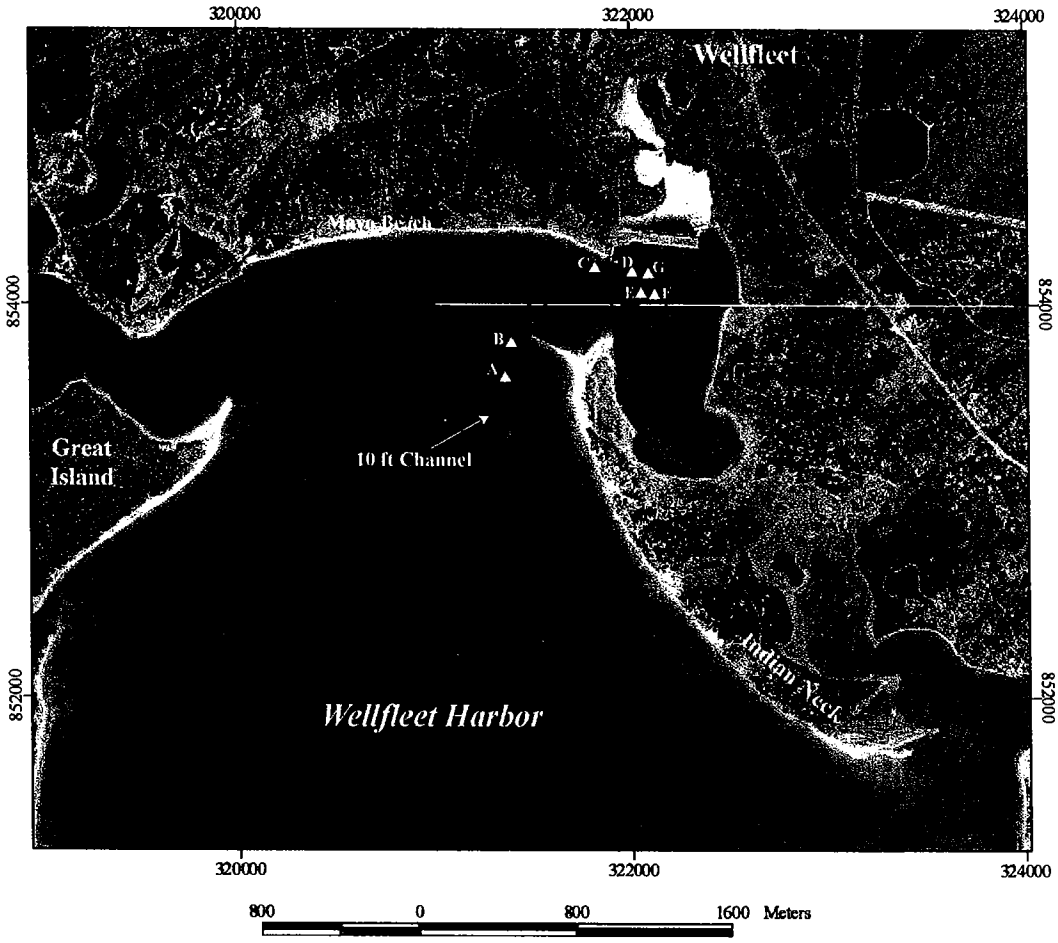
FINAL REPORT

Wellfleet Harbor
Sediment Sampling and Testing
Wellfleet Harbor, Massachusetts



Prepared For:
Department of the Army
New England District
Corps of Engineers
696 Virginia Road
Concord, MA 01742

Prepared By:
Woods Hole Group
Environmental Laboratories
375 Paramount Drive, Suite 2
Raynham, MA 02767

December 29, 2003

WELLFLEET HARBOR
SEDIMENT SAMPLING AND TESTING
WELLFLEET, MASSACHUSETTS

December 2003

Prepared for:
Department of the Army
New England District
Corps of Engineers
696 Virginia Road
Concord, MA 01742

Prepared by:
Woods Hole Group
Environmental Laboratories
375 Paramount Drive, Suite 2
Raynham, MA 02767

USACE CONTRACT NO.: DACW33-D-0006
TASK ORDER NO.: 0013

STATEMENT OF DATA AUTHENTICITY

The enclosed results of sediment sample collection and grain size analyses are representative of the samples collected, received, and analyzed by Woods Hole Group Environmental Laboratories. To the best of my knowledge, the information contained in this report is accurate and complete.

Approved By: Mauro K Surprenant Title: Senior Project Manager

Date: 12 Nov 03

TABLE OF CONTENTS

1.0 OVERVIEW 4

2.0 FIELD SAMPLE COLLECTION 4

3.0 GRAIN SIZE ANALYSIS 4

4.0 BULK SEDIMENT CHEMISTRY 5

5.0 REFERNCES 6

LIST OF APPENDICES

Appendix A: Field Report
Appendix B: Grain Size Bulk Sediment Chemistry Data Report
Appendix C: Definitions of Bulk Sediment Chemistry Data Qualifiers
Appendix D: Summary of Grain Size and Bulk Sediment Chemistry Results
Appendix E: Sample Documentation
Appendix F: Enlarged Site Map

1.0 OVERVIEW

As part of the U.S. Army Corps of Engineers, New England District ongoing navigation maintenance-dredging program, sediment samples were collected within Wellfleet Harbor, Massachusetts. Sampling locations included seven stations within Wellfleet Harbor. All seven sediment samples were classified using grain size data, then composited into three samples for bulk chemistry analysis.

The field collection effort and physical testing efforts and resulting data are summarized in Sections 2.0, 3.0, and 4.0.

2.0 FIELD SAMPLE COLLECTION

Mobilization for this effort began on September 16, 2003. Sampling was conducted on September 17, 2003 by TG&B Marine Services, with oversight and support from James J. Bajek, LLC, and Woods Hole Group Environmental Laboratories (WHGEL). Sampling was conducted from a 24-ft Carolina Skiff open concept workboat to collect sediment core samples to the proposed project depth. Coring equipment consisted of a gasoline driven mechanical vibracoring device as well as a manual hammer push corer. The procedure followed in the field was to utilize the vibracorer if the push corer was unable to sample to project depth. The push corer was successful at each of the seven sampling locations. Sample positioning was accomplished using a DGPS unit. All samples were collected within 10 feet of their designated locations, as specified in the Scope of Work. One core sample was collected at each location to the proposed dredge depth. The sampling locations can be found in the Field Report, Appendix A, as Figure 1. Additionally, a summary of the sampling coordinates and tide corrected water depth at the time of sampling can also be found in the Field Report as Table 1.

3.0 GRAIN SIZE ANALYSIS

Sediment grain size was performed on samples collected from Wellfleet Harbor. Grain size analysis was performed using ASTM Method D-422 (ASTM, 1998). A summary of the grain size data is presented in Appendix E. Additionally, further classification of the sediments was performed using the Unified Soil Classification System, ASTM Method D-2487 (ASTM, 2000). A summary of the grain size results can be found in Appendix D.

The grain size distributions show that samples STA C and STA B are primarily sand, with values close to 100%. The remaining five samples are primarily 40-50% sand and 40-50% clay, with approximately 8% silt.

4.0 BULK SEDIMENT CHEMISTRY

Bulk sediment chemistry was performed on three composited samples using data from the seven sediment grain size samples. Pesticides, polychlorinated biphenyl congeners, polyaromatic hydrocarbons, total metals, total organic carbon, water content, and percent moisture were performed using EPA Methods 8081A, 8082, 8270C, 6020, 9060, ASTM D2216, and gravimetric, respectively. Bulk sediment chemistry parameters were performed on the rinsate blank as well. A summary of the bulk sediment chemistry data is presented in Appendix D.

A complete data report, including grain size and bulk sediment chemistry results, can be found as Appendix B, with data qualifier definitions as Appendix C. All supporting documentation, such as sample tracking sheets, sample receipt logs, etc. can be found as Appendix E.

Bulk sediment chemistry results show that concentrations for both organics and metals are primarily non-detect with some low concentrations for polyaromatic hydrocarbons and total metals.

5.0 REFERENCES

ASTM 1998. Standard Methods for Particle Size Analysis of Soils, Method D-422. In 1998 Annual Book of ASTM Standards, Vol. 4.08. Philadelphia, PA.

ASTM 2000. Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), D-2847. In 2000 Annual Book of ASTM Standards, Vol. 4.03, and 4.08. Philadelphia, PA.

ASTM 1991. Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures, Method D-2216. In 1998 Annual Book of ASTM Standards, Vol. 4.08 and 14.02. Philadelphia, PA.

Woods Hole Group Environmental Laboratories Standard Operating Procedures, *"Analysis of Polynuclear Aromatic Hydrocarbons by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring (Revision 1.0),"* modified Method 8270-PAH-SIM.

Woods Hole Group Environmental Laboratories Standard Operating Procedures, *"Organochlorine Pesticides by Gas Chromatography/Electron Capture Detector (Revision 1.0)*," Method 8081A

Woods Hole Group Environmental Laboratories Standard Operating Procedures, *"Polychlorinated Biphenyls (PCBs) as Aroclors and Congeners by Gas Chromatography/Electron Capture Detection (Revision 1.0),"* Method 8082

Woods Hole Group Environmental Laboratories Standard Operating Procedures, *"Mercury Determination by Cold Vapor Atomic Absorption Spectroscopy (Revision 2.2),"* Method 7470A.

Woods Hole Group Environmental Laboratories Standard Operating Procedures, *"Inductively Coupled Plasma-Mass Spectrometry (Revision 2.1),"* Method 6020.

Woods Hole Group Environmental Laboratories Standard Operating Procedures, *"Total Organic Carbon in Soil and Sediment (Revision 2.0),"* modified from Method 9060.

APPENDIX B

GRAIN SIZE AND BULK SEDIMENT CHEMISTRY DATA REPORT

Woods Hole Group

Environmental Laboratories

ANALYTICAL REPORT

Prepared for:
Army Corps of Engineers
696 Virginia Road
Concord, MA 01742

Project:	Task 0013 Wellfleet Harbor
ETR:	0309064
Report Date:	September 25, 2003

Certifications and Accreditations
Massachusetts MA030
Connecticut PH-0141
New Hampshire 220602
Rhode Island 64
New Jersey MA015
Maine MA030
New York 11627
Louisiana 03090
Army Corps of Engineers
Department of the Navy
Florida E87814

This report shall not be reproduced except in full, without written approval from the laboratory.

