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US ARMY CORPS
OF ENGINEERS
New England District

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_____ October 22, 2007

Final Field Sampling Report

Laboratory Testing in Support of Sampling and Environmental Testing – Brushneck Cove Section 206 Project, Warwick, RI

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FINAL FIELD SAMPLING REPORT

**Laboratory Testing in Support of Environmental Assessment
Sampling and Environmental Testing-
Brushneck Cove Section 206 Project,
Warwick, RI.**

Submitted to:

**Department of the Army
U.S. Army Corps of Engineers
North Atlantic Division
New England District**

**Contract Number: DACW33-03-D-0004
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1.0 INTRODUCTION

This report covers the activities conducted at the request of the US Army Corps of Engineers, New England District (NAE) to support a proposed restoration project for Brushneck Cove Section 206 Project, Warwick, RI.

The proposed work consists of taking sediment cores to depths of approximately 10 feet or refusal from 11 locations within Brushneck and Buttonwoods Coves (Table 1 and Figure 1).

Each of the 11 cores were characterized, homogenized, and sampled for grain size, total organic carbon (TOC), organics (PCB/PEST/PAH), and metals analyses. The data collected from these cores will be used by NAE to determine the alternatives available for disposal of sediment resulting from the restoration efforts.

1.1 Site Description

Brushneck Cove is located within the city of Warwick, Rhode Island. The study area encompasses Brushneck Cove, Buttonwoods Cove and Oakland Beach. The coves are tributaries of Greenwich Bay bordering Warwick City Park and the suburban developments of Oakland Beach and Buttonwoods. Warwick is approximately 15 miles southwest of Providence, RI.

1.2 Project Objectives and Field Activity Summary

This Survey Report details the field sampling and sample preparation activities. On September 5 and 6, 2007, a single core sample was taken at each of the 11 separate locations in Brushneck Cove and Buttonwoods Cove located in Warwick, RI. Cores were collected using a vibracore to the specified project depth or refusal. Upon collection all cores were capped, sealed, labeled, and stored upright until processing could begin. All cores were returned to Battelle's Duxbury facility for characterization and sub-sampling for grain size analyses.

Table 2 lists survey personnel and responsibilities. Sampled locations are shown in Figure 1. This report describes the activities conducted during sampling and provides a synopsis of some preliminary observations from the survey. A description of survey methods is provided in Section 2. A chronological summary of survey activities for sampling is provided in Section 3. Preliminary survey results are provided in Section 4. Analytical results are provided in Section 5. A description of survey problems, corrective actions, and recommendations for future surveys, can be found in Section 6. Sampling and Core Characterization Logs are presented in Appendix A. Daily Operations Logs are presented in Appendix B and Chain of Custody (COC) Logs are presented in Appendix C. The grain size laboratory data report is attached in Appendix D.

Table 1. Target Sample Locations and Estimated Project Depths for Brushneck Cove Section 206 Project, Warwick, RI, Sediment Sampling.

Sampling Location	Estimated Penetration (feet) from Water/Sediment Interface	Longitude NAD 83	Latitude NAD 83
BNC-C-01	10	-71.41325535750	41.69741341260
BNC-C-02	10	-71.41102050130	41.69644492560
BNC-C-03	10	-71.40952836300	41.69522970920
BNC-C-04	10	-71.40690425120	41.69551680750
BNC-C-05	10	-71.40661700910	41.69417634440
BNC-C-06	10	-71.40490002820	41.69230196940
BNC-C-07	10	-71.40344366770	41.68925766530
BNC-C-08	10	-71.40594137840	41.68594710170
BNC-C-09	10	-71.40499035790	41.68791891410
BNC-C-10	10	-71.40876694210	41.68672265390
BNC-C-11	10	-71.41112367790	41.68805687510

Table 2. Survey Personnel for Brushneck Cove Section 206 Project, Warwick, RI, Sediment Sampling.

Date	<i>Battelle Staff</i>		<i>TG&B and the R/V Carolina Skiff</i>	
	Chief Scientist/ Geologist	Research Scientist	Captain	Senior Sampling Staff
	Matt Fitzpatrick	Mike McKee	Mark Avakian	Jeff Balmer
9/5/2007	M/C	M/C	M/C	M/C
9/6/2007	M/C	M/C	M/C	M/C

M= Mobilization/ demobilization
C= Vibracore sampling
NA= Not Applicable

2.0 METHODS

Details on the survey/sampling methods can be found in the final Brushneck Cove Sampling and Analysis Plan (Battelle 2007).

2.1 Sample Collections

Core samples were collected at each of 11 stations (Figure 1) using a vibracorer to maximize efficiency and core recovery. The cores were captured in pre-rinsed polycarbonate (Lexan™) liners. Each acceptable core was capped on the bottom while horizontal, positioned vertically

and capped on top, labeled, and stored upright (in the containers). During all field activities samples were stored on the vessel in barrels or bags filled with ice. Samples were transported from the field to Battelle, Duxbury in the ice filled barrels. Upon arrival at Battelle, samples were placed in a secure, continuously monitored cold room which is maintained at $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$.

Sediment collection data are summarized in Table 3; sampling and core characterization log forms associated with the sediment collections are presented in Appendix A.

Rinsate Blank Collections

One rinsate blank of the vibracore was collected during sampling activities. The rinsate was submitted for metals and organics (PAH/PCB/pesticide) analyses. The vibracore rinsate was collected by pouring several liters of MilliQ water over the sediment catcher device and into a length of Lexan liner (~2.5 feet) which was capped at one end. The rinsate was then decanted into the appropriate sample jars. The metals blank was acidified in the field.

2.2 Core Processing

Details on the sediment processing methods can be found in the Brushneck Cove Sampling and Analysis Plan (Battelle, 2007). Sample collection information is indicated in the sample core and characterization logs in Appendix A and on the Chains of Custody in Appendix C.

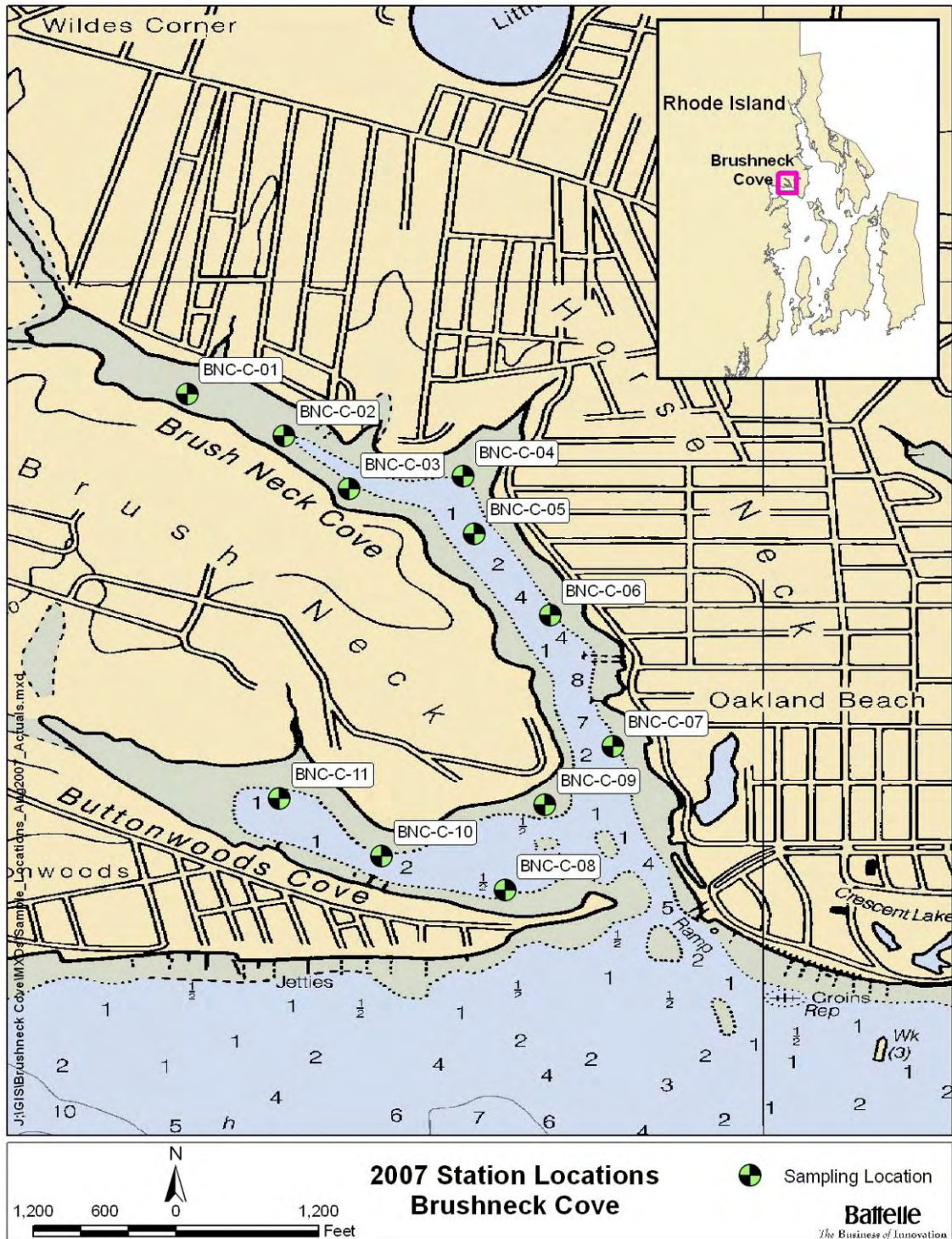


Figure 1. Sampling Locations within Brushneck Cove and Buttonwoods Cove located in Warwick, RI.

