

APPENDIX C

Laboratory Analytical Reports

GROUNDWATER ANALYTICAL

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September 29, 2005

Mr. Kevin Trainer
GeolInsight, Inc.
5 Lan Drive
Second Floor
Westford, MA 01886

LABORATORY REPORT

Project: **Buzzards Bay/3871-002**
Lab ID: **86989**
Received: **08-30-05**

Dear Kevin:

Enclosed are the analytical results for the above referenced project. The project was processed for Standard turnaround.

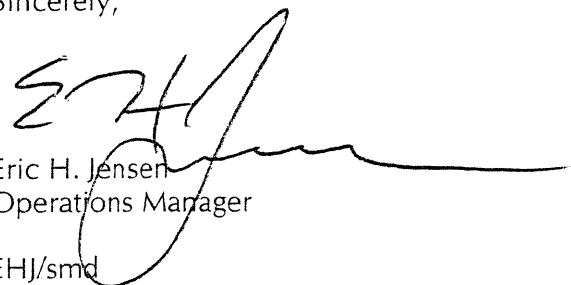
This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a sample receipt report detailing the samples received, a project narrative indicating project changes and non-conformances, a quality control report, and a statement of our state certifications.

The analytical results contained in this report meet all applicable NELAC standards, except as may be specifically noted, or described in the project narrative. This report may only be used or reproduced in its entirety.

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

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,



Eric H. Jensen
Operations Manager

EHJ/smd
Enclosures

Sample Receipt Report

Project: **Buzzards Bay/3871-002**
Client: **Geolnsight, Inc.**
Lab ID: **86989**

Delivery: **Hand**
Airbill: **n/a**
Lab Receipt: **08-30-05**

Temperature: **4.8'C**
Chain of Custody: **Present**
Custody Seal(s): **n/a**

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-1	W2A10-P2-UIT-O1		Soil	8/30/05 10:30	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668311	120 mL Amber Glass	Industrial	BX17923	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-2	W2A10-P2-LIT-O1		Soil	8/30/05 10:37	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668160	120 mL Amber Glass	Industrial	BX17912	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-3	W2A10-P2-UIT-O2		Soil	8/30/05 11:28	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668178	120 mL Amber Glass	Industrial	BX17912	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-8	W2A10-P2-UIT-03		Soil	8/30/05 12:09	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668342	120 mL Amber Glass	Industrial	BX17922	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-9	W2A10-P2-LIT-03		Soil	8/30/05 12:18	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668338	120 mL Amber Glass	Industrial	BX17922	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-10	W2A10-P2-UIT-05		Soil	8/30/05 13:39	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668327	120 mL Amber Glass	Industrial	BX17922	None	n/a	n/a	n/a		
C664738	500 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-11	W2A10-P2-LIT-05		Soil	8/30/05 13:52	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668345	120 mL Amber Glass	Industrial	BX17922	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-12	W2A-P2-M-01		Soil	8/30/05 11:30	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668325	120 mL Amber Glass	Industrial	BX17923	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-13	W2A-P2-M-02		Soil	8/30/05 11:42	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668324	120 mL Amber Glass	Industrial	BX17923	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-14	W2A-P2-M-02-MS		Soil	8/30/05 11:42	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668304	120 mL Amber Glass	Industrial	BX17923	None	n/a	n/a	n/a		

Sample Receipt Report (Continued)

Project: **Buzzards Bay/3871-002**
Client: **GeoInsight, Inc.**
Lab ID: **86989**

Delivery: **Hand**
Airbill: **n/a**
Lab Receipt: **08-30-05**

Temperature: **4.8'C**
Chain of Custody: **Present**
Custody Seal(s): **n/a**

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-15	W2A-P2-M-02-MS-L		Soil	8/30/05 11:42	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668306	120 mL Amber Glass	Industrial	BX17923	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-16	W2A03-P2-M-03		Soil	8/30/05 12:02	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668303	120 mL Amber Glass	Industrial	BX17923	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-17	W2A03-P2-M-04		Soil	8/30/05 12:20	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668302	120 mL Amber Glass	Industrial	BX17923	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-18	W2A03-P2-M-05		Soil	8/30/05 13:26	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668163	120 mL Amber Glass	Industrial	BX17912	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-19	W2A03-P2-M-06		Soil	8/30/05 13:12	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668336	120 mL Amber Glass	Industrial	BX17922	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-20	W2A10-P2-UIT-05		Soil	8/30/05 13:39	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C664736	500 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-21	W2A10-P2-UIT-05		Soil	8/30/05 13:39	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C664739	500 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-22	W2A10-P2-UIT-05		Soil	8/30/05 13:39	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C664737	500 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-23	W2A10-P2-UIT-05		Soil	8/30/05 13:39	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C641981	500 mL Amber Glass	Proline	BX17255	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-24	W2A10-P2-LIT-02		Soil	8/30/05 11:39	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C668664	120 mL Amber Glass	Industrial	BX17917	None	n/a	n/a	n/a		

Sample Receipt Report (Continued)

Project: **Buzzards Bay/3871-002**
Client: **GeolInsight, Inc.**
Lab ID: **86989**

Delivery: **Hand**
Airbill: **n/a**
Lab Receipt: **08-30-05**

Temperature: **4.8'C**
Chain of Custody: **Present**
Custody Seal(s): **n/a**

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-25	W2A-P2-M-02-MSD		Soil	8/30/05 11:42	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C664780	250 mL Glass	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
86989-26	W2A-P2-M-02-MSD-L		Soil	8/30/05 11:42	MA DEP EPH with PAHs by 8270C-Mod SIM				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C664781	250 mL Glass	n/a	n/a	None	n/a	n/a	n/a		

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A10-P2-UIT-O1
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.
Laboratory ID: 86989-01
Sampled: 08-30-05 10:30
Received: 08-30-05 20:21
Extracted: 09-09-05 15:00
Analyzed (AL): 09-13-05 04:06
Analyzed (AR): 09-13-05 04:50
Analyst: MM

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool
QC Batch ID: EP-2140-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 16 g
Final Volume: 1 mL
% Solids: 83
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	35
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	35
n-C11 to n-C22 Aromatic Hydrocarbons [†] [◊]	BRL		mg/Kg	35

Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	35
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QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	3.1	2.5	81 %	40 - 140 %
2-Bromonaphthalene	3.1	2.5	82 %	40 - 140 %
Extraction: Chloro-octadecane	3.1	2.4	78 %	40 - 140 %
ortho-Terphenyl	3.1	2.6	84 %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed? Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved? Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1? No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

[◊] n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A10-P2-UIT-O1
Project: Buzzards Bay/3871-002
Client: Geolnsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-01
Sampled: 08-30-05 10:30
Received: 08-30-05 20:21
Extracted: 09-09-05 15:00
Analyzed: 09-13-05 18:41
Analyst: JJT

QC Batch ID: EP-2140-M
Instrument ID: MS-6 HP 6890
Sample Volume: 16 g
Final Volume: 1 mL
Percent Solids: 83
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	16
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	16
208-96-8	Acenaphthylene	BRL		ug/Kg	16
83-32-9	Acenaphthene	BRL		ug/Kg	16
86-73-7	Fluorene	BRL		ug/Kg	16
85-01-8	Phenanthrene	BRL		ug/Kg	16
120-12-7	Anthracene	BRL		ug/Kg	16
206-44-0	Fluoranthene	BRL		ug/Kg	16
129-00-0	Pyrene	BRL		ug/Kg	16
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	16
218-01-9	Chrysene	BRL		ug/Kg	16
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	16
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	16
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	16
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	16
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	16
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	16

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,100	2,500	82 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A10-P2-LIT-O1
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.

Laboratory ID: 86989-02
Sampled: 08-30-05 10:37
Received: 08-30-05 20:21
Extracted: 09-09-05 15:00
Analyzed (AL): 09-13-05 05:34
Analyzed (AR): 09-13-05 06:19
Analyst: MM

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

QC Batch ID: EP-2140-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 16 g
Final Volume: 1 mL
% Solids: 85
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	34
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	34
n-C11 to n-C22 Aromatic Hydrocarbons ^{† 0}	BRL		mg/Kg	34

Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	34
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QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation:				
2-Fluorobiphenyl	3.0	2.5	84 %	40 - 140 %
2-Bromonaphthalene	3.0	2.6	86 %	40 - 140 %
Extraction:				
Chloro-octadecane	3.0	2.2	74 %	40 - 140 %
ortho -Terphenyl	3.0	2.4	80 %	40 - 140 %

QA/QC Certification				
1. Were all QA/QC procedures required by the method followed?				Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?				Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?				No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.				

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
⁰ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A10-P2-LIT-O1
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-02
Sampled: 08-30-05 10:37
Received: 08-30-05 20:21
Extracted: 09-09-05 15:00
Analyzed: 09-13-05 19:21
Analyst: JJT

QC Batch ID: EP-2140-M
Instrument ID: MS-6 HP 6890
Sample Volume: 16 g
Final Volume: 1 mL
Percent Solids: 85
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	18
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	18
208-96-8	Acenaphthylene	BRL		ug/Kg	18
83-32-9	Acenaphthene	BRL		ug/Kg	18
86-73-7	Fluorene	BRL		ug/Kg	18
85-01-8	Phenanthrene	BRL		ug/Kg	18
120-12-7	Anthracene	BRL		ug/Kg	18
206-44-0	Fluoranthene	BRL		ug/Kg	18
129-00-0	Pyrene	BRL		ug/Kg	18
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	18
218-01-9	Chrysene	BRL		ug/Kg	18
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	18
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	18
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	18
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	18
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	18
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	18

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,000	3,000	99 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A10-P2-UIT-O2
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.
Laboratory ID: 86989-03
Sampled: 08-30-05 11:28
Received: 08-30-05 20:21
Extracted: 09-12-05 14:00
Analyzed (AL): 09-13-05 07:47
Analyzed (AR): 09-13-05 08:32
Analyst: MM

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool
QC Batch ID: EP-2142-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 16 g
Final Volume: 1 mL
% Solids: 94
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	30
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	30
n-C11 to n-C22 Aromatic Hydrocarbons [†] ◊	BRL		mg/Kg	30

Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL	mg/Kg	30
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QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	2.7	2.2	81 %	40 - 140 %
2-Bromonaphthalene	2.7	2.3	83 %	40 - 140 %
Extraction: Chloro-octadecane	2.7	2.0	74 %	40 - 140 %
ortho -Terphenyl	2.7	2.1	76 %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed? Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved? Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1? No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A10-P2-UIT-O2
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-03
Sampled: 08-30-05 11:28
Received: 08-30-05 20:21
Extracted: 09-12-05 14:00
Analyzed: 09-13-05 20:00
Analyst: JJT

QC Batch ID: EP-2142-M
Instrument ID: MS-6 HP 6890
Sample Volume: 16 g
Final Volume: 1 mL
Percent Solids: 94
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	12
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	12
208-96-8	Acenaphthylene	BRL		ug/Kg	12
83-32-9	Acenaphthene	BRL		ug/Kg	12
86-73-7	Fluorene	BRL		ug/Kg	12
85-01-8	Phenanthrene	BRL		ug/Kg	12
120-12-7	Anthracene	BRL		ug/Kg	12
206-44-0	Fluoranthene	BRL		ug/Kg	12
129-00-0	Pyrene	BRL		ug/Kg	12
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	12
218-01-9	Chrysene	BRL		ug/Kg	12
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	12
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	12
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	12
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	12
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	12
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	12

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	2,700	2,200	81 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A10-P2-UIT-03
Project: Buzzards Bay/3871-002
Client: GeolInsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-08
Sampled: 08-30-05 12:09
Received: 08-30-05 20:21
Extracted: 09-12-05 14:00
Analyzed (AL): 09-13-05 09:16
Analyzed (AR): 09-13-05 10:00
Analyst: MM

QC Batch ID: EP-2142-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 16 g
Final Volume: 1 mL
% Solids: 90
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	32
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	32
n-C11 to n-C22 Aromatic Hydrocarbons [†] [◊]	BRL		mg/Kg	32
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	32

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	2.8	2.2	78 %	40 - 140 %
2-Bromonaphthalene	2.8	2.2	80 %	40 - 140 %
Extraction: Chloro-octadecane	2.8	2.1	76 %	40 - 140 %
ortho-Terphenyl	2.8	2.1	75 %	40 - 140 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
[◊] n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A10-P2-UIT-03
Project: Buzzards Bay/3871-002
Client: Geolnsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-08
Sampled: 08-30-05 12:09
Received: 08-30-05 20:21
Extracted: 09-12-05 14:00
Analyzed: 09-13-05 20:39
Analyst: JJT

