommended to be investigated for potential subsurface voids that could affect structural integrity. Two specific areas required monitoring: Cell 44 (sheet separation at mudline) and Cells 5 through 7 (exposed sheet toes). Note these cells are labeled continuously and do not follow the major to minor cell labeling.

**September 2022:** **New Bedford Municipal Piers Fendering and Repairs**

The Cellular Cofferdams were repaired; specifically new rubber fenders were installed in addition to plate repairs to the steel sheet piles. See Appendix F for further information.

**Ongoing - Routine:** **Bathymetric Surveys**

Foth has performed routine bathymetric surveys at the facility. The surveys indicate prop wash and loss of material along the toe of the Cells due to the tugboats berthing along the face of the bulkhead.

## 1.4 Methodology

The above and underwater inspection and assessment was performed in accordance with the scope of work and MOP 130, for a Repair or Upgrade Design Inspection. All commercial diving was conducted by a three-person dive team consisting of a dive supervisor, diver, and tender/backup diver in accordance with applicable Occupational Safety and Health Administration (OSHA), United States Coast Guard (USCG) regulations (29 CFR 1910 Subpart T and 46CFR197 Subpart B), and Association of Diving Contractors International (ADCI). In general, the dive inspection consisted of an in-water diver communicating to the Foth Engineer who was stationed topside via two-way radio. The Foth Engineer was able to view the underwater portion of the structure in real-time via closed-circuit video and direct the in-water diver during the investigations.

### 1.4.1 Levels of Inspection

According to MOP 130, there are three levels of inspection. Specifically for this routine inspection, Level I and Level II inspections were performed. Levels of inspection are outlined below.

- Level I Effort: Includes a close visual examination above and underwater or a tactile examination using large sweeping motions of the hands where visibility is limited underwater. Although the Level I effort is often referred to as a swim by inspection, it must be detailed enough to detect obvious major damage or deterioration due to overstress or other severe deterioration. It should confirm the continuity of the full length of all members and system components and detect undermining or exposure of normally buried elements. A Level I effort may also include limited probing of the substructure and sounding of the adjacent mudline.

- Level II Effort: A detailed inspection above and underwater may require the removal of corrosion and/or marine growth from portions of the structure. Underwater marine growth removal is costly; hence, the inspection must be based on a representative sample of components. For piles, a 12-inch-high band should be cleaned at designated locations, generally near the low waterline, at the mudline, and midway between the low waterline and the mudline. On a rectangular pile, the marine growth removal should include at least three sides; on an octagonal pile, at least six sides; and on a round pile, at least three-fourths of the perimeter. On large-diameter piles, 3 feet or greater, 1 feet × 1 feet areas should be cleaned at four locations approximately equally spaced around the perimeter, at each elevation. On large solid-faced elements, such as retaining structures, 1 feet × 1 feet areas should be cleaned at these three elevations. The Level II effort should also focus on typical areas of weakness such as connections, attachment points, and welds. The Level II effort is intended to detect and identify damaged and deteriorated areas that may be hidden by surface biofouling, coating, or corrosion, or not be readily accessible for a Level I inspection effort. Marine growth removal should be governed by what is necessary to discern the condition of the underlying material. Removal of all biofouling staining is generally not required. Means and methods for the removal of biofouling growth are not typically defined in the scope of work. It may be appropriate for owners to specify particular methods on the basis of environmental and site conditions or concerns about maintaining the integrity of coating materials. Methods may include hand scrapers or mechanical systems ranging from high-pressure water blasters to barnacle busters and pressurized air bubble devices.

- Level III Effort: A detailed inspection above and underwater typically involving nondestructive or partially destructive testing conducted to detect hidden or interior damage or to evaluate material homogeneity. Typical inspection and testing techniques include the use of ultrasonic, coring, boring or resistance drilling, physical material sampling, and in situ hardness testing. Level III testing is generally limited to key structurally suspect areas or areas representative of the structure or system.

### 1.4.2 Element Level Damage Ratings

An element level damage rating was assigned to each structural element inspected during the investigation. The rating reflects the condition of the individual element only and is independent

of the element's structural importance and the type of inspection being conducted. The damage rating varies per element, the general rating terms are as follows: (NI) Not Inspected, (ND) No Defects, (MN) Minor, (MD) Moderate, (MJ) Major, (SV) Severe. These ratings are based on MOP 130 element level ratings.

It is important to note that MOP 130 covers many elements, however if any specialty elements that are not outlined in MOP 130 and that fall within this inspection are up to the Engineer's interpretation. The following elements were specifically referenced for this Repair or Upgrade Design Inspection based on the elements seen in the field.

- Timber Elements (MOP 130 Table 2-4 and Figure 2-2)
- Steel Elements (MOP 130 Table 2-5 and Figure 2-3)
- Reinforced Concrete Elements (MOP 130 Table 2-6 and Figure 2-4)
- Mooring System Elements (MOP 130 Tables 2-8 & 2-9 and Figures 2-6 through 2-9)
- Fender System Elements (MOP 130 Tables 2-10 through 2-13 and Figures 2-19 through 2-14)

### 1.4.3 Condition Assessment Ratings

Upon completion of the Repair or Upgrade Design Inspection and review of element level damage ratings post data processing, a condition assessment rating was assigned to the structural unit, groups of units, and overall facility. The condition assessment ratings are outlined below.

- **Good (6):** No visible or only minor damage was noted. Structural elements may show very minor deterioration, but no overstressing was observed. No repairs are required.
- **Satisfactory (5):** Limited minor to moderate defects or deterioration are observed, but no overstressing was observed. No repairs are required.
- **Fair (4):** All primary structural elements are sound, but minor to moderate defects or deterioration was observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure. Repairs recommended, but the priority of the recommended repairs are low.
- **Poor (3):** Advanced deterioration or overstressing was observed on the widespread portions of the structure but does not significantly reduce the load-bearing capacity of the structure. Repairs may need to be carried out with moderate urgency.
- **Serious (2):** Advanced deterioration overstressing, or breakage may have significantly affected the load- bearing capacity of primary structural components. Local failures are possible and loading restrictions may be necessary. Repairs may be carried out on a high-priority basis with urgency.
- **Critical (1):** Very advanced deterioration, overstressing or breakage has resulted in localized failure(s) of primary structure components. More widespread failures are

possible or likely to occur, and load restrictions should be implemented as necessary. Repairs may need to be carried out on a very high priority basis with strong urgency.

### 1.4.4 Recommended Action Guidelines

Given this was a pre-construction and Repair or Upgrade Design Inspection for recording purposes only, recommendations were not included per ASCE MOP 130 Table 2-16, which outlines standardized action options based on observed conditions. These categories help prioritize response efforts and guide the client in planning appropriate follow-up actions:

- **Emergency Action:** Recommended when unsafe conditions are observed that pose immediate risks to life, property, or the environment. Actions may include closing access, unloading, or placing load restrictions.
- **Engineering Evaluation:** Recommended when significant damage or defects are identified that require further structural analysis to assess capacity or determine appropriate repair methods.
- **Structural Repair or Upgrade Design Inspection:** Recommended when repairs are clearly needed based on inspection findings. This may follow routine, special purpose, or post-event inspections.
- **Special Purpose Inspection:** Recommended to investigate unusual or advanced deterioration. May involve specialized testing, monitoring, or nonstandard techniques.
- **Repair Plans Development:** Recommended once sufficient field data has been collected, and the structure is ready for repair design documentation.
- **No Action:** Recommended when the structure is in satisfactory condition and no further action is needed until the next scheduled inspection.

These action categories were not provided given the purpose of this inspection.

## 1.5 Methodology for Supplemental Activities

In addition to the visual and underwater inspections, several supplemental activities were performed to provide a comprehensive record of existing conditions. These activities included a bathymetric survey, sector scan imaging, and aerial drone survey. Each activity is summarized below.

### 1.5.1 Bathymetric Survey

Foth conducted a high-resolution bathymetric survey in accordance with the U.S. Army Corps of Engineers (USACE) Engineer Manual EM 1110-2-1003: Hydrographic Surveying. The survey utilized a vessel-mounted multibeam echosounder system integrated with RTK GPS positioning and motion compensation sensors to ensure compliance with USACE standards for horizontal and vertical accuracy, data density, and bottom coverage.

The survey was performed from a dedicated hydrographic vessel equipped with a Teledyne Reson multibeam echosounder, a Trimble RTK GNSS receiver for precise geospatial positioning, and an Applanix motion reference unit to correct for heave, pitch, and roll. Raw sonar data were

processed using industry-standard hydrographic software (Hypack) to generate georeferenced outputs. Quality control procedures followed USACE guidelines for data validation and error correction. The final processed bathymetric data is presented in Appendix C.

### 1.5.2 Sector Scan Imaging

Brennan performed sector scan imaging from a dedicated survey vessel, independent of dive operations. The sector scan utilized a high-frequency scanning sonar system, such as the Kongsberg MS1000, mounted on a vessel-deployed tripod with controlled rotation to capture detailed imagery of the submerged cofferdam structures. This method produced high-resolution mosaics of the sheet pile walls, interlocks, and cell geometry, providing enhanced visualization in areas where water clarity limited diver observations. The sonar mosaics offer a baseline for future comparison and are included in Appendix D.

### 1.5.3 Aerial Drone Survey

Foth conducted an aerial drone survey in accordance with the ASPRS Positional Accuracy Standards for Digital Geospatial Data, Edition 2, Version 2 (2024), including the UAS Mapping Addendum. The survey was performed using a Skydio X2 drone equipped with RTK GNSS positioning to ensure accurate georeferencing of all imagery and compliance with ASPRS standards for horizontal accuracy and checkpoint validation.

The drone captured high-resolution imagery and video of the facility structures, providing an overhead perspective for inspection and documentation. Imagery was processed to generate a 3D iTwin Capture Model, with positional accuracy verified against ground control points in accordance with ASPRS checkpoint requirements. The processed imagery and model are archived for record purposes, and results are included in Appendix E.

# 2. Existing Conditions

The following section presents the observed existing conditions of the inspected structures. These observations are based on above- and underwater inspections conducted in accordance with the procedures outlined in ASCE MOP 130. All findings are presented factually and without interpretation or analysis. This section serves as the foundation for subsequent assessment and evaluation and includes only repeatable, observable data that would be verifiable by another qualified engineer. Documentation includes field notes, photographs, sketches, and video recordings where applicable.

The structure and sub-elements inspected include:

- Cellular Cofferdam Bulkhead
  - Steel Sheet Piles
  - Steel H-Piles
  - Reinforced Concrete Wall and Platform
  - Timber Curb
  - Steel Single Bitt Cast Steel Mooring Bollards
  - Steel Mooring Cleats
  - Rubber Fenders
  - Asphalt Pavement and Backfill

Each of these structures is presented in a dedicated subsection below, with observations organized by structural element and location.

## 2.1 Cellular Cofferdam Bulkhead

The following deficiencies were observed along the Cellular Cofferdam Bulkhead structure.

### 2.1.1 Steel Sheet Piles

The steel sheet piles generally exhibit typical deterioration found on steel sheet piles submerged in saltwater conditions.

Plate repair patches were observed throughout with no significant defects. All welds were intact, and signs of fill loss were not observed around the plate repairs. The toe of the sheets exhibits a layer of material with weathered stone or rock. The toe of the sheet piles is unknown unless explicitly stated. At the Cell junctions, there was a slight gap between the junction plates.

At Cell #4A, the sheet pile exhibits a hole with a crack that measures 16 inches long by up to 5 inches wide. The crack extends an additional 5 feet from the bottom of the sheet pile hole. The void behind the hole is greater than 4 feet deep.

Scouring was observed throughout the dive inspection and is representative of the bathymetric survey comparison plan from the 2023 versus 2025 survey data. The survey data shows more than 1 feet of scour along the cells. Additionally, the 2023 inspection survey data indicated up to 4 feet 2 inches of scour along STA -0+30.

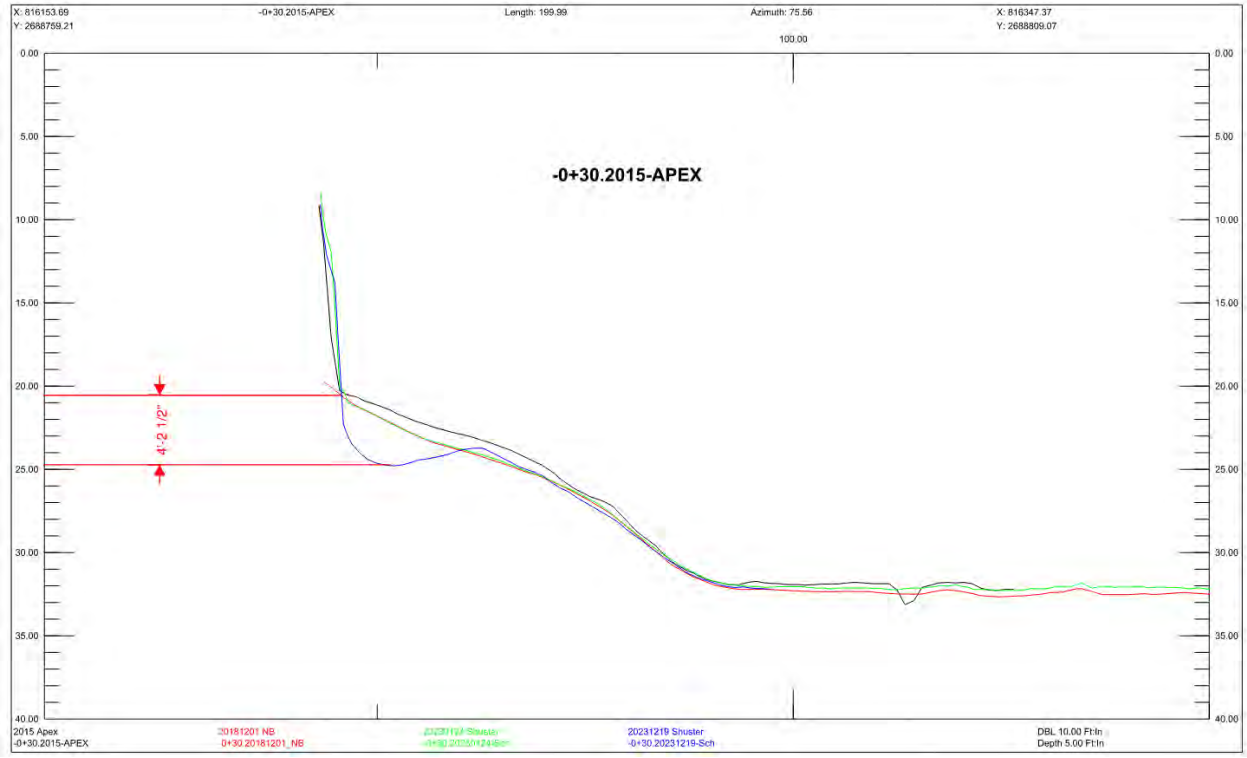



**Figure 2: 2023 Inspection Survey Comparison STA -0+30, Cell #4**

UT measurements were performed on the steel sheet piles using a Cygnus gauge. Due to equipment issues during the inspection, reliable readings could not be obtained at multiple elevations. Only one valid measurement was recorded at the mudline elevation. No readings were captured at mid-water or tidal zone levels.

**Table 1**

**UT Measurements, Cell #4**

| Location | Thickness (in.) | Recording (in.) | Section Loss (%) | Notes |
|---|---|---|---|---|
| **Cell #4, Sheet #13** | | | | |
| Tidal Zone | 0.40 | NR | N/A | Not recorded due to equipment issues. |
| Mid-Water | 0.40 | NR | N/A | Not recorded due to equipment issues. |
| Mudline | 0.40 | 0.38 | 5.0 | Taken at 31 feet below the water surface at the time of inspection. |

### 2.1.2 Steel H-Piles

The steel H-piles were fully buried and were not visible at the time of inspection.

### 2.1.3 Reinforced Concrete Wall and Platform

The reinforced concrete wall and platform exhibited general concrete weathering with localized areas of mechanical corner spalling that measured up to 12 inches long by 6 inches wide and up to 3 inches deep along the exposed face. Hairline cracking was observed throughout. The spalls and cracks were typically seen near the existing cleats and fenders.

### 2.1.4 Timber Curb

The timber curb exhibits typical timber weathering with section loss of up to 25 percent. No significant defects were observed.

### 2.1.5 Cast Steel Single Bitt Mooring Bollard

The single bitt mooring bollard exhibits typical signs of wear consistent with marine exposure. The protective coating is largely worn away, particularly on the upper surfaces and around the base plate, leaving bare steel exposed. General surface corrosion is present across the bollard body, with minor pitting observed near the anchor bolt heads and washers. The anchor bolts themselves show light to moderate rusting, though no deformation or looseness was noted during inspection.

### 2.1.6 Steel Mooring Cleats

The mooring cleats were observed to be fully intact with no visible deformation or damage. The protective coating was present and continuous across all exposed surfaces, providing full coverage. There were no signs of corrosion on the cleat body, base plate, or associated hardware. All anchor bolts and washers were present, secure, and showed no evidence of loosening or material loss. No cracks, spalls, or other deficiencies were noted in the surrounding deck area adjacent to the cleats.

### 2.1.7 Rubber Fenders

The rubber fenders were observed to be fully installed along the bulkhead with no visible displacement or detachment. The fender bodies exhibited uniform alignment and were securely fastened to the supporting hardware. No tears, cracks, or significant surface abrasions were noted on the rubber elements. All associated mounting hardware, including bolts and brackets, were present and appeared properly seated. No missing components or signs of excessive wear were observed at the time of inspection.

### 2.1.8 Asphalt Pavement

The asphalt surface and adjacent fill areas were observed to have cracking throughout, primarily consisting of minor transverse cracks. Very minor depressions and slight heaving were noted in isolated locations, but no significant deviations or large surface failures were present. The cracking and minor surface irregularities appear consistent with typical wear and tear for asphalt pavement exposed to heavy use and environmental conditions. No areas of exposed subgrade or severe raveling were observed at the time of inspection.

# 3. Evaluation and Assessment

In accordance with the ASCE MOP 130; this section provides an engineering evaluation of the structures based on observed conditions. While the previous section documented physical deficiencies, this portion interprets those findings to assess the structural performance, functional reliability, and overall condition of each facility component.

The evaluation considers the severity, extent, and location of deterioration, as well as the potential implications for structural integrity, serviceability, and safety. This assessment forms the basis for prioritizing maintenance and repair needs and supports informed decision-making for asset management and capital planning.

## 3.1 Cellular Cofferdam Bulkhead

The Cellular Cofferdam Bulkhead is in overall **Poor** condition due to continued scouring and section loss of the sheet pile cells. Although previous plate repairs were conducted in 2022 to the sheet piles holes, one large hole was observed along Cell #4A.

### 3.1.1 Steel Sheet Piles

The steel sheet piles are generally in **Poor** condition due to scouring throughout the sheets in addition to 100 percent section loss resulting in a full penetration hole in the sheet pile. The scour may be a result of prop wash and continuation of the scour may result in exposure of the steel sheet pile toes and potential undermining. Additionally, the hole in the sheet pile may result in increased fill loss and potential settlement of the Upland Building or sinkholes.

### 3.1.2 Steel H-Piles

A rating was not provided for the steel H-piles, given that they were fully buried and not observed during the inspection.

### 3.1.3 Reinforced Concrete Wall and Platform

The reinforced concrete wall and platform is generally in **Satisfactory** condition with minor to moderate rated cracking and mechanical spalling.

### 3.1.4 Timber Curb

The timber curb is generally in **Fair** condition due to moderate weathering of the timber with section loss up to 25 percent.

### 3.1.5 Cast Steel Single Bitt Mooring Bollard

The cast steel single bitt mooring bollard is generally in **Fair** condition with minor to moderate rated deterioration, typical to mooring bollards exposed to continued use.

### 3.1.6 Steel Mooring Cleats

The steel mooring cleats are generally in **Satisfactory** condition with limited to no significant defects observed.

### 3.1.7 Rubber Fenders

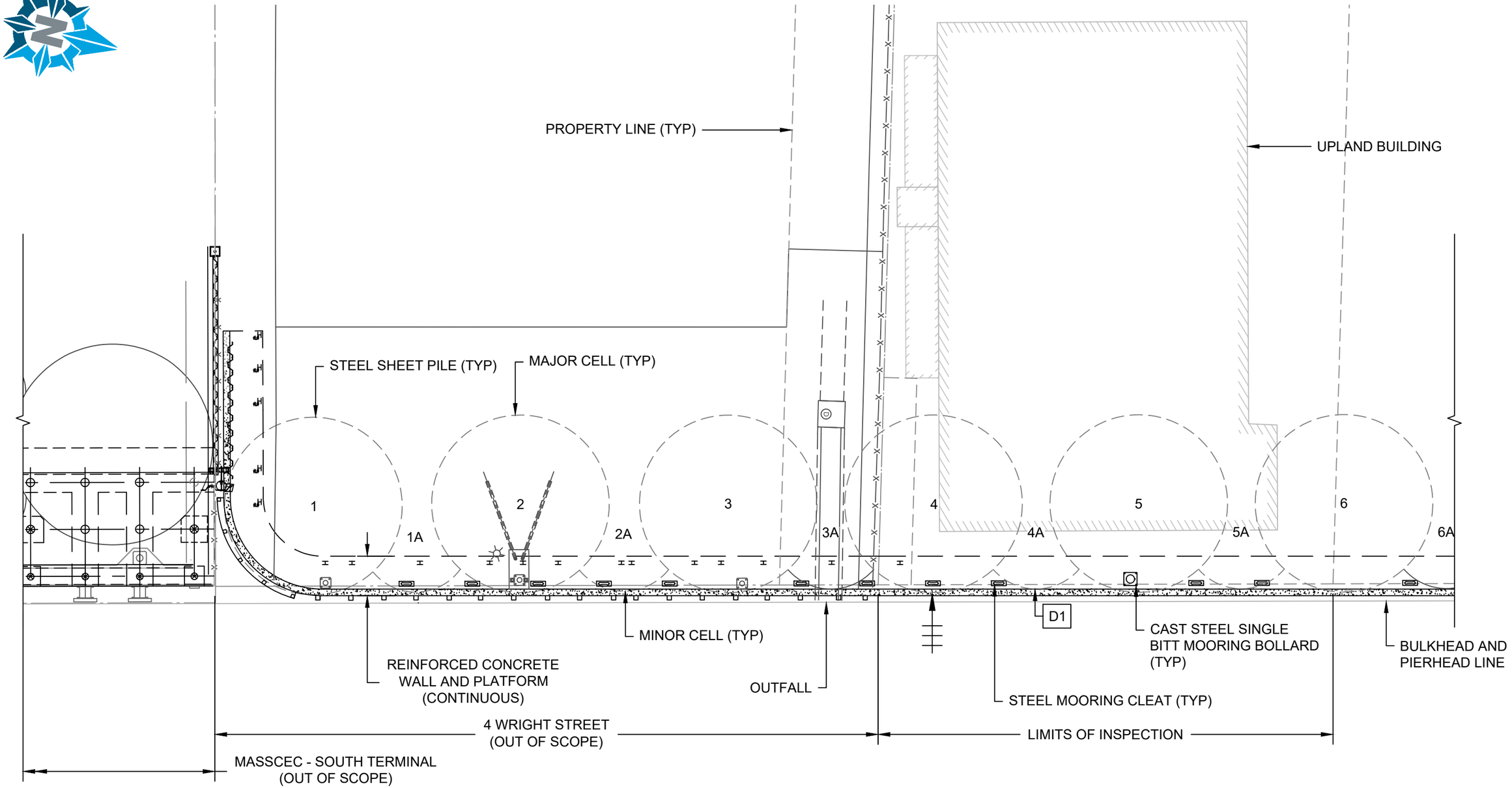
The rubber fenders are generally in **Good** condition with limited to no significant defects observed. The fenders were recently replaced in 2022.

### 3.1.8 Asphalt Pavement

The asphalt pavement is generally in **Poor** condition due to loss of fill behind the sheet pile hole in addition to moderate settlement cracking and heaving along the backside of the cells.

# Appendix A

# Inspection Figures




NEW BEDFORD HARBOR

EBB

FLOOD

## LEGEND

D1 DEFECT NO. 1

LEVEL III (UT READING)

## INSPECTION NOTES

1. THIS INSPECTION WAS LIMITED TO 6 HASSEY STREET.
2. DIVE INSPECTION WAS PERFORMED ON SEPTEMBER 25, 2025.
3. BUILDING AND TOPSIDE INSPECTION WAS PERFORMED ON OCTOBER 17, 2025.
4. D1 - HOLE AND CRACK IN SHEET PILE.

Foth

0 15 30

SCALE

# MASSCEC - 6 HASSEY STREET

FIGURE 1

WATERFRONT FACILITIES INSPECTION AND ASSESSMENT
REPAIR OR UPGRADE DESIGN

| | | | |
|---|---|---|---|
| Date Completed: OCT. 2025 | | Revision Date: # | |
| Drawn By: TJM | Checked By: SRS | Project No: 24M070.04 | |

Monday, November 3, 2025 3:18:11 PM
DWG Filename: 0024m070.04_6 hassey street_inspection_nbpa copy.dwg Layout: figure 1
DWG Folder Location:

# Appendix B

# Photographic Log

# Photographic Log

| Client's Name: | Site Location: | Project No. |
|---|---|---|
| MassCEC | 6 Hassey Street, New Bedford, MA | 0024M070.04 |

| Photo No. 1 | Date: 9/25/2025 |
|---|---|

**Direction Photo Taken:**
South

**Photo Taken By:**
T. Magalhaes

**Description:**

Overview of bulkhead and building along the pierhead, taken from the boat.



| Photo No. 2 | Date: 9/25/2025 |
|---|---|

**Direction Photo Taken:**
North

**Photo Taken By:**
T. Magalhaes

**Description:**

Overview of bulkhead and building along the pierhead, taken from the boat.



Foth

# Photographic Log

| Client's Name: | Site Location: | Project No. |
|---|---|---|
| MassCEC | 6 Hassey Street, New Bedford, MA | 0024M070.04 |

| Photo No. 3 | Date: 10/17/2025 |
|---|---|

**Direction Photo Taken:**
North

**Photo By:**
C. Flynn

**Description:**

Coating loss and corrosion of steel deck elements and general view of single bit bollard located mid-span of the deck area.



| Photo No. 4 | Date: 10/15/2025 |
|---|---|

**Direction Photo Taken:**
West

**Photo Taken By:**
C. Flynn

**Description:**

Typical steel mooring cleat with no significant defects observed.



Foth

# Photographic Log

| Client's Name: | Site Location: | Project No. |
|---|---|---|
| MassCEC | 6 Hassey Street, New Bedford, MA | 0024M070.04 |

| Photo No. 5 | Date: 10/17/2025 |
|---|---|

**Direction Photo Taken:**
North

**Photo By:**
C. Flynn

**Description:**

Typical rubber fendering and timber curb with general weathering on curbing.



| Photo No. 6 | Date: 10/15/2025 |
|---|---|

**Direction Photo Taken:**
North

**Photo Taken By:**
C. Flynn

**Description:**

Typical asphalt pavement with cracking and vegetation growth.



Foth

# Photographic Log

| Client's Name: | Site Location: | Project No. |
|---|---|---|
| MassCEC | 6 Hassey Street, New Bedford, MA | 0024M070.04 |

| Photo No. 7 | Date: 9/25/2025 |
|---|---|

**Direction Photo Taken:**
West

**Photo Taken By:**
JF Brennan

**Description:**

Screenshot taken from dive video of hole in sheet pile at Cell #4A, beyond 4 feet deep.



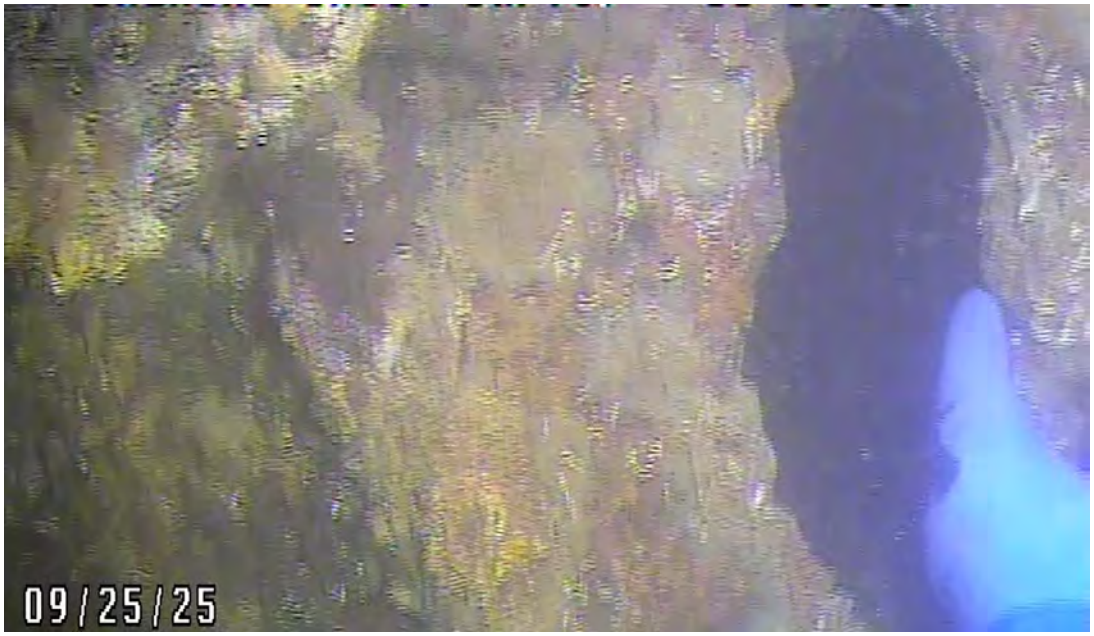

| Photo No. 8 | Date: 9/25/2025 |
|---|---|

**Direction Photo Taken:**
West

**Photo By:**
JF Brennan

**Description:**

Screenshot taken from dive video of hole in sheet pile at Cell #4A, beyond 4 feet deep.

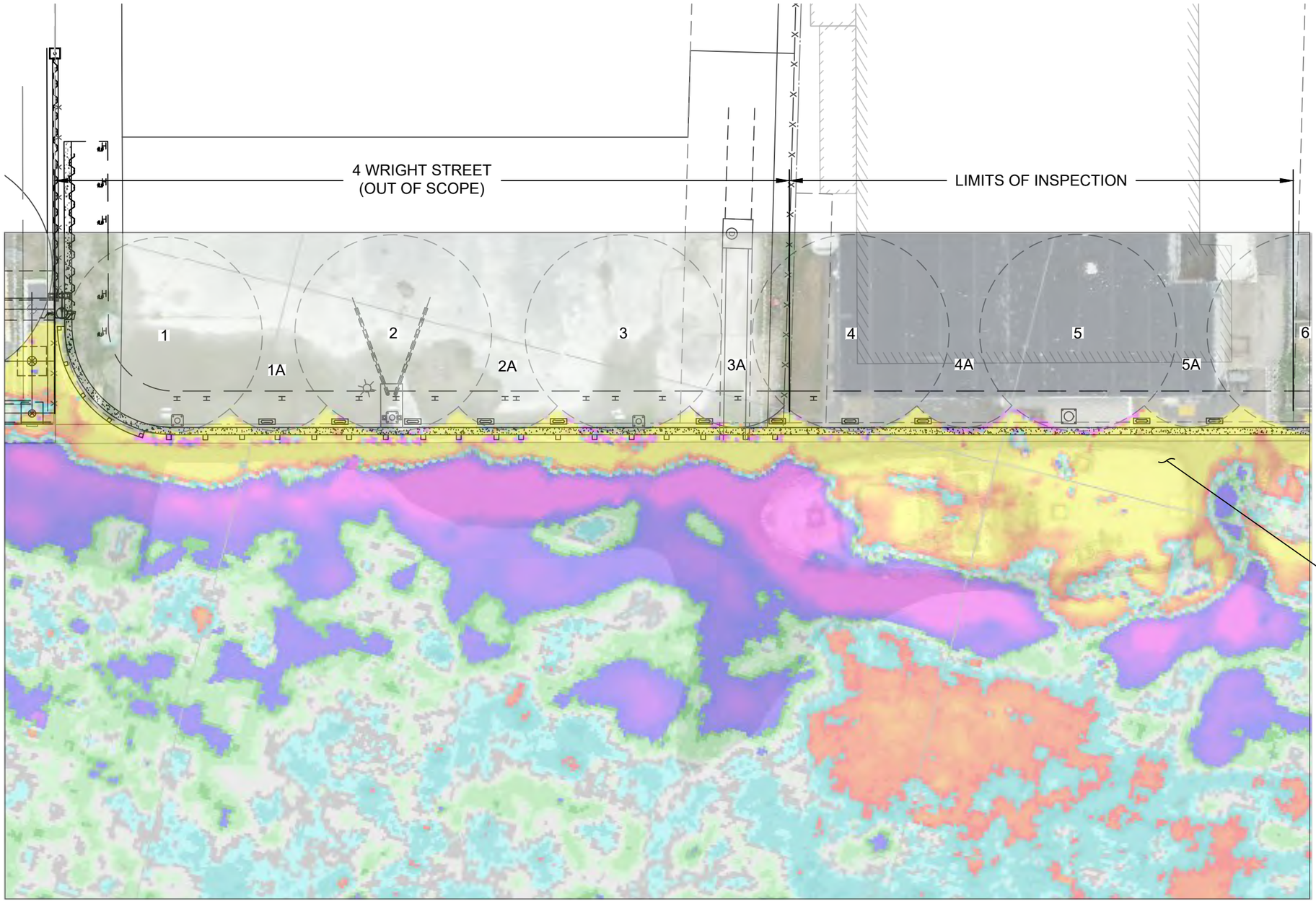


# Appendix C

# Bathymetric Survey Difference Plot, 2023 vs 2025

LEGEND

- < -1.00 (CUT)
- -0.90 TO -0.81
- -0.70 TO -0.61
- -0.50 TO -0.41
- -0.30 TO -0.26
- -0.20 TO -0.11
- -0.05 TO -0.01
- 0.05 TO 0.09
- 0.20 TO 0.24
- 0.30 TO 0.39
- 0.50 T0 0.59
- 0.70 TO 0.79
- 0.90 TO 0.99 (FILL)




NOTE

This bathymetric difference plot is based on comparative analysis of hydrographic survey data collected in January 2023 and September 2025. The data sets were acquired under differing environmental and operational conditions, and may be subject to inherent variability in positioning, tide correction, and sounding density. Apparent changes in elevation may reflect actual seabed movement (e.g., scour or deposition), survey tolerances, or a combination thereof. This plot is intended for general assessment purposes only and should not be used as the sole basis for design, construction, or navigation decisions. Further site-specific investigation is recommended to confirm critical findings.

NEW BEDFORD HARBOR

EBB

FLOOD

Foth

0 15 30

SCALE

**MASSCEC - 6 HASSEY STREET**

FIGURE 1

BATHYMETRIC SURVEY DIFFERENCE PLOT
2023 VS 2025

| Date Completed: OCT. 2025 | Revision Date: # | |
|---|---|---|
| Drawn By: TJM | Checked By: MC | Project No: 24M070.04 |

Wednesday, October 22, 2025 4:24:03 PM
DWG Filename: 0024m070.04_6 hassey street_survey difference plot.dwg Layout: figure 1
DWG Folder Location:

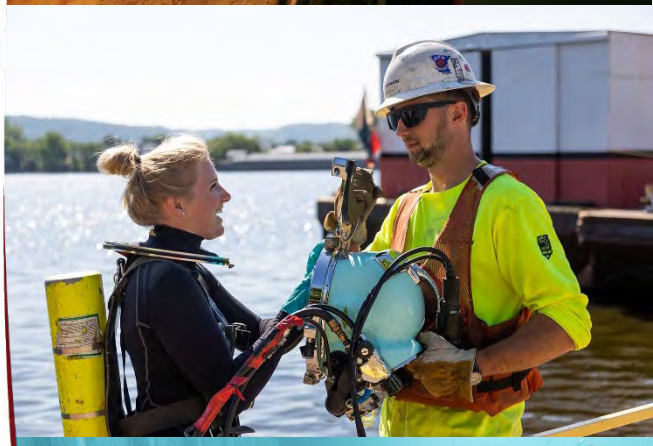
# Appendix D

# Sector Scan Images, Prepared by JF Brennan

Marine Professionals Since 1919
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# UNDERWATER DIVE INSPECTION REPORT



Prepared for:

Foth



Owner: **Marine Commerce Terminal (MCT)**
Structure: **Sheet Pile Cell Dock Wall**
Location: **New Bedford, Massachusetts**
Waterway: **Acushnet River**
Inspection Date: **September 25 & October 3, 2025**




Prepared by:
**J.F. Brennan Company, Inc.**
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La Crosse, WI 54603
Phone: 608.784.7173
jfbrennan.com


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ISO 14001 Environmental Management CERTIFIED EMS 719118
ISO 45001 Occupational Health and Safety Management CERTIFIED OHS 719119

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Appendix A – Sector Scans ..... A1
Appendix B – Photographs ..... B1

**Disclaimer:** The information provided herein is for the limited administrative and operational use of Foth and their contractors. Other requests for this document shall be referred to J.F. Brennan Company, Inc. The accuracy of the information provided is limited by the conditions of the site during the day of the inspection.