Table 3. Summary of Sediment Collection Data from the Brushneck Cove Section 206 Project, Warwick, RI, Sediment Sampling

Station ID	Sample ID	Latitude (NAD 83)	Longitude (NAD 83)	Date	Time (EDT)	Measured Water Depth (Ft)	Tide (Ft)	Penetration (Ft)	Recovery (Ft)
BNC-C-01	GAG-005-A	41°41.8455	71°24.7953	9/5/07	13:01	2.2	3.03	10.0	8.4
BNC-C-02	GAG-006-A	41°41.7870	71°24.6611	9/5/07	13:40	3.5	3.45	10.0	8.9
BNC-C-03	GAG-007-A	41°41.7138	71°24.5717	9/5/07	14:15	4.4	3.88	10.0	8.4
BNC-C-04	GAG-008-A	41°41.7307	71°24.4134	9/5/07	15:02	4.1	4.25	10.0	9.3
BNC-C-05	GAG-009-A	41°41.6510	71°24.3977	9/5/07	15:30	7.4	4.3	10.0	8.3
BNC-C-06	GAG-010-A	41°41.5380	71°24.2932	9/6/07	08:04	3.0	0.95	10.0	8.0
BNC-C-07	GAG-011-A GAG-016-A	41°41.3557	71°24.2065	9/6/07	08:40	2.5	0.81	10.0	8.3
BNC-C-08	GAG-002-A	41°41.1564	71°24.3557	9/5/07	11:00	3.3	1.48	10.0	8.6
BNC-C-09	GAG-001-A GAG-014-A	41°41.2751	71°24.3000	9/5/07	10:05	2.7	1.2	10.0	7.0
BNC-C-10	GAG-003-A GAG-015-A	41°41.2037	71°24.5260	9/5/07	11:31	2.3	1.75	10.0	8.6
BNC-C-11	GAG-004-A	41°41.2838	71° 24.6676	9/5/07	12:15	2.5	2.24	10.0	8.5

3.0 SURVEY CHRONOLOGY

Note: All times are recorded as Eastern Daylight Time

Wednesday, September, 5, 2007

- 0900 Battelle staff and TG&B staff meet at boat ramp, mobilize and launch the *R/V Carolina Skiff*.
- 0930 Board *R/V Carolina Skiff*, conduct health and safety briefing and depart for Station BNC-C-09.
- 1005 Arrive on Station BNC-C-09.
- 1025 Collect core from Station BNC-C-09; recovery not acceptable and core discarded.
- 1050 Second core collected from Station BNC-C-09; recovery acceptable and core retained.
- 1055 Depart for Station BNC-C-08.
- 1100 Arrive on Station BNC-C-08.
- 1120 Collect core from Station BNC-C-08; recovery acceptable and core retained.
- 1125 Depart for Station BNC-C-10.
- 1131 Arrive on Station BNC-C-10.
- 1145 Collect core from Station BNC-C-10; recovery acceptable and core retained.
- 1151 Depart for Station BNC-C-11.
- 1215 Arrive at Station BNC-C-11.
- 1225 Collect core from Station BNC-C-11; recovery acceptable and core retained.
- 1240 Depart for Station BNC-C-01.
- 1301 Arrive on Station BNC-C-01.

- 1320 Collect core from Station BNC-C-01; recovery acceptable and core retained.
- 1330 Depart for Station BNC-C-02.
- 1340 Arrive on Station BNC-C-02.
- 1350 Collect core from Station BNC-C-02; recovery acceptable and core is retained.
- 1405 Depart for Station BNC-C-03.
- 1415 Arrive on Station BNC-C-03.
- 1425 Collect core from Station BNC-C-03; recovery acceptable and core is retained.
- 1440 Depart for Station BNC-C-04.
- 1502 Arrive on Station BNC-C-04.
- 1515 Collect core from Station BNC-C-04; recovery acceptable and core is retained.
- 1525 Depart for Station BNC-C-05.
- 1530 Arrive on Station BNC-C-05.
- 1545 Collect core from Station BNC-C-05; recovery acceptable and core is retained.
- 1554 Secure sampling gear and depart for boat ramp.
- 1625 Arrive at boat ramp, offload core samples, and secure boat.
- 1630 Complete Day 1.

Thursday, September 6, 2006

- 0700 Battelle staff and TG&B staff meet at boat ramp, mobilize and launch the *R/V Carolina Skiff*.
- 0804 Arrive on Station BNC-C-06.
- 0820 Collect core from Station BNC-C-06; recovery acceptable and core retained.
- 0835 Depart for Station BNC-C-07.
- 0840 Arrive on Station BNC-C-07.
- 0846 Collect core from Station BNC-C-07; recovery acceptable and core retained.
- 0910 Secure sampling gear and depart for boat ramp.
- 0930 Arrive at boat ramp and offload core samples.
- 0945 Collect rinsate blanks.
- 1005 Complete Day 2.

4.0 SURVEY RESULTS

One core sample was collected at each of the 11 planned locations in Brushneck Cove and Buttonwoods Cove. Sampling was completed in 1.5 days. A summary of the coring survey data, which includes date, time and location, is presented in Table 3. All cores were processed on September 7 and September 10, 2007, at Battelle's Duxbury facility. A representative from ACOE NAE (Todd Randall) observed the core processing and provided guidance regarding sub-sampling. The sampled intervals are indicated in the core logs (Appendix A). Cores were cut laterally and characterized in terms of gross grain size (sand, silt, and clay), color, and odor. Samples were then homogenized and sampled for grain size, TOC, organics (PCB/PEST/PAH), and metals analyses. On Monday, September 10, 2007, samples collected for grain size and TOC analyses were shipped to Applied Marine Sciences (AMS), metal samples were shipped to Battelle Sequim, and samples collected for organics analyses were hand delivered to the analytical laboratory at Battelle, Duxbury. Samples were also archived in 16 ounce glass jars and stored in both a cold room and freezer for potential further analyses.

5.0 ANALYTICAL RESULTS

The grain size results are summarized in Table 4 and are presented in greater detail in Appendix D. Generally, the sediment composition ranged from clay in the bottom portion of the core to silt and fine sand in the upper portion of the core. A number of cores also possessed layers of shell hash. The sediments from all but one location (Station BNC-C-09) produced a noticeable sulfur odor. Station BNC-C-09, proximate to Buttonwoods Beach, exhibited a transition from fine sand to coarse sand with some fine gravel and a distinct horizon from 1.8 to 2.5 feet.

Table 4. Summary of Grain Size Analyses for Brushneck Cove Sediment Cores.

Sampling Location	% Gravel	% Coarse Sand	% Medium Sand	% Fine Sand	% Silt	% Clay	% Water Content	% Total Solids
GAG-001-A	0.56	0.92	7.73	68.34	15.48	6.97	25	80
GAG-002-A	1.21	0.17	1.83	21.43	45.68	29.68	77	56
GAG-003-A	0.00	0.29	3.58	28.02	39.66	28.45	80	55
GAG-004-A	0.00	0.00	1.05	10.35	55.44	33.16	101	50
GAG-005-A	0.00	0.91	1.74	19.05	48.17	30.13	84	54
GAG-006-A	0.00	0.12	2.08	19.34	46.73	31.73	88	53
GAG-007-A	0.00	0.24	3.06	22.65	38.90	35.15	88	53
GAG-008-A	0.00	0.00	0.86	12.37	50.00	36.77	96	51
GAG-009-A	0.00	0.27	1.29	16.36	47.72	34.36	87	53
GAG-010-A	0.00	0.00	1.63	27.48	42.55	28.34	71	59
GAG-011-A	0.00	0.00	3.84	40.32	36.98	18.86	56	64
GAG-014-A	0.36	1.57	4.23	84.34	9.17	0.33	20	84
GAG-014-A	0.33	1.46	4.34	82.96	10.60	0.31	20	84

6.0 PROBLEMS EXPERIENCED, ACTIONS TAKEN, AND RECOMMENDATIONS

6.1 Logistical

None.

6.2 Technical

None.

7.0 REFERENCES

NAE Brushneck Cove Sampling and Analysis Plan. (Battelle, 2007).

