

September 22, 2017

Mr. Ben Rogan  
Highland Development, Inc.  
98 Winchester Street  
Medford, MA 02155  
e-mail: [ben@highlanddevelopment.net](mailto:ben@highlanddevelopment.net)

**SUBJECT: SUMMARY OF SITE CONDITIONS AND REMEDIATION COST ESTIMATES  
30-44 BROADWAY, SOMERVILLE, MASSACHUSETTS**

Dear Mr. Rogan:

EnviroBusiness, Inc. (EBI Consulting, hereinafter “EBI”) is pleased to provide Highland Development Inc. (Highland) with this summary of environmental conditions and anticipated remediation costs for the property at 30-44 Broadway, in Somerville, Massachusetts (herein the Subject Property). The Subject Property is a Massachusetts Department of Environmental Protection (MassDEP) listed disposal site with Release Tracking Number (RTN) 3-30424. EBI understands that Highland intends to demolish the existing buildings and redevelop the Subject Property for mixed commercial and residential use. The future on-site multi-level building is anticipated to include an underground parking structure, ground-floor commercial/retail/restaurant space and upper level residential units.

This remainder of this letter presents a summary of existing environmental conditions at the Subject Property and describes the environmental assessment, remediation and regulatory submittals that, in EBI's opinion, are required to achieve regulatory closure. Estimated budgetary costs for these activities are provided in the Environmental Remediation Budget Estimates table included in Attachment A.

## **1.0 EXISTING ENVIRONMENTAL CONDITIONS**

To evaluate existing environmental conditions at the Subject Property, EBI reviewed the following documents:

- *Phase I Initial Site Investigation and Tier Classification Report*, prepared Hermenau & Hermenau Consulting Engineers (HHCE), dated November 8, 2012; and,
- EBI Memorandum, *30-44 Broadway – Groundwater Sampling Results and Document Review*, dated December 9, 2015.

Copies of these documents are included as Attachment B to this letter.

The following site conditions were reported in the HHCE Phase I Initial Site Investigation and Tier Classification Report:

- The Subject Property operated as a gasoline station from approximately the 1930's to the 1960s. The Subject Property was also used for automobile service and repair from the 1930s to at least 2012.

- Subsurface soil sampling revealed the presence of petroleum impacts to soil extending to depths up to approximately 16 feet, primarily in the vicinity of the former garage service bays (i.e., the south-central portion of the subject property). Other minor evidence of subsurface petroleum impacts to soil were also observed in boring B-4, located in the northeast corner of the Property, at depths of 5 to 10 feet.

The depth to groundwater at the Subject Property ranged from approximately 5.5 to 13 feet. The direction of groundwater flow and the Subject Property was determined to be to the north.

- Light Non-Aqueous Phase Liquid (LNAPL) was observed on the groundwater surface in well MW-4 located in the vicinity of the former service bays. Additionally, a groundwater sample from well MW-5 located in this area contained dissolved concentrations of petroleum hydrocarbons above MCP RCGW-2 Reportable Concentrations. Petroleum hydrocarbon concentrations in groundwater samples from other monitoring wells at the Subject Property did not exceed MCP RCGW-2 levels.

EBI conducted additional groundwater sampling at the Subject Property in November 2015. The observations and results from that sampling program are summarized below:

- The depth to groundwater at the Site was observed to range from 5.26 feet to 11.23 feet on on-Site wells.
- LNAPL was again observed in well MW-4 located in the vicinity of the service bays.
- Groundwater samples collected from wells MW-1, MW-2, MW-3 and MW-6 did not exhibit dissolved concentrations of petroleum hydrocarbons above MCP RCGW-2 levels. Groundwater samples were not collected from well MW-4 due to the presence of LNAPL, or from well MW-5 because insufficient groundwater was present in the well to collect a sample.

## **2.0 REQUIRED ASSESSMENT, REMEDIATION AND REGULATORY SUBMITTALS TO SUPPORT REDEVELOPMENT**

Based on the above conditions, EBI has developed an assessment and remediation approach that is both technically efficient and cost effective.

### **2.1 Assessment and Remediation Overview**

Based on the planned redevelopment scheme, EBI has developed an approach to integrate site remediation with redevelopment activities in order to minimize remediation cost. Soil and groundwater remediation will be performed primarily through soil excavation and dewatering in conjunction with redevelopment. Other potential in-situ remediation technologies such as in-situ chemical oxidation (ISCO), bioremediation and/or soil vapor extraction are considered infeasible for the Subject Property due to the presence of low permeability clay soils observed at a depth of approximately 10 feet. The presence of these low permeability clay soils will limit the effectiveness of any in-situ remediation approach in achieving a Permanent Solution for the Site within a reasonable period of time.

Subsurface soils at the Subject Property are impacted by petroleum hydrocarbons to depths up to approximately 16 feet. LNAPL and dissolved-phase petroleum impacts to groundwater are also present at the Site. Prior to remediation, the soil and groundwater will require additional sampling to delineate the full extent of the petroleum impacts, to characterize the soil for off-site recycling, reuse or disposal, and to provide further details on the proposed remediation approach to ensure that all potential site risks will be addressed. Petroleum

impacted soil generated during redevelopment will require that special handling and management procedures be developed and implemented during excavation, and the impacted soils will need to be transported off the site for recycling and/or disposal at a properly licensed facility. Soils located outside the area of observed petroleum impacts also likely contain elevated concentrations of metals and/or polynuclear aromatic hydrocarbons (PAHs) typical of historic urban fill material present at the Site. These soils will also require additional testing for off-site disposal characterization and will need to be properly managed at the time of excavation and transported off-Site to an appropriate reuse, recycling or disposal facility based on the analytical testing results.

LNAPL present on the groundwater surface, and dissolved phase petroleum-impacted groundwater will also require special handling, treatment and disposal/discharge during future excavation dewatering. The LNAPL and impacted groundwater will be pumped through a mobile treatment system likely consisting of an oil water separator and two, 200-pound Granular Activated Carbon (GAC) vessels aligned in series. Treated groundwater water will be discharged to a nearby surface water or storm drain in accordance with a National Pollution Discharge Elimination System (NPDES) Remediation General Permit (RGP) obtained from the USEPA. Monitoring and sampling of the treatment system influent, midpoint and effluent will be required to ensure that the system discharge is in compliance with the RGP discharge limits.

Finally, appropriate regulatory reporting to MassDEP will be required and the redevelopment work will need to be overseen by a Massachusetts Licensed Site Professional (MCP) to ensure that the work is conducted in accordance all applicable requirements of the Massachusetts Contingency Plan (MCP). In addition, it is likely that four quarterly rounds of groundwater monitoring will be needed following completion of the redevelopment earthwork activities to ensure that construction dewatering has reduced the on-site groundwater concentration to below applicable MCP standards to achieve No Significant Risk and a Permanent Solution.

## 2.2 Assessment and Remediation – Specific Assumptions

EBI has made the following assumptions with respect to the scope of necessary future assessment and remediation to support the planned redevelopment of the Subject Property. Budgetary estimates for each aspect of the anticipated assessment and remediation approach are included in the Environmental Remediation Budget Estimates table in Attachment A. EBI notes that the cost estimates included in Attachment A are intended as budgetary estimates, based on currently available information, for planning purposes only and should not be considered a final quote for assessment and remediation services.

### I) Additional Assessment

Assessment activities will be conducted at the Site to meet the following two objectives: (1) properly characterize to-be-excavated soil for off-site recycling, reuse and/or disposal during future redevelopment; and, (2) assess and confirm the vertical and horizontal extent of petroleum impacts to soil and groundwater and in accordance with MCP requirements. The assessment activities will include:

- a. Collection of up to twelve (12) additional soil samples for laboratory analyses of typical off-site soil disposal parameters. The number of samples is based on an anticipated soil excavation volume of 5,800 cubic yards (see Task 2 - Soil Excavation) and a typical sample frequency of 1 sample/500 cubic yards for disposal. Typical off-site soil disposal parameters include, VOCs, SVOCs, PCBs, TPH, MCP-14 Metals, pesticides/herbicides, pH, flash point, and reactivity.
- b. Installation of four (4) to six (6) additional soil borings/monitoring wells to evaluate the extent of soil and groundwater impacts at the Site. One soil samples and one groundwater sample will be collected from each boring/well for analyses of EPH and VPH using the MassDEP EPH and VPH methods.
- c. Preparation of a Summary Report on the findings of the additional assessment activities.

## **2) Soil Excavation, Transport and Disposal**

EBI estimates the volume of soil to be removed to be 5,800 cubic yards based upon building measurements of 150-feet by 75-ft by 14-feet deep for the underground parking structure. Soil excavation cost are not included as part of the environmental remediation costs for the purposes of this letter. On-site soil management and off-site soil transport and recycling/reuse/disposal costs assume the following:

- a. Soil excavation and earthwork activities are expected over a 12-month period.
- b. An estimate 1,800 cubic yards (2,700 tons) of petroleum impacted soil will be transported off-site for asphalt recycling.
- c. An estimated 4,000 cubic yards (6,000 tons) of historic urban fill soils will be transported off-site as landfill cover.
- d. EBI field staff on-site to oversee soil excavation, segregation and management approximately 3 days per month over the 12-month period. LSP on-site to oversee soil excavation, segregation and management approximately 1 day per month over the 12-month period.
- e. Up to four soil disposal packages will be prepared to obtain off-site disposal facility acceptance for the excavated soil.

## **3) Dewatering**

Dewatered groundwater will be pumped into a fractionization tank (frac tank) prior to being pumped through bag filters, granular activated carbon (GAC) and discharged. The discharge point will be directly to a surface water if available, or to a storm water drain line. The system discharge will be permitted under an NPDES RGP obtained from the USEPA and MassDEP. Cost assumptions for the dewatering system include:

- a. EBI will prepare and submit an application for a RGP to MassDEP and USEPA for approval prior to field activities.
- b. The dewatering system will consist of a 50 gallon per minute (GPM) system with two 200-pound GAC treatment vessels aligned in series.
- c. Per NPDES RGP permit requirements, sampling of the system influent, mid-point and effluent will be required on days 1, 3, 5, 7, 14, 21 and 28 following system startup, and monthly thereafter for the duration of system operation. The sample parameters are likely to include VOC, EPH and VPH.
- d. GAC replacement is estimated to occur twice over the 12-month dewatering period.

## **4) Post-Construction Monitoring**

Post-construction groundwater monitoring will be needed to demonstrate that groundwater concentrations are below applicable MassDEP standards and are at a level of No Significant Risk. Post-construction monitoring will include the following:

- a. Installation of up to six groundwater monitoring wells to evaluate groundwater quality.
- b. Quarterly sampling from each well for EPH and VPH.
- c. Data tabulation and LSP review to ensure MCP compliance.

## **5) Regulatory Reporting**

The following MCP regulatory submittals are anticipated to maintain MCP compliance and facilitate redevelopment activities:

- a. A Tier Classification/Eligible Person submittal is needed for Highland to re-establish response actions deadlines under the MCP (note that Highland was not the property owner when the release occurred).

- b. A Immediate Response Action Completion (IRA) Statement is needed to close out the IRA left open by the previous owner.
- c. A Release Abatement Measure (RAM) Plan will be needed to describe the proposed construction and soil excavation/dewatering activities in accordance with MCP requirements
- d. Up to four RAM Status Reports will be required to update MassDEP on soil excavation, dewatering and post-construction monitoring activities. RAM Status reports are required at 120-days following submittal of the RAM Plan and then every six months thereafter.
- e. A RAM Completion Report will be required within 60 days following the completion of the redevelopment earthwork and post-redevelopment groundwater monitoring activities.
- f. A MCP annual compliance fee of \$2500 will be assessed by MassDEP for each year that the Site is in the MCP system. EBI has assumed three years of annual compliance fees to MassDEP.

#### **6) Project Management**

EBI has estimated project management costs at 5% of the EBI labor associated with each task. Project management will include project meeting, conference calls, coordination of project staff and field activities, processing subcontractor invoices and project budget tracking.

#### **7) Contingency**

EBI has included a 10% project contingency in the budget estimate to account for potential unforeseen conditions that may be identified during the course of construction.

EBI looks forward to the opportunity to work with you on this important project. Should you have any questions or require additional information, please do not hesitate to contact the undersigned at EBI.

Sincerely,  
EBI Consulting



Mark Casey, PE, LSP  
Sr. Project Manager  
[mcasey@ebiconsulting.com](mailto:mcasey@ebiconsulting.com)

Attachments: A - Environmental Remediation Budget Estimates  
B - Copies of Previous Environmental Reports

## **Attachment A**

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### **Environmental Remediation Budget Estimates**

## Environmental Remediation Budget Estimates: Taco Loco, 44 Broadway, Somerville, MA 02145

1. Additional Assessment: Pre-characterization					
Task #	Task Description	QTY	U/M	U/Cost	Total
1.1	Soil Pre-Characterization Sampling [assume 5800 CY @ 1 sample/500 CY = 12 samples]	12	Each	\$850	\$10,200
1.2	Sampling for Nature & Extent (soil sampling for EPH / VPH)	12	Each	\$225	\$2,700
1.3	Driller	3	day	\$2,000	\$6,000
1.4	EBI Field Labor	4	day	\$1,000	\$4,000
1.5	Summary Report	1	Fee	\$6,500	\$6,500
Subtotal					\$29,400
2. Soil Transportation & Disposal*					
Task #	Task Description	QTY	U/M	U/Cost	Total
5800' CY total based on excavation area of approximately 150' x 75' x 14' deep]					
2.1	Area of 75' x 50' - 1800 CY [2700 ton] = Assumed for Recycling*	2700	Ton	\$86	\$232,200
2.2	Remaining area = 4000 CY [6000 ton] = Assumed for Landfill Cover*	6000	Ton	\$50	\$300,000
2.3	EBI Oversight /soil sampling. [EBI Field labor - Assume 3 days per month for 12 months]	36	days	\$1,000	\$36,000
2.4	EBI Oversight /soil sampling. [LSP Field Oversight - Assume 1 days per month for 12 months]	12	days	\$1,000	\$12,000
2.5	Confirmatory Soil Sample Analyses [Assume 20 confirmatory samples for EPH / VPH]	20	Each	\$225	\$4,500
2.6	Soil Disposal Package/Shipping Documents (Assume 4 disposal packages over life of project)	4	Each	\$850	\$3,400
Subtotal					\$588,100
*Soil Excavation Costs are assumed to be included in construction budget					
3. Dewatering System Sampling					
Task #	Task Description	QTY	U/M	U/Cost	Total
3.1	Dewatering Permit	1	Fee	\$15,000	\$15,000
3.2	Treatment System Mob/Demob	1	Fee	\$7,500	\$7,500
3.3	Treatment System Monthly Rental (Assume 50 GPM system w 2, 200-lb Granular Activated Carbon (GAC) units in series.)	12	Month	\$4,000	\$48,000
3.4	Treatment System Sample Analyses - Laboratory Costs [influent, mid-point and effluent sampling for VOC, VPH, EPH - days 1,3,5 7, 14, 21, and 28 , then monthly for remainder of operation = approximately 18 sampling events x 3 samples per event.]	54	Each	\$300	\$16,200
3.5	Dewatering System Sampling/Reporting - EBI Labor	18	Event	\$1,000	\$18,000
3.6	Granular Activated Carbon Disposal (assume 2 replacements per life of project)	1200	pounds	\$5	\$5,400
Subtotal					\$110,100
4. Post-Construction Monitoring (4 quarters)					
Task #	Task Description	QTY	U/M	U/Cost	Total
4.1	Install 6 post-redevelopment monitoring wells for groundwater monitoring	1	Fee	\$5,500	\$5,500
4.2	Quarterly Groundwater Sample Analyses [Four quarters @ 6 wells per quarter for EPH/VPH]	24	Each	\$225	\$5,400
4.3	EBI Labor (1 day per quarter)	4	Day	\$1,000	\$4,000
4.4	Equipment (1 day per quarter)	4	Day	\$300	\$1,200
4.5	Data Tabulation & Review (per quarter)	4	Fee	\$750	\$3,000
Subtotal					\$19,100

## Environmental Remediation Budget Estimates: Taco Loco, 44 Broadway, Somerville, MA 02145

5. Regulatory Submittals					
Task #	Task Description	QTY	U/M	U/Cost	Total
5.1	Tier Classification/Eligible Person Submittal [to re-establish MCP reporting deadlines for new owner]	1	Fee	\$5,000	\$5,000
5.2	IRA Completion	1	Fee	\$6,500	\$6,500
5.3	RAM Plan	1	Fee	\$10,000	\$10,000
5.4	RAM Status Reports	4	Each	\$7,500	\$30,000
5.5	RAM Completion	1	Fee	\$10,000	\$10,000
5.6	Permanent Solution Statement	1	Fee	\$15,000	\$15,000
5.7	MassDEP Annual Compliance Fee	3	Year	\$2,500	\$7,500
				<b>Subtotal</b>	<b>\$84,000</b>
6. Project Management					
Task #	Task Description	QTY	U/M	U/Cost	Total
6.1	Project Management - meetings, conference calls, staff coordination, invoicing and budget tracking (estimated at 5% of EBI labor)	1	Fee	\$7,500	\$7,500
				<b>Subtotal</b>	<b>\$7,500</b>
7. Contingency					
Task #	Task Description	QTY	U/M	U/Cost	Total
7.1	Contingency (estimated at 10% of project budget)	1	Fee	\$83,820	\$83,820
				<b>Subtotal</b>	<b>\$83,820</b>
<b>TOTAL</b>					<b>\$922,020</b>

The above costs are intended for budgetary purposes and are not considered final quotes.



## **Appendix B**

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### **Copies of Previous Environmental Reports**

# HERMENA U & HERMENA U CONSULTING ENGINEERS

Environmental, Civil and Electrical Professionals  
P.O. Box 909 • ASSONET, MA 02702 • PH/FAX (508) 823-7329

## **PHASE I - INITIAL SITE INVESTIGATION and TIER CLASSIFICATION**

**Prepared For:**  
**DEP RTN 3-30424**

**Prepared For:**  
Broadway Henry, LLC

**Property Located at:**  
Former Gasoline Station  
38 Broadway  
Somerville, MA 02145

November 8, 2012

HHCE 2011.038

# HERMENAU & HERMENAU CONSULTING ENGINEERS

Environmental, Civil and Electrical Professionals  
P.O. Box 909 • ASSONET, MA 02702 • PH/FAX (508) 823-7329

November 8, 2012

Department of Environmental Protection  
Metropolitan Boston - Northeast Regional Office  
205B Lowell Street  
Wilmington, MA 01887

RE: **Phase I Initial Site Investigation and Tier Classification**  
38 Broadway  
Somerville, MA 02145  
MADEP RTN 3-30424

Dear Department,

Hermenau & Hermenau Consulting Engineers (HHCE) has prepared the enclosed Phase I - Initial Site Investigation Report and Tier Classification for the above referenced according to the Massachusetts Contingency Plan (310 CMR 40.0480 and 40.0700).

The completed Tier Classification Submittal Form (BWSC 107), Numerical Ranking System Scoresheet (BWSC 107A) and Tier II Compliance History (BWSC107B) are provided in Appendix A. This same form is being used to submit the Phase I Completion Statement. The resulting NRS score is 183 points - Tier II.

Please do not hesitate to call if you have any questions or require additional information.

Sincerely yours,

**HERMENAU & HERMENAU CONSULTING ENGINEERS**

A handwritten signature in dark ink, appearing to read "Walter B. Hermenau", followed by a horizontal flourish line.

Walter B. Hermenau, P.E., L.S.P.

cc: Martin Henry  
Attorney William Ryan, Jr., Dane & Howe

Enclosures

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Enclosures:

Figure 1 - Site Locus

Figure 2 - MA DEP Priority Resources Map

Site Plan

Table 1 - Soil Screening Results

Table 2 - Monitoring Well Construction Logs

Table 3 - Groundwater Elevation Data

Table 4 - Summary of Soil Analyses

Table 5 - Summary of Groundwater Analyses

Appendix A - Tier Classification Form (BWSC1-07), Numerical Ranking System Scoresheet  
(BWSC 107A) and Tier II Compliance History (BWSC 107B.)

