CERTIFICATE OF ANALYSIS

Adam Cote
GZA GeoEnvironmental, Inc.
1350 Main Street, Suite 1400
Springfield, MA 01103

RE: 123 Pine Street (15.0166521.00)
ESS Laboratory Work Order Number: 1608558

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 3:33 pm, Aug 26, 2016

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with NELAC Standards, A2LA and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

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Client Project ID: 123 Pine Street

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SAMPLE RECEIPT

The following samples were received on August 19, 2016 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has performed and reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Data Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Lab Number	Sample Name	Matrix	Analysis
1608558-01	123 Pine - S-4	Soil	EPH8270, MADEP-EPH
1608558-02	123 Pine - S-5	Soil	EPH8270, MADEP-EPH
1608558-03	123 Pine - S-6	Soil	EPH8270, MADEP-EPH
1608558-04	123 Pine - S-7	Soil	EPH8270, MADEP-EPH

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PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

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CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015D - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

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ESS Laboratory Work Order: 1608558

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **1608558-01 through 1608558-04**

Matrices: ( ) Ground Water/Surface Water (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

( ) 8260 VOC CAM II A	( ) 7470/7471 Hg CAM III B	( ) MassDEP VPH CAM IV A	( ) 8081 Pesticides CAM V B	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
( ) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	(X) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) 8330 Explosives CAM VIII A	( ) TO-15 VOC CAM IX B
( ) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	( ) 8082 PCB CAM V A	( ) 6860 Perchlorate CAM VIII B	( ) 9014 Total Cyanide/PAC CAM VI A	

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	a. VPH, EPH, APH and TO-15 only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (X) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for "'Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes (X) No ( )*
	***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes (X) No ( )*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes (X) No ( )*

All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: _____ Date: August 26, 2016

Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: 123 Pine Street
Client Sample ID: 123 Pine - S-4
Date Sampled: 08/18/16 10:15
Percent Solids: 98
Initial Volume: 24.6
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1608558
ESS Laboratory Sample ID: 1608558-01
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 8/22/16 12:49

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (15.5)		MADEP-EPH		1	ZLC	08/24/16 7:58	CZH0398	CH62218
C19-C36 Aliphatics1	ND (15.5)		MADEP-EPH		1	ZLC	08/24/16 7:58	CZH0398	CH62218
C11-C22 Unadjusted Aromatics1	ND (15.5)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
C11-C22 Aromatics1,2	ND (15.5)		EPH8270			VSC	08/24/16 4:01		[CALC]
2-Methylnaphthalene	ND (0.21)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Acenaphthene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Naphthalene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Phenanthrene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Acenaphthylene	ND (0.21)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Anthracene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Benzo(a)anthracene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Benzo(a)pyrene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Benzo(b)fluoranthene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Benzo(g,h,i)perylene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Benzo(k)fluoranthene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Chrysene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Dibenzo(a,h)Anthracene	ND (0.21)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Fluoranthene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Fluorene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Indeno(1,2,3-cd)Pyrene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218
Pyrene	ND (0.41)		EPH8270		1	VSC	08/24/16 4:01	CZH0424	CH62218

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*68 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*57 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*73 %*		*40-140*
Surrogate: O-Terphenyl	*69 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: 123 Pine Street
Client Sample ID: 123 Pine - S-5
Date Sampled: 08/18/16 10:32
Percent Solids: 94
Initial Volume: 24.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1608558
ESS Laboratory Sample ID: 1608558-02
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 8/22/16 12:49

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (16.3)		MADEP-EPH		1	ZLC	08/24/16 8:45	CZH0398	CH62218
C19-C36 Aliphatics1	**16.4** (16.3)		MADEP-EPH		1	ZLC	08/24/16 8:45	CZH0398	CH62218
C11-C22 Unadjusted Aromatics1	ND (16.3)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
C11-C22 Aromatics1,2	ND (16.3)		EPH8270			VSC	08/24/16 4:38		[CALC]
2-Methylnaphthalene	ND (0.22)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Acenaphthene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Naphthalene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Phenanthrene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Acenaphthylene	ND (0.22)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Anthracene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Benzo(a)anthracene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Benzo(a)pyrene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Benzo(b)fluoranthene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Benzo(g,h,i)perylene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Benzo(k)fluoranthene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Chrysene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Dibenzo(a,h)Anthracene	ND (0.22)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Fluoranthene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Fluorene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Indeno(1,2,3-cd)Pyrene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218
Pyrene	ND (0.43)		EPH8270		1	VSC	08/24/16 4:38	CZH0424	CH62218