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Appendix A

Sampling and Core Characterization Logs

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Project #: G606430
 Project Name: Brushneck Cove
 Location: Warwick, RI
 Client: USACE NAE

Vessel: R/V Carolina Skiff
 Chief Scientist: M. Fitzpatrick
 Survey Duration (Date & Time):

Station ID: BNC-C-09
 Station Descriptor: GAG001
 Core Sample ID: GAG001
 Logged by: MRF
 Collection Mechanism: Vibracore

Time On Station: 1005
 Date: 9/5/07
 Northing (NAD 83): 41° 41.274
 Easting (NAD 83): 71° 24.24943000
 GPS Accuracy: 4m
 Water Depth (ft): 20.5 2.7
 Tide (ft): 91.2
 Time Depart Station: 1055

Attempt: 2
 Total Penetration: 10.0
 Recovery: 7.0
 Time of collection: 1050
 Total Penetration: 2
 Recovery:

As Sampled Depth below mudline (ft)	Adjusted Depth below mudline (ft)	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
		shell hash	Sandy clay	Dark grey	Very firm to hard	fine sand	No odor		7ft core
1.8			fine sand	grey	Very firm to hard	gravel (some pebbles)	No odor		1st 1.8ft
2.5			coarse sand	light brown	Very firm to hard				grey to brown sand transition (1.8-2.5ft) mod to coarse
			fine sand						fine brown sand to 7ft 2.5 yr old
								GAG-014	
								GAG-001	

Comments: ① poor recovery on 1st attempt
 Bottom half - GAG-014
 Subsample for TOC/GS 1.7ft to 7ft
 Top half - full suite 0.6-1.7ft

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Project #: **G606430** Vessel: **R/V Carolina Skiff**
 Project Name: **Brushneck Cove** Chief Scientist: **M. Fitzpatrick**
 Location: **Warwick, RI** Survey Duration (Date & Time):
 Client: **USACE NAE**

Station ID: **BNC-C-08** Time On Station: **1100** Attempt: **1 of 1** Feet
 Station Descriptor: Date: **9/5/07** 1 Total Penetration: **10**
 Core Sample ID: **GAG-002** Northing (NAD 83): **4141564** Recovery: **8.6**
 Logged by: **MRF** Easting (NAD 83): **71243557** Time of collection: **1120**
 Collection Mechanism: **Vibracore** GPS Accuracy: 2 Total Penetration:
 Water Depth (ft): **3.3** Recovery:
 Tide (ft): **~~2.17~~ 1.48** Time of collection:
 Time Depart Station: **1125**

As Sampled Depth below mudline (ft)*	Adjusted Depth below mudline (ft)*	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
0	0		clayey silt	dk grey/black 25/1	med to firm	fine	strong selfie up to 2ft		0-0.7ft clayey silt soft to med silty clay w/ sm amt of fines and
2	2		silty clay	dk grey	firm	fine	low sulfide		0.7ft to bottom med. firm silty clay w/ trace org
4	4							GAG-002	
6	6								
8	8								
10	10								
12	12								

Comments:
Waypoint - 1683

Station ID: BNC-C-10 Time On Station: 1131 Attempt: 1 of 1 Feet
 Station Descriptor: Date: 9/5/07 1 Total Penetration: 10.0
 Core Sample ID: GAG-003 Northing (NAD 83): 4141.2037 Recovery: 8.6
 Logged by: MRF Easting (NAD 83): 7124.5160 Time of collection: 1145
 Collection Mechanism: Vibracore GPS Accuracy: 2 Total Penetration:
 Water Depth (ft): 2.252.3 Recovery:
 Tide (ft): 1.75 Time of collection:
 Time Depart Station: 1151

As Sampled depth below mudline (ft)*	Adjusted Depth below mudline (ft)*	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
0-0.5			Very fine sandy silt shell	Black	Med to loose	fine			0-0.5 black very fine sand/silt
0.5-0.6			silty clay	DK grey	firm	fine	silty surface	GAG-003	0.5-0.6 shell hash
0.6-0.8									0.6-0.8 - firm silty clay
0.8-1.0									0.8-1.0 med to firm silty clay
1.0-1.2									
1.2-1.4									
1.4-1.6									
1.6-1.8									
1.8-2.0									
2.0-2.2									
2.2-2.4									
2.4-2.6									
2.6-2.8									
2.8-3.0									
3.0-3.2									
3.2-3.4									
3.4-3.6									
3.6-3.8									
3.8-4.0									
4.0-4.2									
4.2-4.4									
4.4-4.6									
4.6-4.8									
4.8-5.0									
5.0-5.2									
5.2-5.4									
5.4-5.6									
5.6-5.8									
5.8-6.0									
6.0-6.2									
6.2-6.4									
6.4-6.6									
6.6-6.8									
6.8-7.0									
7.0-7.2									
7.2-7.4									
7.4-7.6									
7.6-7.8									
7.8-8.0									
8.0-8.2									
8.2-8.4									
8.4-8.6									
8.6-8.8									
8.8-9.0									
9.0-9.2									
9.2-9.4									
9.4-9.6									
9.6-9.8									
9.8-10.0									

Comments: Waypoint 1684
 * archiving bottom 2ft of sand GAG-015
 0-5.5 ft sampled

Bottom archived

Station ID: **BNC-C-11** Time On Station: **1215** Attempt: **(1 of 1)** Feet

Station Descriptor: Date: **9/5/07** 1 Total Penetration: **10.0**

Core Sample ID: **GAG-004** Northing (NAD 83): **41°41.2838** Recovery: **8.5**

Logged by: **MRF** Easting (NAD 83): **71°24.6676** Time of collection: **1225**

Collection Mechanism: **Vibracore** GPS Accuracy: 2 Total Penetration:

Water Depth (ft): **4.5** Recovery:

Tide (ft): **2.24** Time of collection:

Time Depart Station: **1240**

As Sampled Depth below mudline (ft)*	Adjusted Depth below mudline (ft)*	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
0			silt	Black	max loose	fine	no odor		0-0.5 - Black silt
2	2		silty cl	DK grey	max firm	fine	surface to about 3ft	↑	0.5-8.9ft DK grey silty clay grades to slightly lighter dk grey
4	4				↓			GAG-004	
6	6				↓			↓	
8	8				↓				
8.9									
10	10								
12	12								

Comments: **Waypoint 1686** **Photographed top 1st bottom 2nd**

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Project #: G606430
 Project Name: Brushneck Cove
 Location: Warwick, RI
 Client: USACE NAE

Vessel: R/V Carolina Skiff
 Chief Scientist: M. Fitzpatrick
 Survey Duration (Date & Time):

Station ID: BAC-C-01 Time On Station: 1301 Attempt: 1 of 1 Feet

Station Descriptor: Date: 9/5/07 Total Penetration: 10.0

Core Sample ID: GAG-005 Northing (NAD 83): 410418455 Recovery: 8.4

Logged by: MRF Easting (NAD 83): 710247953 Time of collection: 1320

Collection Mechanism: Vibracore GPS Accuracy: 2 Total Penetration:

Water Depth (ft): 2.2 Recovery:

Tide (ft): 3.03 Time of collection:

Time Depart Station: 1830

As Sampled depth below mudline (ft)*	Adjusted Depth below mudline (ft)*	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
			clay silt	Black	loose to firm	fine	odor		0-0.7 Black clayey silt
2	2		silty clay	Dark Grey	firm				0.7-8.7 dark clay increase in firmness as you move towards bottom
				2.5/1			some odor		Shell hash @ 2.5 ft
4	4				↓	fine		GAG-005 ↑	
6	6				↓			↓	
8	8				very firm				
10	10								sm. amount of peat
12	12								

Comments: Waypoint 1689

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Project #: **G606430**
 Project Name: **Brushneck Cove**
 Location: **Warwick, RI**
 Client: **USACE NAE**

Vessel: **R/V Carolina Skiff**
 Chief Scientist: **M. Fitzpatrick**
 Survey Duration (Date & Time):

Station ID: **BNC-C-02** Time On Station: **1340** Attempt: **1 of 1** Feet

Station Descriptor: Date: **9/5/07** 1 Total Penetration: **10.0**

Core Sample ID: **GAG006** Northing (NAD 83): **41° 41.7870** Recovery: **8.9**

Logged by: **MRF** Easting (NAD 83): **71° 24.6611** Time of collection: **1350**

Collection Mechanism: **Vibracore** GPS Accuracy: 2 Total Penetration:

Water Depth (ft): **3.5'** Recovery:

Tide (ft): **3.45** Time of collection:

Time Depart Station: **1405**

As Sampled Depth below mudline (ft)*	Adjusted Depth below mudline (ft)*	Lithology. Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
0.0			clayey silt	Black	1002	fine	sulfur		0-0.6 - Black clayey silt
2	2		silty clay	DK grey	firm				0.9 - 2ft shells/shell hash
4	4				fine				0.6 - 8.8 - DK grey silty clay
6	6							GAG-006	firmness increases as more towards bottom
8	8				very firm				
10	10								
12	12								

Comments: **Waypoint 1291**

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Project #: G606430
 Project Name: Brushneck Cove
 Location: Warwick, RI
 Client: USACE NAE

Vessel: R/V Carolina Skiff
 Chief Scientist: M. Fitzpatrick
 Survey Duration (Date & Time):

Station ID: BWL-C-03
 Station Descriptor:
 Core Sample ID: GAG-007
 Logged by: MRF
 Collection Mechanism: Vibracore

Time On Station: 1415
 Date: 9/5/07
 Northing (NAD 83): 4147138
 Easting (NAD 83): 710245717
 GPS Accuracy: 2
 Water Depth (ft): 4.4
 Tide (ft): 3.88
 Time Depart Station: 1440