Appendix B - Soil Results

Appendix C - Groundwater Results

Appendix D - LSP Agent for PRP Certification Statements

## **1.0 INTRODUCTION**

Hermenau & Hermenau Consulting Engineers (“HHCE”) has been contracted by the property owner, Broadway Henry, LLC, to provide environmental services at 30-44 Broadway, Somerville, MA. Services requested include, but are not limited to, the completion and submittal of a Phase I - Initial Site Investigation with Tier Classification in accordance with the Massachusetts Oil and Hazardous Material Release Prevention and Response Act, M.G.L., c.21E, and the Massachusetts Contingency Plan (the “MCP”), 310 CMR 40.0000. This report presents the results of our initial investigation and tier classification of the site.

## **2.0 GENERAL SITE INFORMATION**

### **2.1 Ownership**

Broadway Henry LLC has owned the property since April 25, 2000 as recorded in Deed Book 31342, Page 606 with the Middlesex (South) County Registry of Deeds. It was previously owned by Broadway Henry Trust, Martin A. and Milfred M. Henry, Trustees, whom acquired it from John P. Henry December 17, 1997 as recorded in Middlesex (South) County Registry of Deeds, Book 27989, Page 430. This was not a certified title examination but a cursory review of available title records.

### **2.2 Address, Geographic Location, UTM Coordinates**

The disposal site (“Site”) is addressed 38 Broadway, Somerville, MA and is found on the United States Geological Survey (“USGS”) Topographic Map of Boston North (Figure 1) at latitude 42° 23' 10" and longitude 71° 4' 47" (UTM 4,694,747 m N by 328,817 m E). The site is documented in deed book 31342, pages 606-609 as Parcel No. 3 and consists of 8,887 square feet in area. It is one of four parcels that comprise a rectangular shaped lot with a total area of 13,582 square feet. This group is addressed 30-44 Broadway and is owned by Broadway Henry, LLC. The subject site is also identified by the City of Somerville, MA Assessor’s Office as Map 103, Block B, Lot 3 and is located in a mixed residential and commercial area.

### **2.3 Estimated Number of On-Site Workers**

There are two on-site workers at the City Side Towing.

### **2.4 Estimated Residential Population**

For 2010, the population of Somerville was 18,405 persons per square mile according to the U.S. Census Bureau. Since a 0.5 mile radius equals 0.785 square miles, the population density within a 0.5 mile radius was 14,448 persons.

## **2.5 General Land Uses of Site and Surrounding Properties**

The property is developed with two buildings. The first is occupied by Sullivan Square Liquors at 30 Broadway, Boulter Plywood Corp. (storage only) at 32-34 Broadway, and City Side Towing at 38 Broadway which is a repair garage and towing service. The second building is free standing and occupied by the Taco Loco Mexican Grill at 44 Broadway on the corner with George Street. The adjacent properties are Broadway to the north, Boulter Plywood Corp. at 28 Broadway to the east, a multi-family residence to the southeast at 9 Mount Vernon Street and a multi-family residence to the southwest at 7 George Street. There is a commercial sheet metal shop immediately to the south and on the 7 George Street property. The site and surrounding area are serviced with municipal drinking water and are not located within a potentially productive drinking water area according the MA DEP 21E Priority Resources Map (Figure 2). The nearest water body is the Mystic River located approximately 0.35 miles to the northeast.

## **2.6 Institutions**

There are no Institutions as defined in 310 CMR 40.0006 within 500 feet of the subject site.

## **2.7 Natural Resource Areas**

### ***2.7.a BWSC/MASS Geographic Information System Map***

An environmental resources produced by the Massachusetts Executive Office of Environmental Affairs was reviewed to determine natural resources in the area.

- Potentially Productive Aquifers;
- Non-Potential Drinking Water Source Areas;
- EPA Designated Sole Source Aquifers;
- DEP Approved Zone II;
- Interim Wellhead Protection Areas;
- Public Surface Water Supplies;
- Wetlands;
- Surface Water Features;
- State, Federal, Municipal, Non-Profit and Private Open Space and Recreational Facilities;
- Areas of Critical Environmental concern (ACEC);
- DEP Permitted Solid Waste Facilities; Certified Vernal Pools; and
- NHESP Estimated Habitats of Rare Wetlands Wildlife

Based on this map, the subject site does not lie within any protect environmental resources.

### ***2.7.b Drinking Water Supplies***

Municipal drinking water serves the existing buildings and surrounding properties. The Massachusetts Water Resources Authority provides municipal drinking water to the City of Somerville. MWRA's water comes from the Quabbin Reservoir, about 65 miles west of Boston, and the Wachusett Reservoir, about 35 miles west of Boston.



### **2.7.c Private Water Supply Wells**

No private drinking water supply wells are located on the site. A curb-side inspection of all properties within a 500 foot radius revealed no indication of private water supply wells.

## **3.0 SITE PLAN**

A Site Plan depicting pertinent features is enclosed (see Site Plan).

## **4.0 SITE HISTORY**

### **4.1 Current Use**

The site is completely paved and developed with two buildings. The first is occupied by Sullivan Square Liquors at 30 Broadway, Boulter Plywood Corp. (storage only) at 32-34 Broadway, and City Side Towing at 38 Broadway which is a repair garage and towing service. The second building is free standing and occupied by the Taco Loco Mexican Grill at 44 Broadway on the corner with George Street.

### **4.2 Past Use**

The following excerpts were determined by IES, Inc. as reported in their Phase I Environmental Site Assessment of the subject property, dated February 28, 2011 and prepared for the property owner:

In the past, 30 and 44 Broadway were utilized for retail purposes and 32 and/or 38 Broadway were utilized for automobile repair from approximately the mid 1930's to the present. Based upon records on file with the Somerville Fire Department and City Clerk's Office, 38 Broadway appears to have been utilized as a gasoline filling station from the mid 1930's to 1960. In addition, several former buildings identified as 34-38 Broadway and 40-42 Broadway/5 George Street were utilized for retail and residential purposes. According to the City of Somerville Assessor's Office the site buildings were constructed around 1900.

A review of Sanborn Fire Insurance Atlases dated 1900, 1933, and 1950 was conducted as part of this assessment. The buildings identified as 30 and 44 Broadway were depicted on the 1900 Sanborn Atlas, and appear to have been utilized for retail stores at that time. In addition, three former retail stores were identified as 34, 36 and 38 Broadway and a L- shaped, residential apartment building located at 40-42 Broadway and at 5 George Street was also depicted on the 1900 Atlas. In addition, a Chinese Laundry was identified at 34 Broadway.

In addition to the buildings depicted on the 1900 Sanborn Atlas, the 1933 Sanborn Atlas also depicted two stable buildings identified as 30Y Broadway and 38Y, Broadway. Please note that the building identified as 30Y2 Broadway is the existing site building identified as 32 Broadway.

The 1950 Sanborn Atlas indicated that the existing site buildings identified as 30 and 44 Broadway were utilized for retail stores at that time. The retail buildings identified on the 1900 and 1933 Sanborn Atlases at 34, 36, and 38 Broadway were not depicted on the 1950 Sanborn Atlas. However, the former residential building identified as 40-42 Broadway and 5 George Street was depicted on the 1950 Atlas, and the existing site building identified as 32 Broadway was utilized for automobile repair at that time.

Aerial photographs dated 1955, 1969, 1971, 1978, 1995, 2001 and 2005 were also reviewed as part of this assessment. The existing site buildings appear to have been depicted on each of the above mentioned photographs.

### **4.3 Previous Environmental Investigations**

IES, Inc. prepared a Phase I Environmental Site Assessment of the subject property dated February 28, 2011. Aside from the past used noted above, IES identified the following Recognized Environmental Conditions ("REC") for the subject property:

- Oil stained concrete floor in the vicinity of the waste oil AST and on the concrete floor of the westerly garage bay at 38 Broadway;
- The former use of the site as an automobile repair garage from the mid-1930s to the present,
- The former use of the site as a gasoline station and its associated former gasoline USTs;
- A 275-gallon fuel oil AST at 32 Broadway; and
- The former in ground hydraulic lifts, "oil pit", 275-gallon fuel oil AST, and approximate 200-gallon waste oil AST at 38 Broadway.

IES completed an "ASTM Transaction Screen" for the portion of the site at 30-44 Broadway in March of 2000 (Project #400-118). Potential on-site sources of contamination identified during the 2000 investigation included a 275 gallon AST located in the basement at 30 Broadway; a 275 gallon AST located in the storage area of the building located at 36 Broadway; the use of the 38 Broadway property as an automotive repair facility, and the engine oil, antifreeze and related fluids stored in several tanks and 55-gallon drums associated with the operation. In addition, a 275-gallon AST containing heating oil with oil staining on the concrete floor at 38 Broadway; and a 275-gallon AST located in the basement of 44 Broadway were noted as potential environmental threats.

In addition, an ASTM Screen/Limited Assessment report dated June 8, 2008 for 12-44 Broadway, Somerville, MA was also prepared by IES. According to the June 2008 assessment, the portion of the site at 30 Broadway was occupied by a package store (Square Beverage) and Middlesex Beverage Company previously occupied this portion of the site at that time. The

portion of the site at 36 Broadway was utilized as a warehouse by the southerly abutting Boulter Plywood, and this portion of the site was previously occupied by an automobile detailing facility (E & J Auto Detailing) during the 1990s. The portion of the site at 38 Broadway was an automotive repair facility (City Side Auto) in 2008. Finally, the portion of the site at 44 Broadway was occupied by a restaurant (Taco Loco), and has been since at least the 1990s.

Potential on-site sources of contamination identified at the site in 2008 included the use of 38 Broadway as an automotive repair facility. Oil and hazardous materials observed at 38 Broadway in 2008 included a 275 gallon, fuel oil AST, a 55 gallon, waste oil tank, and two, 55 gallon, engine oil drums. Additionally, a 275 gallon, fuel oil AST was observed at 36 Broadway.

Past potential on-site sources of contamination identified in the 2008 ASTM Screen report included a 275 gallon AST located in the basement at 30 Broadway; a 275 gallon AST located in the storage area of the building at 36 Broadway; and the use of 38 Broadway as an automotive repair facility. Oil and hazardous materials stored in this portion of the site included engine oil, antifreeze, and automotive-related fluids stored in several tanks and 55 gallon drums. In addition, a 275 gallon AST containing heating oil with oil staining on the concrete floor was observed at the 38 Broadway portion of the site; and a 275 gallon AST was located in the basement of 44 Broadway portion of the site.

Nover-Armstrong Associates, Inc. (“NAA”) completed a Subsurface Investigation for 12-22 and 30-44 Broadway, Somerville, Ma for the Central Bank, dated December 15, 2011. Only the Executive Summary was available for review. No Site Plan or supporting analytical data was provided and, as such, HHCE could not substantiate their findings less “MW-101” which had 4 feet of light non-aqueous phase liquid (“LNAPL”). This well is presumably MW-4 for which HHCE measured up to 5.26 feet of oil on November 1, 2011. NAA identified similar compounds of concern as identified by HHCE. NAA reported an RCGW2 exceedance of vinyl chloride in MW-106 which was not a target compound of the subsurface investigation completed by HHCE. NAA also tasked Hager GeoScience, Inc (HGI) to complete a geophysical survey for possible underground storage tanks. HGI reportedly identified an anomaly adjacent to the eastern side of the 38 Broadway garage structure and interpreted it to be a potential small underground storage tank.

#### **4.4 Release History**

On September 19, 2011, HHCE completed several borings and monitoring wells on the subject property as part of an initial subsurface investigation (see Site Plan). Borings and wells were completed inside and outside the existing buildings. Measurable total organic vapors (TOV) up to 223 parts per million (ppm) were detected and found to be predominantly localized to the garage service bays. Ambient measurements for TOV inside the garage were <0.3 ppm and attributable to the numerous parts, equipment and supplies inside the garage. See Table 1 for soil headspace screening results and Table 2 for well construction logs.

On October 3 and 4, 2011, analytical results of a soil and groundwater samples, respectively, received by Walter Hermenau (see Appendices A and B). A comparison of this data to MCP reportable concentrations for RCS-1 and RCGW-2 categories revealed 120 day reporting conditions existed for VPH C5-C8 aliphatics, EPH C9-C18 aliphatics, EPH C11-C22 aromatics and 2-methylnaphthalene in soil and EPH C9-C18 aliphatics and EPH C11-C22 aromatics in groundwater (see Table 4 and 5).

On November 1, 2011 measurement of 5.26 feet of light non-aqueous phase liquid ("LNAPL") in MW-4 was observed by Walter Hermenau (see Table 3). The LNAPL appeared weathered and emulsified. Notification of the 72-hour release condition for >1/2 inch of NAPL was made orally by Mr. Hermenau to Scott Ross of the DEP at 1:10 P.M. on November 2, 2011.

On November 18, 2011, notification of the 72 Hour and 120 Reporting Conditions was made to the DEP via the submission of Release Notification & Notification Retraction Form BWSC-103. The 120 Day Reporting Conditions were a release of oil to soil exceeding Reportable Concentrations and affecting more than 2 cubic yards as well as a release of oil to groundwater exceeding Reportable Concentrations. A Notice of Responsibility ("NOR") was issued to Broadway Henry, LLC and the spill was assigned Release Tracking Number 3-30424.

#### **4.5 Statement of Compliance History**

Broadway Henry LLC has not been issued any permits or licenses by the Department. Broadway Henry LLC was issued a Notice of Noncompliance, dated September 14, 2012, for not submitting an IRA Plan and IRA Status Report per the applicable deadlines. Mr. Hermenau communicated with the listed DEP contact, John Zupkus, on behalf of Broadway Henry LLC, regarding the response deadline and provided these electronic deliverables to the DEP on November 2, 2012.

#### **4.5 Oil and Hazardous Material (OHM) Use and Storage History**

##### ***4.5.a Types, Use, Quantities, Periods of Use and Storage Locations***

The site was reportedly used as a gasoline station from the 1930's to 1960. There was underground storage of gasoline over this period. See next section for additional details.

##### ***4.5.b Aboveground and Underground Storage Tanks***

Records regarding underground and aboveground storage of oil and hazardous materials were requested by IES from the City of Somerville Clerk's Office and the Fire Prevention Division of the Somerville Fire Department for the site and nearby properties. The City of Somerville Clerk's Office provided records for the site and directed further inquiry to the Somerville Fire Department. According to their records, the 38-44 Broadway portion of the site has a license to store 5,000 gallons of gasoline, 50 gallons of alcohol, 1,000 gallons of diesel oil, 100 gallons of motor oil and 100 gallons of range oil. This license was granted/amended on April 11, 1935 and December 9, 1949. In addition, there records also indicated "All Tanks Removed 1960".

The Somerville Fire Department provided to IES records for the subject site. These records indicated that the 30-38 Broadway portion of the site retained the license for the storage of 5,000 gallons of gasoline, 50 gallons of alcohol, 1,000 gallons of diesel oil, 100 gallons of motor oil, 100 gallons of range oil and 15 gallons grease. In addition, the Somerville Fire Department records indicated that a 1,000 gallon UST, a 2,000 gallon UST and a 3,000 gallon UST all containing gasoline were removed from 32 Broadway in September of 1960.

The site buildings at 30 and 44 Broadway area heated with natural gas and the buildings at 32-38 Broadway are heated with fuel oil, which is stored in two, 275 gallon fuel oil ASTs.

#### ***4.5.c Drums, Lagoons, Pits or Piles***

IES reported that an employee of City Side Towing indicated that there were two former in-ground piston hydraulic lifts and a former oil pit at 36-38 Broadway. The aforementioned employee of City Side Towing could not give an exact date of their removal/closure; however, he did indicate that they were removed/filled before their occupancy of the garage approximately 20 years ago. There is one drum of drill cuttings stored along the north outside wall of the building.

### **4.6 Waste Management History (excluding off-site disposal of solid waste)**

#### ***4.6a Landfills and Lagoons***

None.

#### ***4.6.b Drains, Septic Systems and Leach Fields***

The buildings have reportedly been connected to municipal sewer since 1909. There is no history of septic systems or leach fields on the property. No floor drains were observed throughout the buildings.

#### ***4.6.c Surface Water Discharges to Natural and Man-made Water Bodies***

None.

#### ***4.6.d Discharges to Wastewater Treatment Plants***

The buildings have reportedly been connected to municipal sewer since 1909.

#### ***4.6.e Any Other Relevant Means of Disposal or Treatment***

None.

### **4.7 Environmental Permits and Compliance History**

#### ***4.7.a MGL c. 21E Response Actions***

The PRP has performed response actions to remove LNAPL from MW-4 as an orally approved immediate response action. The PRP was issued a Notice of Noncompliance for not submitting an IRA Plan and Status Reports. These submittals were made November 2, 2012.

#### ***4.7.b OHM Storage Permits***

According to the City Clerk, the 38-44 Broadway portion of the site has a license to store 5,000 gallons of gasoline, 50 gallons of alcohol, 1,000 gallons of diesel oil, 100 gallons of motor oil and 100 gallons of range oil.

#### ***4.7.c Wastewater Discharge Permits***

None.

#### ***4.7.d Groundwater Discharge Permits***

None.

#### ***4.7.e Air Quality Discharge Permits***

None.

#### ***4.7.f Wetlands Alteration Permits***

None.

#### ***4.7.g Resource Conservation and Recovery Act (RCRA) Permits***

None.

#### ***4.7.h National Pollution Discharge Elimination System (NPDES) Permits***

None.

## **5.0 SITE HYDROGEOLOGICAL CHARACTERISTICS**

### **5.1 Relevant Geologic, Hydrologic and Geophysical Investigations**

Subsequent to a utility clearance, borings and wells were completed on September 19, 2011, using Geoprobe equipment and a truck mounted hollow stem auger drill rig. Technical Drilling Services, Inc. completed six soil borings/groundwater monitoring wells under the supervision of HHCE. Borings/wells were completed evenly across the property and identified as B-1 to

B-3/MW-1 to MW-3 and G-1 to G-3/MW-4 to MW-6 (see Site Plan). Soils retrieved were loose sand and gravel urban fill to 7-8 feet± underlain by clay to a maximum depth of 16 feet below ground surface. All soil samples retrieved were screened on site with the PID analyzer at the time of collection for total headspace volatiles. Readings varied from 0.8 to 223.1 parts per million. Boring logs with PID results are summarized in Table 1. Well construction details are provided in Table 2.

## **5.2 General Site Topography**

The property has a gentle downwards gradient from the southwest corner at George Street toward the northeast corner at Broadway.

## **5.3 Characterization of Geologic and Stratigraphic Conditions**

### ***5.3.a Soil Types, Stratigraphy and Evidence of Filling or Waste Disposal***

There is an approximate 7-8 foot layer of sand and gravel urban fill (i.e., red brick and trace of coal ash) across the property. The underlying soil is firm blue clay.

### ***5.3.b Estimated Depth to and Description of Bedrock***

Unknown. Bedrock was not encountered to a maximum depth of 16 feet below grade.

## **5.4 Groundwater and Flow Direction**

The groundwater is estimated to flow in a northerly direction across the site.

## **6.0 NATURE AND EXTENT OF CONTAMINATION**

### **6.1 Evidence of Releases of OHM to the Environment**

#### ***6.1.a Visual and Olfactory Evidence***

Visual and olfactory evidence of a release of oil to soil and groundwater was observed at the time of completion of soil borings and during groundwater sampling events. Ambient measurements for TOV inside the garage were <0.3 ppm and attributable to the numerous parts, equipment and supplies inside the garage.

#### ***6.1.b Field Screening for Headspace Volatiles***

All soil samples retrieved from the borings were screened on site for total headspace volatile organics as benzene (v/v) with a Photovac MicroTip Model 2020 photoionization detector (PID) analyzer at the time of collection according to the manufacturer's instructions and the DEP procedures. Responses ranged from 0.8 to 223.1 ppmv TOV. These results are documented in Table 1.

### **6.1.c Sample Collection and Handling**

Soil sampling was discrete (grab) in order to justify and ease comparison to applicable standards set forth in 310 CMR 40.0000. Intact, undisturbed soil samples were taken from Geoprobe column by hand using a latex disposable glove. Groundwater sampling activities followed DEP procedures.<sup>1</sup> Wells were sampled in increasing order of suspected contamination, if any. Depth to groundwater and height of the water column were measured with a pre-cleaned meter prior to sampling each. Up to 5.26 feet of light non-aqueous phase liquid (LNAPL) was measured in MW-4. LNAPL was reduced to 0.56 feet as of October 30, 2012. All wells except MW-4 were gently purged dry using low-flow techniques. This was short of the recommended 3-5 standing volumes of water yet all wells were allowed to fully recover and were sampled on September 21, 2011. Disposable tubing and vinyl gloves were used to sample each well.

