



Nobis Engineering
18 Chenell Drive
Concord, New Hampshire 03301

PROJECT
Remedial Design For Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

BORING NO. FD-105
SHEET 1 of 5
FILE NO. 48138.27
CHKD. BY S. Bonis

Drilling Co. Warren George, Inc.
Driller S. Laurenza
Logged By A. Juneau

Boring Location northing 2697207 easting 814556
Mudline El. -12.29 Datum NGVD
Date Start 11/21/00 Date End 11/30/00

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. center hole hammer free falling from a height of 30 inches.
Rig: Falling Truck Rig
Logging Method: 5-inch (PW) flush joint drill casing, 4-inch (HW) flush joint drill casing, sampling driven with a 300 lb. center hole hammer free falling from a height of 24 inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

D E P T H F E E T	Casing Blows (ft)	SAMPLE INFORMATION					SAMPLE DESCRIPTION (ASTM D2488)	STRATUM DESCRIPTION	R E M A R K S
		Type & No.	PENREC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value			
							Advance sampler to 2 ft.		
	WOC								
	WOC								
	UO-1	24/24	2-4				Organic soil with sand (OH); 5% coarse sand/shells, 15% fine sand, 80% organic clay/silt, strong organic odor, olive gray Advance PW drill casing to 5 ft. Advance 3-7/8 in. roller bit to 5 ft.		
	WOC								
	WOC								
	WOC								
	UO-2	24/24	5-7				Similar to UO-1, possible disturbed sample. Advance PW drill casing to 8.5 ft. Advance 3-7/8 in. roller bit to 8.5 ft.		ORGANIC CLAY
	WOC								
	WOC								
	WOC								
	UO-3	24/24	8.5-10.5				Sandy organic soil (OH); 35% fine sand, 65% organic clay/silt, strong organic odor, olive gray Advance PW drill casing to 11 ft. Advance 3-7/8 in. roller bit to 11 ft.		
	WOC								
	WOC								

GRAVELLY SOILS (VOC)	CORRECTION (VOC)	SYMBOLS
0 to 4 - Very Loose 5 to 10 - Loose 11 to 30 - Medium Dense 31 to 50 - Dense Over 50 - Very Dense	0 to 2 - Very Soft 3 to 4 - Soft 5 to 8 - Medium Stiff 9 to 15 - Stiff 16 to 30 - Very Stiff Over 30 - Hard	1. S denotes split-barrel sampler. 2. U denotes 3-inch O.D. undisturbed sample. 3. UO denotes 3-inch Osterberg undisturbed sample. 4. PEN denotes penetration length of sampler. 5. REC denotes recovered length of sample. 6. SPT denotes Standard Penetration Test.

REMARKS:
1) Sample description based on laboratory classification. Refer to GeoTesting Express Report dated March 5, 2001. Laboratory description presented in bold.
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Casing driven with a 300 lb. center hole hammer free falling from a height of 24 inches.

Groundwater Readings Not Applicable for Offshore Borings

Date	Time	Depth	Elev.	Stabilization Time

DEPTH (ft)	Casing Blows (ft)	SAMPLE INFORMATION					SAMPLE DESCRIPTION (ASTM D2488)	STRATUM DESCRIPTION	REMARKS
		Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value			
11	WOH						Sandy organic soil (OH); soft, 5% coarse sand, 35% fine sand, 60% organic clay/silt, strong organic odor, olive gray. Advance PW drill casing to 13 ft. Advance 3-7/8 in. roller bit to 13 ft.	ORGANIC CLAY	
		UO-4	24/11	11-13					
12	WOH						Poorly graded sand with silt (SP-SM); medium dense, 40% medium sand, 50% fine sand, 10% silt, light gray. Estimated strata change at 13.5 ft. Advance PW drill casing to 15 ft. Advance 3-7/8 in. roller bit to 15 ft.	13.5 ft.	
		S-1	24/5	13-15	WOR-6-11-9	17			
13	20						Perform falling head permeability test at 15 ft. Poorly graded sand with silt (SP-SM); 1% coarse sand, 9% medium sand, 77% fine sand, 13% silt, brownish gray. Advance PW drill casing to 17 ft. Advance 3-7/8 in. roller bit to 17 ft.	MARINE SAND	1
		S-2	24/4	15-17	3-5-4-5	9			
14	8						Silty sand (SM); 2% coarse sand, 4% medium sand, 46% fine sand, 48% silt, light gray. Organic odor. Casing dropped from 17 ft. to 18.4 ft. from 11-22-00 to 11-27-00. Advance PW drill casing to 21 ft. Advance 3-7/8 in. roller bit to 21 ft.		1
		S-3	24/7	17-19	9-6-5-5	11			
15	10								
16	11								
17	26								
18	WOC								
19	18								
20	20								