# Project Recap

| | |
|---|---|
| *Project:* | New Bedford Dock Wall underwater Dive and Sector Scan Inspection. |
| *Scope of Work:* | Brennan will provide commercial diving services to inspect approximately 340 LF of steel sheet pile cells extending to a depth of 30 FSW. The objective of this Level I inspection is to assess the overall condition of the sheet pile walls and identify any areas of deterioration, section loss, or damage requiring further attention. |
| *1. Dive Inspection Team: (09/25/2025)* | Dive Supervisor: Tony Ramella<br>Diver/Tender: Chris Drozell<br>Diver/Tender: Glenn Hutchins<br>Diver/Tender: Steve Bennett<br>Project Manager: Nathan Fontaine |
| *2. Sector Scan Inspection Team: (10/03/25)* | Sector Scan Operator: Sean McMullen<br>Boat Operator/Tender: Tony Ramella<br>Project Manager: Nathan Fontaine |
| *Foth Contacts:* | Scott Skuncik<br>Tim Magalhaes |
| *Weather:* | 9/25: Cloudy, HI 72°F Lo: 70°F, 13.05 mph S winds.<br>10/3: Sunny, Hi: 70°F Lo: 63°F, 10.56 mph SW winds. |
| *Water Visibility:* | Good, 5-feet +. |
| *Site Location:* | Marine Commerce Terminal<br>6 Hassey St.<br>New Bedford, MA 06057 |
| *Access:* | Embankment. |
| *Dive Mode:* | Surface supplied, via mobile station. All dives were conducted in accordance with Brennan's Safe Diving Practices Manual as well as all pertinent ADCI, OSHA, and USCG regulations. Additionally, all dives adhered to the dive schedules and decompression tables outlined in the U.S. Navy Dive Manual, Rev. 7. |
| *Sector Scan Type:* | Kongsberg Single Beam 1171 Sonar. The scanning sonar transmits sound waves through the water column that are then reflected to the sensor and are then processed into the images you will see in this report. The sonar waves also reflect off air bubbles and sediment in the water column which the computer cannot differentiate from the item being imaged, this may cause the image to appear cloudy. Additionally, high flows have a higher than usual amount of air bubbles and sediment in the water column which may magnify this issue. Through the operation of the system and post-processing the effects are minimized to the extent possible but may still be visible. |
| *Gage Height:* | N/A, there was no USGS River Gauge in New Bedford, MA. |
| *Discharge:* | N/A, there was no USGS River Gauge in New Bedford, MA. |
| *Condition Assessment:* | Satisfactory. |
| *Brennan Repair Rating:* | Low. |

*Summary of Findings:*

- Dive Inspection:
  - The dive inspection was performed with a Foth representative onboard the dive boat. This individual directed and took notes for the underwater inspection. All notes were retained with that individual. However, the dive videos from that inspection can be found here (please see below).
    - *To view/download the footage from the inspection, please follow the instructions below. The SharePoint site will remain active for 30 days, during this period please download the files if you want to keep them for your records. After the 30-day period, the site will be removed, and you will no longer be able to access the videos through the SharePoint link.
      - Foth, New Bedford Dock Wall (Click and follow link directly. Your email address must have been given access for you to open the folder. If you do not have access and need it, please reach out so we can get your email address added.).

- Sector Scan:
  - Please see 'Appendix A, Sector Scan 1', for an overall view of the Dock Wall.
  - Please see 'Appendix A, Sector Scan 2' for water depths throughout the New Bedford Dock Wall.
  - Please see 'Appendix B, Figures 1 – 3' for a typical view of the sheeting.
    - Moderate to heavy marine growth was observed throughout, along with minor surface rust.
  - Please see 'Appendix B, Figures 4 & 5' for a typical view of the adherent material.
    - Prop wash appears to have exposed more of the adherent material on which the Cells sheeting was driven.
  - Overall:
    - The Sector Scan inspection showed no evidence of any major holes, splits, and/or broken knuckles throughout the Cells.
      - Please consult the dive inspection report for a more in-depth inspection of the structures that made up the New Bedford Dock Wall.
    - The Sector Scan inspection showed no evidence of any major undermining or not fully driven sheets to the Cells.
      - Please consult the dive inspection report for a more in-depth inspection of the structures that made up the New Bedford Dock Wall.
  - Cell 1: See 'Appendix A, Sector Scan 3'.
    - There were no signs of undermining to the sheets.
    - Adherent Material Height, Location 1: 8.5-feet.
    - Adherent Material Height, Location 2: 7.6-feet.
  - Cell 1A: See 'Appendix A, Sector Scan 4'.
    - There were no signs of any split and/or broken knuckles.
    - There were no signs of undermining to the sheets.
    - Adherent Material Height, Location 1: 8.9-feet.
    - Adherent Material Height, Location 2: 7.4-feet.
  - Cell 2: See 'Appendix A, Sector Scan 5'.
    - There were no signs of any split and/or broken knuckles.
    - There were no signs of undermining to the sheets.
    - Adherent Material Height, in General: 3.0-feet.
  - Cell 2A: See 'Appendix A, Sector Scan 6'.
    - There were no signs of any split and/or broken knuckles.
    - There were no signs of undermining to the sheets.
    - Adherent Material Height, in General: 7.1-feet.
  - Cell 3: See 'Appendix A, Sector Scan 7'.
    - There were no signs of any split and/or broken knuckles.
    - There were no signs of undermining to the sheets.
    - Adherent Material Height, in General: 11.1-feet.
    - Adherent Material Height, Location 1: 8.2-feet tall by 7.0-feet wide.
  - Cell 3A: See 'Appendix A, Sector Scan 8'.

        - There were no signs of any split and/or broken knuckles.
        - There were no signs of undermining to the sheets.
        - Adherent Material Height, in General: 11.8-feet.
    - Cell 4: See 'Appendix A, Sector Scan 9'.
        - There were no signs of any split and/or broken knuckles.
        - There were no signs of undermining to the sheets.
        - Adherent Material Height, in General: There was not a significant amount of adherent material at this location.
    - Cell 4A: See 'Appendix A, Sector Scan 10'.
        - There were no signs of any split and/or broken knuckles.
        - There were no signs of undermining to the sheets.
        - Adherent Material Height, in General: 9.9-feet.
        - Adherent Material Height, Location 1: 8.7-feet tall by 9.9-feet wide.
    - Cell 5: See 'Appendix A, Sector Scan 11'.
        - There were no signs of any split and/or broken knuckles.
        - There were no signs of undermining to the sheets.
        - Adherent Material Height, in General: 7.4-feet.
        - Adherent Material Height, Location 1: 5.2-feet tall by 14.3-feet wide.
    - Cell 5A: See 'Appendix A, Sector Scan 12'.
        - There were no signs of any split and/or broken knuckles.
        - There were no signs of undermining to the sheets.
        - Adherent Material Height, in General: 6.7-feet.
    - Cell 6: See 'Appendix A, Sector Scan 13'.
        - There were no signs of any split and/or broken knuckles.
        - There were no signs of undermining to the sheets.
        - Adherent Material Height, in General: 4.6-feet.

*Summary of Recommendation:*

- Continue to inspect the New Bedford Dock Wall, by use of ROV and/or Sector Scan, on a regularly scheduled basis. We then recommend inspecting the Dock Wall, using a Diver, if we notice any of the following situations: new deficiencies, the growth of deterioration to previously found deficiencies, debris buildup, and/or on the regularly scheduled intervals directed by the PM's schedule.

## Brennan Condition Assessment

**Good:** No visible or only minor sporadic defects or deterioration. The “Brennan Repair Rating” is low.

**Satisfactory:** Limited minor to moderate defects or deterioration. The “Brennan Repair Rating” is low.

**Fair:** Minor to moderate defects or deterioration on widespread portions. Localized areas of moderate to advanced defects or deterioration may be present. The “Brennan Repair Rating” is low to moderate.

**Poor:** Moderate to advanced defects or deterioration on widespread portions. The “Brennan Repair Rating” is moderate.

**Serious:** Advanced defects or deterioration on widespread portions. Localized failures are possible. The “Brennan Repair Rating” is moderate to major.

**Critical:** Heavily advanced defects or deterioration have resulted in localized failure(s). More widespread failures are possible if corrective action is not taken. The “Brennan Repair Rating” is major.

## Brennan Repair Rating

Low: Repairs may have been recommended, but repair priority is low. At a minimum, we recommend continuing to monitor these defects or deteriorated areas within their upcoming routine inspections.

Moderate: We recommend repair talks begin and executed when possible. The observed defects or deterioration could affect the overall functionality of the structure(s).

Major: We consider the repair priority to be urgent, and repairs should be made as soon as possible.

*The Brennan Condition Assessment and Repair Ratings are considered opinions based on inspection findings of the specific inspected structure(s) and at the time of inspection. Company safety plans and/or any applicable industry regulations regarding these structure(s) should always be followed.

We appreciate the opportunity to work with Foth on this project. If you have any questions or concerns regarding the information in this report or if Brennan can be of any further assistance, please do not hesitate to reach out using the contact information below.

Respectfully submitted,

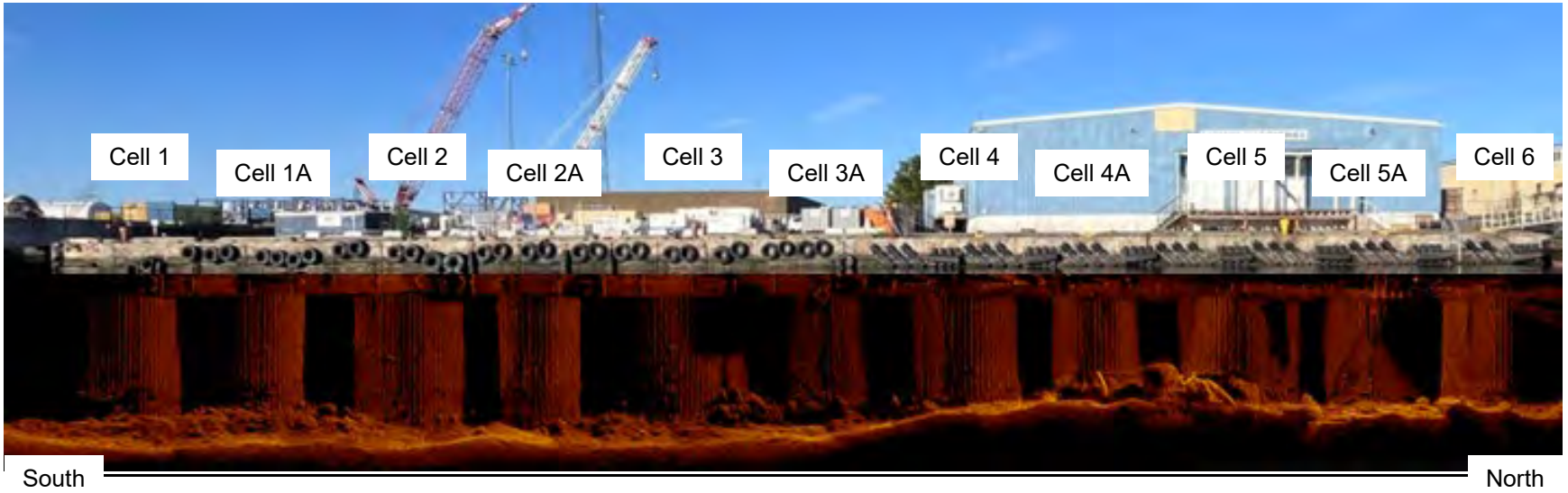


**Joe Baldoni**
Underwater Services- Underwater Inspection Program Supervisor
*cell* 608.799.5952
jbaldoni@jfbrennan.com

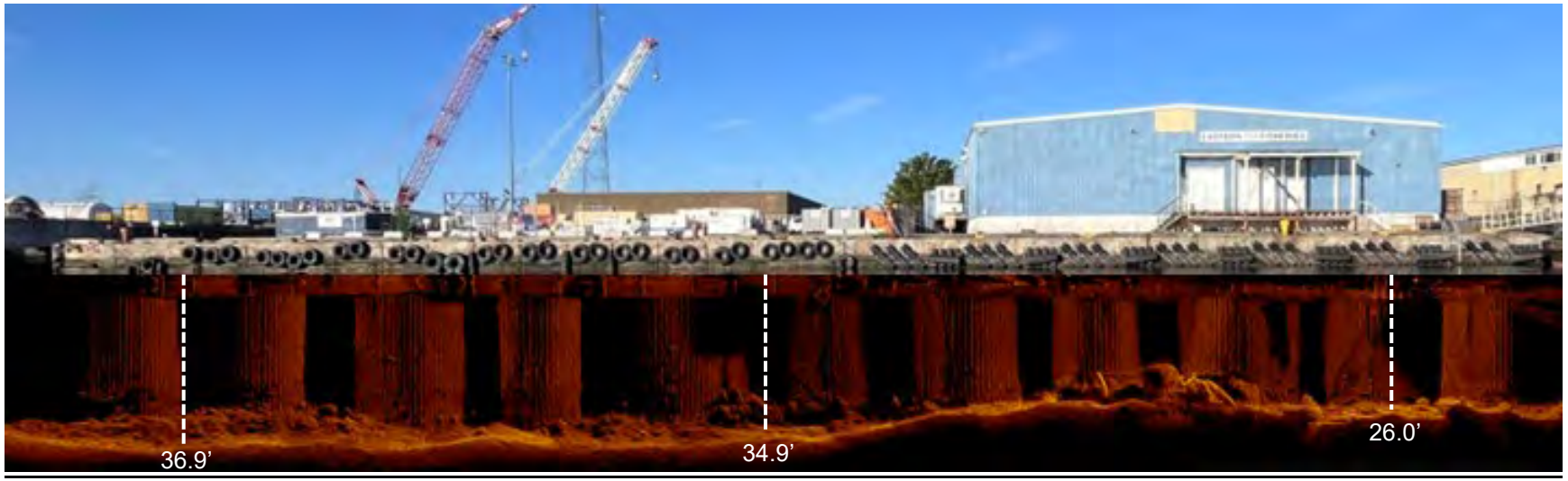
# Appendix A – Sector Scans

## List of Sector Scans

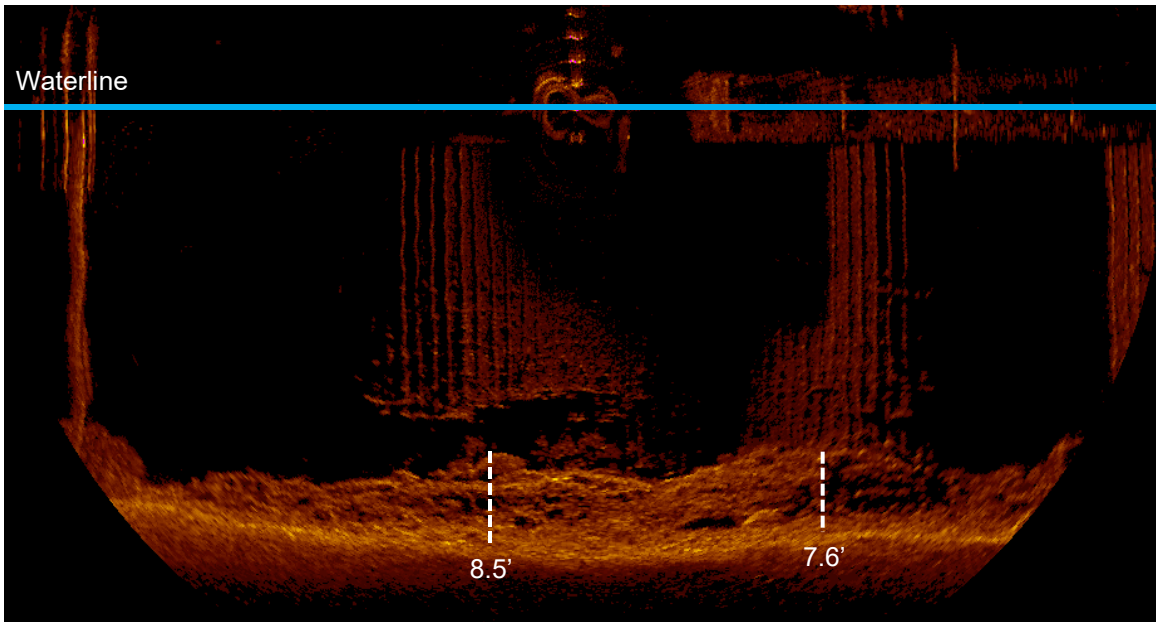
Sector Scan 1 – New Bedford Dock Wall: Overall ..... A2
Sector Scan 2 – New Bedford Dock Wall: Water Depths ..... A2
Sector Scan 3 – Cell 1: Adherent Material Measurements ..... A3
Sector Scan 4 – Cell 1A: Adherent Material Measurements ..... A3
Sector Scan 5 – Cell 2: Adherent Material Measurements ..... A4
Sector Scan 6 – Cell 2A: Adherent Material Measurements ..... A4
Sector Scan 7 – Cell 3: Adherent Material Measurements ..... A5
Sector Scan 8 – Cell 3A: Adherent Material Measurements ..... A5
Sector Scan 9 – Cell 4: Adherent Material Measurements ..... A6
Sector Scan 10 – Cell 4A: Adherent Material Measurements ..... A6
Sector Scan 11 – Cell 5: Adherent Material Measurements ..... A7
Sector Scan 12 – Cell 5A: Adherent Material Measurements ..... A7
Sector Scan 13 – Cell 6: Adherent Material Measurements ..... A8



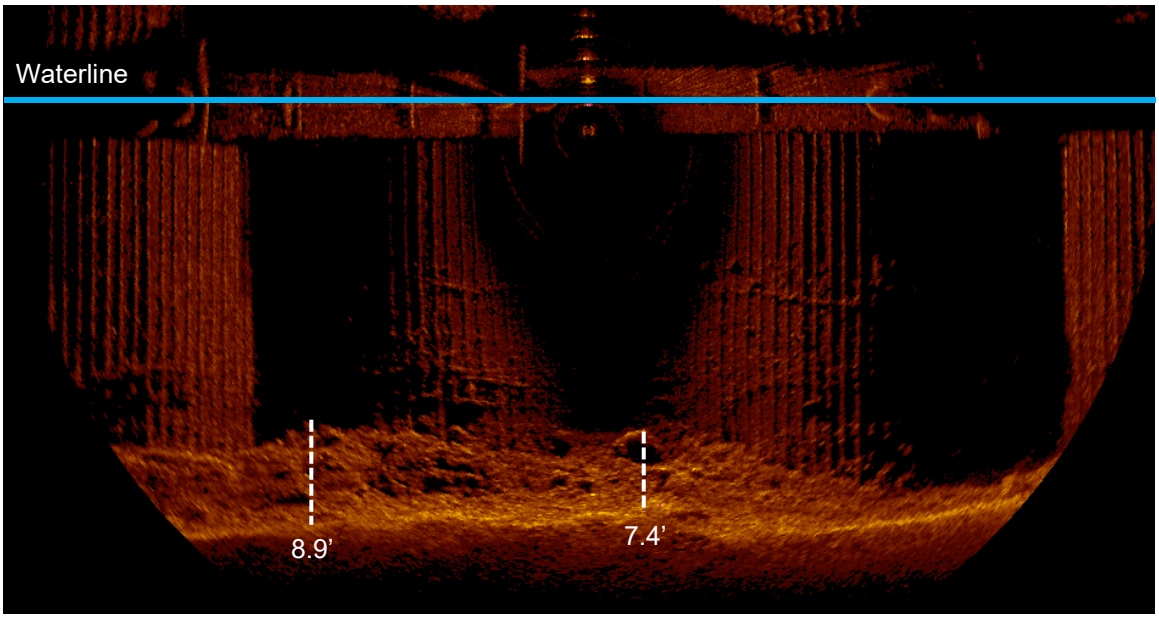

*Sector Scan 1 – New Bedford Dock Wall: Overall*



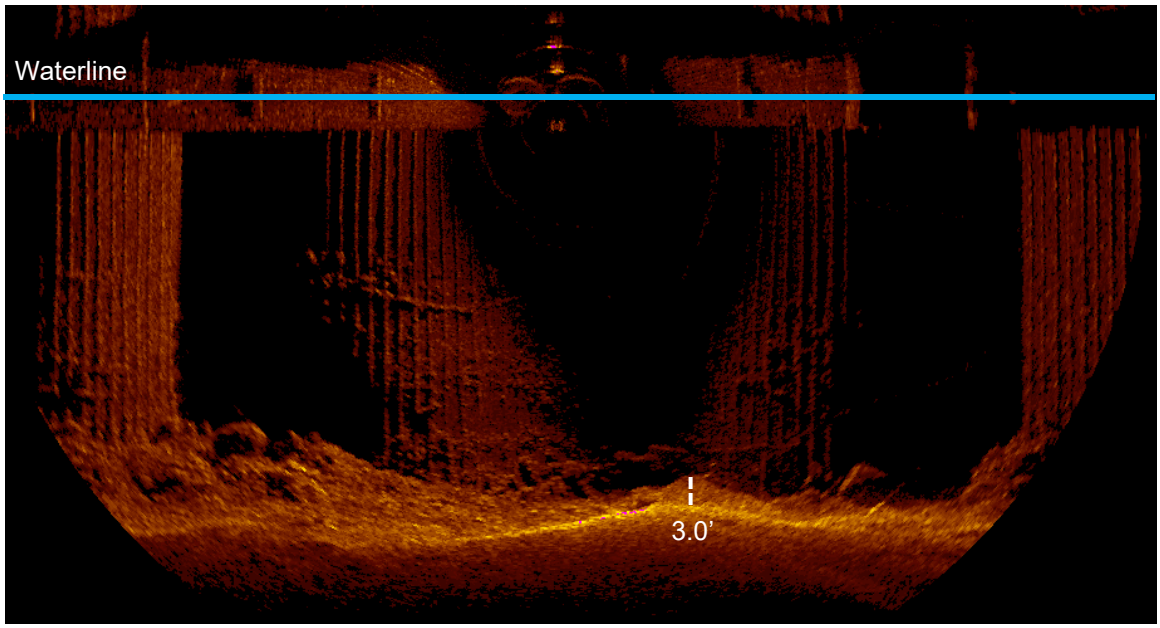

*Sector Scan 2 – New Bedford Dock Wall: Water Depths*



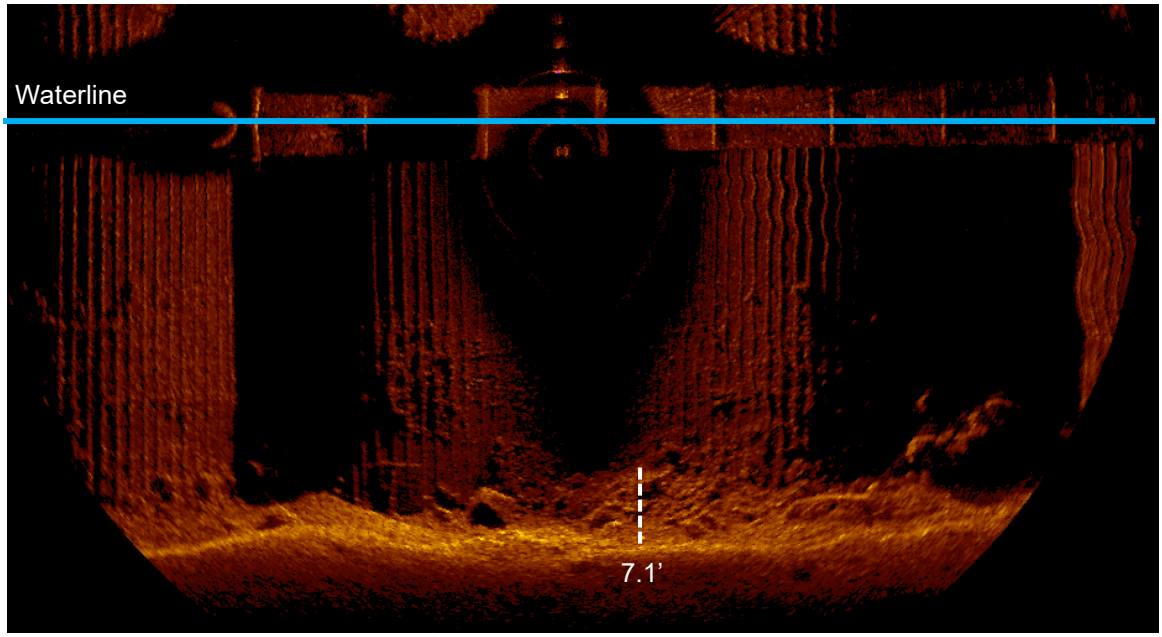

*Sector Scan 3 – Cell 1: Adherent Material Measurements*



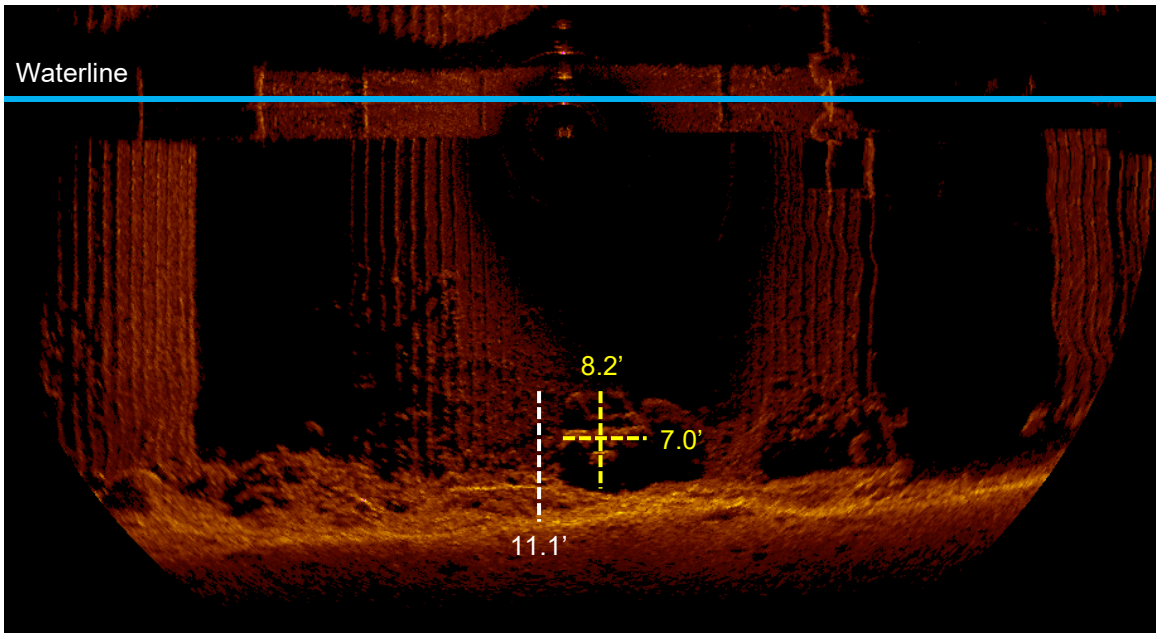

*Sector Scan 4 – Cell 1A: Adherent Material Measurements*



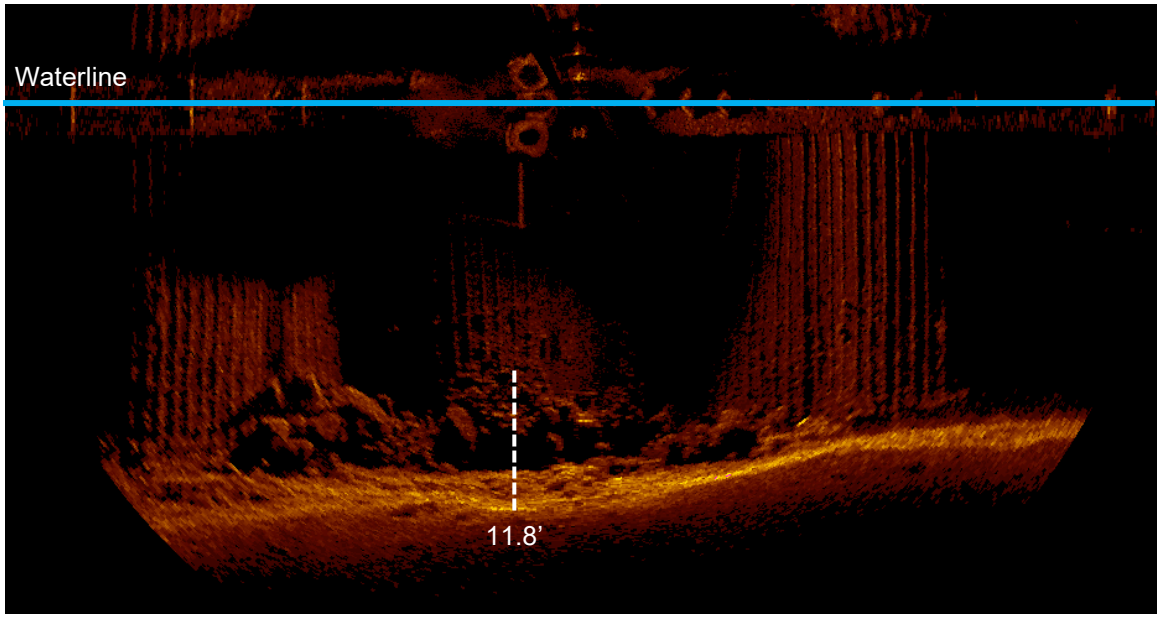

*Sector Scan 5 – Cell 2: Adherent Material Measurements*



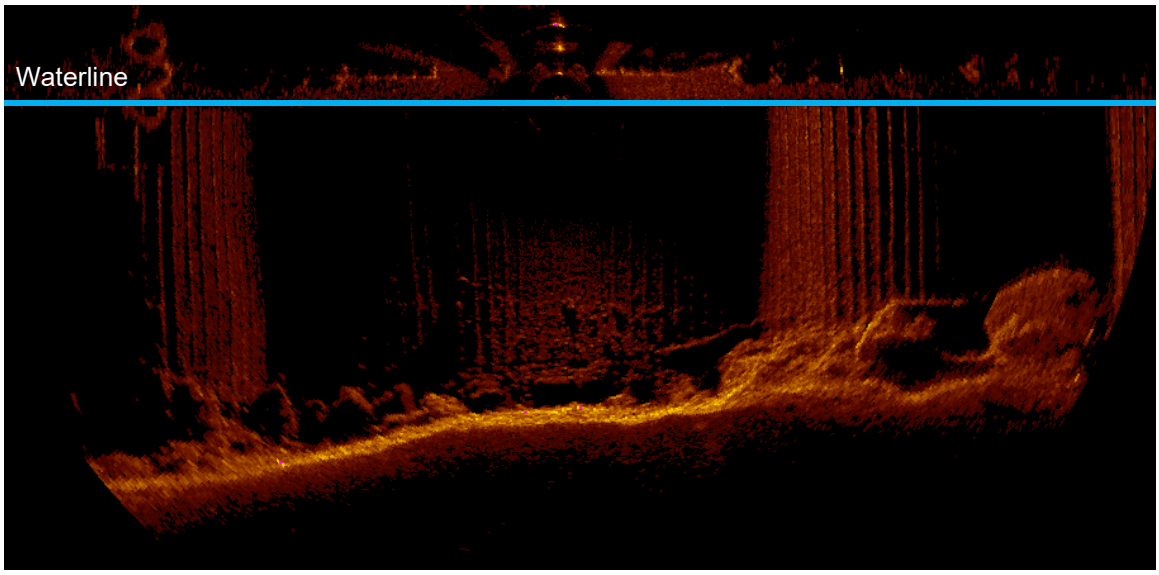

*Sector Scan 6 – Cell 2A: Adherent Material Measurements*



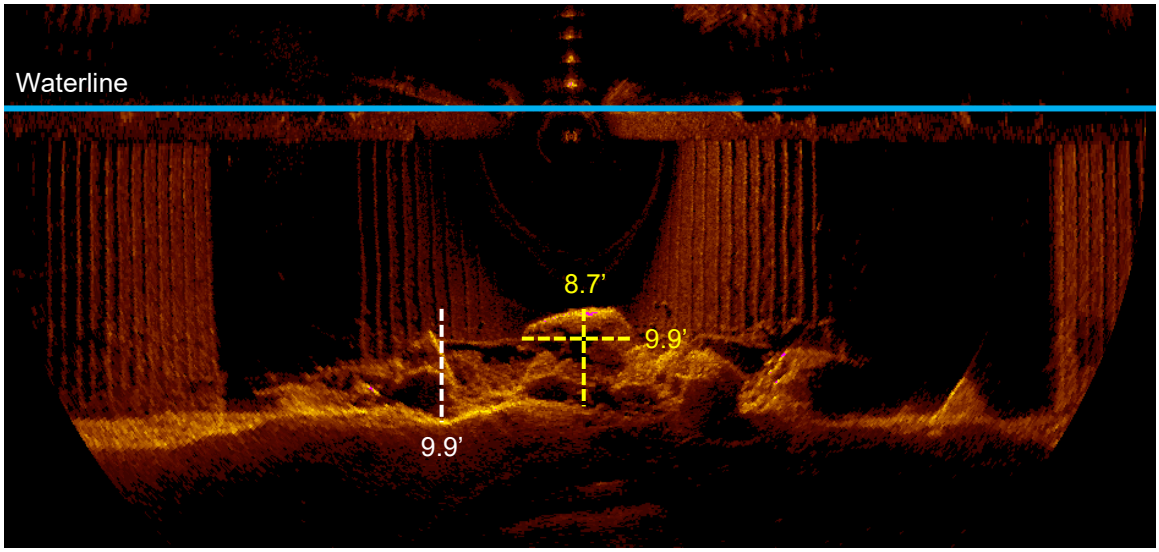

*Sector Scan 7 – Cell 3: Adherent Material Measurements*



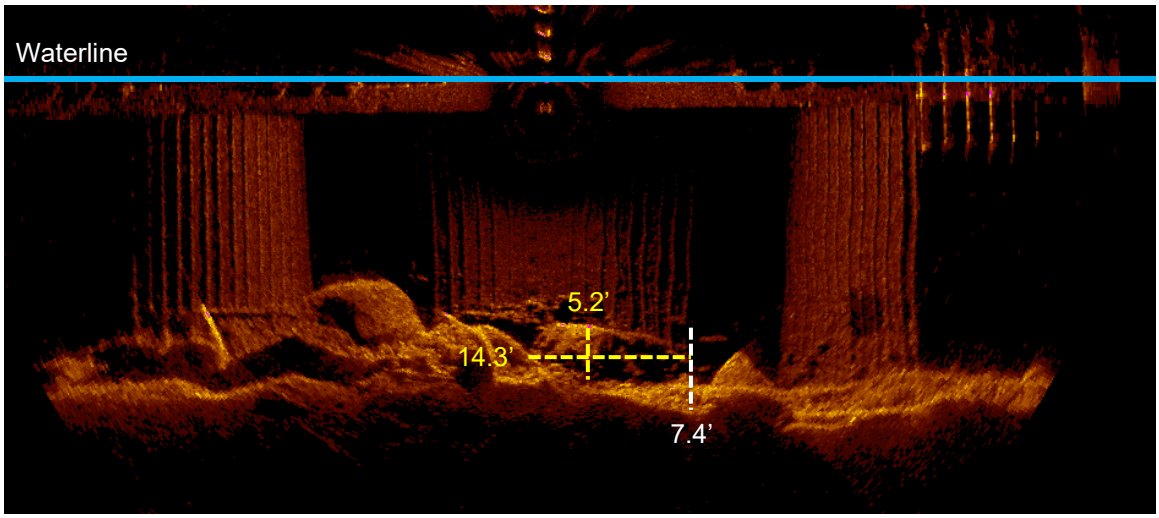

*Sector Scan 8 – Cell 3A: Adherent Material Measurements*



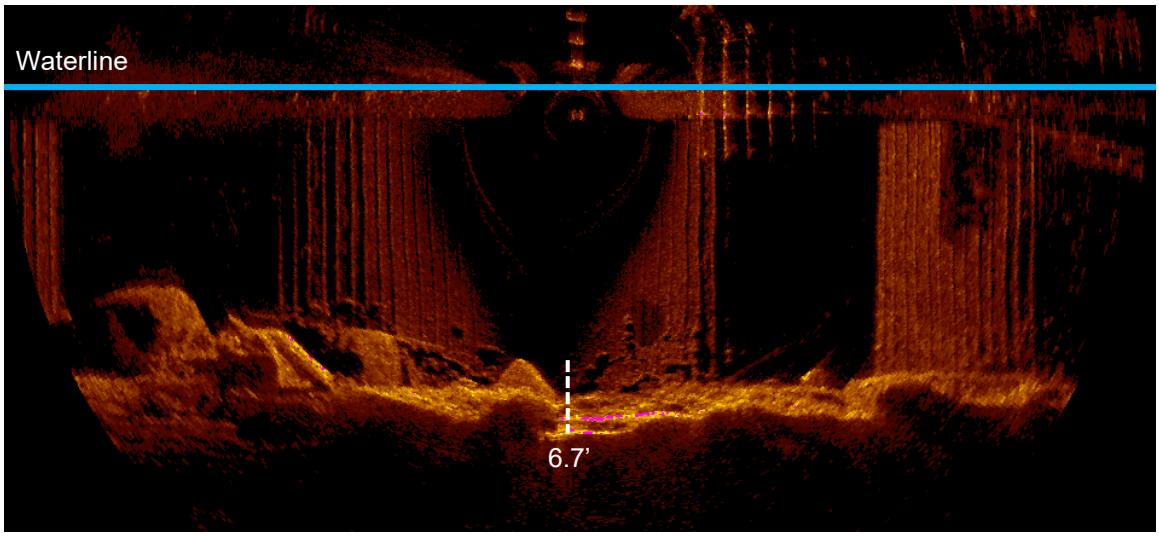

*Sector Scan 9 – Cell 4: Adherent Material Measurements*



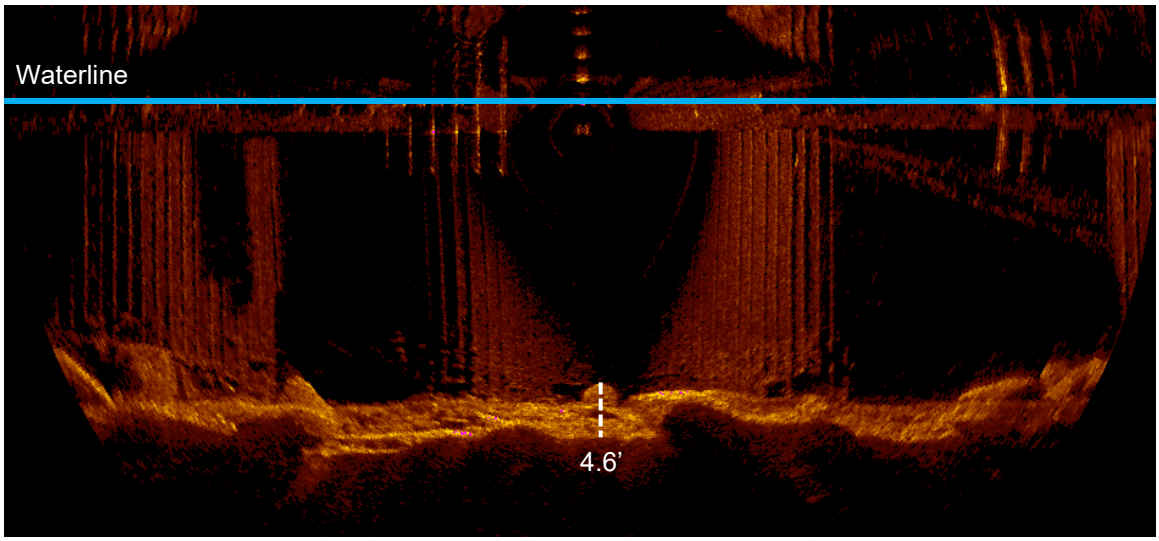

*Sector Scan 10 – Cell 4A: Adherent Material Measurements*




*Sector Scan 11 – Cell 5: Adherent Material Measurements*




*Sector Scan 12 – Cell 5A: Adherent Material Measurements*




*Sector Scan 13 – Cell 6: Adherent Material Measurements*

# Appendix B – Photographs

## List of Figures

Figure 1 – Typical Sheeting Condition..... B2
Figure 2 – Typical Sheeting Condition..... B2
Figure 3 – Typical Sheeting Condition & Interface with Adherent Material..... B3
Figure 4 – Typical Adherent Material..... B3
Figure 5 – Typical Adherent Material..... B4