QC Batch ID: EP-2142-M
Instrument ID: MS-6 HP 6890
Sample Volume: 16 g
Final Volume: 1 mL
Percent Solids: 90
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	12
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	12
208-96-8	Acenaphthylene	BRL		ug/Kg	12
83-32-9	Acenaphthene	BRL		ug/Kg	12
86-73-7	Fluorene	BRL		ug/Kg	12
85-01-8	Phenanthrene	BRL		ug/Kg	12
120-12-7	Anthracene	BRL		ug/Kg	12
206-44-0	Fluoranthene	11		ug/Kg	12
129-00-0	Pyrene	9	j	ug/Kg	12
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	12
218-01-9	Chrysene	BRL		ug/Kg	12
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	12
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	12
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	12
193-39-5	Indeno[1,2,3-c,d]pyrene	8	j	ug/Kg	12
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	12
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	12

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	2,800	2,100	76 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
j Indicates an estimated value detected below the reporting limit for the analyte.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A10-P2-LIT-03
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-09
Sampled: 08-30-05 12:18
Received: 08-30-05 20:21
Extracted: 09-12-05 14:00
Analyzed (AL): 09-13-05 10:45
Analyzed (AR): 09-13-05 11:30
Analyst: MM

QC Batch ID: EP-2142-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 15 g
Final Volume: 1 mL
% Solids: 83
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	36
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	36
n-C11 to n-C22 Aromatic Hydrocarbons [†] [◊]	BRL		mg/Kg	36
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	36

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	3.2	2.6	81 %	40 - 140 %
2-Bromonaphthalene	3.2	2.7	85 %	40 - 140 %
Extraction: Chloro-octadecane	3.2	2.4	76 %	40 - 140 %
ortho-Terphenyl	3.2	2.5	80 %	40 - 140 %

QA/QC Certification				
1. Were all QA/QC procedures required by the method followed?				Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?				Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?				No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.				

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
[◊] n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A10-P2-LIT-03
Project: Buzzards Bay/3871-002
Client: Geolnsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-09
Sampled: 08-30-05 12:18
Received: 08-30-05 20:21
Extracted: 09-12-05 14:00
Analyzed: 09-13-05 21:18
Analyst: JJT

QC Batch ID: EP-2142-M
Instrument ID: MS-6 HP 6890
Sample Volume: 15 g
Final Volume: 1 mL
Percent Solids: 83
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	14
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	14
208-96-8	Acenaphthylene	BRL		ug/Kg	14
83-32-9	Acenaphthene	BRL		ug/Kg	14
86-73-7	Fluorene	BRL		ug/Kg	14
85-01-8	Phenanthrene	BRL		ug/Kg	14
120-12-7	Anthracene	BRL		ug/Kg	14
206-44-0	Fluoranthene	BRL		ug/Kg	14
129-00-0	Pyrene	BRL		ug/Kg	14
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	14
218-01-9	Chrysene	BRL		ug/Kg	14
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	14
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	14
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	14
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	14
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	14
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	14

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,200	2,500	80 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A10-P2-UIT-05
Project: Buzzards Bay/3871-002
Client: GeolInsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-10
Sampled: 08-30-05 13:39
Received: 08-30-05 20:21
Extracted: 09-12-05 14:00
Analyzed (AL): 09-13-05 17:26
Analyzed (AR): 09-13-05 18:10
Analyst: MM

QC Batch ID: EP-2142-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 15 g
Final Volume: 1 mL
% Solids: 94
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	32
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	32
n-C11 to n-C22 Aromatic Hydrocarbons [†] [◊]	BRL		mg/Kg	32

Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	32
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QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	2.8	2.2	80 %	40 - 140 %
2-Bromonaphthalene	2.8	2.0	71 %	40 - 140 %
Extraction: Chloro-octadecane	2.8	2.3	82 %	40 - 140 %
ortho-Terphenyl	2.8	2.3	83 %	40 - 140 %

QA/QC Certification				
1. Were all QA/QC procedures required by the method followed?				Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?				Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?				No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.				

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
[◊] n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

Matrix Spike and Matrix Spike Duplicate MA DEP Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	W2A10-P2-UIT-05	Laboratory ID:	86989-10	Matrix Spike	86989-20	Spike Duplicate	86989-22
Project:	Buzzards Bay/3871-002	Sampled:	08-30-05 13:39	08-30-05 13:39	08-30-05 13:39	08-30-05 13:39	08-30-05 13:39
Client:	Geolnsight, Inc.	Received:	08-30-05 20:21	08-30-05 20:21	08-30-05 20:21	08-30-05 20:21	08-30-05 20:21
Matrix:	Soil	Extracted:	09-12-05 14:00	09-08-04 16:00	09-08-04 16:00	09-08-04 16:00	09-08-04 16:00
Container:	120 mL Amber Glass	Analyzed (AL):	09-13-05 17:26	09-11-04 00:52	09-11-04 02:20	09-11-04 02:20	09-11-04 02:20
Preservation:	Cool	Analyzed (AR):	09-13-05 18:10	09-11-04 01:36	09-11-04 03:05	09-11-04 03:05	09-11-04 03:05
		Analyst:	MM	MM	MM	MM	MM
		QC Batch ID:	EP-2142-M	EP-1945-M	EP-1945-M	EP-1945-M	EP-1945-M
		Instrument ID:	GC-9 Agilent 6890	GC-9 Agilent 6890	GC-9 Agilent 6890	GC-9 Agilent 6890	GC-9 Agilent 6890
		Sample Weight:	14 g	14 g	15 g	15 g	15 g
		Final Volume:	1 mL	1 mL	1 mL	1 mL	1 mL
		% Solids:	94	94	94	94	94
		Aliphatic Dilution Factor:	1	1	1	1	1
		Aromatic Dilution Factor:	1	1	1	1	1

CAS Number	Analyte	Unspiked Sample (mg/Kg)	MS Spiked (mg/Kg)	MS Measured (mg/Kg)	MS Recovery	MSD Spiked (mg/Kg)	MSD Measured (mg/Kg)	MSD Recovery	RPD	QC Limits	
										Spike	RPD
111-84-2	<i>n</i> -Nonane (C ₉)	BRL	4.0	1.8	46 %	4.0	1.7	43 %	9 %	40 - 140 %	50 %
629-59-4	<i>n</i> -Tetradecane (C ₁₄)	BRL	4.0	2.6	65 %	4.0	2.4	61 %	9 %	40 - 140 %	50 %
629-92-5	<i>n</i> -Nonadecane (C ₁₉)	BRL	4.0	3.0	74 %	4.0	2.7	69 %	8 %	40 - 140 %	50 %
112-95-8	<i>n</i> -Eicosane (C ₂₀)	BRL	4.0	3.0	76 %	4.0	2.8	71 %	8 %	40 - 140 %	50 %
630-02-4	<i>n</i> -Octacosane (C ₂₈)	BRL	4.0	2.8	71 %	4.0	2.7	67 %	6 %	40 - 140 %	50 %
91-20-3	Naphthalene	BRL	4.0	2.2	54 %	4.0	2.1	53 %	4 %	40 - 140 %	50 %
83-32-9	Acenaphthene	BRL	4.0	2.6	64 %	4.0	2.4	60 %	8 %	40 - 140 %	50 %
120-12-7	Anthracene	BRL	4.0	3.1	77 %	4.0	2.9	74 %	6 %	40 - 140 %	50 %
129-00-0	Pyrene	BRL	4.0	3.1	76 %	4.0	2.9	73 %	6 %	40 - 140 %	50 %
218-01-9	Chrysene	BRL	4.0	3.0	75 %	4.0	2.9	72 %	6 %	40 - 140 %	50 %

QC Surrogate Compound		Surrogate Recovery							QC Limits	
Fractionation:	2-Fluorobiphenyl	80%	2.7	2.4	81%	3.5	3.1	73%	40 - 140 %	
	2-Bromonaphthalene	71%	2.7	2.5	62%	3.5	3.2	59%	40 - 140 %	
Extraction:	Chloro-octadecane	82%	2.7	2.1	81%	3.5	2.7	79%	40 - 140 %	
	ortho-Terphenyl	83%	2.7	2.3	79%	3.5	3.1	80%	40 - 140 %	

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998).
Sample extraction performed by microwave accelerated solvent extraction. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A10-P2-UIT-05
Project: Buzzards Bay/3871-002
Client: GeolInsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-10
Sampled: 08-30-05 13:39
Received: 08-30-05 20:21
Extracted: 09-12-05 14:00
Analyzed: 09-13-05 21:58
Analyst: JJT

QC Batch ID: EP-2142-M
Instrument ID: MS-6 HP 6890
Sample Volume: 15 g
Final Volume: 1 mL
Percent Solids: 94
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	12
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	12
208-96-8	Acenaphthylene	BRL		ug/Kg	12
83-32-9	Acenaphthene	BRL		ug/Kg	12
86-73-7	Fluorene	BRL		ug/Kg	12
85-01-8	Phenanthrene	BRL		ug/Kg	12
120-12-7	Anthracene	BRL		ug/Kg	12
206-44-0	Fluoranthene	BRL		ug/Kg	12
129-00-0	Pyrene	BRL		ug/Kg	12
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	12
218-01-9	Chrysene	BRL		ug/Kg	12
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	12
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	12
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	12
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	12
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	12
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	12

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	2,800	2,200	78 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

Matrix Spike and Matrix Spike Duplicate EPA Method 8270C

Field ID:	W2A10-P2-UIT-05	Laboratory ID:	86989-10	Parent Sample	86989-21	Matrix Spike	86989-23	Spike Duplicate
Project:	Buzzards Bay/3871-002	Sampled:	08-30-05 13:39		09-03-05 11:42		08-30-05 11:42	
Client:	Geolnsight, Inc.	Received:	08-30-05 20:21		08-30-05 20:21		08-30-05 20:21	
Matrix:	Soil	Extracted:	09-12-05 14:00		09-13-05 22:00		09-13-05 22:00	
Container:	120 mL Amber Glass	Clean Up:	09-13-05 10:00		09-15-05 10:00		09-15-05 10:00	
Preservation:	Cool	Analyzed:	09-13-05 21:58		09-15-05 16:11		09-15-05 16:51	
		Analyst:	JJT		JJT		JJT	
		QC Batch ID:	EP-2142-M		EP-2142-M		EP-2142-M	
		Instrument ID:	MS 6 HP 6890		MS 6 HP 6890		MS 6 HP 6890	
		Sample Weight:	15 g		16 g		15 g	
		Final Volume:	1 mL		1 mL		1 mL	
		Percent Solids:	94		94		94	
		Dilution Factor:	1		1		1	

CAS Number	Analyte	Unspiked Sample (ug/Kg)	MS Spiked (ug/Kg)	MS Measured (ug/Kg)	MS Recovery	MSD Spiked (ug/Kg)	MSD Measured (ug/Kg)	MSD Recovery	RPD	QC Limits	
										Spike	RPD
91-20-3	Naphthalene	BRL	330	200	57 %	340	180	53 %	3 %	40 - 140%	50 %
91-57-6	2-Methylnaphthalene	BRL	330	220	67 %	340	220	65 %	0 %	40 - 140%	50 %
208-96-8	Acenaphthylene	BRL	330	260	77 %	340	260	75 %	0 %	40 - 140%	50 %
83-32-9	Acenaphthene	BRL	330	270	80 %	340	260	77 %	1 %	40 - 140%	50 %
86-73-7	Fluorene	BRL	330	260	78 %	340	260	77 %	1 %	40 - 140%	50 %
85-01-8	Phenanthrene	BRL	330	270	80 %	340	270	79 %	1 %	40 - 140%	50 %
120-12-7	Anthracene	BRL	330	260	79 %	340	280	81 %	4 %	40 - 140%	50 %
206-44-0	Fluoranthene	BRL	330	330	99 %	340	330	95 %	0 %	40 - 140%	50 %
129-00-0	Pyrene	BRL	330	310	92 %	340	310	90 %	1 %	40 - 140%	50 %
56-55-3	Benzo[a]anthracene	BRL	330	310	93 %	340	320	93 %	2 %	40 - 140%	50 %
218-01-9	Chrysene	BRL	330	300	89 %	340	310	90 %	3 %	40 - 140%	50 %
205-99-2	Benzo[b]fluoranthene	BRL	330	300	90 %	340	310	91 %	3 %	40 - 140%	50 %
207-08-9	Benzo[k]fluoranthene	BRL	330	300	88 %	340	310	92 %	4 %	40 - 140%	50 %
50-32-8	Benzo[a]pyrene	BRL	330	300	91 %	340	310	91 %	2 %	40 - 140%	50 %
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL	330	250	76 %	340	270	78 %	4 %	40 - 140%	50 %
53-70-3	Dibenzo[a,h]anthracene	BRL	330	230	69 %	340	250	73 %	5 %	40 - 140%	50 %
191-24-2	Benzo[g,h,i]perylene	BRL	330	250	75 %	340	260	77 %	4 %	40 - 140%	50 %
QC Surrogate Compound		Surrogate Recovery							QC Limits		
ortho-Terphenyl		78%	3,200	2,300	73%	3,700	2,900	79%	40 - 140 %		

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A10-P2-LIT-05
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-11
Sampled: 08-30-05 13:52
Received: 08-30-05 20:21
Extracted: 09-12-05 14:00
Analyzed (AL): 09-13-05 19:39
Analyzed (AR): 09-13-05 20:24
Analyst: MM

QC Batch ID: EP-2142-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 15 g
Final Volume: 1 mL
% Solids: 85
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	35
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	35
n-C11 to n-C22 Aromatic Hydrocarbons [†] [◊]	BRL		mg/Kg	35
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	35

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	3.1	2.6	83 %	40 - 140 %
2-Bromonaphthalene	3.1	2.0	66 %	40 - 140 %
Extraction: Chloro-octadecane	3.1	2.2	72 %	40 - 140 %
ortho-Terphenyl	3.1	2.6	84 %	40 - 140 %

QA/QC Certification				
1. Were all QA/QC procedures required by the method followed?				Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?				Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?				No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.				