Attempt: Feet
 1 Total Penetration: 10
 Recovery: 8.4
 Time of collection: 1425
 2 Total Penetration:
 Recovery:
 Time of collection:

As Sampled Depth below mudline (ft)*	Adjusted Depth below mudline (ft)*	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
0.0			SILT	Black	loose	fine	sulfur		0-0.5 - Black SILT
			clay	DK grey	firm	fine	sulfur	GAG-007	0.85-1.0 - sand patch w/ shells
2	2		clay	DK grey	firm	fine	sulfur		1.0-8.4 fine silty clay DK grey
4	4								
6	6								
8	8								
10	10								
12	12								

Comments:
 * Waypoint # 1692

Battelle
 The Business of Innovation

Project #: G606430
 Project Name: Brushneck Cove
 Location: Warwick, RI
 Client: USACE NAE

Vessel: R/V Carolina Skiff
 Chief Scientist: M. Fitzpatrick
 Survey Duration (Date & Time):

Station ID: BNC-C-04 Time On Station: 15:02 Attempt: 1 of 1 Feet
 Station Descriptor: _____ Date: 9/5/07 1 Total Penetration: 10.0
 Core Sample ID: GAG-008 Northing (NAD 83): 9191.7307 Recovery: 93
 Logged by: MRF Easting (NAD 83): 7124.9134 Time of collection: 1515
 Collection Mechanism: Vibracore GPS Accuracy: _____ 2 Total Penetration: _____
 Water Depth (ft): 4.1' Recovery: _____
 Tide (ft): 4.25 Time of collection: _____
 Time Depart Station: 1525

As Sampled Depth below mudline (ft)*	Adjusted Depth below mudline (ft)*	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
0.0			clayey SILT	Black	loose				0-1.1 ft Black / Dk grey clayey SILT loose
2.0	2.0		Silty CLAY	Dk grey	med firmness	fine	strong sulfur		1.1 ft - 3 ft Dk grey silty clay loose med firmness
4.0	4.0		Silty clay	Dk grey	firm			GAG-008 ↑	3 ft - 9.5 ft firm Dk grey silty clay
6.0	6.0				↓			↓	
8.0	8.0				Very firm				
10.0	10.0								Shell @ 5.8 ft
12.0	12.0								

Comments: Way point : 1693

Battelle
The Business of Innovation

Project #: **G606430**
Project Name: **Brushneck Cove**
Location: **Warwick, RI**
Client: **USACE NAE**

Vessel: **R/V Carolina Skiff**
Chief Scientist: **M. Fitzpatrick**
Survey Duration (Date & Time):

Station ID: **BNC-C-05** Time On Station: **1530** Attempt: **1 of 1** Feet

Station Descriptor: Date: **9/5/07** 1 Total Penetration: **10.0**

Core Sample ID: **GAG-609** Northing (NAD 83): **41° 41.6510** Recovery: **8.3**

Logged by: **MRF** Easting (NAD 83): **71° 24.3977** Time of collection: **1545**

Collection Mechanism: **Vibracore** GPS Accuracy: **2** Total Penetration:

Water Depth (ft): **7.4** Recovery:

Tide (ft): **4.3** Time of collection:

Time Depart Station: **1554**

As Sampled depth below mudline (ft)*	Adjusted Depth below mudline (ft)*	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
			Black Silty	Black	loose	fine	sulfur		0-0.4 Black Silty Organic Matter
			Silty CLAY	2.5Y 2.5/1 DK	firm				0.4-1.4 - DK grey silty clay mod. firmness
2	2		↓	↓	↓	↓	↑	GAG-609	1.4-8.5ft DK grey silty clay firm → very firm
				2.5Y 3/1 DK Gray	↓	fine sulfur odor	↓		
4	4				↓				
					↓				
6	6				↓				
					↓				
8	8				↓				
					↓				
10	10								
12	12								

Comments: **Waypoint**

00

6.5

Station ID: **BNC-C-06** Time On Station: **0804** Attempt: **1 of 1** Feet

Station Descriptor: Date: **9/6/07** 1 Total Penetration: **10.0**

Core Sample ID: **GAG-010** Northing (NAD 83): **41° 41.5380** Recovery: **8.0**

Logged by: **MRF** Easting (NAD 83): **71° 24.2932** Time of collection: **0820**

Collection Mechanism: **Vibracore** GPS Accuracy: 2 Total Penetration:

Water Depth (ft): **3.0** Recovery:

Tide (ft): **0.95** Time of collection:

Time Depart Station: **0835**

As Sampled Depth below mudline (ft)*	Adjusted Depth below mudline (ft)*	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
0.0	0.5		clayey silt	black	loose to mod firm	fine	sulfur	-0.05	- Black Silt w/ clay + shell hash
2	2		Silty clay	DK Gray	firm	↑	↑	0.5-8.2	DK gray silty clay Sm amt of shell hash up to 4 ft Razor clean 4.4-4.6
4	4			25X 311	↓	fine	↑	GAG-010	
6	6				↓	↓	↓		
8	8				↓	↓	↓		
8.2	8.2								
10	10								
12	12								

Comments:
 Depart Dock @ ~ 0730
 Waypoint 1696

Battelle
The Business of Innovation

Project #: **G606430**
 Project Name: **Brushneck Cove**
 Location: **Warwick, RI**
 Client: **USACE NAE**

Vessel: **R/V Carolina Skiff**
 Chief Scientist: **M. Fitzpatrick**
 Survey Duration (Date & Time):

Station ID: **BUC-C-07** Time On Station: **0840** Attempt: **1 of 1** Feet

Station Descriptor: Date: **9/6/07** 1 Total Penetration: **10.0**

Core Sample ID: **GAG-011** Northing (NAD 83): **41° 41.3557** Recovery: **8.3**

Logged by: **MRF** Easting (NAD 83): **71° 24.2065** Time of collection: **0846**

Collection Mechanism: **Vibracore** GPS Accuracy: 2 Total Penetration:

Water Depth (ft): **2.5'** Recovery:

Tide (ft): **.81** Time of collection:

Time Depart Station: **0910**

As Sampled Depth below mudline (ft)*	Adjusted Depth below mudline (ft)*	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
0.0			clayey-silt	Black	loose	fine	buffer		0-0.6 Black clayey-silt loose w/ shell hash
2	2		Silty clay	DK grey	firm				0.6-7.2 DK grey silty-clay
4	4			2.5Y 3/1	↓	fine	buffer	GAG-011	7.2-8.4 - fine sand grey-brown
6	6				↓				
8	8	Sand		Grey brown 10YR 3/1	firm	fine	slight sulfur	GAG-016	Archived
10	10								
12	12								

Comments:

Waypoint 1097

Depart for dock
 Arrive dock @ 0930
 collect blanks @ 0945

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Appendix B

Daily Operations Logs

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Field Log Form

Project: Laboratory Testing In Support of Environmental Assessment-Brushneck Cove, RI
Project #: G606430

DATE INITIALS MRF 9/5/07 **START TIME STOP TIME** 0930-1630
FIELD LOCATION: _____

Brushneck Cove, Warwick, RI

VESSEL NAME R/V Carolina Skiff

PERSONNEL	AFFILIATION
<u>Matt Reputrick</u>	<u>Battelle</u>
<u>Mark Avallian</u>	<u>TG&B</u>
<u>Jeff Balmer</u>	<u>TG&B</u>
<u>Mike Mackee</u>	<u>Battelle</u>

WEATHER

TIME	TEMP °C	PRECIP	SKY	WIND
<u>0953</u>	<u>~65°f</u>	<u>none</u>	<u>Clear</u>	<u>N~5</u>

COMMENTS

Depart dock @ 0930 pick up mike @ other
camp @ 0953
Return to dock @ 1625

Project: Laboratory Testing In Support of Environmental Assessment-Brushneck Cove, RI
Project #: G606430

CHECK dGPS against at least one reference checkpoint at beginning and end of each day.

dGPS Reference Checkpoint Name _____

Benchmark Location:

Time	Units and Datum	Northing / Latitude	Easting / Longitude
Beginning of day			
End of day			

Comments -

No USGS geodetic benchmark
Waypoints marked as ref by T6 & B

Date/Time 09/05/07 Vessel R/V Carolina Skiff

Unit Make/Model Leica MX 420 dGPS

HEALTH AND SAFETY BRIEFING:

Conducted @ 0930 - covered slips, trips,
hard hats, PFDs, eyewear, steel toe boots

Field Log Form

Project: Laboratory Testing In Support of Environmental Assessment-Brushneck Cove, RI
Project #: G606430

DATE INITIALS MM 9/6/07 START TIME STOP TIME 0700/1005

FIELD LOCATION: Brushneck Cove, Warwick, RI

VESSEL NAME R/V Carolina Skiff

PERSONNEL	AFFILIATION
<u>Matt Fitzpatrick</u>	<u>Battelle</u>
<u>Mike McKee</u>	<u>Battelle</u>
<u>Mark Avatizon</u>	<u>TG & B</u>
<u>Jeff Balmer</u>	<u>TG & B</u>

WEATHER

TIME	TEMP °C	PRECIP	SKY	WIND
<u>0800</u>	<u>~65°F</u>	<u>none</u>	<u>overcast</u>	<u>SW ~15</u>

COMMENTS

Depart dock @ 0730
Complete survey @ 0900
Return to dock @ 0930

Project: Laboratory Testing In Support of Environmental Assessment-Brushneck Cove, RI
Project #: G606430

CHECK dGPS against at least one reference checkpoint at beginning and end of each day.

dGPS Reference Checkpoint Name _____

Benchmark Location:

Time	Units and Datum	Northing / Latitude	Easting / Longitude
Beginning of day			
End of day			

Comments -

No USGS geodetic benchmark available.
Waypoints marked by TG & B

Date/Time 09/06/07 Vessel R/V Carolina Skiff

Unit Make/Model Leica MX 420 dGPS

HEALTH AND SAFETY BRIEFING:

Conducted @ NOTIS - covered slips, trips,
PFDs, hard hats, eyewear, steel toe boots



Site Safety and Health Plan Receipt and Acceptance Form

Personnel Accident prevention Guidelines for Marine Operations Conducted in Support of the U.S. Army Corps of Engineers Laboratory Testing in Support of Environmental Assessment Sampling and Environmental Testing, Brushneck Cove, Warwick, RI.