375 Paramount Drive, Suite 2, Raynham, Massachusetts 02767, (508) 822-9300, Fax (508) 822-3288, whale@whgrp.com

CASE NARRATIVE

Woods Hole Group Environmental Laboratories

ETR: **0309064**
Project: **Task 0013 Wellfleet Harbor**

All analyses were performed according to Woods Hole Group Environmental Laboratories' documented Standard Operating Procedures, within holding time and with appropriate quality control measures except where noted. Blank correction of results is not performed in the laboratory for any parameter. Soil/sediment samples are reported on a dry weight basis unless otherwise noted.

Wet Sieve

Particle Size was determined according to *ASTM Method D422-63 (Re-approved 1998)* by drying a homogenized sediment sample. The dried homogenate was placed into a number 200 sieve, washed with tap water, re-dried, re-homogenized, and returned to the number 200 sieve. The dried sediment was mechanically sieved with an array of sieve sizes including sieve numbers 4, 10, 20, 40, 60, 100 and 200. The distribution of sediment sample remaining in each of the sieves was determined by weight and represents various classes of sediment including cobble, gravel, course and fine sand, silt and clay. Soil classification was determined according to *ASTM Method D2487*.

1. Due to the nature of samples STA A, STA B, and STA D (0309064-01, -02 & -04), the liquid limit and plastic limit could not be performed. As such, soil classifications/descriptions are based on laboratory observation and/or field notes.

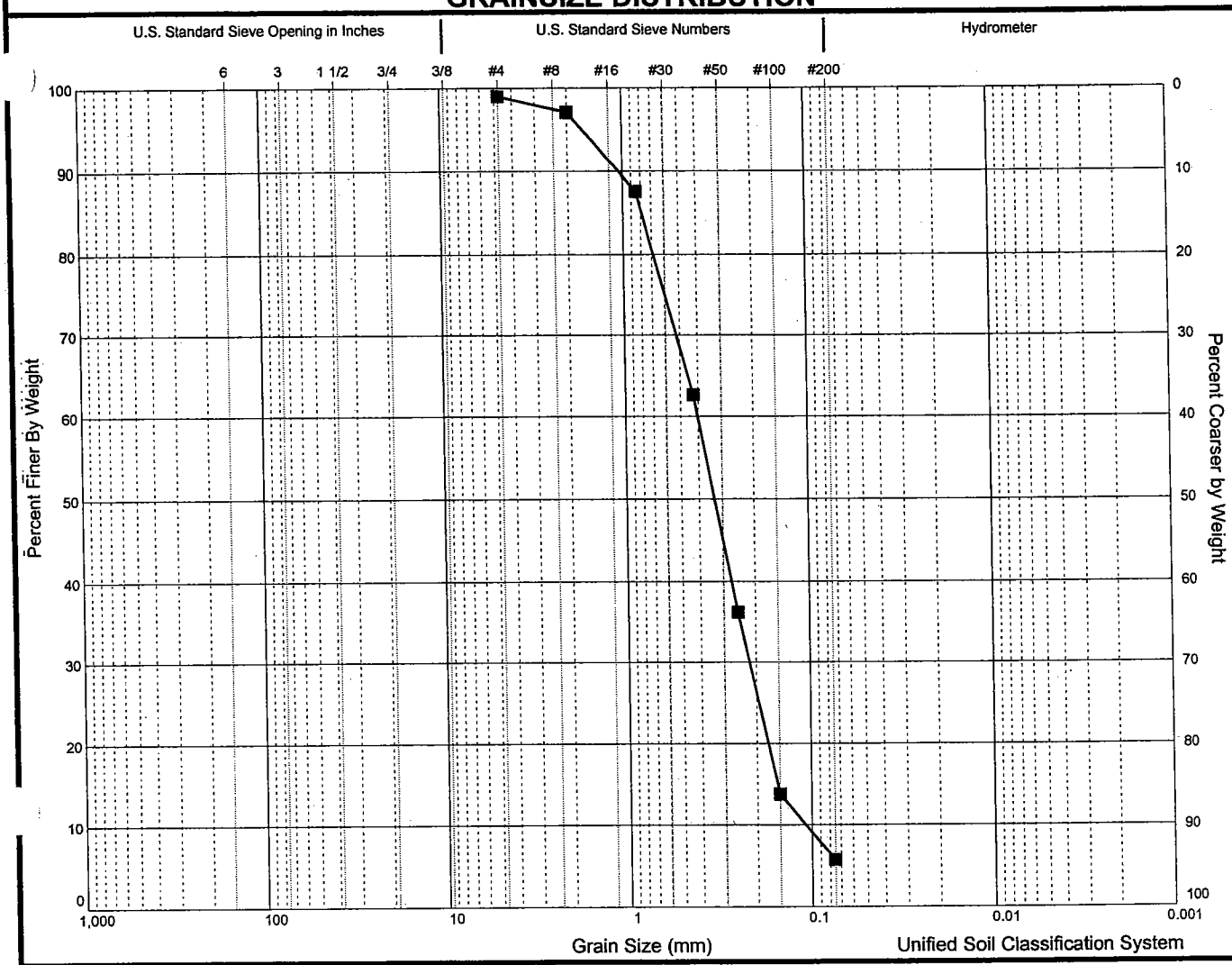
Water Content

Water content was determined according to *ASTM Method D2216-98* by weighing a representative sample aliquot (approximately 50g) and drying the aliquot in an oven at 110°C to a constant mass. The loss of mass due to the sample drying was considered to be water. The water content of the sample is the ratio of the mass of water contained in the pore spaces of the sample, to the solid mass particles of the dried sample, expressed as a percentage.

The enclosed results of analyses are representative of the samples as received by Woods Hole Group Environmental Laboratories (Woods Hole Group). Woods Hole Group makes no representations or certifications as to the method of sample collection, sample identification, or transporting/handling procedures used prior to the receipt of samples by Woods Hole Group. To the best of my knowledge, the information contained in this report is accurate and complete.

Approved by: Robin Swift Title: Proj. Mgr Date: 9-25-03

GRAINSIZE DISTRIBUTION



% Coarse	% Sand	% Silt	% Clay
0.5%	95.1%	4.2%	0.2%

LL	PL	PI	D60 (mm)	D50 (mm)	D30 (mm)	D20 (mm)	D10 (mm)	Cc	Cu
0.0	0.0	0.0	0.4	0.3	0.2	0.2	0.1	1.1	3.4

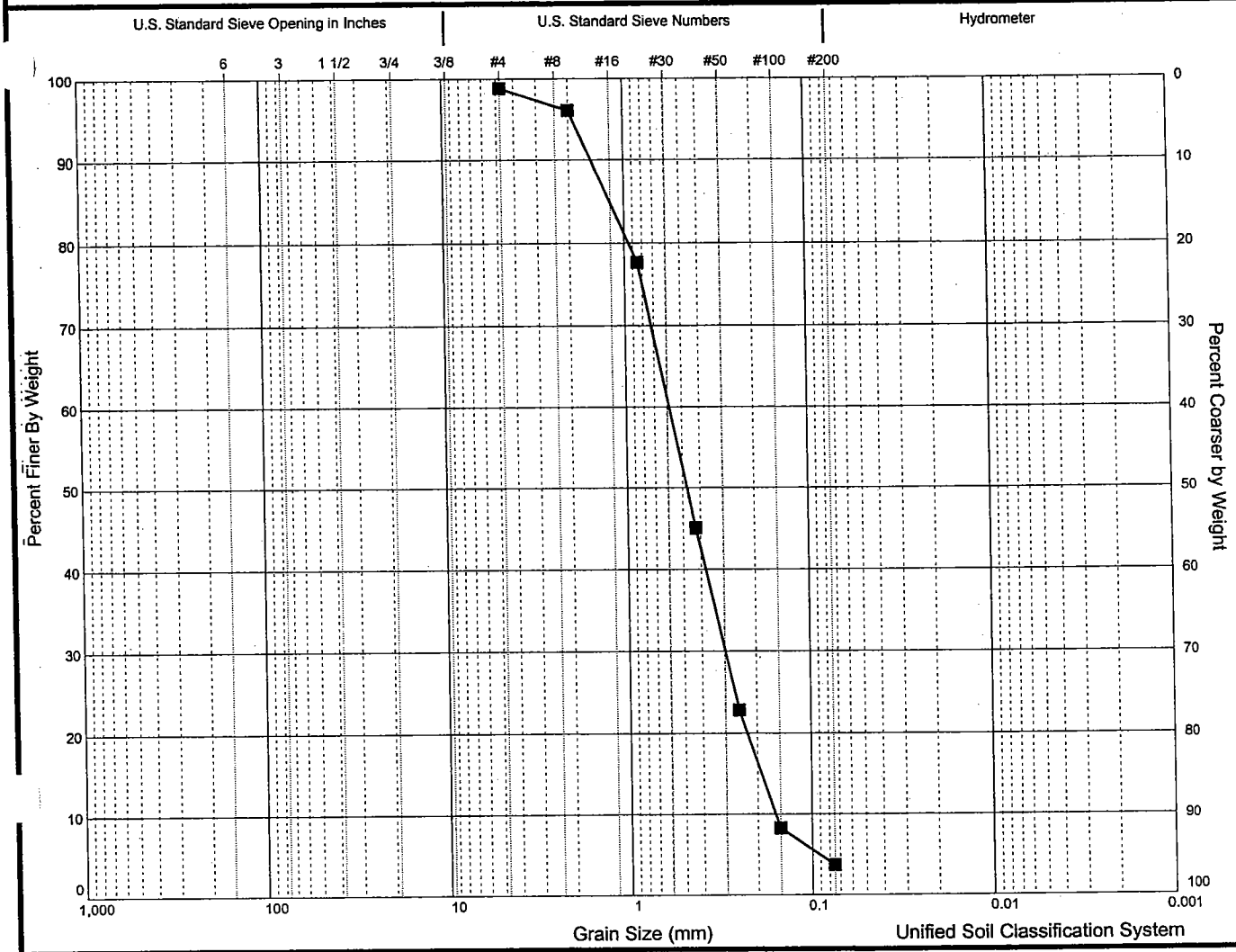
Soil Description	USCS	USDA
Poorly Graded Sand	SP	

Company: Woods Hole Group Environmental Labs
Address: 375 Paramount Drive, Suite 2
Raynham MA
Country: United States
Telephone: 508.822.9300 **Fax:** 508.822.3288

