ESI

EnviroSystems, Inc.
One Lafayette Road
P.O. Box 778
Hampton, N.H. 03843-0778
p 603 926 3345 · f 603 926 3521
envirosystems.com

Ron Bourne
Bourne Consulting Engineering
3 Bent Street
Franklin, MA 02038

PO Number: None
Report Number: 25235
Date Received: 11/19/14
Date Reported: 12/19/14

Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA

Attached please find results for analyses performed on samples received on 11/19/14 at 1530. The results for grain size have been provided as an appendix to this report.

Samples were received in acceptable condition and under chain of custody.

Instruments used in analysis were calibrated with the appropriate frequency and to the specifications of the referenced methods.

Analytes in blanks were below levels affecting sample results.

Matrix effects as monitored by matrix spike recovery or unusual physical properties were not apparent.

Accuracy and precision as monitored by laboratory control sample analyses were within acceptance limits.

Accreditations may be viewed at www.envirosystems.com.

The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s), and are intended to be used only by the submittor.

The results for grain size were provided by GeoTesting Express, Inc. of Acton, Massachusetts.

EnviroSystems, Incorporated

Authorized Signature

Date 12/19/14

Attachment
Report

Report No: 25235 SDG:
Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA

Sample ID: Composite A
Matrix: Solid
Sampled: 11/19/14 1445

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	25235-101	19.8	0.1	%	11/20/14 0945	11/20/14 0945	AC /160.3 EPA 600/4/79/020
Organic Carbon Rep 1	25235-101	5.6	0.49	%	11/21/14	12/08/14	MG /SM 5310 C
Organic Carbon Rep 2	25235-101	5.37	0.49	%	11/21/14	12/08/14	MG /SM 5310 C
Arsenic, total	25235-101	16	0.4	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Cadmium, total	25235-101	1.6	0.4	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Chromium, total	25235-101	42	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Copper, total	25235-101	44	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Lead, total	25235-101	47	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Mercury, total	25235-101	0.13	0.02	ug/g dry wt	11/26/14	11/26/14	JLH/EPA 245.7
Nickel, total	25235-101	20	0.8	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Zinc, total	25235-101	120	3	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020

Notes:

Report No: 25235 SDG:
Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA

Sample ID: Composite B
Matrix: Solid
Sampled: 11/19/14 1500

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	25235-102	22.1	0.1	%	11/20/14 0945	11/20/14 0945	AC /160.3 EPA 600/4/79/020
Organic Carbon Rep 1	25235-102	1.68	0.49	%	11/21/14	12/08/14	MG /SM 5310 C
Organic Carbon Rep 2	25235-102	1.75	0.49	%	11/21/14	12/08/14	MG /SM 5310 C
Arsenic, total	25235-102	14	0.4	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Cadmium, total	25235-102	1.5	0.4	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Chromium, total	25235-102	40	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Copper, total	25235-102	38	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Lead, total	25235-102	41	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Mercury, total	25235-102	0.12	0.02	ug/g dry wt	11/26/14	11/26/14	JLH/EPA 245.7
Nickel, total	25235-102	19	0.8	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Zinc, total	25235-102	110	3	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020

Notes:

Report No: 25235 SDG:
Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA

Sample ID: Composite C
Matrix: Solid
Sampled: 11/19/14 1520

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	25235-103	17.8	0.1	%	11/20/14 0945	11/20/14 0945	AC /160.3 EPA 600/4/79/020
Organic Carbon Rep 1	25235-103	8.37	0.49	%	11/21/14	12/08/14	MG /SM 5310 C
Organic Carbon Rep 2	25235-103	8.67	0.49	%	11/21/14	12/08/14	MG /SM 5310 C
Arsenic, total	25235-103	18	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Cadmium, total	25235-103	1.5	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Chromium, total	25235-103	41	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Copper, total	25235-103	39	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Lead, total	25235-103	38	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Mercury, total	25235-103	0.11	0.02	ug/g dry wt	11/26/14	11/26/14	JLH/EPA 245.7
Nickel, total	25235-103	20	0.9	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Zinc, total	25235-103	120	4	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020

Notes:

Report No: 25235 SDG:
Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA

Sample ID: Composite D
Matrix: Solid
Sampled: 11/19/14 1530

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	25235-104	32.2	0.1	%	11/20/14 0945	11/20/14 0945	AC /160.3 EPA 600/4/79/020
Organic Carbon Rep 1	25235-104	3.92	0.5	%	11/21/14	12/08/14	MG /SM 5310 C
Organic Carbon Rep 2	25235-104	4.05	0.5	%	11/21/14	12/08/14	MG /SM 5310 C
Arsenic, total	25235-104	16	0.4	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Cadmium, total	25235-104	1.5	0.3	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Chromium, total	25235-104	40	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Copper, total	25235-104	29	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Lead, total	25235-104	46	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Mercury, total	25235-104	0.13	0.02	ug/g dry wt	11/26/14	11/26/14	JLH/EPA 245.7
Nickel, total	25235-104	19	0.5	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020
Zinc, total	25235-104	97	2	ug/g dry wt	11/24/14	11/26/14	JLH/SW846 3rd Ed. 6020

Notes:

Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	25235-101
Sample Designation:	Composite A
Date Sampled:	11/19/14 1445
Date Extracted:	11/20/14 1310
Date Analyzed:	11/25/14
Matrix:	Solid
Moisture (%):	80
Sample Amount (g):	20.00
Final Volume (mL)	1.00
Dilution Factor:	1

Compound	Concentration (ug/Kg)	Qualifier
naphthalene	51	U
acenaphthylene	51	U
acenaphthene	51	U
fluorene	51	U
phenanthrene	110	
anthracene	51	U
fluoranthene	150	
pyrene	160	
benzo[a]anthracene	56	
chrysene	79	
benzo[b]fluoranthene	69	
benzo[k]fluoranthene	61	
benzo[a]pyrene	60	
indeno[1,2,3-cd]pyrene	53	
dibenz[a,h]anthracene	51	U
benzo[g,h,i]perylene	52	

Surrogate Standards	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	54	30 - 150
o-terphenyl	124	30 - 150

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Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	25235-102
Sample Designation:	Composite B
Date Sampled:	11/19/14 1500
Date Extracted:	11/20/14 1310
Date Analyzed:	11/26/14
Matrix:	Solid
Moisture (%):	78
Sample Amount (g):	20.00
Final Volume (mL)	1.00
Dilution Factor:	1

Compound	Concentration (ug/Kg)	Qualifier
naphthalene	45	U
acenaphthylene	45	U
acenaphthene	45	U
fluorene	45	U
phenanthrene	28	J
anthracene	45	U
fluoranthene	37	J
pyrene	45	U
benzo[a]anthracene	45	U
chrysene	45	U
benzo[b]fluoranthene	45	U
benzo[k]fluoranthene	45	U
benzo[a]pyrene	45	U
indeno[1,2,3-cd]pyrene	45	U
dibenz[a,h]anthracene	45	U
benzo[g,h,i]perylene	45	U

Surrogate Standards	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	52	30 - 150
o-terphenyl	89	30 - 150

J = Estimated value less than RL
U = Not detected at the reporting limit.

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Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	25235-103
Sample Designation:	Composite C
Date Sampled:	11/19/14 1520
Date Extracted:	11/20/14 1310
Date Analyzed:	11/26/14
Matrix:	Solid
Moisture (%):	82
Sample Amount (g):	20.00
Final Volume (mL)	1.00
Dilution Factor:	1

Compound	Concentration (ug/Kg)	Qualifier
naphthalene	56	U
acenaphthylene	56	U
acenaphthene	56	U
fluorene	56	U
phenanthrene	87	
anthracene	56	U
fluoranthene	120	
pyrene	56	U
benzo[a]anthracene	56	U
chrysene	56	U
benzo[b]fluoranthene	56	U
benzo[k]fluoranthene	56	U
benzo[a]pyrene	56	U
indeno[1,2,3-cd]pyrene	56	U
dibenz[a,h]anthracene	56	U
benzo[g,h,i]perylene	56	U

Surrogate Standards	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	66	30 - 150
o-terphenyl	120	30 - 150

U = Not detected at the reporting limit.

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Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	25235-104
Sample Designation:	Composite D
Date Sampled:	11/19/14 1530
Date Extracted:	11/20/14 1310
Date Analyzed:	11/26/14
Matrix:	Solid
Moisture (%):	68
Sample Amount (g):	20.00
Final Volume (mL)	1.00
Dilution Factor:	1

Compound	Concentration (ug/Kg)	Qualifier
naphthalene	31	U
acenaphthylene	31	U
acenaphthene	31	U
fluorene	31	U
phenanthrene	29	J
anthracene	31	U
fluoranthene	41	
pyrene	31	U
benzo[a]anthracene	31	U
chrysene	20	J
benzo[b]fluoranthene	31	U
benzo[k]fluoranthene	31	U
benzo[a]pyrene	31	U
indeno[1,2,3-cd]pyrene	31	U
dibenz[a,h]anthracene	31	U
benzo[g,h,i]perylene	31	U

Surrogate Standards	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	39	30 - 150
o-terphenyl	67	30 - 150

U = Not detected at the reporting limit.
J = Estimated value less than RL

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PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	25235-101
Sample Designation:	Composite A
Date Sampled:	11/19/14 1445
Date Extracted:	11/20/14 1310
Date Analyzed:	11/25/14
Matrix:	Solid
Moisture (%):	80
Sample Amount (g):	20
Final Volume (mL)	1.0
Dilution Factor:	1

Congener Number	PCB Congener	Concentration (ug/Kg)	Qualifier
8	2,4'-dichlorobiphenyl	0.25	U
18	2,2',5-trichlorobiphenyl	0.91	
28	2,4,4'-trichlorobiphenyl	0.25	U
44	2,2',3,5'-tetrachlorobiphenyl	0.25	U
49	2,2',4,5'-tetrachlorobiphenyl	0.29	
52	2,2',5,5'-tetrachlorobiphenyl	0.72	
66	2,3',4,4'-tetrachlorobiphenyl	0.33	
77	3,3',4,4'-tetrachlorobiphenyl	0.25	U
87	2,2',3,4,5'-pentachlorobiphenyl	0.28	
101	2,2',4,5,5'-pentachlorobiphenyl	0.65	
105	2,3,3',4,4'-pentachlorobiphenyl	0.35	
118	2,3',4,4',5-pentachlorobiphenyl	0.57	
126	3,3',4,4',5-pentachlorobiphenyl	0.25	U
128	2,2',3,3',4,4'-hexachlorobiphenyl	0.46	
138	2,2',3,4,4',5'-hexachlorobiphenyl	1.10	
153	2,2',4,4',5,5'-hexachlorobiphenyl	0.77	
156	2,3,3',4,4',5-hexachlorobiphenyl		
169	3,3',4,4',5,5'-hexachlorobiphenyl		
170	2,2',3,3',4,4',5-heptachlorobiphenyl	0.25	U
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	0.41	
183	2,2',3,4,4',5',6-heptachlorobiphenyl	0.25	U
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	0.25	U
187	2,2',3,4',5,5',6-heptachlorobiphenyl	0.34	
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	0.25	U
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	0.25	U
209	2,2',3,3',4,4',5,5',6,6'-decachlorobiphenyl	0.25	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
PCB 198	113	30 - 150

U = Not detected at value reported

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PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	25235-102
Sample Designation:	Composite B
Date Sampled:	11/19/14 1500
Date Extracted:	11/20/14 1310
Date Analyzed:	11/25/14
Matrix:	Solid
Moisture (%):	78
Sample Amount (g):	20
Final Volume (mL)	1.0
Dilution Factor:	1

Congener Number	PCB Congener	Concentration (ug/Kg)	Qualifier
8	2,4'-dichlorobiphenyl	0.23	U
18	2,2',5-trichlorobiphenyl	0.23	U
28	2,4,4'-trichlorobiphenyl	0.23	U
44	2,2',3,5'-tetrachlorobiphenyl	0.23	U
49	2,2',4,5'-tetrachlorobiphenyl	0.23	U
52	2,2',5,5'-tetrachlorobiphenyl	0.36	
66	2,3',4,4'-tetrachlorobiphenyl	0.38	
77	3,3',4,4'-tetrachlorobiphenyl	0.23	U
87	2,2',3,4,5'-pentachlorobiphenyl	0.23	U
101	2,2',4,5,5'-pentachlorobiphenyl	0.31	
105	2,3,3',4,4'-pentachlorobiphenyl	0.23	U
118	2,3',4,4',5-pentachlorobiphenyl	0.44	
126	3,3',4,4',5-pentachlorobiphenyl	0.23	U
128	2,2',3,3',4,4'-hexachlorobiphenyl	0.23	U
138	2,2',3,4,4',5'-hexachlorobiphenyl	0.86	
153	2,2',4,4',5,5'-hexachlorobiphenyl	0.60	
156	2,3,3',4,4',5-hexachlorobiphenyl		
169	3,3',4,4',5,5'-hexachlorobiphenyl		
170	2,2',3,3',4,4',5-heptachlorobiphenyl	0.23	U
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	0.23	U
183	2,2',3,4,4',5',6-heptachlorobiphenyl	0.23	U
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	0.23	U
187	2,2',3,4',5,5',6-heptachlorobiphenyl	0.23	U
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	0.23	U
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	0.23	U
209	2,2',3,3',4,4',5,5',6,6'-decachlorobiphenyl	0.23	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
PCB 198	110	30 - 150

U = Not detected at value reported

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PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	25235-103
Sample Designation:	Composite C
Date Sampled:	11/19/14 1520
Date Extracted:	11/20/14 1310
Date Analyzed:	11/25/14
Matrix:	Solid
Moisture (%):	82
Sample Amount (g):	20
Final Volume (mL)	1.0
Dilution Factor:	1

Congener Number	PCB Congener	Concentration (ug/Kg)	Qualifier
8	2,4'-dichlorobiphenyl	0.28	U
18	2,2',5-trichlorobiphenyl	0.28	U
28	2,4,4'-trichlorobiphenyl	0.28	U
44	2,2',3,5'-tetrachlorobiphenyl	0.28	U
49	2,2',4,5'-tetrachlorobiphenyl	0.28	U
52	2,2',5,5'-tetrachlorobiphenyl	0.45	
66	2,3',4,4'-tetrachlorobiphenyl	0.28	U
77	3,3',4,4'-tetrachlorobiphenyl	0.28	U
87	2,2',3,4,5'-pentachlorobiphenyl	0.28	U
101	2,2',4,5,5'-pentachlorobiphenyl	0.39	
105	2,3,3',4,4'-pentachlorobiphenyl	0.28	U
118	2,3',4,4',5-pentachlorobiphenyl	0.49	
126	3,3',4,4',5-pentachlorobiphenyl	0.28	U
128	2,2',3,3',4,4'-hexachlorobiphenyl	0.28	U
138	2,2',3,4,4',5'-hexachlorobiphenyl	0.99	
153	2,2',4,4',5,5'-hexachlorobiphenyl	0.51	
156	2,3,3',4,4',5-hexachlorobiphenyl		
169	3,3',4,4',5,5'-hexachlorobiphenyl		
170	2,2',3,3',4,4',5-heptachlorobiphenyl	0.28	U
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	0.28	U
183	2,2',3,4,4',5',6-heptachlorobiphenyl	0.28	U
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	0.28	U
187	2,2',3,4',5,5',6-heptachlorobiphenyl	0.28	U
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	0.28	U
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	0.28	U
209	2,2',3,3',4,4',5,5',6,6'-decachlorobiphenyl	0.28	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
PCB 198	105	30 - 150