GRAIN SIZES (ASTM D 2488)
0 to 4 - Very Loose
5 to 10 - Loose
11 to 30 - Medium Dense
31 to 50 - Dense
Over 50 - Very Dense

COHESIVE SOILS (ASTM D 2488)
0 to 2 - Very Soft
3 to 4 - Soft
5 to 8 - Medium Stiff
9 to 15 - Stiff
16 to 30 - Very Stiff
Over 30 - Hard

SYMBOLS
1. S denotes split-barrel sampler.
2. U denotes 3-inch O.D. undisturbed sample.
3. UO denotes 3-inch Osterberg undisturbed sample.
4. PEN denotes penetration length of sampler.
5. REC denotes recovered length of sample.
6. SPT denotes Standard Penetration Test.

7. PID denotes Photoionization Detector.
8. PPM denotes parts per million.
9. PP denotes Pocket Penetrometer.
10. FVST denotes field vane shear test.
11. RQD denotes Rock Quality Designation.
12. R denotes core run number.

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 Drill Rig: Failing Truck Rig
 Drilling Method: 5-inch (PW) flush joint drill casing. 4-inch (HW) flush joint drill casing. Casing driven with a 300 lb. center hole hammer free falling from a height of 24 inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION				SPT N-Value	SAMPLE DESCRIPTION (ASTM D2488)	STRATUM DESCRIPTION	REMARKS
		Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES				
21	10						Perform falling head permeability test at 21 ft.		
		S-4	24/8	21-23	6-3-3-5	6	S-4A: Poorly graded sand with gravel (SP); loose, 20% coarse sand, 45% fine to medium sand, 30% fine gravel, 5% silt. Subround to round sand and gravel, light gray. (4 in.)		
22	20						S-4B: Silt with sand (ML); 1% coarse sand, 1% medium sand, 26% fine sand, 1% gravel, 71% silt, grayish brown. (4 in.)		1
							Advance PW drill casing to 23 ft.		
23	22						Advance 3-7/8 in. roller bit to 23 ft.		
		S-5	24/8	23-25	5-1-1-6	2	S-5A: Poorly graded sand with gravel (SP); very loose, 10% coarse sand, 20% medium sand, 50% fine sand, 15% gravel, 5% silt. Subround to subangular sand and gravel, light gray. (4 in.)		
24	22						S-5B: Sandy silt (ML); 42% fine sand, 2% medium sand, 56% silt, grayish brown. (4 in.)		1
							Advance PW drill casing to 25 ft.		
25	33						Advance 3-7/8 in. roller bit to 25 ft.		
		S-6	24/10	25-27	26-4-3-8	7	S-6A: Poorly graded sand with silt (SP-SM); loose, 85% fine sand, 5% medium sand, 10% silt, light brown. (5 in.)	MARINE SAND	
26	33						S-6B: Well-graded sand with gravel (SW-SM); loose, 20% coarse sand, 35% medium sand, 25% fine sand, 10% gravel, 10% silt. Subround to subangular sand and gravel, yellow brown. (5 in.) Sample found as thin horizon in top and bottom of spoon sample.		
							Advance PW drill casing to 27 ft.		
27	33						Advance 3-7/8 in. roller bit to 27 ft.		
		S-7	24/0	27-29	14-3-4-3	7	No sample recovered.		
							Advance PW drill casing to 29 ft.		
28	44						Advance 3-7/8 in. roller bit to 29 ft.		
29	41								
		S-8	24/6	29-31	3-2-1-3	3	Poorly graded sand (SP); very loose, 40% coarse sand, 45% medium sand, 10% fine sand, 5% gravel, subround gravel, subround to subangular sand, yellow brown.		
30	35						Advance PW drill casing to 31 ft.		