I have received a copy of the Accident prevention Plan prepared for the above-referenced site and activities. I have read and understood its contents and I agree that I will abide by its requirements.

Name (Print): Matthew R Fitzpatrick

Signature: Matthew R Fitzpatrick Date: 9/5/07

Representing (Print): Battelle
Company Name



Site Safety and Health Plan Receipt and Acceptance Form

Personnel Accident prevention Guidelines for Marine Operations Conducted in Support of the U.S. Army Corps of Engineers Laboratory Testing in Support of Environmental Assessment Sampling and Environmental Testing, Brushneck Cove, Warwick, RI.

I have received a copy of the Accident prevention Plan prepared for the above-referenced site and activities. I have read and understood its contents and I agree that I will abide by its requirements.

Name (Print): Michael P. McKee

Signature: Michael P. McKee Date: 09/05/07

Representing (Print): Battelle
Company Name




Site Safety and Health Plan Receipt and Acceptance Form

Personnel Accident prevention Guidelines for Marine Operations Conducted in Support of the U.S. Army Corps of Engineers Laboratory Testing in Support of Environmental Assessment Sampling and Environmental Testing, Brushneck Cove, Warwick, RI.

I have received a copy of the Accident prevention Plan prepared for the above-referenced site and activities. I have read and understood its contents and I agree that I will abide by its requirements.

Name (Print): Mark Avukray

Signature:  Date: Sept 6 2007

Representing (Print): TG&B
Company Name

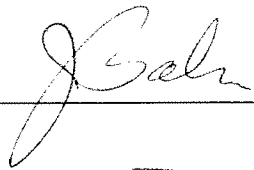


Site Safety and Health Plan Receipt and Acceptance Form

Personnel Accident prevention Guidelines for Marine Operations Conducted in Support of the U.S. Army Corps of Engineers Laboratory Testing in Support of Environmental Assessment Sampling and Environmental Testing, Brushneck Cove, Warwick, RI.

I have received a copy of the Accident prevention Plan prepared for the above-referenced site and activities. I have read and understood its contents and I agree that I will abide by its requirements.

Name (Print): Jeff Balmer

Signature:  Date: 9/6/07

Representing (Print): TG+B
Company Name

Appendix C
Chains of Custody

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Chain of Custody



... Putting Technology To Work

Project Number:
G606430

Project Name:
Brushneck Cove

Sampler's Signature:

Matthew K. Rydzinski

ANALYSIS REQUESTED →
"NUMBER OF CONTAINERS"

Collection Date/Time	Battelle ID	Client ID	Sample Description	PEST	PCB	TPH	PAH	VOA	TBT	METALS	TOC/GRAIN SIZE	Sediment Core	ACIDIFIED	PRESERVED	Total No. of Containers
9/5/07 10:50	GAG-001		Core from Station BNC-C-09 (cut into 2 sections)									X			2
9/5/07 11:20	GAG-002		Core from Station BNC-C-08 (cut into 2 sections)									X			2
9/5/07 11:45	GAG-003		Core from Station BNC-C-10 (cut into 2 sections)									X			2
9/5/07 12:25	GAG-004		Core from Station BNC-C-11 (cut into 2 sections)									X			2
9/5/07 13:20	GAG-005		Core from Station BNC-C-01 (cut into 2 sections)									X			2
9/5/07 13:50	GAG-006		Core from Station BNC-C-02 (cut into 2 sections)									X			2
9/5/07 14:25	GAG-007		Core from Station BNC-C-03 (cut into 2 sections)									X			2
9/5/07 15:15	GAG-008		Core from Station BNC-C-04 (cut into 2 sections)									X			2
9/5/07 15:45	GAG-009		Core from Station BNC-C-05 (cut into 2 sections)									X			2
9/6/07 8:20	GAG-010		Core from Station BNC-C-06 (cut into 2 sections)									X			2
9/6/07 8:46	GAG-011		Core from Station BNC-C-07 (cut into 2 sections)									X			2
9/6/07 9:45	GAG-012		Metals Equipment Blank							X					1
9/6/07 9:45	GAG-013		Organics Equipment Blank	X	X		X								1

Relinquished By:

Matthew K. Rydzinski

Received By:

Jessie M. Fisher

Date/Time

9/6/07 1200

Date/Time

9/6/07 1200

Relinquished By:

Received By:

Comments:



... Putting Technology To Work

Project Number: G606430
 Project Name: Brushneck Cove

Sampler's Signature: _____
 ANALYSIS REQUESTED →
 "NUMBER OF CONTAINERS"

Collection Date/Time	Battelle ID	Client ID	Sample Description	PEST	PCB	TPH	PAH	VOA	TBT	METALS	Archive Cold	Archive Frozen	ACIDIFIED	PRESERVED	Total No. of Containers
9/5/07 15:45		GAG-009-E	Sediment Composite of Single Core								X	X			1
9/6/07 8:20		GAG-010-E	Sediment Composite of Single Core								X	X			1
9/6/07 8:46		GAG-011-E	Sediment Composite of Single Core								X	X			1
9/5/07 10:50		GAG-014-E	Sediment Composite of Bottom Portion of Core GAG-001								X	X			1
9/5/07 11:45		GAG-015-E	Sediment Composite of Bottom Portion of Core GAG-003								X	X			1
9/6/07 8:46		GAG-016-E	Sediment Composite of Bottom Portion of Core GAG-011								X	X			1
9/5/07 10:50		GAG-001-F	Sediment Composite of Top portion of core GAG-001								X	X			1
9/5/07 11:20		GAG-002-F	Sediment Composite of Single Core								X	X			1
9/5/07 11:45		GAG-003-F	Sediment Composite of Single Core								X	X			1
9/5/07 12:25		GAG-004-F	Sediment Composite of Single Core								X	X			1
9/5/07 13:20		GAG-005-F	Sediment Composite of Single Core								X	X			1
9/5/07 13:50		GAG-006-F	Sediment Composite of Single Core								X	X			1
9/5/07 14:25		GAG-007-F	Sediment Composite of Single Core								X	X			1
9/5/07 15:15		GAG-008-F	Sediment Composite of Single Core								X	X			1
9/5/07 15:45		GAG-009-F	Sediment Composite of Single Core								X	X			1
9/6/07 8:20		GAG-010-F	Sediment Composite of Single Core								X	X			1
9/6/07 8:46		GAG-011-F	Sediment Composite of Single Core								X	X			1
9/5/07 10:50		GAG-014-F	Sediment Composite of Bottom Portion of Core GAG-001								X	X			1
9/5/07 11:45		GAG-015-F	Sediment Composite of Bottom Portion of Core GAG-003								X	X			1
9/6/07 8:46		GAG-016-F	Sediment Composite of Bottom Portion of Core GAG-011								X	X			1

Relinquished By: *Jessie M. Joby*
 Date/Time: 9/10/07 1502
 Received By: _____
 Date/Time: _____