All samples were collected in the appropriate containers provided by the project laboratory and preserved accordingly by the laboratory. Each was I-Chem Quality-Assured™ pre-cleaned per US EPA protocols. All samples were individually labeled upon collection and logged on the chain-of-custody record prior to subsequent sampling to eliminate mishandling. All samples were immediately stored in an insulated sample cooler chilled with ice packs. Samples were kept in the custody of the sampler until transfer to the laboratory courier. All samples were kept cool with an ice pack/cooler combination in the field and during transport or by refrigeration until analysis.

### **6.1.d Confirmatory Laboratory Analyses**

The objective of the laboratory analyses was to verify the absence or presence of target petroleum and non-petroleum compounds in soil and/or groundwater regulated by 310 CMR 40.0000. Samples were analyzed for MADEP Extractable Petroleum Hydrocarbons (EPH) and Volatile Petroleum Hydrocarbons (VPH) with target analyte compounds (TAC) per MADEP guidance.<sup>2</sup> All site specific soil and groundwater results are summarized in the enclosed Tables 4 and 5, respectively.

#### **6.1.d(1) Soil Results**

Soil samples submitted for confirmatory laboratory analysis were B-4 5-10', GP-3 4-8' and GP-5 7-8'. These samples were selected for their elevated PID readings and, thus, represent conservative values for the site. Samples were analyzed for the hydrocarbon fractions of interest as well as recommended target analytes per the DEP's *Characterizing Risk Posed by Petroleum Contaminated Sites: Implementation of the MADEP VPH/EPH Approach* (the "EPH/VPH guidance document"). All samples were analyzed by the Massachusetts certified Spectrum Analytical Laboratory, Agawam, MA. No detectable concentrations were found for GP-5 7-8'. Sample B-4 5-10' revealed detectable VPH carbon range organics ("CRO") and naphthalene.

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<sup>3</sup>Massachusetts Department of Environmental Protection, *Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of the MADEP VPH/EPH Approach*, October 31, 2002. Policy #WSC-02-411.



The C<sub>5</sub>-C<sub>8</sub> Aliphatics concentration of 192 ppm was in excess of the Reportable Concentration (RCS-1) of 100 ppm for Soil Category S-1. Sample GP-3 4-8' revealed detectable concentrations of EPH/VPH CRO and/or target analyte compounds. EPH C9-C18 aliphatics of 2,170 ppm, C11-C22 aromatics of 1,290 ppm, and naphthalene at 17.3 ppm exceeded their respective RCS-1 standards of 1,000, 1,000 and 4 ppm. All results are summarized in Table 4 and a complete copy is provided in Appendix B.

#### **6.1.d(2) Groundwater Results**

All wells were sampled on September 22, 2011 except MW-4 which was not included in the budget. The depth to groundwater varied from 7.04 to 13.39 feet below grade. MW-4 and 5 had a sheen and MW-3 had a faint gasoline odor. Whereas LNAPL was not observed in any well on September 20, 2012, it was subsequently measured at 5.26 feet in MW-4 on November 1, 2012. LNAPL in MW-4 has since been reduced to 0.56 feet for MW-4 as of October 30, 2012. Results of groundwater gauging are summarized in Table 5.

Groundwater samples were submitted for confirmatory laboratory analysis for the hydrocarbon fractions of interest as well as recommended target analytes per the DEP's EPH/VPH guidance document. All samples were analyzed by the Massachusetts certified Spectrum Analytical Laboratory in Agawam, MA. Samples from MW-1 and MW-2 revealed no detectable concentrations. MW-6 revealed methyl tert-butyl ether and MW-3 revealed detectable concentrations of EPH/VPH and naphthalene. All were less than the Reportable Concentration for Groundwater Category GW-2. Sample MW-5 revealed detectable concentrations of EPH/VPH and TACs with only the EPH C9-C18 aliphatics and C11-C22 aromatics in excess of their respective RCGW-2 values. A complete copy of the analytical is provided in Appendix C.

#### **6.1.d(3) Other Chemical Analyses and Results**

None.

#### **6.1.e Quality Assurance**

All data meets the requirements for "Presumptive Certainty" as described in Section 2.0 of the MA DEP document CAM VII A *Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data*. The accuracy and precision of the analytical methods were assured by percent recoveries within quality control limits. The batch laboratory control sample assured the accuracy of the analytical method again by a recovery within the quality control limit. Lastly, the batch method blank analysis revealed no preexisting contamination within the analytical method. All results were reported without adjustment for possible minute variances determined by laboratory protocol analyses. All units and terms were consistent with reporting conventions. All data points are considered scientifically valid and usable.

Laboratory quality assessment protocols included a minimum of one method blank and one laboratory control sample for each sample batch of 20 samples or less. All method blanks reported non-detects, thus assuring no pre-existing contamination in the analytical system. Laboratory control sample recoveries were within their respective QC limits, thus assuring satisfactory accuracy of the analytical method. QC surrogate compound spikes revealed recoveries well within their respective QC limits, thus assuring the effectiveness of the method in dealing with each sample matrix.

All samples were digested and/or analyzed within the recommended holding times. All samples were kept chilled at approximately 4° C and analyzed immediately after digestion. Biological degradation was kept to a minimum and the reported concentrations are representative of environmental conditions at the time of collection.

### ***6.1.f Historical Knowledge***

As elaborated in **Section 4.3 Previous Environmental Investigations**, soil and groundwater samples were collected by Nover-Armstrong Associates, Inc. (“NAA”) as described in an Executive Summary of their Subsurface Investigation for 12-22 and 30-44 Broadway, Somerville, MA for the Central Bank, dated December 15, 2011. No Site Plan or supporting analytical data was provided and, as such, HHCE could not substantiate their findings less “MW-101” which had 4 feet of light non-aqueous phase liquid (“LNAPL”). This well is presumably MW-4 for which HHCE measured up to 5.26 feet of oil on November 1, 2011. NAA identified similar compounds of concern as identified by HHCE. NAA reported an RCGW2 exceedance of vinyl chloride in MW-106 which was not a target compound of the subsurface investigation completed by HHCE. NAA also tasked Hager GeoScience, Inc (HGI) to complete a geophysical survey for possible underground storage tanks. HGI reportedly identified an anomaly adjacent to the eastern side of the 38 Broadway garage structure and interpreted it to be a potential small underground storage tank.

## **6.2 Names, Concentrations and Volumes of Released OHM**

### ***6.2.a Minimum/Maximum Concentrations of Each OHM Identified***

Minimum and maximum concentrations of OHM identified as part of this investigation are provided in Tables 4 and 5. OHM identified in soil and groundwater are the petroleum hydrocarbons commonly associated with an oil - MADEP Extractable Petroleum Hydrocarbons (EPH) w/4 target polycyclic aromatic hydrocarbons (PAH) target analyte compounds (TAC) and MADEP Volatile Petroleum Hydrocarbons (VPH) w/all TAC.

## **6.3 Approximate Horizontal/Vertical Extent of #2 Fuel Oil Contamination**

The vertical extent of #2 fuel oil impacted soil and groundwater contamination has been documented to a maximum depth of approximately 16 feet below grade to date. The horizontal extent is approximated at or near to the footprint of the existing and more precisely the service bay side of the building.

## **6.4 Light Non-aqueous Phase Liquid (LNAPL)**

Up to 5.26 feet of light non-aqueous phase liquid (LNAPL) was measured in MW-4. LNAPL was reduced to 0.56 feet as of October 30, 2012. No LNAPL has been observed in any other well on site. The LNAPL measured in MW-4 constitutes a Hot Spot per the MCP definition. A Hot Spot means a discrete area where the concentrations of oil or hazardous material or the thickness of LNAPL are substantially higher than those present in the surrounding area.

## **7.0 MIGRATION PATHWAYS AND EXPOSURE POTENTIAL**

### **7.1 Evidence of and Potential for OHM Migration and Human Exposure**

#### **7.1.a Air**

Indoor air screening at the garage for total organic volatiles (TOV) with a photoionization detector has revealed no significant detectable concentrations (<0.3 ppm). There are no known utility trenches under the garage service bays that could serve as preferential pathways for off-site migration of vapors or oil impacted groundwater. Estimated hydraulic gradients and the surrounding topography suggest a northeasterly flow direction for groundwater toward Broadway. The subsoil is predominantly a blue clay which has a characteristically very low hydraulic conductivity and, hence, the ability to confine and retain the historic release of oil and/or hazardous materials to the immediate proximity of the garage service bays. Thus, migration toward or through underground utilities beyond the garage is an unlikely scenario.

#### **7.1.b Soil**

The site is completely paved with bituminous concrete and developed with buildings. The potential for OHM migration and human exposure is unlikely under current conditions.

#### **7.1.c Groundwater**

Groundwater is not used for drinking water and it approximately 6 or more feet below grade. Considering the release appears localized to the garage service bays area, that the release did not occur in recent years, and the underlying blue clay has limited hydraulic conductivity, the potential for OHM migration and human exposure is unlikely under current conditions.

#### **7.1.d Surface Water and Sediments**

There are no surface waters or sediments within the boundary of the disposal site or in the surrounding area. The potential for OHM migration and human exposure is unlikely under current conditions.

## **7.2 Known and Potential Impacts of OHM to Environmental Receptors**

The site is not located in an area of sensitive environmental receptors. There is no known impact of oil detected to environmental receptors at the site or surrounding area.

## **8.0 IDENTIFICATION OF REPORTING CATEGORIES**

### **8.1 Reporting Category for Groundwater**

The DEP has designated two reporting categories for groundwater samples, RCGW-1 and RCGW-2. RCGW-1 applies to all groundwater samples collected within a current or potential drinking water source area. RCGW-2 applies to all groundwater samples that are not obtained from category RCGW-1 areas. The environmental resources database maintained by the Massachusetts Executive Office of Environmental Affairs was reviewed to determine the applicable category. Based on this map, the subject site lies within a non-potential drinking water source area, and is not RCGW-1. Therefore, reporting category RCGW-2 applies to all groundwater samples.

### **8.2 Reporting Category for Soil**

The DEP has established reporting categories RCS-1 and RCS-2. Reporting category RCS-2 applies to all soil samples that are not obtained from category RCS-1 areas. Reporting category RCS-1 applies to all samples collected at or within any of the following:

- 500 feet of a residential dwelling, a residentially zoned property, school, playground, recreational area or park; or
- within the geographic boundaries of a groundwater resource are categorized as RCGW-1.

Category RCS-1 applies for this location since samples collected during this investigation are within 500 feet of a residential property.

## **9.0 EVALUATION FOR IMMEDIATE RESPONSE ACTIONS**

Immediate Response Actions were orally approved by the DEP to remove LNAPL in MW-4. Mr. Martin Henry, for the Potentially Responsible Party, Broadway Henry LLC, completed the approved IRA actions from November 7, 2011 to January 10, 2012 and recovered approximately 1.03 gallons of oil over this period. The oil has been containerized on site and is awaiting proper disposal. As documented in Table 3, the amount of LNAPL in MW-4 has been substantially reduced from the original 5.26 feet measured on November 1, 2011 to the 0.56 feet measured on October 30, 2012. Additional assessment activities have been proposed to the PRP to better define the extent of oil contamination under the garage. Additional recovery events will be requested of the DEP verbally given the progress to date and an amended IRA Plan will be submitted should the DEP so desire.

## **10.0 TIER CLASSIFICATION**

HHCE has tier classified the above referenced per 310 CMR 40.0500 - Tier Classification and Response Action Deadlines and it is our opinion that the site is a Tier II based on the Numerical Ranking System Scoresheet of 108 points. A comparison of site conditions with the Tier I Inclusionary Criteria set forth in 310 CMR 40.0520(2) revealed no applicable criteria. Tier II sites do not require DEP approval prior to initiating Comprehensive Response Actions. At Tier II sites, persons conducting comprehensive response actions can employ an LSP to oversee assessment and cleanup actions. At the conclusion of these actions, a Response Action Outcome (RAO) Statement must be filed with the DEP to document the achievement of a permanent or temporary solution.

Thus, the Tier Classification Submittal provided in Appendix A consists of the following:

- A completed Tier Classification transmittal form (BWSC-107);
- The completed Numerical Ranking System Scoresheet (BWSC 107A); and
- A completed Tier II Compliance History form (BWSC 107B)

Public Involvement requirements relevant to Tier Classification require the following actions be taken to inform the public about the status of the disposal site's classification:

- DEP legal notice form #6, Notice of an Initial Site Investigation and Tier II Classification, shall be published in a newspaper that circulates in the community in which the disposal site is located, affected, or likely to be affected within seven days of filing the Tier Classification Submittal Form; and
- A copy of this notice must be sent to the Chief Municipal Officer and the Board of Health in the community(ies) in which the disposal site is located, affected, or likely to be affected, at least three days prior to publication of the legal notice; and
- A copy of the legal notice that includes the date of publication and the name of the newspaper, and a copy of the cover letter to the Chief Municipal Officer and the Board of Health, shall be submitted to the DEP within seven days of publication of the legal notice.

## **11.0 CONCLUSIONS**

Hermenau & Hermenau Consulting Engineers (HHCE) has completed a Phase I Initial Site Investigation Report of 30-44 Broadway, Somerville, MA 02145 using the guidelines of the Massachusetts Contingency Plan, 310 CMR 40.0480. As the name implies, this investigation is an initial step whose purpose is to collect rudimentary data such as the site history, ascertain concentrations of oil in soil and groundwater, and attempt to delineate the extent of the release of oil and/or hazardous materials. This Phase I report serves as the basis for the Tier II Classification submitted herein.

The subject site has a history as a gasoline service station from the 1930s to 1960, thereabouts. All underground storage tanks were reportedly removed in 1960 according to Fire Department records. Two former in-ground piston hydraulic lifts and a former oil pit within the garage were supposedly removed/filled prior to 1988.

Subsurface investigation including assessment of site soil and groundwater revealed detectable concentrations of EPH/VPH carbon ranges and/or target analyte compounds in excess of applicable Reportable Concentrations. Detection of 5.26 feet of LNAPL in MW-4 triggered a 72-hour reporting condition. Release notification was made and IRA approval was granted to recover LNAPL. The LNAPL has been reduced to 0.56 feet as of the October 30, 2012 gauging event. MW-4 remains a hot spot per the MCP definition. The past release of oil appears localized to the area of the garage and more specifically the service bays. The potential for OHM migration and human exposure is unlikely under current conditions and no Imminent Hazard, Critical Exposure Pathway or Substantial Release Migration was identified as documented in the Immediate Response Action Plan and Status Reports #1 and #2 submitted to the Department November 2, 2012.

Therefore, the outcome of the Phase I report is that comprehensive response actions are necessary to reach a condition of no significant risk. Response actions should be planned accordingly to further reduce the LNAPL and reach a condition of no significant risk in accordance with the MCP, 310 CMR 40.00.

## **12.0 PHASE II SCOPE OF WORK**

Additional assessment is proposed to complete the determination of the extent of the disposal site and to evaluate remedial alternatives necessary to complete the next MCP phased report, Phase II/III, due on or about November 2014. This work will include the following:

- Additional borings and/or wells will be completed in and around the garage service bay area,
- Installation of soil gas points to further assess potential impacts to indoor air on and off site,
- Reassessment of IH or CEP should the new data warrants it;
- Waste characterization for soil disposal/recycling options;
- Additional groundwater gauging and sampling events for contaminants of concern;
- Building shoring analysis; and
- Continued removal of LNAPL at the discretion of the DEP. HHCE will discuss with the DEP if this action may continue under the current IRA or if an Amended IRA Plan is required.

## **13.0 PRP CERTIFICATION**

Broadway Henry, LLC, c/o Martin Henry, is the Potentially Responsible Party and has authorized Walter Hermenau, PE, LSP, to be his Agent for PRP Certification Statements (Appendix D).

## **14.0 LIMITATIONS AND QUALIFIERS**

The above observations were made under conditions included in this report. The conclusions rendered above were based upon these observations. Opinions and recommendations contained in this report apply to conditions existing when services were performed. HHCE shall not be held responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of our services. Should additional information become available in the future, these data should be reviewed by HHCE and the modifications of conclusions and/or rationale for further testing will be determined.

The purpose of this report was to collect rudimentary data such as the site history, ascertain concentrations of oil in soil and groundwater, and attempt to delineate the extent of the past oil release and Tier Classify the site. No investigation was performed to ensure compliance of past or current owners of the site with federal, state or local laws and regulations.

In preparing this report, HHCE has relied on certain information provided by state and local officials and other parties referenced therein. HHCE did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this investigation. HHCE does not warrant the accuracy of information supplied by others.

Chemical analyses have been performed for specific parameters during the course of this investigation, as described herein. However, it should be noted that additional chemical constituents not searched for and/or quantified during this investigation may be present in soil and/or groundwater at the site at levels that may require regulatory compliance both now and in the future.

This report was prepared for the exclusive use of Broadway Henry LLC. The scope of services performed in execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or re-use of this document or the findings, conclusions, or recommendations is at the risk of said user. The contents of this report may not be copied, provided or otherwise communicated to any party other than those named above for any other purpose, in whole or in part, without the prior written consent of HHCE. The work performed by HHCE is subject to the terms and conditions stated in our agreement with Broadway Henry LLC. This study has been conducted according to generally accepted engineering consulting principals and practices. No other warranty, expressed or implied, is made. This report must be considered in its entirety and HHCE shall not be responsible for damages associated with the use of segregated portions of this report.

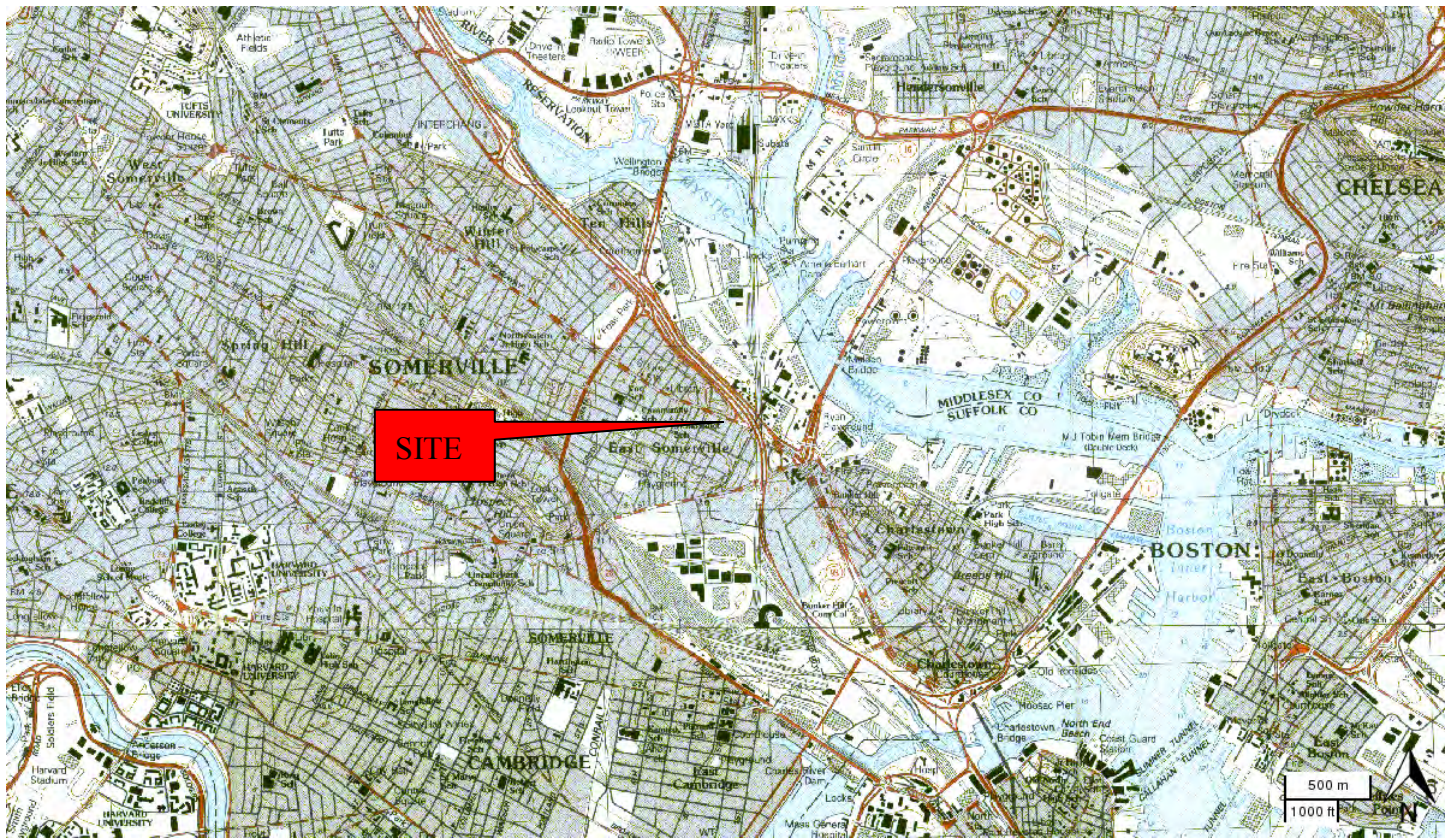
This report addresses the environmental characteristics of the subject property with regard to the reportable release of or possible presence of OHM. It is not intended to guarantee that the subject property is or is not free from conditions, materials or substances that could adversely impact the environment or pose a threat to public health and safety. Rather, it is intended to be used as a summary of available information on existing conditions, the conclusions of which are based upon a reasonable review of information found in accordance with normally accepted industry standards, subject to and as limited by the scope and budget established with the client.