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
[◊] n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A10-P2-LIT-05
Project: Buzzards Bay/3871-002
Client: Geolnsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-11
Sampled: 08-30-05 13:52
Received: 08-30-05 20:21
Extracted: 09-12-05 14:00
Analyzed: 09-14-05 10:54
Analyst: JJT

QC Batch ID: EP-2142-M
Instrument ID: MS-6 HP 6890
Sample Volume: 15 g
Final Volume: 1 mL
Percent Solids: 85
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	6	j	ug/Kg	12
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	12
208-96-8	Acenaphthylene	BRL		ug/Kg	12
83-32-9	Acenaphthene	BRL		ug/Kg	12
86-73-7	Fluorene	BRL		ug/Kg	12
85-01-8	Phenanthrene	BRL		ug/Kg	12
120-12-7	Anthracene	BRL		ug/Kg	12
206-44-0	Fluoranthene	BRL		ug/Kg	12
129-00-0	Pyrene	BRL		ug/Kg	12
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	12
218-01-9	Chrysene	BRL		ug/Kg	12
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	12
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	12
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	12
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	12
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	12
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	12

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,100	2,500	81 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
j Indicates an estimated value detected below the reporting limit for the analyte.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A-P2-M-01
Project: Buzzards Bay/3871-002
Client: Geolnsight, Inc.

Laboratory ID: 86989-12
Sampled: 08-30-05 11:30
Received: 08-30-05 20:21
Extracted: 09-12-05 22:00
Analyzed (AL): 09-13-05 21:08
Analyzed (AR): 09-13-05 21:52
Analyst: MM

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

QC Batch ID: EP-2143-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 15 g
Final Volume: 1 mL
% Solids: 74
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	40
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	40
n-C11 to n-C22 Aromatic Hydrocarbons [†] [◊]	BRL		mg/Kg	40

Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	40
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QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	3.5	2.6	73 %	40 - 140 %
2-Bromonaphthalene	3.5	2.0	58 %	40 - 140 %
Extraction: Chloro-octadecane	3.5	2.8	79 %	40 - 140 %
ortho -Terphenyl	3.5	2.7	77 %	40 - 140 %

QA/QC Certification				
1. Were all QA/QC procedures required by the method followed?				Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?				Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?				No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.				

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
[◊] n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A-P2-M-01
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-12
Sampled: 08-30-05 11:30
Received: 08-30-05 20:21
Extracted: 09-13-05 22:00
Analyzed: 09-14-05 11:33
Analyst: JJT

QC Batch ID: EP-2143-M
Instrument ID: MS-6 HP 6890
Sample Volume: 15 g
Final Volume: 1 mL
Percent Solids: 74
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	10	j	ug/Kg	13
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	13
208-96-8	Acenaphthylene	BRL		ug/Kg	13
83-32-9	Acenaphthene	BRL		ug/Kg	13
86-73-7	Fluorene	BRL		ug/Kg	13
85-01-8	Phenanthrene	9	j	ug/Kg	13
120-12-7	Anthracene	BRL		ug/Kg	13
206-44-0	Fluoranthene	11	j	ug/Kg	13
129-00-0	Pyrene	15		ug/Kg	13
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	13
218-01-9	Chrysene	7	j	ug/Kg	13
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	13
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	13
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	13
193-39-5	Indeno[1,2,3-c,d]pyrene	10	j	ug/Kg	13
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	13
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	13

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,500	2,600	73 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
j Indicates an estimated value detected below the reporting limit for the analyte.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A-P2-M-02
Project: Buzzards Bay/3871-002
Client: Geolnsight, Inc.

Laboratory ID: 86989-13
Sampled: 08-30-05 11:42
Received: 08-30-05 20:21
Extracted: 09-12-05 22:00
Analyzed (AL): 09-13-05 22:36
Analyzed (AR): 09-13-05 23:21
Analyst: MM

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

QC Batch ID: EP-2143-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 15 g
Final Volume: 1 mL
% Solids: 75
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	39
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	39
n-C11 to n-C22 Aromatic Hydrocarbons [†] [◊]	BRL		mg/Kg	39
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	39

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	3.5	2.7	77 %	40 - 140 %
2-Bromonaphthalene	3.5	2.1	60 %	40 - 140 %
Extraction: Chloro-octadecane	3.5	2.7	77 %	40 - 140 %
ortho-Terphenyl	3.5	2.8	79 %	40 - 140 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
[◊] n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

Matrix Spike and Matrix Spike Duplicate MA DEP Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	W2A-P2-M-02	Laboratory ID:	Parent Sample	Matrix Spike	Spike Duplicate
Project:	Buzzards Bay/3871-002	Sampled:	86989-13	86989-14	86989-25
Client:	Geolnsight, Inc.	Received:	08-30-05 11:42	08-30-05 11:42	08-30-05 11:42
Matrix:	Soil	Extracted:	08-30-05 20:21	08-30-05 20:21	08-30-05 20:21
Container:	120 mL Amber Glass	Analyzed (AL):	09-12-05 22:00	09-12-05 22:00	09-12-05 22:00
Preservation:	Cool	Analyzed (AR):	09-13-05 22:36	09-13-05 19:33	09-17-05 17:05
		Analyst:	09-13-05 23:21	09-13-05 20:17	09-17-05 12:09
		QC Batch ID:	MM	MM	MM
		Instrument ID:	EP-2143-M	EP-2143-M	EP-2143-M
		Sample Weight:	GC-9 Agilent 6890	GC-9 Agilent 6890	GC-9 Agilent 6890
		Final Volume:	11 g	16 g	16 g
		% Solids:	75	1 mL	1 mL
		Aliphatic Dilution Factor:	1 mL	97	97
		Aromatic Dilution Factor:	1	1	1

CAS Number	Analyte	Unspiked Sample (mg/Kg)	MS Spiked (mg/Kg)	MS Measured (mg/Kg)	MS Recovery	MSD Spiked (mg/Kg)	MSD Measured (mg/Kg)	MSD Recovery	RPD	QC Limits	
										Spike	RPD
111-84-2	<i>n</i> -Nonane (C ₉)	BRL	4.0	2.1	52 %	4.0	2.0	50 %	7 %	40 - 140 %	50 %
629-59-4	<i>n</i> -Tetradecane (C ₁₄)	BRL	4.0	2.8	69 %	4.0	2.9	73 %	4 %	40 - 140 %	50 %
629-92-5	<i>n</i> -Nonadecane (C ₁₉)	BRL	4.0	3.4	85 %	4.0	3.4	86 %	0 %	40 - 140 %	50 %
112-95-8	<i>n</i> -Eicosane (C ₂₀)	BRL	4.0	3.6	90 %	4.0	3.5	89 %	3 %	40 - 140 %	50 %
630-02-4	<i>n</i> -Octacosane (C ₂₈)	BRL	4.0	3.3	83 %	4.0	3.4	85 %	1 %	40 - 140 %	50 %
91-20-3	Naphthalene	BRL	4.0	3.0	75 %	4.0	2.3	57 %	29 %	40 - 140 %	50 %
83-32-9	Acenaphthene	BRL	4.0	3.5	88 %	4.0	3.0	77 %	15 %	40 - 140 %	50 %
120-12-7	Anthracene	BRL	4.0	4.4	108 %	4.0	3.8	96 %	14 %	40 - 140 %	50 %
129-00-0	Pyrene	BRL	4.0	4.6	114 %	4.0	3.8	95 %	19 %	40 - 140 %	50 %
218-01-9	Chrysene	BRL	4.0	4.8	119 %	4.0	3.7	93 %	26 %	40 - 140 %	50 %

QC Surrogate Compound		Surrogate Recovery							QC Limits	
Fractionation:	2-Fluorobiphenyl	77%	2.7	2.4	90%	3.5	3.1	78%	40 - 140 %	
	2-Bromonaphthalene	60%	2.7	2.5	53%	3.5	3.2	52%	40 - 140 %	
Extraction:	Chloro-octadecane	77%	2.7	2.1	80%	3.5	2.7	78%	40 - 140 %	
	ortho-Terphenyl	79%	2.7	2.3	93%	3.5	3.1	81%	40 - 140 %	

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (1998).
Sample extraction performed by microwave accelerated solvent extraction. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A-P2-M-02
Project: Buzzards Bay/3871-002
Client: Geolnsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-13
Sampled: 08-30-05 11:42
Received: 08-30-05 20:21
Extracted: 09-13-05 22:00
Analyzed: 09-14-05 12:12
Analyst: JJT

QC Batch ID: EP-2143-M
Instrument ID: MS-6 HP 6890
Sample Volume: 15 g
Final Volume: 1 mL
Percent Solids: 75
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	10	j	ug/Kg	13
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	13
208-96-8	Acenaphthylene	BRL		ug/Kg	13
83-32-9	Acenaphthene	BRL		ug/Kg	13
86-73-7	Fluorene	BRL		ug/Kg	13
85-01-8	Phenanthrene	32		ug/Kg	13
120-12-7	Anthracene	7	j	ug/Kg	13
206-44-0	Fluoranthene	99		ug/Kg	13
129-00-0	Pyrene	94		ug/Kg	13
56-55-3	Benzo[a]anthracene	47		ug/Kg	13
218-01-9	Chrysene	48		ug/Kg	13
205-99-2	Benzo[b]fluoranthene	45		ug/Kg	13
207-08-9	Benzo[k]fluoranthene	20		ug/Kg	13
50-32-8	Benzo[a]pyrene	35		ug/Kg	13
193-39-5	Indeno[1,2,3-c,d]pyrene	32		ug/Kg	13
53-70-3	Dibenzo[a,h]anthracene	17		ug/Kg	13
191-24-2	Benzo[g,h,i]perylene	25		ug/Kg	13

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,500	2,700	78 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
j Indicates an estimated value detected below the reporting limit for the analyte.