Comments: _____



... Putting Technology To Work

Project Number: G606430
Project Name: Brushneck Cove

Sampler's Signature: *M. Howard K. Kobayashi*

Collection Date/Time	Battelle ID	Client ID	Sample Description	ANALYSIS REQUESTED - "NUMBER OF CONTAINERS"	PEST	PCB	TPH	PAH	VOA	TBT	METALS	TOC/GRAIN SIZE	Sediment Core	ACIDIFIED	PRESERVED	Total No. of Containers
9/5/07 10:50	GAG-001		Core from Station BNC-C-09 (cut into 2 sections)										X			2
9/5/07 11:20	GAG-002		Core from Station BNC-C-08 (cut into 2 sections)										X			2
9/5/07 11:45	GAG-003		Core from Station BNC-C-10 (cut into 2 sections)										X			2
9/5/07 12:25	GAG-004		Core from Station BNC-C-11 (cut into 2 sections)										X			2
9/5/07 13:20	GAG-005		Core from Station BNC-C-01 (cut into 2 sections)										X			2
9/5/07 13:50	GAG-006		Core from Station BNC-C-02 (cut into 2 sections)										X			2
9/5/07 14:25	GAG-007		Core from Station BNC-C-03 (cut into 2 sections)										X			2
9/5/07 15:15	GAG-008		Core from Station BNC-C-04 (cut into 2 sections)										X			2
9/5/07 15:45	GAG-009		Core from Station BNC-C-05 (cut into 2 sections)										X			2
9/6/07 8:20	GAG-010		Core from Station BNC-C-06 (cut into 2 sections)										X			2
9/6/07 8:46	GAG-011		Core from Station BNC-C-07 (cut into 2 sections)										X			2
9/6/07 9:45	GAG-012		Metals Equipment Blank								X					1
9/6/07 9:45	GAG-013		Organics Equipment Blank			X		X								1
Relinquished By: <i>M. Howard K. Kobayashi</i>																
Received By: _____ Date/Time: _____																
Relinquished By: _____ Date/Time: 9/10/07 12:00																
Received By: _____ Date/Time: _____																
Comments																

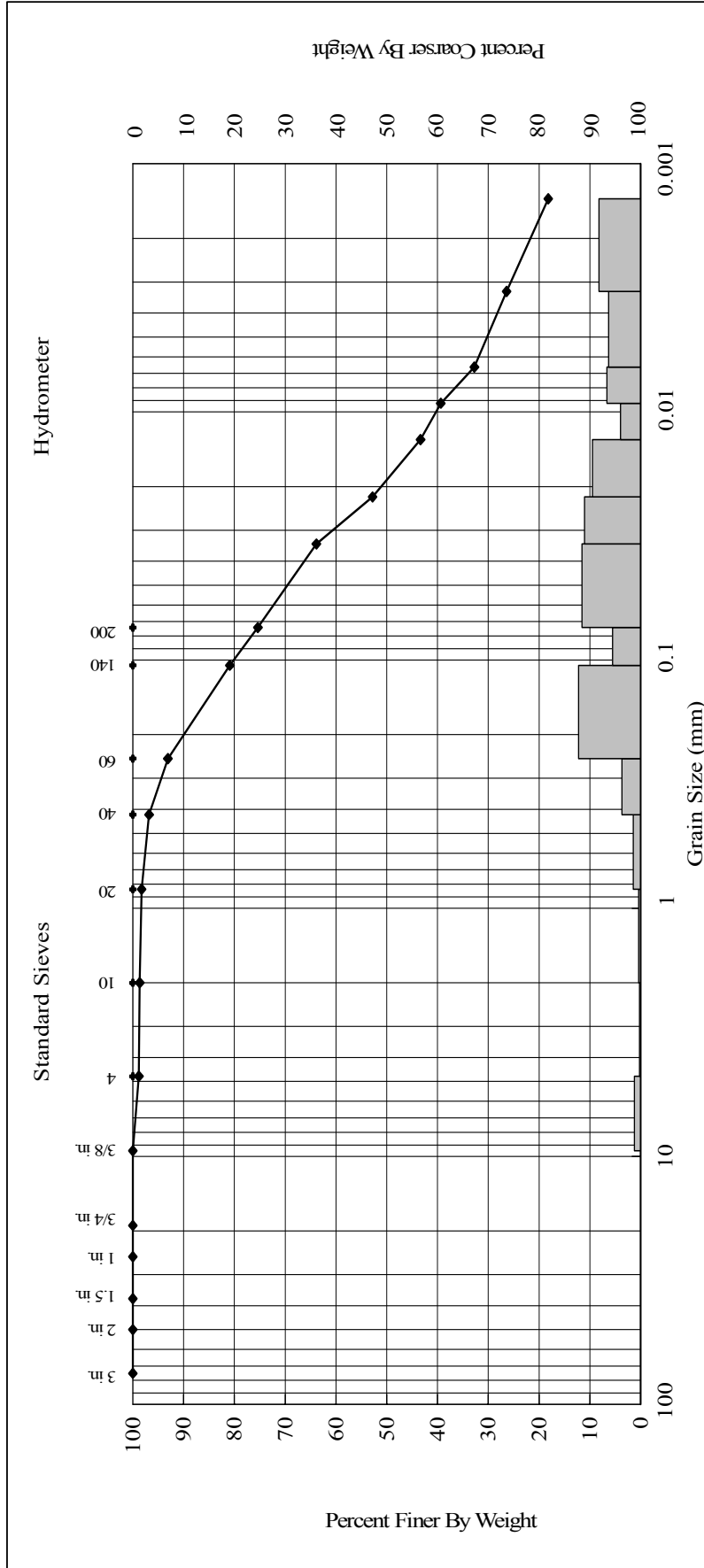
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Appendix D

Grain Size Analysis Results

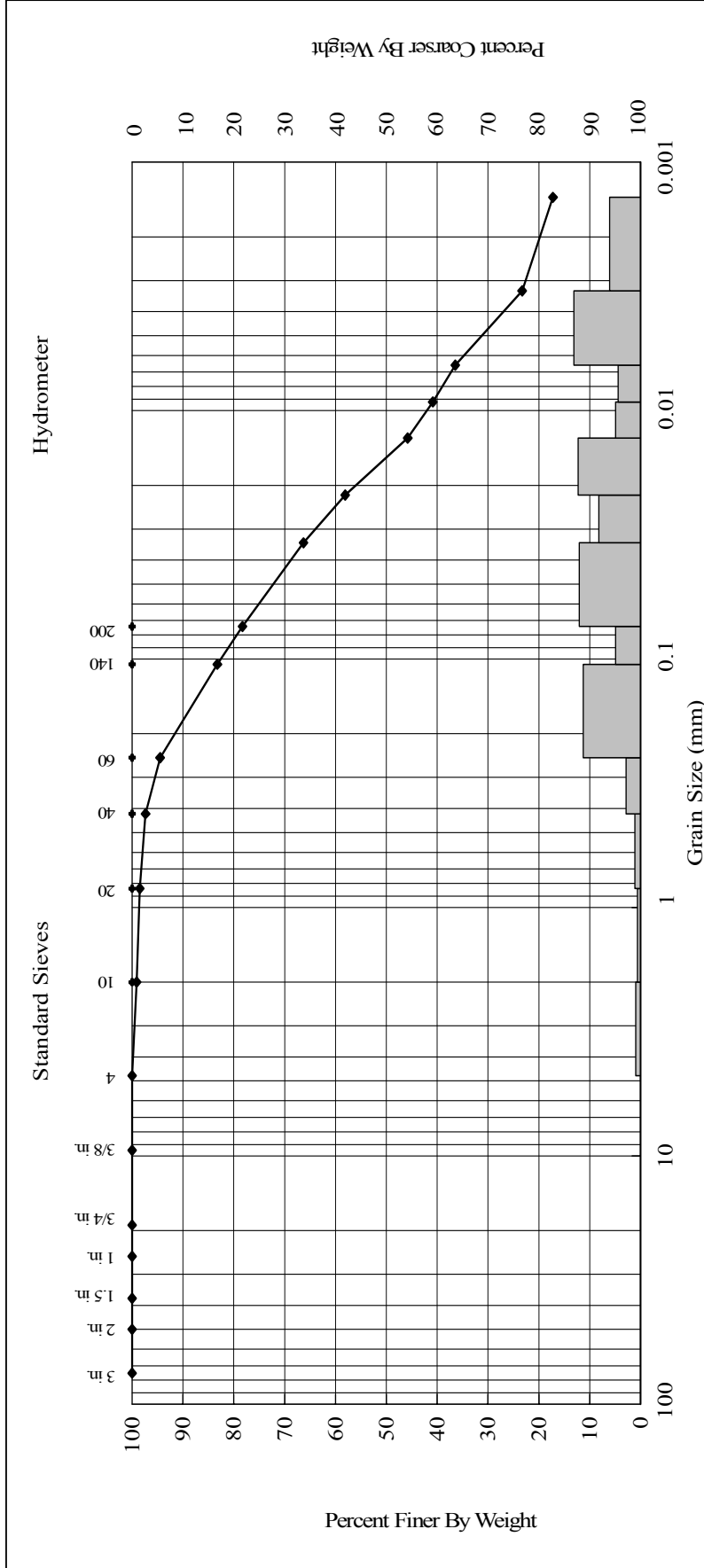
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GEOTECHNICAL RESULTS