*Figure 1 – Typical Sheeting Condition*




*Figure 2 – Typical Sheeting Condition*




*Figure 3 – Typical Sheeting Condition & Interface with Adherent Material*




*Figure 4 – Typical Adherent Material*




*Figure 5 – Typical Adherent Material*

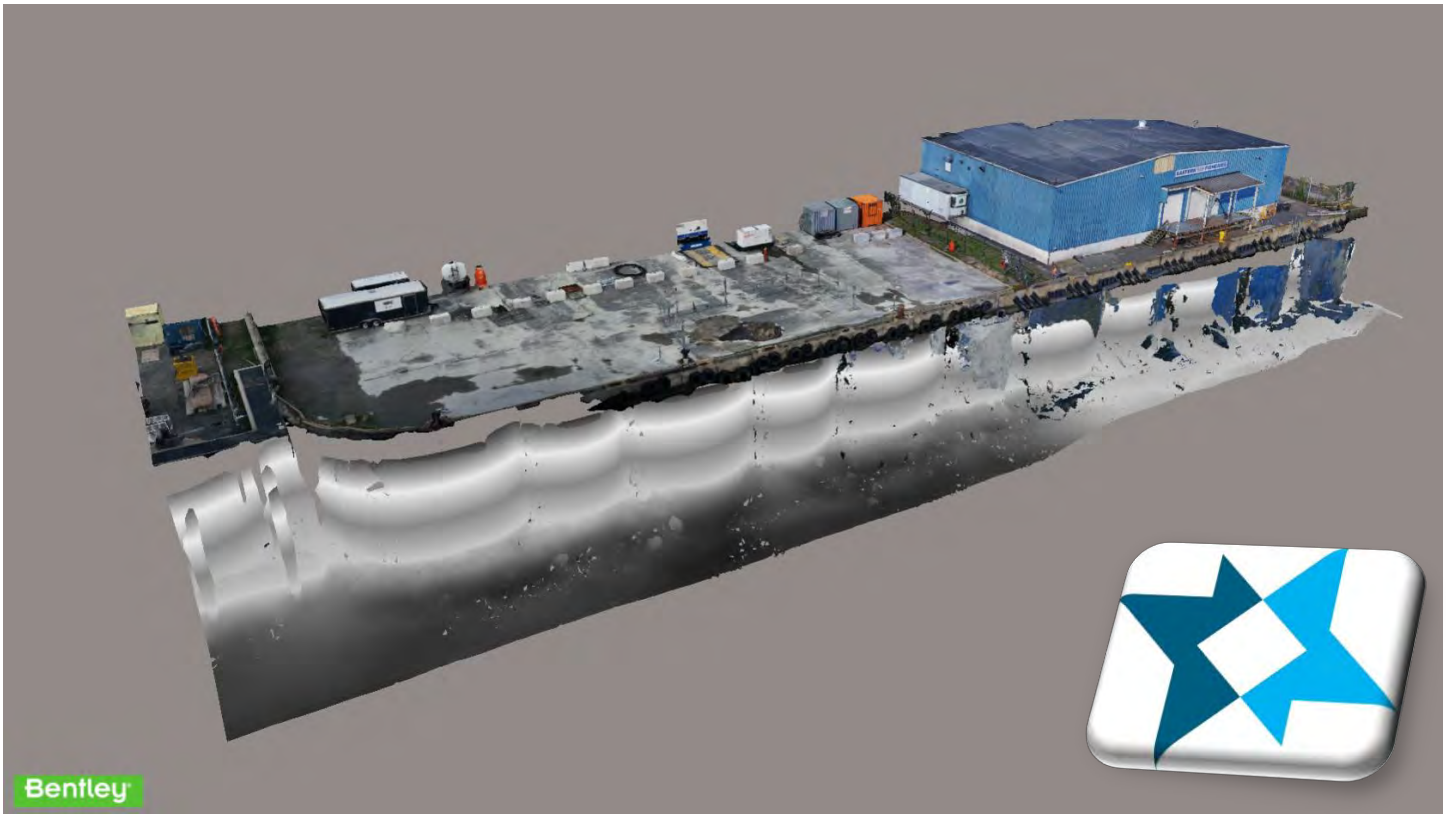
# Appendix E

# Drone Survey, Bentley iTwins Capture Model

# Drone Survey
## *Bentley iTwins Capture Model*

## 4 Wright Street & 6 Hassey Street

November 2025




Model Link: https://3d.foth.com/20251023_MassCEC_Schuster_Final/App/index.html#%2F

Prepared By: Mike Campagnone, P.E.

**Disclaimer Regarding iTwin Capture Model Access**

The Bentley iTwin Capture Model provided via the link above is intended for informational and visualization purposes only. It represents data collected during the aerial drone survey conducted by Foth in accordance with ASPRS Positional Accuracy Standards for Digital Geospatial Data (2024). While reasonable efforts have been made to ensure the accuracy and completeness of the model, it should not be relied upon for engineering design, construction, or legal boundary determination without further validation. Access to the model is provided "as-is," and Foth makes no warranties, express or implied, regarding its fitness for a particular purpose. Users are responsible for verifying any measurements or interpretations derived from the model. Foth assumes no liability for any decisions made or actions taken based on this data.

**Solving our clients' toughest**
**science and engineering challenges.**

# Appendix F

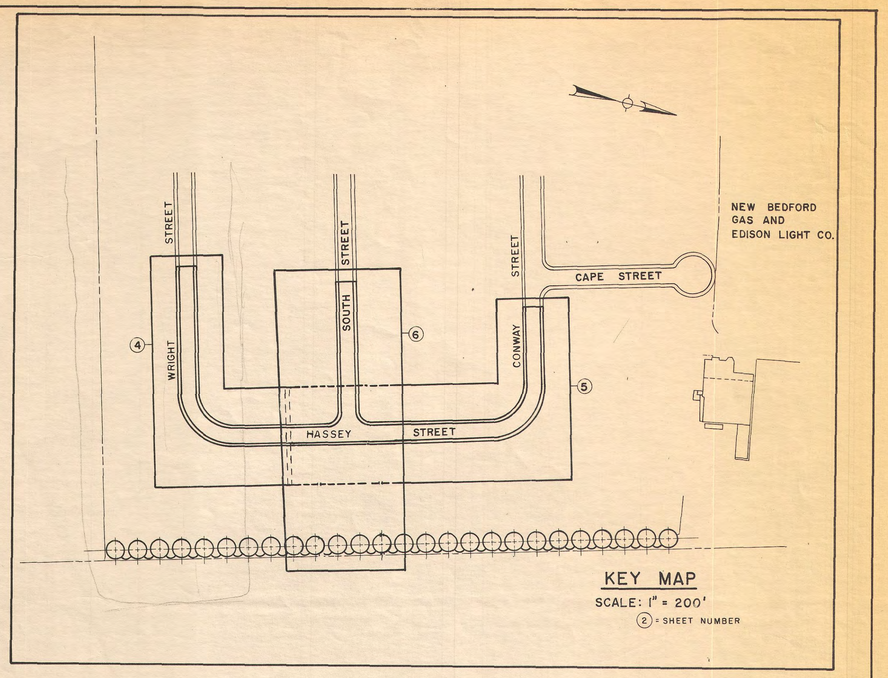
# Historical Documentation

## EXISTING TOPOGRAPHY & ABBREVIATIONS:

| | |
|---|---|
| T | Underground **Telephone** Duct N.E.T. & T. |
| 9 duct E | Underground **Electric** Duct N.B.G. & E.L. Co. |
| 6" G | 6" Gas Main N.B.G. & E.L. Co. |
| P | Underground Police Line |
| B △#21 | Baseline and Angle Point No. 21 |
| 8" S | 8" Sanitary Sewer |
| B Line 19 20 | Stationing Line |
| P | Profile Line |
| F | Underground Fire Alarm Line |
| | Easement Line or R.O.W. Line |
| 4" Steam | 4" Steam Pipe |
| 4" H.W. | 4" Hot Water |
| | Anticipated Rock Line |
| | Stone Wall |
| | Tree |
| | Curb Inlet |
| | Manhole |
| | Water Gate Valve |
| | Hydrant |
| | Street Light or Utility Pole with Street Light |
| | Utility Pole without Street Light |
| Pvt. Pole | Private Utility Pole |
| △F | Fire Alarm Box |
| △P | Police Call Box |
| N.B.G. & E.L. Co. | New Bedford Gas and Edison Light Company |
| N.B.W.W. | New Bedford Water Works |
| N.E.T. & T. or A.T. & T. | New England Telephone and Telegraph |
| Conc. Sdwk. | Portland Cement Concrete Sidewalk |
| Bit. Conc. | Bituminus Concrete |
| P.V.R.C. | Point of Reversing Vertical Curve |
| P.R.C. | Point of Reversing Horizontal Curve |
| P.V.I. | Point of Intersection (Vertical Curve) |
| P.I. | Point of Intersection (Horizontal) |
| L.V.C. | Length of Vertical Curve |
| M.H.W. | Mean High Water |
| M.L.W. | Mean Low Water |
| R.O.W. | Right of way |
| B.O.W. | Back of Walk |
| Inv. | Invert |
| M.H. | Manhole |
| C.B. | Catch Basin |
| R.C. | Reinforced Concrete |
| C.C. | Center to Center |
| B.C. | Beginning of Horizontal Curve |
| E.C. | End of Horizontal Curve |
| E.P. | Edge of Pavement |
| S.B. | Stone Bound |

## PROPOSED CONSTRUCTION: (See Note 1)

| | |
|---|---|
| 12" V.C.P. | New 12" Vitrified Clay Sanitary Sewer Pipe. (See Note 10) |
| 24" R.C.P. | New 24" Reinforced Concrete Storm Drain Pipe. (See Note 9) |
| 16" C.I.P. | New 16" Cast Iron Pipe. (Water pipe except where noted otherwise.) |
| | New Manhole. (4' or 5' diameter.) |
| | New Special Manhole. |
| CB 13 | New Catch Basin. (Number 13) |
| | New Water Gate Valve. |
| | New Hydrant & Valve Assembly. (See Water Details Sht.) |
| | Existing Pipe to be Plugged & Abandoned or Removed. (Removal req'd only where indicated on Drawings) |
| | Existing Manhole to be Removed. |
| | New Street Light Foundation and Conduit |
| △P | New Police Alarm Foundation & Pedestal |
| △F | New Fire Alarm Foundation & Pedestal |
| | New Chain Link Fence |
| 8.50 | New Sign (See Note 14) |
| | Finished Pavement Grade (See Note 5) |
| | New Retaining Wall |
| | New Granite Block Paving |
| M 19 | New Property Monument (Number 19) |
| | New Tree or Shrub — Deciduous (See Note 12) |
| | New Tree or Shrub — Evergreen (See Note 12) |
| | Conform to Existing Surface |
| Pavement — Curb (Granite or Bit. Conc.) — Sdwk (Conc. or Bit. Conc.) | |
| | New Reinforced Concrete Box Culvert (Twin 13' x 7' Shown) |
| | Top of Fill (See Fill & Grading Sheet) |
| | Toe of Slope |



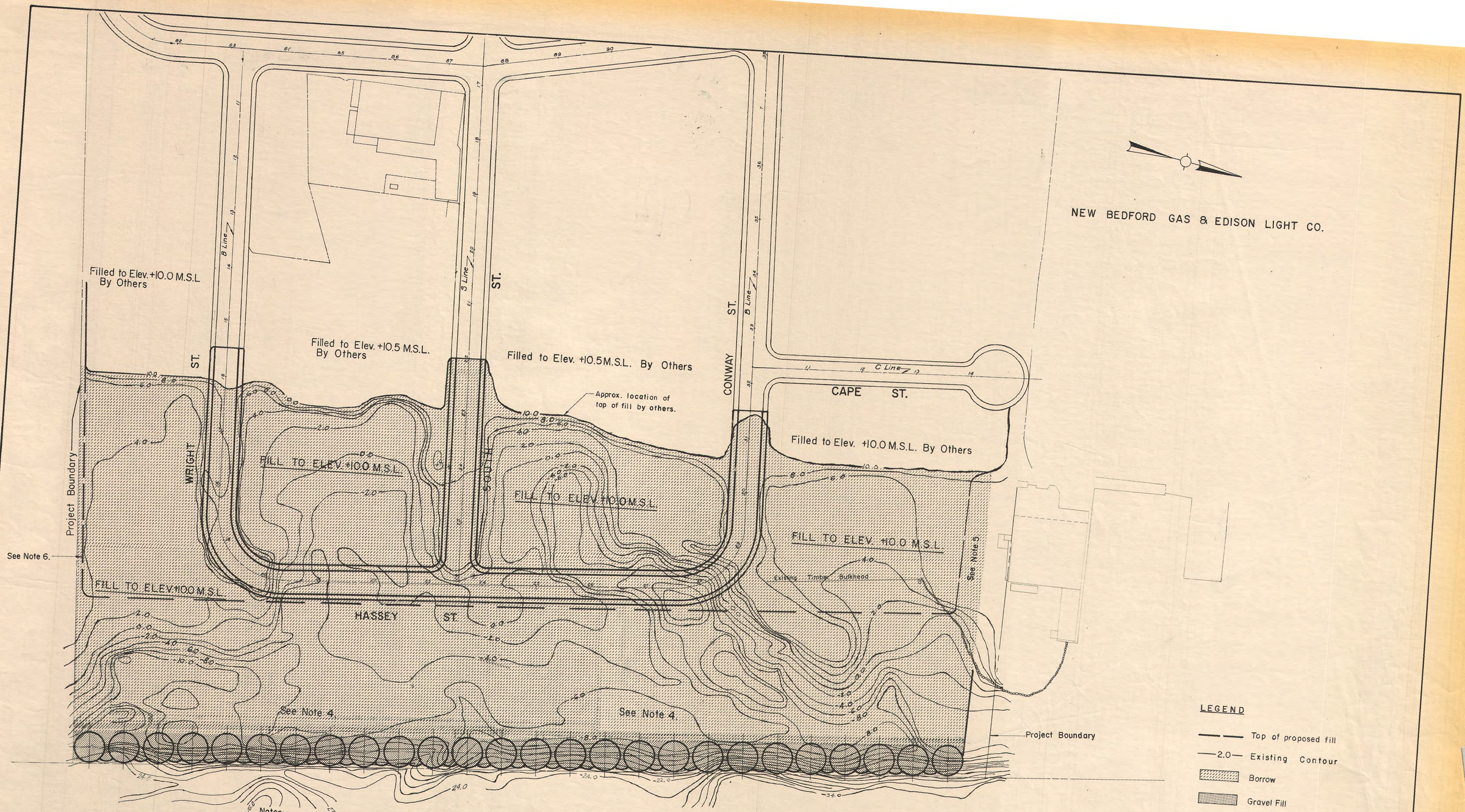

KEY MAP
SCALE: 1" = 200'
(2) = SHEET NUMBER

## GENERAL NOTES:

1. Symbols listed under "Proposed Construction" (at left) refer to work to be done by Contractor under the terms of the contract. These symbols and other specific instructions on the Drawings and in the Specifications will be used to indicate the work to be done by the Contractor.
2. Elevations are referenced to United States Coast and Geodetic Mean Sea Level (M.S.L.) datum.
   Mean high tide = 1.70'
   Spring tide = +3.0'±
   New Bedford city datum = +2.55'
3. Coordinates are referenced to Mass. Geodetic System.
4. Location of existing utilities is approximated, and is based on the best information available. Local connections are not shown. The Contractor is fully responsible for locating all utilities, whether shown on the Drawings or not, and is fully liable for any damage thereto. Additional compensation for errors and omissions in the location of utilities as shown on the Drawings will be allowed only as specified in the Specifications.
5. All elevations refer to finished pavement grade unless otherwise noted.
6. Catch Basin grate elevations are measured at center of grate and at face of curb. Elevations include 1-3/8" gutter depression. (See Catch Basin Details)
7. Curb radii are to face of curb.
8. Location of demolished buildings are not shown.
9. All proposed storm drainage pipes not labeled are 15" R.C.P.
10. All proposed sanitary sewer pipes not labeled are 8" V.C.P.
11. Modification, abandonment and/or addition to gas, electric & telephone utilities are not shown on the Drawings, but are shown on the Information Sheets only.
12. See Landscaping Detail Sheet for other landscaping work to be done by the Contractor.
13. Place 2 vitrified clay "y"s (one aimed at each side of street), with vitrified clay stoppers jointed in place, on V.C.P. sanitary sewer lines every 50' measured upgrade from the last preceeding manhole.

NEW BEDFORD REDEVELOPMENT AUTHORITY
PROJECT - MASS. R-96
SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | LEGEND & GENERAL NOTES | CONTRACT NO. 2 |
| DESIGNED BY E.L. | | SHEET NO. 2 OF 37 |
| CHECKED BY W.D. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G.R.C. | | DRW NO. 371-02-02 |




LEGEND

- Top of proposed fill
- 2.0 Existing Contour
- Borrow
- Gravel Fill

Notes:

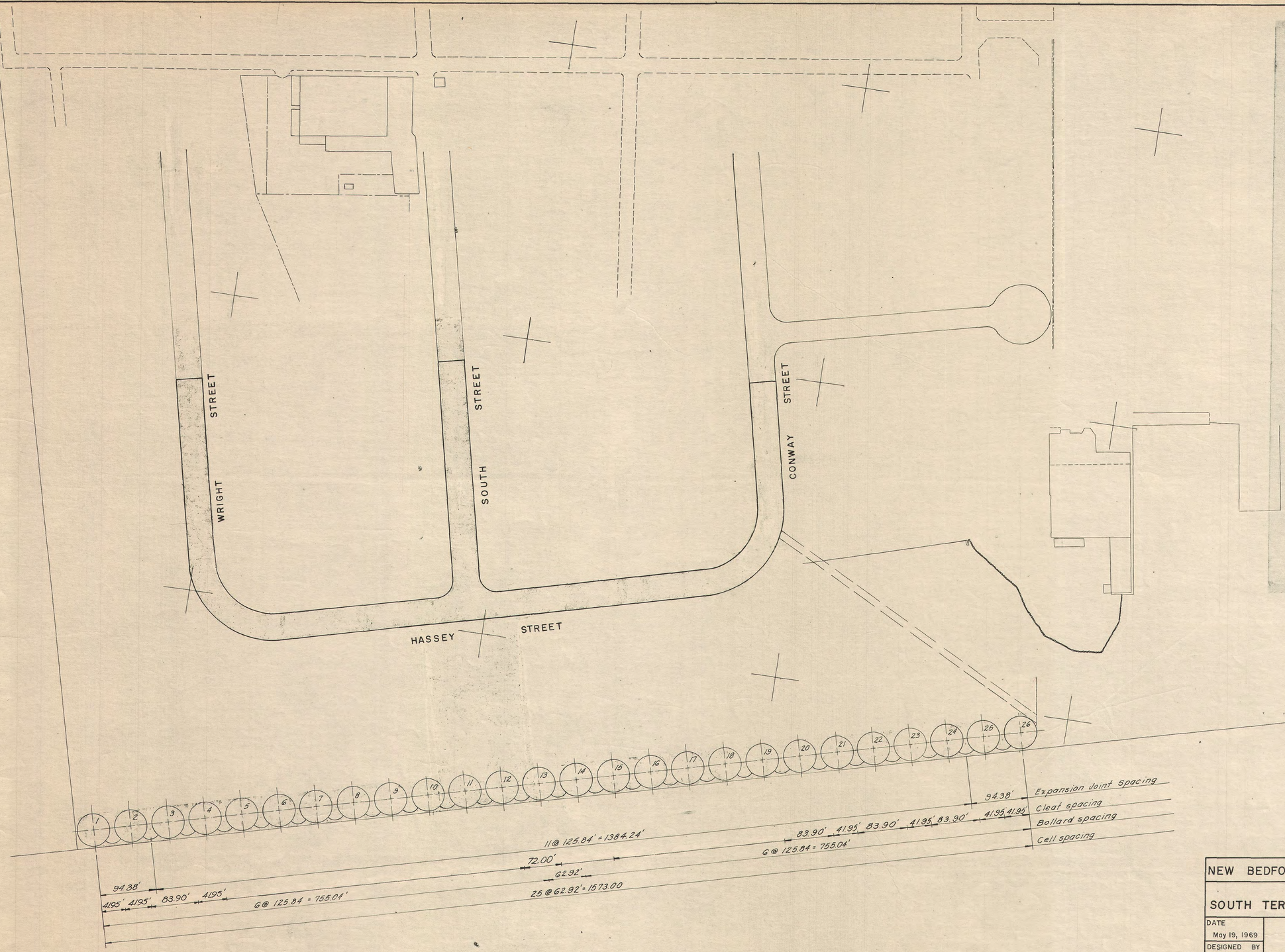
1. Existing contours as per field survey performed March 1969.
2. The entire area in which fill is to be placed shall be cleared and grubbed.
3. Material shall not be removed from areas in which fill is not required, all fill shall be obtained from beyond the Project Boundary.
4. Fill & Grade uniformily from elev. 10.0 M.S.L. to elev. 6.5 M.S.L. at Bulkhead Wall.
5. Grade from elev. 10.0 M.S.L. to existing ground at 10:1 or as directed by the Engineer.
6. Grade from elev. 10.0 M.S.L. to existing ground at Project Boundary at 2:1, or as directed by the Engineer.
7. Dust control shall be performed throughout the entire area of work. (See Specs.)
8. See sheet No. 34 for additional detail on fill & excavation.

NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT - MASS. R-96

SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | FILL & GRADING PLAN | CONTRACT NO. 2 |
| DESIGNED BY: P.L. | | SHEET NO. 14 OF 37 |
| CHECKED BY: W.D. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE 1"=80' |
| APPROVED BY: G.R.C. | | DRW. NO. 371-02-14 |




## DESIGN NOTES

1. General
   a. Elevations are based on mean sea level datum.
   b. Mean tide range is 3.7 feet.

2. Live Load Surcharge - 1,000 psf

3. Earthwork
   a. Unit dry weight = 106 pcf
   b. Unit moist weight = 120 pcf
   c. Unit submerged weight = 60 pcf
   d. Angle of friction, $\phi$ = 35°

4. Concrete
   a. All concrete shall have 4,000 psi ultimate.
   b. Concrete below water shall be tremie concrete.
   c. Reinforcing steel shall have a minimum yield strength of 30,000 psi and shall conform to ASTM A-615.
   d. Lap all splices 30 bar diameters.
   e. All reinforcement to have protection shown on all faces exposed to salt water action protect with 4" Concrete cover.

5. Structural Steel
   a. All material to be ASTM A36 except as noted.
   b. All hardware, anchor bolts, etc., shall be hot dipped galvanized steel.

6. Timber
   a. All timber shall be Douglas fir or Southern Yellow Pine pressure creosoted.

7. Cathodic Protection
   a. Cathodic protection shall be an impressed current system.

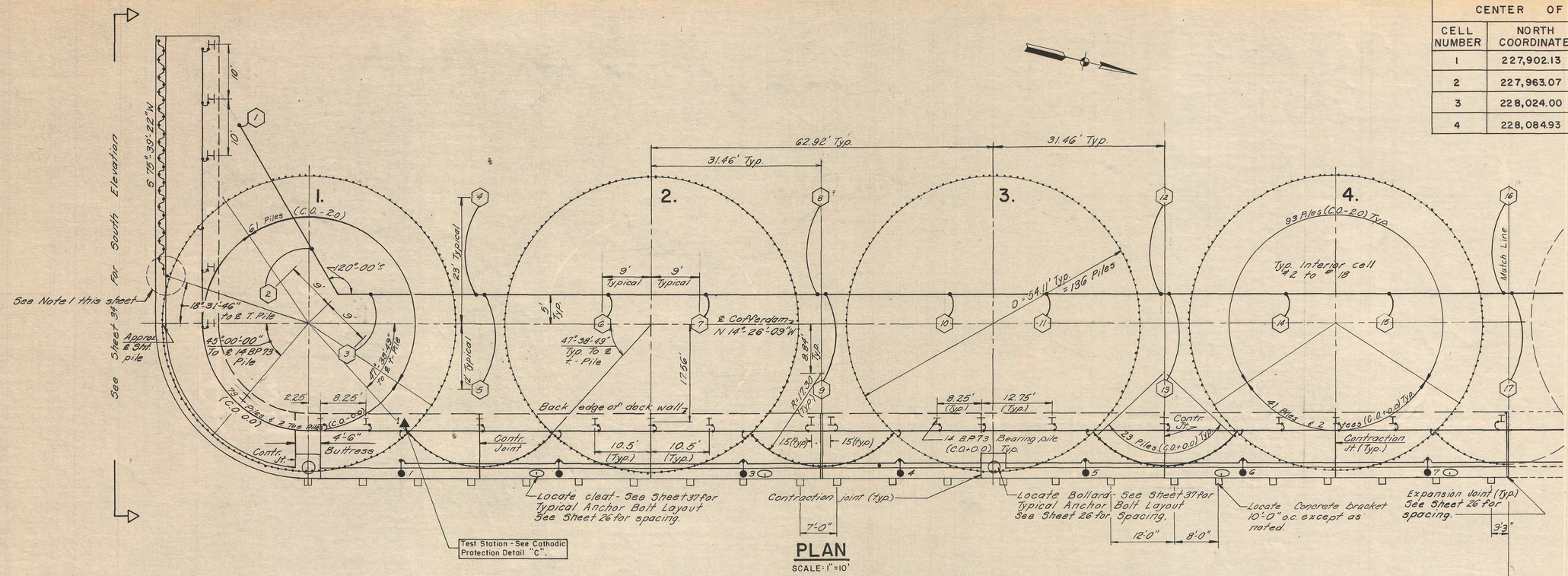
NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT – MASS. R-96

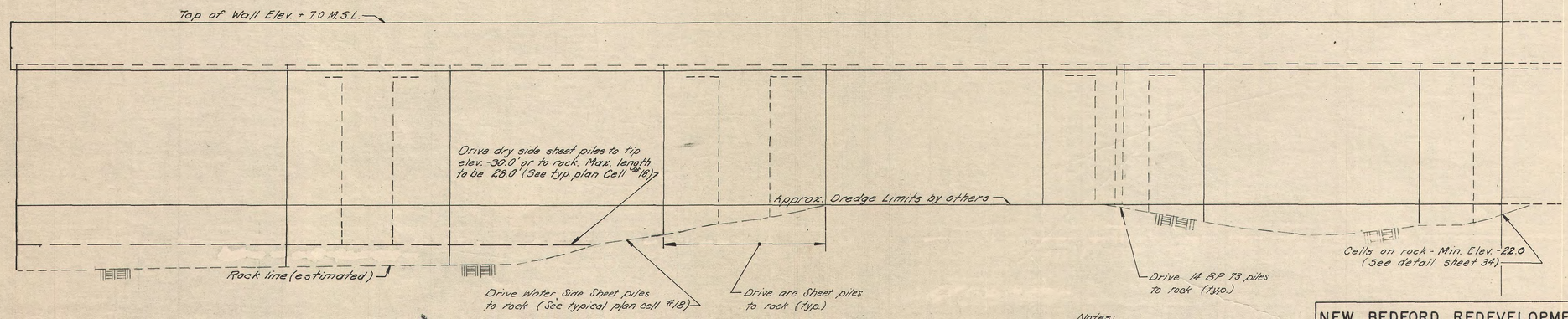
SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE May 19, 1969 | BULKHEAD GENERAL PLAN | CONTRACT NO. 2 |
| DESIGNED BY R.C.S. | | SHEET NO. 26 OF 37 |
| CHECKED BY E.P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE 1" = 80' |
| APPROVED BY G.R.C. | | DRW. NO. 371-02-26 |

| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 1 | 227,902.13 | 759,919.33 |
| 2 | 227,963.07 | 759,903.64 |
| 3 | 228,024.00 | 759,887.96 |
| 4 | 228,084.93 | 759,872.27 |




## PLAN
SCALE: 1"=10'




## PROFILE
SCALE: 1"= 10'

Notes:
1. The Contractor shall furnish details of connection for approval of the Engineer.

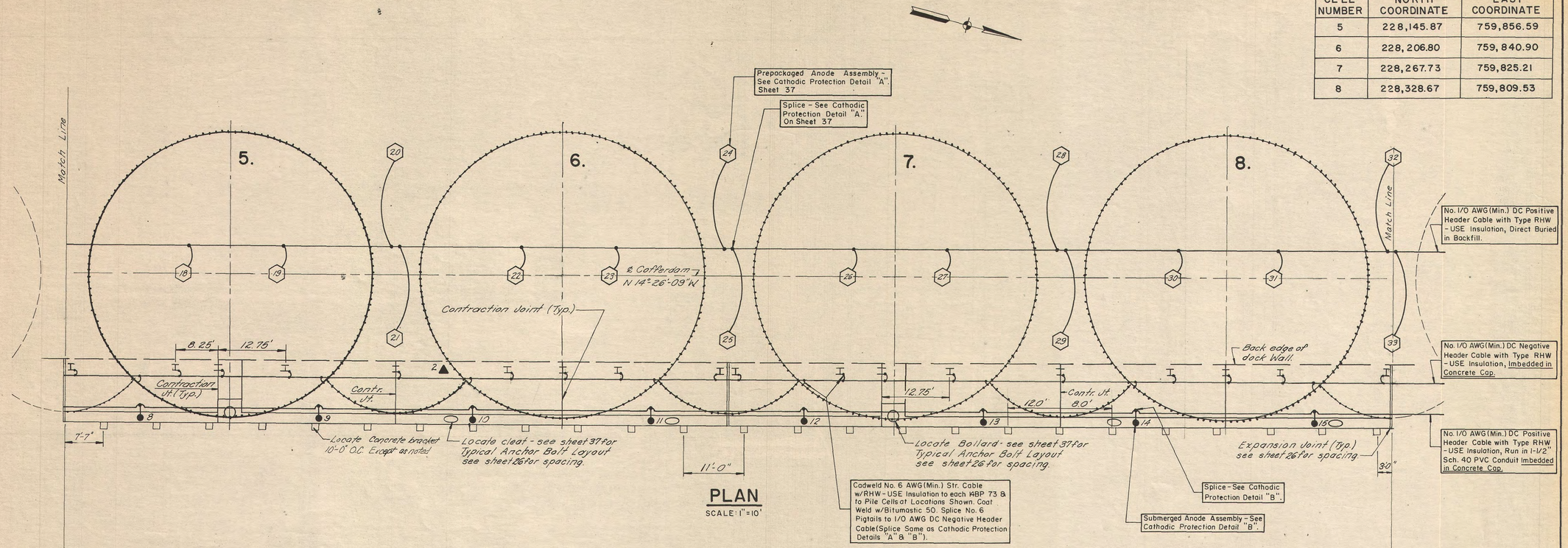
NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT - MASS R-96

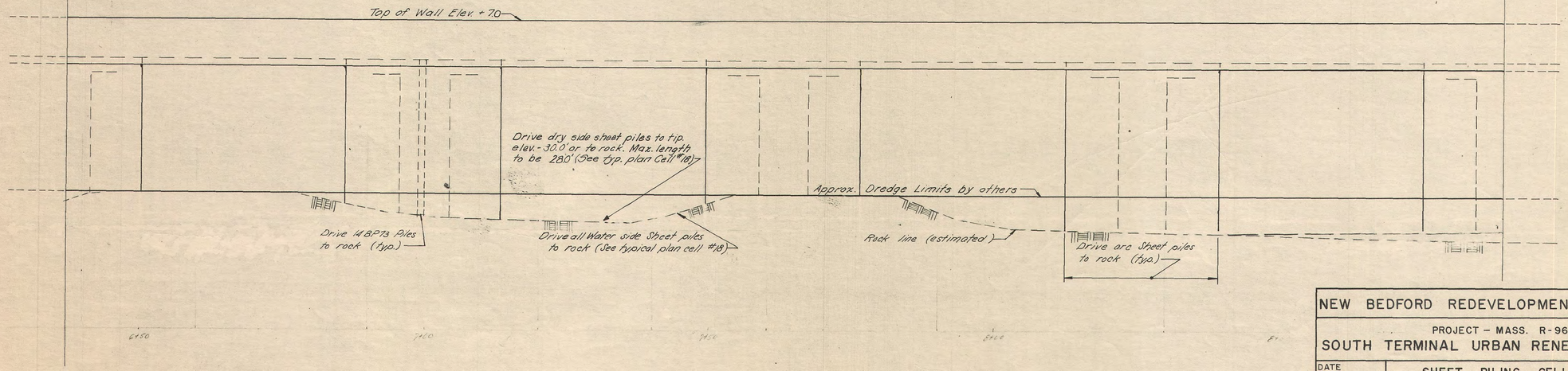
SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | SHEET PILING CELLS 1 THRU 4 PLAN AND PROFILE | CONTRACT NO. 2 |
| DESIGNED BY: R.C.S. | | SHEET NO. 27 OF 37 |
| CHECKED BY: P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE: AS SHOWN |
| APPROVED BY: G.R.C. | | DRW NO. 371-02-27 |

| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 5 | 228,145.87 | 759,856.59 |
| 6 | 228,206.80 | 759,840.90 |
| 7 | 228,267.73 | 759,825.21 |
| 8 | 228,328.67 | 759,809.53 |



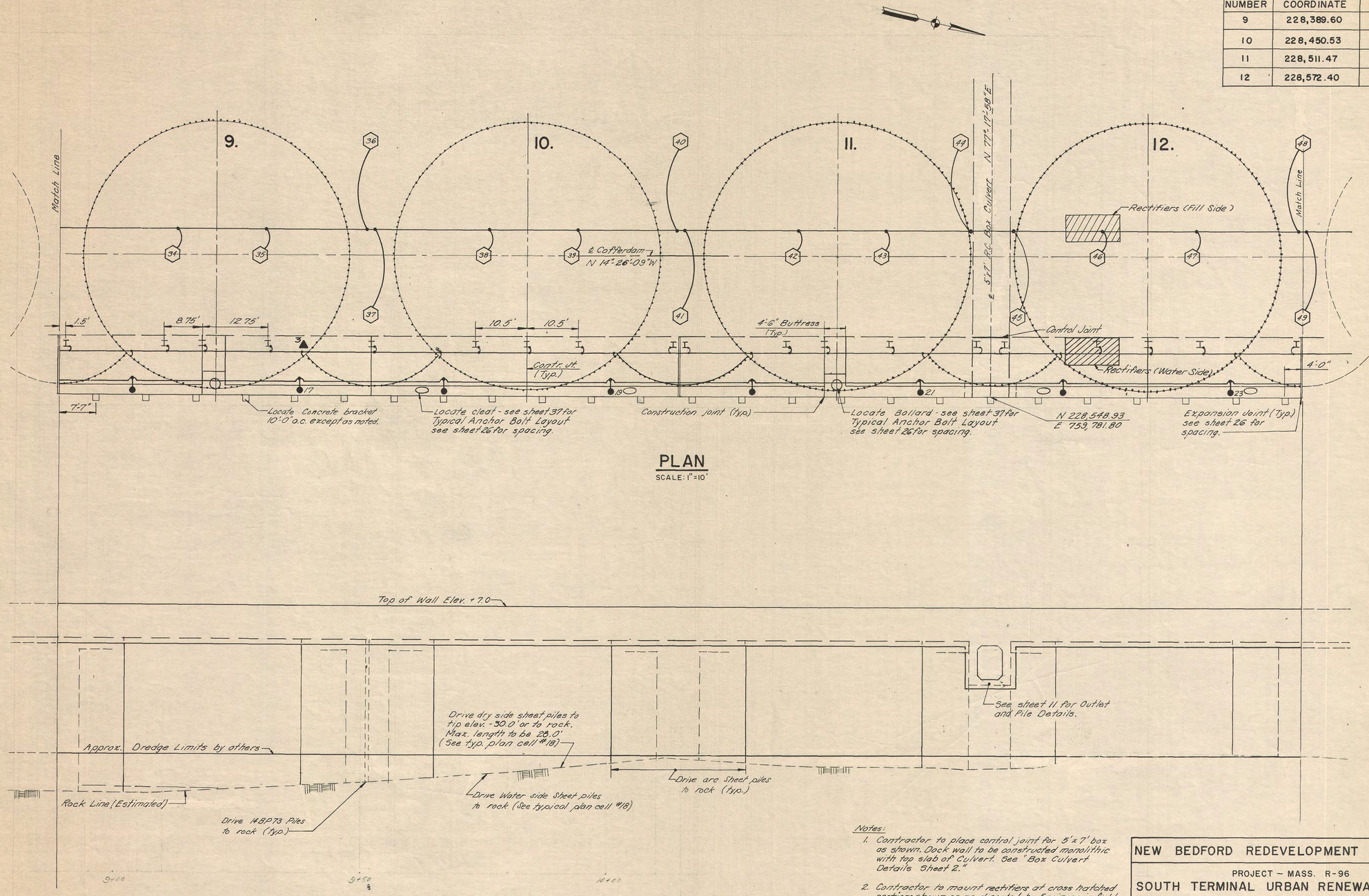

## PLAN
SCALE: 1" = 10'




## PROFILE
SCALE: 1" = 10'

| | | |
|---|---|---|
| NEW BEDFORD REDEVELOPMENT AUTHORITY | | |
| PROJECT – MASS. R-96<br>SOUTH TERMINAL URBAN RENEWAL PROJECT | | |
| DATE: May 19, 1969 | SHEET PILING CELLS 5 THRU 8 PLAN AND PROFILE | CONTRACT NO. 2 |
| DESIGNED BY R.C.S. | | SHEET NO. 28 OF 37 |
| CHECKED BY P. L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G.R.C. | | DRW. NO. 371-02-28 |

| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 9 | 228,389.60 | 759,793.84 |
| 10 | 228,450.53 | 759,778.16 |
| 11 | 228,511.47 | 759,762.47 |
| 12 | 228,572.40 | 759,746.78 |




PLAN
SCALE: 1"=10'




PROFILE
SCALE: 1"= 10'

Notes:

1. Contractor to place control joint for 5'x 7' box as shown. Dock wall to be constructed monolithic with top slab of Culvert. See "Box Culvert Details Sheet 2."
2. Contractor to mount rectifiers at cross hatched sections shown or as directed by Engineer in field. Provision for Concrete Anchors must be made in slab of dock wall in accordance with Manufactuers requirements.
3. A.C. power to rectifier provided by others.