Matrix Spike and Matrix Spike Duplicate EPA Method 8270C

Field ID:	W2A-P2-M-02	Laboratory ID:	Parent Sample	Matrix Spike	Spike Duplicate
Project:	Buzzards Bay/3871-002	Sampled:	86989-13	86989-15	86989-26
Client:	GeoInsight, Inc.	Received:	08-30-05 11:42	08-30-05 11:42	08-30-05 11:42
Matrix:	Soil	Extracted:	08-30-05 20:21	08-30-05 20:21	08-30-05 20:21
Container:	120 mL Amber Glass	Final Volume:	09-13-05 22:00	09-13-05 22:00	09-13-05 22:00
Preservation:	Cool	Percent Solids:	09-13-05 20:00	09-15-05 10:00	09-15-05 10:00
		Dilution Factor:	09-14-05 14:10	09-14-05 13:31	09-15-05 15:32
			Analyst:	JJT	JJT
			QC Batch ID:	EP-2143-M	EP-2143-M
			Instrument ID:	MS 6 HP 6890	MS 6 HP 6890
			Sample Weight:	15 g	16 g
			Final Volume:	1 mL	1 mL
			Percent Solids:	75	79
			Dilution Factor:	1	1

CAS Number	Analyte	Unspiked Sample (ug/Kg)	MS Spiked (ug/Kg)	MS Measured (ug/Kg)	MS Recovery	MSD Spiked (ug/Kg)	MSD Measured (ug/Kg)	MSD Recovery	RPD	QC Limits	
										Spike	RPD
91-20-3	Naphthalene	10	390	230	56 %	450	270	57 %	10 %	40 - 140%	50 %
91-57-6	2-Methylnaphthalene	BRL	390	260	65 %	450	310	68 %	11 %	40 - 140%	50 %
208-96-8	Acenaphthylene	BRL	390	290	71 %	450	370	80 %	16 %	40 - 140%	50 %
83-32-9	Acenaphthene	BRL	390	310	78 %	450	400	87 %	16 %	40 - 140%	50 %
86-73-7	Fluorene	BRL	390	300	75 %	450	390	86 %	17 %	40 - 140%	50 %
85-01-8	Phenanthrene	32	390	310	71 %	450	470	97 %	25 %	40 - 140%	50 %
120-12-7	Anthracene	7	390	310	77 %	450	400	88 %	17 %	40 - 140%	50 %
206-44-0	Fluoranthene	99	390	390	72 %	450	640	119 %	30 %	40 - 140%	50 %
129-00-0	Pyrene	94	390	360	69 %	450	600	112 %	30 %	40 - 140%	50 %
56-55-3	Benzo[a]anthracene	47	390	370	81 %	450	510	103 %	21 %	40 - 140%	50 %
218-01-9	Chrysene	48	390	350	77 %	450	510	103 %	23 %	40 - 140%	50 %
205-99-2	Benzo[b]fluoranthene	45	390	360	80 %	450	520	105 %	22 %	40 - 140%	50 %
207-08-9	Benzo[k]fluoranthene	20	390	360	87 %	450	460	98 %	15 %	40 - 140%	50 %
50-32-8	Benzo[a]pyrene	35	390	370	85 %	450	520	109 %	22 %	40 - 140%	50 %
193-39-5	Indeno[1,2,3-c,d]pyrene	32	390	330	74 %	450	420	86 %	16 %	40 - 140%	50 %
53-70-3	Dibenzo[a,h]anthracene	17	390	300	71 %	450	340	72 %	9 %	40 - 140%	50 %
191-24-2	Benzo[g,h,i]perylene	25	390	330	77 %	450	410	85 %	13 %	40 - 140%	50 %

QC Surrogate Compound	Surrogate Recovery							QC Limits
ortho-Terphenyl	78%	3,200	2,300	73%	3,700	2,900	79%	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A03-P2-M-03
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-16
Sampled: 08-30-05 12:02
Received: 08-30-05 20:21
Extracted: 09-12-05 22:00
Analyzed (AL): 09-13-05 22:30
Analyzed (AR): 09-13-05 23:15
Analyst: MM

QC Batch ID: EP-2143-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 15 g
Final Volume: 1 mL
% Solids: 42
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	70
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	70
n-C11 to n-C22 Aromatic Hydrocarbons ^{† 0}	BRL		mg/Kg	70
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	70

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	6.2	4.8	78 %	40 - 140 %
2-Bromonaphthalene	6.2	4.6	74 %	40 - 140 %
Extraction: Chloro-octadecane	6.2	4.9	80 %	40 - 140 %
ortho -Terphenyl	6.2	4.9	80 %	40 - 140 %

QA/QC Certification	
1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.	

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
⁰ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A03-P2-M-03
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.
Laboratory ID: 86989-16
Sampled: 08-30-05 12:02
Received: 08-30-05 20:21
Extracted: 09-13-05 22:00
Analyzed: 09-14-05 14:10
Analyst: JJT

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool
QC Batch ID: EP-2143-M
Instrument ID: MS-6 HP 6890
Sample Volume: 15 g
Final Volume: 1 mL
Percent Solids: 42
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	15	j	ug/Kg	23
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	23
208-96-8	Acenaphthylene	31		ug/Kg	23
83-32-9	Acenaphthene	BRL		ug/Kg	23
86-73-7	Fluorene	BRL		ug/Kg	23
85-01-8	Phenanthrene	190		ug/Kg	23
120-12-7	Anthracene	39		ug/Kg	23
206-44-0	Fluoranthene	630		ug/Kg	23
129-00-0	Pyrene	800		ug/Kg	23
56-55-3	Benzo[a]anthracene	230		ug/Kg	23
218-01-9	Chrysene	300		ug/Kg	23
205-99-2	Benzo[b]fluoranthene	390		ug/Kg	23
207-08-9	Benzo[k]fluoranthene	130		ug/Kg	23
50-32-8	Benzo[a]pyrene	490		ug/Kg	23
193-39-5	Indeno[1,2,3-c,d]pyrene	380		ug/Kg	23
53-70-3	Dibenzo[a,h]anthracene	48		ug/Kg	23
191-24-2	Benzo[g,h,i]perylene	490		ug/Kg	23

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	6,200	4,400	72 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
j Indicates an estimated value detected below the reporting limit for the analyte.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A03-P2-M-04
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.

Laboratory ID: 86989-17
Sampled: 08-30-05 12:20
Received: 08-30-05 20:21
Extracted: 09-12-05 22:00
Analyzed (AL): 09-17-05 01:50
Analyzed (AR): 09-17-05 02:34
Analyst: MM

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

QC Batch ID: EP-2143-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 15 g
Final Volume: 1 mL
% Solids: 48
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	62
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	62
n-C11 to n-C22 Aromatic Hydrocarbons ^{† 0}	BRL		mg/Kg	62
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	62

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	5.5	4.6	85 %	40 - 140 %
2-Bromonaphthalene	5.5	4.6	84 %	40 - 140 %
Extraction: Chloro-octadecane	5.5	4.0	74 %	40 - 140 %
ortho -Terphenyl	5.5	4.3	78 %	40 - 140 %

QA/QC Certification				
1. Were all QA/QC procedures required by the method followed?				Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?				Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?				No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.				

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
0 n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A03-P2-M-04
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.
Laboratory ID: 86989-17
Sampled: 08-30-05 12:20
Received: 08-30-05 20:21
Extracted: 09-13-05 22:00
Analyzed: 09-15-05 01:19
Analyst: JJT

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool
QC Batch ID: SV-2143-M
Instrument ID: MS-6 HP 6890
Sample Volume: 15 g
Final Volume: 1 mL
Percent Solids: 48
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	11	j	ug/Kg	21
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	21
208-96-8	Acenaphthylene	BRL		ug/Kg	21
83-32-9	Acenaphthene	BRL		ug/Kg	21
86-73-7	Fluorene	BRL		ug/Kg	21
85-01-8	Phenanthrene	BRL		ug/Kg	21
120-12-7	Anthracene	BRL		ug/Kg	21
206-44-0	Fluoranthene	BRL		ug/Kg	21
129-00-0	Pyrene	BRL		ug/Kg	21
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	21
218-01-9	Chrysene	BRL		ug/Kg	21
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	21
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	21
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	21
193-39-5	Indeno[1,2,3-c,d]pyrene	12	j	ug/Kg	21
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	21
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	21

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	5,500	3,400	62 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
j Indicates an estimated value detected below the reporting limit for the analyte.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A03-P2-M-05
Project: Buzzards Bay/3871-002
Client: GeolInsight, Inc.
Laboratory ID: 86989-18
Sampled: 08-30-05 13:26
Received: 08-30-05 20:21
Extracted: 09-12-05 22:00
Analyzed (AL): 09-17-05 03:18
Analyzed (AR): 09-17-05 04:02
Analyst: MM

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool
QC Batch ID: EP-2143-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 15 g
Final Volume: 1 mL
% Solids: 76
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	39
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	39
n-C11 to n-C22 Aromatic Hydrocarbons [†] [◊]	BRL		mg/Kg	39

Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL	mg/Kg	39
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QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	3.5	2.9	82 %	40 - 140 %
2-Bromonaphthalene	3.5	2.8	81 %	40 - 140 %
Extraction: Chloro-octadecane	3.5	2.5	71 %	40 - 140 %
ortho-Terphenyl	3.5	2.6	75 %	40 - 140 %

QA/QC Certification				
1. Were all QA/QC procedures required by the method followed?				Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?				Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?				No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.				

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

[◊] n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A03-P2-M-05
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-18
Sampled: 08-30-05 13:26
Received: 08-30-05 20:21
Extracted: 09-13-05 22:00
Analyzed: 09-15-05 00:39
Analyst: JJT

QC Batch ID: SV-2143-M
Instrument ID: MS-6 HP 6890
Sample Volume: 15 g
Final Volume: 1 mL
Percent Solids: 76
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	13		ug/Kg	13
91-57-6	2-Methylnaphthalene	9	j	ug/Kg	13
208-96-8	Acenaphthylene	7	j	ug/Kg	13
83-32-9	Acenaphthene	BRL		ug/Kg	13
86-73-7	Fluorene	BRL		ug/Kg	13
85-01-8	Phenanthrene	53		ug/Kg	13
120-12-7	Anthracene	13		ug/Kg	13
206-44-0	Fluoranthene	130		ug/Kg	13
129-00-0	Pyrene	120		ug/Kg	13
56-55-3	Benzo[a]anthracene	65		ug/Kg	13
218-01-9	Chrysene	70		ug/Kg	13
205-99-2	Benzo[b]fluoranthene	75		ug/Kg	13
207-08-9	Benzo[k]fluoranthene	30		ug/Kg	13
50-32-8	Benzo[a]pyrene	53		ug/Kg	13
193-39-5	Indeno[1,2,3-c,d]pyrene	44		ug/Kg	13
53-70-3	Dibenzo[a,h]anthracene	20		ug/Kg	13
191-24-2	Benzo[g,h,i]perylene	36		ug/Kg	13

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,500	1,800	52 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
j Indicates an estimated value detected below the reporting limit for the analyte.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A03-P2-M-06
Project: Buzzards Bay/3871-002
Client: Geolnsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-19
Sampled: 08-30-05 13:12
Received: 08-30-05 20:21
Extracted: 09-12-05 22:00
Analyzed (AL): 09-17-05 04:47
Analyzed (AR): 09-17-05 05:31
Analyst: MM

QC Batch ID: EP-2143-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 15 g
Final Volume: 1 mL
% Solids: 74
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	41
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	41
n-C11 to n-C22 Aromatic Hydrocarbons ^{† 0}	BRL		mg/Kg	41

Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	41
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QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	3.6	3.4	95 %	40 - 140 %
2-Bromonaphthalene	3.6	3.2	90 %	40 - 140 %
Extraction: Chloro-octadecane	3.6	2.5	70 %	40 - 140 %
ortho-Terphenyl	3.6	3.3	91 %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed? Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved? Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1? No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

⁰ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A03-P2-M-06
Project: Buzzards Bay/3871-002
Client: Geolnsight, Inc.
Laboratory ID: 86989-19
Sampled: 08-30-05 13:12
Received: 08-30-05 20:21
Extracted: 09-13-05 22:00
Analyzed: 09-15-05 00:00
Analyst: JJT

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool
QC Batch ID: SV-2143-M
Instrument ID: MS-6 HP 6890
Sample Volume: 15 g
Final Volume: 1 mL
Percent Solids: 74
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	9	j	ug/Kg	14
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	14
208-96-8	Acenaphthylene	BRL		ug/Kg	14
83-32-9	Acenaphthene	BRL		ug/Kg	14
86-73-7	Fluorene	BRL		ug/Kg	14
85-01-8	Phenanthrene	16		ug/Kg	14
120-12-7	Anthracene	BRL		ug/Kg	14
206-44-0	Fluoranthene	42		ug/Kg	14
129-00-0	Pyrene	39		ug/Kg	14
56-55-3	Benzo[a]anthracene	21		ug/Kg	14
218-01-9	Chrysene	24		ug/Kg	14
205-99-2	Benzo[b]fluoranthene	22		ug/Kg	14
207-08-9	Benzo[k]fluoranthene	11	j	ug/Kg	14
50-32-8	Benzo[a]pyrene	12	j	ug/Kg	14
193-39-5	Indeno[1,2,3-c,d]pyrene	19		ug/Kg	14
53-70-3	Dibenzo[a,h]anthracene	16		ug/Kg	14
191-24-2	Benzo[g,h,i]perylene	13	j	ug/Kg	14

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,600	2,300	63 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
j Indicates an estimated value detected below the reporting limit for the analyte.