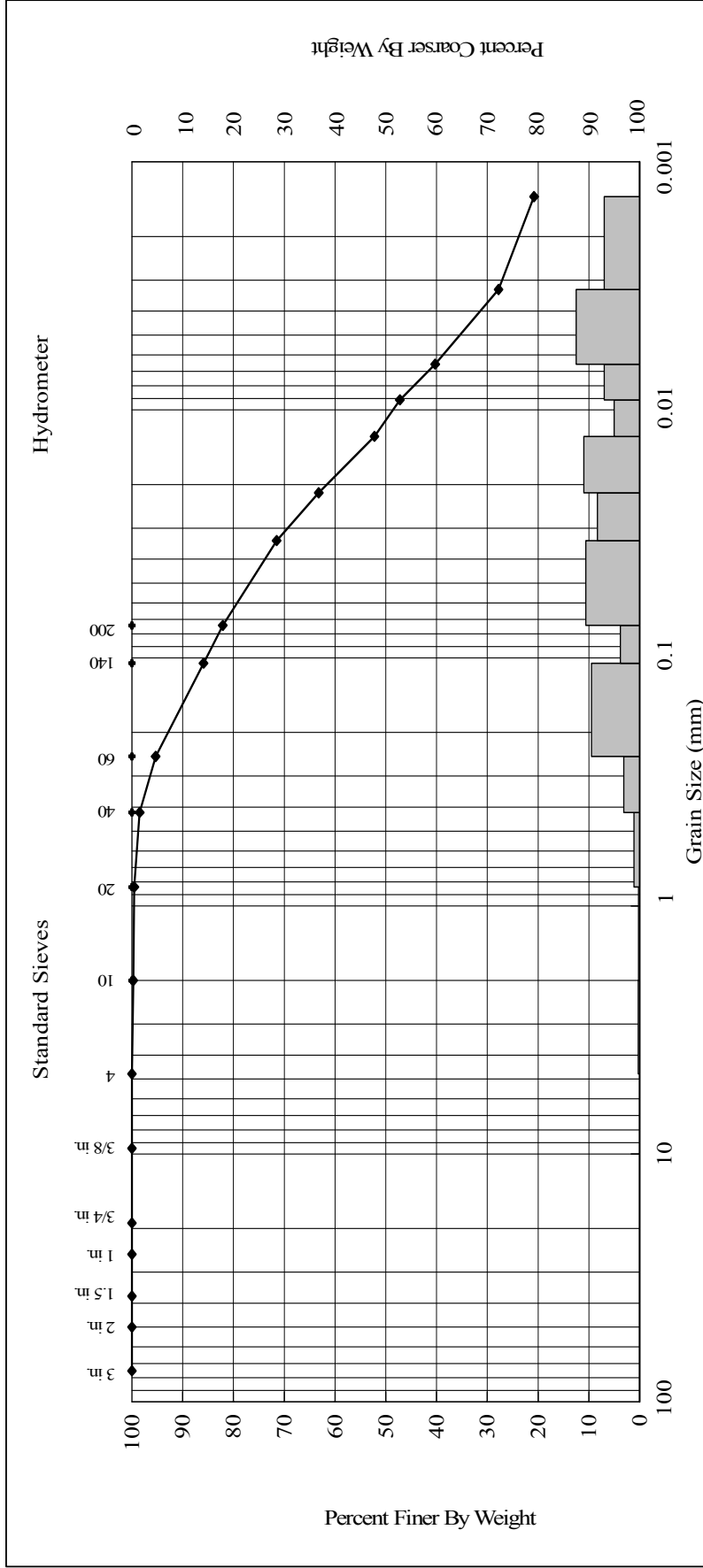
Gravel (%)	Sand (%)	Fines (%)	Client:
1.21	Coarse 0.17 Medium 1.83 Fine 21.43	Silt 45.68 Clay 29.68	Battelle Client Project Title: Brushneck Cove Client Project Number: G606430 AMS Project Number: 07-102
Water Cont. (%)	Total Solids (%)	D₈₅	Date Sampled: 9/5/2007 Date Analyzed: 9/14/2007 Matrix, Method: Sediment, ASTM D 422
77	56	D ₆₀	Client Sample ID: GAG-002-A AMS Sample ID: 28691
Material Description			
Elastic Silt with Sand ("MH"), very dark greenish gray (10Y 3/1)			
<p>APPLIED MARINE SCIENCES, INC. 502 N. Hwy 3, Suite B League City, TX 77573 281.554.7272 Tel. 281.554.6356 Fax</p>		<p>ACCREDITED IN ACCORDANCE WITH nelac Laboratory No. E87956</p>	
<p>These analyses were performed in accordance with ASTM standards, the 2006 DoD Quality Systems Manual (Version 3), and the 2003 NELAC Standard.</p> <p align="right"><i>K.S. Davis, P.G.</i> AMS, Inc. Technical Director</p>			

GEOTECHNICAL RESULTS



Gravel (%)	Sand (%)		Fines (%)	
0.00	Coarse	Medium	Fine	Clay
	0.91	1.74	19.05	30.13
Water Cont. (%)	Total Solids (%)	D₈₅	D₆₀	D₅₀
84	54			
		D₃₀	D₁₅	D₁₀
		C_c	C_u	
Material Description				
Elastic Silt with Sand ("MH"), greenish black (10Y 2.5/1)				
Client:		AMS Project Title:		
Battelle		Brushneck Cove		
AMS Project Number:		Date Sampled:		
07-102		9/5/2007		
Date Analyzed:		Matrix, Method:		
9/14/2007		Sediment, ASTM D 422		
Client Sample ID:		AMS Sample ID:		
GAG-005-A		28694		
<p align="center">  APPLIED MARINE SCIENCES, INC. 502 N. Hwy 3, Suite B League City, TX 77573 281.554.7272 Tel. 281.554.6356 Fax </p>				
<p align="center"> These analyses were performed in accordance with ASTM standards, the 2006 DoD Quality Systems Manual (Version 3), and the 2003 NELAC Standard. </p>				
<p align="center"> <i>K.S. Davis, P.G.</i> AMS, Inc. Technical Director </p>				
<p align="right">  ACCREDITED IN ACCORDANCE WITH Laboratory No. E87956 </p>				

GEOTECHNICAL RESULTS



Gravel (%)	Sand (%)		Fines (%)			
0.00	Coarse	Medium	Fine	Silt	Clay	
	0.27	1.29	16.36	47.72	34.36	
Water Cont. (%)	Total Solids (%)	D₈₅	D₆₀	D₅₀	D₃₀	C_c
87	53					
Material Description						
Elastic Silt with Sand ("MH"), very dark greenish gray (10Y 3/1)						
Client:			AMS Project Title:			
Battelle			Brushneck Cove			
AMS Project Number:			Date Sampled:			
07-102			9/5/2007			
Date Analyzed:			Matrix, Method:			
9/14/2007			Sediment, ASTM D 422			
AMS Sample ID:			AMS Sample ID:			
GAG-009-A			28698			
Client Project Title:			AMS Project Number:			
Brushneck Cove			G606430			



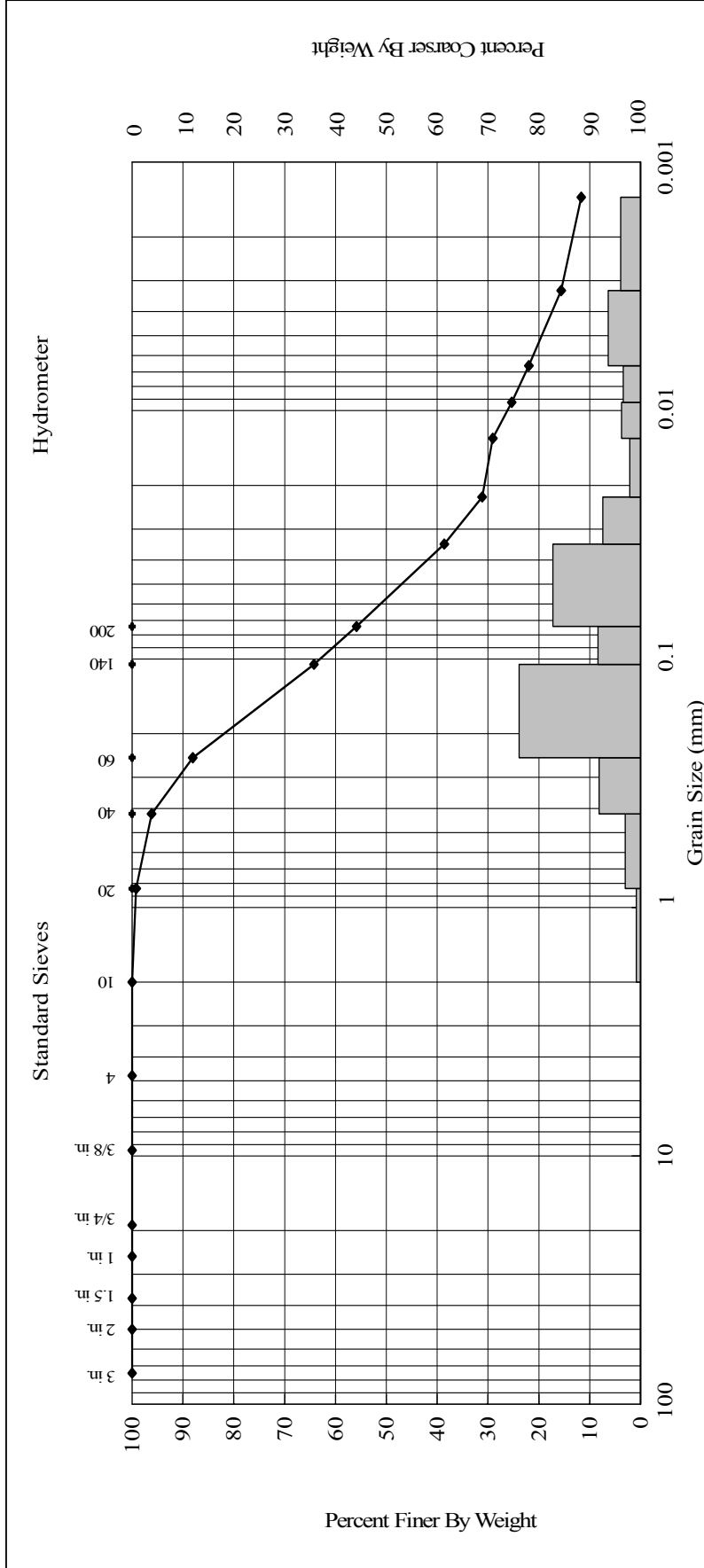
APPLIED MARINE SCIENCES, INC.
 502 N. Hwy 3, Suite B
 League City, TX 77573
 281.554.7272 Tel.
 281.554.6356 Fax


These analyses were performed in accordance with ASTM standards, the 2006 DoD Quality Systems Manual (Version 3), and the 2003 NELAC Standard.