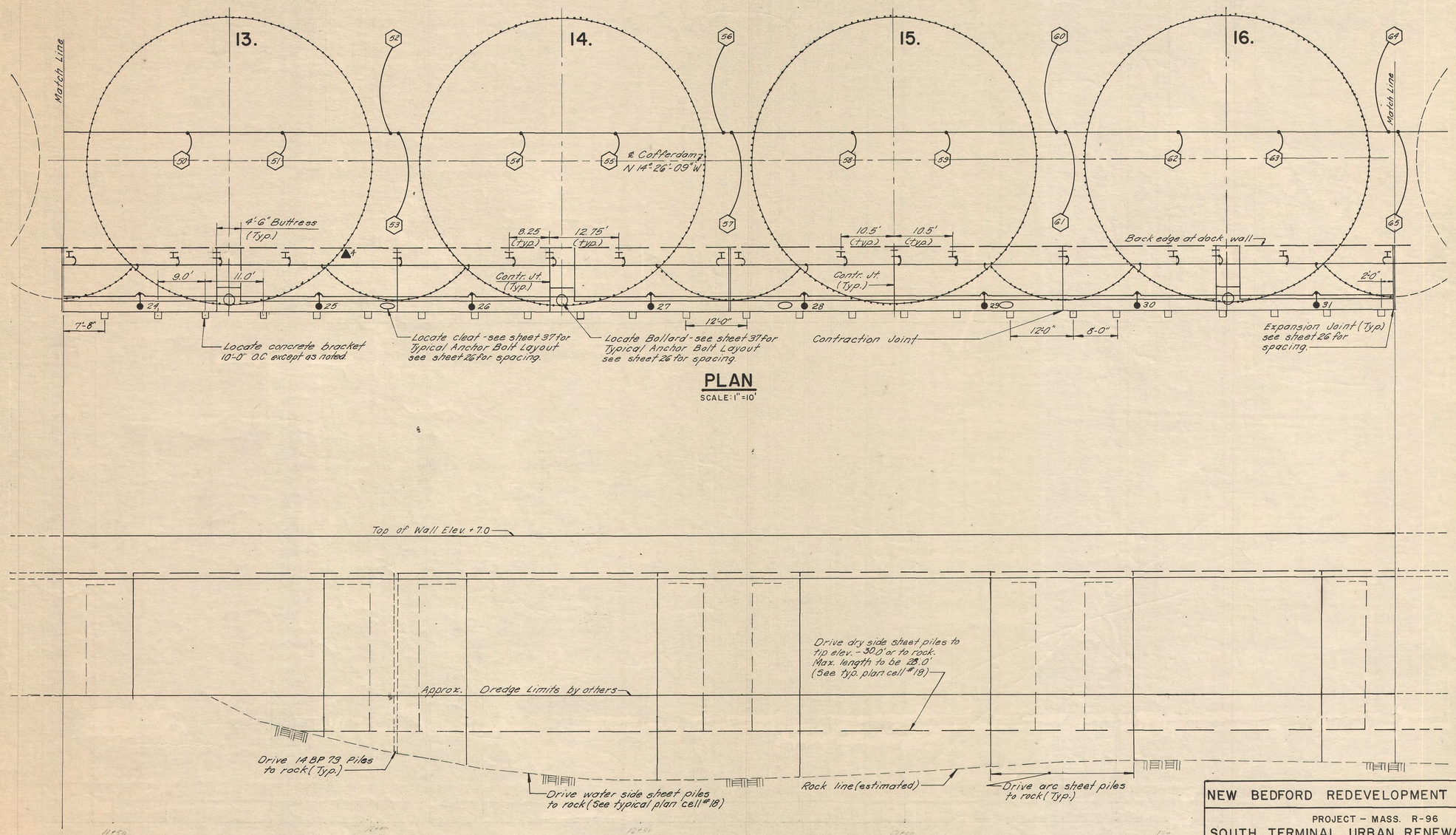
NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT – MASS. R-96

SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | SHEET PILING CELLS 9 THRU 12 PLAN AND PROFILE | CONTRACT NO. 2 |
| DESIGNED BY R.C.S. | | SHEET NO. 29 OF 37 |
| CHECKED BY P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G.R.C. | | DRW. NO. 371-02-29 |

| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 13 | 228,633.34 | 759,731.10 |
| 14 | 228,694.27 | 759,715.41 |
| 15 | 228,755.20 | 759,699.73 |
| 16 | 228,816.14 | 759,684.04 |




## PLAN
SCALE: 1" = 10'




## PROFILE
SCALE: 1" = 10'

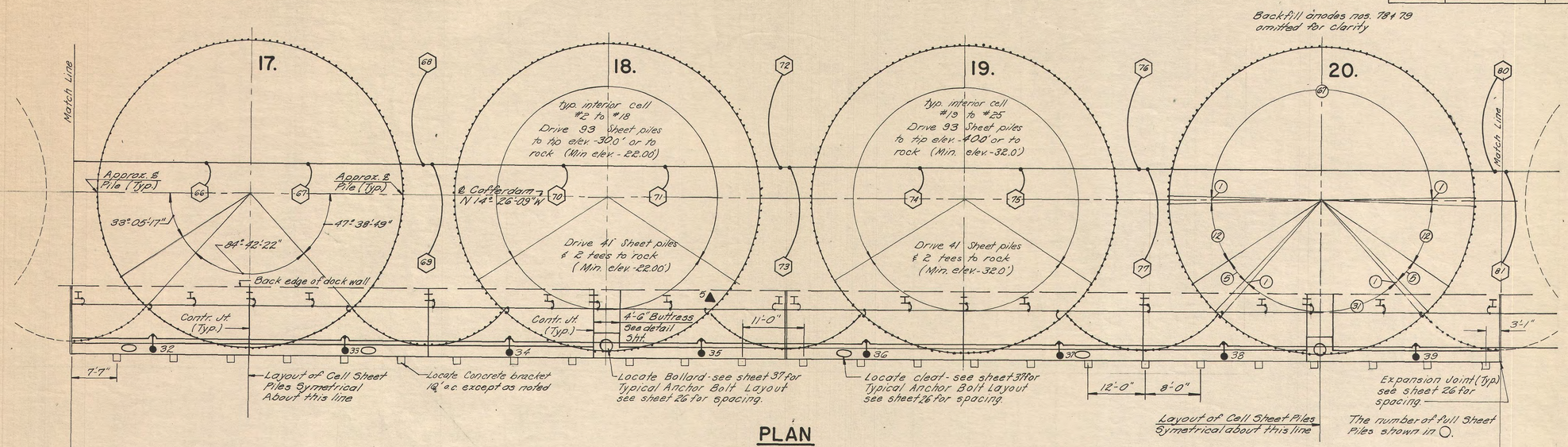
NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT – MASS. R-96

SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE May 19, 1969 | SHEET PILING CELLS 13 THRU 16 PLAN AND PROFILE | CONTRACT NO. 2 |
| DESIGNED BY R.C.S. | | SHEET NO. 30 OF 37 |
| CHECKED BY P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G.R.C. | | DRW. NO. 371-02-30 |

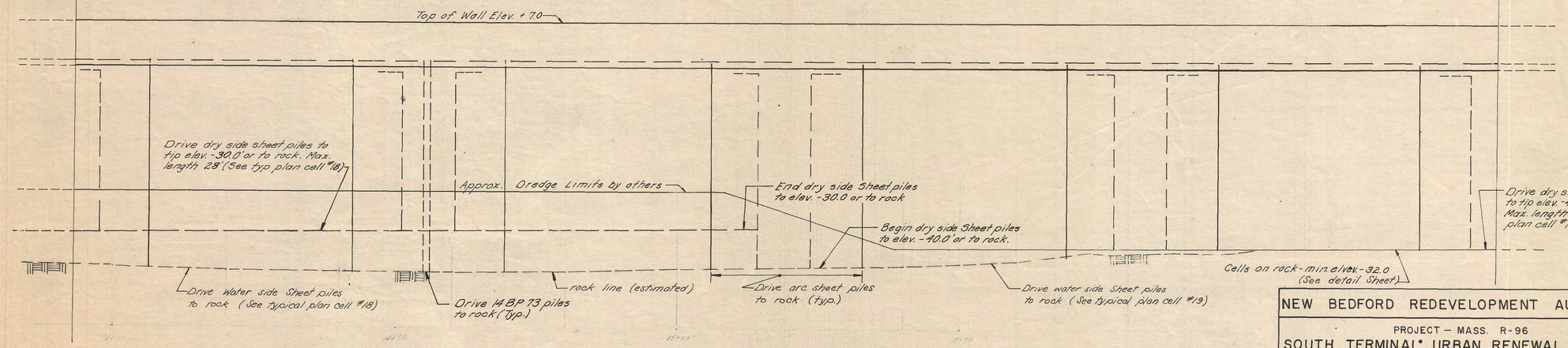
| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 17 | 228,877.07 | 759,668.36 |
| 18 | 228,938.00 | 759,652.67 |
| 19 | 228,998.94 | 759,636.98 |
| 20 | 229,059.87 | 759,621.30 |




## PLAN
SCALE: 1" = 10'

Notes:

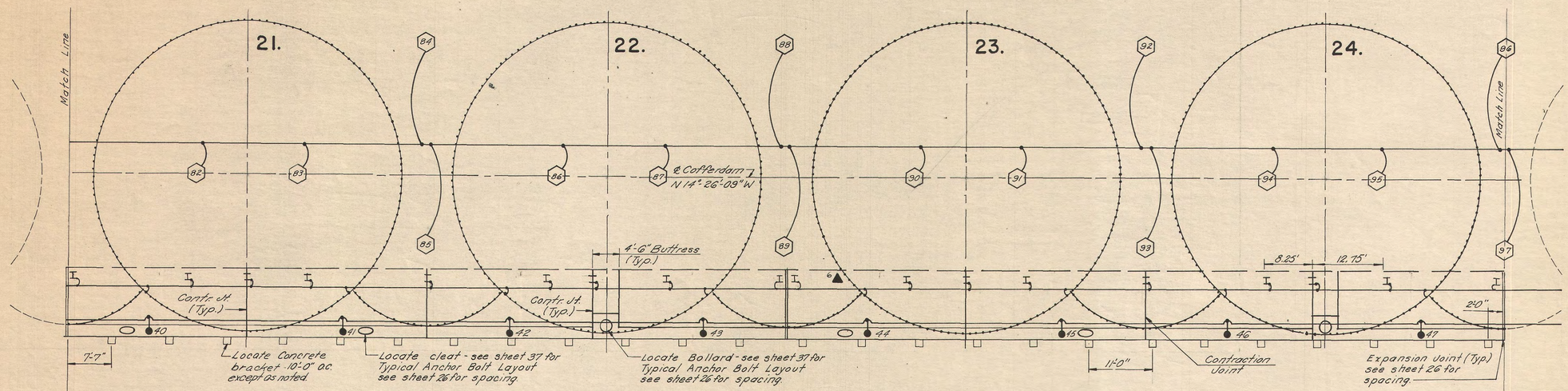
1. See Cell No. 17 for layout of typical interior cells No. 2 thru 25.
2. See Cell No. 18 for tip elev. of typical interior cells No. 2 thru 18.
3. See Cell No. 19 for tip elev. of typical interior cells No. 19 thru 25.
4. See Cell No. 20 for layout of typical interior cells No. 2 thru 25 by no. of full sheet piles.



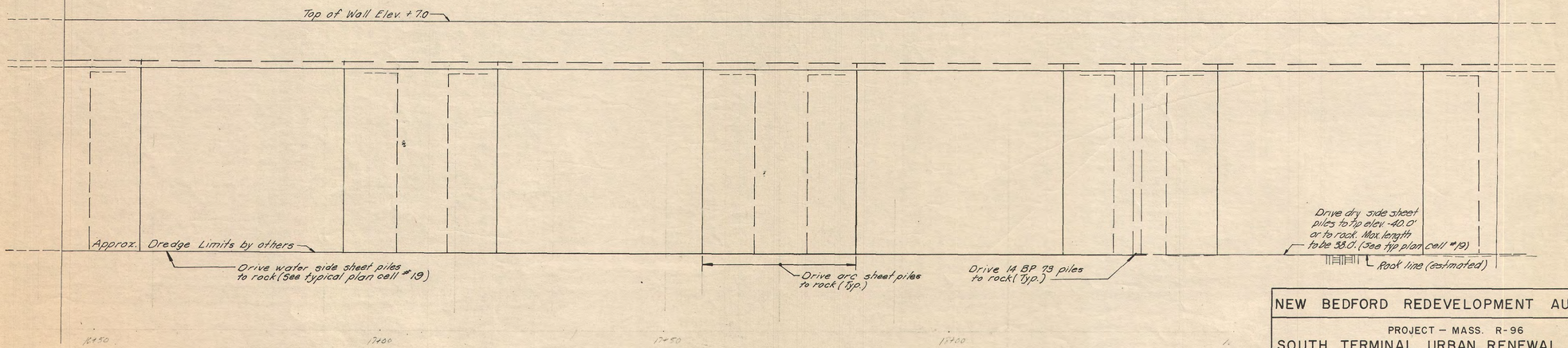

## PROFILE
SCALE: 1" = 10'

| NEW BEDFORD REDEVELOPMENT AUTHORITY | | |
|---|---|---|
| PROJECT – MASS. R-96<br>SOUTH TERMINAL URBAN RENEWAL PROJECT | | |
| DATE<br>May 19, 1969 | SHEET PILING CELLS<br>17 THRU 20<br>PLAN AND PROFILE | CONTRACT NO.<br>2 |
| DESIGNED BY<br>R.C.S. | | SHEET NO.<br>31 OF 37 |
| CHECKED BY<br>P.L. | GOODKIND & O'DEA, INC.<br>CONSULTING ENGINEERS<br>SPRINGFIELD, MASSACHUSETTS | SCALE<br>AS SHOWN |
| APPROVED BY<br>G.R.C. | | DRW NO.<br>371-02-31 |

| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 21 | 229,120.80 | 759,605.61 |
| 22 | 229,181.74 | 759,589.93 |
| 23 | 229,242.67 | 759,574.24 |
| 24 | 229,303.60 | 759,558.56 |




PLAN
SCALE: 1" = 10'




PROFILE
SCALE: 1" = 10'

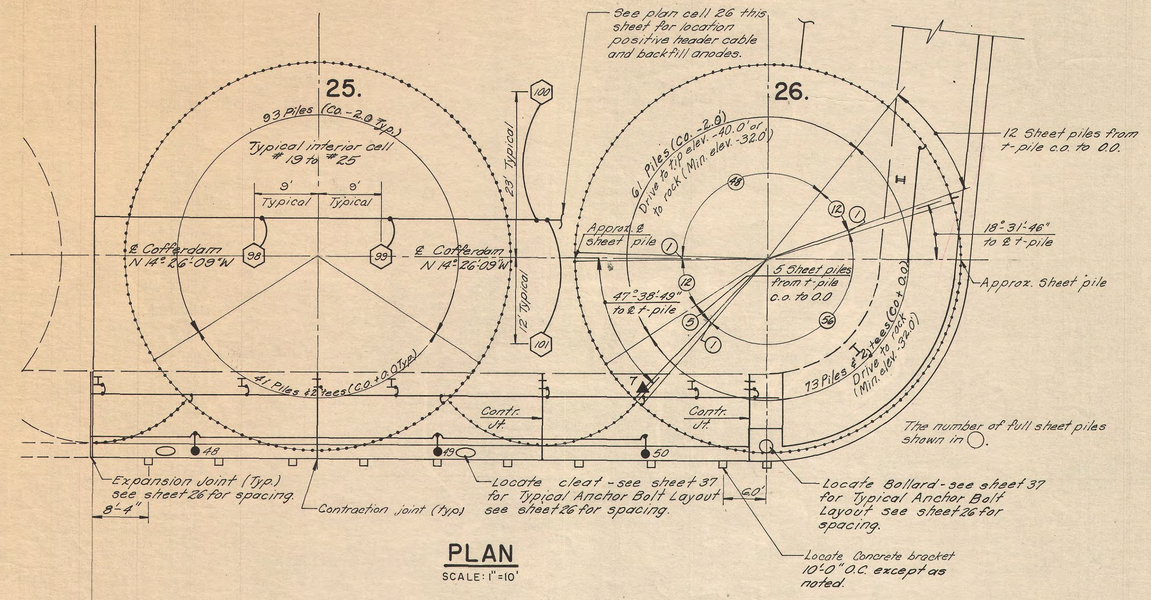
NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT – MASS. R-96

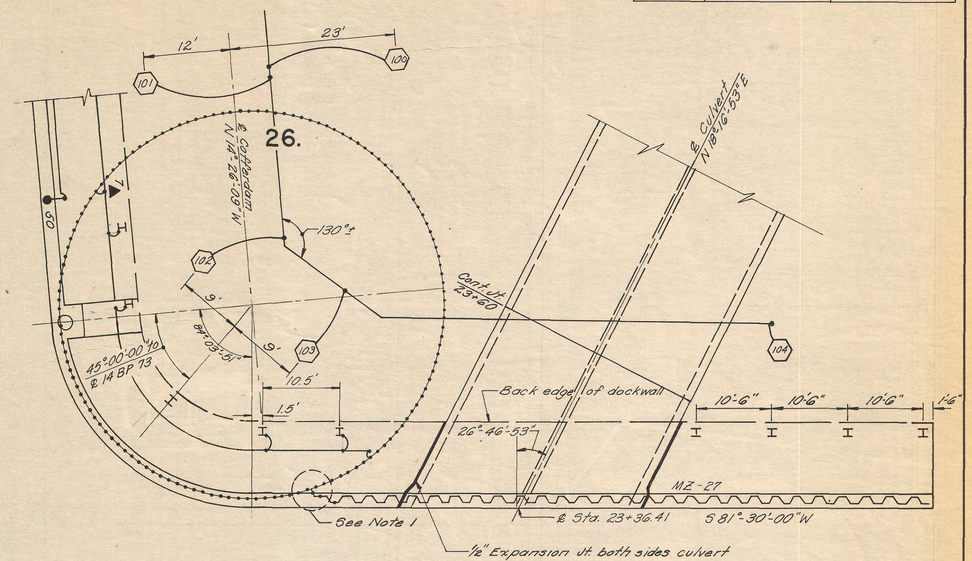
SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | SHEET PILING CELLS 21 THRU 24 PLAN AND PROFILE | CONTRACT NO. 2 |
| DESIGNED BY: R.C.S. | | SHEET NO. 32 OF 37 |
| CHECKED BY: P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY: G.R.C. | | DRW. NO. 371-02-32 |

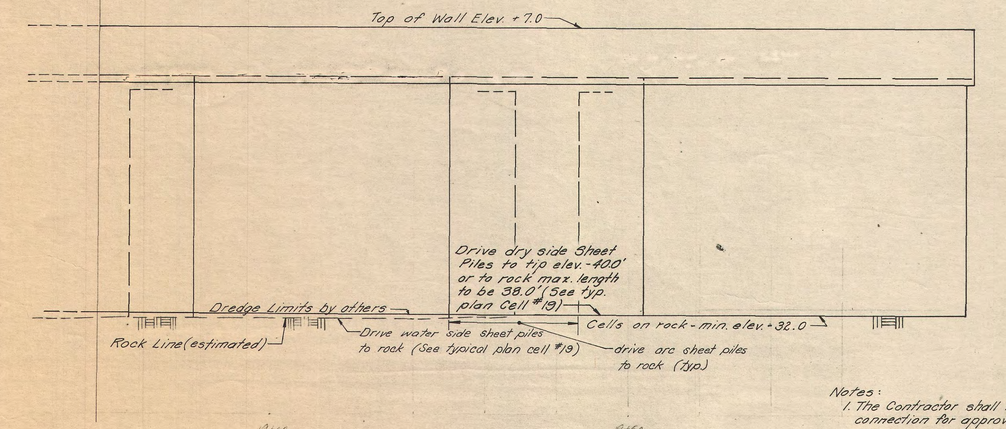
| CENTER OF CELLS | | |
|---|---|---|
| CELL NUMBER | NORTH COORDINATE | EAST COORDINATE |
| 25 | 229,364.87 54 | 759,542.87 |
| 26 | 229,425.47 | 759,527.18 |




PLAN
SCALE: 1"=10'

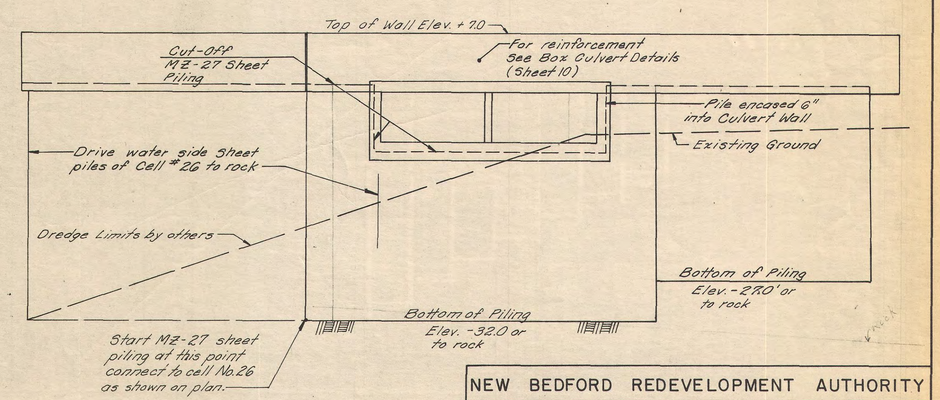



PLAN
SCALE: 1"=10'



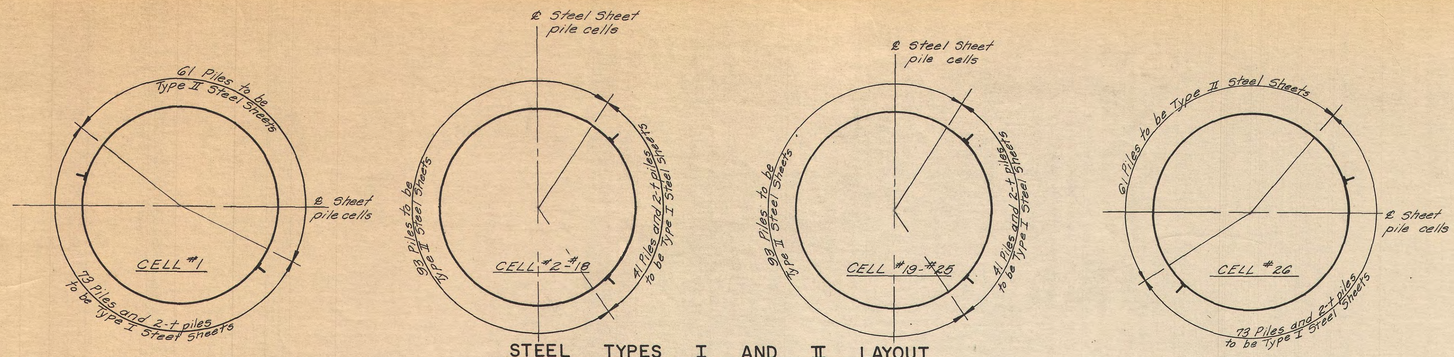

Notes:
1. The Contractor shall furnish details of connection for approval of the Engineer.

PROFILE
SCALE: 1"= 10'



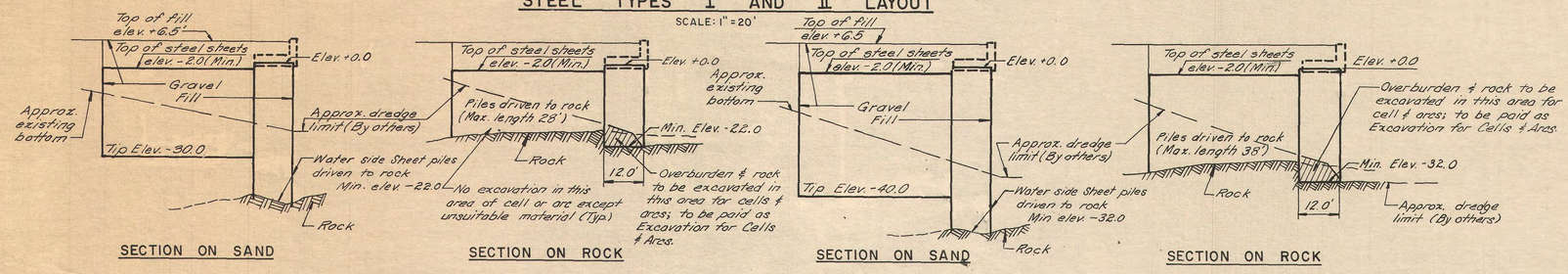

PROFILE
SCALE: 1"= 10'

| | | |
|---|---|---|
| NEW BEDFORD REDEVELOPMENT AUTHORITY | | |
| PROJECT – MASS. R-96<br>SOUTH TERMINAL URBAN RENEWAL PROJECT | | |
| DATE<br>May 19, 1969 | SHEET PILING CELLS<br>25 & 26<br>PLAN AND PROFILE | CONTRACT NO.<br>2 |
| DESIGNED BY<br>R.C.S. | | SHEET NO.<br>33 OF 37 |
| CHECKED BY<br>P.L. | GOODKIND & O'DEA, INC.<br>CONSULTING ENGINEERS<br>SPRINGFIELD, MASSACHUSETTS | SCALE<br>AS SHOWN |
| APPROVED BY<br>G.R.C. | | DRW. NO.<br>371-02-33 |




## STEEL TYPES I AND II LAYOUT

SCALE: 1" = 20'

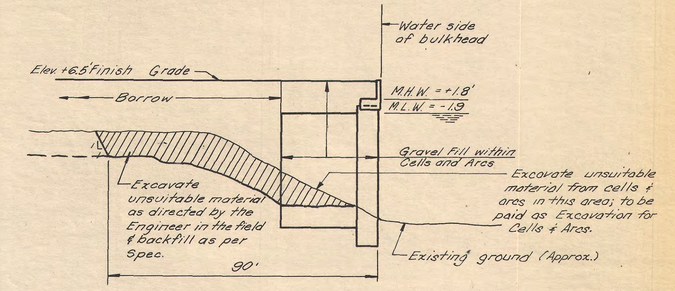



**CELLS 1-18**
(20 FT. DRAFT)

**CELLS 19-26**
(30 FT. DRAFT)

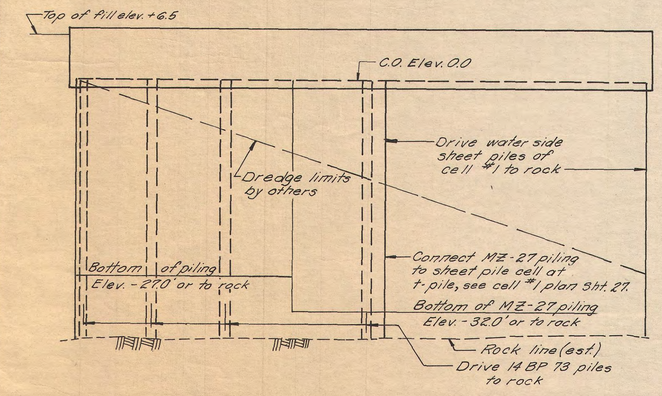
## TYPICAL CELL SECTIONS

SCALE: 1" = 20'



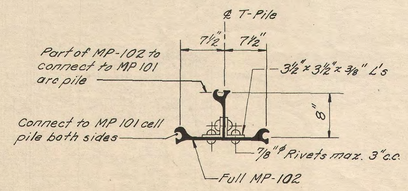

## TYPICAL SECTION SHOWING LIMITS OF REMOVAL OF UNSUITABLE MATERIAL

NOT TO SCALE




## SOUTH ELEVATION

SCALE: 1" = 10'




## TYPICAL "TEE" PILE

NOT TO SCALE

Notes:

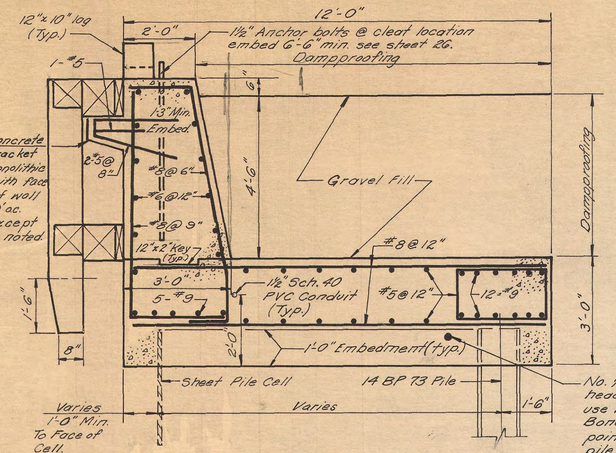
1. Unsuitable material to be disposed of as per specifications.
2. Minimum length of dry side steel sheets in cells to be 15' in 20' draft, and 20' in 30' draft.
3. All steel sheet piling for cells and arcs to have section properties of U.S. Steel MP-101 except as otherwise noted.
4. All arc piles, and all MZ-27 sheet piles to be type-I steel sheets.
5. Gravel fill to be placed within cells and arcs insuring no segregation of particle sizes, uncontrolled dumping will not be allowed.
6. No welding of "tee" pile or fabricated connections will be permitted.
7. Protective Coating to be applied in accordance with Specifications to all type-I steel sheets.

NEW BEDFORD REDEVELOPMENT AUTHORITY

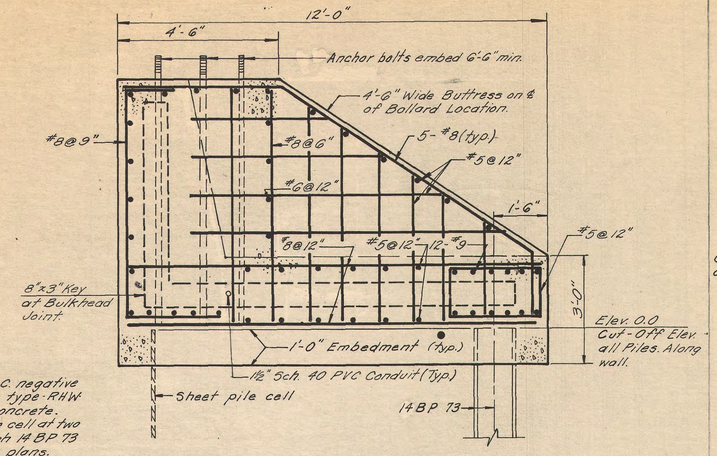
PROJECT MASS. R-96

SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE: May 19, 1969 | DETAILS (SHEET PILING CELLS) | CONTRACT NO. 2 |
| DESIGNED BY: R.C.S. | | SHEET NO. 34 OF 37 |
| CHECKED BY: P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE: AS SHOWN |
| APPROVED BY: G.R.C. | | DRW NO. 371-02-34 |

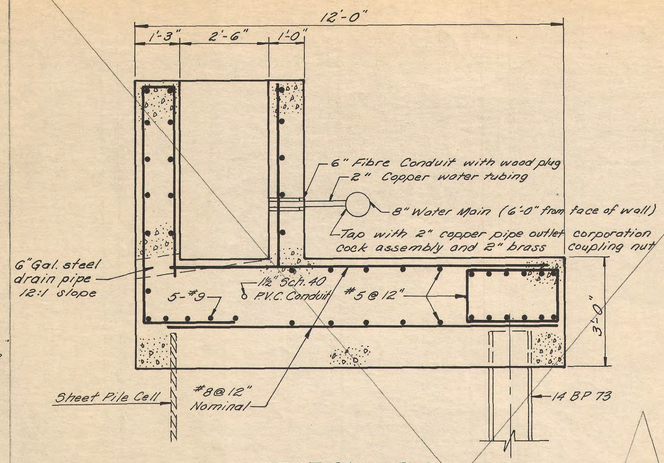



## TYPICAL WALL SECTION




## SECTION A-A

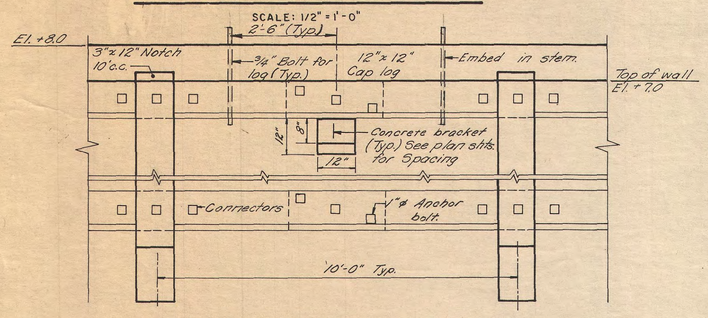
SCALE: 1/2"=1'-0"




## SECTION B-B

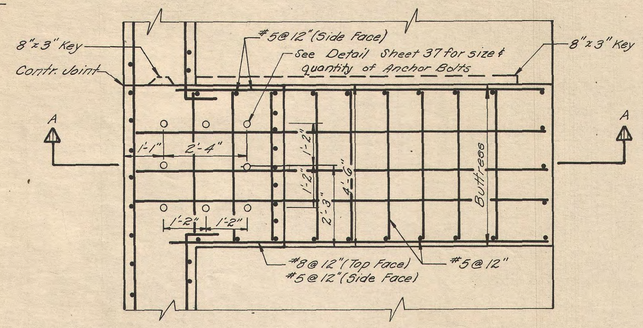
SCALE: 1/2"=1'-0"

N.I.C.