USCS GRAIN-SIZE DISTRIBUTION

Project No.: 0309064 **Borehole:** 0309064-01
Project Name: Task 0013 Wellfleet Harbor
Location: STA A
Soil Counter: 612925370 **Sample ID:** 0309064-01
Depth: ft

GRAINSIZE DISTRIBUTION



% Coarse	% Sand	% Silt	% Clay
0.9%	95.7%	3.1%	0.3%

LL	PL	PI	D60 (mm)	D50 (mm)	D30 (mm)	D20 (mm)	D10 (mm)	Cc	Cu
			0.6	0.5	0.3	0.2	0.2	1.1	3.6

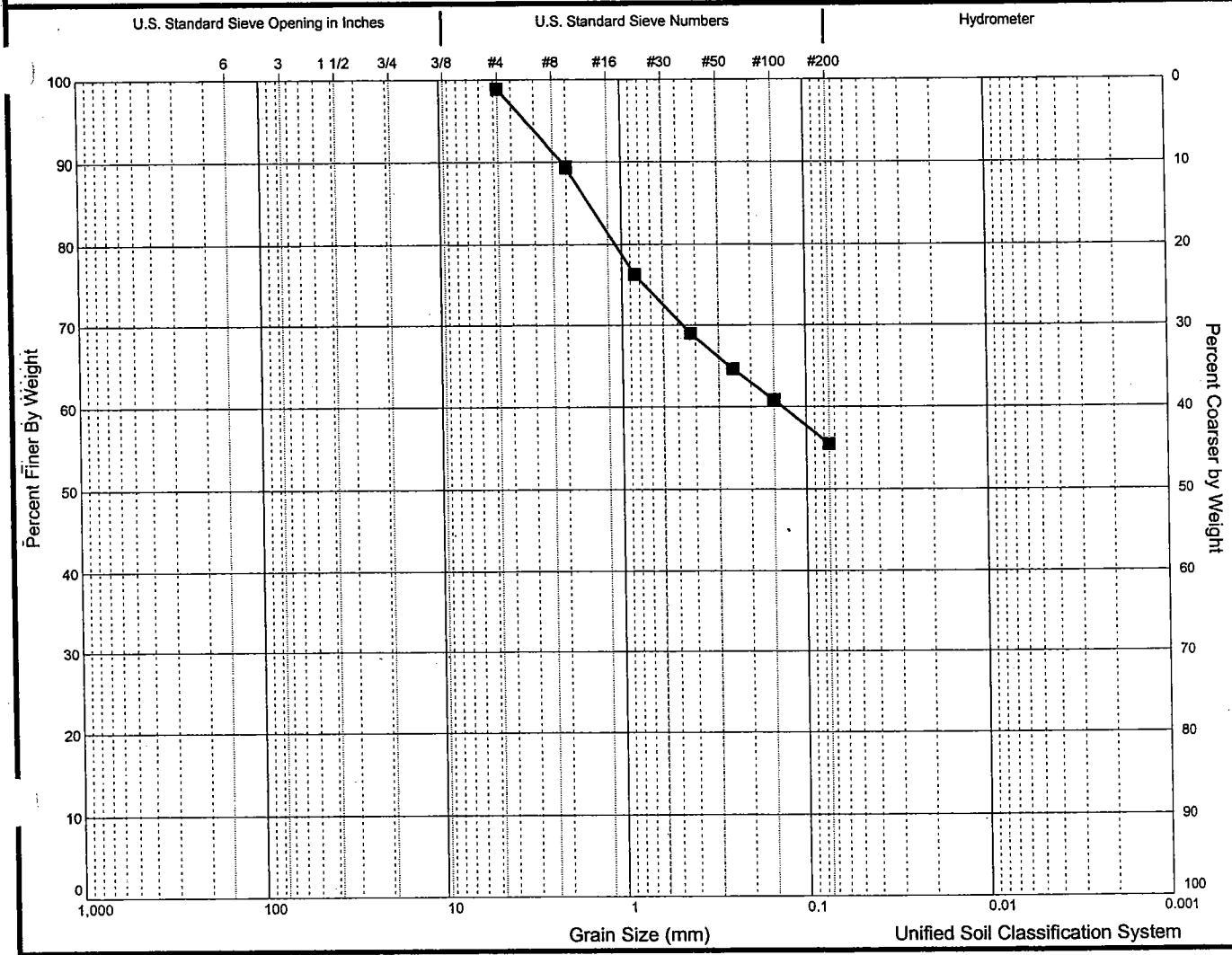
Soil Description	USCS	USDA
Poorly graded sand	SP	

Company: Woods Hole Group Environmental Labs
Address: 375 Paramount Drive, Suite 2
Raynham MA
Country: United States
Telephone: 508.822.9300 **Fax:** 508.822.3288

USCS GRAIN-SIZE DISTRIBUTION

Project No.: 0309064 **Borehole:** 0309064-02
Project Name: Task 0013 Wellfleet Harbor
Location: STA B
Soil Counter: 979488955 **Sample ID:** 0309064-02
Depth: ft

GRAINSIZE DISTRIBUTION



% Coarse	% Sand	% Silt	% Clay
2.2%	41.0%	8.3%	48.5%

LL	PL	PI	D60 (mm)	D50 (mm)	D30 (mm)	D20 (mm)	D10 (mm)	Cc	Cu
247.6	85.4	162.2	0.1	0.0	0.0	0.0	0.0	0.0	11720.2

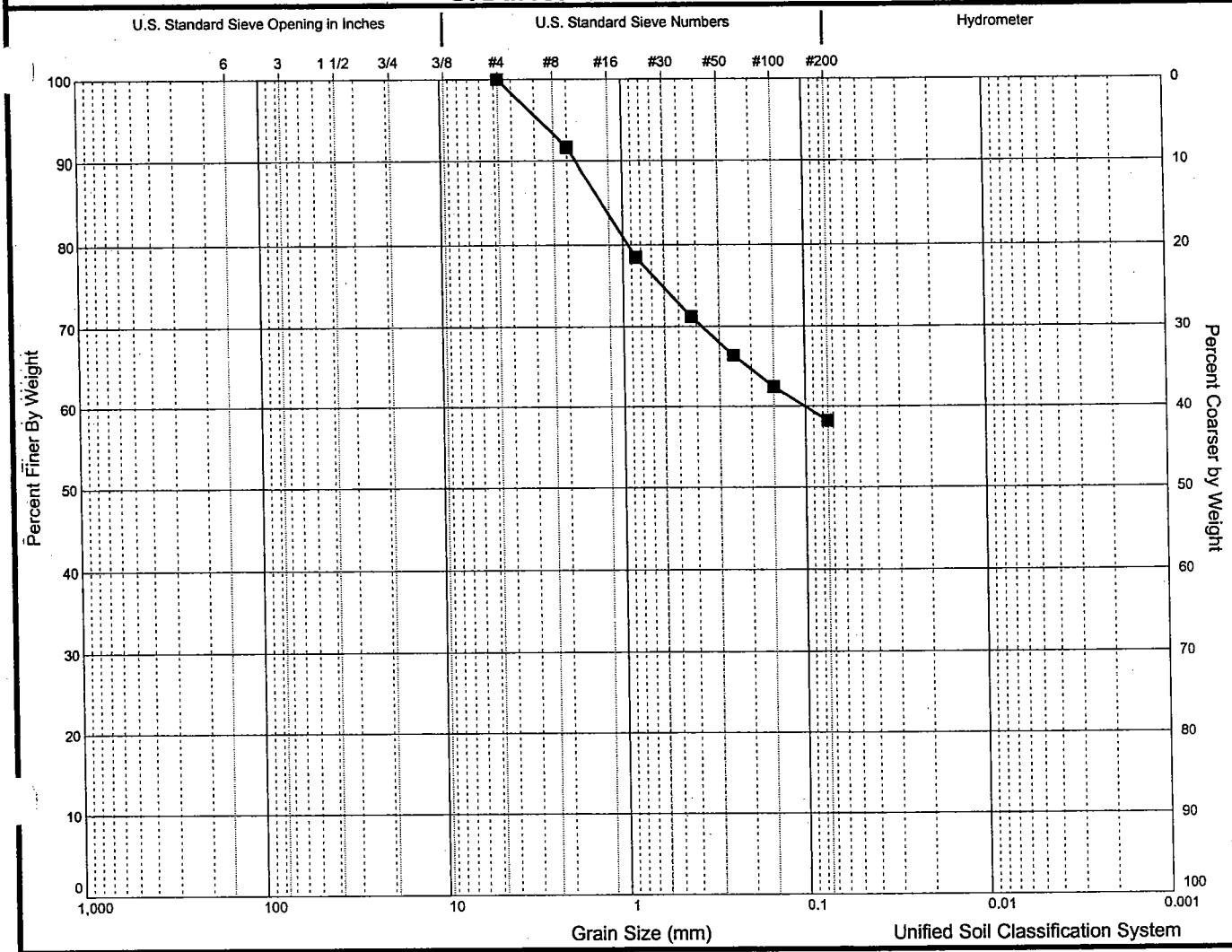
Soil Description	USCS	USDA
Sandy elastic silt	MH	

Company: Woods Hole Group Environmental Labs
Address: 375 Paramount Drive, Suite 2
Raynham MA
Country: United States
Telephone: 508.822.9300 **Fax:** 508.822.3288

USCS GRAIN-SIZE DISTRIBUTION

Project No.: 0309064 **Borehole:** 0309064-03
Project Name: Task 0013 Wellfleet Harbor
Location: STA C
Soil Counter: 905835999 **Sample ID:** 0309064-03
Depth: ft

GRAINSIZE DISTRIBUTION



% Coarse	% Sand	% Silt	% Clay
1.4%	39.6%	8.1%	50.9%

LL	PL	PI	D60 (mm)	D50 (mm)	D30 (mm)	D20 (mm)	D10 (mm)	Cc	Cu
			0.1	0.0	0.0	0.0	0.0	0.0	7859.0