K.S. Davis, P.G.
 AMS, Inc. Technical Director

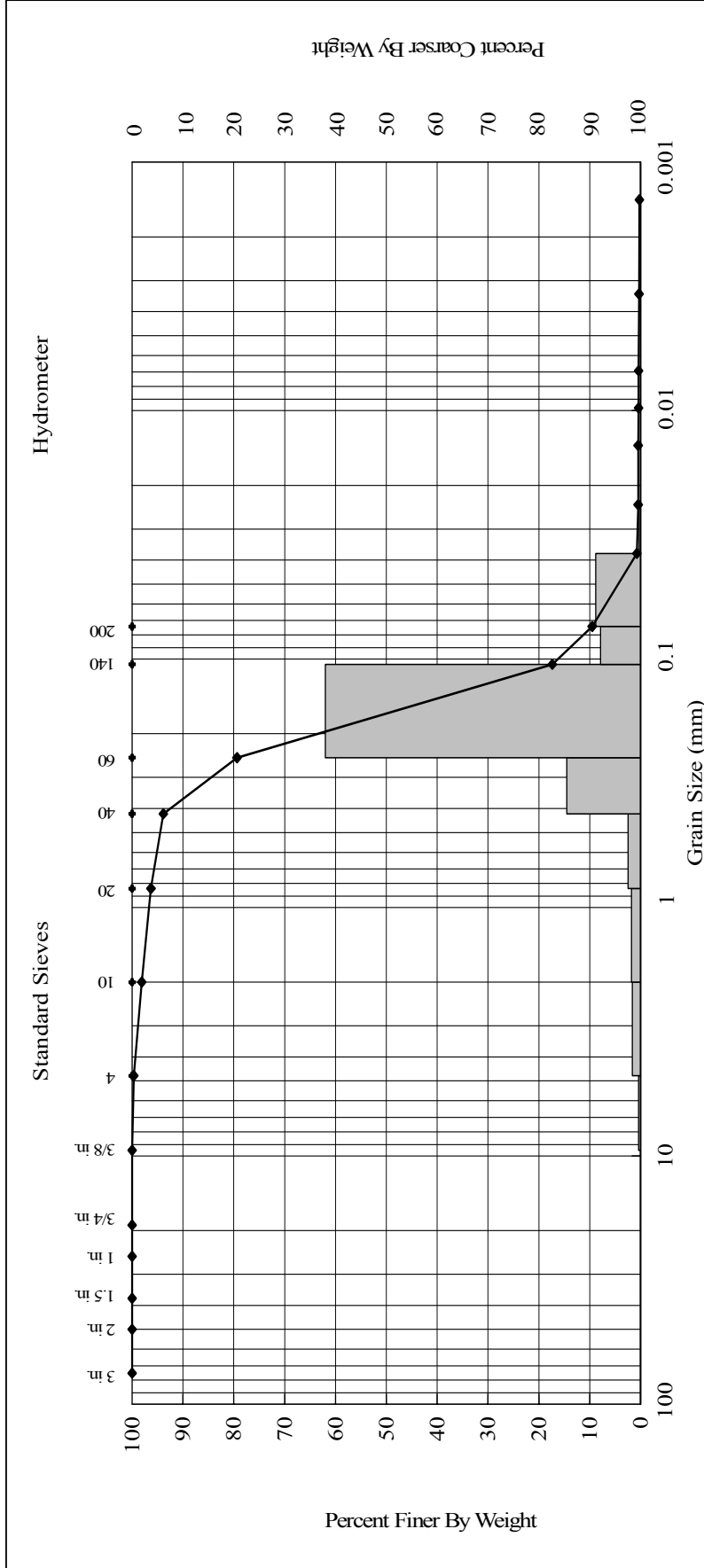


GEOTECHNICAL RESULTS



Gravel (%)	Sand (%)		Fines (%)	
0.00	Coarse	Medium	Fine	Clay
	0.00	3.84	40.32	18.86
Water Cont. (%)	Total Solids (%)	D₈₅	D₆₀	D₃₀
56	64			
Material Description				
Sandy Elastic Silt ("MH"), greenish black (10Y 2.5/1)				
Client:		AMS Project Title:		
Battelle		Brushneck Cove		
AMS Project Number:		Date Analyzed:		
07-102		9/14/2007		
Date Sampled:		Matrix, Method:		
9/6/2007		Sediment, ASTM D 422		
AMS Sample ID:		AMS Sample ID:		
GAG-011-A		28700		
<p>APPLIED MARINE SCIENCES, INC. 502 N. Hwy 3, Suite B League City, TX 77573 281.554.7272 Tel. 281.554.6356 Fax</p>				
<p>These analyses were performed in accordance with ASTM standards, the 2006 DoD Quality Systems Manual (Version 3), and the 2003 NELAC Standard.</p>				
<p align="center"><i>K.S. Davis, P.G.</i> AMS, Inc. Technical Director</p>				
<p align="right">  ACCREDITED IN ACCORDANCE WITH Laboratory No. E87956</p>				

GEOTECHNICAL RESULTS



Gravel (%)	Sand (%)	Fines (%)	
0.36	Coarse: 1.57 Medium: 4.23	Fine: 84.34 Silt: 9.17 Clay: 0.33	
Water Cont. (%)	Total Solids (%)	D₈₅	D₆₀
20	84	0.31	0.19
		D₃₀	D₁₅
		0.17	0.09
		D₁₀	C_c
		0.08	1.20
		C_u	C_u
		2.51	2.51
Material Description			
Poorly Graded Sand with Silt ("SP-SM"), pale olive (5Y 6/4)			
Client:		AMS Project Title:	
Battelle		Brushneck Cove	
AMS Project Number:		Date Sampled:	
07-102		9/5/2007	
Date Analyzed:		Matrix, Method:	
9/14/2007		Sediment, ASTM D 422	
AMS Sample ID:		AMS Sample ID:	
28701		GAG-014-A	
APPLIED MARINE SCIENCES, INC. 502 N. Hwy 3, Suite B League City, TX 77573 281.554.7272 Tel. 281.554.6356 Fax			
These analyses were performed in accordance with ASTM standards, the 2006 DoD Quality Systems Manual (Version 3), and the 2003 NELAC Standard. <i>K.S. Davis, P.G.</i> AMS, Inc. Technical Director			
ACCREDITED IN ACCORDANCE WITH nelac Laboratory No. E87956			

QUALITY CONTROL RESULTS

Client:	Battelle	AMS Project Number:	07-102
Project Title:	Brushneck Cove	Date Sampled:	9/5/2007
Project Number:	G606430	Date Analyzed:	9/14/2007
Client Sample ID:	GAG-014-A	Matrix:	Sediment
AMS Sample ID:	28701	Method:	ASTM D 422
		Batch:	091407-01

Particle Diameter Range (mm)	U.S. Standard Sieve Mesh #	Size Class	Sample Result (%)	Duplicate Result (%)	RPD (%)	Data Qualifier	QC Limits (%RPD)
4.76	No. 4	Gravel	0.36	0.33	8.70		≤ 25
2.00	No. 10	Coarse Sand	1.57	1.46	7.26		≤ 25
0.425	No. 40	Medium Sand	4.23	4.34	2.57		≤ 25
0.074	No. 200	Fine Sand	84.34	82.96	1.65		≤ 25
<0.074 - 0.005	Hydrometer	Silt	9.17	10.60	14.47		≤ 25
<0.005	Hydrometer	Clay	0.33	0.31	6.25		≤ 25

Samples in Batch: 28690 28692 28694 28696 28698 28700
 28691 28693 28695 28697 28699 28701

Qualifiers: Q - RPD value outside Quality Control Limits
 I - Insufficient sample material to perform Quality Control Analyses

Soil Classification: Unified Soil Classification System (USCS) classifications are estimated in accordance with ASTM D 2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) unless the sample contains less than 5% fines (GW, GP, SW, and SP), or the Liquid Limit, Plastic Limit, and Plasticity Index (Atterberg Limits) have been determined in accordance with ASTM D 4318. When these values have been determined the samples are definitively classified using ASTM D 2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).



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K.S. Davis, P.G.
 AMS, Inc. Technical Director