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*65 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*49 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*70 %*		*40-140*
Surrogate: O-Terphenyl	*65 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: 123 Pine Street
Client Sample ID: 123 Pine - S-6
Date Sampled: 08/18/16 10:43
Percent Solids: 89
Initial Volume: 24.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1608558
ESS Laboratory Sample ID: 1608558-03
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 8/22/16 12:49

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	**384** (17.0)		MADEP-EPH		1	ZLC	08/24/16 9:32	CZH0398	CH62218
C19-C36 Aliphatics1	**88.9** (17.0)		MADEP-EPH		1	ZLC	08/24/16 9:32	CZH0398	CH62218
C11-C22 Unadjusted Aromatics1	**84.4** (17.0)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
C11-C22 Aromatics1,2	**83.4** (17.0)		EPH8270			VSC	08/24/16 5:14		[CALC]
2-Methylnaphthalene	**0.95** (0.23)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Acenaphthene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Naphthalene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Phenanthrene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Acenaphthylene	ND (0.23)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Anthracene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Benzo(a)anthracene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Benzo(a)pyrene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Benzo(b)fluoranthene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Benzo(g,h,i)perylene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Benzo(k)fluoranthene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Chrysene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Dibenzo(a,h)Anthracene	ND (0.23)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Fluoranthene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Fluorene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Indeno(1,2,3-cd)Pyrene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218
Pyrene	ND (0.45)		EPH8270		1	VSC	08/24/16 5:14	CZH0424	CH62218

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*60 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*50 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*64 %*		*40-140*
Surrogate: O-Terphenyl	*55 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: 123 Pine Street
Client Sample ID: 123 Pine - S-7
Date Sampled: 08/18/16 10:54
Percent Solids: 96
Initial Volume: 24.6
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1608558
ESS Laboratory Sample ID: 1608558-04
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 8/22/16 12:49

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (15.9)		MADEP-EPH		1	ZLC	08/24/16 10:20	CZH0398	CH62218
C19-C36 Aliphatics1	ND (15.9)		MADEP-EPH		1	ZLC	08/24/16 10:20	CZH0398	CH62218
C11-C22 Unadjusted Aromatics1	ND (15.9)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
C11-C22 Aromatics1,2	ND (15.9)		EPH8270			VSC	08/24/16 5:51		[CALC]
2-Methylnaphthalene	ND (0.21)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Acenaphthene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Naphthalene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Phenanthrene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Acenaphthylene	ND (0.21)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Anthracene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Benzo(a)anthracene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Benzo(a)pyrene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Benzo(b)fluoranthene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Benzo(g,h,i)perylene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Benzo(k)fluoranthene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Chrysene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Dibenzo(a,h)Anthracene	ND (0.21)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Fluoranthene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Fluorene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Indeno(1,2,3-cd)Pyrene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218
Pyrene	ND (0.42)		EPH8270		1	VSC	08/24/16 5:51	CZH0424	CH62218

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*68 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*59 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*73 %*		*40-140*
Surrogate: O-Terphenyl	*65 %*		*40-140*

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Client Project ID: 123 Pine Street