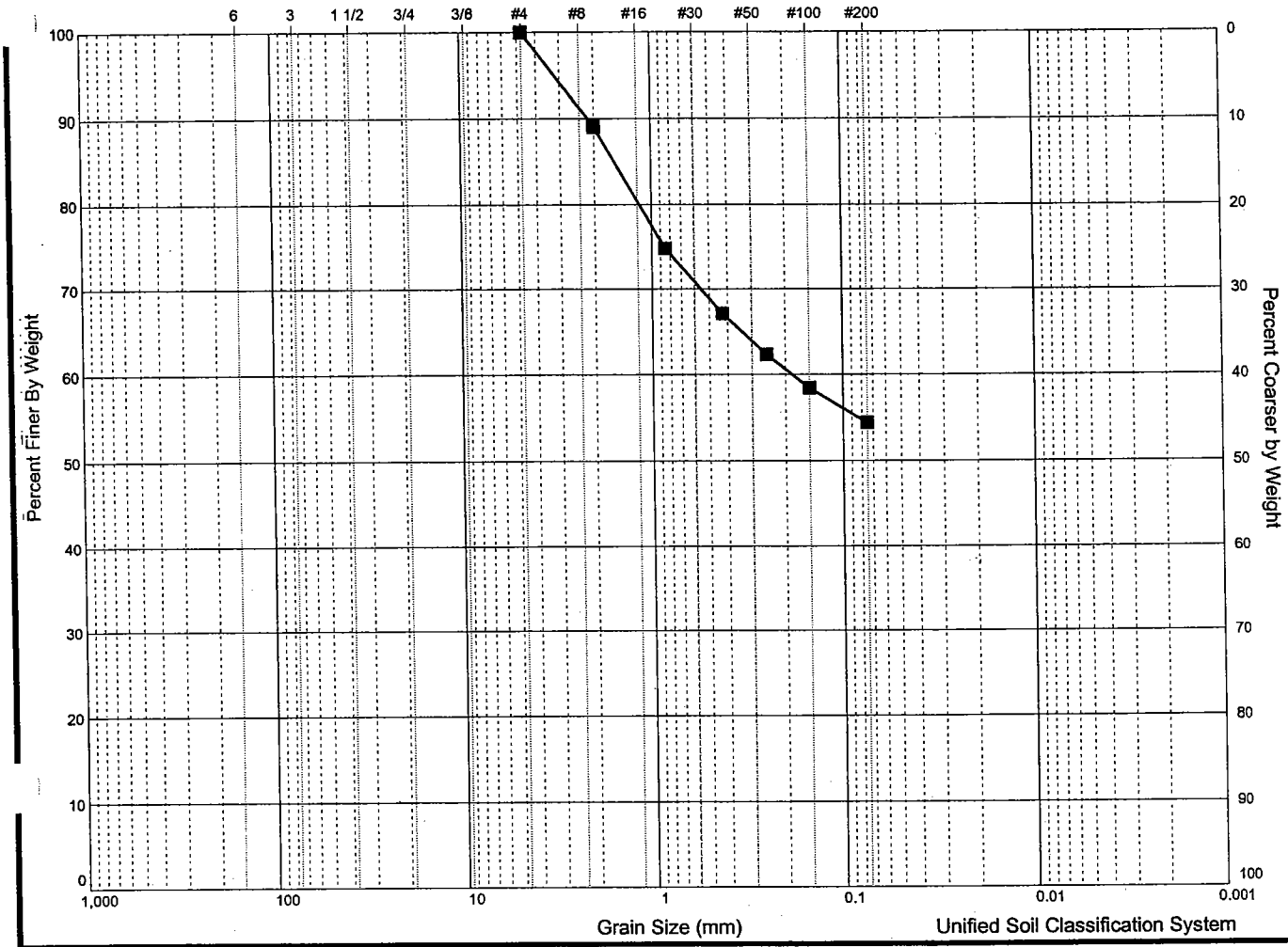
Soil Description	USCS	USDA
Sandy elastic silt	MH	

Company: Woods Hole Group Environmental Labs
Address: 375 Paramount Drive, Suite 2
Raynham MA
Country: United States
Telephone: 508.822.9300 **Fax:** 508.822.3288

USCS GRAIN-SIZE DISTRIBUTION

Project No.: 0309064 **Borehole:** 0309064-04
Project Name: Task 0013 Wellfleet Harbor
Location: STA D
Soil Counter: 710046821 **Sample ID:** 0309064-04
Depth: ft

GRAINSIZE DISTRIBUTION



% Coarse	% Sand	% Silt	% Clay
1.6%	43.2%	7.9%	47.3%

LL	PL	PI	D60 (mm)	D50 (mm)	D30 (mm)	D20 (mm)	D10 (mm)	Cc	Cu
			0.2	0.0	0.0	0.0	0.0	0.0	15757.1

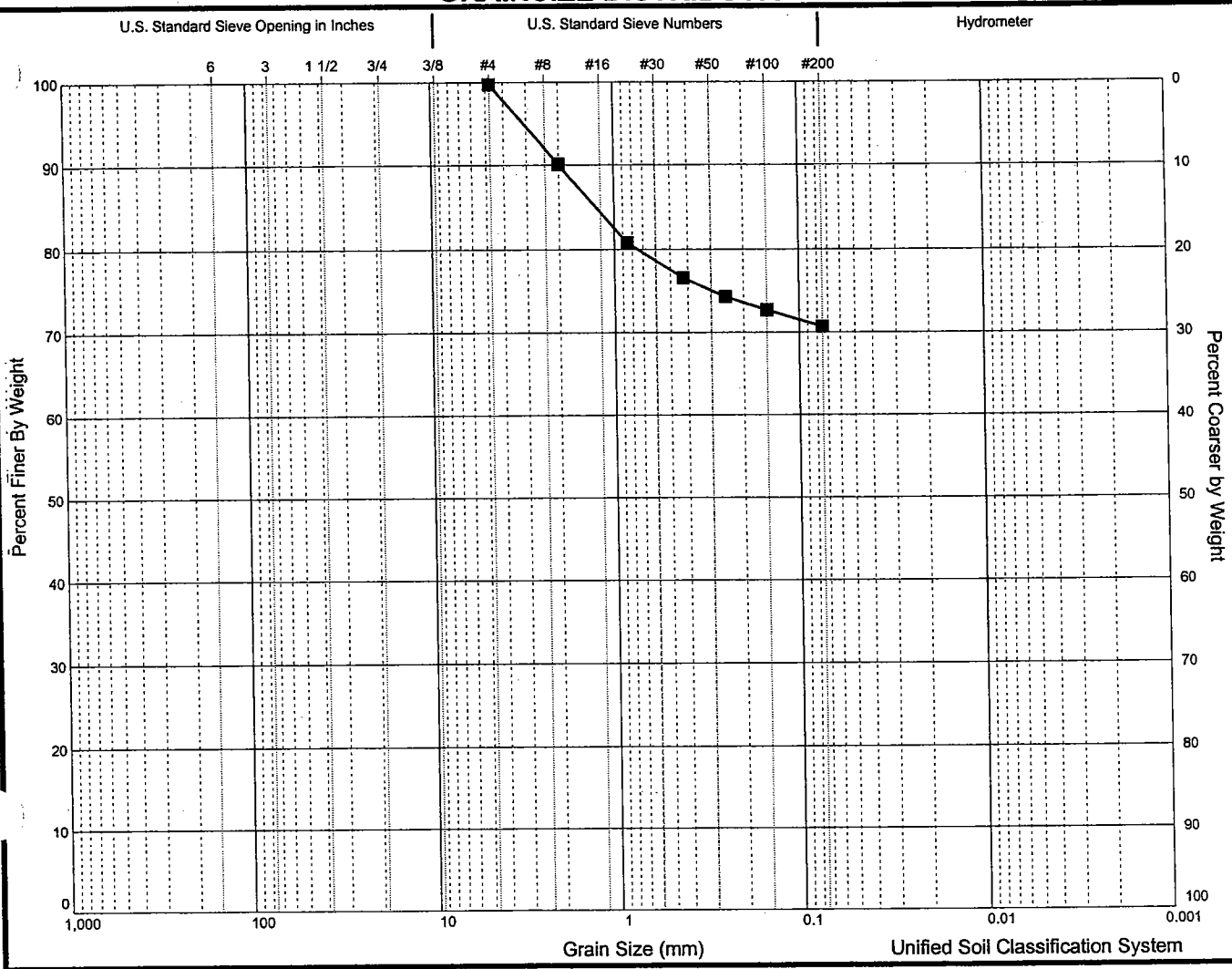
Soil Description	USCS	USDA
Sandy elastic silt	MH	

Company: Woods Hole Group Environmental Labs
Address: 375 Paramount Drive, Suite 2
Raynham MA
Country: United States
Telephone: 508.822.9300 **Fax:** 508.822.3288

USCS GRAIN-SIZE DISTRIBUTION

Project No.: 0309064 **Borehole:** 0309064-4D
Project Name: Task 0013 Wellfleet Harbor
Location: STA D
Soil Counter: 172455045 **Sample ID:** 0309064-4D
Depth: ft

GRAINSIZE DISTRIBUTION



% Coarse	% Sand	% Silt	% Clay
0.6%	28.5%	4.5%	66.3%

LL	PL	PI	D60 (mm)	D50 (mm)	D30 (mm)	D20 (mm)	D10 (mm)	Cc	Cu
274.6	101.1	173.5	0.0	0.0	0.0	0.0	0.0	0.3	5.3