It must be recognized that environmental investigations are inherently limited in the sense that conclusions are drawn and recommendations developed from information obtained from limited research and site investigation. All site subsurface conditions were not field investigated as part of this study and may differ from the conditions implied by the limited investigation performed at the site subject property. Additionally, the passage of time may result in a change in the environmental characteristics at this site subject property and surrounding properties. This report does not warrant against future operations or conditions, nor does this warrant operations or conditions present of a type or at a location not investigated.

It should be noted that a certain percentage of Response Action Outcome Statements and supporting documentation are audited by the Massachusetts Department of Environmental Protection (“the Department”). The Department may conduct Random Audits or Targeted Audits for up to five years following the submission of an RAO Statement. Under certain circumstances, as provided in 310 CMR 40.1110, there are no time constraints for Targeted Audits. Due to the inherent flexibility in interpreting the applicable regulations, the Audits are often subjective and dependent on the opinion of the auditor. As a result, the auditor could require additional assessment of the site subject property and/or remedial actions. Based on these considerations, HHCE is not and will not be responsible for costs or other possible ramifications of additional work required by the Department. Any other parties with financial or other interests in the subject property are urged to consider these facts.



# FIGURE 1



USGS Topographical Quadrangle Map, Boston North, MA (Not to Scale)

Coordinates: 42° 23' 10" Latitude, 71° 4' 47" Longitude (UTM 4,694,747 m N by 328,817 m E)

## **FIGURE 2**



# MassDEP - Bureau of Waste Site Cleanup

## Site Information: MCP Numerical Ranking System Map: 500 feet & 0.5 Mile Radii

FORMER GASOLINE STATION  
38 BROADWAY SOMERVILLE, MA  
3-00030424

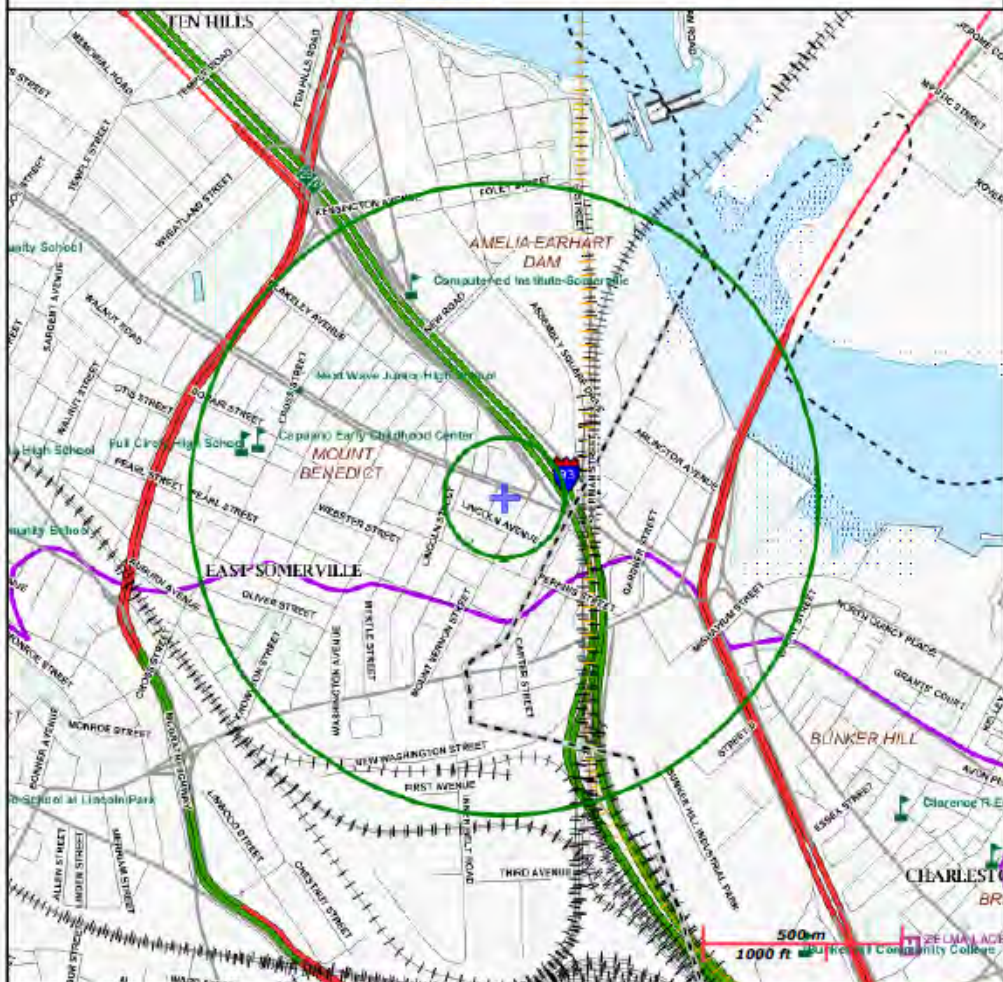
NAD83 UTM Metric:  
4894746mE, 325818mE (Zone: 19)

October 26, 2012

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at:  
<http://www.mass.gov/mgl>



**MassDEP**  
Commonwealth of Massachusetts  
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region, Train, Powerline, Pipeline, Aqueduct

Basins: Major, PWS, Breams: Perennial, Interim, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source, ...

Non Potential Drinking Water Source Area: Medium, High (Yield) ...

PWS Protection Areas: Zone II, RWPA, Zone A

Hydrography: Open Water, PWS Reservoir, Tidal Flat

Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100-ft Floodplain, Protected Open Space, ACEC

Est. Rare Wetland Wildlife Hab, Vernal Pools, Cert., Potential  
Solid Waste Landfill, PWS: Com GW, SW, Emerg, Non-Com

## **SITE PLAN**



# TABLES

**TABLE 1**

**SOIL SAMPLES AND HEADSPACE SCREENING RESULTS**

ID	D (ft)	R (in)	TOTAL HEADSPACE VOCs (ppm)	DESCRIPTION	NOTES
B-1	5-7'	8	1.1	Fill	Bituminous concrete 0-3". Loose. Red brick.
B-1	10-12'	48	1.4	Silty clay	Stiff blue clay.
B-1	15-17'	48	0.9	Silty clay	Stiff blue clay. Saturated with groundwater.
B-2	0-2'	18	0.8	Fill	Bituminous concrete 0-3". Loose. Stones and red brick. Old foundation/concrete wall.
B-2	5-7'	2	0.9	Fill	Loose. Stones and red brick. Old foundation/concrete wall.
B-2	10-12'	28	0.8	Silty clay	Traces of gravel.
B-2	12-15'	34	0.8	Clay	Stiff blue clay.
B-2	15-16'	12	1.0	Sand & gravel	Dense. Trace of clay.
B-3	0-2'	18	2.0	Fill	Bituminous concrete 0-3". Loose. Stones and red brick.
B-3	5-7'	2	3.9	Fill	Loose. Stones and red brick.
B-3	10-12'	24	1.3	Sand	Dense gravelly and clayey till.
B-3	12-15'	34	0.8	Clay	Stiff blue clay.
B-3	15-16'	12	1.5	Sand & gravel	Dense. Trace of clay.
B-4	0-2'	20	1.2	Fill	Bituminous concrete 0-3". Loose. Fill. Stones and red brick.
B-4	5-7'	15	34.7	Fill	Dark brown silty sand and gravel w/ trace of coal ash.
B-4	5-10'	NA	142	Clay	Auger cuttings composite. Saturated with groundwater. Strong gasoline odor.
B-4	10-12'	28	4.8	Clay	Dense sandy gravelly till.
B-4	15-17'	28	1.8	Clay	Dense sandy gravelly till.
G-1	0-4'	0	N/A	N/A	Concrete 0-4". No recovery.
G-1	4-8'	20	13.8 (Tip)	Sand & gravel	Black. Oil stained.
G-1	8-12'	40	14.4	Silty gravel	Black. Loose. Oil Stained. Distinct petrolic odor. Blue-green clay 0-15". Brown-blue clay 30-40".
G-1	12-16'	36	88.7 (0-18")	Silty clay	Blue clay 0-4". Coarse sand 4-8". Blue clay 8-18". All petrolic odor and stained.
G-1	12-16'	36	43.1 (18-36")	Silty clay	Blue-brown clay. No petrolic odor or stain.
G-2	0-4'	24	44.2 (Tip)	Fill	Concrete 0-3". 0-6" Trace of coal ash, red brick, 6-24" gray stained med. sand w/ strong petrolic odor.
G-2	4-8'	48	10.8 (Tip)	Fill	Trace of coal ash, red brick. Gray stained med. sand w/ strong petrolic odor.
G-2	8-12'	48	65.4 (Tip)	Clay	0-12" petroleum stained med. sand, 12-48" stiff blue clay w/ petrolic odor.
G-2	12-16'	48	79.0 (0-6")	Clay	0-18" petroleum stained med. gray sand, 18-48" stiff blue clay w/ petrolic odor.
G-2	12-16'	48	41.8 (Tip)	Clay	0-18" petroleum stained med. gray sand, 18-48" stiff blue clay w/ petrolic odor.
G-3	0-4'	18	25.2 (Tip)	Fill	Concrete 0-3". 0-6" Trace of coal ash, red brick, 6-18" gray stained med. sand w/ petrolic odor.
G-3	4-8'	24	223.1 (Tip)	Sand	0-12" coarse black sand, 12-24" petroleum contaminated med. black/gray sand.
G-3	8-12'	48	66.9 (0-12")	Clay	0-12" petroleum contaminated med. black/gray sand; 12-48" petroleum contaminated stiff blue clay
G-3	8-12'	48	76.9 (Tip)	Clay	0-12" petroleum contaminated med. black/gray sand; 12-48" petroleum contaminated stiff blue clay
G-3	12-16'	48	82.6 (0-12")	Clay	0-22" petroleum contaminated med. coarse sand, 22-48" stiff blue clay. Faint petrolic odor.
G-3	12-16'	48	80.5 (Tip)	Clay	0-22" petroleum contaminated med. coarse sand, 22-48" stiff blue clay. Faint petrolic odor.
G-4	0-4'	12	4.2 (Tip)	Fill	Concrete 0-6". 6-12" Trace of coal ash.
G-4	4-8'	8	148.0 (Tip)	Sand	Oil stained (black) med. sand and gravel.
G-4	8-12'	36	13.0 (Tip)	Silty Clay	Stiff black/brown. Faint petrolic odor.
G-4	12-14'	24	92.4 (0-18")	Clay	Greasy sandy stiff blue clay. 0-18" wet with petrolic odor; 18-24" faint petrolic odor. Refusal at 14 feet.
G-4	12-14'	24	9.8 (Tip)	Clay	Greasy sandy stiff blue clay. 0-18" wet with petrolic odor; 18-24" faint petrolic odor. Refusal at 14 feet.
G-5	0-4'	24	6.4	Fill	Bituminous concrete 0-3". 3-24" fill - coal ash with red brick. Loose.
G-5	4-8'	40	2.5 (0-12")	Clay	Black wet sand 0-12". Stiff black/blue clay 12-40"
G-5	4-8'	40	1.6 (Tip)	Clay	Black wet sand 0-12". Stiff black/blue clay 12-40"
G-5	8-12'	48	1.2 (0-12")	Clay	Clay w/ gray sand 0-12", Blue/black sand and gravelly loam (fill?). Stiff blue clay 18-48"
G-5	8-12'	48	0.9 (Tip)	Clay	Clay w/ gray sand 0-12", Blue/black sand and gravelly loam (fill?). Stiff blue clay 18-48"

**Notes:**

Photoionization detector calibrated with 100 ppm Isobutylene (RF = 1.0). Headspace readings as benzene are equal to half of the reported values.

B-1 to B-6 completed September 19, 2011 with a Geoprobe drill rig and a truck mounted hollow stem auger drill rig.



**TABLE 2 - MONITORING WELL CONSTRUCTION LOGS**

BORING ID	WELL ID	MATERIALS
B-1	MW-1	2-inch schedule 40 PVC well at 15 feet Screen slot size 0.010 inch 5-15 feet Filter sand 2-15 feet Bentonite chip seal 1-2 feet End plug at bottom 8-inch diameter aluminum roadway box set
B-3	MW-2	2-inch schedule 40 PVC well at 15 feet Screen slot size 0.010 inch 5-15 feet Filter sand 2-15 feet Bentonite chip seal 1-2 feet End plug at bottom 8-inch diameter aluminum roadway box set
B-4	MW-3	2-inch schedule 40 PVC well at 15 feet Screen slot size 0.010 inch 5-15 feet Filter sand 2-15 feet Bentonite chip seal 1-2 feet End plug at bottom 8-inch diameter aluminum roadway box set
G-1	MW-4	1-inch schedule 40 PVC well at 15 feet Screen slot size 0.010 inch 5-15 feet Filter sand 2-15 feet Bentonite chip seal 1-2 feet End plug at bottom 4-inch diameter aluminum roadway box set
G-4	MW-5	1-inch schedule 40 PVC well at 14 feet Screen slot size 0.010 inch 5-14 feet Filter sand 2-14 feet Bentonite chip seal 1-2 feet End plug at bottom 4-inch diameter aluminum roadway box set
G-5	MW-6	1-inch schedule 40 PVC well at 12 feet Screen slot size 0.010 inch 5-12 feet Filter sand 2-12 feet Bentonite chip seal 1-2 feet End plug at bottom 4-inch diameter aluminum roadway box set

**TABLE 3**

**GROUNDWATER ELEVATION DATA**

Well ID	Top of PVC	Depth to Bottom	September 20, 2011				November 1, 2011				November 21, 2011				October 30, 2012			
			Depth to Product	Depth to Water	Apparent LNAPL	GW Elev.	Depth to Product	Depth to Water	Apparent LNAPL	GW Elev.	Depth to Product	Depth to Water	Apparent LNAPL	GW Elev.	Depth to Product	Depth to Water	Apparent LNAPL	GW Elev.
MW-1	100.75	15.00	0.00	8.55	0.00	92.20	0.00	7.56	0.00	93.19	NA	NA	NA	TBD	NA	9.87	NA	90.88
MW-2	99.02	15.00	0.00	12.07	0.00	86.95	0.00	11.21	0.00	87.81	NA	NA	NA	TBD	NA	13.39	NA	85.63
MW-3	98.59	15.00	0.00	9.01	0.00	89.58	0.00	8.18	0.00	90.41	NA	NA	NA	TBD	NA	10.33	NA	88.26
MW-4	99.27	15.00	0.00	5.85	0.00	93.42	5.50	10.76	5.26	NA	9.85	11.86	2.01	TBD	10.34	10.90	0.56	88.37
MW-5	99.25	14.00	0.00	5.72	0.00	93.53	0.00	2.92	0.00	96.33	NA	NA	NA	TBD	0.00	7.04	0.00	92.21
MW-6	98.12	12.00	0.00	6.80	0.00	91.32	0.00	5.95	0.00	92.17	NA	NA	NA	TBD	NA	8.12	NA	90.00

Notes:

All data are expressed in feet.

All measurements made from high point of PVC wells.

LNAPL = Light non-aqueous phase liquid.

NM = Not Measured

NA = Not Applicable

Monitoring wells MW-1 to MW-6 installed 9-19-11.

MW-1 through MW-3 are 2" ID diameter well Sch. 40 PVC.

MW-4 through MW-6 are 1" ID diameter wells Sch. 40 PVC.

**TABLE 4 - SUMMARY OF SOIL ANALYSES**

CHEMICAL				Massachusetts Contingency Plan 310 CMR 40.1600 Reportable Concentration in Soil for Category RCS-1
Sample ID	B-4 5-10'	GP-3 4-8'	GP-5 7-8'	
Sample Date	9/19/11	9/19/11	9/19/11	
<b>VPH</b>				
C <sub>5</sub> -C <sub>8</sub> Aliphatics	192	46.6	< 0.857	100
C <sub>9</sub> -C <sub>12</sub> Aliphatics	170	192	< 0.286	1,000
C <sub>9</sub> -C <sub>10</sub> Aromatics	61.5	97.7	< 0.286	100
<b>VPH TACs</b>				
Methyl tert-butyl ether	< 0.5	< 2.3	< 0.06	0.1
Benzene	< 0.5	< 2.3	< 0.06	2
Toluene	< 0.5	< 2.3	< 0.06	30
Ethylbenzene	< 0.5	< 2.3	< 0.06	40
meta- and para-Xylenes	< 1	< 4.6	< 0.1	300
ortho-Xylene	< 0.5	< 2.3	< 0.06	300
Naphthalene	1.1	17.3	< 0.06	4
<b>EPH</b>				
C <sub>9</sub> -C <sub>18</sub> Aliphatics	< 12.2	2,170	< 12.6	1,000
C <sub>19</sub> -C <sub>36</sub> Aliphatics	< 12.2	1,460	< 12.6	3,000
C <sub>11</sub> -C <sub>22</sub> Aromatics	< 12.2	1,290	< 12.6	1,000
<b>EPH TACs</b>				
Naphthalene	< 0.405	2.88	< 0.419	4
2-Methylnaphthalene	< 0.405	15	< 0.419	0.7
Acenaphthylene	< 0.405	< 0.374	< 0.419	1
Acenaphthene	< 0.405	< 0.374	< 0.419	4
Fluorene	< 0.405	2.09	< 0.419	1000
Phenanthrene	< 0.405	5.02	< 0.419	10
Anthracene	< 0.405	0.601	< 0.419	1000
Fluoranthene	< 0.405	< 0.374	< 0.419	1000
Pyrene	< 0.405	0.772	< 0.419	1000
Benzo (a) anthracene	< 0.405	< 0.374	< 0.419	7
Chrysene	< 0.405	< 0.374	< 0.419	70
Benzo (b) fluoranthene	< 0.405	< 0.374	< 0.419	7
Benzo (k) fluoranthene	< 0.405	< 0.374	< 0.419	70
Benzo (a) pyrene	< 0.405	< 0.374	< 0.419	2
Indeno (1,2,3-cd) pyrene	< 0.405	< 0.374	< 0.419	7
Dibenzo (a,h) anthracene	< 0.405	< 0.374	< 0.419	0.7
Benzo (g,h,i) perylene	< 0.405	< 0.374	< 0.419	1000
<b>PCB</b>				
Aroclor-1016	NA	< 0.0224	NA	2
Aroclor-1221	NA	< 0.0224	NA	2
Aroclor-1232	NA	< 0.0224	NA	2
Aroclor-1242	NA	< 0.0224	NA	2
Aroclor-1248	NA	< 0.0224	NA	2
Aroclor-1254	NA	< 0.0224	NA	2
Aroclor-1260	NA	< 0.0224	NA	2
Aroclor-1262	NA	< 0.0224	NA	2
Aroclor-1268	NA	< 0.0224	NA	2

Notes:

All concentrations in units of mg/Kg (ppm) unless otherwise noted.

NA = Not Analyzed

Samples not detected at laboratory reporting limits ("BRL") are presented as "<" followed by the method reporting limit.