Massachusetts DEP EPH Method Extractable Petroleum Hydrocarbons by GC/FID

Field ID: W2A10-P2-LIT-02
Project: Buzzards Bay/3871-002
Client: GeolInsight, Inc.

Laboratory ID: 86989-24
Sampled: 08-30-05 11:39
Received: 08-30-05 20:21
Extracted: 09-12-05 22:00
Analyzed (AL): 09-17-05 09:56
Analyzed (AR): 09-17-05 10:41
Analyst: MM

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

QC Batch ID: EP-2143-M
Instrument ID: GC-9 Agilent 6890
Sample Weight: 16 g
Final Volume: 1 mL
% Solids: 79
Aliphatic Dilution Factor: 1
Aromatic Dilution Factor: 1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	36
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	36
n-C11 to n-C22 Aromatic Hydrocarbons [†] [◊]	BRL		mg/Kg	36

Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	36
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QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	3.2	2.7	86 %	40 - 140 %
2-Bromonaphthalene	3.2	2.5	80 %	40 - 140 %
Extraction: Chloro-octadecane	3.2	2.8	87 %	40 - 140 %
ortho-Terphenyl	3.2	2.9	92 %	40 - 140 %

QA/QC Certification				
1. Were all QA/QC procedures required by the method followed?				Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?				Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?				No
Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.				

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
[◊] n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

EPA Method 8270C (Modified) MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID: W2A10-P2-LIT-02
Project: Buzzards Bay/3871-002
Client: GeoInsight, Inc.

Matrix: Soil
Container: 120 mL Amber Glass
Preservation: Cool

Laboratory ID: 86989-24
Sampled: 08-30-05 11:39
Received: 08-30-05 20:21
Extracted: 09-13-05 22:00
Analyzed: 09-15-05 17:30
Analyst: JJT

QC Batch ID: EP-2143-M
Instrument ID: MS-6 HP 6890
Sample Volume: 16 g
Final Volume: 1 mL
Percent Solids: 79
Dilution Factor: 1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	15		ug/Kg	12
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	12
208-96-8	Acenaphthylene	BRL		ug/Kg	12
83-32-9	Acenaphthene	BRL		ug/Kg	12
86-73-7	Fluorene	BRL		ug/Kg	12
85-01-8	Phenanthrene	7	j	ug/Kg	12
120-12-7	Anthracene	BRL		ug/Kg	12
206-44-0	Fluoranthene	24		ug/Kg	12
129-00-0	Pyrene	22		ug/Kg	12
56-55-3	Benzo[a]anthracene	12		ug/Kg	12
218-01-9	Chrysene	10	j	ug/Kg	12
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	12
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	12
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	12
193-39-5	Indeno[1,2,3-c,d]pyrene	11	j	ug/Kg	12
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	12
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	12

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho-Terphenyl	3,200	3,200	100 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
j Indicates an estimated value detected below the reporting limit for the analyte.

Project Narrative

Project: Buzzards Bay/3871-002
Client: GeolInsight, Inc.

Lab ID: 86989
Received: 08-30-05 20:21

A. Documentation and Client Communication

The following documentation discrepancies, and client changes or amendments were noted for this project:

1. Sample 'W2A10-P2-LIT-02-B' was not received by the laboratory. Sample 86989-24 for analysis by MA DEP EPH with PAHs by 8270C-Mod SIM was composited by the laboratory from samples 'W2A10-P2-LIT-02-A' and 'W2A10-P2-LIT-02-C', per Kevin Trainer, 09-07-05.
2. Samples 86989-01 through -03 and -08 through -23 for analysis by MA DEP EPH with PAHs by 8270C-Mod SIM were composited upon receipt by the laboratory, as indicated on the Chain of Custody.

B. Method Modifications, Non-Conformances and Observations

The sample(s) in this project were analyzed by the references analytical method(s), and no method modifications, non-conformances or analytical issues were noted, except as indicated below:

1. No method modifications, non-conformances or analytical issues were noted.

GROUNDWATER ANALYTICAL

228 Main Street, PO Box 1200
Buzards Bay, MA 02532
Telephone (508) 759-4441 • FAX (508) 759-4475
www.groundwateranalytical.com

CHAIN-OF-CUSTODY RECORD AND WORK ORDER

No 084664

Project Name: **Buzzards Bay**
 Project Number: **2871-002**
 Sampler Name: **KZ, LC, AW, AP**
 Project Manager: **KEVIN TRAINER**

Firm: **GeoInsight**
 Address: **5 LAW DRIVE**
 City / State / Zip: **Westford, MA 01886**
 Telephone: **978-692-1114**

TURNAROUND

☒ STANDARD (10 Business Days)
☐ PRIORITY (5 Business Days)
☐ RUSH (RAN - Rush requires Rush Authorization Number)
 Please Email to: **katrina@geoinsight.com**
☐ Please FAX to:

BILLING

☐ Purchase Order No.:
☐ Third Party Billing:
☐ GWA Quote:

INSTRUCTIONS: Use separate line for each container (except replicates).

Sampling		SAMPLE IDENTIFICATION	Matrix				Type	Container(s)										Preservation					Filtered	LABORATORY NUMBER (Lab Use Only)			
DATE	TIME		GROUNDWATER	DRINKING WATER	WASTEWATER	OTHER SOLID		DI/ORGANIC LIQUID	COMPOSITE	NUMBER	40mL VOA Vial	120mL/8 oz Amber Glass	250mL/8 oz Glass	500mL/16 oz Glass	1L/22 oz Amber Glass	250mL/8 oz Plastic	500mL/16 oz Plastic	1L/22 oz Plastic	120mL Sterile	HCl	HNO ₃	H ₂ SO ₄			Methanol	Sodium Bisulfate	ICE
10/15	10:30	W2A10-P2-UT-01-A																									
	10:32	W2A10-P2-UT-01-B																									
	10:34	W2A10-P2-UT-01-C																									
	10:37	W2A10-P2-UT-01-A																									
	10:39	W2A10-P2-UT-01-B																									
	10:42	W2A10-P2-UT-01-C																									
	11:28	W2A10-P2-UT-02-A																									
	11:31	W2A10-P2-UT-02-B																									
	11:33	W2A10-P2-UT-02-C																									
	11:35	W2A10-P2-UT-02-A																									
	11:37	W2A10-P2-UT-02-B																									
	11:39	W2A10-P2-UT-02-C																									

REMARKS / SPECIAL INSTRUCTIONS

1) Composite the A, B, & C sample aliquots.
 2) After compositing, freeze the A, B, & C aliquots remaining soil - and send to B&B Labs for archiving on dry ice.
 3) PAH analyzed by 8270 w/ (sim) Selected Ion Monitoring.

DATA QUALITY OBJECTIVES

Regulatory Program

State: ☐ CT ☒ MA ☐ NH ☐ NY ☐ RI ☐ VT ☐

Standard: ☒ MCP GW-1/S-1 ☐ MCP GW-2/S-2 ☐ NY STARS ☐ Drinking Water ☐ Wastewater ☐ Waste Disposal ☐ Dredge Material

Deliverables: ☐ PWS Form ☐ MWRA ☐

Project Specific QC

Many regulatory programs and EPA methods require project specific QC. Project specific QC includes Sample Duplicates, Matrix Spikes, and/or Matrix Spike Duplicates. Laboratory QC is not project specific unless prearranged. Project specific QC samples are charged on a per sample basis. Each MS, MSD and Sample Duplicate requires an additional sample aliquot.

Project Specific QC Required

☐ Sample Duplicate ☐ Matrix Spike ☐ Matrix Spike Duplicate

Selection of QC Sample

☐ Please use sample:

CHAIN-OF-CUSTODY RECORD

NOTE: All samples submitted subject to Standard Terms and Conditions on reverse hereof.

Relinquished by Sampler: **Kevin Trainer** Date: **8/30/05** Time: **2:31**

Relinquished by: _____ Date: _____ Time: _____

Relinquished by: _____ Date: _____ Time: _____

Relinquished by: _____ Date: _____ Time: _____

Method of Shipment: ☐ GWA Courier ☐ Express Mail ☐ Federal Express ☐ UPS ☐ Hand

Shipping/Airbill Number: _____

Custody Seal Number: _____

Received by: _____ Date: _____ Time: _____

Received by: _____ Date: _____ Time: _____

Received by: _____ Date: _____ Time: _____

Container Count: **48**

GROUNDWATER ANALYTICAL

228 Main Street, P.O. Box 1200
Buzards Bay, MA 02532
Telephone (508) 759-4441 • FAX (508) 759-4475
www.groundwateranalytical.com

CHAIN-OF-CUSTODY, RECORD AND WORK ORDER

Nº 084665

Project Name: BUZARDS BAY		Firm: GeoInsight
Project Number: 3871-002		Address: 5 Lan Drive
Sampler Name: K2, LC, AW, AD		City / State / Zip: Westford, MA 01880
Project Manager: KEVIN TRAWER		Telephone: 978-692-1114

INSTRUCTIONS: Use separate line for each container (except replicates).

DATE	TIME	SAMPLE IDENTIFICATION	Matrix		Type	Container(s)		Preservation		Filtered	LABORATORY NUMBER (Lab Use Only)
			GROUNDWATER	OTHER SOLID		500mL/16 oz Glass	120mL/4 oz Glass	40mL VOA Vial	60mL/2 oz Glass		
12/16/01	12:09	W2A10-P2-UII-03-A	☒	☒	COMPOSITE	☒	☒	☒	☒	☒	58
12/12		W2A10-P2-UII-03-B	☒	☒	GRAV	☒	☒	☒	☒	☒	69
12/15		W2A10-P2-UII-03-C	☒	☒	GRAV	☒	☒	☒	☒	☒	710
12/18		W2A10-P2-UII-03-A	☒	☒	GRAV	☒	☒	☒	☒	☒	811
12/22		W2A10-P2-UII-03-B	☒	☒	GRAV	☒	☒	☒	☒	☒	
12/30		W2A10-P2-UII-03-C	☒	☒	GRAV	☒	☒	☒	☒	☒	
13/39		W2A10-P2-UII-05-A	☒	☒	GRAV	☒	☒	☒	☒	☒	
13/44		W2A10-P2-UII-05-B	☒	☒	GRAV	☒	☒	☒	☒	☒	
13/48		W2A10-P2-UII-05-C	☒	☒	GRAV	☒	☒	☒	☒	☒	
13/52		W2A10-P2-UII-05-A	☒	☒	GRAV	☒	☒	☒	☒	☒	
13/54		W2A10-P2-UII-05-B	☒	☒	GRAV	☒	☒	☒	☒	☒	
13/50		W2A10-P2-UII-05-C	☒	☒	GRAV	☒	☒	☒	☒	☒	

REMARKS / SPECIAL INSTRUCTIONS

1) Composite the A, B, + C sample aliquots
2) After compositing, freeze the A, B, + C aliquots remaining soil- and send B+B labs for archiving on dry ice.
3) PAH analyzed by 8270 w/ (Sim)
Selected Ion Monitoring

DATA QUALITY OBJECTIVES

Regulatory Program		Project Specific QC	
State	Standard	Many regulatory programs and EPA methods require project specific QC. Project specific QC includes Sample Duplicates, Matrix Spikes, and/or Matrix Spike Duplicates. Laboratory QC is not project specific unless prearranged. Project specific QC samples are charged on a per sample basis. Each MS, MSD and Sample Duplicate requires an additional sample aliquot.	
☐ CT	☒ MCP GW-1/S-1	☐ Sample Duplicate	☒ Selection of QC Sample
☐ ME	☒ MCP GW-2/S-2	☒ Matrix Spike	☒ Please use sample:
☒ MA	☐ NY STARS	☒ Matrix Spike Duplicate	☒ W2A10-P2-UII-05-A
☐ NH	☐ Drinking Water		☒ W2A10-P2-UII-05-B
☐ NY	☐ Wastewater		☒ W2A10-P2-UII-05-C
☐ RI	☐ Waste Disposal		
☐ VT	☐ Dredge Material		

ANALYSIS REQUEST

Volatiles		Semivolatiles		Pesticides/PCBs		Metals		Perfluorinated Hydrocarbons		Hazardous Waste		General Chemistry		Other	
☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search
☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search

☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search
☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search
☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search	☐ T10 Search

CHAIN-OF-CUSTODY RECORD

NOTE: All samples submitted subject to Standard Terms and Conditions on reverse hereof.