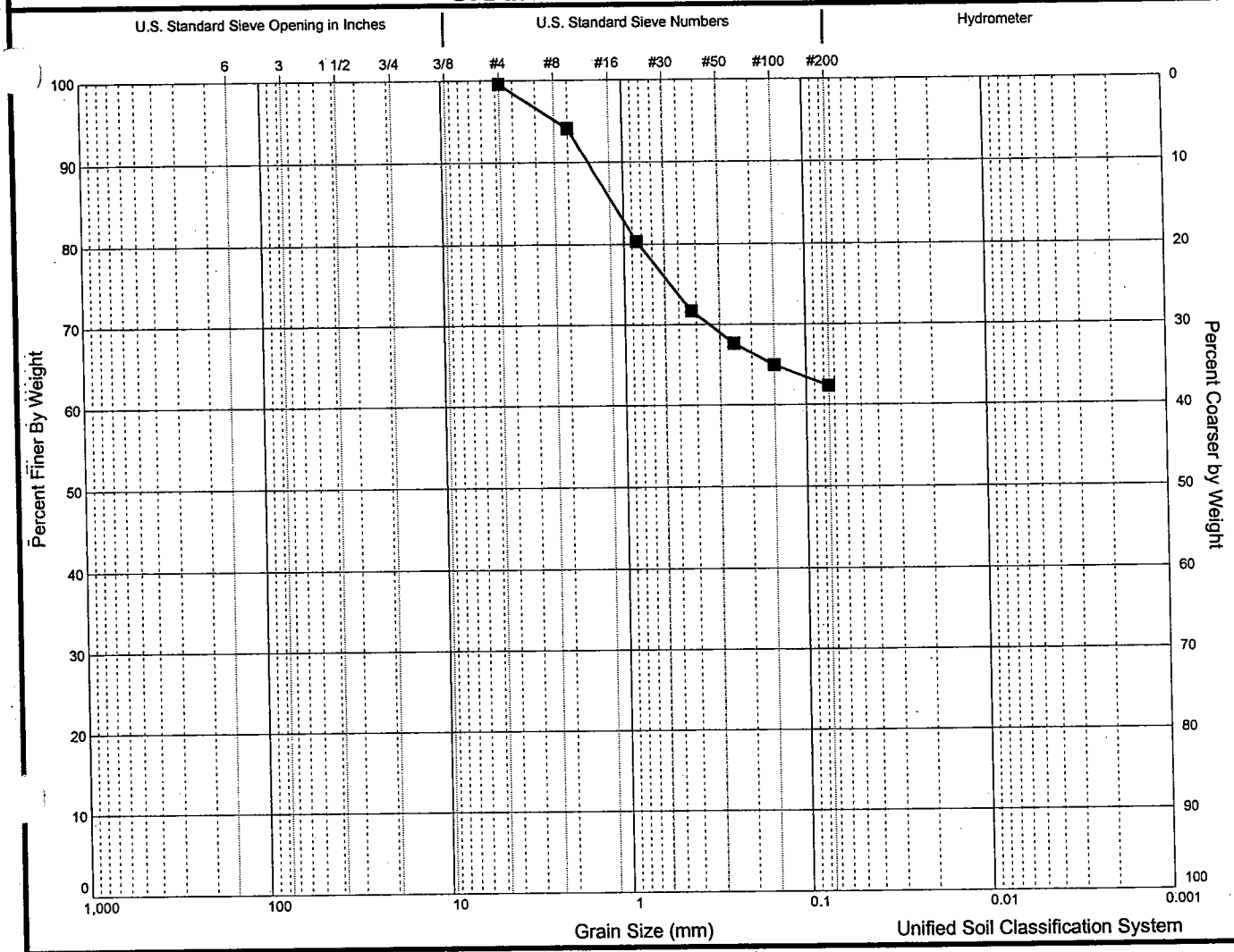
Soil Description	USCS	USDA
Sandy elastic silt	MH	

Company: Woods Hole Group Environmental Labs
Address: 375 Paramount Drive, Suite 2
Raynham MA
Country: United States
Telephone: 508.822.9300 **Fax:** 508.822.3288

USCS GRAIN-SIZE DISTRIBUTION

Project No.: 0309064 **Borehole:** 0309064-05
Project Name: Task 0013 Wellfleet Harbor
Location: STA E
Soil Counter: 896341482 **Sample ID:** 0309064-05
Depth: ft

GRAINSIZE DISTRIBUTION



% Coarse	% Sand	% Silt	% Clay
0.5%	37.5%	7.0%	55.0%

LL	PL	PI	D60 (mm)	D50 (mm)	D30 (mm)	D20 (mm)	D10 (mm)	Cc	Cu
272.5	142.6	129.9	0.0	0.0	0.0	0.0	0.0	0.0	3561.5

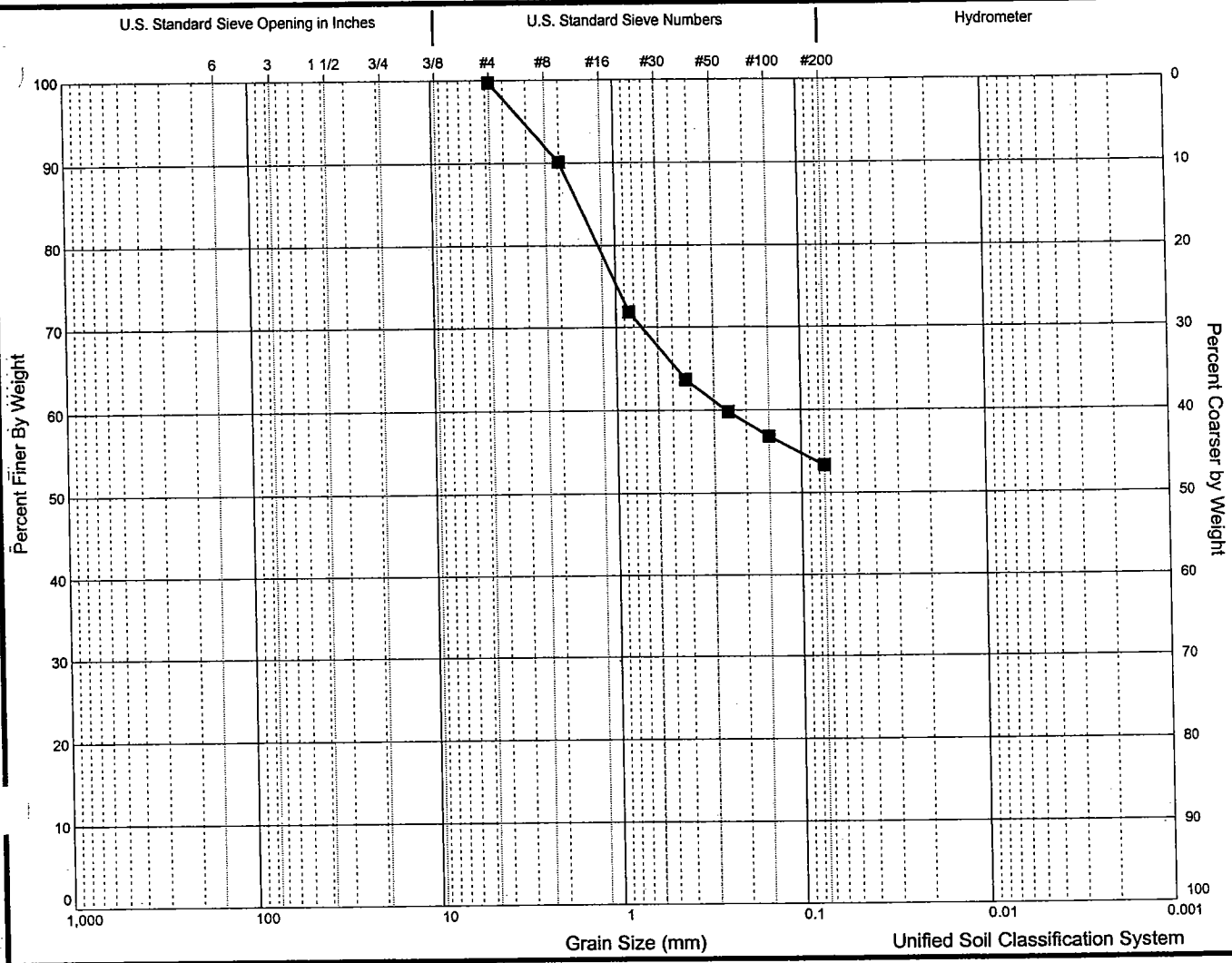
Soil Description	USCS	USDA
Sandy Elastic Silt	MH	

Company: Woods Hole Group Environmental Labs
Address: 375 Paramount Drive, Suite 2
Raynham MA
Country: United States
Telephone: 508.822.9300 **Fax:** 508.822.3288

USCS GRAIN-SIZE DISTRIBUTION

Project No.: 0309064 **Borehole:** 0309064-06
Project Name: Task 0013 Wellfleet Harbor
Location: STA F
Soil Counter: 738530370 **Sample ID:** 0309064-06
Depth: ft

GRAINSIZE DISTRIBUTION



% Coarse	% Sand	% Silt	% Clay
0.7%	45.7%	7.1%	46.6%

LL	PL	PI	D60 (mm)	D50 (mm)	D30 (mm)	D20 (mm)	D10 (mm)	Cc	Cu
272.5	142.6	129.9	0.3	0.0	0.0	0.0	0.0	0.0	21994.7

Soil Description	USCS	USDA
Sandy elastic silt	MH	

Company: Woods Hole Group Environmental Labs
Address: 375 Paramount Drive, Suite 2
Raynham MA
Country: United States
Telephone: 508.822.9300 **Fax:** 508.822.3288

USCS GRAIN-SIZE DISTRIBUTION

Project No.: 0309064 **Borehole:** 0309064-07
Project Name: Task 0013 Wellfleet Harbor
Location: STA G
Soil Counter: 975893285 **Sample ID:** 0309064-07
Depth: ft

APPENDIX D

SUMMARY OF GRAIN SIZE AND BULK SEDIMENT CHEMISTRY RESULTS

Wellfleet Harbor Sediment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

SAMPLE ID		STA A		STA B		STA C	
SAMPLING DATE		9/17/03		9/17/03		9/17/03	
LAB SAMPLE ID		0309064-01		0309064-02		0309064-03	
	Units		Qual		Qual		Qual
Wet Sieve Analysis							
% Coarse	%	**0.5**		**0.9**		**2.2**	
% Sand	%	**95.1**		**95.7**		**41.0**	
% Silt	%	**4.2**		**3.1**		**8.3**	
% Clay	%	**0.2**		**0.3**		**48.5**	
LL	%	**0.0**				**247.6**	
PL	%	**0.0**				**85.4**	
PI	%	**0.0**				**162.2**	
USCS	%	**SP**		**SP**		**MH**	
Inorganics							
Water Content	%	**28**		**21**		**320**	

Wellfleet Harbor ...iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

SAMPLE ID		STA D		STA D		STA E	
SAMPLING DATE		9/17/03		9/17/03		9/17/03	
LAB SAMPLE ID		0309064-04		0309064-04D		0309064-05	
	Units		Qual		Qual		Qual
Wet Sieve Analysis							
% Coarse	%	**1.4**		**1.6**		**0.6**	
% Sand	%	**39.6**		**43.2**		**28.5**	
% Silt	%	**8.1**		**7.9**		**4.5**	
% Clay	%	**50.9**		**47.3**		**66.3**	
LL	%					**274.6**	
PL	%					**101.1**	
PI	%					**173.5**	
USCS	%	**MH**		**MH**		**MH**	
Inorganics							
Water Content	%	**320**		**320**		**380**	