A = Petroleum Products in the Fuel Oil Range

**TABLE 5 - SUMMARY OF GROUNDWATER RESULTS**

CHEMICAL	Sample Location	MW-1	MW-2	MW-3	MW-5	MW-6	Massachusetts Contingency Plan 310 CMR 40.1600 Reportable Concentration in Groundwater for Category RCGW-2
	Sample Date	9/21/11	9/21/11	9/21/11	9/21/11	9/21/11	
<b>VPH</b>							
C <sub>5</sub> -C <sub>8</sub> Aliphatics	< 75	< 75	934	< 75	< 75		3,000
C <sub>9</sub> -C <sub>12</sub> Aliphatics	< 25	< 25	481	319	< 25		5,000
C <sub>9</sub> -C <sub>10</sub> Aromatics	< 25	< 25	198	171	< 25		7,000
<b>VPH TACs</b>							
Methyl <i>tert</i> -butyl Ether	< 5.0	< 5.0	< 5.0	< 5.0	12.3		5,000
Benzene	< 5.0	< 5.0	< 5.0	5.5	< 5.0		2,000
Toluene	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		40,000
Ethylbenzene	< 5.0	< 5.0	< 5.0	26.5	< 5.0		5,000
meta- and para-Xylenes	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0		5,000
ortho-Xylene	< 5.0	< 5.0	< 5.0	8.5	< 5.0		5,000
Naphthalene	< 5.0	< 5.0	9.2	181	< 5.0		1,000
<b>EPH</b>							
C <sub>9</sub> -C <sub>18</sub> Aliphatics	< 103	< 104	< 103	6,280	< 105		5,000
C <sub>19</sub> -C <sub>36</sub> Aliphatics	< 103	< 104	< 103	9,040	< 105		50,000
C <sub>11</sub> -C <sub>22</sub> Aromatics	< 103	< 104	123	5,840	< 105		5,000
<b>EPH TACs</b>							
Naphthalene	< 5.15	< 5.21	< 5.15	121	< 5.26		1,000
2-Methylnaphthalene	< 5.15	< 5.21	< 5.15	169	< 5.26		2,000
Phenanthrene	< 5.15	< 5.21	< 5.15	24.1	< 5.26		10,000
Acenaphthene	< 5.15	< 5.21	< 5.15	< 5.26	< 5.26		6,000

Notes:

All concentrations in units of ug/L (ppb) unless otherwise noted.

NA = Not Analyzed

NSP = No Standard Promulgated

Samples not detected at laboratory reporting limits ("BRL") are presented as "<" followed by the method reporting

A = Petroleum Products in the Fuel Oil Range

# **APPENDIX A**

## **APPENDIX B**

Report Date:  
04-Oct-11 11:26



**SPECTRUM ANALYTICAL, INC.**

*Featuring*

**HANIBAL TECHNOLOGY**

***Laboratory Report***

Hermenau & Hermenau Consulting Engineers  
P.O. Box 909  
Assonet, MA 02702-1711  
Attn: Walter B. Hermenau

Project: Broadway Henry LLC - Somerville, MA  
Project #: HHCE 2011.038

- ☒ Final Report  
☐ Re-Issued Report  
☐ Revised Report

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date Sampled</u>	<u>Date Received</u>
SB35895-01	B-4 5-10'	Soil	19-Sep-11 13:00	20-Sep-11 16:30
SB35895-02	GP-3 4-8'	Soil	19-Sep-11 11:00	20-Sep-11 16:30
SB35895-03	GP-5 7-8'	Soil	19-Sep-11 15:00	20-Sep-11 16:30

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.  
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110  
Connecticut # PH-0777  
Florida # E87600/E87936  
Maine # MA138  
New Hampshire # 2538  
New Jersey # MA011/MA012  
New York # 11393/11840  
Pennsylvania # 68-04426/68-02924  
Rhode Island # 98  
USDA # S-51435



Authorized by:

Nicole Leja  
Laboratory Director

Spectrum Analytical holds certification in the State of Massachusetts for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of Massachusetts does not offer certification for all analytes.  
Please note that this report contains 24 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

*Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Spectrum is currently accredited for the specific method or analyte indicated. Please refer to our "Quality" web page at [www.spectrum-analytical.com](http://www.spectrum-analytical.com) for a full listing of our current certifications and fields of accreditation. States in which Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (NY-11840, FL-E87936 and NJ-MA012).*

The following outlines the condition of all VPH samples contained within this report upon laboratory receipt.

<b>Matrices</b>	Soil		
<b>Containers</b>	✓ Satisfactory		
<b>Sample Preservative</b>	<b>Aqueous</b> (acid preserved)	✓ N/A	pH≤2      pH>2
	<b>Soil or Sediment</b>	N/A	Samples not received in Methanol
		✓ Samples received in Methanol:	<div> <div>✓ covering soil/sediment</div> <div>not covering soil/sediment</div> </div>
		✓ Samples received in air-tight container	
<b>Temperature</b>	<div> <div>✓ Received on ice</div> <div>✓ Received at 4 ± 2 °C</div> </div>		

Were all QA/QC procedures followed as required by the VPH method? *Yes*

Were any significant modifications made to the VPH method as specified in section 11.3? *No*

Were all performance/acceptance standards for required QA/QC procedures achieved? *Yes*

The following outlines the condition of all EPH samples contained within this report upon laboratory receipt.

<b>Matrices</b>	Soil		
<b>Containers</b>	✓ Satisfactory		
<b>Aqueous Preservative</b>	✓ N/A	pH≤2      pH>2	pH adjusted to <2 in lab
<b>Temperature</b>	<div> <div>✓ Received on ice</div> <div>✓ Received at 4 ± 2 °C</div> </div>		

Were all QA/QC procedures followed as required by the EPH method? *Yes*

Were any significant modifications made to the EPH method as specified in Section 11.3? *No*

Were all performance/acceptance standards for required QA/QC procedures achieved? *Yes*

I attest 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.


Authorized by:



Nicole Leja  
Laboratory Director



## MassDEP Analytical Protocol Certification Form

<b>Laboratory Name:</b> Spectrum Analytical, Inc.			<b>Project #:</b> HHCE 2011.038		
<b>Project Location:</b> Broadway Henry LLC - Somerville, MA			<b>RTN:</b>		
<b>This form provides certifications for the following data set:</b>			SB35895-01 through SB35895-03		
<b>Matrices:</b> Soil					
<b>CAM Protocol</b>					
8260 VOC CAM II A	7470/7471 Hg CAM III B	✓ MassDEP VPH CAM IV A	8081 Pesticides CAM V B	7196 Hex Cr CAM VI B	MassDEP APH CAM IX A
8270 SVOC CAM II B	7010 Metals CAM III C	✓ MassDEP EPH CAM IV B	8151 Herbicides CAM V C	8330 Explosives CAM VIII A	TO-15 VOC CAM IX B
✓ 6010 Metals CAM III A	6020 Metals CAM III D	✓ 8082 PCB CAM V A	9012 Total Cyanide/PAC CAM VI A	9014 Total Cyanide/PAC CAM VI A	6860 Perchlorate CAM VIII B
<b>Affirmative responses to questions A through F are required for "Presumptive Certainty" status</b>					
<b>A</b>	Were all samples received in a condition consistent with those described on the Chain of Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?				✓ Yes    No
<b>B</b>	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?				✓ Yes    No
<b>C</b>	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?				✓ Yes    No
<b>D</b>	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?				✓ Yes    No
<b>E</b>	a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?				✓ Yes    No Yes    No
<b>F</b>	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to questions A through E)?				✓ Yes    No
<b>Responses to questions G, H and I below are required for "Presumptive Certainty" status</b>					
<b>G</b>	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?				Yes    ✓ No
<b>Data User Note:</b> Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.					
<b>H</b>	Were all QC performance standards specified in the CAM protocol(s) achieved?				✓ Yes    No
<b>I</b>	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?				Yes    ✓ No
<b>All negative responses are addressed in a case narrative on the cover page of this report.</b>					
<p><i>I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.</i></p> <div style="text-align: right; margin-top: 20px;">   Nicole Leja  Laboratory Director  Date: 10/4/2011 </div>					

## CASE NARRATIVE:

The sample temperature upon receipt by Spectrum Analytical courier was recorded as 6.0 degrees Celsius. The condition of these samples was further noted as received on ice. The samples were transported on ice to the laboratory facility and the temperature was recorded at 0.8 degrees Celsius upon receipt at the laboratory. Please refer to the Chain of Custody for details specific to sample receipt times.

An infrared thermometer with a tolerance of +/- 2.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

MADEP has published a list of analytical methods (CAM) which provides a series of recommended protocols for the acquisition, analysis and reporting of analytical data in support of MCP decisions. "Presumptive Certainty" can be established only for those methods published by the MADEP in the MCP CAM. The compounds and/or elements reported were specifically requested by the client on the Chain of Custody and in some cases may not include the full analyte list as defined in the method. Regulatory limits may not be achieved if specific method and/or technique was not requested on the Chain of Custody.

According to WSC-CAM 5/2009 Rev.1, Table 11 A-1, recovery for some VOC analytes have been deemed potentially difficult. Although they may still be within the recommended recovery range, a range has been set based on historical control limits.

Some target analytes which are not listed as exceptions in the Summary of CAM Reporting Limits may exceed the recommended RL based on sample initial volume or weight provided, % moisture content, or responsiveness of a particular analyte to purge and trap instrumentation.

All VOC soils samples submitted and analyzed in methanol will have a minimum dilution factor of 50. This is the minimum amount of solvent allowed on the instrumentation without causing interference. Additional dilution factors may be required to keep analyte concentration within instrument calibration.

**See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.**

### **MADEP EPH 5/2004 R**

#### **Samples:**

S108940-CCV2

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Analyte percent difference is outside individual acceptance criteria (25), but within overall method allowances.

Benzo (b) fluoranthene (36.9%)

This affected the following samples:

B-4 5-10'

GP-3 4-8'

### **MADEP VPH 5/2004 Rev. 1.1**

#### **Samples:**

SB35895-01

*B-4 5-10'*

---

The VOC preserved soil sample is not within the 1:1 weight to volume ratio as recommended by SW846 methods 5030 and 5035 but may be within the 1:1 volume to volume ratio. This variance may affect the final reporting limit.

This sample was not able to be analyzed for client requested reporting limits due to high concentrations of target analytes in the sample.

SB35895-02

*GP-3 4-8'*

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The VOC preserved soil sample is not within the 1:1 weight to volume ratio as recommended by SW846 methods 5030 and 5035 but may be within the 1:1 volume to volume ratio. This variance may affect the final reporting limit.

**Samples:**

SB35895-02                      *GP-3 4-8'*

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This sample was not able to be analyzed for client requested reporting limits due to high concentrations of target analytes in the sample.

SB35895-03                      *GP-5 7-8'*

---

The VOC preserved soil sample is not within the 1:1 weight to volume ratio as recommended by SW846 methods 5030 and 5035 but may be within the 1:1 volume to volume ratio. This variance may affect the final reporting limit.

Sample Identification

B-4 5-10'

SB35895-01

Client Project #

HHCE 2011.038

Matrix

Soil

Collection Date/Time

19-Sep-11 13:00

Received

20-Sep-11

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
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**Volatile Organic Compounds**

VOC Extraction

Field extracted

N/A

1

VOC Soil Extraction 22-Sep-11 22-Sep-11 BD 1119332

VPH Aliphatic/Aromatic Carbon Ranges

GS, VC10

Prepared by method VPH - EPA 5030B

Initial weight: 15 g

C5-C8 Aliphatic  
Hydrocarbons

192

mg/kg dry

7.73

0.726

500

ADEP VPH 5/2004 28-Sep-11 29-Sep-11 mp 1119692  
Rev. 1.1C9-C12 Aliphatic  
Hydrocarbons

170

mg/kg dry

2.58

0.376

500

" " " " "

C9-C10 Aromatic  
Hydrocarbons

61.5

mg/kg dry

2.58

0.0665

500

" " " " "

Unadjusted C5-C8  
Aliphatic Hydrocarbons

192

mg/kg dry

7.73

0.593

500

" " " " "

Unadjusted C9-C12  
Aliphatic Hydrocarbons

232

mg/kg dry

2.58

0.353

500

" " " " "

VPH Target Analytes

GS, VC10

Prepared by method VPH - EPA 5030B

Initial weight: 15 g

71-43-2 Benzene &lt; 0.5

mg/kg dry

0.5

0.1

500

" " " " "

100-41-4 Ethylbenzene &lt; 0.5

mg/kg dry

0.5

0.1

500

" " " " "

1634-04-4 Methyl tert-butyl ether &lt; 0.5

mg/kg dry

0.5

0.08

500

" " " " "

91-20-3 Naphthalene 1.1

mg/kg dry

0.5

0.1

500

" " " " "

108-88-3 Toluene &lt; 0.5

mg/kg dry

0.5

0.1

500

" " " " "

179601-23-1 m,p-Xylene &lt; 1.0

mg/kg dry

1.0

0.3

500

" " " " "

95-47-6 o-Xylene &lt; 0.5

mg/kg dry

0.5

0.1

500

" " " " "

Surrogate recoveries:

615-59-8 2,5-Dibromotoluene (FID) 98 70-130 % " " " " "

615-59-8 2,5-Dibromotoluene (PID) 99 70-130 % " " " " "

**Extractable Petroleum Hydrocarbons**EPH Aliphatic/Aromatic RangesPrepared by method SW846 3545AC9-C18 Aliphatic  
Hydrocarbons

&lt; 12.2

mg/kg dry

12.2

1.79

1

ADEP EPH 5/2004 27-Sep-11 30-Sep-11 jg 1119588  
RC19-C36 Aliphatic  
Hydrocarbons

&lt; 12.2

mg/kg dry

12.2

5.94

1

" " " " "

C11-C22 Aromatic  
Hydrocarbons

&lt; 12.2

mg/kg dry

12.2

4.40

1

" " " " "

Unadjusted C11-C22  
Aromatic Hydrocarbons

&lt; 12.2

mg/kg dry

12.2

4.40

1

" " " " "

Total Petroleum  
Hydrocarbons

&lt; 12.2

mg/kg dry

12.2

12.1

1

" " " " "

Unadjusted Total  
Petroleum Hydrocarbons

&lt; 12.2

mg/kg dry

12.2

12.1

1

" " " " "

EPH Target PAH AnalytesPrepared by method SW846 3545A

91-20-3 Naphthalene &lt; 0.405 mg/kg dry 0.405 0.212 1 " " " " "

91-57-6 2-Methylnaphthalene &lt; 0.405 mg/kg dry 0.405 0.212 1 " " " " "

208-96-8 Acenaphthylene &lt; 0.405 mg/kg dry 0.405 0.237 1 " " " " "

83-32-9 Acenaphthene &lt; 0.405 mg/kg dry 0.405 0.237 1 " " " " "

86-73-7 Fluorene &lt; 0.405 mg/kg dry 0.405 0.239 1 " " " " "

85-01-8 Phenanthrene &lt; 0.405 mg/kg dry 0.405 0.276 1 " " " " "

120-12-7 Anthracene &lt; 0.405 mg/kg dry 0.405 0.300 1 " " " " "

206-44-0 Fluoranthene &lt; 0.405 mg/kg dry 0.405 0.271 1 " " " " "

129-00-0 Pyrene &lt; 0.405 mg/kg dry 0.405 0.292 1 " " " " "

*This laboratory report is not valid without an authorized signature on the cover page.*

\* Reportable Detection Limit

Page 6 of 24

Sample Identification**B-4 5-10'**

SB35895-01

Client Project #

HHCE 2011.038

Matrix

Soil

Collection Date/Time

19-Sep-11 13:00

Received

20-Sep-11

<i>CAS No.</i>	<i>Analyte(s)</i>	<i>Result</i>	<i>Flag</i>	<i>Units</i>	<i>*RDL</i>	<i>MDL</i>	<i>Dilution</i>	<i>Method Ref.</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Analyst</i>	<i>Batch</i>	<i>Cert.</i>
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**Extractable Petroleum Hydrocarbons**EPH Target PAH AnalytesPrepared by method SW846 3545A

56-55-3	Benzo (a) anthracene	< 0.405		mg/kg dry	0.405	0.293	1	MADEP EPH 5/200427-Sep-11	30-Sep-11	yg	1119588		
								R					
218-01-9	Chrysene	< 0.405		mg/kg dry	0.405	0.315	1	"	"	"	"	"	"
205-99-2	Benzo (b) fluoranthene	< 0.405		mg/kg dry	0.405	0.361	1	"	"	"	"	"	"
207-08-9	Benzo (k) fluoranthene	< 0.405		mg/kg dry	0.405	0.337	1	"	"	"	"	"	"
50-32-8	Benzo (a) pyrene	< 0.405		mg/kg dry	0.405	0.272	1	"	"	"	"	"	"
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.405		mg/kg dry	0.405	0.360	1	"	"	"	"	"	"
53-70-3	Dibenzo (a,h) anthracene	< 0.405		mg/kg dry	0.405	0.293	1	"	"	"	"	"	"
191-24-2	Benzo (g,h,i) perylene	< 0.405		mg/kg dry	0.405	0.303	1	"	"	"	"	"	"

Surrogate recoveries:

3386-33-2	1-Chlorooctadecane	47			40-140 %			"	"	"	"	"	"
84-15-1	Ortho-Terphenyl	42			40-140 %			"	"	"	"	"	"
321-60-8	2-Fluorobiphenyl	57			40-140 %			"	"	"	"	"	"

**General Chemistry Parameters**

% Solids	82.1			%			1	SM2540 G Mod.	26-Sep-11	26-Sep-11	BD	1119535	
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Sample Identification

<b>GP-3 4-8'</b>	<u>Client Project #</u>	<u>Matrix</u>	<u>Collection Date/Time</u>	<u>Received</u>
SB35895-02	HHCE 2011.038	Soil	19-Sep-11 11:00	20-Sep-11

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result</u>	<u>Flag</u>	<u>Units</u>	<u>*RDL</u>	<u>MDL</u>	<u>Dilution</u>	<u>Method Ref.</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Volatile Organic Compounds**

VOC Extraction	<b>Field extracted</b>	N/A	1	VOC Soil Extraction	22-Sep-11	22-Sep-11	BD	1119332
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VPH Aliphatic/Aromatic Carbon Ranges

GS, VC10

Prepared by method VPH - EPA 5030BInitial weight: 15 g

C5-C8 Aliphatic Hydrocarbons	<b>46.6</b>	mg/kg dry	34.6	3.25	2500	1ADEP VPH 5/2004 Rev. 1.1	28-Sep-11	28-Sep-11	mp	1119692
C9-C12 Aliphatic Hydrocarbons	<b>192</b>	mg/kg dry	11.5	1.68	2500	"	"	"	"	"
C9-C10 Aromatic Hydrocarbons	<b>97.7</b>	mg/kg dry	11.5	0.298	2500	"	"	"	"	"
Unadjusted C5-C8 Aliphatic Hydrocarbons	<b>46.6</b>	mg/kg dry	34.6	2.65	2500	"	"	"	"	"
Unadjusted C9-C12 Aliphatic Hydrocarbons	<b>290</b>	mg/kg dry	11.5	1.58	2500	"	"	"	"	"

VPH Target Analytes

GS, VC10

Prepared by method VPH - EPA 5030BInitial weight: 15 g

71-43-2	Benzene	< 2.3	mg/kg dry	2.3	0.5	2500	"	"	"	"	"
100-41-4	Ethylbenzene	< 2.3	mg/kg dry	2.3	0.6	2500	"	"	"	"	"
1634-04-4	Methyl tert-butyl ether	< 2.3	mg/kg dry	2.3	0.4	2500	"	"	"	"	"
91-20-3	Naphthalene	<b>17.3</b>	mg/kg dry	2.3	0.4	2500	"	"	"	"	"
108-88-3	Toluene	< 2.3	mg/kg dry	2.3	0.5	2500	"	"	"	"	"
179601-23-1	m,p-Xylene	< 4.6	mg/kg dry	4.6	1.4	2500	"	"	"	"	"
95-47-6	o-Xylene	< 2.3	mg/kg dry	2.3	0.6	2500	"	"	"	"	"

Surrogate recoveries:

615-59-8	2,5-Dibromotoluene (FID)	87	70-130 %	"	"	"	"	"
615-59-8	2,5-Dibromotoluene (PID)	84	70-130 %	"	"	"	"	"