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)	SYMBOLS	
0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

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Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION					SAMPLE DESCRIPTION (ASTM D2488)	STRATUM DESCRIPTION	REMARKS
		Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value			
							Advance 3-7/8 in. roller bit to 31 ft.	MARINE SAND	
31	39						Perform falling head permeability test at 31 ft.	31.0 ft.	
		S-9	24/8	31-33	6-7-18-23	25	Poorly graded sand with gravel (SP); 42% coarse sand, 10% medium sand, 3% fine sand, 43% gravel, 2% silt, brown.	GLACIO FLUVIAL	1
							Angular to subround sand and gravel, coarse gravel in tip of split spoon sampler.		
32	38						Advance PW drill casing to 35 ft.		
							Mix bentonite drilling mud, specific gravity = 1.07.		
33	38						Advance 3-7/8 in. roller bit to 35 ft.		
34	51								
35	171						Perform falling head permeability test at 35 ft.		
		S-10	2/2	35-35.1	100/2"	>50	Poorly graded sand with silt (SP-SM); 85% fine sand, 5% medium sand, 10% silt/clay, yellow brown	35.3 ft.	
							PW casing refusal at 35.3 ft. Telescope HW drill casing to 39.0 ft. (Spin and wash).		
36	177						Advance 3-7/8 in. roller bit to 39 ft.	Boulder	
37	64								
38	24						Broke through boulder at 38.3 ft.	38.3 ft.	
39	52								
		S-11	24/10	39-41	12-14-15-15	29	Poorly graded sand (SP); medium dense, 60% fine sand, 30% medium sand, 5% gravel, 5% silt, angular to subangular sand and gravel, light gray.	GLACIO FLUVIAL	
40	170						Remove HW drill casing at 39.0 ft. switch to wash and drive.		

0 to 4 - Very Loose 5 to 10 - Loose 11 to 30 - Medium Dense 31 to 50 - Dense Over 50 - Very Dense	0 to 2 - Very Soft 3 to 4 - Soft 5 to 8 - Medium Stiff 9 to 15 - Stiff 16 to 30 - Very Stiff Over 30 - Hard	1. S denotes split-barrel sampler. 2. U denotes 3-inch O.D. undisturbed sample. 3. UO denotes 3-inch Osterberg undisturbed sample. 4. PEN denotes penetration length of sampler. 5. REC denotes recovered length of sample. 6. SPT denotes Standard Penetration Test.	7. PID denotes Photoionization Detector 8. PPM denotes parts per million. 9. PP denotes Pocket Penetrometer. 10. FVST denotes field vane shear test. 11. RQD denotes Rock Quality Designation. 12. R denotes core run number.
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DEPTH (ft)	Casing Blows (ft)	SAMPLE INFORMATION					SAMPLE DESCRIPTION (ASTM D2488)	STRATUM DESCRIPTION	REMARKS
		Type & No.	PENREC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value			
							Advance HW drill casing to 41 ft. Mix bentonite drilling mud, specific gravity = 1.09.		
41	194/ 6"						Advance 3-7/8 in. roller bit to 41 ft. Advance 3-7/8 in. roller bit to 45 ft. NW drill rod broke at 35.0 ft. Borehole abandoned at 41 ft. Borehole grouted to mudline, specific gravity = 1.50.		
42									
43									
44									
45									
46									
47									
48									
49									
50									

GRANULAR SOILS 0 to 4 - Very Loose 5 to 10 - Loose 11 to 30 - Medium Dense 31 to 50 - Dense Over 50 - Very Dense	COHESIVE SOILS 0 to 2 - Very Soft 3 to 4 - Soft 5 to 8 - Medium Stiff 9 to 15 - Stiff 16 to 30 - Very Stiff Over 30 - Hard	SYMBOL KEY 1. S denotes split-barrel sampler. 2. U denotes 3-inch O.D. undisturbed sample. 3. UO denotes 3-inch Osterberg undisturbed sample. 4. PEN denotes penetration length of sampler. 5. REC denotes recovered length of sample. 6. SPT denotes Standard Penetration Test.	7. PID denotes Photoionization Detector 8. PPM denotes parts per million. 9. PP denotes Pocket Penetrometer. 10. FVST denotes field vane shear test. 11. RQD denotes Rock Quality Designation. 12. R denotes core run number.
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