Relinquished by Sampler:	Date	Time	Received by:	Date	Time
<i>Kevin Traver</i>	2021	8/24/21	<i>Kevin Traver</i>	2021	8/24/21
Relinquished by:	Date	Time	Received by:	Date	Time
			<i>Kevin Traver</i>		
Relinquished by:	Date	Time	Received by:	Date	Time
			<i>Kevin Traver</i>		

Method of Shipment: ☐ GWA Courier ☐ Express Mail ☐ Federal Express

Shipping/Airbill Number: _____

Custody Seal Number: _____

CHAIN-OF-CUSTODY RECORD AND WORK ORDER

№ 084668

[illegible]

☐ Third Party Billing: ☐ GWA Quote: _____

[illegible]

DATA QUALITY OBJECTIVES

Project Specific QC

Many regulatory programs and EPA methods require project specific QC. Project specific QC includes Sample Duplicates, Matrix Spikes, and/or Matrix Spike Duplicates. Laboratory QC is not project specific unless prearranged. Project specific QC samples are charged on a per sample basis. Each MS, MSD and Sample Duplicate requires an additional sample aliquot.

Project Specific QC Required	Selection of QC Sample
☐ Sample Duplicate	☒ Please use sample: composite <i>DT</i>
☐ Matrix Spike	

✓	CHAIN OF CUSTODY RECORD
---	-------------------------

specific QC

EPA methods require project to include Sample Duplicates, Spike Duplicates, Laboratory QC, and Project specific QC arranged. Project specific QC is on an additional sample aliquot.

Selection of QC Sample

☒ Please use sample: composite of

Receipt Temperature: ☐ Ice ☐ Refrigerated ☒ 2-6 C Recommended	Container Count:	Shipping/Airbill Number:
---	-------------------------	---------------------------------

☒ Matrix Spike Duplicate
☐ Matrix Spike Duplicate

Method of Shipment: ☐ GWA Courier ☐ Express Mail ☐ Federal Express

☐ UPS ☐ Hand ☐

Custody Seal Number: _____

CHAIN-OF-CUSTODY RECORD AND WORK ORDER

Nº 084669

100

Quality Assurance/Quality Control

A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste*, US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

B. Definitions

Batches are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

Laboratory Control Samples are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

Method Blanks are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

Surrogate Compounds are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

Quality Control Report Laboratory Control Samples

Category: EPA 8270C Modified
QC Batch ID: EP-2143-M
Matrix: Soil
Units: ug/Kg

LCS
Instrument ID: MS-6 HP 6890
Extracted: 09-13-05 22:00
Analyzed: 09-13-05 16:03
Analyst: JJT

LCSD
Instrument ID: MS-6 HP 6890
Extracted: 09-13-05 22:00
Analyzed: 09-13-05 16:43
Analyst: JJT

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
91-20-3	Naphthalene	330	220	67 %	330	210	64 %	5 %	40 - 140 %	20%
91-57-6	2-Methylnaphthalene	330	260	79 %	330	240	73 %	8 %	40 - 140 %	20%
85-01-8	Phenanthrene	330	280	85 %	330	270	82 %	4 %	40 - 140 %	20%
83-32-9	Acenaphthene	330	300	91 %	330	280	85 %	7 %	40 - 140 %	20%
208-96-8	Acenaphthylene	330	280	85 %	330	270	82 %	4 %	40 - 140 %	20%
86-73-7	Fluorene	330	290	88 %	330	270	82 %	7 %	40 - 140 %	20%
120-12-7	Anthracene	330	280	85 %	330	280	85 %	0 %	40 - 140 %	20%
206-44-0	Fluoranthene	330	330	100 %	330	320	97 %	3 %	40 - 140 %	20%
129-00-0	Pyrene	330	320	97 %	330	310	94 %	3 %	40 - 140 %	20%
56-55-3	Benzo[a]anthracene	330	320	97 %	330	310	94 %	3 %	40 - 140 %	20%
218-01-9	Chrysene	330	320	97 %	330	310	94 %	3 %	40 - 140 %	20%
205-99-2	Benzo[b]fluoranthene	330	310	94 %	330	300	91 %	3 %	40 - 140 %	20%
207-08-9	Benzo[k]fluoranthene	330	330	100 %	330	310	94 %	6 %	40 - 140 %	20%
50-32-8	Benzo[a]pyrene	330	310	94 %	330	310	94 %	0 %	40 - 140 %	20%
193-39-5	Indeno[1,2,3-c,d]pyrene	330	300	91 %	330	290	88 %	3 %	40 - 140 %	20%
53-70-3	Dibenzo[a,h]anthracene	330	280	85 %	330	270	82 %	4 %	40 - 140 %	20%
191-24-2	Benzo[g,h,i]perylene	330	330	100 %	330	310	94 %	6 %	40 - 140 %	20%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
ortho -Terphenyl	2,700	2,300	85 %	2,700	2,200	81 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.
The LCS and LCSD are prepared from separate source standards than those used for calibration.

Quality Control Report Method Blank

Category: EPA Method 8270C (Mod.) - EPH PAHs by GC/MS-SIM
QC Batch ID: EP-2143-M
Matrix: Soil

Instrument ID: MS-6 HP 6890
Extracted: 09-13-05 22:00
Analyzed: 09-13-05 15:23
Analyst: JJT

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	10
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	10
208-96-8	Acenaphthylene	BRL		ug/Kg	10
83-32-9	Acenaphthene	BRL		ug/Kg	10
86-73-7	Fluorene	BRL		ug/Kg	10
85-01-8	Phenanthrene	BRL		ug/Kg	10
120-12-7	Anthracene	BRL		ug/Kg	10
206-44-0	Fluoranthene	BRL		ug/Kg	10
129-00-0	Pyrene	BRL		ug/Kg	10
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	10
218-01-9	Chrysene	BRL		ug/Kg	10
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	10
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	10
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	10
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	10
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	10
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	10

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	2,700	2,200	82 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

Quality Control Report Laboratory Control Samples

Category:	MA DEP EPH Method	LCS	Instrument ID:	GC-7 HP 5890	LCSD	Instrument ID:	GC-7 HP 5890
QC Batch ID:	EP-2140-M	Extracted:	09-09-05 15:00	Extracted:	09-09-05 15:00	Analized (AL):	09-12-05 17:10
Matrix:	Soil	Analized (AR):	09-12-05 16:25	Analized (AR):	09-12-05 17:54	Analyst:	MM
Units:	mg/Kg	Analyst:	MM	Analyst:	MM		

CAS Number	Analyte	LCS			LCS Duplicate			RPD	QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery		Spike	RPD
111-84-2	n-Nonane (C ₉)	3.3	1.9	58 %	3.3	1.8	55 %	5 %	30 - 140 %	25%
124-18-5	n-Decane (C ₁₀)	3.3	2.3	69 %	3.3	2.1	65 %	6 %	40 - 140 %	25%
112-40-3	n-Dodecane (C ₁₂)	3.3	2.4	73 %	3.3	2.3	68 %	7 %	40 - 140 %	25%
629-59-4	n-Tetradecane (C ₁₄)	3.3	2.5	77 %	3.3	2.4	72 %	8 %	40 - 140 %	25%
544-76-3	n-Hexadecane (C ₁₆)	3.3	2.7	82 %	3.3	2.6	78 %	5 %	40 - 140 %	25%
593-45-3	n-Octadecane (C ₁₈)	3.3	2.9	88 %	3.3	2.8	84 %	4 %	40 - 140 %	25%
n/a	n-C9 to n-C18 Group	20	15	75 %	20	14	70 %	6 %	40 - 140 %	25%
629-92-5	n-Nonadecane (C ₁₉)	3.3	2.8	84 %	3.3	2.7	81 %	3 %	40 - 140 %	25%
112-95-8	n-Eicosane (C ₂₀)	3.3	2.8	86 %	3.3	2.7	83 %	4 %	40 - 140 %	25%
629-97-0	n-Docosane (C ₂₂)	3.3	2.8	84 %	3.3	2.7	81 %	4 %	40 - 140 %	25%
646-31-1	n-Tetracosane (C ₂₄)	3.3	2.8	85 %	3.3	2.7	82 %	3 %	40 - 140 %	25%
630-01-3	n-Hexacosane (C ₂₆)	3.3	2.7	82 %	3.3	2.6	79 %	3 %	40 - 140 %	25%
630-02-4	n-Octacosane (C ₂₈)	3.3	2.6	79 %	3.3	2.5	77 %	3 %	40 - 140 %	25%
638-68-6	n-Triacontane (C ₃₀)	3.3	2.6	78 %	3.3	2.5	76 %	3 %	40 - 140 %	25%
630-06-8	n-Hexatriacontane (C ₃₆)	3.3	2.3	71 %	3.3	2.3	69 %	3 %	40 - 140 %	25%
n/a	n-C19 to n-C36 Group	26	21	81 %	26	21	79 %	3 %	40 - 140 %	25%
91-20-3	Naphthalene	3.3	2.1	63 %	3.3	2.1	64 %	2 %	40 - 140 %	25%
91-57-6	2-Methylnaphthalene	3.3	2.3	69 %	3.3	2.4	72 %	4 %	40 - 140 %	25%
208-96-8	Acenaphthylene	3.3	2.4	73 %	3.3	2.5	75 %	2 %	40 - 140 %	25%
83-32-9	Acenaphthene	3.3	2.2	68 %	3.3	2.3	70 %	3 %	40 - 140 %	25%
86-73-7	Fluorene	3.3	2.4	72 %	3.3	2.5	76 %	4 %	40 - 140 %	25%
85-01-8	Phenanthrene	3.3	2.5	77 %	3.3	2.7	82 %	6 %	40 - 140 %	25%
120-12-7	Anthracene	3.3	2.7	83 %	3.3	2.9	87 %	5 %	40 - 140 %	25%
206-44-0	Fluoranthene	3.3	2.6	79 %	3.3	2.8	84 %	6 %	40 - 140 %	25%
129-00-0	Pyrene	3.3	2.6	77 %	3.3	2.7	82 %	6 %	40 - 140 %	25%
56-55-3	Benzo[a]anthracene	3.3	2.6	79 %	3.3	2.7	81 %	3 %	40 - 140 %	25%
218-01-9	Chrysene	3.3	2.7	82 %	3.3	2.7	82 %	0 %	40 - 140 %	25%
205-99-2	Benzo[b]fluoranthene	3.3	2.5	75 %	3.3	2.6	78 %	5 %	40 - 140 %	25%
207-08-9	Benzo[k]fluoranthene	3.3	2.6	78 %	3.3	2.6	78 %	0 %	40 - 140 %	25%
50-32-8	Benzo[a]pyrene	3.3	2.5	76 %	3.3	2.6	78 %	2 %	40 - 140 %	25%
193-39-5	Indeno[1,2,3-c,d]pyrene	3.3	2.6	79 %	3.3	2.7	81 %	3 %	40 - 140 %	25%
53-70-3	Dibenzo[a,h]anthracene	3.3	2.5	75 %	3.3	2.5	75 %	0 %	40 - 140 %	25%
191-24-2	Benzo[g,h,i]perylene	3.3	2.4	73 %	3.3	2.5	75 %	3 %	40 - 140 %	25%
n/a	PAH Group	56	42	75 %	56	44	78 %	3 %	40 - 140 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	2.7	2.0	74 %	2.7	2.2	81 %	40 - 140 %
2-Bromonaphthalene	2.7	2.1	78 %	2.7	2.3	85 %	40 - 140 %
Extraction: Chloro-octadecane	2.7	2.0	74 %	2.7	2.0	74 %	40 - 140 %
ortho -Terphenyl	2.7	2.0	74 %	2.7	2.1	78 %	40 - 140 %

Fractionation Breakthrough Evaluation							QC Limits
91-20-3	Naphthalene	LCS	0 %	LCSD	0 %		5%
91-57-6	2-Methylnaphthalene	LCS	0 %	LCSD	0 %		5%

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Method modified by use of microwave accelerated solvent extraction technique.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.
The LCS and LCSD are prepared from separate source standards than those used for calibration.