U = Not detected at value reported

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PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	25235-104
Sample Designation:	Composite D
Date Sampled:	11/19/14 1530
Date Extracted:	11/20/14 1310
Date Analyzed:	11/26/14
Matrix:	Solid
Moisture (%):	68
Sample Amount (g):	20
Final Volume (mL)	1.0
Dilution Factor:	1

Congener Number	PCB Congener	Concentration (ug/Kg)	Qualifier
8	2,4'-dichlorobiphenyl	0.16	U
18	2,2',5-trichlorobiphenyl	0.16	U
28	2,4,4'-trichlorobiphenyl	0.16	U
44	2,2',3,5'-tetrachlorobiphenyl	0.33	
49	2,2',4,5'-tetrachlorobiphenyl	0.47	
52	2,2',5,5'-tetrachlorobiphenyl	0.97	
66	2,3',4,4'-tetrachlorobiphenyl	0.49	
77	3,3',4,4'-tetrachlorobiphenyl	0.16	U
87	2,2',3,4,5'-pentachlorobiphenyl	0.37	
101	2,2',4,5,5'-pentachlorobiphenyl	0.75	
105	2,3,3',4,4'-pentachlorobiphenyl	0.33	
118	2,3',4,4',5-pentachlorobiphenyl	0.63	
126	3,3',4,4',5-pentachlorobiphenyl	0.16	U
128	2,2',3,3',4,4'-hexachlorobiphenyl	0.37	
138	2,2',3,4,4',5'-hexachlorobiphenyl	1.50	
153	2,2',4,4',5,5'-hexachlorobiphenyl	0.91	
156	2,3,3',4,4',5-hexachlorobiphenyl		
169	3,3',4,4',5,5'-hexachlorobiphenyl		
170	2,2',3,3',4,4',5-heptachlorobiphenyl	0.18	
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	0.29	
183	2,2',3,4,4',5',6-heptachlorobiphenyl	0.16	U
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	0.16	U
187	2,2',3,4',5,5',6-heptachlorobiphenyl	0.38	
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	0.16	U
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	0.16	U
209	2,2',3,3',4,4',5,5',6,6'-decachlorobiphenyl	0.16	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
PCB 198	107	30 - 150

U = Not detected at value reported

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Pesticides in Sediment
SW 846 8081B

Lab Number:	25235-101
Sample Designation:	Composite A
Date Sampled:	11/19/14 1445
Date Extracted:	12/11/14 0900
Date Analyzed:	12/13/14
Matrix:	Solid
Moisture (%):	80
Sample Amount (g):	20
Final Volume (mL)	1.0
Dilution Factor:	1

Analyte	Concentration (ug/Kg)	Qualifier
aldrin	0.5	U
gamma-chlordane (cis)	0.5	U
alpha-chlordane (trans)	0.5	U
cis-nonachlor	0.5	U
trans-nonachlor	0.5	U
oxychlordane	0.5	U
4,4'-DDT	1	U
4,4'-DDE	1	U
4,4'-DDD	1	U
alpha-BHC	0.5	U
dieldrin	1	U
endosulfan I	0.5	U
endosulfan II	1	U
endrin	1	U
heptachlor	0.5	U
heptachlor epoxide	0.5	U
hexachlorobenzene	0.5	U
gamma-BHC (lindane)	0.5	U
methoxychlor	5	U
toxaphene	30	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	74	30 - 150
decachlorobiphenyl	83	30 - 150

U = Not detected at indicated level.

Pesticides in Sediment
SW 846 8081B

Lab Number:	25235-102
Sample Designation:	Composite B
Date Sampled:	11/19/14 1500
Date Extracted:	12/11/14 0900
Date Analyzed:	12/13/14
Matrix:	Solid
Moisture (%):	78
Sample Amount (g):	20
Final Volume (mL)	1.0
Dilution Factor:	1

Analyte	Concentration (ug/Kg)	Qualifier
aldrin	0.5	U
gamma-chlordane (cis)	0.5	U
alpha-chlordane (trans)	0.5	U
cis-nonachlor	0.5	U
trans-nonachlor	0.5	U
oxychlordane	0.5	U
4,4'-DDT	0.9	U
4,4'-DDE	0.9	U
4,4'-DDD	0.9	U
alpha-BHC	0.5	U
dieldrin	0.9	U
endosulfan I	0.5	U
endosulfan II	0.9	U
endrin	0.9	U
heptachlor	0.5	U
heptachlor epoxide	0.5	U
hexachlorobenzene	0.5	U
gamma-BHC (lindane)	0.5	U
methoxychlor	5	U
toxaphene	20	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	75	30 - 150
decachlorobiphenyl	81	30 - 150

U = Not detected at indicated level.

Pesticides in Sediment
SW 846 8081B

Lab Number:	25235-103
Sample Designation:	Composite C
Date Sampled:	11/19/14 1520
Date Extracted:	12/11/14 0900
Date Analyzed:	12/13/14
Matrix:	Solid
Moisture (%):	82
Sample Amount (g):	20
Final Volume (mL)	1.0
Dilution Factor:	1

Analyte	Concentration (ug/Kg)	Qualifier
aldrin	0.6	U
gamma-chlordane (cis)	0.6	U
alpha-chlordane (trans)	0.6	U
cis-nonachlor	0.6	U
trans-nonachlor	0.6	U
oxychlordane	0.6	U
4,4'-DDT	1	U
4,4'-DDE	1	U
4,4'-DDD	1	U
alpha-BHC	0.6	U
dieldrin	1	U
endosulfan I	0.6	U
endosulfan II	1	U
endrin	1	U
heptachlor	0.6	U
heptachlor epoxide	0.6	U
hexachlorobenzene	0.6	U
gamma-BHC (lindane)	0.6	U
methoxychlor	6	U
toxaphene	30	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	76	30 - 150
decachlorobiphenyl	87	30 - 150

U = Not detected at indicated level.

Pesticides in Sediment
SW 846 8081B

Lab Number:	25235-104
Sample Designation:	Composite D
Date Sampled:	11/19/14 1530
Date Extracted:	12/11/14 0900
Date Analyzed:	12/13/14
Matrix:	Solid
Moisture (%):	68
Sample Amount (g):	20
Final Volume (mL)	1.0
Dilution Factor:	1

Analyte	Concentration (ug/Kg)	Qualifier
aldrin	0.3	U
gamma-chlordane (cis)	0.3	U
alpha-chlordane (trans)	0.3	U
cis-nonachlor	0.3	U
trans-nonachlor	0.3	U
oxychlordane	0.3	U
4,4'-DDT	0.6	U
4,4'-DDE	0.6	U
4,4'-DDD	0.6	U
alpha-BHC	0.3	U
dieldrin	0.6	U
endosulfan I	0.3	U
endosulfan II	0.6	U
endrin	0.6	U
heptachlor	0.3	U
heptachlor epoxide	0.3	U
hexachlorobenzene	0.3	U
gamma-BHC (lindane)	0.3	U
methoxychlor	3	U
toxaphene	20	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	73	30 - 150
decachlorobiphenyl	92	30 - 150

U = Not detected at indicated level.

Quality Control Summary

Parameter: Arsenic, total
Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA
Matrix: Solid
QC Batch No: 360S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
25235-101	Composite A		
25235-102	Composite B		
25235-103	Composite C		
25235-104	Composite D		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB360S	0.03	0.03	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	70-130	12.8	12.5	102	12.6	12.5	101	Pass
SRM	70-130	16.6	18.9	88				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
25235-101	30	16.3		16.1		1		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
25235-101S	70-130	53.0	42.2	16.1		87		Pass
25235-101SD	70-130	52.4	41.9	16.1		87		Pass

Quality Control Summary

Parameter: Cadmium, total
Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA
Matrix: Solid
QC Batch No: 360S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
25235-101	Composite A		
25235-102	Composite B		
25235-103	Composite C		
25235-104	Composite D		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB360S	0.03	0.03	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	70-130	6.45	6.25	103	6.52	6.25	104	Pass
SRM	70-130	8.38	8.8	95				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
25235-101	30	1.64		1.64		0		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
25235-101S	70-130	22.3	21.1	1.64		98		Pass
25235-101SD	70-130	22.2	21.0	1.64		98		Pass

Quality Control Summary

Parameter: Chromium, total
Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA
Matrix: Solid
QC Batch No: 360S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
25235-101	Composite A		
25235-102	Composite B		
25235-103	Composite C		
25235-104	Composite D		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB360S	0.02	0.02	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	70-130	10.3	10.0	103	10.1	10.0	101	Pass
SRM	70-130	179	266	67				Low

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
25235-101	30	40.5		41.6		3		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
25235-101S	70-130	73.4	33.8	41.6		94		Pass
25235-101SD	70-130	72.8	33.5	41.6		93		Pass

Quality Control Summary

Parameter: Copper, total
Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA
Matrix: Solid
QC Batch No: 360S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
25235-101	Composite A		
25235-102	Composite B		
25235-103	Composite C		
25235-104	Composite D		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB360S	0.03	0.03	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	70-130	12.6	12.5	101	13.0	12.5	104	Pass
SRM	70-130	308	380	81				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
25235-101	30	43.8		44.4		1		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
25235-101S	70-130	82.9	42.2	44.4		91		Pass
25235-101SD	70-130	81.6	41.9	44.4		89		Pass

Quality Control Summary

Parameter: Lead, total
Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA
Matrix: Solid
QC Batch No: 360S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
25235-101	Composite A		
25235-102	Composite B		
25235-103	Composite C		
25235-104	Composite D		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB360S	0.03	0.03	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	70-130	12.9	12.5	103	13.0	12.5	104	Pass
SRM	70-130	296	330	90				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
25235-101	30	46.2		47.2		2		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
25235-101S	70-130	92.3	42.2	47.2		107		Pass
25235-101SD	70-130	91.8	41.9	47.2		106		Pass

Quality Control Summary

Parameter: Mercury, total
Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA
Matrix: Solid
QC Batch No: 038S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
25235-101	Composite A		
25235-102	Composite B		
25235-103	Composite C		
25235-104	Composite D		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB038S	0.01	0.01	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	70-130	0.023	0.025	92	0.022	0.025	88	Pass
SRM	70-130	3.66	3.4	108				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
25235-101	30	0.135		0.134		1		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
25235-101S	70-130	0.229	0.084	0.134		113		Pass
25235-101SD	70-130	0.224	0.084	0.134		107		Pass

Quality Control Summary

Parameter: Nickel, total
Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA
Matrix: Solid
QC Batch No: 360S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
25235-101	Composite A		
25235-102	Composite B		
25235-103	Composite C		
25235-104	Composite D		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB360S	0.05	0.05	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	70-130	25.6	25.0	102	25.5	25.0	102	Pass
SRM	70-130	57.5	76.1	76				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
25235-101	30	19.8		20.3		2		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
25235-101S	70-130	97.6	84.4	20.3		92		Pass
25235-101SD	70-130	95.5	83.8	20.3		90		Pass

Quality Control Summary

Parameter: Zinc, total
Project: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA
Matrix: Solid
QC Batch No: 360S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
25235-101	Composite A		
25235-102	Composite B		
25235-103	Composite C		
25235-104	Composite D		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB360S	0.2	0.2	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	70-130	26.2	25.0	105	26.3	25.0	105	Pass
SRM	70-130	540	656	82				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
25235-101	30	116		116		0		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
25235-101S	70-130	197	84.4	116		96		Pass
25235-101SD	70-130	195	83.8	116		94		Pass

Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	PB816S
Sample Designation:	Laboratory Blank
Date Sampled:	11/20/14 1310
Date Extracted:	11/20/14 1310
Date Analyzed:	11/24/14
Matrix:	Solid
Sample Amount (g):	20.00
Final Volume (mL)	1.00
Dilution Factor:	1

Compound	Concentration (ug/Kg)	Qualifier
naphthalene	10	U
acenaphthylene	10	U
acenaphthene	10	U
fluorene	10	U
phenanthrene	10	U
anthracene	10	U
fluoranthene	10	U
pyrene	10	U
benzo[a]anthracene	10	U
chrysene	10	U
benzo[b]fluoranthene	10	U
benzo[k]fluoranthene	10	U
benzo[a]pyrene	10	U
indeno[1,2,3-cd]pyrene	10	U
dibenz[a,h]anthracene	10	U
benzo[g,h,i]perylene	10	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	44	30 - 150
o-terphenyl	48	30 - 150

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Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	LCS816S / LCSD816S
Sample Designation:	Laboratory Control Sample Duplicate
Date Sampled:	11/20/14 1310
Date Extracted:	11/20/14 1310
Date Analyzed:	11/24/14
Matrix:	Solid
Sample Amount (g):	20.00
Final Volume (mL)	1.00
Dilution Factor:	1

Compound	True Value (ug/Kg)	LCS Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	LCSD Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	Relative Difference (%)	RPD Limit (%)
naphthalene	50	25	50	30 - 150	30	60	30 - 150	20	30
acenaphthylene	50	25	49	30 - 150	31	62	30 - 150	23	30
acenaphthene	50	27	54	30 - 150	32	63	30 - 150	17	30
fluorene	50	28	56	30 - 150	34	68	30 - 150	20	30
phenanthrene	50	33	66	30 - 150	38	75	30 - 150	13	30
anthracene	50	28	56	30 - 150	35	70	30 - 150	21	30
fluoranthene	50	33	66	30 - 150	37	75	30 - 150	12	30
pyrene	50	32	64	30 - 150	37	74	30 - 150	14	30
benzo[a]anthracene	50	27	53	30 - 150	32	64	30 - 150	19	30
chrysene	50	35	69	30 - 150	40	79	30 - 150	13	30
benzo[b]fluoranthene	50	24	48	30 - 150	31	61	30 - 150	24	30
benzo[k]fluoranthene	50	36	72	30 - 150	41	82	30 - 150	13	30
benzo[a]pyrene	50	33	65	30 - 150	37	75	30 - 150	13	30
indeno[1,2,3-cd]pyrene	50	31	62	30 - 150	36	73	30 - 150	16	30
dibenz[a,h]anthracene	50	31	61	30 - 150	37	73	30 - 150	18	30
benzo[g,h,i]perylene	50	32	64	30 - 150	38	76	30 - 150	17	30

Surrogate Standards	Recovery (%)	Advisory Limits (%)	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	39	30 - 150	48	30 - 150
o-terphenyl	44	30 - 150	47	30 - 150

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Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	25235-101D
Sample Designation:	Composite A (Laboratory Duplicate)
Date Sampled:	11/19/14
Date Extracted:	11/20/14 1310
Date Analyzed:	11/25/14
Matrix:	Solid
Sample Amount (g):	20
Final Volume (mL)	1.00
Dilution Factor:	1

Compound	Duplicate Concentration (ug/Kg)	Duplicate Qualifier	Sample Concentration (ug/Kg)	Sample Qualifier	Relative Difference (%)	Limit (%)	Qualifier
naphthalene	25	U	51	U	NC	30	
acenaphthylene	25	U	51	U	NC	30	
acenaphthene	25	U	51	U	NC	30	
fluorene	25	U	51	U	NC	30	
phenanthrene	160		110		NC	30	
anthracene	25	U	51	U	NC	30	
fluoranthene	240		150		NC	30	
pyrene	240		160		NC	30	
benzo[a]anthracene	77		56		NC	30	
chrysene	120		79		NC	30	
benzo[b]fluoranthene	110		69		NC	30	
benzo[k]fluoranthene	68		61		NC	30	
benzo[a]pyrene			60		NC	30	
indeno[1,2,3-cd]pyrene	78		53		NC	30	
dibenz[a,h]anthracene	25	U	51	U	NC	30	
benzo[g,h,i]perylene	78		52		NC	30	

Surrogate Standard	Recovery (%)	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	73	43	30 - 150
o-terphenyl	137	98	30 - 150

U = Not detected.
NC = Not calculated due to one or both values less than five times the reporting limit.

Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	25235-101MSD
Sample Designation:	Composite A (Matrix Spike Duplicate)
Date Sampled:	11/20/14 1310
Date Extracted:	11/20/14 1310
Date Analyzed:	11/24/14
Matrix:	Solid
Sample Amount (g):	20.00
Final Volume (mL)	1
Dilution Factor:	1

Compound	Sample Result (ug/Kg)	Amount Added (ug/Kg)	MS Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	MSD Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	Relative Difference (%)	RPD Limit (%)
naphthalene	U	253	183	70	30 - 150	140	54	30 - 150	25	30
acenaphthylene	U	253	222	86	30 - 150	190	75	30 - 150	13	30
acenaphthene	U	253	226	86	30 - 150	200	74	30 - 150	14	30
fluorene	U	253	263	97	30 - 150	220	80	30 - 150	18	30
phenanthrene	110	253	360	99	30 - 150	320	84	30 - 150	12	30
anthracene	U	253	276	102	30 - 150	230	85	30 - 150	18	30
fluoranthene	150	253	456	123	30 - 150	400	100	30 - 150	13	30
pyrene	160	253	535	150	30 - 150	480	128	30 - 150	11	30
benzo[a]anthracene	56	253	338	111	30 - 150	310	100	30 - 150	9	30
chrysene	79	253	402	127	30 - 150	350	108	30 - 150	13	30
benzo[b]fluoranthene	69	253	353	112	30 - 150	280	84	30 - 150	23	30
benzo[k]fluoranthene	61	253	332	107	30 - 150	310	97	30 - 150	8	30
benzo[a]pyrene	60	253	344	112	30 - 150	300	95	30 - 150	13	30
indeno[1,2,3-cd]pyrene	53	253	319	105	30 - 150	280	90	30 - 150	13	30
dibenz[a,h]anthracene	U	253	281	107	30 - 150	250	94	30 - 150	12	30
benzo[g,h,i]perylene	52	253	346	116	30 - 150	300	96	30 - 150	15	30

Surrogate Standard	Recovery (%)	Advisory Limits (%)	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	61	30 - 150	51	30 - 150
o-terphenyl	107	30 - 150	92	30 - 150

ND = Not detected
NA = Not added or evaluated
J6 = MS or MSD %R above limit.

PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	PB816S
Sample Designation:	Laboratory Blank PB816S
Date Sampled:	11/20/14 1310
Date Extracted:	11/20/14 1310
Date Analyzed:	11/25/14
Matrix:	Solid
Sample Amount (g):	20
Final Volume (mL)	1.00
Dilution Factor:	1

Congener Number	PCB Congener	Concentration (ug/Kg)	Qualifier
8	2,4'-dichlorobiphenyl	0.1	U
18	2,2',5-trichlorobiphenyl	0.1	U
28	2,4,4'-trichlorobiphenyl	0.1	U
44	2,2',3,5'-tetrachlorobiphenyl	0.1	U
49	2,2',4,5'-tetrachlorobiphenyl	0.1	U
52	2,2',5,5'-tetrachlorobiphenyl	0.1	U
66	2,3',4,4'-tetrachlorobiphenyl	0.1	U
77	3,3',4,4'-tetrachlorobiphenyl	0.1	U
87	2,2',3,4,5'-pentachlorobiphenyl	0.1	U
101	2,2',4,5,5'-pentachlorobiphenyl	0.1	U
105	2,3,3',4,4'-pentachlorobiphenyl	0.1	U
118	2,3',4,4',5-pentachlorobiphenyl	0.1	U
126	3,3',4,4',5-pentachlorobiphenyl	0.1	U
128	2,2',3,3',4,4'-hexachlorobiphenyl	0.1	U
138	2,2',3,4,4',5'-hexachlorobiphenyl	0.1	U
153	2,2',4,4',5,5'-hexachlorobiphenyl	0.1	U
156	2,3,3',4,4',5-hexachlorobiphenyl		
169	3,3',4,4',5,5'-hexachlorobiphenyl		
170	2,2',3,3',4,4',5-heptachlorobiphenyl	0.1	U
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	0.1	U
183	2,2',3,4,4',5',6-heptachlorobiphenyl	0.1	U
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	0.1	U
187	2,2',3,4',5,5',6-heptachlorobiphenyl	0.1	U
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	0.1	U
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	0.1	U
209	2,2',3,3',4,4',5,5',6,6'-decachlorobiphenyl	0.1	U

Surrogate Standards	Recovery (%)	Advisory Limits (%)
PCB 198	137	30 - 150

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PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	LCS816S / LCSD816S
Sample Designation:	Laboratory Control Sample Duplicate
Date Sampled:	11/20/14 1310
Date Extracted:	11/20/14 1310
Date Analyzed:	11/25/14
Matrix:	Solid
Sample Amount (g):	20
Final Volume (mL)	1.00
Dilution Factor:	1

Congener Number	PCB Congener	LCS Concentratio (ug/Kg)	Recovery (%)	Recovery Limit (%)	LCSD Concentration (ug/Kg)	Recovery (%)	Recovery Limit (%)	Relative Difference (%)	RPD Limit (%)
8	2,4'-dichlorobiphenyl	9.8	98	30 - 150	9.8	98	30 - 150	0	30
18	2,2',5-trichlorobiphenyl	9.55	96	30 - 150	10	101	30 - 150	5	30
28	2,4,4'-trichlorobiphenyl	10.3	103	30 - 150	11	113	30 - 150	9	30
44	2,2',3,5'-tetrachlorobiphenyl	9.79	98	30 - 150	11	108	30 - 150	10	30
49	2,2',4,5'-tetrachlorobiphenyl	9.64	96	30 - 150	11	107	30 - 150	10	30
52	2,2',5,5'-tetrachlorobiphenyl	10.3	103	30 - 150	11	113	30 - 150	10	30
66	2,3',4,4'-tetrachlorobiphenyl	10.8	108	30 - 150	11	112	30 - 150	4	30
77	3,3',4,4'-tetrachlorobiphenyl	11.7	117	30 - 150	13	132	30 - 150	12	30
87	2,2',3,4,5'-pentachlorobiphenyl	11.1	111	30 - 150	11	112	30 - 150	1	30
101	2,2',4,5,5'-pentachlorobiphenyl	10.7	107	30 - 150	11	115	30 - 150	7	30
105	2,3,3',4,4'-pentachlorobiphenyl	11.5	115	30 - 150	13	132	30 - 150	14	30
118	2,3',4,4',5-pentachlorobiphenyl	11.3	113	30 - 150	13	127	30 - 150	11	30
126	3,3',4,4',5-pentachlorobiphenyl	11.9	119	30 - 150	12	119	30 - 150	1	30
128	2,2',3,3',4,4'-hexachlorobiphenyl	10.9	109	30 - 150	10	104	30 - 150	4	30
138	2,2',3,4,4',5'-hexachlorobiphenyl	10.6	106	30 - 150	12	121	30 - 150	13	30
153	2,2',4,4',5,5'-hexachlorobiphenyl	10.4	104	30 - 150	12	123	30 - 150	17	30
156	2,3,3',4,4',5-hexachlorobiphenyl			30 - 150			30 - 150		30
169	3,3',4,4',5,5'-hexachlorobiphenyl			30 - 150			30 - 150		30
170	2,2',3,3',4,4',5-heptachlorobiphenyl	10.8	108	30 - 150	13	128	30 - 150	17	30
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	10.5	105	30 - 150	12	117	30 - 150	10	30
183	2,2',3,4,4',5',6-heptachlorobiphenyl	9.98	100	30 - 150	11	113	30 - 150	13	30
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	10.9	109	30 - 150	13	126	30 - 150	15	30
187	2,2',3,4',5,5',6-heptachlorobiphenyl	10.3	103	30 - 150	12	120	30 - 150	15	30
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	11.4	114	30 - 150	13	125	30 - 150	9	30
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	13.3	133	30 - 150	12	117	30 - 150	13	30
209	2,2',3,3',4,4',5,5',6,6'-decachlorobipheny	11.8	118	30 - 150	13	129	30 - 150	9	30

Surrogate Standard		Recovery (%)	Advisory Limits (%)	Recovery (%)	Advisory Limits (%)
198	2,2',3,3',4,5,5',6-octachlorobiphenyl	136	30 - 150	130	30 - 150

PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	25235-101D
Sample Designation:	Composite A (Laboratory Duplicate)
Date Sampled:	11/20/14 1310
Date Extracted:	11/20/14 1310
Date Analyzed:	11/25/14
Matrix:	Solid
Moisture (%):	80
Sample Amount (g):	20.00
Final Volume (mL)	1.00
Dilution Factor:	1

Congener Number	PCB Congener	Duplicate Result (ug/Kg)	Duplicate Qualifier	Sample Result (ug/Kg)	Sample Qualifier	Relative Difference (%)	Limit (%)
8	2,4'-dichlorobiphenyl	0.25	U	0.25	U	NC	30
18	2,2',5-trichlorobiphenyl	1.1		0.91		NC	30
28	2,4,4'-trichlorobiphenyl	0.25	U	0.25	U	NC	30
44	2,2',3,5'-tetrachlorobiphenyl	0.25	U	0.25	U	NC	30
49	2,2',4,5'-tetrachlorobiphenyl	0.25	U	0.29		NC	30
52	2,2',5,5'-tetrachlorobiphenyl	0.43		0.72		NC	30
66	2,3',4,4'-tetrachlorobiphenyl	0.25	U	0.33		NC	30
77	3,3',4,4'-tetrachlorobiphenyl	0.25	U	0.25	U	NC	30
87	2,2',3,4,5'-pentachlorobiphenyl	0.25	U	0.28		NC	30
101	2,2',4,5,5'-pentachlorobiphenyl	0.39		0.65		NC	30
105	2,3,3',4,4'-pentachlorobiphenyl	0.25	U	0.35		NC	30
118	2,3',4,4',5-pentachlorobiphenyl	0.4		0.57		NC	30
126	3,3',4,4',5-pentachlorobiphenyl	0.25	U	0.25	U	NC	30
128	2,2',3,3',4,4'-hexachlorobiphenyl	0.25		0.46		NC	30
138	2,2',3,4,4',5'-hexachlorobiphenyl	0.8		1.2		NC	30
153	2,2',4,4',5,5'-hexachlorobiphenyl	0.59		0.77		NC	30
156	2,3,3',4,4',5-hexachlorobiphenyl						30
169	3,3',4,4',5,5'-hexachlorobiphenyl						30
170	2,2',3,3',4,4',5-heptachlorobiphenyl	0.25	U	0.25	U	NC	30
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	0.32		0.41		NC	30
183	2,2',3,4,4',5',6-heptachlorobiphenyl	0.25	U	0.25	U	NC	30
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	0.25	U	0.25	U	NC	30
187	2,2',3,4',5,5',6-heptachlorobiphenyl	0.33		0.42		NC	30
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	0.25	U	0.25	U	NC	30
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	0.25	U	0.25	U	NC	30
209	2,2',3,3',4,4',5,5',6,6'-decachlorobipheny	0.25	U	0.25	U	NC	30

Surrogate Standard	Recovery (%)	Recovery (%)	Advisory Limits (%)
PCB 198	84	128	30 - 150

U = Not detected at reporting limit.
NC = Not calculated due to one or more values less than five times the reporting limit.

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PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	25235-101MSD
Sample Designation:	Composite A (Matrix Spike Duplicate)
Date Sampled:	11/20/14 1310
Date Extracted:	11/20/14 1310
Date Analyzed:	11/25/14
Matrix:	Solid
Sample Amount (g):	20.00
Final Volume (mL)	1.00
Dilution Factor:	1.00

Congener Number	PCB Congener	Sample Result (ug/Kg)	Amount Added (ug/Kg)	MS Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	MSD Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	Relative Difference (%)	RPD Limit (%)
8	2,4'-dichlorobiphenyl	ND	51	39.600	78	30 - 150	35.000	70	30 - 150	8	30
18	2,2',5-trichlorobiphenyl	0.91	51	47.700	92	30 - 150	53.000	102	30 - 150	10	30
28	2,4,4'-trichlorobiphenyl	ND	51	58.800	116	30 - 150	53.000	104	30 - 150	12	30
44	2,2',3,5'-tetrachlorobiphenyl	ND	51	44.300	88	30 - 150	47.000	93	30 - 150	6	30
49	2,2',4,5'-tetrachlorobiphenyl	0.29	51	42.100	83	30 - 150	44.000	85	30 - 150	3	30
52	2,2',5,5'-tetrachlorobiphenyl	0.72	51	46.500	90	30 - 150	47.000	92	30 - 150	2	30
66	2,3',4,4'-tetrachlorobiphenyl	0.33	51	42.200	83	30 - 150	46.000	90	30 - 150	7	30
77	3,3',4,4'-tetrachlorobiphenyl	ND	51	41.200	81	30 - 150	42.000	82	30 - 150	1	30
87	2,2',3,4,5'-pentachlorobiphenyl	0.28	51	38.800	76	30 - 150	40.000	78	30 - 150	2	30
101	2,2',4,5,5'-pentachlorobiphenyl	0.65	51	40.300	78	30 - 150	41.000	79	30 - 150	0	30
105	2,3,3',4,4'-pentachlorobiphenyl	0.35	51	39.000	76	30 - 150	39.000	76	30 - 150	0	30
118	2,3',4,4',5-pentachlorobiphenyl	0.57	51	39.800	78	30 - 150	39.000	76	30 - 150	1	30
126	3,3',4,4',5-pentachlorobiphenyl	ND	51	50.000	99	30 - 150	51.000	101	30 - 150	2	30
128	2,2',3,3',4,4'-hexachlorobiphenyl	0.46	51	43.400	85	30 - 150	43.000	84	30 - 150	1	30
138	2,2',3,4,4',5'-hexachlorobiphenyl	1.2	51	47.200	91	30 - 150	48.000	92	30 - 150	2	30
153	2,2',4,4',5,5'-hexachlorobiphenyl	0.77	51	35.700	69	30 - 150	36.000	69	30 - 150	0	30
156	2,3,3',4,4',5-hexachlorobiphenyl	NA	NA								
169	3,3',4,4',5,5'-hexachlorobiphenyl	NA	NA								
170	2,2',3,3',4,4',5-heptachlorobiphenyl	ND	51	46.800	92	30 - 150	47.000	93	30 - 150	1	30
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	0.41	51	45.600	89	30 - 150	43.000	85	30 - 150	4	30
183	2,2',3,4,4',5',6-heptachlorobiphenyl	ND	51	42.900	85	30 - 150	41.000	81	30 - 150	4	30
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	ND	51	36.700	73	30 - 150	36.000	71	30 - 150	2	30
187	2,2',3,4',5,5',6-heptachlorobiphenyl	0.42	51	44.000	86	30 - 150	44.000	86	30 - 150	0	30
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	ND	51	44.800	88	30 - 150	44.000	87	30 - 150	1	30
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	ND	51	44.800	88	30 - 150	45.000	90	30 - 150	1	30
209	2,2',3,3',4,4',5,5',6,6'-decachlorobipheny	ND	51	39.100	77	30 - 150	39.000	76	30 - 150	1	30

Surrogate Standard	MS Recovery (%)	Advisory Limits (%)	MSD Recovery (%)	Advisory Limits (%)
PCB 198	102	30 - 150	104	30 - 150

ND = Not detected
NA = Not added or evaluated

Pesticides in Sediment
SW 846 8081B

Lab Number:	PB819S
Sample Designation:	Laboratory Blank
Date Sampled:	12/11/14 0900
Date Extracted:	12/11/14 0900
Date Analyzed:	12/12/14
Matrix:	Solid
Moisture (%):	NA
Sample Amount (g):	20.00
Final Volume (mL)	1.00
Dilution Factor:	1

Analyte	Concentration (ug/Kg)	Qualifier
aldrin	0.1	U
gamma-chlordane (cis)	0.1	U
alpha-chlordane (trans)	0.1	U
cis-nonachlor	0.1	U
trans-nonachlor	0.1	U
oxychlordane	0.1	U
4,4'-DDT	0.2	U
4,4'-DDE	0.2	U
4,4'-DDD	0.2	U
alpha-BHC	0.1	U
dieldrin	0.2	U
endosulfan I	0.1	U
endosulfan II	0.2	U
endrin	0.2	U
heptachlor	0.1	U
heptachlor epoxide	0.1	U
hexachlorobenzene	0.1	U
gamma-BHC (lindane)	0.1	U
methoxychlor	1	U
toxaphene	5	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	79	30 - 150
decachlorobiphenyl	86	30 - 150

U = Not detected at indicated level.