Wellfleet Harbor ...iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

SAMPLE ID		STA F		STA G	
SAMPLING DATE		9/17/03		9/17/03	
LAB SAMPLE ID		0309064-06		0309064-07	
	Units		Qual		Qual
Wet Sieve Analysis					
% Coarse	%	**0.5**		**0.7**	
% Sand	%	**37.5**		**45.7**	
% Silt	%	**7.0**		**7.1**	
% Clay	%	**55.0**		**46.6**	
LL	%	**272.5**		**272.5**	
PL	%	**142.6**		**142.6**	
PI	%	**129.9**		**129.9**	
USCS	%	**MH**		**MH**	
Inorganics					
Water Content	%	**370**		**340**	

Wellfleet Harbor liment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

SAMPLE ID		Sta A & B Comp	Sta C , D & E Comp		Sta C , D & E Comp		
SAMPLING DATE		9/17/03		9/17/03		9/17/03	
LAB SAMPLE ID		0310008-01		0310008-02		0310008-02D	
	Units		Qual		Qual		Qual
Pesticides and PCB Congeners by GC/ECD							
Aldrin	µg/Kg	0.46	U	1.6	U	1.6	U
alpha-BHC	µg/Kg	0.46	U	1.6	U	1.6	U
alpha-Chlordane	µg/Kg	0.46	U	1.6	U	1.6	U
beta-BHC	µg/Kg	0.46	U	1.6	U	1.6	U
delta-BHC	µg/Kg	0.46	U	1.6	U	1.6	U
gamma-BHC	µg/Kg	0.46	U	1.6	U	1.6	U
gamma-Chlordane	µg/Kg	0.46	U	1.6	U	1.6	U
4,4'-DDD	µg/Kg	0.46	U	1.6	U	1.6	U
4,4'-DDE	µg/Kg	0.46	U	1.6	U	1.6	U
4,4'-DDT	µg/Kg	0.46	U	1.6	U	1.6	U
Dieldrin	µg/Kg	0.46	U	1.6	U	1.6	U
Endosulfan I	µg/Kg	0.46	U	1.6	U	1.6	U
Endosulfan II	µg/Kg	0.46	U	1.6	U	1.6	U
Endosulfan sulfate	µg/Kg	0.46	U	1.6	U	1.6	U
Endrin	µg/Kg	0.46	U	1.6	U	1.6	U
Endrin aldehyde	µg/Kg	0.46	U	1.6	U	1.6	U
Heptachlor	µg/Kg	0.46	U	1.6	U	1.6	U
Heptachlor epoxide (B)	µg/Kg	0.46	U	1.6	U	1.6	U
Methoxychlor	µg/Kg	2.3	U	8.3	U	7.9	U
Toxaphene	µg/Kg	46	U	160	U	160	U
BZ 8	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 18	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 28	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 44	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 49	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 52	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 66	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 87	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 101	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 105	µg/Kg	0.46	U	1.6	U	1.6	U

Wellfleet Harbor ...iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

BZ 118	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 128	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 138	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 153	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 170	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 180	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 183	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 184	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 187	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 195	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 206	µg/Kg	0.46	U	1.6	U	1.6	U
BZ 209	µg/Kg	0.46	U	1.6	U	1.6	U
Aldrin	µg/L						
alpha-BHC	µg/L						
alpha-Chlordane	µg/L						
beta-BHC	µg/L						
delta-BHC	µg/L						
gamma-BHC	µg/L						
gamma-Chlordane	µg/L						
4,4'-DDD	µg/L						
4,4'-DDE	µg/L						
4,4'-DDT	µg/L						
Dieldrin	µg/L						
Endosulfan I	µg/L						
Endosulfan II	µg/L						
Endosulfan sulfate	µg/L						
Endrin	µg/L						
Endrin aldehyde	µg/L						
Heptachlor	µg/L						
Heptachlor epoxide (B)	µg/L						
Methoxychlor	µg/L						
Toxaphene	µg/L						
BZ 8	µg/L						
BZ 18	µg/L						
BZ 28	µg/L						
BZ 44	µg/L						

Wellfleet Harbor ..iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

BZ 49	µg/L						
BZ 52	µg/L						
BZ 66	µg/L						
BZ 87	µg/L						
BZ 101	µg/L						
BZ 105	µg/L						
BZ 118	µg/L						
BZ 128	µg/L						
BZ 138	µg/L						
BZ 153	µg/L						
BZ 170	µg/L						
BZ 180	µg/L						
BZ 183	µg/L						
BZ 184	µg/L						
BZ 187	µg/L						
BZ 195	µg/L						
BZ 206	µg/L						
BZ 209	µg/L						
Aldrin	%						
alpha-BHC	%						
alpha-Chlordane	%						
beta-BHC	%						
delta-BHC	%						
gamma-BHC	%						
gamma-Chlordane	%						
4,4'-DDD	%						
4,4'-DDE	%						
4,4'-DDT	%						
Dieldrin	%						
Endosulfan I	%						
Endosulfan II	%						
Endosulfan sulfate	%						
Endrin	%						
Endrin aldehyde	%						
Heptachlor	%						
Heptachlor epoxide (B)	%						

Wellfleet Harbor Sediment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

Methoxychlor	%						
Toxaphene	%						
BZ 8	%						
BZ 18	%						
BZ 28	%						
BZ 44	%						
BZ 49	%						
BZ 52	%						
BZ 66	%						
BZ 87	%						
BZ 101	%						
BZ 105	%						
BZ 118	%						
BZ 128	%						
BZ 138	%						
BZ 153	%						
BZ 170	%						
BZ 180	%						
BZ 183	%						
BZ 184	%						
BZ 187	%						
BZ 195	%						
BZ 206	%						
BZ 209	%						
Semi-Volatile Organics by GC/MS - SIM							
Naphthalene	µg/Kg	22	U	80	U	86	U
2-Methylnaphthalene	µg/Kg	22	U	80	U	86	U
1-Methylnaphthalene	µg/Kg	22	U	80	U	86	U
Biphenyl	µg/Kg	22	U	80	U	86	U
2,6-Dimethylnaphthalene	µg/Kg	22	U	**420**		**420**	
Acenaphthylene	µg/Kg	**24**		80	U	86	U
Acenaphthene	µg/Kg	22	U	80	U	86	U
Fluorene	µg/Kg	22	U	80	U	86	U
Phenanthrene	µg/Kg	**49**		80	U	86	U
Anthracene	µg/Kg	**28**		80	U	86	U

Wellfleet Harbor ...iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

1-Methylphenanthrene	µg/Kg	22	U	80	U	86	U
Fluoranthene	µg/Kg	**290**		**130**		**130**	
Pyrene	µg/Kg	**330**		**180**		**170**	
Benz[a]anthracene	µg/Kg	**130**		80	U	86	U
Chrysene	µg/Kg	**120**		80	U	86	U
Benzo[b]fluoranthene	µg/Kg	**93**		**84**		**90**	
Benzo[k]fluoranthene	µg/Kg	**110**		80	U	86	U
Benzo[e]pyrene	µg/Kg	**65**		80	U	86	U
Benzo[a]pyrene	µg/Kg	**120**		80	U	86	U
Perylene	µg/Kg	**29**		80	U	86	U
Indeno[1,2,3-cd]pyrene	µg/Kg	**56**		80	U	86	U
Dibenz[a,h]anthracene	µg/Kg	22	U	80	U	86	U
Benzo[g,h,i]perylene	µg/Kg	**52**		80	U	86	U
Naphthalene	ng/L						
2-Methylnaphthalene	ng/L						
1-Methylnaphthalene	ng/L						
Biphenyl	ng/L						
2,6-Dimethylnaphthalene	ng/L						
Acenaphthylene	ng/L						
Acenaphthene	ng/L						
Fluorene	ng/L						
Phenanthrene	ng/L						
Anthracene	ng/L						
1-Methylphenanthrene	ng/L						
Fluoranthene	ng/L						
Pyrene	ng/L						
Benz[a]anthracene	ng/L						
Chrysene	ng/L						
Benzo[b]fluoranthene	ng/L						
Benzo[k]fluoranthene	ng/L						
Benzo[e]pyrene	ng/L						
Benzo[a]pyrene	ng/L						
Perylene	ng/L						
Indeno[1,2,3-cd]pyrene	ng/L						
Dibenz[a,h]anthracene	ng/L						
Benzo[g,h,i]perylene	ng/L						

Wellfleet Harbor __iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

Naphthalene	%						
2-Methylnaphthalene	%						
1-Methylnaphthalene	%						
Biphenyl	%						
2,6-Dimethylnaphthalene	%						
Acenaphthylene	%						
Acenaphthene	%						
Fluorene	%						
Phenanthrene	%						
Anthracene	%						
1-Methylphenanthrene	%						
Fluoranthene	%						
Pyrene	%						
Benz[a]anthracene	%						
Chrysene	%						
Benzo[b]fluoranthene	%						
Benzo[k]fluoranthene	%						
Benzo[e]pyrene	%						
Benzo[a]pyrene	%						
Perylene	%						
Indeno[1,2,3-cd]pyrene	%						
Dibenz[a,h]anthracene	%						
Benzo[g,h,i]perylene	%						
Inorganics							
Total Organic Carbon (Run 1)	%	**0.24**		**6.6**		**6.6**	
Total Organic Carbon (Run 2)	%	**0.18**		**6.6**		**6.3**	
Percent Moisture	%	**19.2**		**77.4**		**77.4**	
Water Content	%	**24**		**340**		**340**	
Metals							
Antimony	mg/Kg	0.13	U	0.41	U	0.49	U
Arsenic	mg/Kg	**1.5**		**24**		**24**	
Cadmium	mg/Kg	**0.12**		**1.6**		**1.6**	
Chromium	mg/Kg	**2.8**		**39**		**37**	
Copper	mg/Kg	**2.0**		**34**		**31**	

Wellfleet Harbor Sediment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

Lead	mg/Kg	**2.6**		**38**		**37**	
Mercury	mg/Kg	0.0077	U	**0.11**		**0.098**	
Nickel	mg/Kg	**1.5**		**20**		**19**	
Zinc	mg/Kg	**8.3**		**110**		**100**	
Antimony	µg/L						
Arsenic	µg/L						
Cadmium	µg/L						
Chromium	µg/L						
Copper	µg/L						
Lead	µg/L						
Mercury	µg/L						
Nickel	µg/L						
Zinc	µg/L						
Antimony	%						
Arsenic	%						
Cadmium	%						
Chromium	%						
Copper	%						
Lead	%						
Mercury	%						
Nickel	%						
Zinc	%						