Quality Control Report Method Blank

Category: MA DEP EPH
QC Batch ID: EP-2140-M
Matrix: Soil

Instrument ID: GC-7 HP 5890
Extracted: 09-09-05 15:00
Analyzed (AL): 09-12-05 14:11
Analyzed (AR): 09-12-05 14:56
Analyst: MM

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	30
n-C19 to n-C36 Aliphatic Hydrocarbons [†]	BRL		mg/Kg	30
n-C11 to n-C22 Aromatic Hydrocarbons [†] [◊]	BRL		mg/Kg	30
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]	BRL		mg/Kg	30

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	2.7	2.3	87 %	40 - 140 %
2-Bromonaphthalene	2.7	2.3	88 %	40 - 140 %
Extraction: Chloro-octadecane	2.7	2.0	76 %	40 - 140 %
ortho-Terphenyl	2.7	2.1	79 %	40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
[◊] n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

Quality Control Report Laboratory Control Samples

Category:	MA DEP EPH Method	LCS	Instrument ID:	GC-9 Agilent 6890	LCSD	Instrument ID:	GC-9 Agilent 6890
QC Batch ID:	EP-2142-M	Extracted:	09-12-05 14:00	Extracted:	09-12-05 14:00		
Matrix:	Soil	Analyzed (AL):	09-13-05 01:09	Analyzed (AL):	09-13-05 02:37		
Units:	mg/Kg	Analyzed (AR):	09-13-05 01:53	Analyzed (AR):	09-13-05 03:21		
		Analyst:	MM	Analyst:	MM		

CAS Number	Analyte	LCS			LCS Duplicate			RPD	QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery		Spike	RPD
111-84-2	n-Nonane (C ₉)	3.3	1.6	47 %	3.3	1.5	46 %	2 %	30 - 140 %	25%
124-18-5	n-Decane (C ₁₀)	3.3	1.8	55 %	3.3	1.8	54 %	2 %	40 - 140 %	25%
112-40-3	n-Dodecane (C ₁₂)	3.3	1.9	58 %	3.3	1.9	57 %	2 %	40 - 140 %	25%
629-59-4	n-Tetradecane (C ₁₄)	3.3	1.9	59 %	3.3	1.9	59 %	1 %	40 - 140 %	25%
544-76-3	n-Hexadecane (C ₁₆)	3.3	2.2	68 %	3.3	2.2	67 %	2 %	40 - 140 %	25%
593-45-3	n-Octadecane (C ₁₈)	3.3	2.6	80 %	3.3	2.7	81 %	1 %	40 - 140 %	25%
n/a	n-C9 to n-C18 Group	20	12	61 %	20	12	61 %	1 %	40 - 140 %	25%
629-92-5	n-Nonadecane (C ₁₉)	3.3	2.6	80 %	3.3	2.7	82 %	3 %	40 - 140 %	25%
112-95-8	n-Eicosane (C ₂₀)	3.3	2.7	83 %	3.3	2.8	86 %	3 %	40 - 140 %	25%
629-97-0	n-Docosane (C ₂₂)	3.3	2.7	83 %	3.3	2.8	86 %	4 %	40 - 140 %	25%
646-31-1	n-Tetracosane (C ₂₄)	3.3	2.8	84 %	3.3	2.9	87 %	3 %	40 - 140 %	25%
630-01-3	n-Hexacosane (C ₂₆)	3.3	2.7	82 %	3.3	2.8	85 %	3 %	40 - 140 %	25%
630-02-4	n-Octacosane (C ₂₈)	3.3	2.7	82 %	3.3	2.8	85 %	4 %	40 - 140 %	25%
638-68-6	n-Triacontane (C ₃₀)	3.3	2.7	82 %	3.3	2.8	86 %	4 %	40 - 140 %	25%
630-06-8	n-Hexatriacontane (C ₃₆)	3.3	2.4	73 %	3.3	2.5	77 %	5 %	40 - 140 %	25%
n/a	n-C19 to n-C36 Group	26	21	81 %	26	22	84 %	4 %	40 - 140 %	25%
91-20-3	Naphthalene	3.3	2.0	61 %	3.3	1.9	56 %	9 %	40 - 140 %	25%
91-57-6	2-Methylnaphthalene	3.3	2.1	64 %	3.3	1.9	58 %	9 %	40 - 140 %	25%
208-96-8	Acenaphthylene	3.3	2.3	69 %	3.3	2.0	62 %	11 %	40 - 140 %	25%
83-32-9	Acenaphthene	3.3	2.1	65 %	3.3	1.9	58 %	11 %	40 - 140 %	25%
86-73-7	Fluorene	3.3	2.3	71 %	3.3	2.1	63 %	12 %	40 - 140 %	25%
85-01-8	Phenanthrene	3.3	2.7	82 %	3.3	2.3	71 %	14 %	40 - 140 %	25%
120-12-7	Anthracene	3.3	3.0	91 %	3.3	2.8	83 %	8 %	40 - 140 %	25%
206-44-0	Fluoranthene	3.3	3.2	96 %	3.3	2.8	86 %	11 %	40 - 140 %	25%
129-00-0	Pyrene	3.3	3.2	96 %	3.3	2.8	86 %	11 %	40 - 140 %	25%
56-55-3	Benzo[a]anthracene	3.3	3.3	100 %	3.3	3.1	93 %	7 %	40 - 140 %	25%
218-01-9	Chrysene	3.3	3.4	102 %	3.3	3.3	99 %	3 %	40 - 140 %	25%
205-99-2	Benzo[b]fluoranthene	3.3	3.1	94 %	3.3	2.8	86 %	10 %	40 - 140 %	25%
207-08-9	Benzo[k]fluoranthene	3.3	3.2	98 %	3.3	3.1	94 %	4 %	40 - 140 %	25%
50-32-8	Benzo[a]pyrene	3.3	3.1	94 %	3.3	2.9	88 %	7 %	40 - 140 %	25%
193-39-5	Indeno[1,2,3-c,d]pyrene	3.3	2.6	79 %	3.3	2.4	73 %	8 %	40 - 140 %	25%
53-70-3	Dibenzo[a,h]anthracene	3.3	2.8	84 %	3.3	2.7	81 %	4 %	40 - 140 %	25%
191-24-2	Benzo[g,h,i]perylene	3.3	2.4	74 %	3.3	2.3	69 %	6 %	40 - 140 %	25%
n/a	PAH Group	56	47	83 %	56	43	77 %	8 %	40 - 140 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	2.7	2.1	78 %	2.7	2.0	74 %
	2-Bromonaphthalene	2.7	2.2	81 %	2.7	2.1	78 %
Extraction:	Chloro-octadecane	2.7	2.1	78 %	2.7	2.1	78 %
	ortho-Terphenyl	2.7	2.3	85 %	2.7	1.9	70 %

Fractionation Breakthrough Evaluation						QC Limits
91-20-3	Naphthalene	LCS	0 %	LCSD	0 %	5 %
91-57-6	2-Methylnaphthalene	LCS	0 %	LCSD	0 %	5 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Method modified by use of microwave accelerated solvent extraction technique.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.
The LCS and LCSD are prepared from separate source standards than those used for calibration.

Quality Control Report Method Blank

Category: MA DEP EPH
QC Batch ID: EP-2142-M
Matrix: Soil

Instrument ID: GC-9 Agilent 6890
Extracted: 09-12-05 14:00
Analyzed (AL): 09-12-05 23:40
Analyzed (AR): 09-13-05 00:24
Analyst: MM

EPH Ranges		Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]		BRL		mg/Kg	30
n-C19 to n-C36 Aliphatic Hydrocarbons [†]		BRL		mg/Kg	30
n-C11 to n-C22 Aromatic Hydrocarbons [†] [◊]		BRL		mg/Kg	30
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]		BRL		mg/Kg	30

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	2.7	1.9	72 %	40 - 140 %
	2-Bromonaphthalene	2.7	2.0	74 %	40 - 140 %
Extraction:	Chloro-octadecane	2.7	1.9	73 %	40 - 140 %
	ortho-Terphenyl	2.7	2.0	76 %	40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

[◊] n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

Quality Control Report Laboratory Control Samples

Category: MA DEP EPH Method
QC Batch ID: EP-2143-M
Matrix: Soil
Units: mg/Kg

LCS
Instrument ID: GC-9 Agilent 6890
Extracted: 09-12-05 22:00
Analyzed (AL): 09-13-05 15:51
Analyzed (AR): 09-13-05 16:35
Analyst: MM

LCSD
Instrument ID: GC-9 Agilent 6890
Extracted: 09-12-05 22:00
Analyzed (AL): 09-13-05 17:20
Analyzed (AR): 09-13-05 18:04
Analyst: MM

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
111-84-2	n-Nonane (C ₉)	3.3	1.8	54 %	3.3	1.8	54 %	1 %	30 - 140 %	25 %
124-18-5	n-Decane (C ₁₀)	3.3	2.1	65 %	3.3	2.1	62 %	4 %	40 - 140 %	25 %
112-40-3	n-Dodecane (C ₁₂)	3.3	2.3	69 %	3.3	2.2	65 %	5 %	40 - 140 %	25 %
629-59-4	n-Tetradecane (C ₁₄)	3.3	2.4	74 %	3.3	2.3	68 %	7 %	40 - 140 %	25 %
544-76-3	n-Hexadecane (C ₁₆)	3.3	2.7	82 %	3.3	2.5	77 %	7 %	40 - 140 %	25 %
593-45-3	n-Octadecane (C ₁₈)	3.3	3.1	94 %	3.3	2.8	86 %	8 %	40 - 140 %	25 %
n/a	n-C9 to n-C18 Group	20	14	73 %	20	14	69 %	6 %	40 - 140 %	25 %
629-92-5	n-Nonadecane (C ₁₉)	3.3	2.9	89 %	3.3	2.7	81 %	9 %	40 - 140 %	25 %
112-95-8	n-Eicosane (C ₂₀)	3.3	3.1	95 %	3.3	2.9	87 %	9 %	40 - 140 %	25 %
629-97-0	n-Docosane (C ₂₂)	3.3	3.1	93 %	3.3	2.8	85 %	10 %	40 - 140 %	25 %
646-31-1	n-Tetracosane (C ₂₄)	3.3	3.1	94 %	3.3	2.8	85 %	10 %	40 - 140 %	25 %
630-01-3	n-Hexacosane (C ₂₆)	3.3	3.0	90 %	3.3	2.7	82 %	10 %	40 - 140 %	25 %
630-02-4	n-Octacosane (C ₂₈)	3.3	2.9	89 %	3.3	2.7	81 %	9 %	40 - 140 %	25 %
638-68-6	n-Triacontane (C ₃₀)	3.3	2.9	87 %	3.3	2.6	80 %	9 %	40 - 140 %	25 %
630-06-8	n-Hexatriacontane (C ₃₆)	3.3	2.3	70 %	3.3	2.1	65 %	8 %	40 - 140 %	25 %
n/a	n-C19 to n-C36 Group	26	23	89 %	26	21	81 %	9 %	40 - 140 %	25 %
91-20-3	Naphthalene	3.3	2.1	64 %	3.3	1.9	59 %	8 %	40 - 140 %	25 %
91-57-6	2-Methylnaphthalene	3.3	2.3	69 %	3.3	2.1	64 %	9 %	40 - 140 %	25 %
208-96-8	Acenaphthylene	3.3	2.5	76 %	3.3	2.3	69 %	10 %	40 - 140 %	25 %
83-32-9	Acenaphthene	3.3	2.4	72 %	3.3	2.2	65 %	10 %	40 - 140 %	25 %
86-73-7	Fluorene	3.3	2.5	76 %	3.3	2.2	68 %	11 %	40 - 140 %	25 %
85-01-8	Phenanthrene	3.3	2.7	81 %	3.3	2.4	72 %	11 %	40 - 140 %	25 %
120-12-7	Anthracene	3.3	2.9	88 %	3.3	2.6	80 %	9 %	40 - 140 %	25 %
206-44-0	Fluoranthene	3.3	3.0	91 %	3.3	2.7	81 %	12 %	40 - 140 %	25 %
129-00-0	Pyrene	3.3	3.0	92 %	3.3	2.7	81 %	12 %	40 - 140 %	25 %
56-55-3	Benzo[a]anthracene	3.3	3.1	95 %	3.3	2.8	85 %	11 %	40 - 140 %	25 %
218-01-9	Chrysene	3.3	3.4	102 %	3.3	3.1	94 %	9 %	40 - 140 %	25 %
205-99-2	Benzo[b]fluoranthene	3.3	3.0	90 %	3.3	2.6	79 %	13 %	40 - 140 %	25 %
207-08-9	Benzo[k]fluoranthene	3.3	3.2	97 %	3.3	2.9	89 %	9 %	40 - 140 %	25 %
50-32-8	Benzo[a]pyrene	3.3	3.0	91 %	3.3	2.7	81 %	11 %	40 - 140 %	25 %
193-39-5	Indeno[1,2,3-c,d]pyrene	3.3	2.3	69 %	3.3	2.0	60 %	14 %	40 - 140 %	25 %
53-70-3	Dibenzo[a,h]anthracene	3.3	2.6	79 %	3.3	2.3	70 %	12 %	40 - 140 %	25 %
191-24-2	Benzo[g,h,i]perylene	3.3	2.1	63 %	3.3	1.8	55 %	14 %	40 - 140 %	25 %
n/a	PAH Group	56	46	82 %	56	41	74 %	11 %	40 - 140 %	25 %