Pesticides in Sediment
SW 846 8081B

Lab Number:	LCSD819S
Sample Designation:	Laboratory Control Sample Duplicate
Date Sampled:	12/11/14 0900
Date Extracted:	12/11/14 0900
Date Analyzed:	12/12/14
Matrix:	Solid
Moisture:	NA
Sample Amount (g):	20
Final Volume (mL)	1
Dilution Factor:	1

Analyte	LCS True Value (ug/Kg)	LCS Found (ug/Kg)	LCS Recovery (%)	LCSD True Value (ug/Kg)	LCSD Found (ug/Kg)	LCSD Recovery (%)	Relative Difference (%)
aldrin	1	0.824	82	1	0.845	85	3
gamma-chlordane	1	0.99	99	1	1.04	104	5
alpha-chlordane	1	0.896	90	1	0.864	86	4
cis-nonachlor	1	1.05	105	1	1.17	117	11
trans-nonachlor	1	0.86	86	1	0.889	89	3
oxychlordane	1	0.959	96	1	1.01	101	5
4,4'-DDT	2	1.79	90	2	1.73	86	4
4,4'-DDE	2	1.71	86	2	1.77	89	3
4,4'-DDD	2	1.76	88	2	1.74	87	1
alpha-BHC	1	0.771	77	1	0.774	77	0
dieldrin	2	1.68	84	2	1.72	86	2
endosulfan I	1	0.954	95	1	0.947	95	1
endosulfan II	2	1.54	77	2	1.58	79	2
endrin	2	1.81	90	2	1.79	90	1
heptachlor	1	0.831	83	1	0.89	89	7
heptachlor epoxide	1	0.94	94	1	0.961	96	2
hexachlorobenzene	1	0.865	86	1	0.861	86	0
gamma-BHC (lindane)	1	0.946	95	1	0.926	93	2
methoxychlor	10	9.13	91	10	8.94	89	2

Surrogate Standard	Recovery (%)	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	80	81	30 - 150
decachlorobiphenyl	88	83	30 - 150

Pesticides in Sediment
SW 846 8081B

Lab Number:	SRM819S
Sample Designation:	Standard Reference Material
Date Sampled:	12/11/14
Date Extracted:	12/11/14
Date Analyzed:	12/13/14
Matrix:	Solid
Moisture (%):	0
Sample Amount (g):	1.00
Final Volume (mL)	1.00
Dilution Factor:	1

Anayte	Concentration (ug/Kg)	True Value (ug/Kg)	Recovery (%)	Limit (%)
aldrin	NA	NA	NA	30-150
gamma-chlordane	NA	NA	NA	30-150
alpha-chlordane	16	16.51	99	30-150
cis-nonachlor	3.5	3.7	94	30-150
trans-nonachlor	8.9	8.2	108	30-150
oxychlordane	NA	NA	NA	30-150
4,4'-DDT	110	170	64	30-150
4,4'-DDE	76	86	89	30-150
4,4'-DDD	77	108	71	30-150
alpha-BHC	0.84	2	42	30-150
dieldrin	NA	NA	NA	30-150
endosulfan I	NA	NA	NA	30-150
endosulfan II	NA	NA	NA	30-150
endrin	NA	NA	NA	30-150
heptachlor	NA	NA	NA	30-150
heptachlor epoxide	NA	NA	NA	30-150
hexachlorobenzene	3.6	6.03	59	30-150
gamma-BHC (Lindane)	NA	NA	NA	30-150
methoxychlor	NA	NA	NA	30-150
toxaphene	NA	NA	NA	30-150

Surrogate Standard	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	59	30 - 150
decachlorobiphenyl	90	30 - 150

NA = No reference value available

Pesticides in Sediment
SW 846 8081B

Lab Number:	25235-101
Sample Designation:	Composite A (Laboratory Duplicate)
Date Sampled:	11/19/14 1445
Date Extracted:	12/11/14 0900
Date Analyzed:	12/13/14
Matrix:	Solid
Moisture (%):	80
Sample Amount (g):	20
Final Volume (mL)	1
Dilution Factor:	1

Analyte	Sample Concentration (ug/Kg)	Qualifier	Duplicate Concentration (ug/Kg)	Qualifier	Relative Difference (%)	Limit (%)
aldrin	0.51	U	0.51	U	NC	30
gamma-chlordane (cis)	0.51	U	0.51	U	NC	30
alpha-chlordane (trans)	0.51	U	0.51	U	NC	30
cis-nonachlor	0.51	U	0.51	U	NC	30
trans-nonachlor	0.51	U	0.51	U	NC	30
oxychlordane	0.51	U	0.51	U	NC	30
4,4'-DDT	1	U	1	U	NC	30
4,4'-DDE	1	U	1	U	NC	30
4,4'-DDD	1	U	1	U	NC	30
alpha-BHC	0.51	U	0.51	U	NC	30
dieldrin	1	U	1	U	NC	30
endosulfan I	0.51	U	0.51	U	NC	30
endosulfan II	1	U	1	U	NC	30
endrin	1	U	1	U	NC	30
heptachlor	0.51	U	0.51	U	NC	30
heptachlor epoxide	0.51	U	0.51	U	NC	30
hexachlorobenzene	0.51	U	0.51	U	NC	30
gamma-BHC (lindane)	0.51	U	0.51	U	NC	30
methoxychlor	5.1	U	5.1	U	NC	30
toxaphene	25	U	25	U	NC	30

Surrogate Standard	Sample Recovery (%)	Duplicate Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	74	75	30 - 150
decachlorobiphenyl	83	87	30 - 150

U = Not detected at indicated level.
NC = Not calculated due to one or both values less than five times quantitation limit.

Pesticides in Sediment
SW 846 8081B

Lab Number:	25235-101MSD
Sample Designation:	Composite A (Matrix Spike Duplicate)
Date Sampled:	11/19/14 1445
Date Extracted:	12/11/14 0900
Date Analyzed:	12/12/14
Matrix:	Solid
Moisture (%):	80
Sample Amount (g):	20
Final Volume (mL)	1
Dilution Factor:	1

Compound	Sample Result (ug/Kg)	Amount Added (ug/Kg)	MS Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	MSD Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	Relative Difference (%)	RPD Limit (%)	Qual
aldrin	ND	5.1	3.6	71	30-150	3.5	66	30-150	7	30	
gamma-chlordane (cis)	ND	5.1	4.1	82	30-150	5	93	30-150	13	30	
alpha-chlordane (trans)	ND	5.1	4.2	83	30-150	4.2	79	30-150	4	30	
cis-nonachlor	ND	5.1	3.8	75	30-150	3.7	71	30-150	6	30	
trans-nonachlor	ND	5.1	4.6	91	30-150	4.9	97	30-150	6	30	
oxychlordane	ND	5.1	4	78	30-150	4.4	80	30-150	NA	30	
4,4'-DDT	ND	10.1	7.8	77	30-150	7.6	75	30-150	3	30	
4,4'-DDE	ND	10.1	8	79	30-150	7.9	76	30-150	4	30	
4,4'-DDD	ND	10.1	8.4	83	30-150	9.6	93	30-150	12	30	
alpha-BHC	ND	5.1	3.3	65	30-150	3.2	62	30-150	4	30	
dieldrin	ND	10.1	7.8	77	30-150	7.7	75	30-150	3	30	
endosulfan I	ND	5.1	3.8	76	30-150	4.5	84	30-150	10	30	
endosulfan II	ND	10.1	6.7	66	30-150	5.9	58	30-150	NA	30	
endrin	ND	10.1	8.2	81	30-150	8.1	74	30-150	9	30	
heptachlor	ND	5.1	3.2	63	30-150	3.1	58	30-150	8	30	
heptachlor epoxide	ND	5.1	4.2	83	30-150	4.6	88	30-150	6	30	
hexachlorobenzene	ND	5.1	3.4	68	30-150	3.6	63	30-150	8	30	
gamma-BHC (lindane)	ND	5.1	4.2	82	30-150	4.3	82	30-150	0	30	
methoxychlor	ND	50.6	43	84	30-150	41	80	30-150	5	30	
toxaphene	ND	NA	NA	NA	30-150	NA	NA	30-150	NA	30	

Notes:

ND = Not detected
NA = Not added or evaluated

Analytical Reporting Limits and Method Detection Limits.

COMPOUND	UNITS	Reporting Limit ESI	Reporting Limit RIM	Method Detection Limit
Metals				
Arsenic	µg/g	0.5	0.5	0.005
Cadmium	µg/g	0.1	0.1	0.003
Chromium	µg/g	1	1	0.014
Copper	µg/g	1	1	0.040
Lead	µg/g	1	1	0.002
Mercury	µg/g	0.02	0.02	0.001
Nickel	µg/g	1	1	0.005
Zinc	µg/g	1	1	0.082
PAHs				
Acenaphthene	ng/g	20	20	2
Acenaphthylene	ng/g	10	20	2
Anthracene	ng/g	10	20	2
Benzo(a)anthracene	ng/g	10	20	2
Benzo(a)pyrene	ng/g	10	20	2
Benzo(b)fluoranthene	ng/g	10	20	1
Benzo(k)fluoranthene	ng/g	10	20	1
Benzo(g,h,i)perylene	ng/g	10	20	2
Chrysene	ng/g	10	20	2
Dibenz(a,h)anthracene	ng/g	10	20	1
Fluoranthene	ng/g	20	20	2
Fluorene	ng/g	20	20	4
Indeno(1,2,3-c,d)pyrene	ng/g	10	20	2
Naphthalene	ng/g	10	20	2
Phenanthrene	ng/g	20	20	16
Pyrene	ng/g	10	20	2
PCB Congeners				
PCB 008	ng/g	0.2	0.5	0.08
PCB 018	ng/g	0.2	0.5	0.05
PCB 028	ng/g	0.2	0.5	0.10
PCB 044	ng/g	0.2	0.5	0.09
PCB 049	ng/g	0.2	0.5	0.07
PCB 052	ng/g	0.2	0.5	0.07
PCB 066	ng/g	0.2	0.5	0.08
PCB 077	ng/g	0.2	0.5	0.09
PCB 087	ng/g	0.2	0.5	0.11
PCB 101	ng/g	0.2	0.5	0.10
PCB 105	ng/g	0.2	-	0.14
PCB 118	ng/g	0.2	0.5	0.10
PCB 126	ng/g	0.2	-	0.14
PCB 128	ng/g	0.2	-	0.13
PCB 138	ng/g	0.2	-	0.10
PCB 153	ng/g	0.2	0.5	0.09
PCB 170	ng/g	0.2	0.5	0.09
PCB 180	ng/g	0.2	0.5	0.11
PCB 183	ng/g	0.2	-	0.10
PCB 184	ng/g	0.2	0.5	0.09
PCB 187	ng/g	0.2	0.5	0.09
PCB 195	ng/g	0.2	0.5	0.12
PCB 206	ng/g	0.2	0.5	0.12
PCB 209	ng/g	0.2	0.5	0.09
Pesticides				
4,4'-DDD	ng/g	1	1	0.068
4,4'-DDE	ng/g	1	1	0.224
4,4'-DDT	ng/g	1	1	0.102
Aldrin	ng/g	0.5	1	0.055
Alpha-BHC	ng/g	0.5	1	0.020
Alpha-Chlordane (trans)	ng/g	0.5	1	0.073
Beta-BHC	ng/g	0.5	1	0.090
Chlorpyrifos	ng/g	0.5	-	0.093
cis-Nonachlor	ng/g	1	1	0.084
Delta-BHC	ng/g	0.5	1	0.075
Dieldrin	ng/g	1	1	0.086
Endosulfan I	ng/g	1	1	0.067
Endosulfan II	ng/g	1	1	0.105
Endosulfan sulfate	ng/g	5	1	0.250
Endrin	ng/g	1	1	0.022
Endrin Aldehyde	ng/g	1	-	0.084
Endrin ketone	ng/g	1	1	0.233
Gamma-BHC (lindane)	ng/g	0.5	1	0.099
Gamma-Chlordane	ng/g	0.5	1	0.110
Heptachlor	ng/g	0.5	1	0.078
Heptachlor epoxide	ng/g	0.5	1	0.078
Hexachlorobenzene	ng/g	0.5	1	0.004
Methoxychlor	ng/g	1	1	0.533
Oxychlordane	ng/g	0.5	1	0.032
Toxaphene	ng/g	30	25	46.1
Trans-Nonachlor	ng/g	0.5	1	0.087

Laboratory Composite Preparation Documentation

Project Number: 25235

Project Name: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA

Composite Identifier: Composite A

Composite Lab ID.: 25235-101 Composite Final Volume: 2 gallons

Composite Matrix: solid Composite Container(s): 1 x 2 gallon

Composite Prepared Date: 11/19/14

Composite Prepared Time: 1445

Initials: JTP / BP

Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
Station 5	25235-005	solid	—	1 Shell	≈ 1 gallon	
Station 6	25235-006	solid	—	—	≈ 1 gallon	

Subsamples Removed:

Lab Number	Sample Use
	Bulk Sediment Chemistry

Laboratory Composite Preparation Documentation

Project Number: 25235

Project Name: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA

Composite Identifier: Composite B

Composite Lab ID.: 25235-102 Composite Final Volume: ≈ 7 1/2 L

Composite Matrix: solid Composite Container(s): 1 x 2 gallon

Composite Prepared Date: 11/19/14

Composite Prepared Time: 1500

Initials: JTP/BP

Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
Station 7	25235-007	solid	—	—	≈ 2 1/2 L	
Station 8	25235-008	solid	—	—	≈ 2 1/2 L	
Station 9	25235-009	solid	—	—	≈ 2 1/2 L	

Subsamples Removed:

Lab Number	Sample Use
	Bulk Sediment Chemistry

Laboratory Composite Preparation Documentation

Project Number: 25235

Project Name: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA

Composite Identifier: Composite C

Composite Lab ID.: 25235-103 Composite Final Volume: 2 gallons

Composite Matrix: solid Composite Container(s): 1 X 2 gallon

Composite Prepared Date: 11/19/14

Composite Prepared Time: 1520

Initials: BP/RS

Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
Station 1	25235-001	solid	—	—	~1.5L	
Station 2	25235-002	solid	—	—	~1.5L	
Station 3	25235-003	solid	—	—	~1.5L	
Station 4	25235-004	solid	—	—	~1.5L	

Subsamples Removed:

Lab Number	Sample Use
	Bulk Sediment Chemistry

Laboratory Composite Preparation Documentation

Project Number: 25235

Project Name: Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA

Composite Identifier: Composite D

Composite Lab ID.: 25235-104 Composite Final Volume: 3.5 gallons

Composite Matrix: solid Composite Container(s): 2 x 2 gallon

Composite Prepared Date: 11/19/14

Composite Prepared Time: 1530

Initials: BP/RS

Protocol: ESI SOP 1358

This composite was prepared according to protocols cited using the samples and amounts listed below:

Field ID	ESI Lab ID	Matrix	Liquids Excluded	Solids Excluded	Amount Added	Notes
Station 10	25235-010	solid	—	—	≈3L	
Station 11	25235-011	solid	—	—	≈3L	
Station 12	25235-012	solid	—	—	≈3L	
Station 13	25235-013	solid	—	—	≈3L	
Station 14	25235-014	solid	—	—	≈3L	

Subsamples Removed:

Lab Number	Sample Use
	Bulk Sediment Chemistry

ESI

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	25235		
SDG No:			
Project:	Town of Wellfleet, Wellfleet Harbor, Wellfleet, MA		
Delivered via:	ESI		
Date and Time Received:	10/10/14 0745	Date and TIme Logged into Lab:	10/10/14 1300
Recieved By:	DW	Logged into Lab by:	RAM RAM
Air bill / Way bill:	No	Air bill included in folder if received?	NA
Cooler on ice/packs:	NA	Custody Seals present?	NA
Cooler Blank Temp (C) at arrival:	NA	Custody Seals intact?	NA
Number of COC Pages:	2		
COC Serial Number(s):			
COC Complete:	Yes	Does the info on the COC match the samples?	Yes
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	Yes
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required		

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Station 1	25235-001	S	Core Characterization	core	4 C	
Station 2	25235-002	S	Core Characterization	core	4 C	
Station 3	25235-003	S	Core Characterization	core	4 C	
Station 4	25235-004	S	Core Characterization	core	4 C	
Station 5	25235-005	S	Core Characterization	core	4 C	
Station 6	25235-006	S	Core Characterization	core	4 C	
Station 7	25235-007	S	Core Characterization	core	4 C	
Station 8	25235-008	S	Core Characterization	core	4 C	
Station 9	25235-009	S	Core Characterization	core	4 C	
Station 10	25235-010	S	Core Characterization	core	4 C	
Station 11	25235-011	S	Core Characterization	core	4 C	
Station 12	25235-012	S	Core Characterization	core	4 C	
Station 13	25235-013	S	Core Characterization	core	4 C	
Station 14	25235-014	S	Core Characterization	core	4 C	

Notes and qualifications:

See project SAP.

EnviroSystems, Inc. One Lafayette Road P.O. Box 778 Hampt 842-0778 (603) 926-3345 fax (603) 926-3521 www.envirosystems.com

ESI
EnviroSystems, Inc.
1 Lafayette Road
P.O. Box 778
Hampton, N.H. 03843

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 25235

CHAIN OF CUSTODY DOCUMENTATION

Client: Bourne Consulting Engineering	Contact:	Project Name: Town of Wellfleet, Wellfleet Harbor; Wellfleet MA	Page 1 of 2
Report to:	Address:	Project Number: NAE-2005-1059	
Invoice to:	Address:	Project Manager:	
Voice:	Fax:	email:	P.O. No: Quote No:

Protocol: RCRA SDWA NPDES USCOE Other

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
-001	1	10/9	745	CP	G						see project SAP
-002	2		810								
-003	3		821								
-004	4		900								
-005	5		912								
-006	6		922								
-007	7		938								
-008	8		949								
-009	9		1010								
-010	10		1021								
-011	11		1049								
-012	12		1112								

45/65

Relinquished By: Mark [illegible]	Date: 10/10/14 Time: 745	Received By: D [illegible]	Date: 10/10/14 Time: 745
Relinquished By:	Date: Time:	Received at Lab By:	Date: Time:

Comments:

Sample Delivery Group No:	Page of

ESI
EnviroSystems, Inc.
1 Lafayette Road
P.O. Box 778
Hampton, N.H. 03843

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 25235

CHAIN OF CUSTODY DOCUMENTATION

Client: Bourne Consulting Engineering	Contact:	Project Name: Town of Wellfleet, Wellfleet Harbor, Wellfleet MA	Page 2 of 2
Report to:	Address:	Project Number: NAE-2005-1059	
Invoice to:	Address:	Project Manager:	
Voice:	Fax:	email:	P.O. No: Quote No:

Protocol: RCRA SDWA NPDES USCOE Other

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
-013	13	10/9	1130	CP	G						See project SAP
-014	14	10/9	1150	↓	G						↓

46/65

Relinquished By: [illegible]	Date: 10/10/14 Time: 745	Received By: [illegible]	Date: 10/10/14 Time: 745
Relinquished By:	Date: Time:	Received at Lab By:	Date: Time:

Comments:

Sample Delivery Group No:	Page of

GeoTesting
EXPRESS

Technologies to manage risk for infrastructure

Boston
Atlanta
Chicago
Los Angeles
New York
www.geotesting.com

November 11, 2014

Rene'e McIsaac
EnviroSystems, Inc.
PO Box 778, 1 Lafayette Road
Hampton, NH 03843

RE: 25235 Grain Size, (GTX-302512)

Dear Rene'e:

Enclosed are the test results you requested for the above referenced project. GeoTesting Express, Inc. (GTX) received 14 samples from you on 10/29/2014. These samples were labeled as follows:

25235-001
25235-002
25235-003
25235-004
25235-005
25235-006
25235-007
25235-008
25235-009
25235-010
25235-011
25235-012
25235-013
25235-014

GTX performed the following test on each of these samples:

ASTM D422 - Grain Size Analysis - Sieve Only

A copy of your test request is attached.

The results presented in this report apply only to the items tested. This report shall not be reproduced except in full, without written approval from GeoTesting Express. The remainder of these samples will be retained for a period of sixty (60) days and will then be discarded unless otherwise notified by you. Please call me if you have any questions or require additional information. Thank you for allowing GeoTesting Express the opportunity of providing you with testing services. We look forward to working with you again in the future.

Respectfully yours,

Joe Tomei
Laboratory Manager

GeoTesting
EXPRESS

Technologies to manage risk for infrastructure

Boston
Atlanta
Chicago
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New York

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Geotechnical Test Report

11/11/2014

GTX-302512
25235 Grain Size

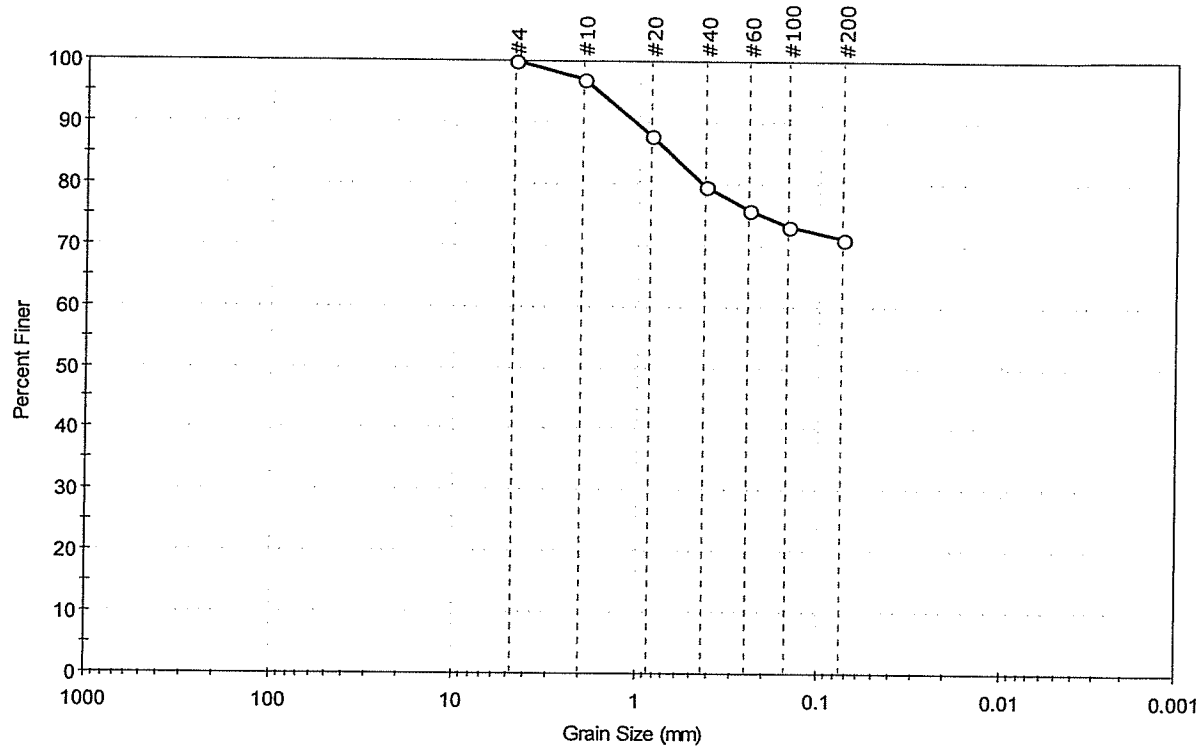
Prepared for:

EnviroSystems, Inc.

GeoTesting EXPRESS

Client:	EnviroSystems, Inc.		
Project:	25235 Grain Size		
Location:	---	Project No:	GTX-302512
Boring ID: ---	Sample Type: jar	Tested By:	jbr
Sample ID: 25235-001	Test Date: 11/10/14	Checked By:	jdt
Depth : ---	Test Id: 313704		
Test Comment:	---		
Sample Description:	Moist, black silt with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	28.9	71.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	97		
#20	0.85	88		
#40	0.42	80		
#60	0.25	76		
#100	0.15	73		
#200	0.075	71		

Coefficients

D_{85} = 0.6606 mm D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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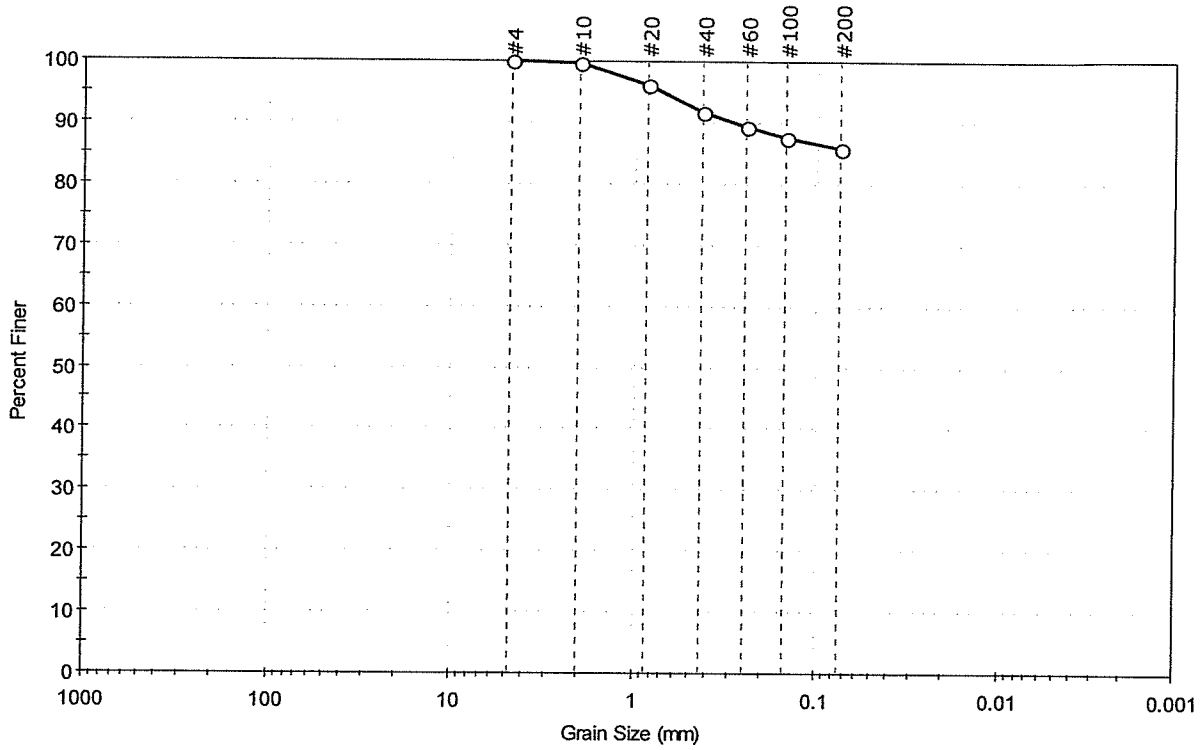
GeoTesting EXPRESS

Client:	EnviroSystems, Inc.				
Project:	25235 Grain Size				
Location:	---			Project No:	GTX-302512
Boring ID:	---	Sample Type:	jar	Tested By:	jbr
Sample ID:	25235-002	Test Date:	11/10/14	Checked By:	jdt
Depth :	---	Test Id:	313705		
Test Comment:	---				
Sample Description:	Moist, black silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	14.2	85.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	96		
#40	0.42	92		
#60	0.25	89		
#100	0.15	88		
#200	0.075	86		

Coefficients

D_{85} =N/A D_{30} =N/A

D_{60} =N/A D_{15} =N/A

D_{50} =N/A D_{10} =N/A

C_u =N/A C_c =N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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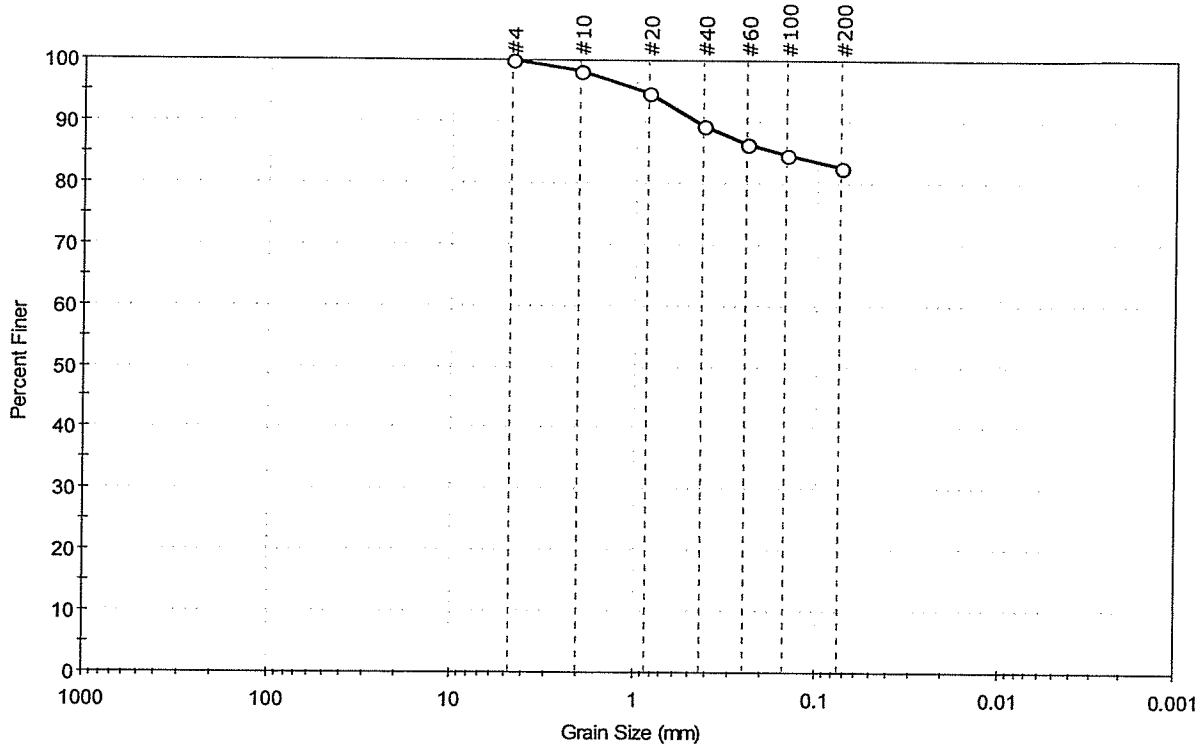
GeoTesting EXPRESS