ESS Laboratory Work Order: 1608558

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CH62218 - 3546										
Blank										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
Decane (C10)	ND	0.5	mg/kg wet							
Docosane (C22)	ND	0.5	mg/kg wet							
Dodecane (C12)	ND	0.5	mg/kg wet							
Eicosane (C20)	ND	0.5	mg/kg wet							
Hexacosane (C26)	ND	0.5	mg/kg wet							
Hexadecane (C16)	ND	0.5	mg/kg wet							
Hexatriacontane (C36)	ND	0.5	mg/kg wet							
Nonadecane (C19)	ND	0.5	mg/kg wet							
Nonane (C9)	ND	0.5	mg/kg wet							
Octacosane (C28)	ND	0.5	mg/kg wet							
Octadecane (C18)	ND	0.5	mg/kg wet							
Tetracosane (C24)	ND	0.5	mg/kg wet							
Tetradecane (C14)	ND	0.5	mg/kg wet							
Triacontane (C30)	ND	0.5	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.42*		mg/kg wet	*2.000*		*71*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.20	mg/kg wet							
Acenaphthene	ND	0.40	mg/kg wet							
Acenaphthylene	ND	0.20	mg/kg wet							
Anthracene	ND	0.40	mg/kg wet							
Benzo(a)anthracene	ND	0.40	mg/kg wet							
Benzo(a)pyrene	ND	0.40	mg/kg wet							
Benzo(b)fluoranthene	ND	0.40	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.40	mg/kg wet							
Benzo(k)fluoranthene	ND	0.40	mg/kg wet							
C11-C22 Aromatics1,2	ND	15.0	mg/kg wet							
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Chrysene	ND	0.40	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.20	mg/kg wet							
Fluoranthene	ND	0.40	mg/kg wet							
Fluorene	ND	0.40	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.40	mg/kg wet							
Naphthalene	ND	0.40	mg/kg wet							
Phenanthrene	ND	0.40	mg/kg wet							
Pyrene	ND	0.40	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*1.85*		mg/kg wet	*2.000*		*92*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.95*		mg/kg wet	*2.000*		*97*	*40-140*			
Surrogate: O-Terphenyl	*1.64*		mg/kg wet	*2.000*		*82*	*40-140*			
LCS										
C19-C36 Aliphatics1	13.9	15.0	mg/kg wet	16.00		87	40-140			
C9-C18 Aliphatics1	7.8	15.0	mg/kg wet	12.00		65	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: 123 Pine Street

ESS Laboratory Work Order: 1608558

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CH62218 - 3546										
Decane (C10)	0.9	0.5	mg/kg wet	2.000		45	40-140			
Docosane (C22)	1.6	0.5	mg/kg wet	2.000		82	40-140			
Dodecane (C12)	1.0	0.5	mg/kg wet	2.000		51	40-140			
Eicosane (C20)	1.5	0.5	mg/kg wet	2.000		74	40-140			
Hexacosane (C26)	1.5	0.5	mg/kg wet	2.000		74	40-140			
Hexadecane (C16)	1.3	0.5	mg/kg wet	2.000		66	40-140			
Hexatriacontane (C36)	1.4	0.5	mg/kg wet	2.000		69	40-140			
Nonadecane (C19)	1.5	0.5	mg/kg wet	2.000		74	40-140			
Nonane (C9)	0.7	0.5	mg/kg wet	2.000		37	30-140			
Octacosane (C28)	1.5	0.5	mg/kg wet	2.000		74	40-140			
Octadecane (C18)	1.4	0.5	mg/kg wet	2.000		71	40-140			
Tetracosane (C24)	1.5	0.5	mg/kg wet	2.000		75	40-140			
Tetradecane (C14)	1.1	0.5	mg/kg wet	2.000		55	40-140			
Triacontane (C30)	1.5	0.5	mg/kg wet	2.000		75	40-140			
Surrogate: 1-Chlorooctadecane	*1.44*		mg/kg wet	*2.000*		*72*	*40-140*			
LCS										
2-Methylnaphthalene	1.24	0.20	mg/kg wet	2.000		62	40-140			
Acenaphthene	1.36	0.40	mg/kg wet	2.000		68	40-140			
Acenaphthylene	1.36	0.20	mg/kg wet	2.000		68	40-140			
Anthracene	1.54	0.40	mg/kg wet	2.000		77	40-140			
Benzo(a)anthracene	1.60	0.40	mg/kg wet	2.000		80	40-140			
Benzo(a)pyrene	1.69	0.40	mg/kg wet	2.000		84	40-140			
Benzo(b)fluoranthene	1.65	0.40	mg/kg wet	2.000		82	40-140			
Benzo(g,h,i)perylene	1.67	0.40	mg/kg wet	2.000		83	40-140			
Benzo(k)fluoranthene	1.73	0.40	mg/kg wet	2.000		86	40-140			
C11-C22 Aromatics1,2	ND	15.0	mg/kg wet							
C11-C22 Unadjusted Aromatics1	26.8	15.0	mg/kg wet	34.00		79	40-140			
Chrysene	1.66	0.40	mg/kg wet	2.000		83	40-140			
Dibenzo(a,h)Anthracene	1.65	0.20	mg/kg wet	2.000		83	40-140			
Fluoranthene	1.58	0.40	mg/kg wet	2.000		79	40-140			
Fluorene	1.45	0.40	mg/kg wet	2.000		73	40-140			
Indeno(1,2,3-cd)Pyrene	1.63	0.40	mg/kg wet	2.000		82	40-140			
Naphthalene	1.22	0.40	mg/kg wet	2.000		61	40-140			
Phenanthrene	1.55	0.40	mg/kg wet	2.000		78	40-140			
Pyrene	1.62	0.40	mg/kg wet	2.000		81	40-140			
Surrogate: 2-Bromonaphthalene	*1.82*		mg/kg wet	*2.000*		*91*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.87*		mg/kg wet	*2.000*		*94*	*40-140*			
Surrogate: O-Terphenyl	*1.72*		mg/kg wet	*2.000*		*86*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS Dup										
C19-C36 Aliphatics1	13.6	15.0	mg/kg wet	16.00		85	40-140	2	25	
C9-C18 Aliphatics1	7.8	15.0	mg/kg wet	12.00		65	40-140	0.2	25	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: 123 Pine Street