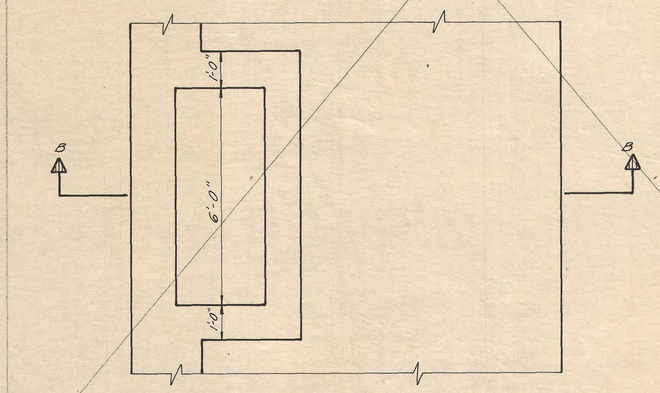

## TYPICAL FRONT ELEVATION

SCALE: 1/2"=1'-0"



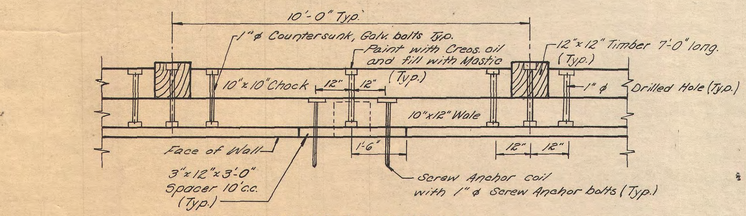

## PLAN AT BOLLARD LOCATION

SCALE: 1/2"=1'-0"



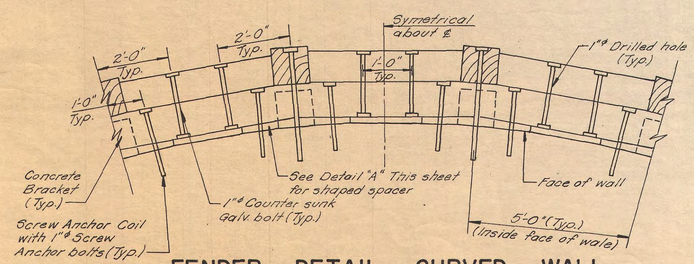

## UTILITY PIT PLAN

SCALE: 1/2"=1'-0"



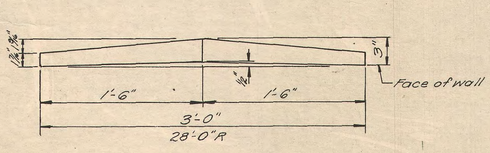

## FENDER DETAIL

SCALE: 1/2"=1'-0"



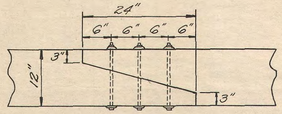

## FENDER DETAIL CURVED WALL

SCALE: 1/2"=1'-0"




## DETAIL "A"

NOT TO SCALE




## WALE SPLICE

NOT TO SCALE

### Notes:

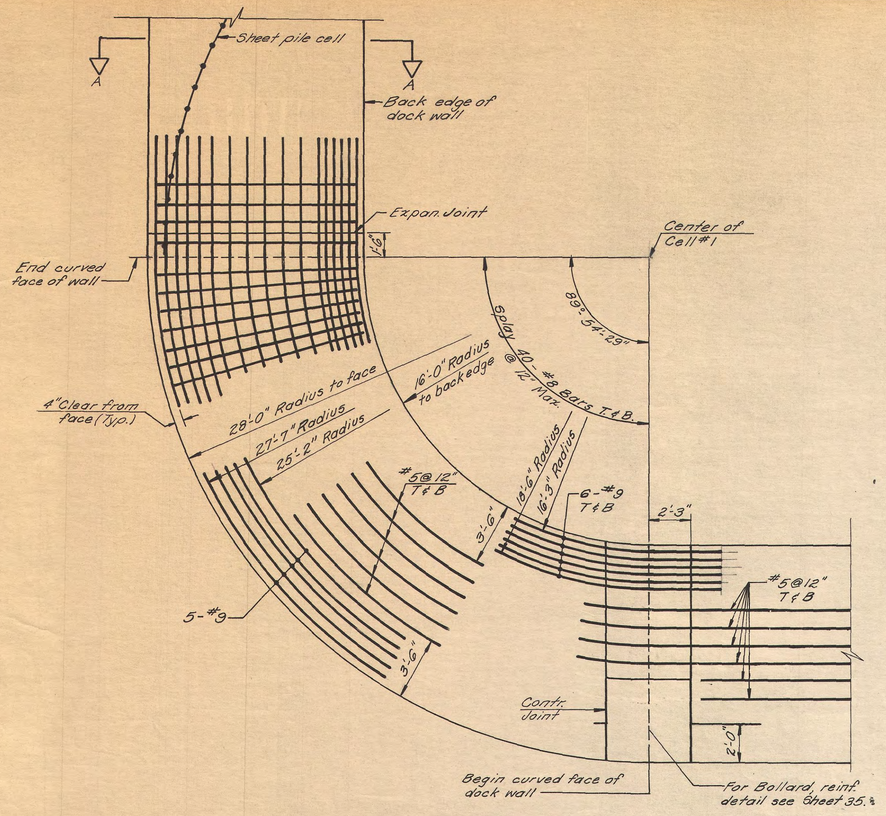
1. All exposed edges of Concrete Dock Wall to have 1"x1" chamfer.
2. Fender System to be pressure creosoted Douglas Fir conforming to details shown. The Contractor is to submit Shop Drawings of Fender System for approval of Engineer prior to fabrication.
3. Upper and lower wale splices to be staggered 10'-0" c.c. minimum.
4. All piles are to be driven prior to placing Dock Wall.
5. Cap log to be discontinued at Bollard and cleat locations to allow for tie-up lines.

NEW BEDFORD REDEVELOPMENT AUTHORITY

PROJECT – MASS. R-96

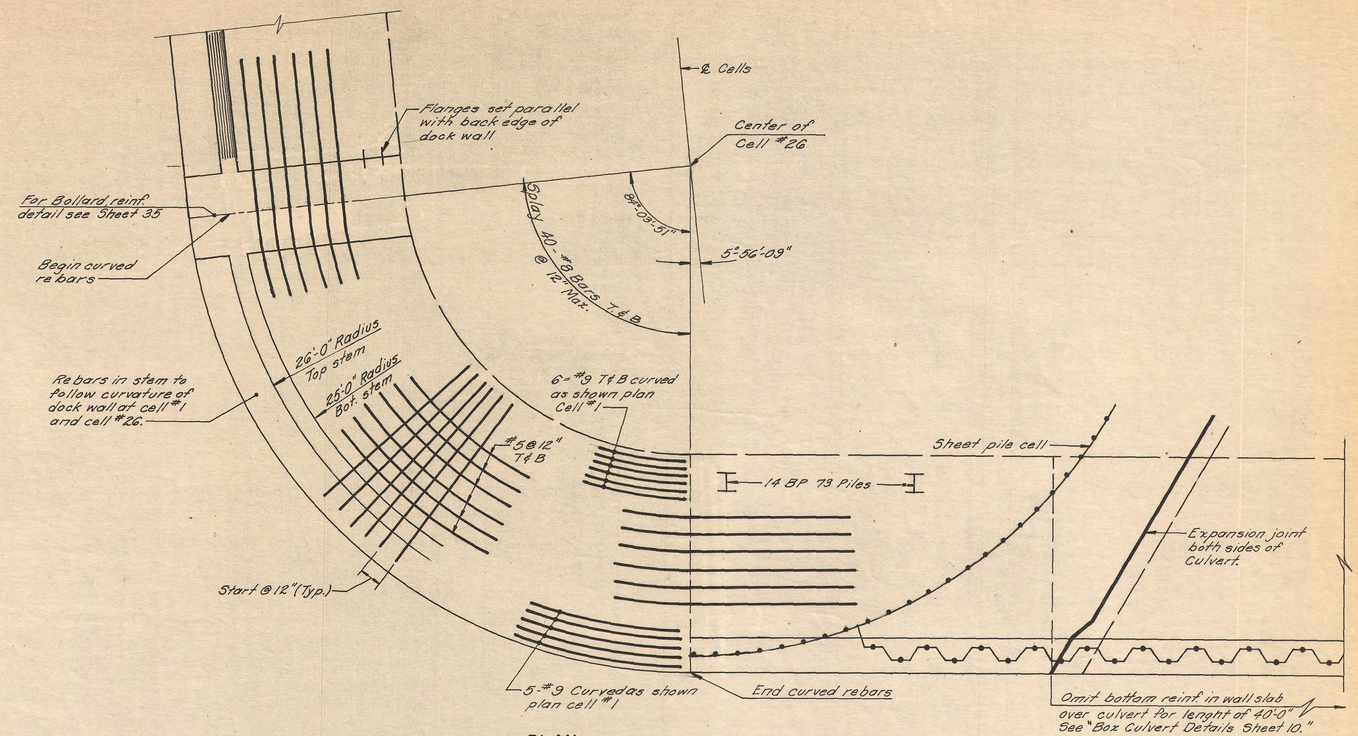
SOUTH TERMINAL URBAN RENEWAL PROJECT

| | | |
|---|---|---|
| DATE May 19, 1969 | CONCRETE DOCK WALL & FENDER SYSTEM | CONTRACT NO. 2 |
| DESIGNED BY R.C.S. | | SHEET NO. 35 OF 37 |
| CHECKED BY P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G.R.C. | | DRW. NO. 371-02-35 |



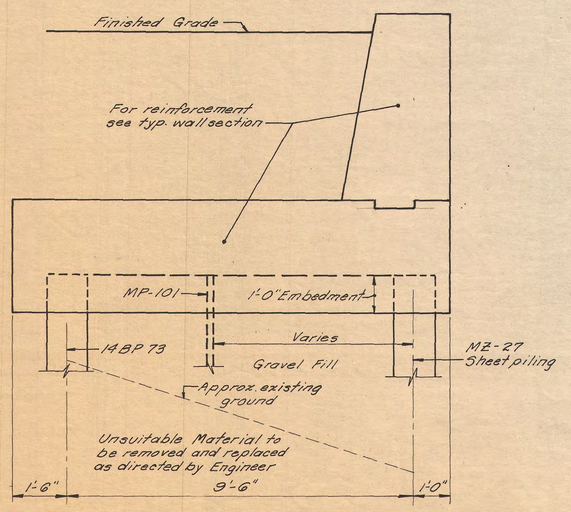

**PLAN**

SCALE: 1/4" = 1'-0"



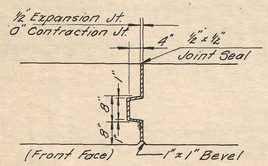

**PLAN**

SCALE: 1/4" = 1'-0"

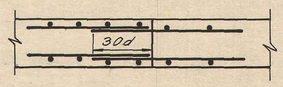



**SECTION A-A**

SCALE: 1/2" = 1'-0"




**WALL JOINT DETAILS**



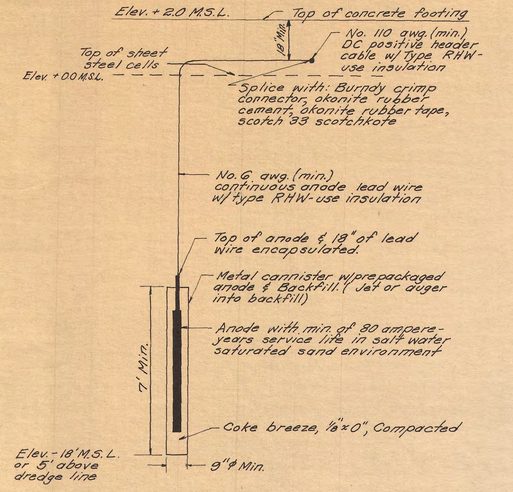

**CONSTRUCTION JOINT**

## DOCK WALL JOINT DETAILS

NOT TO SCALE

Notes:
1. Joint filler to extend to top of wall.
2. No reinforcement to pass through expansion joint.

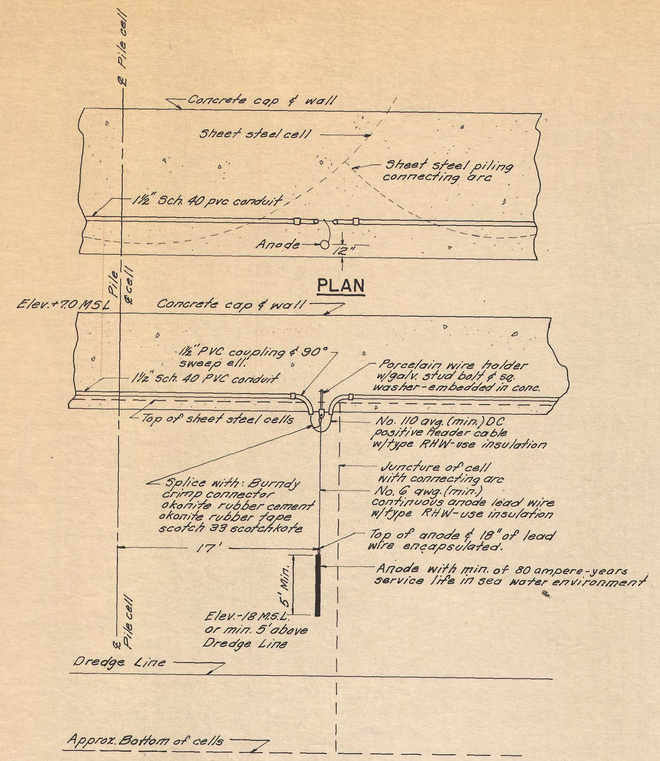
| | | |
|---|---|---|
| NEW BEDFORD REDEVELOPMENT AUTHORITY | | |
| PROJECT - MASS. R-96 | | |
| SOUTH TERMINAL URBAN RENEWAL PROJECT | | |
| DATE: May 19, 1969 | DOCK WALL DETAILS | CONTRACT NO. 2 |
| DESIGNED BY R.C.S. | | SHEET NO. 36 OF 37 |
| CHECKED BY P.L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G.R.C. | | DRW. NO. 371-02-36 |




## DETAIL "A"

NOT TO SCALE

TYPICAL ANODE INSTALLATION IN BACKFILL SAND

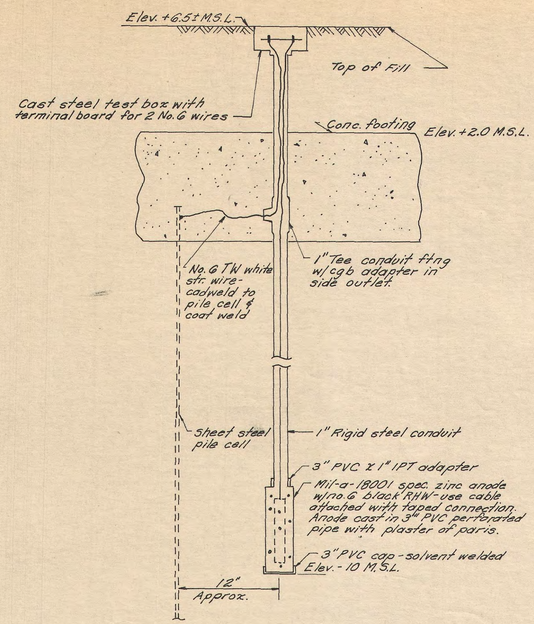



ELEVATION

## DETAIL "B"

NOT TO SCALE

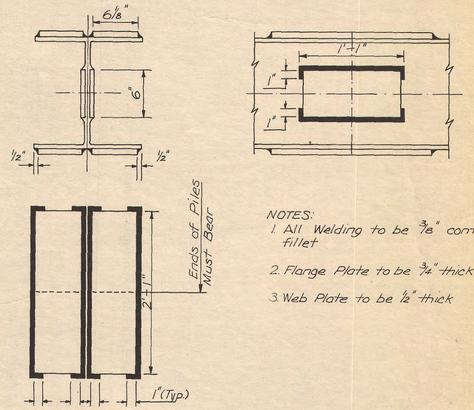
TYPICAL ANODE INSTALLATION ON WATER SIDE OF BULKHEAD




## DETAIL "C"

NOT TO SCALE

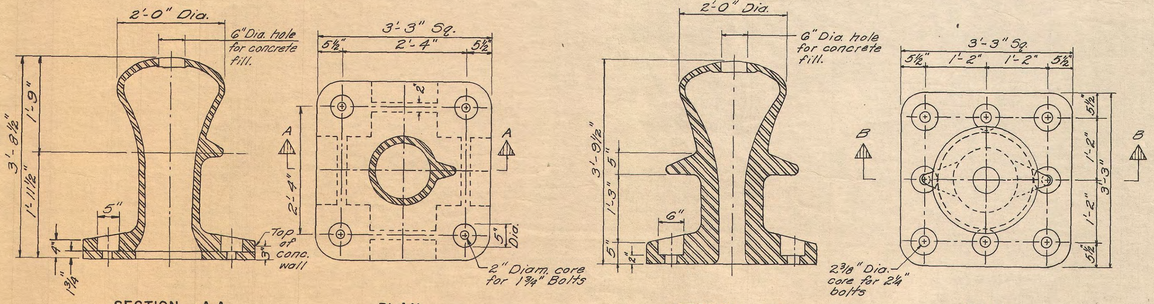
TYPICAL TEST STATION FOR CATHODIC PROTECTION




NOTES:
1. All Welding to be ⅜" continuous fillet
2. Flange Plate to be ¾" thick
3. Web Plate to be ½" thick

## 14 BP 73 SPLICE DETAIL

NOT TO SCALE



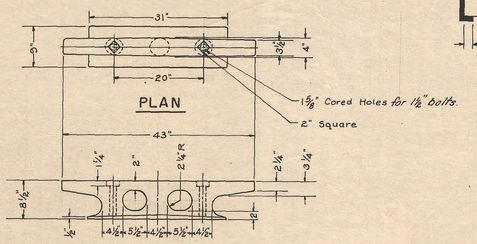

## CAST STEEL BOLLARDS

SCALE: 3/4" = 1'-0"

Type "A" Bollard to have 70,000 lbs. capacity for use in 20' Draft.

Type "B" Bollard to have 300,000 lbs. capacity for use in 30' Draft.

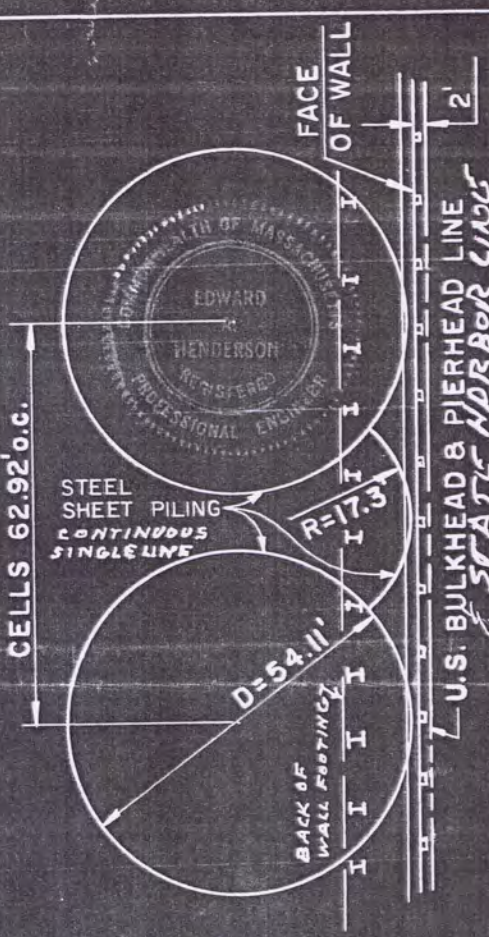
Notes:
1. See Sheet 35 for Anchor bolt embedment lengths.
2. No anchor bolt for bollard or cleats shall come within 3 inches of reinforcing steel.




## CLEAT DETAIL

SCALE: 3/4" = 1'-0"

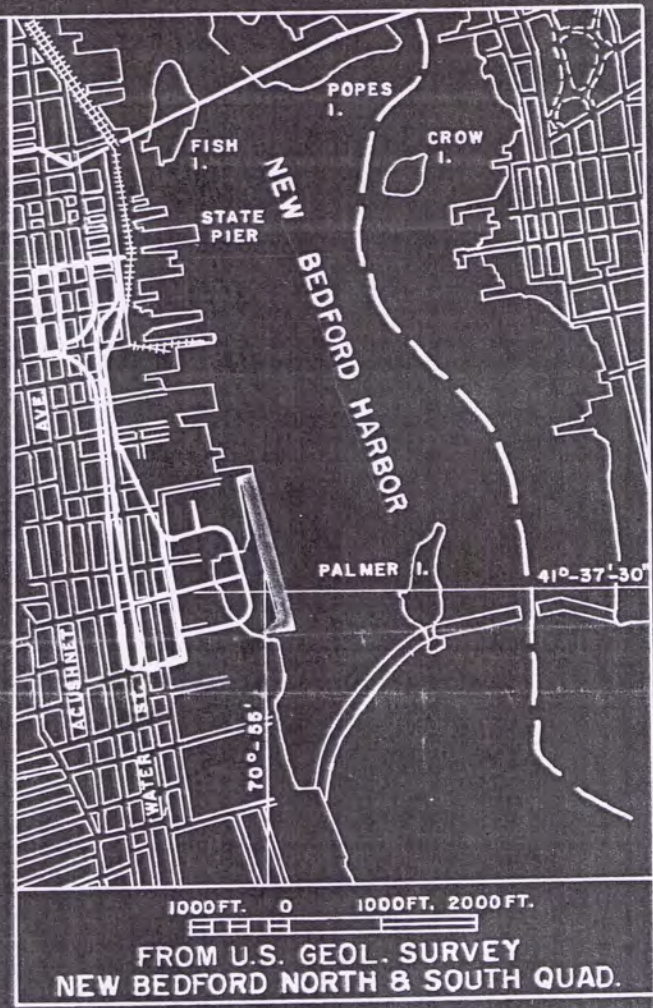
| | | |
|---|---|---|
| NEW BEDFORD REDEVELOPMENT AUTHORITY | | |
| PROJECT - MASS. R-96 | | |
| SOUTH TERMINAL URBAN RENEWAL PROJECT | | |
| DATE: May 19, 1969 | MISCELLANEOUS BULKHEAD DETAILS | CONTRACT NO. 2 |
| DESIGNED BY R. C. S. | | SHEET NO. 37 OF 37 |
| CHECKED BY P. L. | GOODKIND & O'DEA, INC. CONSULTING ENGINEERS SPRINGFIELD, MASSACHUSETTS | SCALE AS SHOWN |
| APPROVED BY G. R. C. | | DRW. NO. 371-02-37 |



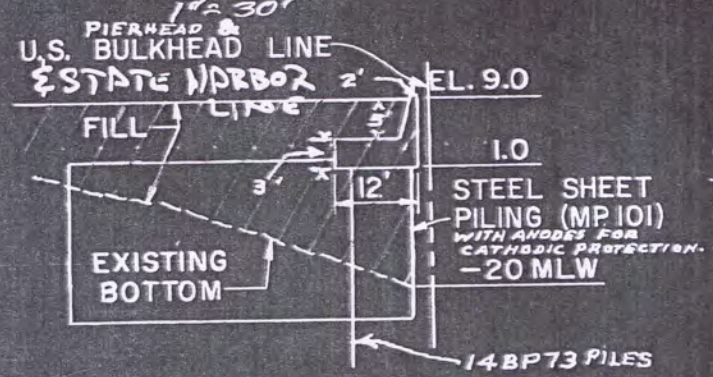

TYPICAL CELL PLAN

10 0 10 20

1" = 30'



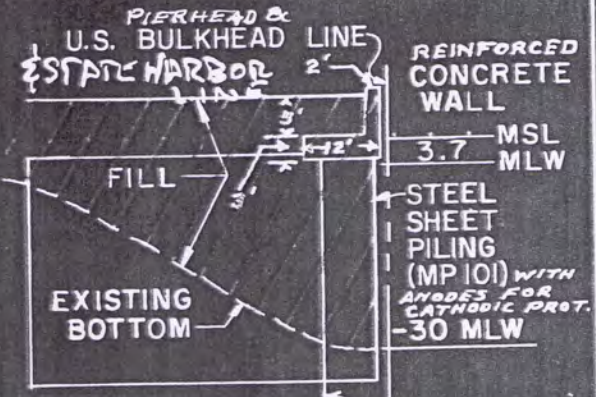

FROM U.S. GEOL. SURVEY
NEW BEDFORD NORTH & SOUTH QUAD.




SECTION A-A

20' DRAFT

SCALE 1" = 30'




SECTION B-B

30' DRAFT

PLAN TO ACCOMPANY PETITION
OF
NEW BEDFORD
REDEVELOPMENT AUTHORITY
TO BUILD SHEET PILE & CONCRETE
BULKHEAD, & FILL
IN
NEW BEDFORD HARBOR
NEW BEDFORD

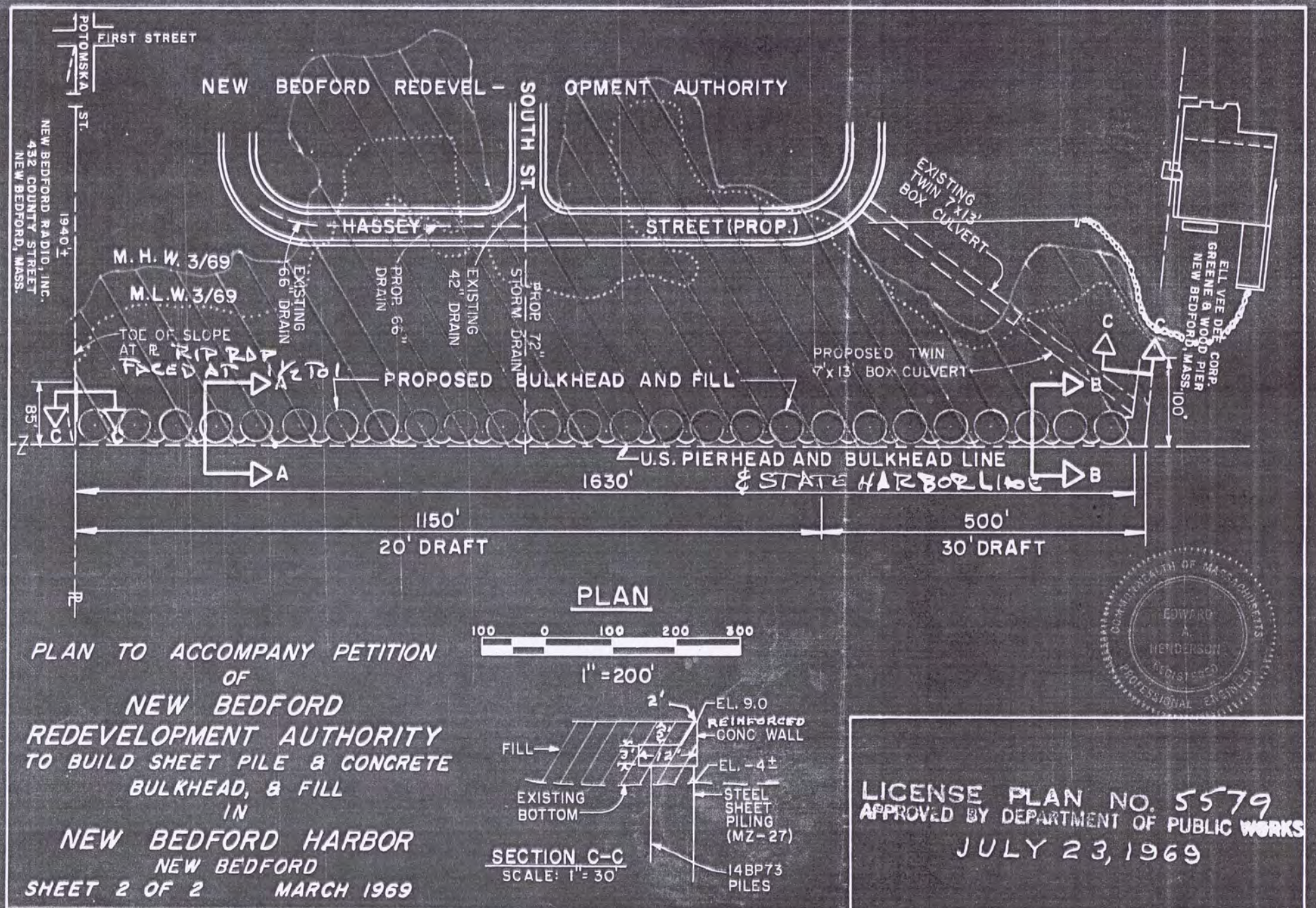
SHEET 1 OF 2 MARCH, 1969

LICENSE PLAN NO. 5579
APPROVED BY DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
JULY 23, 1969

Richard [illegible]
Charles A. Parker
Edgar Gonsalves
John P. Kenney
Robert S. Foster

COMMISSIONER - DEPT. OF PUBLIC WORKS

ASSOCIATE COMMISSIONERS




PLAN

100 0 100 200 300

1" = 200'




SECTION C-C
SCALE: 1" = 30'

PLAN TO ACCOMPANY PETITION
OF
NEW BEDFORD
REDEVELOPMENT AUTHORITY
TO BUILD SHEET PILE & CONCRETE
BULKHEAD, & FILL
IN
NEW BEDFORD HARBOR
NEW BEDFORD
SHEET 2 OF 2 MARCH 1969

COMMONWEALTH OF MASSACHUSETTS
EDWARD A. HENDERSON
REGISTERED
PROFESSIONAL ENGINEER

LICENSE PLAN NO. 5579
APPROVED BY DEPARTMENT OF PUBLIC WORKS
JULY 23, 1969

ISSUED FOR CONSTRUCTION

# NEW BEDFORD MUNICIPAL PIERS FENDERING AND REPAIRS

## (EDA AWARD NO. 01-79-15040)

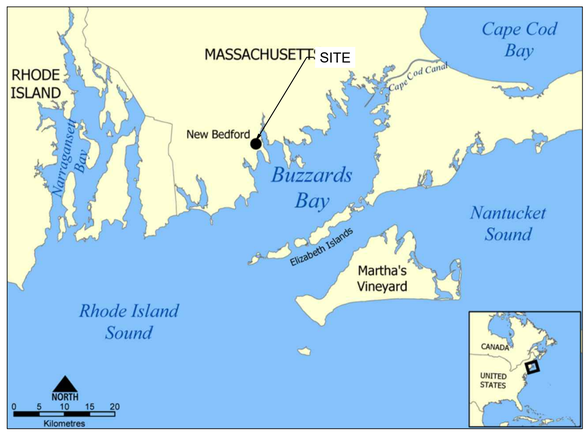
NEW BEDFORD, MASSACHUSETTS
PROJECT NO. 21N007
SEPTEMBER 2022

Prepared for:
NEW BEDFORD PORT AUTHORITY

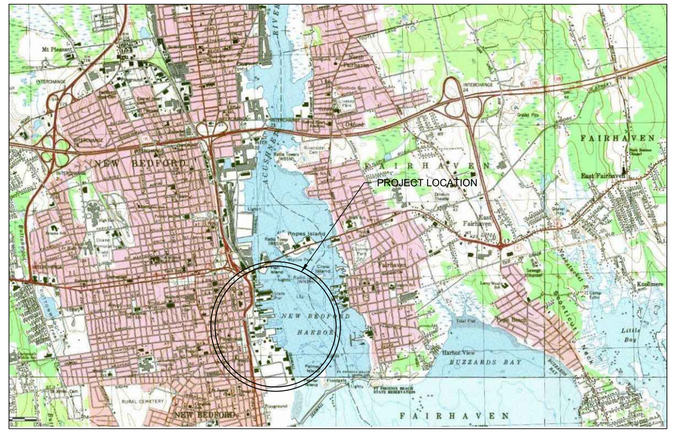
Prepared by:
FOTH INFRASTRUCTURE & ENVIRONMENT, LLC

DRAWING INDEX

| SHEET NUMBER | TITLE |
|---|---|
| G-001 | COVER SHEET |
| G-002 | GENERAL NOTES, LEGEND, & ABBREVIATIONS |
| C-001 | SITE LOCATION, STAGING, & VESSEL MOVEMENT PLAN |
| C-002 | PIER 3 SITE PLAN |
| C-003 | STEAMSHIP PIER SITE PLAN |
| C-004 | SOUTH TERMINAL SITE PLAN |
| S-001 | TYPICAL SECTIONS - SHEET 1 OF 1 |
| S-002 | TYPICAL DETAILS - SHEET 1 OF 1 |




VICINITY MAP




LOCATION MAP

ALEX L MORA
CIVIL
NO. 55309
REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
14 September 2022

SHEET TITLE
COVER SHEET

SHEET NUMBER
**G-001**

GENERAL NOTES:

1. NOTES BELOW ARE NOT INTENDED TO REPLACE SPECIFICATIONS. SEE SPECIFICATIONS FOR REQUIREMENTS IN ADDITIONAL INFORMATION.
2. THE CONTRACTOR IS ADVISED THAT THE DRAWINGS AND SPECIFICATIONS FORM A PART OF THE CONTRACT DOCUMENTS. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL KEEP A COPY OF THE DRAWINGS AND SPECIFICATIONS ONSITE AT ALL TIMES DURING THE PROJECT.
3. THE CONTRACTOR SHALL MAINTAIN ADEQUATE SURVEY CONTROL AT ALL TIMES TO ESTABLISH AND MAINTAIN ALL LINES AND ELEVATIONS SHOWN ON THE CONTRACT DRAWINGS.
4. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES AND SUBMERGED UTILITIES WITHIN THE LIMITS OF THE WORK PRIOR TO COMMENCING ANY EXCAVATION OR GROUND PENETRATING WORK. THE CONTRACTOR SHALL NOTIFY "DIG SAFE" (1-888-344-7223) AT LEAST 3 BUSINESS DAYS PRIOR TO COMMENCEMENT OF THE EXCAVATION OR GROUND PENETRATING ACTIVITY.
5. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE AND MAINTAIN ENVIRONMENTAL CONTROLS AS REQUIRED BY STATE, LOCAL, AND FEDERAL REGULATION AND LAW, AS WELL AS REQUIRED WITHIN EXISTING PERMITS AND APPROVALS.
6. ALL APPLICABLE FEDERAL AND STATE REGULATION AND PERMITS SHALL BE FOLLOWED, INCLUDING BUT NOT LIMITED TO, THE CLEAN WATER ACT, THE FEDERAL DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY, HEALTH ACT, 401 WATER QUALITY CERTIFICATION, CHAPTER 91 LICENSE, AND U.S. ARMY CORP OF ENGINEERS PERMIT.
7. THE CONTRACTOR IS TO VERIFY THAT THERE ARE NO EXISTING HAZARDS OR OBSTRUCTIONS IN THE SILT CURTAIN AREA SHOWN HEREON.
8. BASE PLAN COMPILED BY FOTH USING AVAILABLE MAGIS DATA AND INFORMATION PROVIDED BY USACE AND NBPA.
9. THE CONTRACTOR, PRIOR TO CONSTRUCTION AND FABRICATION OF CONSTRUCTION MATERIALS, SHALL VERIFY EXISTING CONDITIONS AND DIMENSIONS.
10. IF, DURING THE PERFORMANCE OF THE WORK, THE CONTRACTOR FINDS A CONFLICT, ERROR, OR DISCREPANCY IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL SO REPORT TO THE ENGINEER IN WRITING AT ONCE BEFORE PROCEEDING WITH THE WORK AFFECTED THEREBY. THE CONTRACTOR SHALL OBTAIN A WRITTEN INTERPRETATION OR CLARIFICATION FROM THE ENGINEER. WORK DONE BEFORE THE ENGINEER RENDERS HIS/HE DECISION IS AT THE CONTRACTOR'S SOLE RISK.
11. THE CONTRACTOR SHALL TAKE HIS OWN MEASUREMENTS AT THE SITE, VERIFYING THE SAME WITH THE CONTRACT DRAWINGS AND EXISTING FACILITIES, AND WILL BE HELD RESPONSIBLE FOR THE PROPER FIT AND ALIGNMENT OF COMPLETED WORK IN POSITION.
12. LENGTHS SHOWN ON THE DRAWINGS ARE CONSIDERED APPROXIMATE, AND THE ACTUAL LENGTHS MAY VARY WHEN SO ACCEPTED BY THE ENGINEER.
13. EXISTING SITE CONDITION PLAN TAKEN FROM PLAN ENTITLED "NEW BEDFORD WATERFRONT FACILITIES INSPECTIONS" BY PARE CORPORATION DATED NOVEMBER 2008.
14. PROPERTY LINES OBTAINED FROM THE MA GIS DATABASE.
15. CONTRACTOR SHALL MAINTAIN A 6-FOOT SETBACK FROM THE EXISTING BULKHEAD FOR LOAD RESTRICTION. CRANE MATTS SHALL BE UTILIZED FOR ANY CRANE OR HEAVY EQUIPMENT LOADS. A STAGING PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO START OF WORK.