Client:	EnviroSystems, Inc.		
Project:	25235 Grain Size		
Location:	---	Project No:	GTX-302512
Boring ID:	---	Sample Type: jar	Tested By: jbr
Sample ID:	25235-003	Test Date: 11/10/14	Checked By: jdt
Depth :	---	Test Id: 313706	
Test Comment:	---		
Sample Description:	Moist, black silt with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	17.4	82.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	98		
#20	0.85	95		
#40	0.42	89		
#60	0.25	87		
#100	0.15	85		
#200	0.075	83		

Coefficients

D_{85} = 0.1680 mm D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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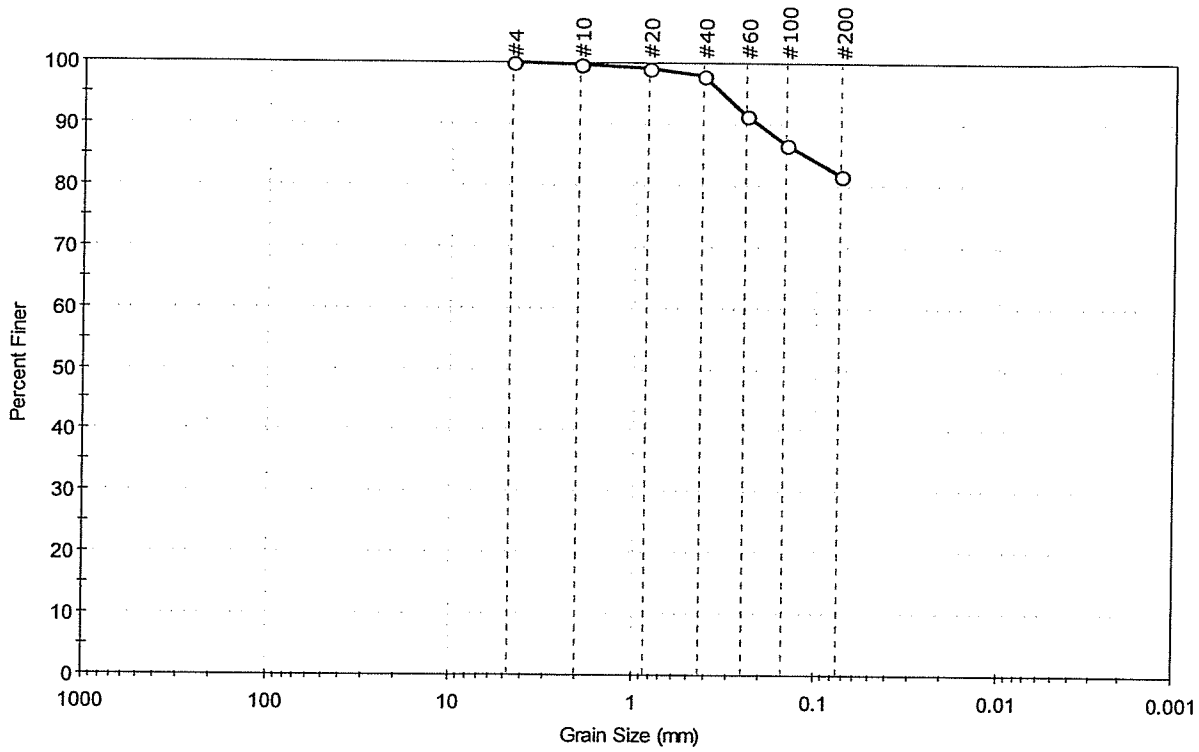
GeoTesting EXPRESS

Client:	EnviroSystems, Inc.		
Project:	25235 Grain Size		
Location:	---	Project No:	GTX-302512
Boring ID: ---	Sample Type: jar	Tested By:	jbr
Sample ID: 25235-004	Test Date: 11/10/14	Checked By:	jdt
Depth : ---	Test Id: 313707		
Test Comment: ---			
Sample Description:	Moist, black silt with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	18.2	81.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	91		
#100	0.15	87		
#200	0.075	82		

Coefficients

D_{85} = 0.1190 mm D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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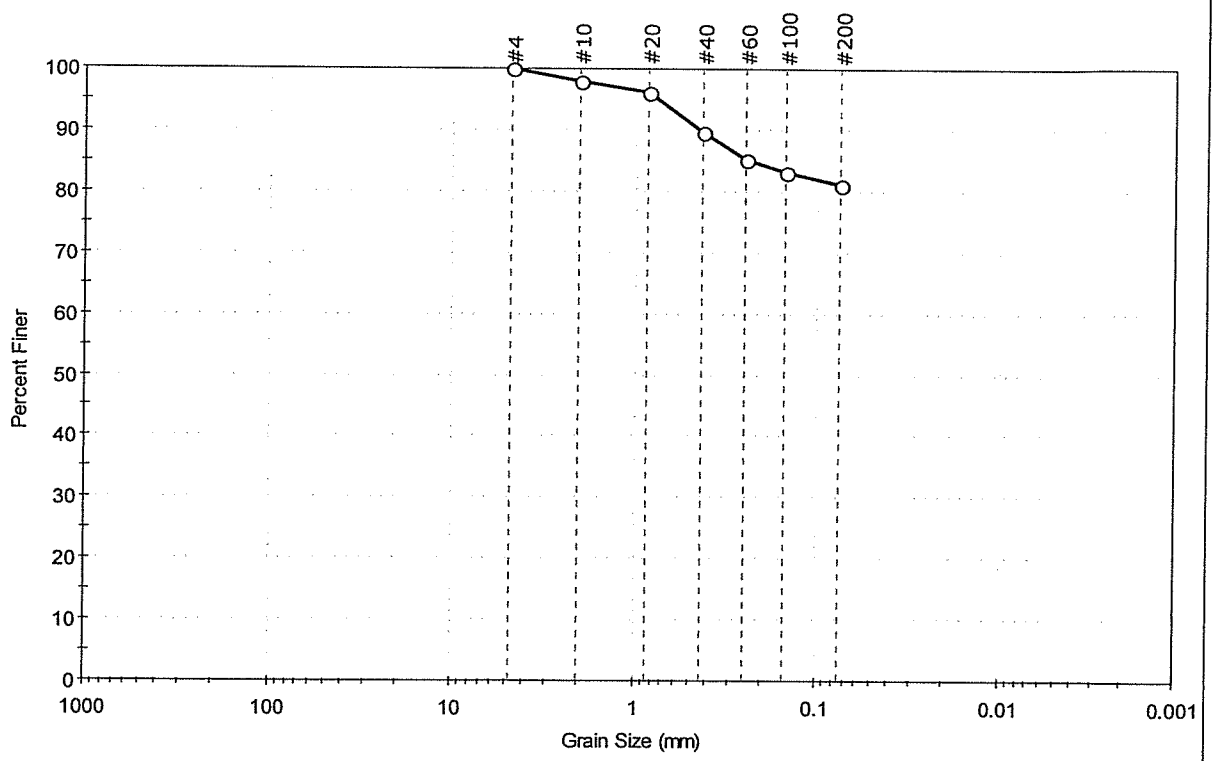
GeoTesting EXPRESS

Client:	EnviroSystems, Inc.				
Project:	25235 Grain Size				
Location:	---			Project No:	GTX-302512
Boring ID:	---	Sample Type:	jar	Tested By:	jbr
Sample ID:	25235-005	Test Date:	11/10/14	Checked By:	jdt
Depth :	---	Test Id:	313708		
Test Comment:	---				
Sample Description:	Moist, black silt with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	19.0	81.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	98		
#20	0.85	96		
#40	0.42	90		
#60	0.25	85		
#100	0.15	83		
#200	0.075	81		

Coefficients

D_{85} = 0.2414 mm D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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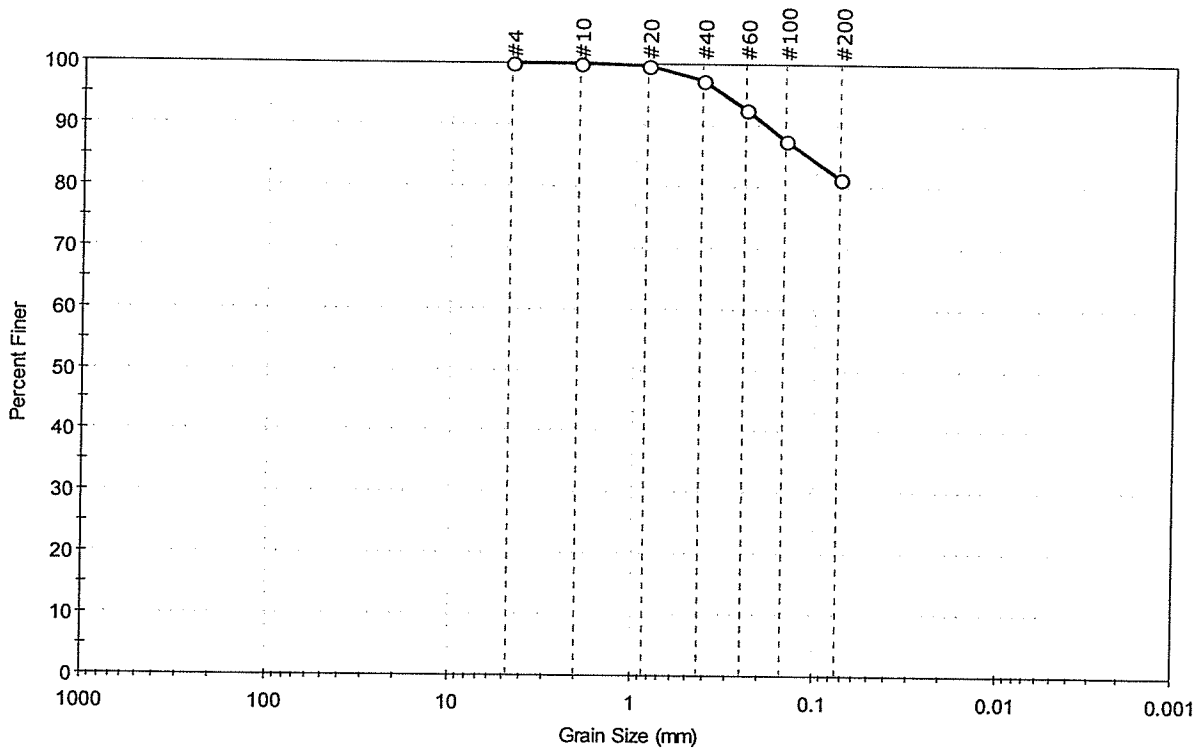
GeoTesting EXPRESS

Client:	EnviroSystems, Inc.		
Project:	25235 Grain Size		
Location:	---	Project No:	GTX-302512
Boring ID:	---	Sample Type: jar	Tested By: jbr
Sample ID:	25235-006	Test Date: 11/10/14	Checked By: jdt
Depth :	---	Test Id: 313709	
Test Comment:	---		
Sample Description:	Moist, black silt with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	18.5	81.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	93		
#100	0.15	88		
#200	0.075	82		

Coefficients

D_{85} = 0.1121 mm D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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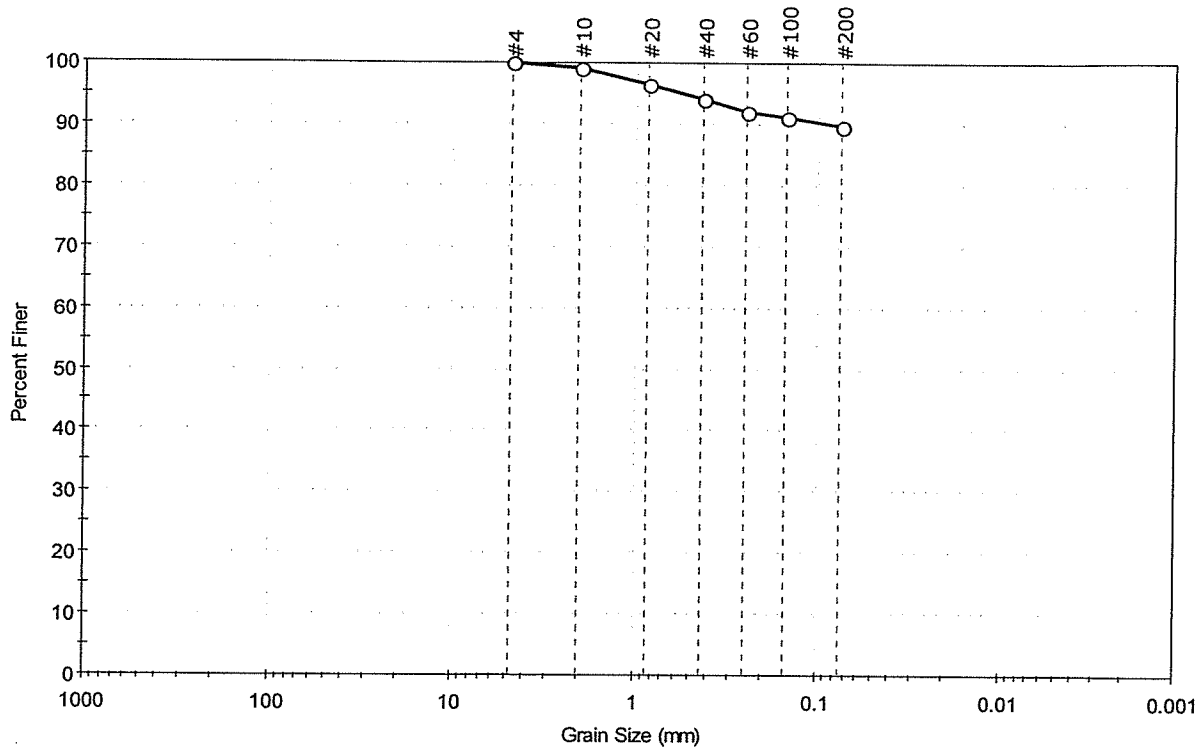
GeoTesting EXPRESS

Client:	EnviroSystems, Inc.		
Project:	25235 Grain Size		
Location:	---	Project No:	GTX-302512
Boring ID:	---	Sample Type: jar	Tested By: jbr
Sample ID:	25235-007	Test Date: 11/10/14	Checked By: jdt
Depth :	---	Test Id: 313710	
Test Comment:	---		
Sample Description:	Moist, black silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	10.5	89.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	94		
#60	0.25	92		
#100	0.15	91		
#200	0.075	90		