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
Fractionation: 2-Fluorobiphenyl	2.7	1.9	70 %	2.7	1.9	70 %	40 - 140 %
2-Bromonaphthalene	2.7	1.6	59 %	2.7	1.5	56 %	40 - 140 %
Extraction: Chloro-octadecane	2.7	2.4	89 %	2.7	2.2	81 %	40 - 140 %
ortho-Terphenyl	2.7	2.1	78 %	2.7	1.9	70 %	40 - 140 %

Fractionation Breakthrough Evaluation						QC Limits
91-20-3	Naphthalene	LCS	1 %	LCSD	1 %	5 %
91-57-6	2-Methylnaphthalene	LCS	0 %	LCSD	0 %	5 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Method modified by use of microwave accelerated solvent extraction technique.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.
The LCS and LCSD are prepared from separate source standards than those used for calibration.

Quality Control Report Method Blank

Category: MA DEP EPH
QC Batch ID: EP-2143-M
Matrix: Soil

Instrument ID: GC-9 Agilent 6890
Extracted: 09-12-05 22:00
Analyzed (AL): 09-13-05 14:23
Analyzed (AR): 09-13-05 15:06
Analyst: MM

EPH Ranges		Concentration		Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons [†]		BRL			mg/Kg	30
n-C19 to n-C36 Aliphatic Hydrocarbons [†]		BRL			mg/Kg	30
n-C11 to n-C22 Aromatic Hydrocarbons [†] [◊]		BRL			mg/Kg	30
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons [†]		BRL			mg/Kg	30
QC Surrogate Compound		Spiked	Measured	Recovery		QC Limits
Fractionation:	2-Fluorobiphenyl	2.7	2.0	75 %		40 - 140 %
	2-Bromonaphthalene	2.7	1.5	57 %		40 - 140 %
Extraction:	Chloro-octadecane	2.7	2.3	85 %		40 - 140 %
	ortho -Terphenyl	2.7	2.1	80 %		40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

[†] Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

[◊] n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

Quality Control Report Laboratory Control Samples

Category:	EPA 8270C Modified	LCS	Instrument ID:	MS-6 HP 6890	LCSD	Instrument ID:	MS-6 HP 6890
QC Batch ID:	EP-2140-M	Extracted:	09-09-05 15:00	Extracted:	09-09-05 15:00	Analyst:	JJT
Matrix:	Soil	Analyzed:	09-13-05 03:58	Analyzed:	09-13-05 04:37	Analyst:	JJT
Units:	ug/Kg	Analyst:	JJT	Analyst:	JJT		

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
91-20-3	Naphthalene	330	200	61 %	330	210	64 %	5 %	40 - 140 %	20%
91-57-6	2-Methylnaphthalene	330	220	67 %	330	240	73 %	9 %	40 - 140 %	20%
85-01-8	Phenanthrene	330	240	73 %	330	250	76 %	4 %	40 - 140 %	20%
83-32-9	Acenaphthene	330	270	82 %	330	280	85 %	4 %	40 - 140 %	20%
208-96-8	Acenaphthylene	330	250	76 %	330	260	79 %	4 %	40 - 140 %	20%
86-73-7	Fluorene	330	250	76 %	330	260	79 %	4 %	40 - 140 %	20%
120-12-7	Anthracene	330	240	73 %	330	250	76 %	4 %	40 - 140 %	20%
206-44-0	Fluoranthene	330	270	82 %	330	290	88 %	7 %	40 - 140 %	20%
129-00-0	Pyrene	330	270	82 %	330	290	88 %	7 %	40 - 140 %	20%
56-55-3	Benzo[a]anthracene	330	270	82 %	330	290	88 %	7 %	40 - 140 %	20%
218-01-9	Chrysene	330	270	82 %	330	290	88 %	7 %	40 - 140 %	20%
205-99-2	Benzo[b]fluoranthene	330	260	79 %	330	280	85 %	7 %	40 - 140 %	20%
207-08-9	Benzo[k]fluoranthene	330	270	82 %	330	290	88 %	7 %	40 - 140 %	20%
50-32-8	Benzo[a]pyrene	330	260	79 %	330	290	88 %	11 %	40 - 140 %	20%
193-39-5	Indeno[1,2,3-c,d]pyrene	330	260	79 %	330	280	85 %	7 %	40 - 140 %	20%
53-70-3	Dibenzo[a,h]anthracene	330	240	73 %	330	260	79 %	8 %	40 - 140 %	20%
191-24-2	Benzo[g,h,i]perylene	330	270	82 %	330	290	88 %	7 %	40 - 140 %	20%
QC Surrogate Compound		Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits		
ortho -Terphenyl		2,700	1,900	70 %	2,700	2,100	78 %	40 - 140 %		

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.
The LCS and LCSD are prepared from separate source standards than those used for calibration.

Quality Control Report Method Blank

Category: EPA Method 8270C (Mod.) - EPH PAHs by GC/MS-SIM
QC Batch ID: EP-2140-M
Matrix: Soil

Instrument ID: MS-6 HP 6890
Extracted: 09-09-05 15:00
Analyzed: 09-13-05 03:19
Analyst: JJT

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	10
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	10
208-96-8	Acenaphthylene	BRL		ug/Kg	10
83-32-9	Acenaphthene	BRL		ug/Kg	10
86-73-7	Fluorene	BRL		ug/Kg	10
85-01-8	Phenanthrene	BRL		ug/Kg	10
120-12-7	Anthracene	BRL		ug/Kg	10
206-44-0	Fluoranthene	BRL		ug/Kg	10
129-00-0	Pyrene	BRL		ug/Kg	10
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	10
218-01-9	Chrysene	BRL		ug/Kg	10
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	10
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	10
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	10
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	10
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	10
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	10

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	2,700	2,300	86 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

Quality Control Report Laboratory Control Samples

Category: EPA 8270C Modified
QC Batch ID: EP-2142-M
Matrix: Soil
Units: ug/Kg

LCS
Instrument ID: MS-6 HP 6890
Extracted: 09-12-05 14:00
Analyzed: 09-13-05 14:03
Analyst: JJT

LCSD
Instrument ID: MS-6 HP 6890
Extracted: 09-12-05 14:00
Analyzed: 09-13-05 14:43
Analyst: JJT

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
91-20-3	Naphthalene	330	220	67 %	330	200	61 %	10 %	40 - 140 %	20%
91-57-6	2-Methylnaphthalene	330	240	73 %	330	220	67 %	9 %	40 - 140 %	20%
85-01-8	Phenanthrene	330	250	76 %	330	230	70 %	8 %	40 - 140 %	20%
83-32-9	Acenaphthene	330	280	85 %	330	250	76 %	11 %	40 - 140 %	20%
208-96-8	Acenaphthylene	330	260	79 %	330	230	70 %	12 %	40 - 140 %	20%
86-73-7	Fluorene	330	260	79 %	330	240	73 %	8 %	40 - 140 %	20%
120-12-7	Anthracene	330	260	79 %	330	240	73 %	8 %	40 - 140 %	20%
206-44-0	Fluoranthene	330	300	91 %	330	290	88 %	3 %	40 - 140 %	20%
129-00-0	Pyrene	330	300	91 %	330	290	88 %	3 %	40 - 140 %	20%
56-55-3	Benzo[a]anthracene	330	310	94 %	330	300	91 %	3 %	40 - 140 %	20%
218-01-9	Chrysene	330	300	91 %	330	290	88 %	3 %	40 - 140 %	20%
205-99-2	Benzo[b]fluoranthene	330	290	88 %	330	280	85 %	4 %	40 - 140 %	20%
207-08-9	Benzo[k]fluoranthene	330	310	94 %	330	290	88 %	7 %	40 - 140 %	20%
50-32-8	Benzo[a]pyrene	330	300	91 %	330	290	88 %	3 %	40 - 140 %	20%
193-39-5	Indeno[1,2,3-c,d]pyrene	330	290	88 %	330	280	85 %	4 %	40 - 140 %	20%
53-70-3	Dibenzo[a,h]anthracene	330	270	82 %	330	260	79 %	4 %	40 - 140 %	20%
191-24-2	Benzo[g,h,i]perylene	330	310	94 %	330	290	88 %	7 %	40 - 140 %	20%
QC Surrogate Compound		Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits	
ortho -Terphenyl		2,700	2,200	81 %	2,700	2,000	74 %		40 - 140 %	

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.
The LCS and LCSD are prepared from separate source standards than those used for calibration.

Quality Control Report Method Blank

Category: EPA Method 8270C (Mod.) - EPH PAHs by GC/MS-SIM
QC Batch ID: EP-2142-M
Matrix: Soil

Instrument ID: MS-6 HP 6890
Extracted: 09-12-05 14:00
Analyzed: 09-13-05 13:23
Analyst: JJT

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	10
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	10
208-96-8	Acenaphthylene	BRL		ug/Kg	10
83-32-9	Acenaphthene	BRL		ug/Kg	10
86-73-7	Fluorene	BRL		ug/Kg	10
85-01-8	Phenanthrene	BRL		ug/Kg	10
120-12-7	Anthracene	BRL		ug/Kg	10
206-44-0	Fluoranthene	BRL		ug/Kg	10
129-00-0	Pyrene	BRL		ug/Kg	10
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	10
218-01-9	Chrysene	BRL		ug/Kg	10
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	10
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	10
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	10
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	10
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	10
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	10

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	2,700	2,100	78 %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

Certifications and Approvals

Groundwater Analytical maintains environmental laboratory certification in a variety of states. Copies of our current certificates may be obtained from our website:

<http://www.groundwateranalytical.com/qualifications.htm>

CONNECTICUT, Department of Health Services, PH-0586

Categories: Potable Water, Wastewater, Solid Waste and Soil
http://www.dph.state.ct.us/BRS/Environmental_Lab/OutStateLabList.htm

FLORIDA, Department of Health, Bureau of Laboratories, E87643

Categories: SDWA, CWA, RCRA/CERCLA
<http://www.floridadep.org/labs/qa/dohforms.htm>

MAINE, Department of Human Services, MA103

Categories: Drinking Water and Wastewater
<http://www.state.me.us/dhs/eng/water/Compliance.htm>

MASSACHUSETTS, Department of Environmental Protection, M-MA-103

Categories: Potable Water and Non-Potable Water
<http://www.state.ma.us/dep/bspt/wes/files/certlabs.pdf>

NEW HAMPSHIRE, Department of Environmental Services, 202703

Categories: Drinking Water and Wastewater
<http://www.des.state.nh.us/asp/NHELAP/labsview.asp>

NEW YORK, Department of Health, 11754

Categories: Potable Water, Non-Potable Water and Solid Waste
<http://www.wadsworth.org/labcert/elap/comm.html>

PENNSYLVANIA, Department of Environmental Protection, 68-665

Environmental Laboratory Registration (Non-drinking water and Non-wastewater)
<http://www.dep.state.pa.us/Labs/Registered/>

RHODE ISLAND, Department of Health, 54

Categories: Surface Water, Air, Wastewater, Potable Water, Sewage
http://www.healthri.org/labs/labsCT_MA.htm

U.S. Department of Agriculture, Soil Permit, S-53921

Foreign soil import permit

VERMONT, Department of Environmental Conservation, Water Supply Division

Category: Drinking Water
<http://www.vermontdrinkingwater.org/wsops/labtable.PDF>