TOPOGRAPHIC SURVEY NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW A TOPOGRAPHIC SURVEY AS THE RESULT OF AN ON-THE-GROUND INSTRUMENT SURVEY WHICH OCCURRED BETWEEN 6-20-2020 TO 6-27-2020.
2. HORIZONTAL COORDINATES REFER TO MASSACHUSETTS STATE PLANE, MAINLAND ZONE, US SURVEY FEET BASED ON GPS RTK OBSERVATIONS.
3. ELEVATION REFERS TO MEAN LOW WATER MARK (MLW) VERTICAL BASED ON THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL 2008.
4. THE ENTIRE PROJECT SITE WORK AREA IS WITHIN LAND SUBJECT TO COASTAL STORM FLOWAGE. FEMA FLOOD ZONE AE (EL 6) REFERENCED FROM MAP# 25005C0393G & 25005C0481G DATED 7/16/14.
5. WATER BOUNDARIES ARE SUBJECT TO CHANGE DUE TO NATURAL CAUSES AND THE WATER BOUNDARIES SHOWN HEREON MAY OR MAY NOT REPRESENT THE ACTUAL LOCATION OF THE LIMIT OF TITLE.
6. THE MEAN HIGH WATER ELEVATION (3.75') BASED ON VDATUM CONVERSION FROM MEAN LOWER LOW WATER TO MEAN HIGH WATER.

HYDROGRAPHIC SURVEY NOTE:

1. COORDINATES SHOWN ARE IN STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE 2001, REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83), EXPRESSED IN US SURVEY FEET.
2. INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF SURVEYS MADE ON DATES INDICATED BELOW AND CAN ONLY BE CONSIDERED TO REPRESENT THE CONDITION AT THE TIME OF THE SURVEY AND AT SOUNDING POINTS NOTED ON THE PLAN. HYDROGRAPHIC SURVEY OF NEW BEDFORD HARBOR WAS PERFORMED BY FOTH INFRASTRUCTURE & ENVIRONMENTAL, LLC. SURVEY DATED NOVEMBER 2018.
3. ELEVATIONS & SOUNDINGS SHOWN ARE DEPTHS IN FEET BELOW MEAN LOW WATER (MLW) FOR CLARK'S POINT NOAA STATION 8447712. THE MLW ELEVATION FOR THE NEW BEDFORD HARBOR AREA IS -1.78 FEET NAVD88. SEE GRAPHIC REPRESENTATION OF DATUM SEPARATION FOR MORE INFORMATION.
4. ELEVATION REFERS TO THE PUBLISHED BENCHMARK STATION BOLT 2008 ESTABLISHED BY U.S.A.C.E.-NAD-NE IN APRIL
5. 2008. SEE SPECIFICATIONS SECTION 00800 - SUPPLEMENTAL CONDITIONS FOR BENCHMARK INFORMATION.
6. SOUNDINGS SHOWN AS NEGATIVE ARE ABOVE THE REFERENCE PLANE.
7. THE SOUNDING INFORMATION SHOWN ON THIS PLAN REPRESENTS THE AVERAGE SOUNDINGS OBTAINED FROM HYDROGRAPHIC SURVEYS. SOUNDINGS ARE GENERATED FROM A 25' X 25' AVERAGE. VALUE DATA SET.
8. THE SOUNDING INFORMATION DEPICTED ON THIS PLAN SHOULD NOT BE USED FOR THE DETERMINATION OF VOLUMES. VOLUMES ARE TO BE DETERMINED FROM A SEPARATE AVERAGE VALUE DATA SET.
9. CONTOURS SHOWN FOR NEW BEDFORD HARBOR ARE BASED ON A 3'X3' AVERAGE VALUE DATA SET. CONTOURS ARE SHOWN AT 1' INTERVALS UNLESS OTHERWISE NOTED.

UTILITY NOTES:

1. THE SUB-SURFACE UTILITY INFORMATION SHOWN HEREON IS COMPILED BASED ON FIELD SURVEY INFORMATION, RECORD INFORMATION AS SUPPLIED BY THE APPROPRIATE UTILITY COMPANIES, AND PLAN INFORMATION SUPPLIED BY THE NEW BEDFORD PORT AUTHORITY, IF ANY; THEREFORE WE CANNOT GUARANTEE THE ACCURACY OF SAID COMPILED SUB-SURFACE INFORMATION TO ANY CERTAIN DEGREE OF STATED TOLERANCE. ONLY PHYSICALLY LOCATED SUB-SURFACE UTILITY FEATURES FALL WITHIN NORMAL STANDARD OF CARE ACCURACIES.
2. THE LOCATIONS OF UNDERGROUND PIPES, CONDUITS, AND STRUCTURES HAVE BEEN DETERMINED FROM SAID INFORMATION, AND ARE APPROXIMATE ONLY. COMPILED LOCATIONS OF ANY UNDERGROUND STRUCTURES, NOT VISIBLY OBSERVED AND LOCATED, CAN VARY FROM THEIR ACTUAL LOCATIONS.
3. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED.
4. THE STATUS OF UTILITIES, WHETHER ACTIVE, ABANDONED, OR REMOVED, IS AN UNKNOWN CONDITION AS FAR AS OUR COMPILATION OF THIS INFORMATION.
5. IT IS INCUMBENT UPON INDIVIDUALS USING THIS INFORMATION TO UNDERSTAND THAT COMPILING UTILITY INFORMATION IS NOT EXACT, AND IS SUBJECT TO CHANGE BASED UPON VARYING PLAN INFORMATION RECEIVED AND ACTUAL LOCATIONS.
6. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES IS SUBJECT TO FIELD CONDITIONS, THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS AND OTHER MATTERS.
7. THE PROPER UTILITY ENGINEERING/COMPANY SHOULD BE CONSULTED AND THE ACTUAL LOCATIONS OF SUBSURFACE STRUCTURES SHOULD BE VERIFIED IN THE FIELD (V.I.F.) BEFORE PLANNING FUTURE CONNECTIONS. CONTACT THE DIG SAFE CALL CENTER AT 1-888-344-7233, SEVENTY-TWO HOURS PRIOR TO EXCAVATION, BLASTING, GRADING, AND/OR PAVING.

STRUCTURAL NOTES:

1. SHOP DRAWINGS SHALL SHOW IN DETAIL ALL SIZES, SHAPES, MATERIALS, FINISHES AND METHODS OF ATTACHING MISCELLANEOUS METAL ITEMS TO ONE ANOTHER, AND WORK OF OTHER TRADES.
2. THE WORK SHALL BE PERFORMED IN A GENERAL SEQUENCE DEVELOPED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR REVIEW, IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR THE SEQUENCES AND PROCEDURES TO BE USED.

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LIST OF ABBREVIATIONS:

| | | | | | |
|---|---|---|---|---|---|
| ALTERNATE | - | ALT | LENGTH | - | L |
| AMERICAN ASSOCIATION OF STATE & HIGHWAY TRANSPORTATION OFFICIALS | - | AASHTO | LINEAR FOOT | - | LF |
| | | | LOWER HARBOR CAD CELL | - | LHCC |
| APPROXIMATE | - | APPROX | MANHOLE | - | MH |
| BENCHMARK | - | BM | MASS HIGHWAY DEPARTMENT | - | MHD |
| BOTTOM OF SLOPE | - | BOS | MAXIMUM | - | MAX |
| BOTTOM OF CURB | - | BOC | MEAN HIGH WATER | - | MHW |
| BUILDING | - | BLDG | MEAN LOWER LOW WATER | - | MLLW |
| CATCH BASIN | - | CB | MISCELLANEOUS | - | MISC. |
| CAST IN PLACE | - | C.I.P. | NEW BEDFORD PORT AUTHORITY | - | NBPA |
| CELLULAR COFFERDAM | - | CELL | NOT TO SCALE | - | NTS |
| CENTERLINE | - | CL | ORGANIC MATERIAL | - | OL |
| CENTER TO CENTER | - | C-C | OUTSIDE DIAMETER | - | OD |
| CHAIN LINK FENCE | - | CLF | OVERDREDGE | - | OD |
| CONTROLLED LOW-STRENGTH MATERIAL | - | CLSM | POORLY GRADED SAND | - | SP |
| CONFINED AQUATIC DISPOSAL | - | CAD | POUNDS PER SQUARE INCH | - | PSI |
| CONTROL POINT | - | CP | PROPOSED | - | PROP. |
| CUBIC FEET PER SECOND | - | CFS | SILTY SAND | - | SM |
| CUBIC YARDS | - | CY | SPECIFICATION | - | SPEC |
| ELEVATION | - | EL. ELEV. | SPLIT SPOON TEST | - | SPT |
| EDGE OF PAVEMENT | - | EOP | STATION | - | STA |
| ENVIRONMENTAL PROTECTION AGENCY | - | EPA | SQUARE FOOT | - | SF |
| EXISTING | - | EXIST | TOP OF CURB | - | TOC |
| FEET | - | FT | TOP OF SLOPE | - | TOS |
| GALVANIZED | - | GALV | TYPICAL | - | TYP |
| HIGH DENSITY POLYETHYLENE | - | HDPE | UNDERGROUND ELECTRICAL | - | UGE |
| HOT DIPPED GALVANIZED | - | HDG | WALL THICKNESS | - | WT |
| INCHES | - | IN | WELL GRADED SAND | - | SW |
| KIPS PER SQUARE INCH | - | KSI | | | |

GENERAL MATERIAL SPECIFICATIONS

STEEL:

1. STRUCTURAL STEEL SHALL COMPLY WITH THE "STEEL CONSTRUCTION MANUAL" FIFTEENTH EDITION PUBLISHED BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
2. MISC STEEL OR STEEL NOT SPECIFIED TO BE GRADE 50.
3. WELDING SHALL CONFORM TO THE 'STRUCTURAL WELDING CODE - STEEL', PUBLISHED BY THE AMERICAN WELDING SOCIETY (AWS D1.1). A WELDER CERTIFIED IN ACCORDANCE WITH AWS STANDARDS SHALL PERFORM WELDING.
4. WELDING ELECTRODES SHALL BE E70XX AND COMPLY WITH AWS A5.1 AND AWS A5.5 UNLESS NOTED OTHERWISE.
5. STRUCTURAL STEEL SHAPES/PILES SHALL CONFORM TO ASTM A588, GRADE 50. STEEL PLATES SHALL CONFORM TO ASTM A588 WITH 50 KSI YIELD.
6. STEEL HARDWARE: ANCHOR AND CARRIAGE BOLTS: ASTM F 1554 GRADE 55 AND ASTM A307, HIGH STRENGTH STRUCTURAL BOLTS: ASTM F3125 GR. A325, W/ HEXAGONAL OR CARRIAGE HEADS NUTS: ASTM A563, WASHERS (EXCEPT AGAINST TIMBER): ASTM F436, WASHERS AGAINST TIMBER SHALL BE COMMON DOCK WASHERS.
7. STEEL HARDWARE ABOVE GRADE SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153.
8. CONNECTIONS SHALL BE DESIGNED AND DETAILED BY THE STEEL FABRICATOR EXCEPT FOR THOSE SPECIFICALLY DETAILED IN THE CONTRACT DOCUMENTS.
9. PREFABRICATED PILE CAP ASSEMBLIES SHALL BE HOT DIP GALVANIZED.

STEEL PROTECTIVE COATING:

1. MATERIAL USED FOR FACTORY EPOXY COATING OF ALL SCHEDULED SURFACES SHALL BE AMERCOAT 240 OR APPROVED EQUAL ACCEPTED BY THE ENGINEER.
2. COATING SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATION WITH SURFACE PREPARATION FOR IMMERSION SERVICE WITH MINIMUM GRIT BLASTING TO NEAR WHITE FINISH (SSPC-SP10 OR NACE).
3. FIELD TOUCH-UP COATING SHALL BE AMERCOAT 240 FOR AREAS ABOVE MEAN HIGH WATER AND DENSO SPLASHZONE UNDERWATER EPOXY FOR AREAS BELOW MEAN HIGH WATER, OR APPROVED EQUAL, AND SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
4. THE PROTECTIVE COATING SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
5. ALL IMPERFECTIONS IN THE COATING SHALL BE REMOVED OR REPAIRED AT THE CONTRACTORS EXPENSE PRIOR TO FINAL ACCEPTANCE OF THE WORK.

CONCRETE:

1. CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF ACI-318 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE", AS ADOPTED BY THE AMERICAN CONCRETE INSTITUTE.
2. CONCRETE SHALL BE NORMAL WEIGHT WITH COMPRESSIVE STRENGTH OF 5000 PSI AT 28 DAYS. PORTLAND CEMENT SHALL BE TYPE II. CONCRETE SHALL CONTAIN 6% (+/- 1.5%) ENTRAINED AIR AND HAVE A MAXIMUM WATER TO CEMENT RATIO OF 0.40.
3. USE ACCELERATORS/ADMIXTURES TO IMPROVE WORKABILITY AND REDUCE WATER/CEMENT RATIO TO CONTROL SHRINKAGE. SUBMIT PROPOSED CONCRETE MIX TO THE ENGINEER FOR REVIEW. NO WATER SHALL BE ADDED TO THE MIX AT THE JOB SITE.
4. CONCRETE SHALL BE CONTROLLED CONCRETE, MIXED AND PLACED IN THE PRESENCE OF THE APPROVED TESTING AGENCY.
5. DO NOT PLACE CONCRETE UNTIL REINFORCEMENT AND EMBEDDED ITEMS HAVE BEEN APPROVED BY THE ENGINEER AND/OR THE APPROVED TESTING AGENCY (IF/WHEN DIRECTED). PROVIDE A MINIMUM OF 24 HOURS NOTIFICATION TO THE ENGINEER.
6. A MINIMUM OF 72 HOURS SHALL ELAPSE BETWEEN ADJACENT CONCRETE PLACEMENTS.

REINFORCEMENT:

1. REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615 GRADE 60, OR 75 AS CALLED FOR.
2. DETAILING, FABRICATION, AND ERECTION OF REINFORCING STEEL SHALL BE EPOXY COATED AND CONFORM TO THE REQUIREMENTS OF ACI-318 AND ACI-315 'DETAILS AND DETAILING OF CONCRETE REINFORCEMENT'.
3. REINFORCEMENT SHALL CONFORM TO BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318), ACI DETAILING MANUAL (SP-66), CRSI MANUAL OF STANDARD PRACTICE (MSP), AND THE STRUCTURAL WELDING CODE-REINFORCING STEEL (AWS D1.4). ELECTRODES TO BE E-8018.
4. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185
5. PROVIDE SUPPLEMENTAL BARS AND ACCESSORIES AS REQUIRED TO HOLD REINFORCEMENT SECURELY IN POSITION.
6. MINIMUM CONCRETE PROTECTIVE COVER, UNLESS NOTED OTHERWISE, SHALL BE AS FOLLOWS:
   - 6.1. CONCRETE EXPOSED TO WEATHER 3 INCHES
   - 6.2. CONCRETE AT ADJACENT POURS 2 INCHES
   - 6.3. CONCRETE PLACED AGAINST EARTH 3 INCHES
7. ALL CONTINUOUS REINFORCEMENT SHALL BE EXTENDED AROUND CORNERS AND LAPPED AT NECESSARY SPLICES OR HOOKED AT DISCONTINUOUS ENDS. USE STANDARD HOOKS UNLESS OTHERWISE INDICATED.
8. LAPS SHALL BE CLASS B TENSION LAP SPLICES, UNLESS NOTED OTHERWISE.
9. REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS. PROVIDE MECHANICAL COUPLERS WHERE REQUIRED CONTINUOUS REINFORCEMENT EXCEEDS AVAILABLE LENGTHS.

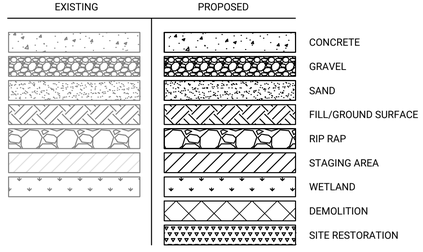
COMPOSITE FENDER SYSTEM:

1. FENDER PILES SHALL BE 13" DIAMETER PILE W/ 8x11 FG REBAR OR APPROVED EQUAL.
2. WALERS SHALL BE 12x12 TIMBER W/ 4x08 FG REBAR OR APPROVED EQUAL.
3. CHOCKS SHALL BE 8x12 TIMBER W/ 4x08 FG REBAR OR APPROVED EQUAL.
4. MATERIAL COLOR SHALL BE BLACK.
5. FENDER PILES SHALL BE DRIVEN STRAIGHT AND TRUE AT INDICATED LOCATIONS, WITH DEVIATION FROM THE LONGITUDINAL AXIS OF NOT MORE THAN 1/8 INCH PER FOOT.
6. WALERS SHALL BE CONTINUOUSLY EXTRUDED.
7. CONTRACTOR SHOULD COORDINATE WALE LENGTHS TO THE MAXIMUM EXTENT POSSIBLE IN ORDER TO MINIMIZE OVERLAP AREAS.

FIBERGLASS PILE JACKET REPAIRS:

1. FIBERGLASS PILE JACKETS SHALL BE DENSO FIBER-FORM PILE JACKETS OR APPROVED EQUAL.
2. GROUT FOR PILE JACKET REPAIRS SHALL BE DENSO SEASHIELD 550 EPOXY GROUT OR APPROVED EQUAL.
3. FIBERGLASS JACKETS AND EPOXY GROUT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATIONS.

HATCHING




Pier 3 / Fisherman's Wharf Plating Repair Schedule

| Station | Description |
|---|---|
| 0+04 | Hole 4" DIA outer sheet flange |
| 0+18 | Hole 3" DIA on web |
| 0+20 | Hole 3" DIA outer flange behind fender |
| 0+30 | Hole 3" DIA outer flange behind fender |
| 0+40 | Hole 3" DIA outer flange behind fender |
| 0+78 | Hole 5" DIA outer flange behind fender |
| 0+90 | Hole 5" DIA outer flange behind fender |
| 1+00 | Hole 5"x18" on web & outside flange |
| 1+10 | Hole 2"x3" outer flange behind fender |
| 1+12 | Hole 3" DIA outer flange behind fender |
| 1+55 | Hole 3" DIA outer flange behind fender |
| 1+60 | Hole 3" DIA outer flange behind fender |
| 1+65 | Hole 3" DIA outer flange behind fender |
| 1+72 | Hole 1" DIA inside flange behind fender |
| 2+00 | Hole 3" DIA outer flange behind fender |
| 2+50 | Hole 3" DIA on web behind fender |
| 3+00 | Hole 4" DIA inside flange |
| 3+10 | Hole 3"x3" outside flange |
| 3+40 | Hole 1"x1" outside flange |
| 4+40 | (2) Holes 1"x1" outside flange |
| 4+54 | Hole 3"x3" outside flange |
| 4+62 | Hole 4"x4" outside flange |
| 4+65 | Hole 4"x4" outside flange |
| 4+72 | Hole 2"x2" and 1"x1" outside flange |
| 4+75 | Hole 1"x3" outside flange |
| 4+77 | Hole 3"x3" outside flange |
| 4+81 | Hole 3"x3" outside flange |
| 4+85 | (2) Holes 4"x4" outside flange |
| 4+85 | Hole 1"x3" outside flange |
| 4+87 | Hole 2"x2" outside flange |
| 4+94 | Hole 3"x3" outside flange |
| 4+96 | Hole 2"x2" outside flange |
| 5+00 | Hole 2"x2" outside flange |
| 5+05 | (2) Holes 1"x1" outside flange |
| 5+10 | Hole 1"x1" outside flange of corner sheet |
| 5+12 | Hole 2"x3" behind ladder |
| 5+14 | Hole 2"x2" outside flange |
| 5+17 | Hole 2"x2" outside flange |
| 5+30 | Hole 1"x1" outside flange |
| 5+35 | Hole 3"x3" and Hole 1"x1" outside flange |
| 5+42 | Hole 4"x4" and Hole 1"x1" outside flange behind fender |
| 5+45 | Hole 2"x2" inside flange below waler bolt |
| 5+50 | Hole 1"x2" and Hole 2"x2" outside flange |
| 5+60 | (3) Holes 2"x2" outside flange |
| 5+75 | (2) Hole 2"x2" outside flange |
| 5+80 | Hole 2"x2" outside flange at waler level |
| 5+90 | Hole 2"x2" outside flange at waler level |
| 6+15 | Hole 2"x2" behind ladder |
| 6+25 | Hole 1"x1" outside flange |
| 6+30 | Hole 2"x2" and Hole 1"x1" outside flange |
| 6+40 | Hole 1"x1" outside flange |
| 6+62 | Hole 1"x1" outside flange |
| 6+80 | Hole 2"x2" outside flange |
| 6+85 | Hole 2"x2" outside flange |
| 6+92 | Hole 1"x1" outside flange |
| 7+00 | Hole 2"x2" outside flange |
| 7+72 | Hole 1"x1" outside flange |
| 10+28 through 10+35 | Hole 2"x2" outside flange at Mud Line |

South Terminal Plating Repair Schedule

Note: Sheets at each cell are numbered from south to north with sheet #1 adjacent to the Y junction sheet

| Cell No. | Sheet No. | Description |
|---|---|---|
| 7 | 1 | Hole 3'x6' at top of sheet |
| 7 | 1 - 9 | Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below |
| 8 | 10 | Hole 6"x6" at top of sheet |
| 8 | 11 | Hole 2"x4" at top of sheet near expansion joint |
| 9 | 15 | Hole 6"x10" at top of sheet |
| 9 | 28 | Hole 6"x6" at top of sheet |
| 10 | 12 | Hole 4"x6" & 1.5"x2" at top of sheet |
| 12 | 12 | Hole/Crack 2"x240" at top of sheet near expansion joint |
| 12 | 15 | Hole 3"x4" at top of sheet |
| 13 | 2 | Hole 1"x1" at top of sheet |
| 15 | 30 | Hole 4"x6" at top of sheet |
| 16 | 11 | Hole 6"x12" at top of sheet near expansion joint |
| 16 | 12 | Hole 12"x36" at top of sheet |
| 16 | 22 | Hole 1"x2" at top of sheet |
| 17 | 30 | Hole 4"x6" at top of sheet |
| 18 | 19 | Hole 6"x12" at top of sheet |
| 19 | 23 | Hole 1"x2" at top of sheet |
| 19 | 30 | Hole 3"x5" at top of sheet |
| 20 | 12 | Hole 6"x20" at top of sheet |
| 20 | 13 | Hole 8"x36" at top of sheet near expansion joint |
| 20 | 14 | Hole 12"x36" at top of sheet |
| 22 | 6 | Hole 2"x2" at top of sheet by diver |
| 23 | 4 | Hole 1"x1" at top of sheet by diver |
| 23 | 10 | Hole 2"x3" mid water |
| 24 | 12 | Hole 8"x24" w/ 24" long crack at top of sheet |
| 24 | 13 | Hole 8"x36" at top of sheet near expansion joint |
| 24 | 14 | Hole 12"x48" at top of sheet |
| 25 | 27 | Hole 1"x2" at top of sheet |
| 27 | 10 | Hole 4"x6" at top of sheet |
| 28 | 12 | Hole 3"x4" at top of sheet |
| 28 | 13 | Hole 8"x8" at top of sheet near expansion joint |
| 28 | 14 | Hole 8"x12" at top of sheet |
| 29 | 19 | Hole 2"x3" at top of sheet |
| 30 | 13 | Hole 6"x8" at top of sheet |
| 31 | 12 | Hole 2"x2" at top of sheet |
| 32 | 13 | Hole 12"x24" at top of sheet |
| 32 | 14 | Hole 12"x36" w/ 24" long crack at top of sheet near expansion joint |
| 32 | 15 | Hole 10"x24" w/ 24" long crack at top of sheet |
| 32 | 18 | Hole 3"x4" at top of sheet |
| 35 | 2 | Hole 2"x4" at top of sheet |
| 36 | 12 | Hole 6"x24" at top of sheet |
| 36 | 13 | Hole 12"x36" at top of sheet near expansion joint |
| 36 | 14 | Hole 10"x24" at top of sheet |
| 36 | 15 | Hole 4"x10" at top of sheet |
| 36 | 16 | Hole 4"x4" at top of sheet |
| 40 | 12 | Hole 3"x3" at top of sheet |
| 40 | 13 | Hole 4"x18" w/ 12" long crack at top of sheet near expansion joint |
| 40 | 23 | Hole 2"x6" at top of sheet |
| 41 | 2 | Hole 2"x6" at top of sheet |
| 41 | 30 | Hole 1"x3" at top of sheet |
| 42 | 10 | Hole 1"x1" at top of sheet |
| 42 | 15 | Hole 2"x2" at top of sheet |
| 44 | 5 & 6 | Bowed outward with interlock separation at bottom 12" of sheets at mud line |
| 44 | 13 | Hole 6"x12" w/ 12" long crack at top of sheet near expansion joint |
| 44 | 16 | Hole 12"x42" at top of sheet |
| 46 | 4 | Hole 3"x3" at top of sheet |
| 46 | 22 | Hole 6"x24" at top of sheet |
| 47 | 15 | Hole 2"x3" at top of sheet |
| 48 | 13 | Hole 8"x24" at top of sheet near expansion joint |
| 49 | 16 | Hole 2"x2" at top of sheet |
| 51 | 15 | Hole 4"x4" at top of sheet |
| 51 | 53 | Hole 12"x24" at top of sheet |
| Z-Sheets (Northern End of Bulkhead) | 2 | Large Hole that goes through & through on the web from both sides |
| Z-Sheets (Northern End of Bulkhead) | 3 | Large Hole that goes through & through on the web from both sides |
| Z-Sheets (Northern End of Bulkhead) | 4 | Large Hole that goes through & through on the web from both sides |

GENERAL SYMBOLS

| EXISTING | PROPOSED | |
|---|---|---|
| | | CONTOURS (MAJOR) |
| | | CONTOURS (MINOR) |
| | | CONDUIT |
| E | E | ELECTRIC |
| GAS | GAS | GAS |
| SS | SS | STORM SEWER (DRAINAGE) |
| SAN | SAN | SANITARY SEWER |
| W | W | WATER (POTABLE / IRRIGATION) |
| OHE | OHE | OVERHEAD UTILITY |
| FO | FO | FIBER OPTICS |
| COMM | COMM | COMMUNICATIONS |
| CA | CA | COMPRESSED AIR |
| | | EROSION CONTROL |
| X X X X | X X X X | FENCE |
| | | ANNUAL HIGH TIDE LINE (AHTL) |
| | | MEAN HIGH WATER (MHW) |
| | | MEAN LOW WATER (MLW) |
| | | PROPERTY LINE |
| | | FEMA FLOOD LIMIT |
| | | HISTORIC HIGH WATER LINE |
| | | SHELLFISH SUITABILITY LIMIT |
| | | HARBOR LINE |
| | | ACOE CHANNEL LIMIT |
| | | WATER SUPPLY |
| | | CONTROL POINT |
| | | BENCHMARK |
| | | VALVE |
| | | WATER VALVE |
| | | GAS WELL |
| D | D | DRAIN MANHOLE |
| E | E | ELECTRIC MANHOLE |
| M | M | MISC MANHOLE |
| S | S | SEWER MANHOLE |
| W | W | WATER MANHOLE |
| C | C | COMMUNICATIONS MANHOLE |
| GG | GG | GAS GATE |
| WG | WG | WATER GATE |
| | | HYDRANT |
| | | UTILITY POLE |
| HH | HH | HANDHOLE |
| | | LIGHT POLE |
| | | PILE (TIMBER OR STEEL) |
| | | SHEET PILE |
| | | TRAFFIC SIGN |
| | | W BEAM |
| | | CATCH BASIN |
| | | LOCATION OF STEEL PLATING REPAIRS |

DATUM OFFSETS

| MLW | | NAVD 88 | |
|---|---|---|---|
| 4.85 | 3.07 | | HTL |
| 3.57 | 1.79 | | MHW |
| 1.78 | 0.00 | | NAVD 88 |
| 0.00 | -1.78 | | MLW |
| -0.14 | -1.92 | | MLLW |

OFFSETS PROVIDED BY THE USACE IN MEMO DATED 2/18/15 BY JACOBS AND NOAA TIDAL STATION "CLARKS POINT" #8447712 TIDAL EPOCH 1983-2001

COMMONWEALTH OF MASSACHUSETTS
ALEX L MORA
CIVIL
NO. 65309
REGISTERED PROFESSIONAL ENGINEER
14 September 2022

Foth

NEW BEDFORD PORT AUTHORITY
123 MACARTHUR DRIVE
NEW BEDFORD, MA 02740

NEW BEDFORD MUNICIPAL PIERS
FENDERING AND REPAIRS

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | DESCRIPTION |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

SHEET TITLE:

GENERAL NOTES, LEGEND, & ABBREVIATIONS

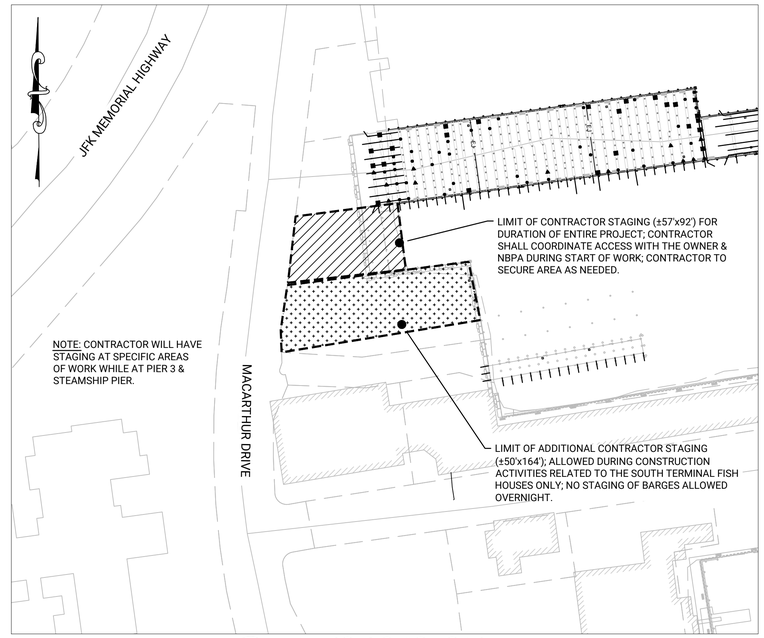
ISSUANCE: ISSUED FOR CONSTRUCTION

PROJECT NO: 21N007

SHEET NUMBER

G-002




ENLARGED STAGING AREA
SCALE: 1" = 60'

ALEX L MORA
CIVIL
NO. 55309
REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS

14 September 2022

GRAPHIC SCALE
0 30 60 120
(IN FEET)
1 INCH = 60 FEET

GRAPHIC SCALE
0 100 200 400
(IN FEET)
1 INCH = 200 FEET

Foth

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**NEW BEDFORD, MA 02740**

**NEW BEDFORD MUNICIPAL PIERS**
**FENDERING AND REPAIRS**

| REVISIONS | | | |
|---|---|---|---|
| NO. | DESCRIPTION | DATE | BY |
| | | | |

DATE OF PREPARATION

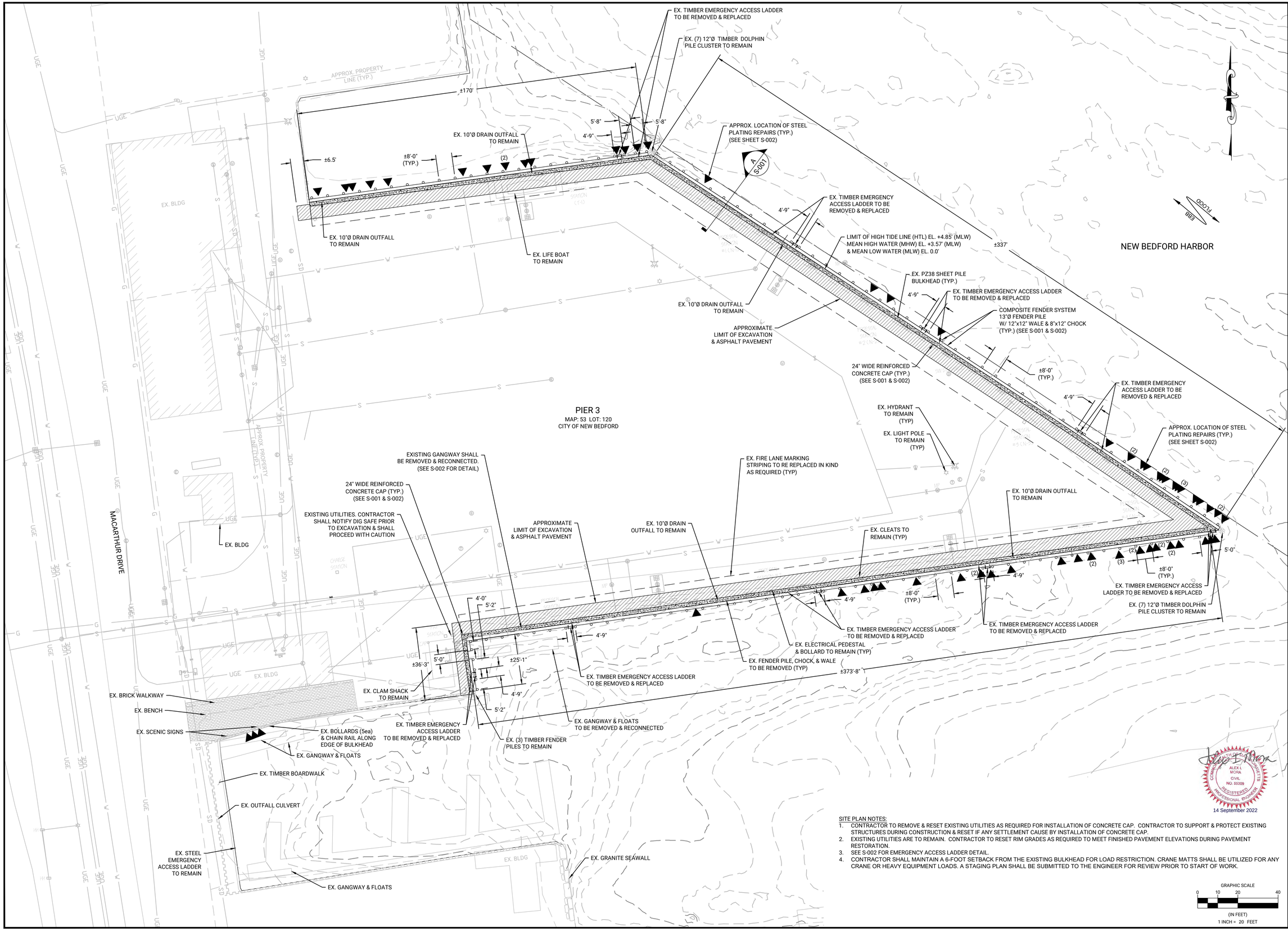
| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

SHEET TITLE:
SITE LOCATION, STAGING, & VESSEL MOVEMENT PLAN

ISSUANCE: **ISSUED FOR CONSTRUCTION**

PROJECT NO: 21N007

SHEET NUMBER
C-001




SITE PLAN NOTES:

1. CONTRACTOR TO REMOVE & RESET EXISTING UTILITIES AS REQUIRED FOR INSTALLATION OF CONCRETE CAP. CONTRACTOR TO SUPPORT & PROTECT EXISTING STRUCTURES DURING CONSTRUCTION & RESET IF ANY SETTLEMENT CAUSE BY INSTALLATION OF CONCRETE CAP.
2. EXISTING UTILITIES ARE TO REMAIN. CONTRACTOR TO RESET RIM GRADES AS REQUIRED TO MEET FINISHED PAVEMENT ELEVATIONS DURING PAVEMENT RESTORATION.
3. SEE S-002 FOR EMERGENCY ACCESS LADDER DETAIL.
4. CONTRACTOR SHALL MAINTAIN A 6-FOOT SETBACK FROM THE EXISTING BULKHEAD FOR LOAD RESTRICTION. CRANE MATTS SHALL BE UTILIZED FOR ANY CRANE OR HEAVY EQUIPMENT LOADS. A STAGING PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO START OF WORK.