**Semivolatile Organic Compounds by GC**Polychlorinated Biphenyls by SW846 8082Prepared by method SW846 3545A

12674-11-2	Aroclor-1016	< 22.4	µg/kg dry	22.4	11.2	1	SW846 8082A	23-Sep-11	24-Sep-11	IMR	1119337
11104-28-2	Aroclor-1221	< 22.4	µg/kg dry	22.4	20.2	1	"	"	"	"	"
11141-16-5	Aroclor-1232	< 22.4	µg/kg dry	22.4	14.4	1	"	"	"	"	"
53469-21-9	Aroclor-1242	< 22.4	µg/kg dry	22.4	13.2	1	"	"	"	"	"
12672-29-6	Aroclor-1248	< 22.4	µg/kg dry	22.4	11.0	1	"	"	"	"	"
11097-69-1	Aroclor-1254	< 22.4	µg/kg dry	22.4	16.4	1	"	"	"	"	"
11096-82-5	Aroclor-1260	< 22.4	µg/kg dry	22.4	8.58	1	"	"	"	"	"
37324-23-5	Aroclor-1262	< 22.4	µg/kg dry	22.4	20.8	1	"	"	"	"	"
11100-14-4	Aroclor-1268	< 22.4	µg/kg dry	22.4	7.02	1	"	"	"	"	"

Surrogate recoveries:

10386-84-2	4,4-DB-Octafluorobiphenyl (Sr)	55	30-150 %	"	"	"	"
10386-84-2	4,4-DB-Octafluorobiphenyl (Sr) [2C]	65	30-150 %	"	"	"	"
2051-24-3	Decachlorobiphenyl (Sr)	40	30-150 %	"	"	"	"
2051-24-3	Decachlorobiphenyl (Sr) [2C]	50	30-150 %	"	"	"	"

**Extractable Petroleum Hydrocarbons**EPH Aliphatic/Aromatic RangesPrepared by method SW846 3545A

C9-C18 Aliphatic Hydrocarbons	<b>2,170</b>	mg/kg dry	11.2	1.65	1	1ADEP EPH 5/2004 R	27-Sep-11	30-Sep-11	jj	1119588
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*This laboratory report is not valid without an authorized signature on the cover page.*

\* Reportable Detection Limit

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Sample Identification

<b>GP-3 4-8'</b>	<u>Client Project #</u>	<u>Matrix</u>	<u>Collection Date/Time</u>	<u>Received</u>
SB35895-02	HHCE 2011.038	Soil	19-Sep-11 11:00	20-Sep-11

<i>CAS No.</i>	<i>Analyte(s)</i>	<i>Result</i>	<i>Flag</i>	<i>Units</i>	<i>*RDL</i>	<i>MDL</i>	<i>Dilution</i>	<i>Method Ref.</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Analyst</i>	<i>Batch</i>	<i>Cert.</i>
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**Extractable Petroleum Hydrocarbons**EPH Aliphatic/Aromatic RangesPrepared by method SW846 3545A

C19-C36 Aliphatic Hydrocarbons	<b>1,460</b>	mg/kg dry	11.2	5.49	1	MADEP EPH 5/200427-Sep-11	30-Sep-11	1119588
C11-C22 Aromatic Hydrocarbons	<b>1,290</b>	mg/kg dry	11.2	4.06	1	"	"	"
Unadjusted C11-C22 Aromatic Hydrocarbons	<b>1,320</b>	mg/kg dry	11.2	4.06	1	"	"	"
Total Petroleum Hydrocarbons	<b>4,920</b>	mg/kg dry	11.2	11.2	1	"	"	"
Unadjusted Total Petroleum Hydrocarbons	<b>4,940</b>	mg/kg dry	11.2	11.2	1	"	"	"

EPH Target PAH AnalytesPrepared by method SW846 3545A

91-20-3	Naphthalene	<b>2.88</b>	mg/kg dry	0.374	0.195	1	"	"	"	"
91-57-6	2-Methylnaphthalene	<b>15.0</b>	mg/kg dry	0.374	0.195	1	"	"	"	"
208-96-8	Acenaphthylene	< 0.374	mg/kg dry	0.374	0.219	1	"	"	"	"
83-32-9	Acenaphthene	< 0.374	mg/kg dry	0.374	0.218	1	"	"	"	"
86-73-7	Fluorene	<b>2.09</b>	mg/kg dry	0.374	0.221	1	"	"	"	"
85-01-8	Phenanthrene	<b>5.02</b>	mg/kg dry	0.374	0.254	1	"	"	"	"
120-12-7	Anthracene	<b>0.601</b>	mg/kg dry	0.374	0.277	1	"	"	"	"
206-44-0	Fluoranthene	< 0.374	mg/kg dry	0.374	0.251	1	"	"	"	"
129-00-0	Pyrene	<b>0.772</b>	mg/kg dry	0.374	0.269	1	"	"	"	"
56-55-3	Benzo (a) anthracene	< 0.374	mg/kg dry	0.374	0.271	1	"	"	"	"
218-01-9	Chrysene	< 0.374	mg/kg dry	0.374	0.291	1	"	"	"	"
205-99-2	Benzo (b) fluoranthene	< 0.374	mg/kg dry	0.374	0.333	1	"	"	"	"
207-08-9	Benzo (k) fluoranthene	< 0.374	mg/kg dry	0.374	0.311	1	"	"	"	"
50-32-8	Benzo (a) pyrene	< 0.374	mg/kg dry	0.374	0.251	1	"	"	"	"
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.374	mg/kg dry	0.374	0.332	1	"	"	"	"
53-70-3	Dibenzo (a,h) anthracene	< 0.374	mg/kg dry	0.374	0.271	1	"	"	"	"
191-24-2	Benzo (g,h,i) perylene	< 0.374	mg/kg dry	0.374	0.280	1	"	"	"	"

Surrogate recoveries:

3386-33-2	1-Chlorooctadecane	58		40-140 %	"	"	"	"
84-15-1	Ortho-Terphenyl	61		40-140 %	"	"	"	"
321-60-8	2-Fluorobiphenyl	52		40-140 %	"	"	"	"

**Total Metals by EPA 6000/7000 Series Methods**

7439-92-1	Lead	<b>42.2</b>	mg/kg dry	1.72	0.204	1	SW846 6010C	30-Sep-11	30-Sep-11	EDT	1119909
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**General Chemistry Parameters**

% Solids	<b>86.7</b>	%		1	SM2540 G Mod.	26-Sep-11	26-Sep-11	BD	1119535
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Sample Identification

<b>GP-5 7-8'</b>	<u>Client Project #</u>	<u>Matrix</u>	<u>Collection Date/Time</u>	<u>Received</u>
SB35895-03	HHCE 2011.038	Soil	19-Sep-11 15:00	20-Sep-11

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result</u>	<u>Flag</u>	<u>Units</u>	<u>*RDL</u>	<u>MDL</u>	<u>Dilution</u>	<u>Method Ref.</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Volatile Organic Compounds**

VOC Extraction	<b>Field extracted</b>	N/A					1	VOC Soil Extraction	22-Sep-11	22-Sep-11	BD	1119332
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VPH Aliphatic/Aromatic Carbon Ranges

VC10

Prepared by method VPH - EPA 5030BInitial weight: 15 g

C5-C8 Aliphatic Hydrocarbons	< 0.857	mg/kg dry	0.857	0.0805	50	IADEP VPH 5/200428-Sep-11	28-Sep-11	mp	1119692
						Rev. 1.1			
C9-C12 Aliphatic Hydrocarbons	< 0.286	mg/kg dry	0.286	0.0416	50	"	"	"	"
C9-C10 Aromatic Hydrocarbons	< 0.286	mg/kg dry	0.286	0.00737	50	"	"	"	"
Unadjusted C5-C8 Aliphatic Hydrocarbons	< 0.857	mg/kg dry	0.857	0.0657	50	"	"	"	"
Unadjusted C9-C12 Aliphatic Hydrocarbons	< 0.286	mg/kg dry	0.286	0.0391	50	"	"	"	"

VPH Target Analytes

VC10

Prepared by method VPH - EPA 5030BInitial weight: 15 g

71-43-2	Benzene	< 0.06	mg/kg dry	0.06	0.01	50	"	"	"	"
100-41-4	Ethylbenzene	< 0.06	mg/kg dry	0.06	0.01	50	"	"	"	"
1634-04-4	Methyl tert-butyl ether	< 0.06	mg/kg dry	0.06	0.009	50	"	"	"	"
91-20-3	Naphthalene	< 0.06	mg/kg dry	0.06	0.01	50	"	"	"	"
108-88-3	Toluene	< 0.06	mg/kg dry	0.06	0.01	50	"	"	"	"
179601-23-1	m,p-Xylene	< 0.1	mg/kg dry	0.1	0.03	50	"	"	"	"
95-47-6	o-Xylene	< 0.06	mg/kg dry	0.06	0.02	50	"	"	"	"

Surrogate recoveries:

615-59-8	2,5-Dibromotoluene (FID)	92		70-130 %		"	"	"	"	"
615-59-8	2,5-Dibromotoluene (PID)	87		70-130 %		"	"	"	"	"

**Extractable Petroleum Hydrocarbons**EPH Aliphatic/Aromatic RangesPrepared by method SW846 3545A

C9-C18 Aliphatic Hydrocarbons	< 12.6	mg/kg dry	12.6	1.85	1	IADEP EPH 5/200427-Sep-11	02-Oct-11	ig	1119588
						R			
C19-C36 Aliphatic Hydrocarbons	< 12.6	mg/kg dry	12.6	6.15	1	"	"	"	"
C11-C22 Aromatic Hydrocarbons	< 12.6	mg/kg dry	12.6	4.55	1	"	"	"	"
Unadjusted C11-C22 Aromatic Hydrocarbons	< 12.6	mg/kg dry	12.6	4.55	1	"	"	"	"
Total Petroleum Hydrocarbons	< 12.6	mg/kg dry	12.6	12.5	1	"	"	"	"
Unadjusted Total Petroleum Hydrocarbons	< 12.6	mg/kg dry	12.6	12.5	1	"	"	"	"

EPH Target PAH AnalytesPrepared by method SW846 3545A

91-20-3	Naphthalene	< 0.419	mg/kg dry	0.419	0.219	1	"	"	"	"
91-57-6	2-Methylnaphthalene	< 0.419	mg/kg dry	0.419	0.219	1	"	"	"	"
208-96-8	Acenaphthylene	< 0.419	mg/kg dry	0.419	0.245	1	"	"	"	"
83-32-9	Acenaphthene	< 0.419	mg/kg dry	0.419	0.245	1	"	"	"	"
86-73-7	Fluorene	< 0.419	mg/kg dry	0.419	0.247	1	"	"	"	"
85-01-8	Phenanthrene	< 0.419	mg/kg dry	0.419	0.285	1	"	"	"	"
120-12-7	Anthracene	< 0.419	mg/kg dry	0.419	0.310	1	"	"	"	"
206-44-0	Fluoranthene	< 0.419	mg/kg dry	0.419	0.281	1	"	"	"	"
129-00-0	Pyrene	< 0.419	mg/kg dry	0.419	0.302	1	"	"	"	"

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\* Reportable Detection Limit

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Sample Identification

<b>GP-5 7-8'</b>	<u>Client Project #</u>	<u>Matrix</u>	<u>Collection Date/Time</u>	<u>Received</u>
SB35895-03	HHCE 2011.038	Soil	19-Sep-11 15:00	20-Sep-11

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
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**Extractable Petroleum Hydrocarbons**EPH Target PAH AnalytesPrepared by method SW846 3545A

56-55-3	Benzo (a) anthracene	< 0.419		mg/kg dry	0.419	0.303	1	MADEP EPH 5/200427-Sep-11	02-Oct-11		yg	1119588	
								R					
218-01-9	Chrysene	< 0.419		mg/kg dry	0.419	0.326	1	"	"	"	"	"	
205-99-2	Benzo (b) fluoranthene	< 0.419		mg/kg dry	0.419	0.373	1	"	"	"	"	"	
207-08-9	Benzo (k) fluoranthene	< 0.419		mg/kg dry	0.419	0.349	1	"	"	"	"	"	
50-32-8	Benzo (a) pyrene	< 0.419		mg/kg dry	0.419	0.281	1	"	"	"	"	"	
193-39-5	Indeno (1,2,3-cd) pyrene	< 0.419		mg/kg dry	0.419	0.372	1	"	"	"	"	"	
53-70-3	Dibenzo (a,h) anthracene	< 0.419		mg/kg dry	0.419	0.303	1	"	"	"	"	"	
191-24-2	Benzo (g,h,i) perylene	< 0.419		mg/kg dry	0.419	0.314	1	"	"	"	"	"	

Surrogate recoveries:

3386-33-2	1-Chlorooctadecane	80			40-140 %			"	"	"	"	"	
84-15-1	Ortho-Terphenyl	56			40-140 %			"	"	"	"	"	
321-60-8	2-Fluorobiphenyl	56			40-140 %			"	"	"	"	"	

**General Chemistry Parameters**

% Solids	77.8			%			1	SM2540 G Mod.	26-Sep-11	26-Sep-11	BD	1119535	
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# Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119692 - VPH - EPA 5030B</b>										
<b>Blank (1119692-BLK1)</b>					<u>Prepared &amp; Analyzed: 28-Sep-11</u>					
C5-C8 Aliphatic Hydrocarbons	< 0.750		mg/kg wet	0.750						
C9-C12 Aliphatic Hydrocarbons	< 0.250		mg/kg wet	0.250						
C9-C10 Aromatic Hydrocarbons	< 0.250		mg/kg wet	0.250						
Unadjusted C5-C8 Aliphatic Hydrocarbons	< 0.750		mg/kg wet	0.750						
Unadjusted C9-C12 Aliphatic Hydrocarbons	< 0.250		mg/kg wet	0.250						
Benzene	< 0.05		mg/kg wet	0.05						
Ethylbenzene	< 0.05		mg/kg wet	0.05						
Methyl tert-butyl ether	< 0.05		mg/kg wet	0.05						
Naphthalene	< 0.05		mg/kg wet	0.05						
Toluene	< 0.05		mg/kg wet	0.05						
m,p-Xylene	< 0.1		mg/kg wet	0.1						
o-Xylene	< 0.05		mg/kg wet	0.05						
2-Methylpentane	< 0.05		mg/kg wet	0.05						
n-Nonane	< 0.1		mg/kg wet	0.1						
n-Pentane	< 0.1		mg/kg wet	0.1						
1,2,4-Trimethylbenzene	< 0.05		mg/kg wet	0.05						
2,2,4-Trimethylpentane	< 0.05		mg/kg wet	0.05						
n-Butylcyclohexane	< 0.05		mg/kg wet	0.05						
n-Decane	< 0.05		mg/kg wet	0.05						
Surrogate: 2,5-Dibromotoluene (FID)	44.9		mg/kg wet		50.0		90	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	42.7		mg/kg wet		50.0		85	70-130		
<b>LCS (1119692-BS1)</b>					<u>Prepared &amp; Analyzed: 28-Sep-11</u>					
C5-C8 Aliphatic Hydrocarbons	61.2		mg/kg wet		60.0		102	70-130		
C9-C12 Aliphatic Hydrocarbons	55.9		mg/kg wet		60.0		93	70-130		
C9-C10 Aromatic Hydrocarbons	16.0		mg/kg wet		20.0		80	70-130		
Unadjusted C5-C8 Aliphatic Hydrocarbons	183		mg/kg wet		200		92	70-130		
Unadjusted C9-C12 Aliphatic Hydrocarbons	71.9		mg/kg wet		80.0		90	70-130		
Benzene	18.3		mg/kg wet		20.0		91	70-130		
Ethylbenzene	17.4		mg/kg wet		20.0		87	70-130		
Methyl tert-butyl ether	17.6		mg/kg wet		20.0		88	70-130		
Naphthalene	15.8		mg/kg wet		20.0		79	70-130		
Toluene	17.6		mg/kg wet		20.0		88	70-130		
m,p-Xylene	34.0		mg/kg wet		40.0		85	70-130		
o-Xylene	17.0		mg/kg wet		20.0		85	70-130		
2-Methylpentane	18.8		mg/kg wet		20.0		94	70-130		
n-Nonane	15.6		mg/kg wet		20.0		78	70-130		
n-Pentane	16.5		mg/kg wet		20.0		83	70-130		
1,2,4-Trimethylbenzene	17.0		mg/kg wet		20.0		85	70-130		
2,2,4-Trimethylpentane	19.4		mg/kg wet		20.0		97	70-130		
n-Butylcyclohexane	17.0		mg/kg wet		20.0		85	70-130		
n-Decane	15.4		mg/kg wet		20.0		77	70-130		
Surrogate: 2,5-Dibromotoluene (FID)	44.0		mg/kg wet		50.0		88	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	40.6		mg/kg wet		50.0		81	70-130		
<b>LCS Dup (1119692-BSD1)</b>					<u>Prepared &amp; Analyzed: 28-Sep-11</u>					
C5-C8 Aliphatic Hydrocarbons	52.5		mg/kg wet		60.0		88	70-130	15	25
C9-C12 Aliphatic Hydrocarbons	52.2		mg/kg wet		60.0		87	70-130	7	25
C9-C10 Aromatic Hydrocarbons	18.1		mg/kg wet		20.0		90	70-130	12	25
Unadjusted C5-C8 Aliphatic Hydrocarbons	183		mg/kg wet		200		92	70-130	0.02	25
Unadjusted C9-C12 Aliphatic Hydrocarbons	70.3		mg/kg wet		80.0		88	70-130	2	25

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\* Reportable Detection Limit

# Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119692 - VPH - EPA 5030B</b>										
<b><u>LCS Dup (1119692-BSD1)</u></b>	<b><u>Prepared &amp; Analyzed: 28-Sep-11</u></b>									
Benzene	17.9		mg/kg wet		20.0		89	70-130	2	25
Ethylbenzene	19.4		mg/kg wet		20.0		97	70-130	11	25
Methyl tert-butyl ether	16.7		mg/kg wet		20.0		84	70-130	5	25
Naphthalene	17.6		mg/kg wet		20.0		88	70-130	11	25
Toluene	18.5		mg/kg wet		20.0		92	70-130	5	25
m,p-Xylene	38.6		mg/kg wet		40.0		96	70-130	13	25
o-Xylene	19.5		mg/kg wet		20.0		97	70-130	14	25
2-Methylpentane	17.3		mg/kg wet		20.0		87	70-130	8	25
n-Nonane	16.9		mg/kg wet		20.0		84	70-130	8	25
n-Pentane	15.1		mg/kg wet		20.0		76	70-130	9	25
1,2,4-Trimethylbenzene	19.4		mg/kg wet		20.0		97	70-130	13	25
2,2,4-Trimethylpentane	18.9		mg/kg wet		20.0		95	70-130	2	25
n-Butylcyclohexane	18.7		mg/kg wet		20.0		93	70-130	9	25
n-Decane	15.8		mg/kg wet		20.0		79	70-130	3	25
Surrogate: 2,5-Dibromotoluene (FID)	56.4		mg/kg wet		50.0		113	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	52.2		mg/kg wet		50.0		104	70-130		

# Semivolatile Organic Compounds by GC - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119337 - SW846 3545A</b>										
<b><u>Blank (1119337-BLK1)</u></b>					<b><u>Prepared &amp; Analyzed: 23-Sep-11</u></b>					
Aroclor-1016	< 20.0		µg/kg wet	20.0						
Aroclor-1016 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1221	< 20.0		µg/kg wet	20.0						
Aroclor-1221 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1232	< 20.0		µg/kg wet	20.0						
Aroclor-1232 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1242	< 20.0		µg/kg wet	20.0						
Aroclor-1242 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1248	< 20.0		µg/kg wet	20.0						
Aroclor-1248 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1254	< 20.0		µg/kg wet	20.0						
Aroclor-1254 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1260	< 20.0		µg/kg wet	20.0						
Aroclor-1260 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1262	< 20.0		µg/kg wet	20.0						
Aroclor-1262 [2C]	< 20.0		µg/kg wet	20.0						
Aroclor-1268	< 20.0		µg/kg wet	20.0						
Aroclor-1268 [2C]	< 20.0		µg/kg wet	20.0						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	18.0		µg/kg wet		20.0		90	30-150		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	20.0		µg/kg wet		20.0		100	30-150		
Surrogate: Decachlorobiphenyl (Sr)	16.0		µg/kg wet		20.0		80	30-150		
Surrogate: Decachlorobiphenyl (Sr) [2C]	20.0		µg/kg wet		20.0		100	30-150		
<b><u>LCS (1119337-BS1)</u></b>					<b><u>Prepared &amp; Analyzed: 23-Sep-11</u></b>					
Aroclor-1016	264		µg/kg wet	20.0	250		106	50-140		
Aroclor-1016 [2C]	258		µg/kg wet	20.0	250		103	50-140		
Aroclor-1260	245		µg/kg wet	20.0	250		98	50-140		
Aroclor-1260 [2C]	240		µg/kg wet	20.0	250		96	50-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	19.0		µg/kg wet		20.0		95	30-150		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	19.0		µg/kg wet		20.0		95	30-150		
Surrogate: Decachlorobiphenyl (Sr)	18.0		µg/kg wet		20.0		90	30-150		
Surrogate: Decachlorobiphenyl (Sr) [2C]	22.0		µg/kg wet		20.0		110	30-150		
<b><u>LCS Dup (1119337-BSD1)</u></b>					<b><u>Prepared &amp; Analyzed: 23-Sep-11</u></b>					
Aroclor-1016	236		µg/kg wet	20.0	250		94	50-140	11	30
Aroclor-1016 [2C]	244		µg/kg wet	20.0	250		98	50-140	6	30
Aroclor-1260	227		µg/kg wet	20.0	250		91	50-140	8	30
Aroclor-1260 [2C]	228		µg/kg wet	20.0	250		91	50-140	5	30
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	18.0		µg/kg wet		20.0		90	30-150		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	19.0		µg/kg wet		20.0		95	30-150		
Surrogate: Decachlorobiphenyl (Sr)	17.0		µg/kg wet		20.0		85	30-150		
Surrogate: Decachlorobiphenyl (Sr) [2C]	19.0		µg/kg wet		20.0		95	30-150		