ESS Laboratory Work Order: 1608558

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CH62218 - 3546										
Decane (C10)	0.9	0.5	mg/kg wet	2.000		45	40-140	1	25	
Docosane (C22)	1.5	0.5	mg/kg wet	2.000		73	40-140	12	25	
Dodecane (C12)	1.0	0.5	mg/kg wet	2.000		50	40-140	0.8	25	
Eicosane (C20)	1.5	0.5	mg/kg wet	2.000		73	40-140	2	25	
Hexacosane (C26)	1.5	0.5	mg/kg wet	2.000		73	40-140	2	25	
Hexadecane (C16)	1.3	0.5	mg/kg wet	2.000		65	40-140	3	25	
Hexatriacontane (C36)	1.4	0.5	mg/kg wet	2.000		69	40-140	0.6	25	
Nonadecane (C19)	1.4	0.5	mg/kg wet	2.000		72	40-140	2	25	
Nonane (C9)	0.7	0.5	mg/kg wet	2.000		37	30-140	0.7	25	
Octacosane (C28)	1.5	0.5	mg/kg wet	2.000		73	40-140	2	25	
Octadecane (C18)	1.4	0.5	mg/kg wet	2.000		69	40-140	2	25	
Tetracosane (C24)	1.5	0.5	mg/kg wet	2.000		73	40-140	2	25	
Tetradecane (C14)	1.1	0.5	mg/kg wet	2.000		53	40-140	3	25	
Triacontane (C30)	1.5	0.5	mg/kg wet	2.000		74	40-140	2	25	
Surrogate: 1-Chlorooctadecane	*1.41*		mg/kg wet	*2.000*		*71*	*40-140*			
LCS Dup										
2-Methylnaphthalene	1.18	0.20	mg/kg wet	2.000		59	40-140	4	30	
Acenaphthene	1.29	0.40	mg/kg wet	2.000		65	40-140	5	30	
Acenaphthylene	1.31	0.20	mg/kg wet	2.000		65	40-140	4	30	
Anthracene	1.49	0.40	mg/kg wet	2.000		74	40-140	4	30	
Benzo(a)anthracene	1.50	0.40	mg/kg wet	2.000		75	40-140	7	30	
Benzo(a)pyrene	1.63	0.40	mg/kg wet	2.000		82	40-140	3	30	
Benzo(b)fluoranthene	1.65	0.40	mg/kg wet	2.000		82	40-140	0.1	30	
Benzo(g,h,i)perylene	1.61	0.40	mg/kg wet	2.000		80	40-140	4	30	
Benzo(k)fluoranthene	1.51	0.40	mg/kg wet	2.000		75	40-140	14	30	
C11-C22 Aromatics1,2	ND	15.0	mg/kg wet							
C11-C22 Unadjusted Aromatics1	25.1	15.0	mg/kg wet	34.00		74	40-140	6	25	
Chrysene	1.56	0.40	mg/kg wet	2.000		78	40-140	6	30	
Dibenzo(a,h)Anthracene	1.58	0.20	mg/kg wet	2.000		79	40-140	4	30	
Fluoranthene	1.49	0.40	mg/kg wet	2.000		74	40-140	6	30	
Fluorene	1.36	0.40	mg/kg wet	2.000		68	40-140	7	30	
Indeno(1,2,3-cd)Pyrene	1.56	0.40	mg/kg wet	2.000		78	40-140	5	30	
Naphthalene	1.17	0.40	mg/kg wet	2.000		59	40-140	4	30	
Phenanthrene	1.46	0.40	mg/kg wet	2.000		73	40-140	6	30	
Pyrene	1.54	0.40	mg/kg wet	2.000		77	40-140	5	30	
Surrogate: 2-Bromonaphthalene	*1.61*		mg/kg wet	*2.000*		*80*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.96*		mg/kg wet	*2.000*		*98*	*40-140*			
Surrogate: O-Terphenyl	*1.62*		mg/kg wet	*2.000*		*81*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: 123 Pine Street