ALEX L MORA
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NO. 55309
REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
14 September 2022

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

Foth

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**NEW BEDFORD MUNICIPAL PIERS**
**FENDERING AND REPAIRS**

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

SHEET TITLE:

PIER 3
SITE PLAN

ISSUANCE: **ISSUED FOR CONSTRUCTION**

PROJECT NO: 21N007

SHEET NUMBER

C-002

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

MACARTHUR DRIVE

STEAMSHIP PIER

NEW BEDFORD HARBOR
EBB
FLOOD

COMPOSITE FENDER SYSTEM
13"Ø FENDER PILE
W/ 2"x12" WALE & 8"x12" CHOCK
(TYP.)

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. STEEL PIPE PILES
(TYP. ON EASTERN
SECTION)

SEE BELOW

MATCHLINE

EX. GRANITE
SEAWALL

LIMIT OF HIGH TIDE LINE (HTL) EL. +4.85'
MEAN HIGH WATER (MHW) EL. +3.57'
& MEAN LOW WATER (MLW) EL. 0.0'
ALONG EXISTING GRANITE SEAWALL

EX. TIMBER BOARDWALK

EX. TIMBER PILES
W/ CONCRETE AND/OR
FIBERGLASS JACKETS
(TYP. ON WESTERN SECTION)

EX. TIMBER FENDER PILES, WALE, & CHOCK
(TO BE REMOVED & REPLACED)

FIBERGLASS PILE
JACKET REPAIRS
(TYP. OF 73)

DEBRIS CONTAINMENT BOOM
TO BE USED DURING
PILE JACKETING ACTIVITIES

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

±260'
±384'
±8'-0" (TYP.)
4'-9"
6'-0"
3'-0"
±25'
±138'
4.75'
5'-2"
4'-0"

C S-001
D S-001

APPROX. PROPERTY LINE (TYP.)

SEWERAGE

SD
UGE
W
S

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

NEW BEDFORD HARBOR
EBB
FLOOD

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

13"Ø COMPOSITE
FENDER PILE W/ 2"x12" COMPOSITE
WALER & 8"x12" COMPOSITE CHOCK
FENDER SYSTEM (TYP.)

EX. (7) 12"Ø TIMBER DOLPHIN
PILE CLUSTER
TO REMAIN

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

MATCHLINE

STEAMSHIP PIER

SEE ABOVE

EX. STEEL PIPE PILES
(TYP. ON EASTERN
SECTION)

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

EX. TIMBER EMERGENCY ACCESS LADDER
TO BE REMOVED & REPLACED

DEBRIS CONTAINMENT TO BE USED IN WAY OF
PILE JACKETING ACTIVITIES (TYP)

±243.50'
±167'
±74'-6"
±25'
±59.75'
±33.08'
±8'-0" (TYP.)
4'-9"
1'-8"
6'-0"

ALEX L MORA
CIVIL
NO. 55309
REGISTERED
PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
14 September 2022

PILE RATINGS KEY:
- ● CATEGORY 1 (36 TOTAL)
- ■ CATEGORY 2 (25 TOTAL)
- ▲ CATEGORY 3 (12 TOTAL)

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NEW BEDFORD PORT AUTHORITY
123 MACARTHUR DRIVE
NEW BEDFORD, MA 02740

NEW BEDFORD MUNICIPAL PIERS
FENDERING AND REPAIRS

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | DESCRIPTION |
| | | | |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

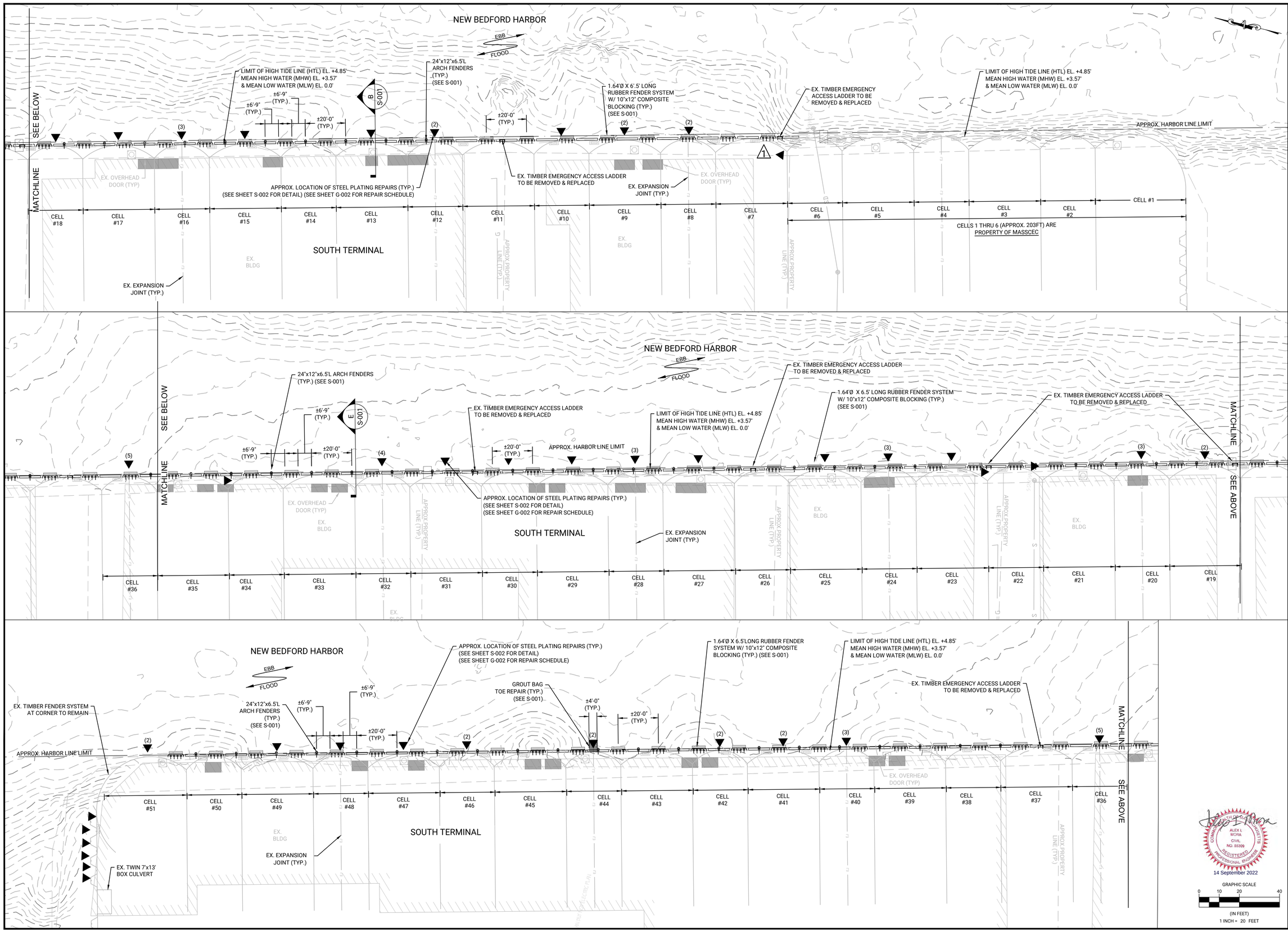
SHEET TITLE:

STEAMSHIP
PIER
SITE PLAN

ISSUANCE:
**ISSUED FOR CONSTRUCTION**

PROJECT NO: 21N007

SHEET NUMBER
C-003




Foth

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**123 MACARTHUR DRIVE**
**NEW BEDFORD, MA 02740**

**NEW BEDFORD MUNICIPAL PIERS**
**FENDERING AND REPAIRS**

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | DTHA | 6/22/2022 | GROUT BAGS REMOVED FROM CELL #7 |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

SHEET TITLE:

SOUTH TERMINAL SITE PLAN

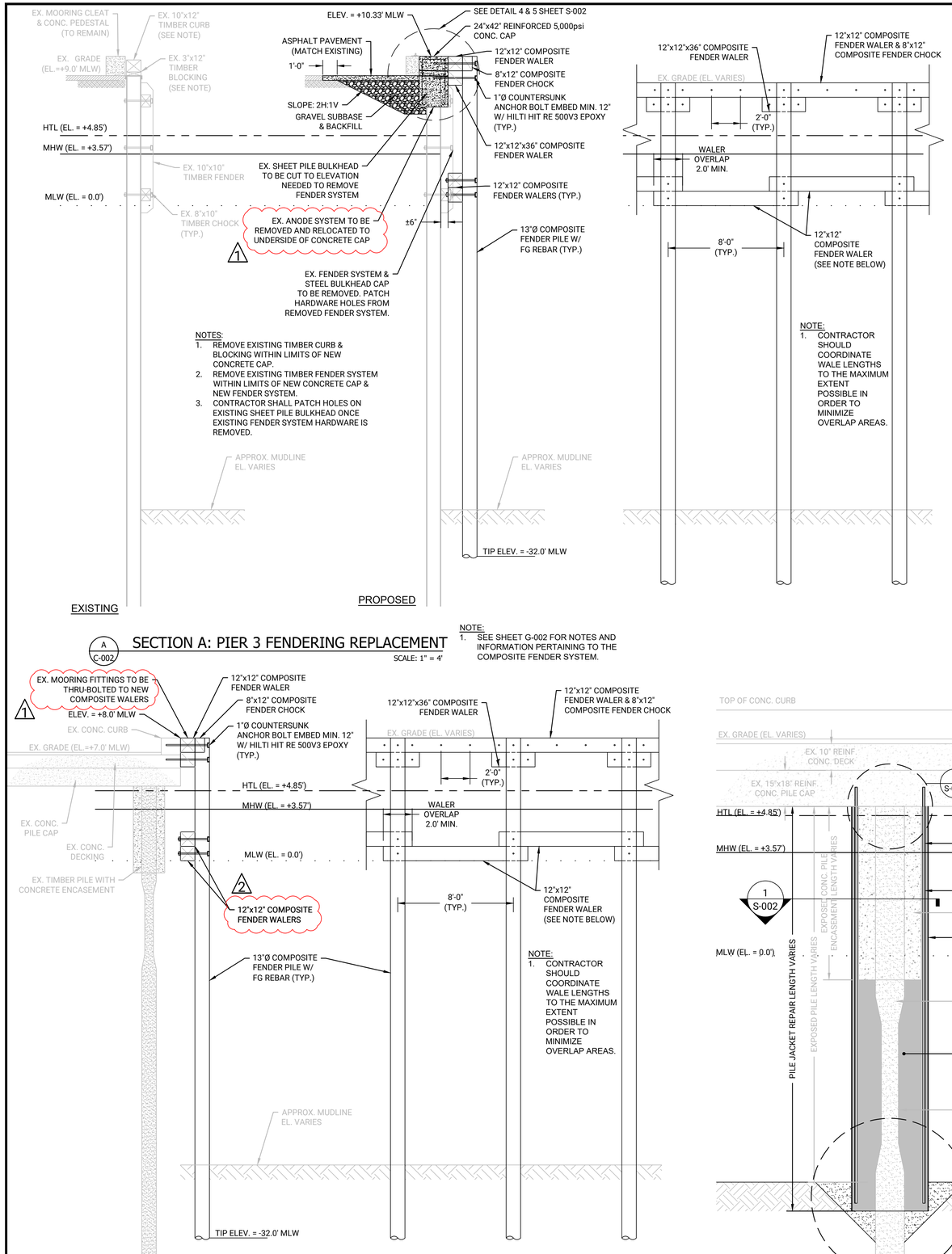
ISSUANCE: **ISSUED FOR CONSTRUCTION**

ALEX I. MORA
CIVIL
NO. 55309
REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
14 September 2022

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

PROJECT NO: 21N007

SHEET NUMBER
C-004




NOTES:
1. REMOVE EXISTING TIMBER CURB & BLOCKING WITHIN LIMITS OF NEW CONCRETE CAP.
2. REMOVE EXISTING TIMBER FENDER SYSTEM WITHIN LIMITS OF NEW CONCRETE CAP & NEW FENDER SYSTEM.
3. CONTRACTOR SHALL PATCH HOLES ON EXISTING SHEET PILE BULKHEAD ONCE EXISTING FENDER SYSTEM HARDWARE IS REMOVED.

NOTE:
1. CONTRACTOR SHOULD COORDINATE WALE LENGTHS TO THE MAXIMUM EXTENT POSSIBLE IN ORDER TO MINIMIZE OVERLAP AREAS.

## A C-002 SECTION A: PIER 3 FENDERING REPLACEMENT

SCALE: 1" = 4'

NOTE:
1. SEE SHEET G-002 FOR NOTES AND INFORMATION PERTAINING TO THE COMPOSITE FENDER SYSTEM.

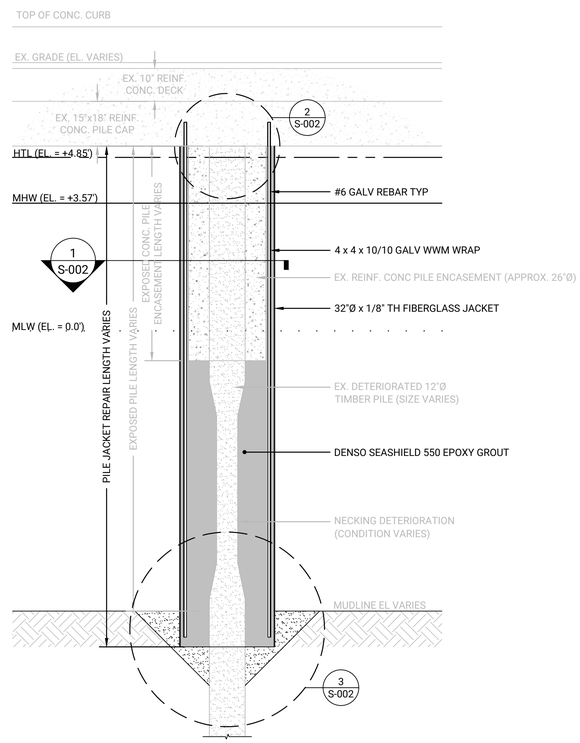



NOTE:
1. CONTRACTOR SHOULD COORDINATE WALE LENGTHS TO THE MAXIMUM EXTENT POSSIBLE IN ORDER TO MINIMIZE OVERLAP AREAS.

## C C-003 SECTION C: STEAMSHIP PIER FENDERING REPLACEMENT

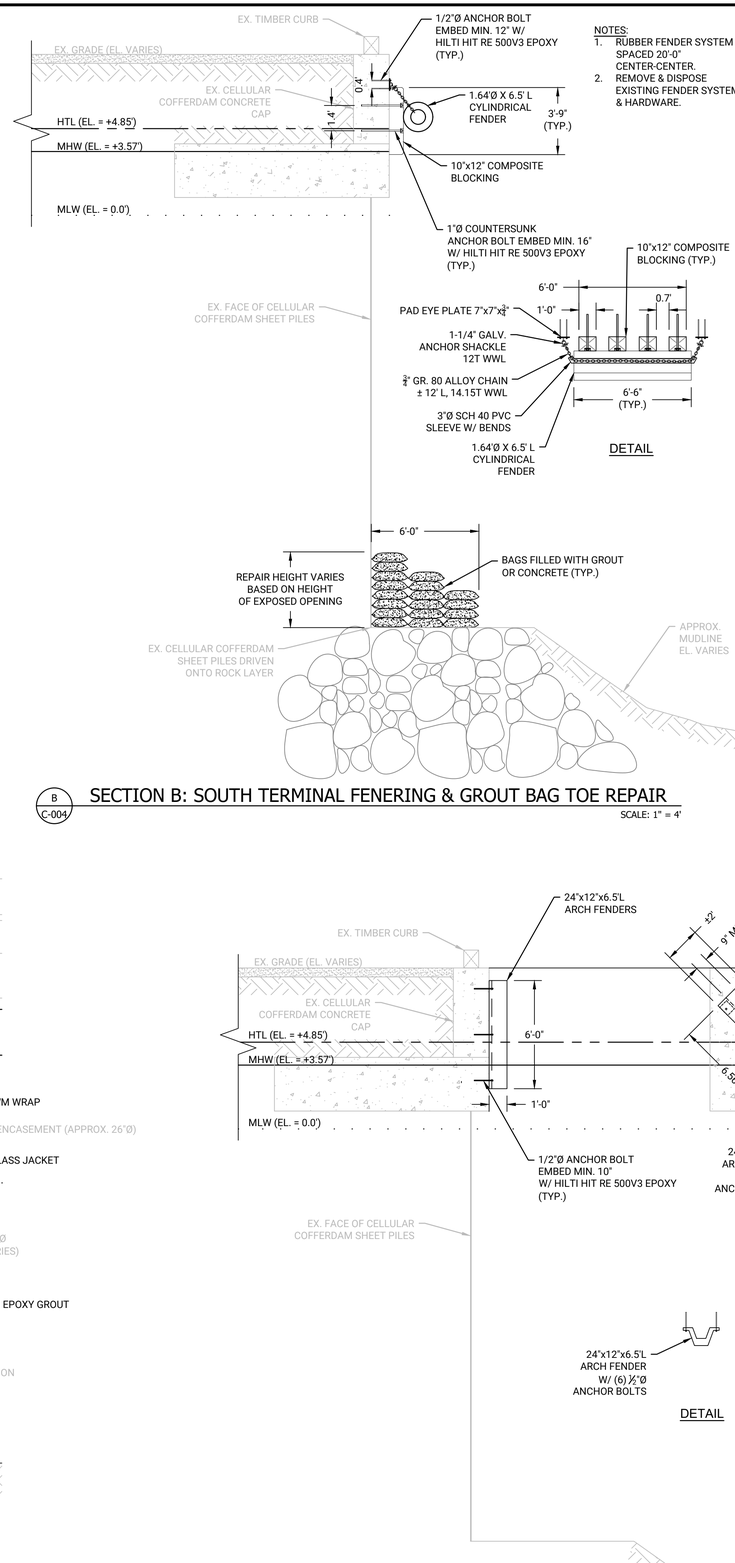
SCALE: 1" = 4'

NOTE:
1. SEE SHEET G-002 FOR NOTES AND INFORMATION PERTAINING TO THE COMPOSITE FENDER SYSTEM.




## D C-003 SECTION D: TYPICAL FIBERGLASS JACKET REPAIR

SCALE: 1" = 2'




NOTES:
1. RUBBER FENDER SYSTEM SPACED 20'-0" CENTER-CENTER.
2. REMOVE & DISPOSE EXISTING FENDER SYSTEM & HARDWARE.

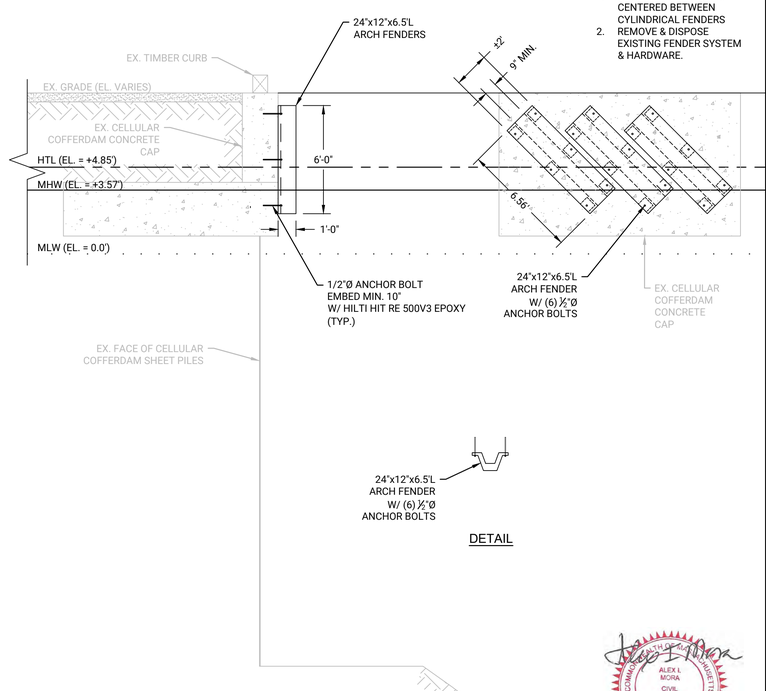
GRAPHIC SCALE
0 0.5 1 2
(IN FEET)
1 INCH = 1 FEET

GRAPHIC SCALE
0 1 2 4
(IN FEET)
1 INCH = 2 FEET

GRAPHIC SCALE
0 2 4 8
(IN FEET)
1 INCH = 4 FEET

## B C-004 SECTION B: SOUTH TERMINAL FENERING & GROUT BAG TOE REPAIR

SCALE: 1" = 4'




NOTES:
1. ARCH FENDER SYSTEM CENTERED BETWEEN CYLINDRICAL FENDERS
2. REMOVE & DISPOSE EXISTING FENDER SYSTEM & HARDWARE.

## E C-004 SECTION E: SOUTH TERMINAL D-FENERING

SCALE: 1" = 4'

ALEX I. MORA
COMMONWEALTH OF MASSACHUSETTS
CIVIL
NO. 55309
REGISTERED
PROFESSIONAL ENGINEER
14 September 2022

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**NEW BEDFORD PORT AUTHORITY**
**123 MACARTHUR DRIVE**
**NEW BEDFORD, MA 02740**

**NEW BEDFORD MUNICIPAL PIERS**
**FENDERING AND REPAIRS**

REVISIONS

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | DTHA | 6/27/2022 | NOTES RE MOORING FITTINGS ON STEAMSHIP PIER AND ANODES ON PIER 3 |
| 2 | DTHA | 7/7/2022 | CLARIFICATION ON CHOCK/WALER INSTALLATION FOR STEAMSHIP PIER |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

SHEET TITLE:

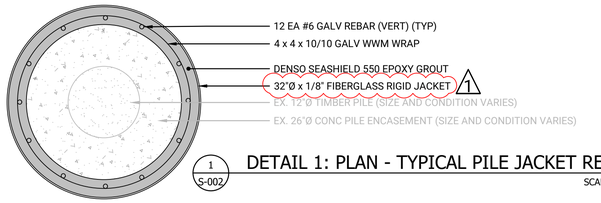
TYPICAL SECTIONS
SHEET 1 OF 1

ISSUANCE: **ISSUED FOR CONSTRUCTION**

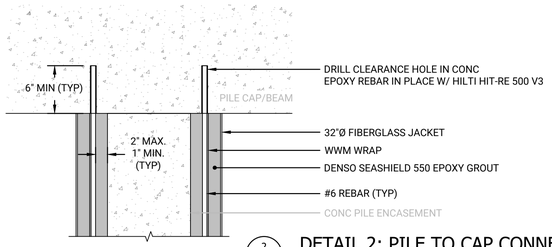
PROJECT NO: 21N007

SHEET NUMBER

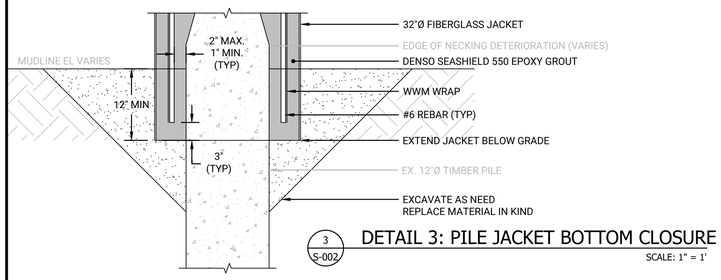
S-001



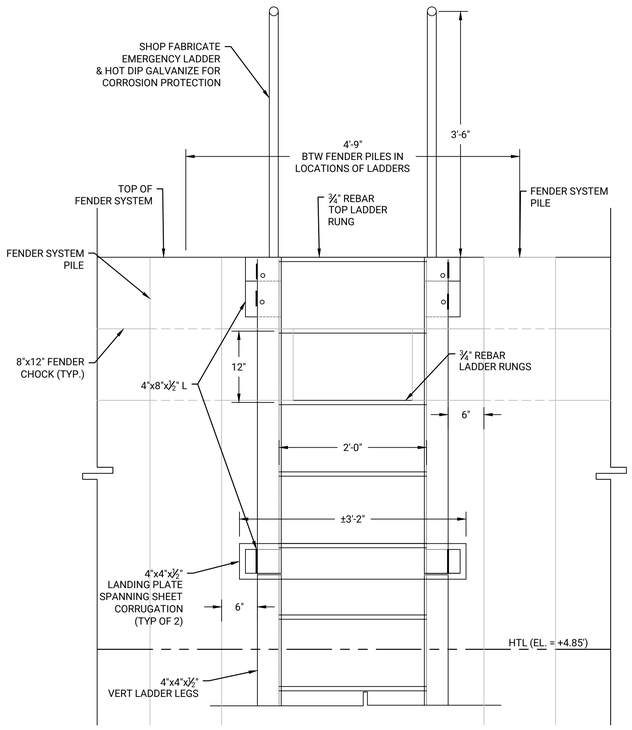

1 S-002 **DETAIL 1: PLAN - TYPICAL PILE JACKET REPAIR**
SCALE: 1" = 1'



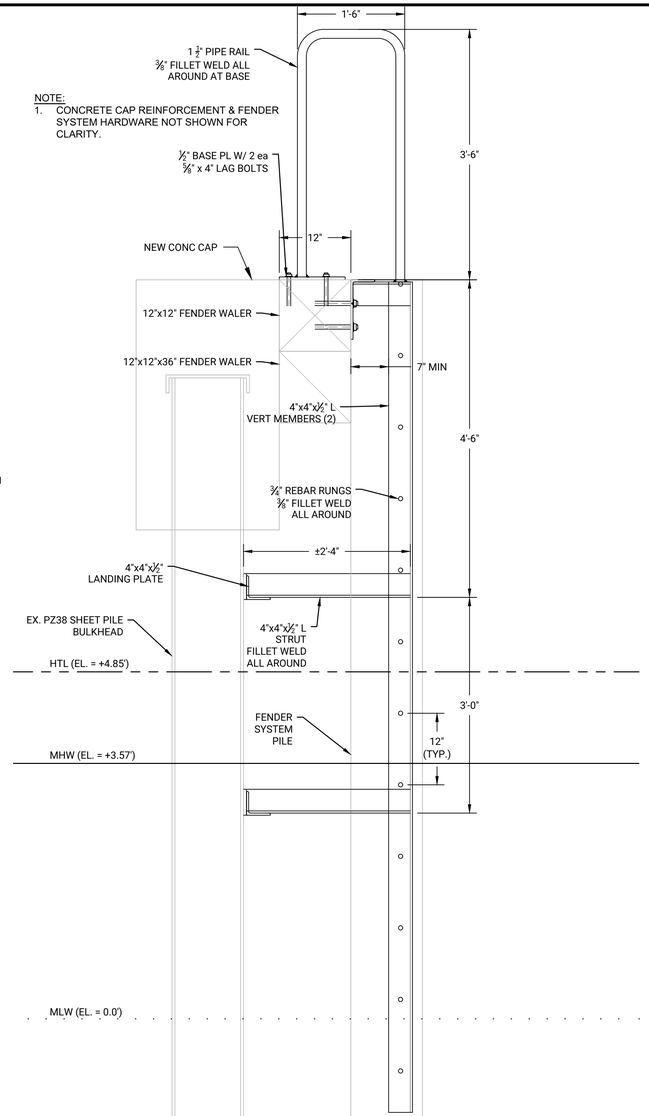

2 S-002 **DETAIL 2: PILE TO CAP CONNECTION**
SCALE: 1" = 1'



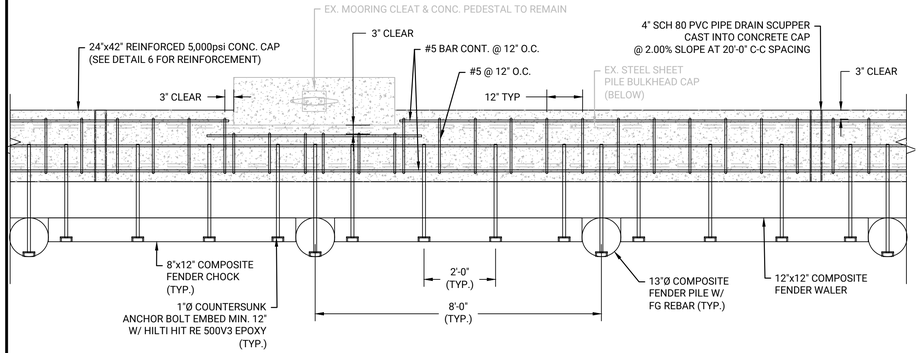

3 S-002 **DETAIL 3: PILE JACKET BOTTOM CLOSURE**
SCALE: 1" = 1'



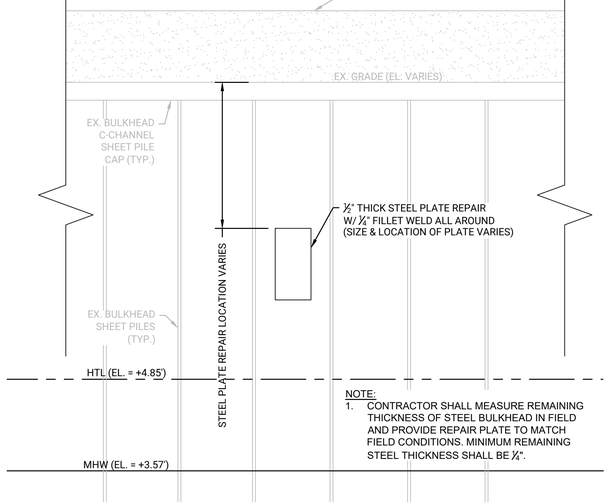

6 S-002 **DETAIL 6: EMERGENCY ACCESS LADDER REPLACEMENT**
SCALE: 1" = 1'




7 S-002 **DETAIL 7: EMERGENCY ACCESS LADDER REPLACEMENT**
SCALE: 1" = 1'

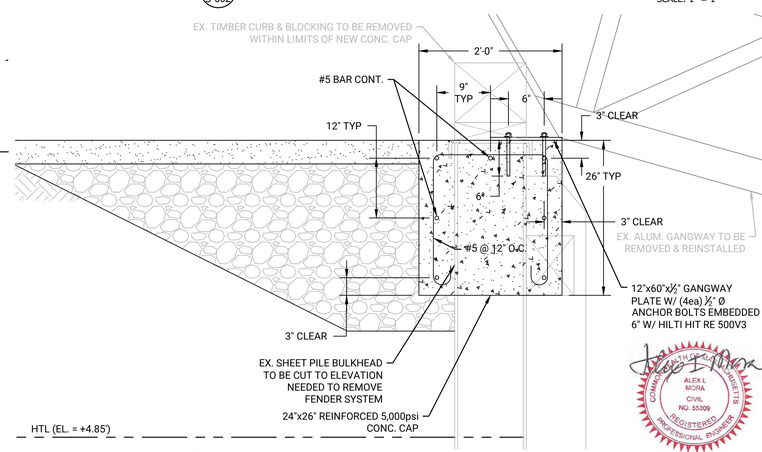



4 S-002 **DETAIL 4: PIER 3 CONCRETE CAP**
SCALE: 1" = 2'

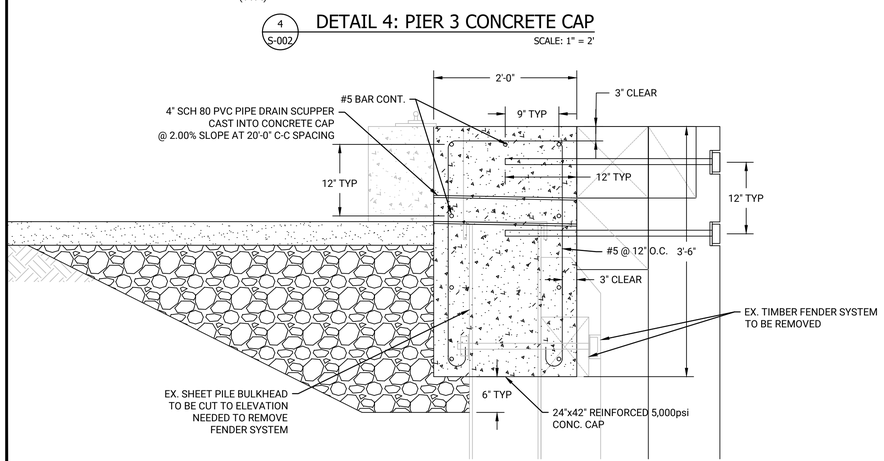



NOTE:
1. CONTRACTOR SHALL MEASURE REMAINING THICKNESS OF STEEL BULKHEAD IN FIELD AND PROVIDE REPAIR PLATE TO MATCH FIELD CONDITIONS. MINIMUM REMAINING STEEL THICKNESS SHALL BE ¼".

8 ALL **DETAIL 8: STEEL PLATING REPAIR**
SCALE: 1" = 1'




9 S-002 **DETAIL 9: PIER 3 CONCRETE CAP AT GANGWAY**
SCALE: 1" = 1'




5 S-002 **DETAIL 5: PIER 3 CONCRETE CAP REINFORCEMENT**
SCALE: 1" = 1'

GRAPHIC SCALE 0 0.5 1 2 (IN FEET) 1 INCH = 1 FEET

GRAPHIC SCALE 0 1 2 4 (IN FEET) 1 INCH = 2 FEET

GRAPHIC SCALE 0 2 4 8 (IN FEET) 1 INCH = 4 FEET

Foth

**NEW BEDFORD PORT AUTHORITY**
**123 MACARTHUR DRIVE**
**NEW BEDFORD, MA 02740**

**NEW BEDFORD MUNICIPAL PIERS**
**FENDERING AND REPAIRS**

| NO. | BY | DATE | DESCRIPTION |
|---|---|---|---|
| 1 | DTHA | 6/29/2022 | CORRECTIONS TO PILE JACKET DIAMETER REQUIRED |

DATE OF PREPARATION

| | BY | DATE |
|---|---|---|
| SURVEYED | | |
| DRAWN | JSD | 6/1/2022 |
| DESIGNED | AIM | 6/1/2022 |
| CHECKED | AIM / DHA | 6/1/2022 |

SHEET TITLE:

TYPICAL
DETAILS
SHEET 1 OF 1

ISSUANCE: **ISSUED FOR CONSTRUCTION**

PROJECT NO: 21N007

SHEET NUMBER
S-002

COMMONWEALTH OF MASSACHUSETTS
ALEX I. MORA
CIVIL
NO. 55309
REGISTERED PROFESSIONAL ENGINEER
14 September 2022

# 7. South Terminal Fish Houses

## 7.1 Description of Site

### 7.1.1 Site Location

South Terminal is located off of Hassey Street, south of Leonard's Wharf and north of the Hurricane Barrier along the New Bedford waterfront on Buzzards Bay as shown on ***Figure 6***. The parcel is referenced by the City of New Bedford Assessor's Office as Map 31, 37-2, and 42, Lot 47 and 302. The project site is located within a Designated Port Area and Shellfish Suitability Area as regulated under the MA WPA.




Figure 6: Location of South Terminal Fish Houses

### 7.1.2 Facility Description

South Terminal is believed to have been constructed in the 1960s. It is divided into several marine industrial parcels and ship berths, and is constructed of an approximate 1,800-foot long steel cellular bulkhead with a reinforced concrete cap wall. The cellular bulkhead retains solid fill material and provides support for vessel berthing and adjacent building structures. South Terminal is constructed of twenty-six 54-foot diameter cofferdams and twenty-five 17-foot radius cofferdams that make up the total 51 steel cellular cofferdams which are built with MP-101 steel sheet piles. A bulkhead also spans the northern and southern portions of the site which connect the northern and southern most cofferdams to the landside shoreline. The northern bulkhead is constructed of approximately 100 feet of MZ-27 steel sheet piles and the southern bulkhead is constructed of approximately 85 feet of MZ-27 steel sheet piles. Supported by the cellular cofferdam cells is an L-shaped reinforced concrete cap wall that is 2-foot wide by 5-foot thick on the stem and 12-foot wide by 3-foot thick at the base. Additionally, 148 P73 H-piles were driven approximately 10-feet landward of the face of the cellular bulkhead. The cellular cofferdam cells and bulkhead are numbered, for reference, as shown on the attached plans in **Appendix A – Condition Plans**. Structures extend over the cells for the majority of the 1,800 linear feet. The first 203 feet of the bulkhead are owned and maintained by the MA Clean Energy Center (MassCEC), while the remaining ~1,597 feet are owned and maintained by the New Bedford Port Authority (NBPA). (The full extent of the bulkhead was inspected, as the bulkhead had been previously owned by NBPA in its entirety.) The fender system along South Terminal consists of a combination of large diameter tires and D-Fenders hung from the concrete deck cap. The fenders are secured by chains which are connected to eye bolts anchored to the concrete deck cap.