# Extractable Petroleum Hydrocarbons - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119588 - SW846 3545A</b>										
<b>Blank (1119588-BLK1)</b>	<b>Prepared: 27-Sep-11 Analyzed: 28-Sep-11</b>									
C9-C18 Aliphatic Hydrocarbons	< 5.00		mg/kg wet	5.00						
C19-C36 Aliphatic Hydrocarbons	< 5.00		mg/kg wet	5.00						
C11-C22 Aromatic Hydrocarbons	< 5.00		mg/kg wet	5.00						
Unadjusted C11-C22 Aromatic Hydrocarbons	< 5.00		mg/kg wet	5.00						
Total Petroleum Hydrocarbons	< 5.00		mg/kg wet	5.00						
Unadjusted Total Petroleum Hydrocarbons	< 5.00		mg/kg wet	5.00						
Naphthalene	< 0.166		mg/kg wet	0.166						
2-Methylnaphthalene	< 0.166		mg/kg wet	0.166						
Acenaphthylene	< 0.166		mg/kg wet	0.166						
Acenaphthene	< 0.166		mg/kg wet	0.166						
Fluorene	< 0.166		mg/kg wet	0.166						
Phenanthrene	< 0.166		mg/kg wet	0.166						
Anthracene	< 0.166		mg/kg wet	0.166						
Fluoranthene	< 0.166		mg/kg wet	0.166						
Pyrene	< 0.166		mg/kg wet	0.166						
Benzo (a) anthracene	< 0.166		mg/kg wet	0.166						
Chrysene	< 0.166		mg/kg wet	0.166						
Benzo (b) fluoranthene	< 0.166		mg/kg wet	0.166						
Benzo (k) fluoranthene	< 0.166		mg/kg wet	0.166						
Benzo (a) pyrene	< 0.166		mg/kg wet	0.166						
Indeno (1,2,3-cd) pyrene	< 0.166		mg/kg wet	0.166						
Dibenzo (a,h) anthracene	< 0.166		mg/kg wet	0.166						
Benzo (g,h,i) perylene	< 0.166		mg/kg wet	0.166						
n-Nonane (C9)	< 0.166		mg/kg wet	0.166						
n-Decane	< 0.166		mg/kg wet	0.166						
n-Dodecane	< 0.166		mg/kg wet	0.166						
n-Tetradecane	< 0.166		mg/kg wet	0.166						
n-Hexadecane	< 0.166		mg/kg wet	0.166						
n-Octadecane	< 0.166		mg/kg wet	0.166						
n-Nonadecane	< 0.166		mg/kg wet	0.166						
n-Eicosane	< 0.166		mg/kg wet	0.166						
n-Docosane	< 0.166		mg/kg wet	0.166						
n-Tetracosane	< 0.166		mg/kg wet	0.166						
n-Hexacosane	< 0.166		mg/kg wet	0.166						
n-Octacosane	< 0.166		mg/kg wet	0.166						
n-Triacontane	< 0.166		mg/kg wet	0.166						
n-Hexatriacontane	< 0.166		mg/kg wet	0.166						
Naphthalene (aliphatic fraction)	<b>0.00</b>		mg/kg wet							
2-Methylnaphthalene (aliphatic fraction)	<b>0.00</b>		mg/kg wet							
<i>Surrogate: 1-Chlorooctadecane</i>	2.86		mg/kg wet		3.33		86	40-140		
<i>Surrogate: Ortho-Terphenyl</i>	2.36		mg/kg wet		3.33		71	40-140		
<i>Surrogate: 2-Fluorobiphenyl</i>	1.96		mg/kg wet		2.67		74	40-140		
<b>LCS (1119588-BS1)</b>	<b>Prepared: 27-Sep-11 Analyzed: 28-Sep-11</b>									
C9-C18 Aliphatic Hydrocarbons	<b>27.5</b>		mg/kg wet	5.00	40.0		69	40-140		
C19-C36 Aliphatic Hydrocarbons	<b>54.5</b>		mg/kg wet	5.00	53.3		102	40-140		
C11-C22 Aromatic Hydrocarbons	<b>65.3</b>		mg/kg wet	5.00	113		58	40-140		
Naphthalene	<b>2.84</b>		mg/kg wet	0.166	6.67		43	40-140		
2-Methylnaphthalene	<b>3.02</b>		mg/kg wet	0.166	6.67		45	40-140		
Acenaphthylene	<b>3.54</b>		mg/kg wet	0.166	6.67		53	40-140		
Acenaphthene	<b>3.74</b>		mg/kg wet	0.166	6.67		56	40-140		
Fluorene	<b>4.03</b>		mg/kg wet	0.166	6.67		60	40-140		

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\* Reportable Detection Limit

# Extractable Petroleum Hydrocarbons - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119588 - SW846 3545A</b>										
<b><u>LCS (1119588-BS1)</u></b>					<u>Prepared: 27-Sep-11 Analyzed: 28-Sep-11</u>					
Phenanthrene	4.53		mg/kg wet	0.166	6.67		68	40-140		
Anthracene	4.37		mg/kg wet	0.166	6.67		66	40-140		
Fluoranthene	4.72		mg/kg wet	0.166	6.67		71	40-140		
Pyrene	4.67		mg/kg wet	0.166	6.67		70	40-140		
Benzo (a) anthracene	4.91		mg/kg wet	0.166	6.67		74	40-140		
Chrysene	4.80		mg/kg wet	0.166	6.67		72	40-140		
Benzo (b) fluoranthene	4.86		mg/kg wet	0.166	6.67		73	40-140		
Benzo (k) fluoranthene	5.17		mg/kg wet	0.166	6.67		78	40-140		
Benzo (a) pyrene	4.29		mg/kg wet	0.166	6.67		64	40-140		
Indeno (1,2,3-cd) pyrene	4.70		mg/kg wet	0.166	6.67		70	40-140		
Dibenzo (a,h) anthracene	4.43		mg/kg wet	0.166	6.67		67	40-140		
Benzo (g,h,i) perylene	4.45		mg/kg wet	0.166	6.67		67	40-140		
n-Nonane (C9)	2.89		mg/kg wet	0.166	6.67		43	30-140		
n-Decane	3.75		mg/kg wet	0.166	6.67		56	40-140		
n-Dodecane	4.12		mg/kg wet	0.166	6.67		62	40-140		
n-Tetradecane	5.10		mg/kg wet	0.166	6.67		77	40-140		
n-Hexadecane	6.02		mg/kg wet	0.166	6.67		90	40-140		
n-Octadecane	6.41		mg/kg wet	0.166	6.67		96	40-140		
n-Nonadecane	6.50		mg/kg wet	0.166	6.67		98	40-140		
n-Eicosane	6.62		mg/kg wet	0.166	6.67		99	40-140		
n-Docosane	6.75		mg/kg wet	0.166	6.67		101	40-140		
n-Tetracosane	6.70		mg/kg wet	0.166	6.67		101	40-140		
n-Hexacosane	6.73		mg/kg wet	0.166	6.67		101	40-140		
n-Octacosane	6.74		mg/kg wet	0.166	6.67		101	40-140		
n-Triacontane	6.53		mg/kg wet	0.166	6.67		98	40-140		
n-Hexatriacontane	4.00		mg/kg wet	0.166	6.67		60	40-140		
Naphthalene (aliphatic fraction)	0.00000667		mg/kg wet		6.67		0.0001	0-200		
2-Methylnaphthalene (aliphatic fraction)	0.00000667		mg/kg wet		6.67		0.0001	0-200		
Surrogate: 1-Chlorooctadecane	3.26		mg/kg wet		3.33		98	40-140		
Surrogate: Ortho-Terphenyl	2.26		mg/kg wet		3.33		68	40-140		
Surrogate: 2-Fluorobiphenyl	1.94		mg/kg wet		2.67		73	40-140		
Naphthalene Breakthrough	0.00		%					0-5		
2-Methylnaphthalene Breakthrough	0.00		%					0-5		
<b><u>LCS (1119588-BS2)</u></b>					<u>Prepared: 27-Sep-11 Analyzed: 28-Sep-11</u>					
C9-C18 Aliphatic Hydrocarbons	25.7		mg/kg wet	5.00	40.0		64	40-140		
C19-C36 Aliphatic Hydrocarbons	44.3		mg/kg wet	5.00	53.3		83	40-140		
C11-C22 Aromatic Hydrocarbons	62.7		mg/kg wet	5.00	113		55	40-140		
Naphthalene	3.26		mg/kg wet	0.166	6.67		49	40-140		
2-Methylnaphthalene	3.37		mg/kg wet	0.166	6.67		51	40-140		
Acenaphthylene	3.72		mg/kg wet	0.166	6.67		56	40-140		
Acenaphthene	3.88		mg/kg wet	0.166	6.67		58	40-140		
Fluorene	4.08		mg/kg wet	0.166	6.67		61	40-140		
Phenanthrene	4.29		mg/kg wet	0.166	6.67		64	40-140		
Anthracene	4.20		mg/kg wet	0.166	6.67		63	40-140		
Fluoranthene	4.46		mg/kg wet	0.166	6.67		67	40-140		
Pyrene	4.39		mg/kg wet	0.166	6.67		66	40-140		
Benzo (a) anthracene	4.41		mg/kg wet	0.166	6.67		66	40-140		
Chrysene	4.43		mg/kg wet	0.166	6.67		66	40-140		
Benzo (b) fluoranthene	4.46		mg/kg wet	0.166	6.67		67	40-140		
Benzo (k) fluoranthene	4.76		mg/kg wet	0.166	6.67		71	40-140		
Benzo (a) pyrene	4.08		mg/kg wet	0.166	6.67		61	40-140		

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\* Reportable Detection Limit

# Extractable Petroleum Hydrocarbons - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119588 - SW846 3545A</b>										
<b><u>LCS (1119588-BS2)</u></b>					<u>Prepared: 27-Sep-11 Analyzed: 28-Sep-11</u>					
Indeno (1,2,3-cd) pyrene	4.26		mg/kg wet	0.166	6.67		64	40-140		
Dibenzo (a,h) anthracene	4.16		mg/kg wet	0.166	6.67		62	40-140		
Benzo (g,h,i) perylene	4.03		mg/kg wet	0.166	6.67		60	40-140		
n-Nonane (C9)	3.36		mg/kg wet	0.166	6.67		50	30-140		
n-Decane	3.96		mg/kg wet	0.166	6.67		59	40-140		
n-Dodecane	4.13		mg/kg wet	0.166	6.67		62	40-140		
n-Tetradecane	4.64		mg/kg wet	0.166	6.67		70	40-140		
n-Hexadecane	5.08		mg/kg wet	0.166	6.67		76	40-140		
n-Octadecane	5.33		mg/kg wet	0.166	6.67		80	40-140		
n-Nonadecane	5.40		mg/kg wet	0.166	6.67		81	40-140		
n-Eicosane	5.49		mg/kg wet	0.166	6.67		82	40-140		
n-Docosane	5.59		mg/kg wet	0.166	6.67		84	40-140		
n-Tetracosane	5.58		mg/kg wet	0.166	6.67		84	40-140		
n-Hexacosane	5.63		mg/kg wet	0.166	6.67		84	40-140		
n-Octacosane	5.65		mg/kg wet	0.166	6.67		85	40-140		
n-Triacontane	5.48		mg/kg wet	0.166	6.67		82	40-140		
n-Hexatriacontane	3.32		mg/kg wet	0.166	6.67		50	40-140		
Naphthalene (aliphatic fraction)	0.00		mg/kg wet		6.67			0-200		
2-Methylnaphthalene (aliphatic fraction)	0.00		mg/kg wet		6.67			0-200		
Surrogate: 1-Chlorooctadecane	2.56		mg/kg wet		3.33		77	40-140		
Surrogate: Ortho-Terphenyl	2.14		mg/kg wet		3.33		64	40-140		
Surrogate: 2-Fluorobiphenyl	1.87		mg/kg wet		2.67		70	40-140		
Naphthalene Breakthrough	0.00		%					0-5		
2-Methylnaphthalene Breakthrough	0.00		%					0-5		
<b><u>LCS Dup (1119588-BSD1)</u></b>					<u>Prepared: 27-Sep-11 Analyzed: 28-Sep-11</u>					
C9-C18 Aliphatic Hydrocarbons	28.3		mg/kg wet	5.00	40.0		71	40-140	3	25
C19-C36 Aliphatic Hydrocarbons	53.5		mg/kg wet	5.00	53.3		100	40-140	2	25
C11-C22 Aromatic Hydrocarbons	69.3		mg/kg wet	5.00	113		61	40-140	6	25
Naphthalene	3.23		mg/kg wet	0.166	6.67		48	40-140	13	25
2-Methylnaphthalene	3.38		mg/kg wet	0.166	6.67		51	40-140	11	25
Acenaphthylene	4.13		mg/kg wet	0.166	6.67		62	40-140	15	25
Acenaphthene	4.27		mg/kg wet	0.166	6.67		64	40-140	13	25
Fluorene	4.60		mg/kg wet	0.166	6.67		69	40-140	13	25
Phenanthrene	4.88		mg/kg wet	0.166	6.67		73	40-140	7	25
Anthracene	4.72		mg/kg wet	0.166	6.67		71	40-140	8	25
Fluoranthene	4.98		mg/kg wet	0.166	6.67		75	40-140	5	25
Pyrene	4.90		mg/kg wet	0.166	6.67		73	40-140	5	25
Benzo (a) anthracene	4.78		mg/kg wet	0.166	6.67		72	40-140	3	25
Chrysene	4.85		mg/kg wet	0.166	6.67		73	40-140	1	25
Benzo (b) fluoranthene	4.63		mg/kg wet	0.166	6.67		69	40-140	5	25
Benzo (k) fluoranthene	5.20		mg/kg wet	0.166	6.67		78	40-140	0.6	25
Benzo (a) pyrene	4.23		mg/kg wet	0.166	6.67		63	40-140	2	25
Indeno (1,2,3-cd) pyrene	4.47		mg/kg wet	0.166	6.67		67	40-140	5	25
Dibenzo (a,h) anthracene	4.52		mg/kg wet	0.166	6.67		68	40-140	2	25
Benzo (g,h,i) perylene	4.43		mg/kg wet	0.166	6.67		67	40-140	0.4	25
n-Nonane (C9)	3.01		mg/kg wet	0.166	6.67		45	30-140	4	25
n-Decane	4.07		mg/kg wet	0.166	6.67		61	40-140	8	25
n-Dodecane	4.39		mg/kg wet	0.166	6.67		66	40-140	6	25
n-Tetradecane	5.24		mg/kg wet	0.166	6.67		79	40-140	3	25
n-Hexadecane	5.90		mg/kg wet	0.166	6.67		89	40-140	2	25
n-Octadecane	6.25		mg/kg wet	0.166	6.67		94	40-140	3	25

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\* Reportable Detection Limit

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# Extractable Petroleum Hydrocarbons - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119588 - SW846 3545A</b>										
<b><u>LCS Dup (1119588-BSD1)</u></b>					<b><u>Prepared: 27-Sep-11 Analyzed: 28-Sep-11</u></b>					
n-Nonadecane	6.36		mg/kg wet	0.166	6.67		95	40-140	2	25
n-Eicosane	6.49		mg/kg wet	0.166	6.67		97	40-140	2	25
n-Docosane	6.70		mg/kg wet	0.166	6.67		100	40-140	0.7	25
n-Tetracosane	6.75		mg/kg wet	0.166	6.67		101	40-140	0.6	25
n-Hexacosane	6.84		mg/kg wet	0.166	6.67		103	40-140	2	25
n-Octacosane	6.84		mg/kg wet	0.166	6.67		103	40-140	2	25
n-Triacontane	6.65		mg/kg wet	0.166	6.67		100	40-140	2	25
n-Hexatriacontane	4.02		mg/kg wet	0.166	6.67		60	40-140	0.5	25
Naphthalene (aliphatic fraction)	0.00000667		mg/kg wet		6.67		0.0001	0-200	0	200
2-Methylnaphthalene (aliphatic fraction)	0.00000667		mg/kg wet		6.67		0.0001	0-200	0	200
Surrogate: 1-Chlorooctadecane	3.02		mg/kg wet		3.33		91	40-140		
Surrogate: Ortho-Terphenyl	2.44		mg/kg wet		3.33		73	40-140		
Surrogate: 2-Fluorobiphenyl	2.11		mg/kg wet		2.67		79	40-140		
Naphthalene Breakthrough	0.00		%					0-5		
2-Methylnaphthalene Breakthrough	0.00		%					0-5		



# **Total Metals by EPA 6000/7000 Series Methods - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119909 - SW846 3050B</b>										
<b><u>Blank (1119909-BLK1)</u></b>	<u>Prepared &amp; Analyzed: 30-Sep-11</u>									
Lead	< 1.29		mg/kg wet	1.29						
<b><u>Reference (1119909-SRM1)</u></b>	<u>Prepared &amp; Analyzed: 30-Sep-11</u>									
Lead	<b>53.4</b>		mg/kg wet	1.50	52.8		101	82.3-116.5		
<b><u>Reference (1119909-SRM2)</u></b>	<u>Prepared &amp; Analyzed: 30-Sep-11</u>									
Lead	<b>55.0</b>		mg/kg wet	1.50	51.6		107	82.3-116.5		

# Extractable Petroleum Hydrocarbons - CCV Evaluation Report

Analyte(s)	Average RF	CCRF	% D	Limit
<b>Batch S108940</b>				
<b><u>Calibration Check (S108940-CCV1)</u></b>				
C9-C18 Aliphatic Hydrocarbons	1.077597E+08	9.990813E+07	0.0	25
C19-C36 Aliphatic Hydrocarbons	1.129792E+08	1.128886E+08	23.4	25
C11-C22 Aromatic Hydrocarbons	24.56243	18.44906	-16.5	25
Naphthalene	8.003419	8.115082	1.4	25
2-Methylnaphthalene	5.351536	5.420203	1.3	25
Acenaphthylene	7.765333	7.796059	0.4	25
Acenaphthene	4.869087	4.959449	1.9	25
Fluorene	5.655684	5.693894	0.7	25
Phenanthrene	7.874853	7.758803	-1.5	25
Anthracene	6.981425	6.370125	-8.8	25
Fluoranthene	8.318135	8.400237	1.0	25
Pyrene	8.513716	8.742161	2.7	25
Benzo (a) anthracene	7.3365	7.871402	7.3	25
Chrysene	7.586051	7.766811	2.4	25
Benzo (b) fluoranthene	6.69292	7.763892	16.0	25
Benzo (k) fluoranthene	7.424765	7.919605	6.7	25
Benzo (a) pyrene	6.284834	6.962964	10.8	25
Indeno (1,2,3-cd) pyrene	6.995628	8.639786	23.5	25
Dibenzo (a,h) anthracene	6.210598	7.534147	8.9	25
Benzo (g,h,i) perylene	6.4595	7.418932	14.9	25
n-Decane	102864.8	97833.04	-4.9	25
n-Dodecane	103161.7	98688.35	-4.3	25
n-Hexadecane	100979	99184.96	-1.8	25
n-Nonane (C9)	103134.8	97268.94	-5.7	30
n-Octadecane	98980.42	97557.79	-1.4	25
n-Tetradecane	101806.9	99221.93	-2.5	25
n-Eicosane	95375.55	96374.61	1.0	25
n-Nonadecane	97472.38	97231.46	-0.2	25
n-Docosane	93276.75	96404.98	3.4	25
n-Tetracosane	91785.2	94749.4	3.2	25
n-Octacosane	88486.73	94283.42	6.6	25
n-Hexacosane	91457.1	95239.28	4.1	25
n-Triacontane	90872.17	93909.54	3.3	25
n-Hexatriacontane	88235.92	85382.3	-3.2	25
<b><u>Calibration Check (S108940-CCV2)</u></b>				
C9-C18 Aliphatic Hydrocarbons	1.077597E+08	9.982938E+07	0.0	25
C19-C36 Aliphatic Hydrocarbons	1.129792E+08	1.115425E+08	21.8	25
C11-C22 Aromatic Hydrocarbons	24.56243	17.89933	-18.8	25
Naphthalene	8.003419	8.26882	3.3	25
2-Methylnaphthalene	5.351536	5.664981	5.9	25
Acenaphthylene	7.765333	8.096285	4.3	25
Acenaphthene	4.869087	5.136709	5.5	25
Fluorene	5.655684	5.78424	2.3	25
Phenanthrene	7.874853	8.106672	2.9	25
Anthracene	6.981425	6.541547	-6.3	25
Fluoranthene	8.318135	8.84657	6.4	25
Pyrene	8.513716	8.946085	5.1	25
Benzo (a) anthracene	7.3365	8.349328	13.8	25
Chrysene	7.586051	8.271388	9.0	25
Benzo (b) fluoranthene	6.69292	9.161673	36.9	# 25
Benzo (k) fluoranthene	7.424765	7.693578	3.6	25