Coefficients

D_{85} =N/A D_{30} =N/A
D_{60} =N/A D_{15} =N/A
D_{50} =N/A D_{10} =N/A
C_u =N/A C_c =N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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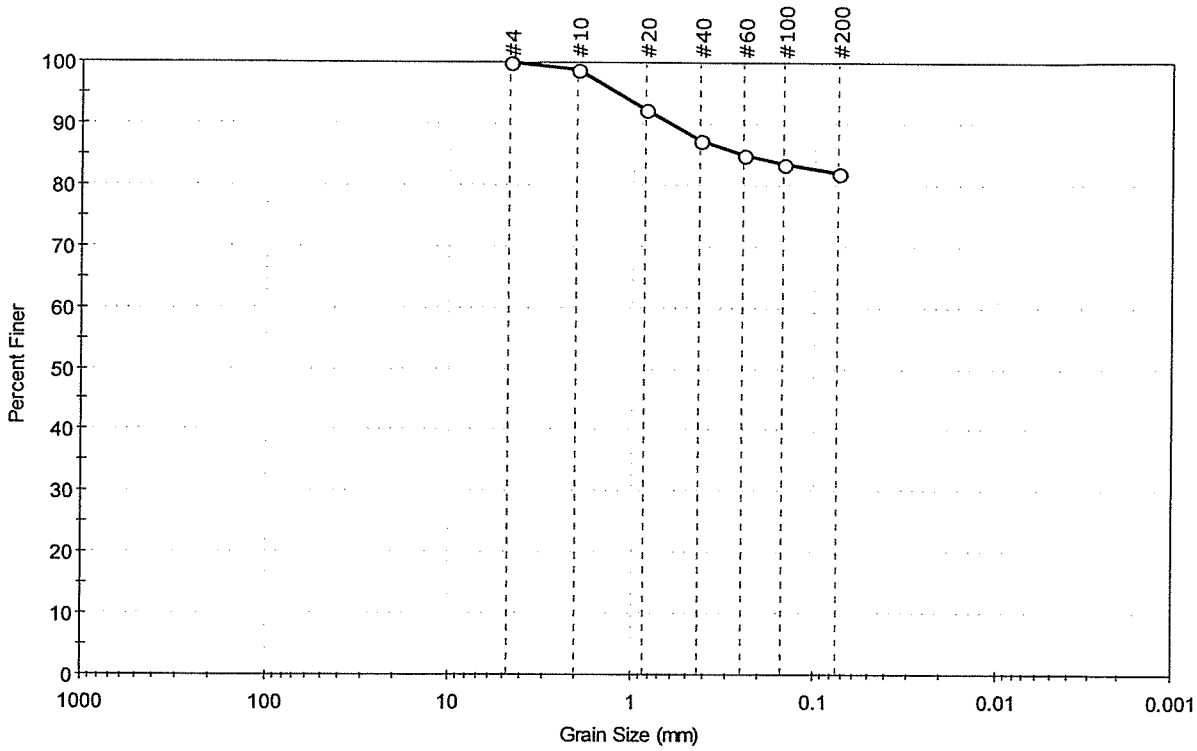
Client:	EnviroSystems, Inc.		
Project:	25235 Grain Size		
Location:	---	Project No:	GTX-302512
Boring ID:	---	Sample Type: jar	Tested By: jbr
Sample ID:	25235-008	Test Date: 11/10/14	Checked By: jdt
Depth :	---	Test Id: 313711	
Test Comment:	---		
Sample Description:	Moist, black silt with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	18.0	82.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	92		
#40	0.42	87		
#60	0.25	85		
#100	0.15	83		
#200	0.075	82		

Coefficients

D_{85} = 0.2608 mm D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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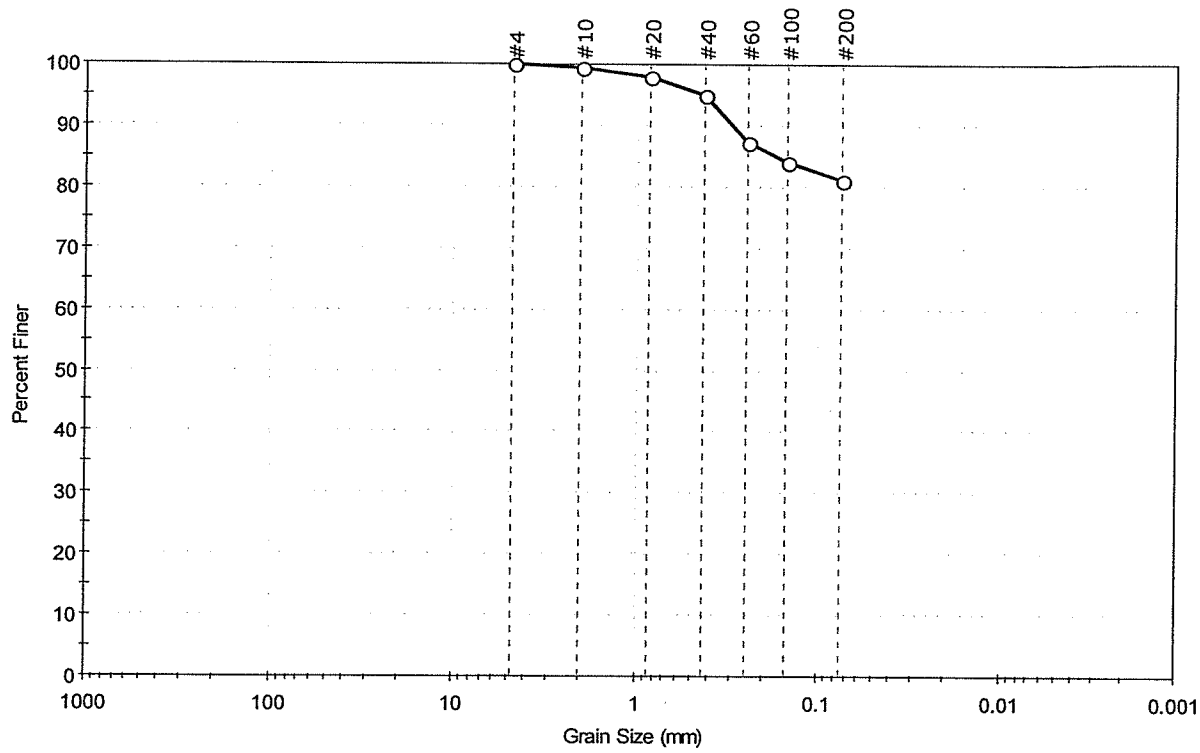
GeoTesting EXPRESS

Client:	EnviroSystems, Inc.				
Project:	25235 Grain Size				
Location:	---			Project No:	GTX-302512
Boring ID:	---	Sample Type:	jar	Tested By:	jbr
Sample ID:	25235-009	Test Date:	11/10/14	Checked By:	jdt
Depth :	---	Test Id:	313712		
Test Comment:	---				
Sample Description:	Moist, black silt with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	18.9	81.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	98		
#40	0.42	95		
#60	0.25	87		
#100	0.15	84		
#200	0.075	81		

Coefficients

D_{85} = 0.1707 mm D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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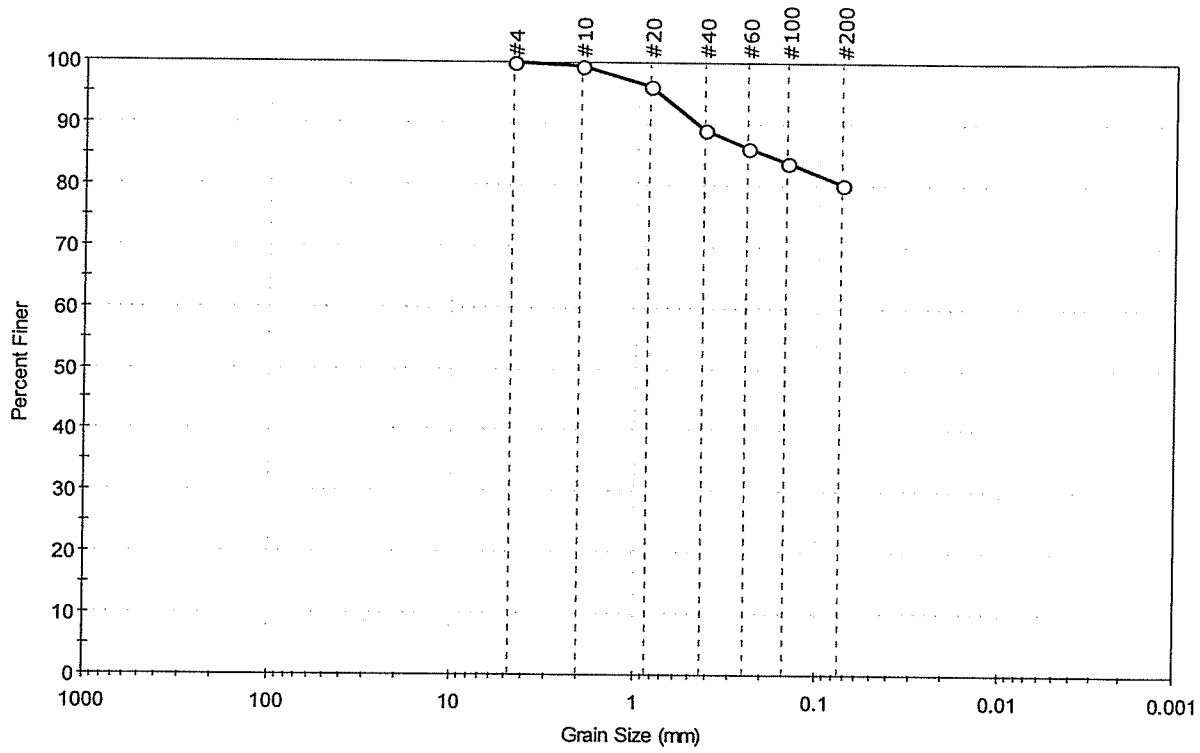
GeoTesting EXPRESS

Client:	EnviroSystems, Inc.		
Project:	25235 Grain Size		
Location:	---	Project No:	GTX-302512
Boring ID:	---	Sample Type: jar	Tested By: jbr
Sample ID:	25235-010	Test Date: 11/10/14	Checked By: jdt
Depth :	---	Test Id: 313713	
Test Comment:	---		
Sample Description:	Moist, very dark gray silt with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	19.8	80.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	96		
#40	0.42	89		
#60	0.25	86		
#100	0.15	84		
#200	0.075	80		

Coefficients

D_{85} =0.1949 mm D_{30} =N/A
D_{60} =N/A D_{15} =N/A
D_{50} =N/A D_{10} =N/A
C_u =N/A C_c =N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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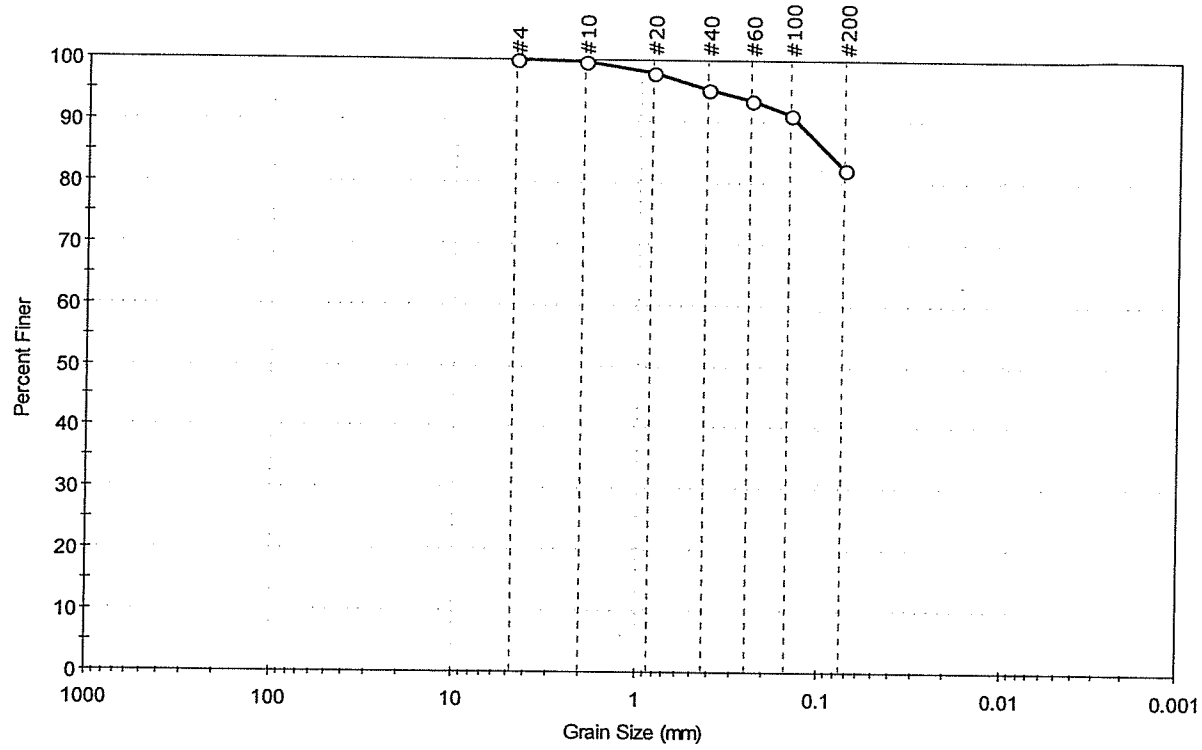
GeoTesting EXPRESS

Client:	EnviroSystems, Inc.		
Project:	25235 Grain Size		
Location:	---	Project No:	GTX-302512
Boring ID:	---	Sample Type: jar	Tested By: jbr
Sample ID:	25235-011	Test Date: 11/10/14	Checked By: jdt
Depth :	---	Test Id: 313714	
Test Comment:	---		
Sample Description:	Moist, very dark gray silt with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	17.7	82.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	98		
#40	0.42	95		
#60	0.25	94		
#100	0.15	91		
#200	0.075	82		

Coefficients

D_{85} = 0.0925 mm D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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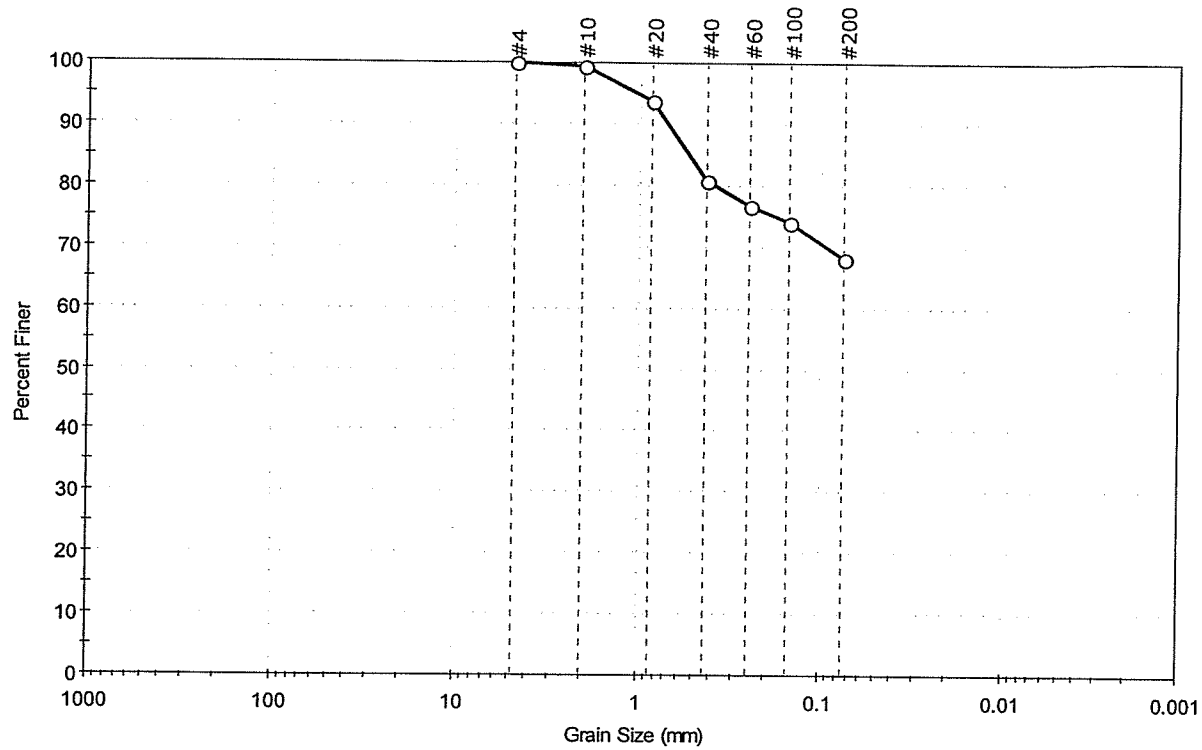
GeoTesting EXPRESS