## 7.2 Observed Conditions - 2020

The underwater inspection of South Terminal, executed with Fathom, was performed on February 3, 4, and 5, 2021. The topside inspection was performed on January 8, 2021 by Foth. Assessment of the bituminous pavement and utilities will be stated in a later section of this report. Assessment of the adjacent buildings, loading platforms, fencing, and stairways are not included in the scope of work and therefore were not inspected. For reference, as shown on the attached plans in **Appendix E – South Terminal 2020 Condition Plan**, a baseline stationing was established along the top of the bulkhead during the inspection. Station 0+00 is located at the southern end of the project site adjacent to the Marine Commerce Terminal and extends north terminating at Station 18+15. (Stations 0+00 thru 2+60 are not the property of NBPA, but conditions have been noted since they had been previously owned by NBPA and therefore included in historic reports.) Observations were made in relation to their stationing and cofferdam cell location along the baseline as appropriate, and as noted herein and in the plans. Overall, the condition of South Terminal was found to be in *Fair* condition.

The steel sheet pile cells are of varying diameters alternating between major and minor cells and are exposed from the mud line up to the concrete cap. The flat steel sheets which comprise the cells, exhibit signs of heavy corrosion with pitting of the steel and no evidence of a passive or active cathodic protection system.

### 7.2.1 Appurtenances

Appurtenances such as the life rings were typically given a condition rating of *Minor*. Life rings were observed either bolted to the timber curb along the bulkhead or placed on the adjacent buildings at Station 2+92, Station 6+10, and Station 10+35, with no major deficiencies noted. The Life Ring at Station 14+70 was observed to be loose due to the loose and compromised timber curb, therefore was given a condition rating of *Severe*.

Similarly, the mooring cleats and mooring bollards located throughout the pier were given a condition rating ranging from *Minor* to *Severe*. Typically the mooring cleats and bollards were given condition ratings of *Minor* with typical observations consisting of coating loss, minor surface corrosion, minor wearing marks or pitting, and in-tact epoxy on hardware. (Refer to Photographs 1 through 3 of Appendix B.) Corrosion of the mooring cleats and bollards will lead to loss of section and, therefore, a reduction of strength. Mooring cleats and bollards with typical observations consisting of missing hardware epoxy, significant surface wear marks and pitting, moderate surface corrosion, delamination, scaling, and corroded hardware less than 25% loss of section were given a condition rating of *Moderate*. (Refer to Photographs 4 through 6 of Appendix B.) Several mooring cleats were observed to have corroded hardware greater than 25% loss of section and advanced corrosion and scaling with surface wear marks and pitting, resulting in a *Major* condition rating. (Refer to Photographs 7 and 8 of Appendix B.) These mooring cleats are identified as #17, #23, #27, #29, #38, and #44, as well as, mooring bollards #4, #5, and #12. Additionally, mooring bollard #13 was observed to be broken and therefore was given a condition rating of *Severe*. (Refer to Photograph 9 of Appendix B.) Refer to **Table 17** for a list of deficiencies encountered related to the mooring cleats and mooring bollards.

Additional appurtenances, such as the access ladders, are located along the bulkhead to provide access to and from the deck to the water below. The construction of the access ladders vary between timber and steel throughout the pier. The access ladders were given condition ratings of either *Minor* or *Severe*. Typical observations which attributed to these ratings were missing ladder rungs, heavily cracked/split vertical legs, damaged or broken components, impact damage, and heavy corrosion and deterioration of the hardware. Foth noted that it had appeared as though the majority of damage observed on the access ladders is likely a result of impact from vessels causing damage to the rungs and the vertical legs. The steel access ladder at Station 2+88 was given a condition rating of *Severe* and was observed to have bent/deformed vertical legs at the top of the ladder, likely from impact, as well as broken step rungs at the top of the ladder and broken connection to the reinforced concrete bulkhead cap. (Refer to Photograph 10 of Appendix B.) Timber access ladders at Station 6+65, Station 9+00, and Station 10+40

were all given condition ratings of *Severe* and were observed to have corroded connection hardware, broken step rungs, and/or broken vertical legs compromising its connection to the concrete cap. (Refer to Photographs 11 through 13 of Appendix B.) The timber access ladder at Station 4+26 was observed to have corroded connections to the reinforced concrete bulkhead cap and was given a condition rating of *Minor*. The timber access ladders at Station 7+90 and Station 12+45 had no deficiencies observed and therefore were also given condition ratings of *Minor*.

## Table 17

## South Terminal Observed Mooring Cleat and Mooring Bollard Deficiencies

| Station | Structure | Deficiency |
|---|---|---|
| **1+20 [MassCEC]** | Mooring Bollard #1 | Moderate Condition |
| **1+40 – 2+20 [MassCEC]** | Mooring Cleats #1 - #5 | Moderate Condition; Delamination and Scaling |
| **2+40 [MassCEC]** | Mooring Bollard #2 | Moderate Condition |
| **2+60 [MassCEC]** | Mooring Cleat #6 | Moderate Condition |
| **2+80** | Mooring Cleat #7 | Moderate Condition |
| **3+00** | Mooring Cleat #8 | Minor Condition |
| **3+20** | Mooring Cleat #9 | Minor Condition |
| **3+60** | Mooring Bollard #3 | Minor Condition |
| **3+80** | Mooring Cleat #10 | Minor Condition |
| **4+00** | Mooring Cleat #11 | Moderate Condition |
| **4+45** | Mooring Cleat #12 | Moderate Condition |
| **4+70** | Mooring Cleat #13 | Minor Condition |
| **4+90** | Mooring Bollard #4 | Major Condition; Heavily Corroded Fasteners |
| **5+10** | Mooring Cleat #14 | Minor Condition |
| **5+30** | Mooring Cleat #15 | Moderate Condition |
| **5+50** | Mooring Cleat #16 | Minor Condition |
| **5+70** | Mooring Cleat #17 | Major Condition |
| **5+90** | Mooring Cleat #18 | Minor Condition |
| **6+10** | Mooring Bollard #5 | Major Condition |
| **6+60** | Mooring Cleat #19 | Moderate Condition |
| **6+80** | Mooring Cleat #20 | Minor Condition |
| **7+00** | Mooring Cleat #21 | Moderate Condition |
| **7+20** | Mooring Cleat #22 | Minor Condition; Missing Hardware Epoxy |
| **7+40** | Mooring Bollard #6 | Moderate Condition |
| **7+80** | Mooring Cleat #23 | Major Condition |
| **8+00** | Mooring Cleat #24 | Minor Condition |
| **8+20** | Mooring Cleat #25 | Moderate Condition |
| **8+60** | Mooring Cleat #26 | Moderate Condition |
| **8+65** | Mooring Bollard #7 | Moderate Condition |
| **8+95** | Mooring Cleat #27 | Major Condition |
| **9+30** | Mooring Bollard #8 | Moderate Condition |
| **9+55** | Mooring Cleat #28 | Minor Condition |
| **9+70** | Mooring Cleat #29 | Major Condition |
| **9+90** | Mooring Cleat #30 | Minor Condition; On Expansion Joint |
| **10+10** | Mooring Cleat #31 | Minor Condition |
| **10+35** | Mooring Cleat #32 | Minor Condition |
| **10+55** | Mooring Bollard #9 | Moderate-Major Condition |
| **10+80** | Mooring Cleat #33 | Minor Condition |
| **11+00** | Mooring Cleat #34 | Moderate Condition |

| Station | Structure | Deficiency |
|---|---|---|
| **11+40** | Mooring Cleat #35 | Moderate Condition |
| **11+60** | Mooring Cleat #36 | Minor Condition |
| **11+90** | Mooring Bollard #10 | Minor Condition |
| **12+20** | Mooring Cleat #37 | Minor Condition |
| **12+40** | Mooring Cleat #38 | Moderate-Major Condition |
| **12+80** | Mooring Cleat #39 | Moderate Condition |
| **13+00** | Mooring Cleat #40 | Minor Condition |
| **13+20** | Mooring Bollard #11 | Minor Condition |
| **13+60** | Mooring Cleat #41 | Moderate Condition |
| **13+80** | Mooring Cleat #42 | Moderate Condition |
| **14+00** | Mooring Cleat #43 | Minor Condition |
| **14+40** | Mooring Cleat #44 | Major Condition |
| **14+70** | Mooring Bollard #12 | Major Condition |
| **15+00** | Mooring Cleat #45 | Moderate Condition |
| **15+20** | Mooring Cleat #46 | Moderate Condition |
| **15+40** | Mooring Cleat #47 | Moderate Condition |
| **15+60** | Mooring Bollard #13 | Severe Condition; Broken |
| **16+00** | Mooring Cleat #48 | Minor Condition |
| **16+20** | Mooring Cleat #49 | Moderate Condition |
| **16+40** | Mooring Cleat #50 | Moderate Condition |
| **16+60** | Mooring Cleat #51 | Moderate Condition |
| **16+80** | Mooring Bollard #14 | Minor Condition |
| **17+20** | Mooring Cleat #52 | Moderate Condition |

### 7.2.2 Timber Curb

The timber curb was generally found to be in ***Fair - Poor*** condition. Condition ratings for the timber curb were given ranging from ***Minor*** to ***Severe***. (Refer to Photographs 14 through 23 of Appendix B.) Typical observations which attributed to a ***Minor*** condition rating consisted primarily of rot, fungal decay, and checking typically found given the age of the timber elements. Typical observations which attributed to the ***Moderate*** condition rating were moderate fungal decay/rotting, section loss up to 25%, checking or splitting wider than ½", and dislodged sections. Typical observations which attributed to the ***Major*** condition rating were section loss 25% to 50%, heavily corroded hardware, checking or splitting through full section, and displacement or loss of bearing connections. Typical observations which attributed to the ***Severe*** condition rating were section loss greater than 50%, loss of connection or full bearing, and partial or full breakage. In addition, there are several areas along the bulkhead were the timber curb was observed to be missing.

### 7.2.3 Rubber Fender System

The fender system primarily consists of D-Fenders and non-engineered rubber elements (tires, cylinders, etc.). Minor oxidation was observed on the hardware of the fender system. Overall, the fender system was generally given a condition rating of ***Minor-Moderate*** with gouges/wears less than 25% nominal depth, surface cracking of rubber components, and intact connections. (Refer to Photograph 24 of Appendix B.) However, several areas of the fender system along the bulkhead were given a condition rating of ***Severe***. This rating was generally given for sections where the fender system was observed to be missing, which indicates that the connections had failed. One particular section of the fender system which was missing is between Station 9+30 through 10+30 (refer to Photograph 25 Appendix B), and the other area is between Station 1+60 through Station 2+00. (Refer to Photograph 26 Appendix B.) Additionally, several D-Fenders were observed to be torn through the rubber. (Refer to Photographs 27 to 29 of Appendix B.)

### 7.2.4 Concrete Bulkhead Cap

The concrete deck was given a condition rating of *Moderate* with typical surface cracking and spalling. (Refer to Photographs 30 through 35 of Appendix B.) Vertical hairline cracks were observed along the face of the concrete deck cap, along with spalling on the topside leading edge of the concrete deck throughout the entire length of the project site. Occasionally, these areas of spalling and cracking coincided with areas where the mooring bollards or mooring cleats are located. (Refer to Photographs 33 through 35 of Appendix B.) This has a potential of compromising the structural integrity of their fasteners. Lastly, multiple areas of isolated spalling resulting in loss of section, along with exposed reinforcement were also observed during the inspection and were subsequently given a condition rating of *Severe*.

### 7.2.5 Sheet Pile Cofferdam Bulkhead

The sheet pile cellular cofferdam bulkhead at South Terminal is comprised of 51 sheet pile cells is constructed over 1,630 linear feet (the first~200 linear feet of which are not owned by NBPA) with a northern bulkhead comprised of approximately 100 feet of MZ-27 steel sheet piles and the southern bulkhead comprised of approximately 85 feet of MZ-27 steel sheet piles. The sheet pile cofferdams and bulkheads at South Terminal were given an overall condition rating of *Severe*. (Refer to Photographs 36 through 48 of Appendix B.) Typical observations which attributed to this are holes in the sheet piles, structural deformation, loss of thickness and section, and washout. During the underwater inspection, the divers encountered holes on the sheet piles at 38 out of a total of 51 cellular cofferdams. The holes range in size and diameter or length from one to two inches to greater than 30 inches and also range in location from between the tidal zone to the top of the sheets. (Refer to Photographs 36 through 41 of Appendix B.) Coincidentally, a majority of the holes observed on the cells coincided with locations of the concrete cap expansion joints. **Table 18** indicates the size and location of each hole observed during the inspection. Refer to **Table 19**for UT readings.

In addition to the observed holes, the divers also indicated a section of the sheet piles from Cell #5 through Cell #7 to be washing out from below the sheets. (Refer to Photographs 42 and 43 of Appendix B.) It appeared as though the harbor was dredged sometime after the 2016 inspection, indicated by a layer of old mudline material on the sheet piles, which has exposed the bottom of the sheets at this location. It was noted that the sheet piles appeared to have been driven to a rock layer, which may have been mistaken as refusal or bedrock during the time of installation, and therefore did not extend to the depths required. Since the previous dredge limit was higher than the current elevation and above this deficiency, it was not observed during the previous inspection in 2016. Similarly, an additional area of washout was encountered at Cell #44. The divers indicated that two of the sheet piles at this location were separated from the interlocks approximately 12 inches from the mudline where they continued to bow outward. (Refer to Photographs 44 and 45 of Appendix B.) Therefore, washout was observed at this location due to the separation of the interlocks from the adjacent sheet piles.

Lastly, during the inspection, the divers observed the sheet piles of the northern bulkhead to be in *Critical* condition. Large holes were encountered that extended through the webs of the sheet piles essentially leaving the inner and outer flanges to remain. (Refer to Photographs 46 through 48 of Appendix B.)

# Table 18

## South Terminal Cellular Cofferdam Deficiencies:

| Cell # | Sheet # | Deficiency |
|---|---|---|
| 1 [Mass CEC] | 3 | Hole 4"x6" near concrete cap |
| 2 [Mass CEC] | 25 | Hole 2"x5" at top of sheet |
| 3 [Mass CEC] | 3 | Hole 12"x24" at top of sheet |
| 3 [Mass CEC] | 6 | Hole 6"x30" at top of sheet |
| 4 [Mass CEC] | 12 | Hole 6"x10" at top of sheet near expansion joint |
| 5 [Mass CEC] | 15 | Hole 2"x2" at top of sheet by diver |
| 5 [Mass CEC] | 22-30 | Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below |
| 6 [Mass CEC] | 1-24 | Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below |
| 6 [Mass CEC] | 9-14 | Large Hole - 5 sheets wide by 48" long (assumed for drainage; not for repair) |
| 7 [Mass CEC] | 1 | Hole 3"x6" at top of sheet |
| 7 [Mass CEC/ NBPA] | 1-9 | Sheets sitting on rocks w/ large void space beneath sheets; Washout occurring below |
| 7 | 9-30 | Go into mud line, mud line jogs out away from cell 3', then rocks continue below |
| 8 | 10 | Hole 6"x6" at top of sheet |
| 8 | 11 | Hole 2"x4" at top of sheet near expansion joint |
| 9 | 15 | Hole 6"x10" at top of sheet |
| 9 | 28 | Hole 6"x6" at top of sheet |
| 10 | 12 | Hole 4"x6" and 1.5"x2" at top of sheet |
| 12 | 12 | Hole/Crack 2"x240" at top of sheet near expansion joint |
| 12 | 15 | Hole 3"x4" at top of sheet |
| 13 | 2 | Hole 1"x1" at top of sheet |
| 15 | 30 | Hole 4"x6" at top of sheet |
| 16 | 11 | Hole 6"x12" at top of sheet near expansion joint |
| 16 | 12 | Hole 12"x36" at top of sheet |
| 16 | 22 | Hole 1"x2" at top of sheet |
| 17 | 30 | Hole 4"x6" at top of sheet |
| 18 | 19 | Hole 6"x12" at top of sheet |
| 19 | 23 | Hole 1"x2" at top of sheet |
| 19 | 30 | Hole 3"x5" at top of sheet |
| 20 | 12 | Hole 6"x20" at top of sheet |
| 20 | 13 | Hole 8"x36" at top of sheet near expansion joint |
| 20 | 14 | Hole 12"x36" at top of sheet |
| 22 | 6 | Hole 2"x2" at top of sheet by diver |
| 22 | 12 | Large Hole (assumed for drainage; not for repair) |
| 23 | 4 | Hole 1"x1" at top of sheet by diver |
| 23 | 10 | Hole 2"x3" mid water |
| 24 | 12 | Hole 8"x24" w/ 24" long crack at top of sheet |
| 24 | 13 | Hole 8"x36" at top of sheet near expansion joint |

| Cell # | Sheet # | Deficiency |
|---|---|---|
| 24 | 14 | Hole 12"x48" at top of sheet |
| 25 | 27 | Hole 1"x2" at top of sheet |
| 27 | 10 | Hole 4"x6" at top of sheet |
| 28 | 12 | Hole 3"x4" at top of sheet |
| 28 | 13 | Hole 8"x8" at top of sheet near expansion joint |
| 28 | 14 | Hole 8"x12" at top of sheet |
| 29 | 19 | Hole 2"x3" at top of sheet |
| 30 | 13 | Hole 6"x8" at top of sheet |
| 31 | 12 | Hole 2"x2" at top of sheet |
| 32 | 13 | Hole 12"x24" at top of sheet |
| 32 | 14 | Hole 12"x36" w/ 24" long crack at top of sheet near expansion joint |
| 32 | 15 | Hole 10"x24" w/ 24" long crack at top of sheet |
| 32 | 18 | Hole 3"x4" at top of sheet |
| 35 | 2 | Hole 2"x4" at top of sheet |
| 36 | 12 | Hole 6"x24" at top of sheet |
| 36 | 13 | Hole 12"x36" at top of sheet near expansion joint |
| 36 | 14 | Hole 10"x24" at top of sheet |
| 36 | 15 | Hole 4"x10" at top of sheet |
| 36 | 16 | Hole 4"x4" at top of sheet |
| 40 | 12 | Hole 3"x3" at top of sheet |
| 40 | 13 | Hole 4"x18" w/ 12" long crack at top of sheet near expansion joint |
| 40 | 23 | Hole 2"x6" at top of sheet |
| 41 | 2 | Hole 2"x6" at top of sheet |
| 41 | 30 | Hole 1"x3" at top of sheet |
| 42 | 10 | Hole 1"x1" at top of sheet |
| 42 | 15 | Hole 2"x2" at top of sheet |
| 44 | 5 and 6 | Bowed outward with interlock separation at bottom 12" of sheets at mud line |
| 44 | 13 | Hole 6"x12" w/ 12" long crack at top of sheet near expansion joint |
| 44 | 16 | Hole 12"x42" at top of sheet |
| 46 | 4 | Hole 3"x3" at top of sheet |
| 46 | 22 | Hole 6"x24" at top of sheet |
| 47 | 15 | Hole 2"x3" at top of sheet |
| 48 | 13 | Hole 8"x24" at top of sheet near expansion joint |
| 49 | 16 | Hole 2"x2" at top of sheet |
| 51 | 15 | Hole 4"x4" at top of sheet |
| 51 | 53 | Hole 12"x24" at top of sheet |
| Z-Sheets | 2 | Large Hole that goes through and through on the web from both sides |
| Z-Sheets | 3 | Large Hole that goes through and through on the web from both sides |
| Z-Sheets | 4 | Large Hole that goes through and through on the web from both sides |

# Table 19

## UTM Readings South Terminal

| Sheet No. | Cell # | Elevation | 2020 UT *Outer Face* |
|---|---|---|---|
| 23 | 2 | Mud Line | 0.395 |
| | | Mid Water | 0.295 |
| | | Tidal Zone | 0.350 |
| 15 | 5 | Mud Line | 0.385 |
| | | Mid Water | 0.350 |
| | | Tidal Zone | To Pitted |
| 18 | 9 | Mud Line | 0.310 |
| | | Mid Water | 0.290 |
| | | Tidal Zone | 0.220 |
| 12 | 12 | Mud Line | 0.385 |
| | | Mid Water | 0.280 |
| | | Tidal Zone | 0.130 |
| 12 | 16 | Mud Line | 0.300 |
| | | Mid Water | 0.320 |
| | | Tidal Zone | Hole |
| 15 | 23 | Mud Line | 0.360 |
| | | Mid Water | 0.275 |
| | | Tidal Zone | 0.125 |
| 11 | 28 | Mud Line | 0.340 |
| | | Mid Water | 0.285 |
| | | Tidal Zone | 0.275 |
| 12 | 32 | Mud Line | 0.340 |
| | | Mid Water | 0.270 |
| | | Tidal Zone | 0.130 |
| 11 | 36 | Mud Line | 0.315 |
| | | Mid Water | 0.295 |
| | | Tidal Zone | 0.280 |
| 11 | 40 | Mud Line | 0.345 |
| | | Mid Water | 0.375 |
| | | Tidal Zone | 0.145 |
| 12 | 43 | Mud Line | 0.305 |
| | | Mid Water | 0.300 |
| | | Tidal Zone | 0.245 |
| 12 | 47 | Mud Line | 0.340 |
| | | Mid Water | 0.325 |
| | | Tidal Zone | 0.280 |
| 16 | 51 | Mud Line | 0.310 |
| | | Mid Water | 0.325 |
| | | Tidal Zone | 0.250 |

## 7.3 Structural Condition Assessment

South Terminal was observed to have 73 holes through the steel bulkhead however, due to the original design these have a lesser impact to overall capacity of the system. Overall the structure is in Fair condition with localized areas of advanced deterioration but no significant reduction in capacity.

Due to the number of sinkholes observed, the interiors and areas adjacent to the buildings should be thoroughly investigated for additional sinkholes, which may compromise their structural integrity.

Two areas should be monitored periodically – Cell 44 with the separated sheets at the mudline and the exposed toes of the sheets within Cells 5 to 7.

**Immediate Needs:**

No immediate needs identified, repairs can be completed within the 0-5 year timeframe.

**Short Term (0-5 years):**

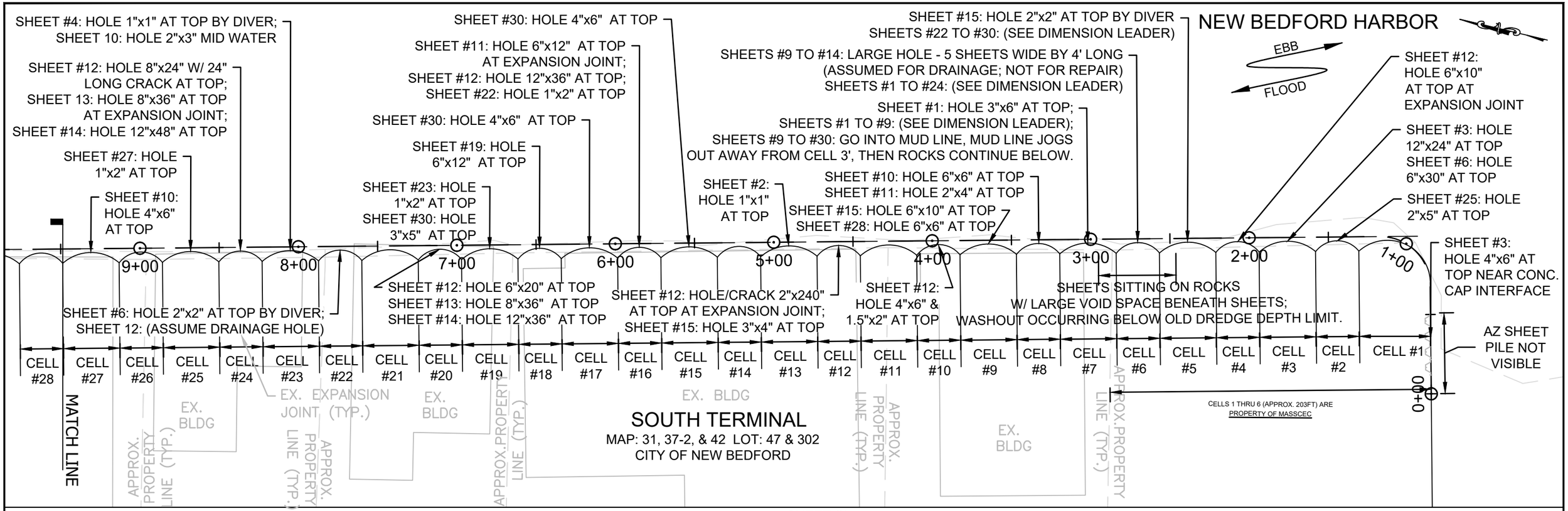
Localized repair of holes in steel plating at 73 locations.

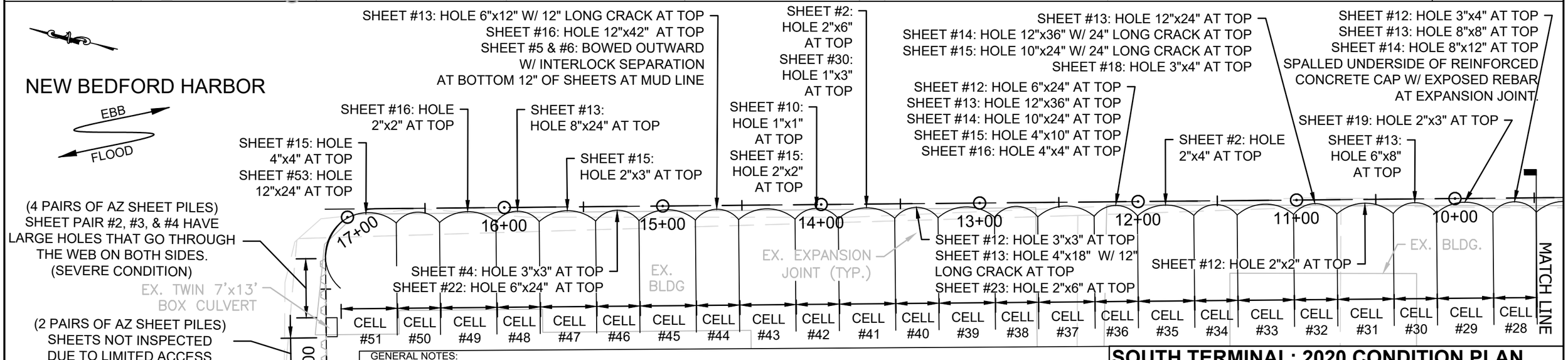
**Medium Term (5-15 years):**

Toe repairs will be required along a portion of cell 7, grout bags recommended.

**Long Term (15-50 years):**

- Plan for a full replacement of the South Terminal bulkhead within 30 years
- Requirements for replacement are dependent on the loading from the building located at the site




GRAPHIC SCALE
0 30 60 120
(IN FEET)
1 INCH = 60 FEET

GENERAL NOTES:

1. TOPSIDE SITE INSPECTION PERFORMED ON 01/08/2021 BY FOTH. UNDERWATER INSPECTION PERFORMED ON 02/03/2021, 02/04/2021, & 02/05/2021 BY FATHOM RESOURCES, INC.
2. ALL MEASUREMENTS DEPICTED ON THE DRAWINGS CAN ONLY BE CONSIDERED FOR INSPECTION PURPOSES AND NOT USED FOR CONSTRUCTION. FOTH DOES NOT WARRANT THE ACCURACY OF SAID PHYSICAL FEATURES.
3. NO SURVEYS WERE CONDUCTED TO LOCATE PROPERTY LINES, CHANNEL LIMITS, EASEMENTS, UTILITIES, GEOTECHNICAL FEATURES, OR ANY OTHER PHYSICAL FEATURES RELATING TO THE PROJECT SITE, NOR DOES FOTH WARRANT THE EXISTENCE OR LOCATION OF SAID PHYSICAL FEATURES.
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# SOUTH TERMINAL: 2020 CONDITION PLAN

**NEW BEDFORD HARBOR DEVELOPMENT COMMISSION**
**CZM GRANT**
**SOUTH TERMINAL, NEW BEDFORD, MA 02740**
**SHEET 1 OF 2**

| | |
|---|---|
| DATE: 01/29/2021 | REV. DATE: |
| DRAWN BY: JSD | CHECKED BY: SRS |
| PROJECT NO: 20N010.00 | |

Foth

TIMBER CURB: MODERATE CONDITION;
MOORING CLEAT #23: MAJOR CONDITION
TIMBER ACCESS LADDER: MINOR CONDITION
TIMBER CURB: SEVERE CONDITION
MOORING CLEAT #25 & #26: MODERATE CONDITION
MOORING BOLLARD #7: MODERATE CONDITION; ALSO SIGNIFICANT SPALLING ON CONC. CAP
TIMBER CURB: SEVERE CONDITION; LOSS OF CONNECTION
TIMBER ACCESS LADDER: SEVERE CONDITION
MOORING BOLLARD #8: MODERATE CONDITION
TIMBER CURB: MAJOR CONDITION
MOORING CLEAT #27: MAJOR CONDITION
TIMBER CURB: SEVERE CONDITION; MISSING
MOORING BOLLARD #6: MODERATE CONDITION; ALSO LARGE SPALL ON CONC. CAP
SPLIT D-FENDER
MOORING CLEAT #21: MODERATE CONDITION
SIGNIFICANT SPALL W/ EXPOSED REBAR ON CONC. CAP
TIMBER ACCESS LADDER: SEVERE CONDITION
MOORING CLEAT #19: MODERATE CONDITION
TIMBER CURB: MAJOR CONDITION; SPLIT FULL SECTION
TIMBER CURB: SEVERE CONDITION; MISSING
TIMBER CURB: MODERATE CONDITION
MOORING BOLLARD #5: MAJOR CONDITION
MOORING CLEAT #17: MAJOR CONDITION
SIGNIFICANT SPALL W/ REBAR ON CONC. CAP
TIMBER CURB: MODERATE CONDITION; END ROT BOTH ENDS
MOORING CLEAT #15: MAJOR CONDITION; ALSO VERTICAL HAIRLINE CRACK ON CONC. CAP
MOORING BOLLARD #4: MAJOR CONDITION; ALSO LARGE SPALL ON CONC. CAP
TIMBER CURB: MODERATE CONDITION; LARGE SPLIT & ROTTING
MOORING CLEAT #12: MODERATE CONDITION
TIMBER ACCESS LADDER: MINOR CONDITION
TIMBER CURB: MODERATE CONDITION; DISLODGED
MOORING CLEAT #11: MODERATE CONDITION
TIMBER CURB: SEVERE CONDITION; MISSING
MOORING CLEATS #6 & #7 MODERATE CONDITION
STEEL ACCESS LADDER: SEVERE CONDITION
MOORING BOLLARD #2: MODERATE CONDITION
MOORING CLEATS #1-#5 MODERATE CONDITION
FENDER SYSTEM: SEVERE CONDITION; MISSING
MOORING BOLLARD #1: MODERATE CONDITION

10+00 9+00 8+00 7+00 6+00 5+00 4+00 3+00 2+00 1+00 0+00

CELL #28 CELL #27 CELL #26 CELL #25 CELL #24 CELL #23 CELL #22 CELL #21 CELL #20 CELL #19 CELL #18 CELL #17 CELL #16 CELL #15 CELL #14 CELL #13 CELL #12 CELL #11 CELL #10 CELL #9 CELL #8 CELL #7 CELL #6 CELL #5 CELL #4 CELL #3 CELL #2 CELL #1

MATCH LINE

EX. BLDG
APPROX. PROPERTY LINE (TYP.)
EX. EXPANSION JOINT (TYP.)
EX. BLDG
APPROX. PROPERTY LINE (TYP.)
EX. BLDG
APPROX. PROPERTY LINE (TYP.)
EX. EXPANSION JOINT (TYP.)
EX. BLDG
APPROX. PROPERTY LINE (TYP.)

# SOUTH TERMINAL

MAP: 31, 37-2, & 42 LOT: 47 & 302
CITY OF NEW BEDFORD

TIMBER CURB: SEVERE CONDITION
MOORING CLEAT #29: MAJOR CONDITION
FENDER SYSTEM: SEVERE CONDITION; MISSING
TIMBER CURB: MODERATE CONDITION
TIMBER CURB: SEVERE CONDITION
TIMBER CURB: MODERATE CONDITION
TIMBER ACCESS LADDER: MINOR CONDITION
TIMBER CURB: MODERATE CONDITION; DISLODGED
MOORING CLEAT #44: MAJOR CONDITION
MOORING BOLLARD #12: MAJOR CONDITION
TIMBER CURB: MODERATE CONDITION; DISLODGED
MOORING CLEATS #45, #46 & #47: MODERATE CONDITION
MOORING CLEATS #49, #50 & #51: MODERATE CONDITION
MOORING BOLLARD #13: SEVERE CONDITION
MOORING CLEATS #41 & #42: MODERATE CONDITION
SPLIT D-FENDER
TIMBER CURB: MODERATE CONDITION; END ROT BOTH ENDS
MOORING CLEAT #39: MODERATE CONDITION
TIMBER CURB: MODERATE CONDITION; DISLODGED
SPLIT D-FENDER
MOORING CLEAT #38: MAJOR CONDITION
TIMBER CURB: MODERATE CONDITION
TIMBER CURB: MAJOR CONDITION
MOORING CLEATS #34 & #35: MODERATE CONDITION
MOORING BOLLARD #9: MAJOR CONDITION
TIMBER ACCESS LADDER: SEVERE CONDITION
SPLIT D-FENDER
FENDER SYSTEM: MAJOR CONDITION; HEAVY ROT & DETERIORATION
MOORING CLEAT #52: MODERATE CONDITION
EX. TWIN 7'x13' BOX CULVERT
TIMBER CURB: MODERATE CONDITION; END ROT BOTH ENDS
TIMBER CURB: MODERATE CONDITION; END ROT BOTH ENDS
SIGNIFICANT SPALL W/ EXPOSED REBAR ON CONC. CAP

17+00 16+00 15+00 14+00 13+00 12+00 11+00 10+00

18+00 18+15

CELL #51 CELL #50 CELL #49 CELL #48 CELL #47 CELL #46 CELL #45 CELL #44 CELL #43 CELL #42 CELL #41 CELL #40 CELL #39 CELL #38 CELL #37 CELL #36 CELL #35 CELL #34 CELL #33 CELL #32 CELL #31 CELL #30 CELL #29 CELL #28

MATCH LINE

EX. BLDG

NEW BEDFORD HARBOR

EBB
FLOOD

NOTE:
1. EXPANSION JOINT LOCATED ON REINFORCED CONCRETE CAP AT CELLS #4, #8, #12, #16, #20, #24, #28, #32, #36, #40, #44, & #48.

GRAPHIC SCALE
0 30 60 120
(IN FEET)
1 INCH = 60 FEET

GENERAL NOTES:
1. TOPSIDE SITE INSPECTION PERFORMED ON 01/08/2021 BY FOTH. UNDERWATER INSPECTION PERFORMED ON 02/03/2021, 02/04/2021, & 02/05/2021 BY FATHOM RESOURCES, INC.
2. ALL MEASUREMENTS DEPICTED ON THE DRAWINGS CAN ONLY BE CONSIDERED FOR INSPECTION PURPOSES AND NOT USED FOR CONSTRUCTION. FOTH DOES NOT WARRANT THE ACCURACY OF SAID PHYSICAL FEATURES.
3. NO SURVEYS WERE CONDUCTED TO LOCATE PROPERTY LINES, CHANNEL LIMITS, EASEMENTS, UTILITIES, GEOTECHNICAL FEATURES, OR ANY OTHER PHYSICAL FEATURES RELATING TO THE PROJECT SITE, NOR DOES FOTH WARRANT THE EXISTENCE OR LOCATION OF SAID PHYSICAL FEATURES.
4. POSSESSION AND USE OF THE MATERIAL CONTAINED ON THESE DRAWINGS IS GRANTED ONLY IN CONNECTION WITH ITS USE AS IT RELATES TO THE TITLED PROJECT, ANY OTHER USE, REPRODUCTION OR DISCLOSURE OF THE INFORMATION CONTAINED HEREON IS EXPRESSLY PROHIBITED WITHOUT THE WRITTEN CONSENT OF FOTH INFRASTRUCTURE & ENVIRONMENTAL, LLC.

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**SOUTH TERMINAL: 2020 CONDITION PLAN**
**NEW BEDFORD HARBOR DEVELOPMENT COMMISSION**
**CZM GRANT**
**SOUTH TERMINAL, NEW BEDFORD, MA 02740**
**SHEET 2 OF 2**

| | |
|---|---|
| DATE: 01/29/2021 | REV. DATE: |
| DRAWN BY: JSD | CHECKED BY: SRS |
| PROJECT NO: 20N010.00 | |

Foth

**ATTACHMENT 18: RELEASE ABATEMENT MEASURE PLAN/ EPA SELF-IMPLEMENTING PLAN (CIVIL & ENVIRONMENTAL CONSULTANTS, INC., MARCH 31, 2025)**

**NOTE: Attachment 18 is provided as a separate PDF.**

**ATTACHMENT 19: PHASE 3 BULKHEAD REPLACEMENT DATA PACKAGE (FOTH INFRASTRUCTURE & ENVIRONMENT, LLC, NOVEMBER 6, 2025)**

**NOTE: Attachment 19 is provided as a separate PDF.**