Wellfleet Harbor ___iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

SAMPLE ID		Sta C , D & E Comp		Sta C , D & E Comp		Sta F & G Comp	
SAMPLING DATE		9/17/03		9/17/03		9/17/03	
LAB SAMPLE ID		0310008-02MS		0310008-02MSD		0310008-03	
	Units		Qual		Qual		Qual
Pesticides and PCB Congeners by GC/ECD							
Aldrin	µg/Kg					1.6	U
alpha-BHC	µg/Kg					1.6	U
alpha-Chlordane	µg/Kg					1.6	U
beta-BHC	µg/Kg					1.6	U
delta-BHC	µg/Kg					1.6	U
gamma-BHC	µg/Kg					1.6	U
gamma-Chlordane	µg/Kg					1.6	U
4,4'-DDD	µg/Kg					1.6	U
4,4'-DDE	µg/Kg					1.6	U
4,4'-DDT	µg/Kg					1.6	U
Dieldrin	µg/Kg					1.6	U
Endosulfan I	µg/Kg					1.6	U
Endosulfan II	µg/Kg					1.6	U
Endosulfan sulfate	µg/Kg					1.6	U
Endrin	µg/Kg					1.6	U
Endrin aldehyde	µg/Kg					1.6	U
Heptachlor	µg/Kg					1.6	U
Heptachlor epoxide (B)	µg/Kg					8.2	U
Methoxychlor	µg/Kg					160	U
Toxaphene	µg/Kg					1.6	U
BZ 8	µg/Kg					1.6	U
BZ 18	µg/Kg					1.6	U
BZ 28	µg/Kg					1.6	U
BZ 44	µg/Kg					1.6	U
BZ 49	µg/Kg					1.6	U
BZ 52	µg/Kg					1.6	U
BZ 66	µg/Kg					1.6	U
BZ 87	µg/Kg					1.6	U
BZ 101	µg/Kg					1.6	U
BZ 105	µg/Kg					1.6	U

Wellfleet Harbor Sediment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

BZ 118	µg/Kg					1.6	U
BZ 128	µg/Kg					1.6	U
BZ 138	µg/Kg					1.6	U
BZ 153	µg/Kg					1.6	U
BZ 170	µg/Kg					1.6	U
BZ 180	µg/Kg					1.6	U
BZ 183	µg/Kg					1.6	U
BZ 184	µg/Kg					1.6	U
BZ 187	µg/Kg					1.6	U
BZ 195	µg/Kg					1.6	U
BZ 206	µg/Kg					1.6	U
BZ 209	µg/Kg					1.6	U
Aldrin	µg/L						
alpha-BHC	µg/L						
alpha-Chlordane	µg/L						
beta-BHC	µg/L						
delta-BHC	µg/L						
gamma-BHC	µg/L						
gamma-Chlordane	µg/L						
4,4'-DDD	µg/L						
4,4'-DDE	µg/L						
4,4'-DDT	µg/L						
Dieldrin	µg/L						
Endosulfan I	µg/L						
Endosulfan II	µg/L						
Endosulfan sulfate	µg/L						
Endrin	µg/L						
Endrin aldehyde	µg/L						
Heptachlor	µg/L						
Heptachlor epoxide (B)	µg/L						
Methoxychlor	µg/L						
Toxaphene	µg/L						
BZ 8	µg/L						
BZ 18	µg/L						
BZ 28	µg/L						
BZ 44	µg/L						

Wellfleet Harbor Sediment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

BZ 49	µg/L						
BZ 52	µg/L						
BZ 66	µg/L						
BZ 87	µg/L						
BZ 101	µg/L						
BZ 105	µg/L						
BZ 118	µg/L						
BZ 128	µg/L						
BZ 138	µg/L						
BZ 153	µg/L						
BZ 170	µg/L						
BZ 180	µg/L						
BZ 183	µg/L						
BZ 184	µg/L						
BZ 187	µg/L						
BZ 195	µg/L						
BZ 206	µg/L						
BZ 209	µg/L						
Aldrin	%	**59**	S	**77**	S		
alpha-BHC	%	**60**	S	**71**	S		
alpha-Chlordane	%	**60**	S	**78**	S		
beta-BHC	%	**66**	S	**81**	S		
delta-BHC	%	**62**	S	**81**	S		
gamma-BHC	%	**66**	S	**78**	S		
gamma-Chlordane	%	**68**	S	**79**	S		
4,4'-DDD	%	**68**	S	**87**	S		
4,4'-DDE	%	**62**	S	**73**	S		
4,4'-DDT	%	**54**	S	**80**	S		
Dieldrin	%	**63**	S	**78**	S		
Endosulfan I	%	**66**	S	**75**	S		
Endosulfan II	%	**60**	S	**76**	S		
Endosulfan sulfate	%	**62**	S	**82**	S		
Endrin	%	**61**	S	**79**	S		
Endrin aldehyde	%	**20**	S[a]	**52**	S		
Heptachlor	%	**57**	S	**66**	S		
Heptachlor epoxide (B)	%	**65**	IS	**99**	S		

Wellfleet Harbor ___ liment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

Methoxychlor	%	**55**	IS	**84**	S		
Toxaphene	%						
BZ 8	%	**50**	S	**64**	S		
BZ 18	%	**66**	S	**78**	S		
BZ 28	%	**78**	S	**84**	S		
BZ 44	%	**64**	S	**77**	S		
BZ 49	%	**63**	S	**80**	S		
BZ 52	%	**96**	S	**84**	S		
BZ 66	%	**70**	S	**75**	S		
BZ 87	%	**72**	S	**85**	S		
BZ 101	%	**58**	S	**65**	S		
BZ 105	%	**67**	S	**83**	S		
BZ 118	%	**71**	S	**79**	S		
BZ 128	%	**65**	S	**94**	S		
BZ 138	%	**65**	S	**86**	S		
BZ 153	%	**69**	S	**83**	S		
BZ 170	%	**67**	S	**83**	S		
BZ 180	%	**71**	S	**89**	S		
BZ 183	%	**68**	S	**81**	S		
BZ 184	%	**69**	S	**78**	S		
BZ 187	%	**90**	S	**82**	S		
BZ 195	%	**63**	S	**84**	S		
BZ 206	%	**63**	S	**84**	S		
BZ 209	%	**61**	S	**84**	S		
Semi-Volatile Organics by GC/MS - SIM							
Naphthalene	µg/Kg					90	U
2-Methylnaphthalene	µg/Kg					90	U
1-Methylnaphthalene	µg/Kg					90	U
Biphenyl	µg/Kg					90	U
2,6-Dimethylnaphthalene	µg/Kg					**380**	
Acenaphthylene	µg/Kg					90	U
Acenaphthene	µg/Kg					90	U
Fluorene	µg/Kg					90	U
Phenanthrene	µg/Kg					90	U
Anthracene	µg/Kg					90	U

Wellfleet Harbor ___iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

1-Methylphenanthrene	µg/Kg					90	U
Fluoranthene	µg/Kg					**160**	
Pyrene	µg/Kg					**210**	
Benz[a]anthracene	µg/Kg					90	U
Chrysene	µg/Kg					90	U
Benzo[b]fluoranthene	µg/Kg					**110**	
Benzo[k]fluoranthene	µg/Kg					90	U
Benzo[e]pyrene	µg/Kg					90	U
Benzo[a]pyrene	µg/Kg					90	U
Perylene	µg/Kg					90	U
Indeno[1,2,3-cd]pyrene	µg/Kg					90	U
Dibenz[a,h]anthracene	µg/Kg					90	U
Benzo[g,h,i]perylene	µg/Kg					90	U
Naphthalene	ng/L						
2-Methylnaphthalene	ng/L						
1-Methylnaphthalene	ng/L						
Biphenyl	ng/L						
2,6-Dimethylnaphthalene	ng/L						
Acenaphthylene	ng/L						
Acenaphthene	ng/L						
Fluorene	ng/L						
Phenanthrene	ng/L						
Anthracene	ng/L						
1-Methylphenanthrene	ng/L						
Fluoranthene	ng/L						
Pyrene	ng/L						
Benz[a]anthracene	ng/L						
Chrysene	ng/L						
Benzo[b]fluoranthene	ng/L						
Benzo[k]fluoranthene	ng/L						
Benzo[e]pyrene	ng/L						
Benzo[a]pyrene	ng/L						
Perylene	ng/L						
Indeno[1,2,3-cd]pyrene	ng/L						
Dibenz[a,h]anthracene	ng/L						
Benzo[g,h,i]perylene	ng/L						

Wellfleet Harbor Sediment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

Naphthalene	%	94	S	93	S		
2-Methylnaphthalene	%	85	S	83	S		
1-Methylnaphthalene	%						
Biphenyl	%						
2,6-Dimethylnaphthalene	%						
Acenaphthylene	%	85	S	84	S		
Acenaphthene	%	91	S	91	S		
Fluorene	%	89	S	88	S		
Phenanthrene	%	85	S	83	S		
Anthracene	%	86	S	84	S		
1-Methylphenanthrene	%						
Fluoranthene	%	76	S	80	S		
Pyrene	%	132	S	131	S		
Benz[a]anthracene	%	91	S	91	S		
Chrysene	%	95	S	92	S		
Benzo[b]fluoranthene	%	89	S	87	S		
Benzo[k]fluoranthene	%	96	S	90	S		
Benzo[e]pyrene	%						
Benzo[a]pyrene	%	93	S	89	S		
Perylene	%						
Indeno[1,2,3-cd]pyrene	%	86	S	82	S		
Dibenz[a,h]anthracene	%	81	S	76	S		
Benzo[g,h,i]perylene	%	76	S	72	S		
Inorganics							
Total Organic Carbon (Run 1)	%	109	S			7.0	
Total Organic Carbon (Run 2)	%	97	S			7.0	
Percent Moisture	%					77.9	
Water Content	%					350	
Metals							
Antimony	mg/Kg					0.52	U
Arsenic	mg/Kg					29	
Cadmium	mg/Kg					1.8	
Chromium	mg/Kg					41	
Copper	mg/Kg					37	

Wellfleet Harbor .iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

Lead	mg/Kg					**40**	
Mercury	mg/Kg					**0.096**	
Nickel	mg/Kg					**21**	
Zinc	mg/Kg					**120**	
Antimony	µg/L						
Arsenic	µg/L						
Cadmium	µg/L						
Chromium	µg/L						
Copper	µg/L						
Lead	µg/L						
Mercury	µg/L						
Nickel	µg/L						
Zinc	µg/L						
Antimony	%	**45**	PN				
Arsenic	%	**95**	P				
Cadmium	%	**105**	P				
Chromium	%	**98**	P				
Copper	%	**95**	P				
Lead	%	**94**	P				
Mercury	%	**72**	PN				
Nickel	%	**93**	P				
Zinc	%	**89**	P				