Client:	EnviroSystems, Inc.				
Project:	25235 Grain Size				
Location:	---			Project No:	GTX-302512
Boring ID:	---	Sample Type:	jar	Tested By:	jbr
Sample ID:	25235-012	Test Date:	11/10/14	Checked By:	jdt
Depth :	---	Test Id:	313715		
Test Comment:	---				
Sample Description:	Moist, very dark gray sandy silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	31.8	68.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	94		
#40	0.42	81		
#60	0.25	77		
#100	0.15	74		
#200	0.075	68		

Coefficients

D_{85} = 0.5341 mm D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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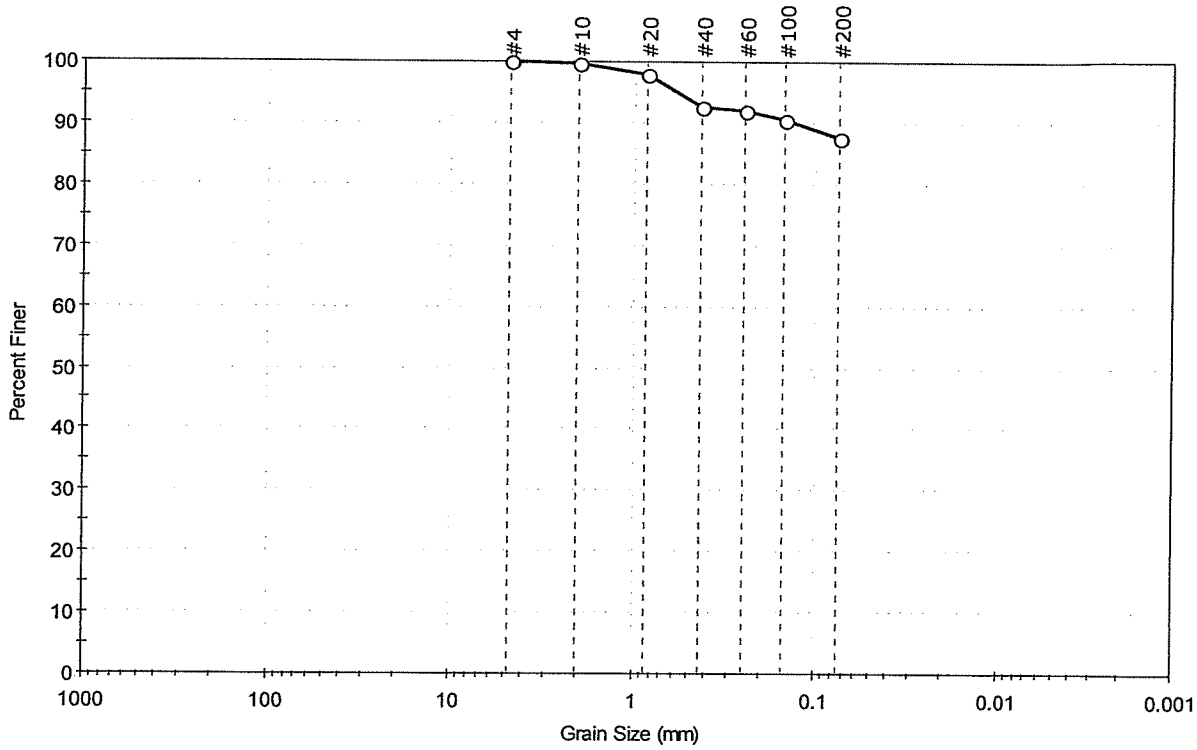
GeoTesting EXPRESS

Client:	EnviroSystems, Inc.		
Project:	25235 Grain Size		
Location:	---	Project No:	GTX-302512
Boring ID: ---	Sample Type: jar	Tested By:	jbr
Sample ID: 25235-013	Test Date: 11/10/14	Checked By:	jdt
Depth : ---	Test Id: 313716		
Test Comment:	---		
Sample Description:	Moist, very dark gray silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	12.4	87.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	98		
#40	0.42	93		
#60	0.25	92		
#100	0.15	91		
#200	0.075	88		

Coefficients

D_{85} = N/A D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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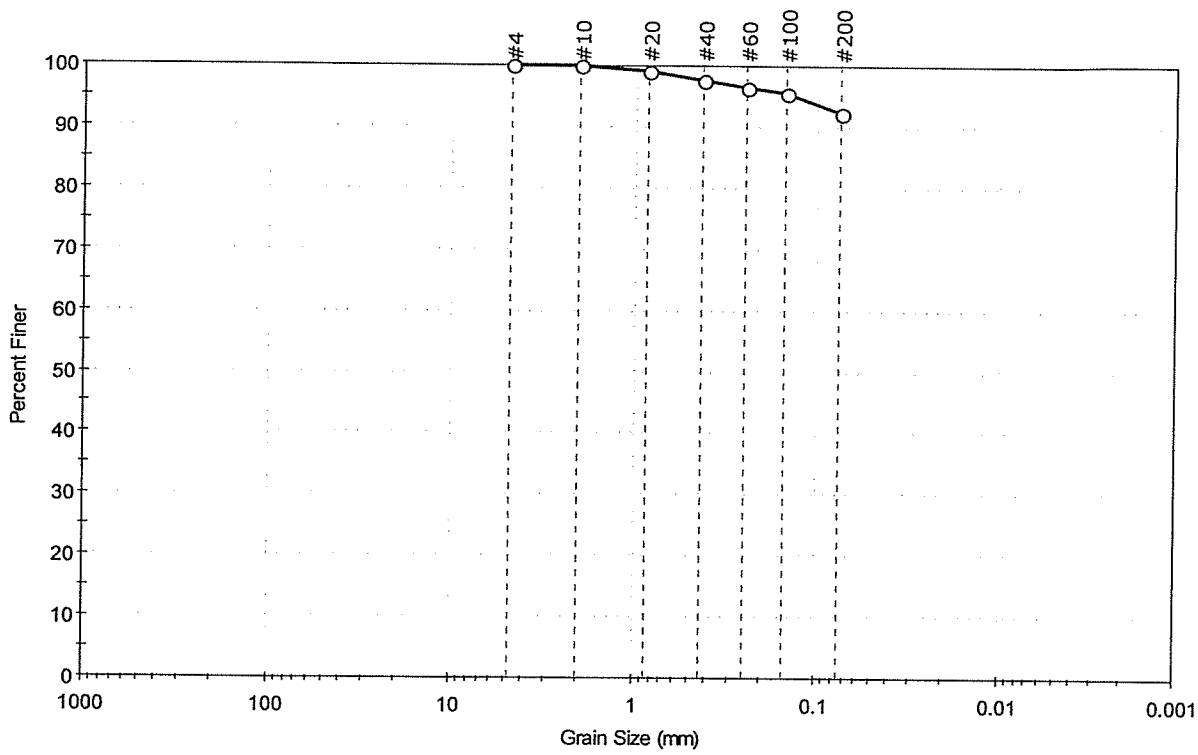
GeoTesting EXPRESS

Client:	EnviroSystems, Inc.				
Project:	25235 Grain Size				
Location:	---			Project No:	GTX-302512
Boring ID:	---	Sample Type:	jar	Tested By:	jbr
Sample ID:	25235-014	Test Date:	11/10/14	Checked By:	jdt
Depth :	---	Test Id:	313717		
Test Comment:	---				
Sample Description:	Moist, very dark gray silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	7.7	92.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	96		
#100	0.15	95		
#200	0.075	92		

Coefficients

D_{85} = N/A D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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ESI

EnviroSystems, Inc.
1 Lafayette Road
P.O. Box 778
Hampton, N.H. 03843

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: L1425540

CHAIN OF CUSTODY DOCUMENTATION

ent: ESI	Contact: Renée McIsaac	Project Name: 25235 Grain Size	Page 1 of 2
port to:	Address:	Project Number:	
oice to:	Address:	Project Manager:	
ice: 603-926-3345 ext. 212	Fax:	r.mcisaac@envirosystems.com email:	P.O. No: Quote No:

otocol: RCRA SDWA NPDES USCOE Other

b Number signed lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
40 01	25235-001	10/22/14	—	ESI	—	8oz	G	4°C	S	—	Grain Size Analysis (No hydrometer)
02	25235-002										NE RIM Criteria
03	25235-003										
04	25235-004										
05	25235-005	10/23/14									
06	25235-006	10/22/14									
07	25235-007										
08	25235-008										
09	25235-009	10/23/14									
10	25235-010	10/22/14									
11	25235-011										
12	25235-012										

linquished By: [signature]	Date: 10/24/14 Time: 11:14	Received By: Lan Thuong [signature]	Date: 10/24/14 Time: 1114
linquished By: [signature]	Date: 10/25/14 Time: 0400	Received at Lab By: Mansfield Lab	Date: 10/25/14 Time: 0400
omments: Tanya Mueller	10/28/14 10:30	[signature]	10/28/14 1310
[signature]	10/28/14 1730	[signature]	10/29/14 1320
[signature]	10/28/14 1800		
[signature]	10/29/14 1411		

Sample Delivery Group No: ACE [signature]	Page 10/25/14 1320

Rw V. MO GTX 10/29/14 14:15

ESI
EnviroSystems, Inc.
1 Lafayette Road
P.O. Box 778
Hampton, N.H. 03843

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: L1425540

CHAIN OF CUSTODY DOCUMENTATION

ient: ESI	Contact: Renée McIsaac	Project Name: 25235GrainSize	Page 2 of 2
eport to:	Address:	Project Number:	
voice to:	Address:	Project Manager:	
ice: 603-926-3345 ext. 212	Fax:	rmcisaac@envirosystems.com email:	P.O. No: Quote No:

otocol: RCRA SDWA NPDES USCOE Other

.b Number signed lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com-posit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preser-vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
40 -13	25235-013	10/22/14	ESI →		–	8oz	G	4°C	S	–	Grain Size Analysis (No hydrometer)
/ -14	25235-014	10/22/14	ESI →		–	8oz	G	4°C	S	–	NE RIM Criteria

RAM 10/24/14

64/65

elinquished By: [signature] Date: 10/24/14 Time: 1114 Received By: [signature] HAL Date: 10/24/14 Time: 1114

elinquished By: [signature] Date: 10/25/14 Time: 0400 Received at Lab By: [signature] Date: 10/25/14 Time: 0400

omments: [signature] 10/28/14 10:30 [signature] 10/28/14 1315

[signature] 10/28/14 1730 [signature] 10/29/14 1330

[signature] 10/25/14 1800

[signature] 10/29/14 1411

Sample Delivery Group No: [signature] Page 10/25/14 1320

[signature] GTX 10/29/14 1415

GeoTesting EXPRESS

WARRANTY and LIABILITY

GeoTesting Express (GTX) warrants that all tests it performs are run in general accordance with the specified test procedures and accepted industry practice. GTX will correct or repeat any test that does not comply with this warranty. GTX has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GTX may report engineering parameters that require us to interpret the test data. Such parameters are determined using accepted engineering procedures. However, GTX does not warrant that these parameters accurately reflect the true engineering properties of the *in situ* material. Responsibility for interpretation and use of the test data and these parameters for engineering and/or construction purposes rests solely with the user and not with GTX or any of its employees.

GTX's liability will be limited to correcting or repeating a test which fails our warranty. GTX's liability for damages to the Purchaser of testing services for any cause whatsoever shall be limited to the amount GTX received for the testing services. GTX will not be liable for any damages, or for any lost benefits or other consequential damages resulting from the use of these test results, even if GTX has been advised of the possibility of such damages. GTX will not be responsible for any liability of the Purchaser to any third party.

Commonly Used Symbols

A	pore pressure parameter for $\Delta\sigma_1 - \Delta\sigma_3$
B	pore pressure parameter for $\Delta\sigma_3$
CIU	isotropically consolidated undrained triaxial shear test
CR	compression ratio for one dimensional consolidation
C_c	coefficient of curvature, $(D_{30})^2 / (D_{10} \times D_{60})$
C_u	coefficient of uniformity, D_{60}/D_{10}
C_c	compression index for one dimensional consolidation
C_α	coefficient of secondary compression
c_v	coefficient of consolidation
c	cohesion intercept for total stresses
c'	cohesion intercept for effective stresses
D	diameter of specimen
D_{10}	diameter at which 10% of soil is finer
D_{15}	diameter at which 15% of soil is finer
D_{30}	diameter at which 30% of soil is finer
D_{50}	diameter at which 50% of soil is finer
D_{60}	diameter at which 60% of soil is finer
D_{85}	diameter at which 85% of soil is finer
d_{50}	displacement for 50% consolidation
d_{90}	displacement for 90% consolidation
d_{100}	displacement for 100% consolidation
E	Young's modulus
e	void ratio
e_c	void ratio after consolidation
e_o	initial void ratio
G	shear modulus
G_s	specific gravity of soil particles
H	height of specimen
PI	plasticity index
i	gradient
K_o	lateral stress ratio for one dimensional strain
k	permeability
LI	Liquidity Index
m_v	coefficient of volume change
n	porosity
PI	plasticity index
P_c	preconsolidation pressure
p	$(\sigma_1 + \sigma_3) / 2$, $(\sigma_v + \sigma_h) / 2$
p'	$(\sigma'_1 + \sigma'_3) / 2$, $(\sigma'_v + \sigma'_h) / 2$
p'_c	p' at consolidation
Q	quantity of flow
q	$(\sigma_1 - \sigma_3) / 2$
q_f	q at failure
q_o, q_i	initial q
q_c	q at consolidation
S	degree of saturation
SL	shrinkage limit
s_u	undrained shear strength
T	time factor for consolidation
T	temperature
t	time
U, UC	unconfined compression test
UU, Q	unconsolidated undrained triaxial test
u_a	pore gas pressure
u_e	excess pore water pressure
u, u_w	pore water pressure
V	total volume
V_g	volume of gas
V_s	volume of solids
V_v	volume of voids
V_w	volume of water
V_o	initial volume
v	velocity
W	total weight
W_s	weight of solids
W_w	weight of water
w	water content
w_c	water content at consolidation
w_f	final water content
w_l	liquid limit
w_n	natural water content
w_p	plastic limit
w_s	shrinkage limit
w_o, w_i	initial water content
α	slope of q_f versus p_f
α'	slope of q_f versus p_f'
γ_t	total unit weight
γ_d	dry unit weight
γ_s	unit weight of solids
γ_w	unit weight of water
ε	strain
ε_{vol}	volume strain
ε_h, ε_v	horizontal strain, vertical strain
μ	Poisson's ratio, also viscosity
σ	normal stress
σ'	effective normal stress
σ_c, σ'_c	consolidation stress in isotropic stress system
σ_h, σ'_h	horizontal normal stress
σ_v, σ'_v	vertical normal stress
σ_1	major principal stress
σ_2	intermediate principal stress
σ_3	minor principal stress
τ	shear stress
φ	friction angle based on total stresses
φ'	friction angle based on effective stresses
φ'_r	residual friction angle
φ_{ult}	φ for ultimate strength