ESS Laboratory Work Order: 1608558

Notes and Definitions

U	Analyte included in the analysis, but not detected
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
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ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/documents/AllLabs.xls

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.depweb.state.pa.us/portal/server.pt/community/labs/13780/laboratory_accreditation_program/590095

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Springfield, MA - GZA/CMT

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1608558
Date Received: 8/19/2016
Project Due Date: 8/26/2016
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.6 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOAs brought to freezer: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	62338	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	62337	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	62336	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	62335	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review
Are barcode labels on correct containers? (Yes) / No

Completed By: Date & Time: 8/19/16 1442
Reviewed By: Adam Bys Iso Date & Time: 8/19/16 1450
Delivered By: Adam Bys Iso 8/19/16 1450

ESS Laboratory

Division of Thielsch Engineering, Inc.

185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1608558

Turn Time ✓ Standard Other_____

Regulatory State: MA RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____

Electonic Deliverables Excel Access PDF

Co. Name: GZA GeoEnvironmental	Project #: 15.0166521.00	Project Name: 123 Pine Street, Holyoke, MA	
Contact Person: Adam Cote	Address: 1350 Main Street - Suite 1400		
City: Springfield	State: MA	Zip: 01103	PO #: —
Tel.: 413-726-2100	Fax: —	email: adam.cote@gza.com	

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: MA-EPH w/ HC Ranges + Targets									
1	8/18/16	10:15	G	S	123 Pine - S-4	1	1	AG	4oz	X									
2	↓	10:32	↓	↓	123 Pine - S-5	1	1	↓	↓	X									
3	↓	10:43	↓	↓	123 Pine - S-6	1	1	↓	↓	X									
4	↓	10:54	↓	↓	123 Pine - S-7	1	1	↓	↓	X									

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes ____ No

Seals Intact ____ Yes ____ No NA: ✓

Cooler Temperature: 1.6 Ice ✓

Internal Use Only

[N] Pickup

[ ] Technician___

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by : D. Harris

Comments:

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
8/18/16 1330	GZA Fridge 8/18/16 1330	8/19/16	8/19/16 8:30
8/19/16 14:30	8/19/16 1437		

* By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

1 (White) Lab Copy
2 (Yellow) Client Receipt