Wellfleet Harbor iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

SAMPLE ID		SRM 1944		D0345		Rinse Blank PC	
SAMPLING DATE		10/2/03		10/2/03		9/17/03	
LAB SAMPLE ID		0310008-04		0310008-05		0310008-06	
	Units		Qual		Qual		Qual
Pesticides and PCB Congeners by GC/ECD							
Aldrin	µg/Kg	1.2	U				
alpha-BHC	µg/Kg	1.2	U				
alpha-Chlordane	µg/Kg	**13**	I				
beta-BHC	µg/Kg	1.2	U				
delta-BHC	µg/Kg	1.2	U				
gamma-BHC	µg/Kg	1.2	U				
gamma-Chlordane	µg/Kg	1.2	U				
4,4'-DDD	µg/Kg	1.2	U				
4,4'-DDE	µg/Kg	1.2	U				
4,4'-DDT	µg/Kg	**110**					
Dieldrin	µg/Kg	1.2	U				
Endosulfan I	µg/Kg	1.2	U				
Endosulfan II	µg/Kg	1.2	U				
Endosulfan sulfate	µg/Kg	1.2	U				
Endrin	µg/Kg	1.2	U				
Endrin aldehyde	µg/Kg	1.2	U				
Heptachlor	µg/Kg	1.2	U				
Heptachlor epoxide (B)	µg/Kg	1.2	U				
Methoxychlor	µg/Kg	5.9	U				
Toxaphene	µg/Kg	120	U				
BZ 8	µg/Kg	**18**					
BZ 18	µg/Kg	**30**	I				
BZ 28	µg/Kg	**61**					
BZ 44	µg/Kg	**52**	P				
BZ 49	µg/Kg	**37**					
BZ 52	µg/Kg	**48**					
BZ 66	µg/Kg	**46**					
BZ 87	µg/Kg	**38**					
BZ 101	µg/Kg	**43**					
BZ 105	µg/Kg	**16**	I				

Wellfleet Harbor ___iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

BZ 118	µg/Kg	**37**					
BZ 128	µg/Kg	**6.2**					
BZ 138	µg/Kg	**36**					
BZ 153	µg/Kg	**40**					
BZ 170	µg/Kg	**25**	P				
BZ 180	µg/Kg	**39**	P				
BZ 183	µg/Kg	**9.2**					
BZ 184	µg/Kg	1.2	U				
BZ 187	µg/Kg	**14**					
BZ 195	µg/Kg	**3.7**	I				
BZ 206	µg/Kg	**7.9**	P				
BZ 209	µg/Kg	**6.5**	P				
Aldrin	µg/L					0.0010	U
alpha-BHC	µg/L					0.0010	U
alpha-Chlordane	µg/L					0.0010	U
beta-BHC	µg/L					0.0010	U
delta-BHC	µg/L					0.0010	U
gamma-BHC	µg/L					0.0010	U
gamma-Chlordane	µg/L					0.0010	U
4,4'-DDD	µg/L					0.0010	U
4,4'-DDE	µg/L					0.0010	U
4,4'-DDT	µg/L					0.0010	U
Dieldrin	µg/L					0.0010	U
Endosulfan I	µg/L					0.0010	U
Endosulfan II	µg/L					0.0010	U
Endosulfan sulfate	µg/L					0.0010	U
Endrin	µg/L					0.0010	U
Endrin aldehyde	µg/L					0.0010	U
Heptachlor	µg/L					0.0010	U
Heptachlor epoxide (B)	µg/L					0.0010	U
Methoxychlor	µg/L					0.0052	U
Toxaphene	µg/L					0.10	U
BZ 8	µg/L					0.0010	U
BZ 18	µg/L					0.0010	U
BZ 28	µg/L					0.0010	U
BZ 44	µg/L					0.0010	U

Wellfleet Harbor ment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

BZ 49	µg/L					0.0010	U
BZ 52	µg/L					0.0010	U
BZ 66	µg/L					0.0010	U
BZ 87	µg/L					0.0010	U
BZ 101	µg/L					0.0010	U
BZ 105	µg/L					0.0010	U
BZ 118	µg/L					0.0010	U
BZ 128	µg/L					0.0010	U
BZ 138	µg/L					0.0010	U
BZ 153	µg/L					0.0010	U
BZ 170	µg/L					0.0010	U
BZ 180	µg/L					0.0010	U
BZ 183	µg/L					0.0010	U
BZ 184	µg/L					0.0010	U
BZ 187	µg/L					0.0010	U
BZ 195	µg/L					0.0010	U
BZ 206	µg/L					0.0010	U
BZ 209	µg/L					0.0010	U
Aldrin	%						
alpha-BHC	%						
alpha-Chlordane	%	77	I				
beta-BHC	%						
delta-BHC	%						
gamma-BHC	%						
gamma-Chlordane	%						
4,4'-DDD	%						
4,4'-DDE	%						
4,4'-DDT	%	89					
Dieldrin	%						
Endosulfan I	%						
Endosulfan II	%						
Endosulfan sulfate	%						
Endrin	%						
Endrin aldehyde	%						
Heptachlor	%						
Heptachlor epoxide (B)	%						

Wellfleet Harbor ment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

Methoxychlor	%						
Toxaphene	%						
BZ 8	%	**79**					
BZ 18	%	**59**	I				
BZ 28	%	**76**					
BZ 44	%	**86**	P				
BZ 49	%	**69**					
BZ 52	%	**60**					
BZ 66	%	**64**					
BZ 87	%	**128**					
BZ 101	%	**59**					
BZ 105	%	**64**	I				
BZ 118	%	**63**					
BZ 128	%	**73.0**					
BZ 138	%	**58**					
BZ 153	%	**54**					
BZ 170	%	**110**	P				
BZ 180	%	**88**	P				
BZ 183	%	**75.0**					
BZ 184	%						
BZ 187	%	**55**					
BZ 195	%	**99.0**	I				
BZ 206	%	**86.0**	P				
BZ 209	%	**95.0**	P				
Semi-Volatile Organics by GC/MS - SIM							
Naphthalene	µg/Kg						
2-Methylnaphthalene	µg/Kg						
1-Methylnaphthalene	µg/Kg						
Biphenyl	µg/Kg						
2,6-Dimethylnaphthalene	µg/Kg						
Acenaphthylene	µg/Kg						
Acenaphthene	µg/Kg						
Fluorene	µg/Kg						
Phenanthrene	µg/Kg						
Anthracene	µg/Kg						

Wellfleet Harbor .iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

1-Methylphenanthrene	µg/Kg						
Fluoranthene	µg/Kg						
Pyrene	µg/Kg						
Benz[a]anthracene	µg/Kg						
Chrysene	µg/Kg						
Benzo[b]fluoranthene	µg/Kg						
Benzo[k]fluoranthene	µg/Kg						
Benzo[e]pyrene	µg/Kg						
Benzo[a]pyrene	µg/Kg						
Perylene	µg/Kg						
Indeno[1,2,3-cd]pyrene	µg/Kg						
Dibenz[a,h]anthracene	µg/Kg						
Benzo[g,h,i]perylene	µg/Kg						
Naphthalene	ng/L					21	U
2-Methylnaphthalene	ng/L					21	U
1-Methylnaphthalene	ng/L					21	U
Biphenyl	ng/L					21	U
2,6-Dimethylnaphthalene	ng/L					21	U
Acenaphthylene	ng/L					21	U
Acenaphthene	ng/L					21	U
Fluorene	ng/L					21	U
Phenanthrene	ng/L					21	U
Anthracene	ng/L					21	U
1-Methylphenanthrene	ng/L					21	U
Fluoranthene	ng/L					21	U
Pyrene	ng/L					21	U
Benz[a]anthracene	ng/L					21	U
Chrysene	ng/L					21	U
Benzo[b]fluoranthene	ng/L					21	U
Benzo[k]fluoranthene	ng/L					21	U
Benzo[e]pyrene	ng/L					21	U
Benzo[a]pyrene	ng/L					21	U
Perylene	ng/L					21	U
Indeno[1,2,3-cd]pyrene	ng/L					21	U
Dibenz[a,h]anthracene	ng/L					21	U
Benzo[g,h,i]perylene	ng/L					21	U

Wellfleet Harbor ment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

Naphthalene	%	68					
2-Methylnaphthalene	%						
1-Methylnaphthalene	%						
Biphenyl	%						
2,6-Dimethylnaphthalene	%						
Acenaphthylene	%						
Acenaphthene	%						
Fluorene	%						
Phenanthrene	%	89					
Anthracene	%	83					
1-Methylphenanthrene	%						
Fluoranthene	%	98					
Pyrene	%	82					
Benz[a]anthracene	%	76					
Chrysene	%	83					
Benzo[b]fluoranthene	%	117					
Benzo[k]fluoranthene	%	128					
Benzo[e]pyrene	%	83					
Benzo[a]pyrene	%	75					
Perylene	%	64					
Indeno[1,2,3-cd]pyrene	%	58					
Dibenz[a,h]anthracene	%	63					
Benzo[g,h,i]perylene	%	60					
Inorganics							
Total Organic Carbon (Run 1)	%	106					
Total Organic Carbon (Run 2)	%	89					
Percent Moisture	%						
Water Content	%						
Metals							
Antimony	mg/Kg						
Arsenic	mg/Kg						
Cadmium	mg/Kg						
Chromium	mg/Kg						
Copper	mg/Kg						

Wellfleet Harbor [illegible]iment Sampling
Contract No.: DACW33-02-D-0006
Task Order: 0013
Sediment Chemistry Data Summary

Lead	mg/Kg						
Mercury	mg/Kg						
Nickel	mg/Kg						
Zinc	mg/Kg						
Antimony	µg/L					2.5	U
Arsenic	µg/L					0.50	U
Cadmium	µg/L					0.50	U
Chromium	µg/L					2.5	U
Copper	µg/L					2.5	U
Lead	µg/L					0.50	U
Mercury	µg/L					0.20	U
Nickel	µg/L					2.5	U
Zinc	µg/L					25	U
Antimony	%			**93**			
Arsenic	%			**105**			
Cadmium	%			**107**			
Chromium	%			**103**			
Copper	%			**109**			
Lead	%			**97**			
Mercury	%			**101**			
Nickel	%			**112**			
Zinc	%			**102**			