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# Extractable Petroleum Hydrocarbons - CCV Evaluation Report

Analyte(s)	Average RF	CCRF	% D	Limit
<b>Batch S108940</b>				
<b><u>Calibration Check (S108940-CCV2)</u></b>				
Benzo (a) pyrene	6.284834	7.511154	19.5	25
Indeno (1,2,3-cd) pyrene	6.995628	8.699371	24.4	25
Dibenzo (a,h) anthracene	6.210598	8.249405	18.5	25
Benzo (g,h,i) perylene	6.4595	8.021432	24.2	25
n-Decane	102864.8	97848.07	-4.9	25
n-Dodecane	103161.7	98652.47	-4.4	25
n-Hexadecane	100979	98751.7	-2.2	25
n-Octadecane	98980.42	97073.48	-1.9	25
n-Nonane (C9)	103134.8	97200.76	-5.8	30
n-Tetradecane	101806.9	99053.74	-2.7	25
n-Eicosane	95375.55	95974.24	0.6	25
n-Docosane	93276.75	96063.11	3.0	25
n-Nonadecane	97472.38	96851.7	-0.6	25
n-Octacosane	88486.73	93874.21	6.1	25
n-Tetracosane	91785.2	94341.3	2.8	25
n-Hexacosane	91457.1	94847.96	3.7	25
n-Triacontane	90872.17	93618.8	3.0	25
n-Hexatriacontane	88235.92	83623.89	-5.2	25
<b>Batch S108944</b>				
<b><u>Calibration Check (S108944-CCV1)</u></b>				
C9-C18 Aliphatic Hydrocarbons	1.077597E+08	1.084312E+08	9.2	25
C19-C36 Aliphatic Hydrocarbons	1.129792E+08	1.02667E+08	11.2	25
C11-C22 Aromatic Hydrocarbons	24.56243	20.23261	-7.6	25
Naphthalene	8.003419	7.890714	-1.4	25
2-Methylnaphthalene	5.351536	5.440903	1.7	25
Acenaphthylene	7.765333	8.114725	4.5	25
Acenaphthene	4.869087	4.996538	2.6	25
Fluorene	5.655684	5.870952	3.8	25
Phenanthrene	7.874853	8.240013	4.6	25
Anthracene	6.981425	7.091849	1.6	25
Fluoranthene	8.318135	8.780312	5.6	25
Pyrene	8.513716	9.264952	8.8	25
Benzo (a) anthracene	7.3365	8.129729	10.8	25
Chrysene	7.586051	8.129729	7.2	25
Benzo (b) fluoranthene	6.69292	7.56465	13.0	25
Benzo (k) fluoranthene	7.424765	7.56465	1.9	25
Benzo (a) pyrene	6.284834	7.273173	15.7	25
Indeno (1,2,3-cd) pyrene	6.995628	8.148154	16.5	25
Dibenzo (a,h) anthracene	6.210598	7.58641	9.6	25
Benzo (g,h,i) perylene	6.4595	7.837827	21.3	25
n-Decane	102864.8	126556.1	23.0	25
n-Dodecane	103161.7	128484.7	24.5	25
n-Hexadecane	100979	123724.7	22.5	25
n-Nonane (C9)	103134.8	131681.2	27.7	30
n-Octadecane	98980.42	120291.7	21.5	25
n-Tetradecane	101806.9	127240.2	25.0	25
n-Eicosane	95375.55	118313.7	24.1	25
n-Nonadecane	97472.38	119588	22.7	25
n-Docosane	93276.75	116034.1	24.4	25
n-Tetracosane	91785.2	114699.3	25.0	25
n-Octacosane	88486.73	110484.5	24.9	25

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# Extractable Petroleum Hydrocarbons - CCV Evaluation Report

Analyte(s)	Average RF	CCRF	% D	Limit
<b>Batch S108944</b>				
<b><u>Calibration Check (S108944-CCV1)</u></b>				
n-Hexacosane	91457.1	113457.8	24.1	25
n-Triacontane	90872.17	113245.6	24.6	25
n-Hexatriacontane	88235.92	101951.7	15.5	25
<b><u>Calibration Check (S108944-CCV2)</u></b>				
C9-C18 Aliphatic Hydrocarbons	1.077597E+08	1.161304E+08	17.3	25
C19-C36 Aliphatic Hydrocarbons	1.129792E+08	1.123692E+08	22.8	25
C11-C22 Aromatic Hydrocarbons	24.56243	19.97094	-8.8	25
Naphthalene	8.003419	8.325982	4.0	25
2-Methylnaphthalene	5.351536	5.642489	5.4	25
Acenaphthylene	7.765333	8.11305	4.5	25
Acenaphthene	4.869087	5.113941	5.0	25
Fluorene	5.655684	6.067798	7.3	25
Phenanthrene	7.874853	8.373367	6.3	25
Anthracene	6.981425	7.125239	2.1	25
Fluoranthene	8.318135	8.876118	6.7	25
Pyrene	8.513716	9.288201	9.1	25
Benzo (a) anthracene	7.3365	8.467508	15.4	25
Chrysene	7.586051	8.467508	11.6	25
Benzo (b) fluoranthene	6.69292	7.84144	17.2	25
Benzo (k) fluoranthene	7.424765	8.988077	21.1	25
Benzo (a) pyrene	6.284834	7.774206	23.7	25
Indeno (1,2,3-cd) pyrene	6.995628	8.743006	25.0	25
Dibenzo (a,h) anthracene	6.210598	8.029188	15.6	25
Benzo (g,h,i) perylene	6.4595	7.830187	21.2	25
n-Decane	102864.8	119235.7	15.9	25
n-Dodecane	103161.7	118310.7	14.7	25
n-Hexadecane	100979	109977.9	8.9	25
n-Octadecane	98980.42	107000.1	8.1	25
n-Nonane (C9)	103134.8	119485.3	15.9	30
n-Tetradecane	101806.9	114366	12.3	25
n-Eicosane	95375.55	105465.4	10.6	25
n-Docosane	93276.75	105243.6	12.8	25
n-Nonadecane	97472.38	106526.3	9.3	25
n-Octacosane	88486.73	103331.3	16.8	25
n-Tetracosane	91785.2	103226.3	12.5	25
n-Hexacosane	91457.1	103957.3	13.7	25
n-Triacontane	90872.17	103170.2	13.5	25
n-Hexatriacontane	88235.92	90373.8	2.4	25

# Volatile Organic Compounds - CCV Evaluation Report

Analyte(s)	Average RF	CCRF	% D	Limit
<b>Batch S108773</b>				
<b><u>Calibration Check (S108773-CCV1)</u></b>				
Benzene	156193.6	159380.6	2.0	25
Ethylbenzene	73221.19	80920.6	10.5	25
Methyl tert-butyl ether	93026.18	85945.02	-7.6	25
Naphthalene	73930.95	70365.26	-4.8	25
Toluene	104529.6	108864	4.1	25
m,p-Xylene	81483.58	89070.87	9.3	25
o-Xylene	69127.04	73650.4	6.5	25
2-Methylpentane	45567.46	55327.14	21.4	25
n-Nonane	27809.25	30528.3	9.8	30
n-Pentane	42116.88	52505.4	24.7	25
1,2,4-Trimethylbenzene	68262.81	72221.2	5.8	25
2,2,4-Trimethylpentane	42940.56	52493.26	22.2	25
n-Butylcyclohexane	26064.71	28995.4	11.2	25
n-Decane	21769.87	21844.36	0.3	25
<b><u>Calibration Check (S108773-CCV2)</u></b>				
Benzene	156193.6	153459.4	-1.8	25
Ethylbenzene	73221.19	78798.28	7.6	25
Methyl tert-butyl ether	93026.18	86451.5	-7.1	25
Naphthalene	73930.95	74062.38	0.2	25
Toluene	104529.6	105337.4	0.8	25
m,p-Xylene	81483.58	86943.84	6.7	25
o-Xylene	69127.04	72293.86	4.6	25
2-Methylpentane	45567.46	55847.34	22.6	25
n-Nonane	27809.25	29829.76	7.3	30
n-Pentane	42116.88	51872.36	23.2	25
1,2,4-Trimethylbenzene	68262.81	71350.92	4.5	25
2,2,4-Trimethylpentane	42940.56	51430.86	19.8	25
n-Butylcyclohexane	26064.71	27981.68	7.4	25
n-Decane	21769.87	20939.64	-3.8	25

## Notes and Definitions

GS	This sample was not able to be analyzed for client requested reporting limits due to high concentrations of target analytes in the sample.
VC10	The VOC preserved soil sample is not within the 1:1 weight to volume ratio as recommended by SW846 methods 5030 and 5035 but may be within the 1:1 volume to volume ratio. This variance may affect the final reporting limit.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference

A Matrix Spike and Matrix Spike Duplicate (MS/MSD) for MADEP EPH CAM may not have been analyzed with the samples in this work order. According to the method these spikes are performed only when requested by the client. If requested the spike recoveries are included in the batch QC data.

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

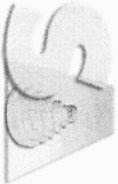
Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

Validated by:  
June O'Connor  
Kimberly Wisk

SB 35895 M

COC # 1294



SPECTRUM ANALYTICAL, INC.  
Environmental Chemistry  
ANALYTICAL TECHNOLOGY

# CHAIN OF CUSTODY RECORD

Page 1 of 1

## Special Handling:

- ☒ Standard TAT - 7 to 10 business days
- ☐ Rush TAT - Date Needed:
- All TATs subject to laboratory approval
- Min. 24-hour notification needed for rushes
- Samples disposed of after 60 days unless otherwise instructed.

Report to: Walter B. Herniman  
Herniman Engineering  
6 Thomas Road  
Berkeley, MA 02779

Invoice to: Walter B. Herniman  
Herniman Engineering  
PO Box 909  
Assonet, MA 02702

Project No.: HHCE 2011.038  
Site Name: Broadway Henry LLC  
Location: 30-44 Broadway, Somerville, MA  
Sampler(s): Walter B. Herniman

Project Mgr.: Walter B. Herniman

P.O. No. 909

RQN

## Containers:

## Analyses:

## QA Reporting Notes:

G=Grab C=Composite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	Other (none)	Voa Vial CH3OH	8082 PCBs	EPH	Pb Total ICP 200.7	VPH	W/TACs	W/TAC PAHS	QA Reporting Notes: (check if needed)
35895.61	B-4 5-10'	9/19/2011	13:00	C	Soil		1							Provide MA DEP MCP CAM Report Provide CT DPH RCP Report QAVQC Reporting Levels Standard State specific reporting standards:
	B-4 5-10'	9/19/2011	13:00	C	Soil									
	GP-3 4-8'	9/19/2011	11:00	G	Soil									
	GP-3 4-8'	9/19/2011	11:00	G	Soil									
	GP-5 7-8'	9/19/2011	15:00	G	Soil									
	GP-5 7-8'	9/19/2011	15:00	G	Soil									

## Relinquished by:

## Received by:

Date:

Time:

Temp °C

☒ E-mail to: wherniman@comcast.net  
EDD Format: pdf and xls

☐ Ambient ☒ Refrigerated ☐ Fridge temp °C ☐ Freezer temp °C

11 Almgren Drive · Agawam, Massachusetts 01001 · 413-789-9018 · Fax 413-789-4076 · www.spectrum-analytical.com

## **APPENDIX C**



Report Date:  
03-Oct-11 15:55



**SPECTRUM ANALYTICAL, INC.**

*Featuring*

**HANIBAL TECHNOLOGY**

***Laboratory Report***

- ☒ Final Report  
☐ Re-Issued Report  
☐ Revised Report

Hermenau & Hermenau Consulting Engineers  
P.O. Box 909  
Assonet, MA 02702-1711  
Attn: Walter B. Hermenau

Project: Broadway Henry LLC - Somerville, MA  
Project #: HHCE 2011.038

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date Sampled</u>	<u>Date Received</u>
SB35995-01	MW-1	Ground Water	21-Sep-11 13:00	22-Sep-11 17:00
SB35995-02	MW-2	Ground Water	21-Sep-11 15:00	22-Sep-11 17:00
SB35995-03	MW-3	Ground Water	21-Sep-11 14:00	22-Sep-11 17:00
SB35995-04	MW-5	Ground Water	21-Sep-11 16:00	22-Sep-11 17:00
SB35995-05	MW-6	Ground Water	21-Sep-11 14:00	22-Sep-11 17:00

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.

All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110  
Connecticut # PH-0777  
Florida # E87600/E87936  
Maine # MA138  
New Hampshire # 2538  
New Jersey # MA011/MA012  
New York # 11393/11840  
Pennsylvania # 68-04426/68-02924  
Rhode Island # 98  
USDA # S-51435



Authorized by:

Nicole Leja  
Laboratory Director

Spectrum Analytical holds certification in the State of Massachusetts for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of Massachusetts does not offer certification for all analytes. Please note that this report contains 21 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

*Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Spectrum is currently accredited for the specific method or analyte indicated. Please refer to our "Quality" web page at [www.spectrum-analytical.com](http://www.spectrum-analytical.com) for a full listing of our current certifications and fields of accreditation. States in which Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (NY-11840, FL-E87936 and NJ-MA012).*

The following outlines the condition of all VPH samples contained within this report upon laboratory receipt.

Matrices	Ground Water		
Containers	✓ Satisfactory		
Sample Preservative	Aqueous (acid preserved)	N/A      ✓ pH≤2      pH>2	
	Soil or Sediment	✓ N/A      Samples not received in Methanol	ml Methanol/g soil  1:1 +/-25%  Other
		Samples received in Methanol:      covering soil/sediment not covering soil/sediment	
		Samples received in air-tight container	
Temperature	✓ Received on ice      ✓ Received at 4 ± 2 °C		

Were all QA/QC procedures followed as required by the VPH method? *Yes*

Were any significant modifications made to the VPH method as specified in section 11.3? *No*

Were all performance/acceptance standards for required QA/QC procedures achieved? *Yes*

The following outlines the condition of all EPH samples contained within this report upon laboratory receipt.

<b>Matrices</b>	Ground Water		
<b>Containers</b>	✓ Satisfactory		
<b>Aqueous Preservative</b>	N/A	✓ pH≤2      pH>2	pH adjusted to <2 in lab
<b>Temperature</b>	✓ Received on ice      ✓ Received at 4 ± 2 °C		

Were all QA/QC procedures followed as required by the EPH method? *Yes*

Were any significant modifications made to the EPH method as specified in Section 11.3? *No*

Were all performance/acceptance standards for required QA/QC procedures achieved? *Yes*


I attest 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.

Authorized by:



Nicole Leja  
Laboratory Director

## MassDEP Analytical Protocol Certification Form

<b>Laboratory Name:</b> Spectrum Analytical, Inc.			<b>Project #:</b> HHCE 2011.038		
<b>Project Location:</b> Broadway Henry LLC - Somerville, MA			<b>RTN:</b>		
<b>This form provides certifications for the following data set:</b>			SB35995-01 through SB35995-05		
<b>Matrices:</b> Ground Water					
<b>CAM Protocol</b>					
8260 VOC CAM II A	7470/7471 Hg CAM III B	✓ MassDEP VPH CAM IV A	8081 Pesticides CAM V B	7196 Hex Cr CAM VI B	MassDEP APH CAM IX A
8270 SVOC CAM II B	7010 Metals CAM III C	✓ MassDEP EPH CAM IV B	8151 Herbicides CAM V C	8330 Explosives CAM VIII A	TO-15 VOC CAM IX B
6010 Metals CAM III A	6020 Metals CAM III D	8082 PCB CAM V A	9012 Total Cyanide/PAC CAM VI A	9014 Total Cyanide/PAC CAM VI A	6860 Perchlorate CAM VIII B
<b>Affirmative responses to questions A through F are required for "Presumptive Certainty" status</b>					
<b>A</b>	Were all samples received in a condition consistent with those described on the Chain of Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?				✓ Yes    No
<b>B</b>	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?				✓ Yes    No
<b>C</b>	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?				✓ Yes    No
<b>D</b>	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?				✓ Yes    No
<b>E</b>	a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?				✓ Yes    No Yes    No
<b>F</b>	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to questions A through E)?				✓ Yes    No
<b>Responses to questions G, H and I below are required for "Presumptive Certainty" status</b>					
<b>G</b>	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?				Yes    ✓ No
<b>Data User Note:</b> Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.					
<b>H</b>	Were all QC performance standards specified in the CAM protocol(s) achieved?				Yes    ✓ No
<b>I</b>	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?				Yes    ✓ No
<b>All negative responses are addressed in a case narrative on the cover page of this report.</b>					
<p><i>I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.</i></p> <div style="text-align: right; margin-top: 20px;">   Nicole Leja  Laboratory Director  Date: 10/3/2011 </div>					

## **CASE NARRATIVE:**

The sample temperature upon receipt by Spectrum Analytical courier was recorded as 4.0 degrees Celsius. The condition of these samples was further noted as received on ice. The samples were transported on ice to the laboratory facility and the temperature was recorded at 0.5 degrees Celsius upon receipt at the laboratory. Please refer to the Chain of Custody for details specific to sample receipt times.

An infrared thermometer with a tolerance of +/- 2.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

MADEP has published a list of analytical methods (CAM) which provides a series of recommended protocols for the acquisition, analysis and reporting of analytical data in support of MCP decisions. "Presumptive Certainty" can be established only for those methods published by the MADEP in the MCP CAM. The compounds and/or elements reported were specifically requested by the client on the Chain of Custody and in some cases may not include the full analyte list as defined in the method. Regulatory limits may not be achieved if specific method and/or technique was not requested on the Chain of Custody.

According to WSC-CAM 5/2009 Rev.1, Table 11 A-1, recovery for some VOC analytes have been deemed potentially difficult. Although they may still be within the recommended recovery range, a range has been set based on historical control limits.

Some target analytes which are not listed as exceptions in the Summary of CAM Reporting Limits may exceed the recommended RL based on sample initial volume or weight provided, % moisture content, or responsiveness of a particular analyte to purge and trap instrumentation.

**See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.**

## **MADEP EPH 5/2004 R**

### **Laboratory Control Samples:**

1120116-BSD1

---

The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.

n-Decane  
n-Hexatriacontane  
n-Nonane (C9)

Sample Identification

MW-1

SB35995-01

Client Project #

HHCE 2011.038

Matrix

Ground Water

Collection Date/Time

21-Sep-11 13:00

Received

22-Sep-11

<i>CAS No.</i>	<i>Analyte(s)</i>	<i>Result</i>	<i>Flag</i>	<i>Units</i>	<i>*RDL</i>	<i>MDL</i>	<i>Dilution</i>	<i>Method Ref.</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Analyst</i>	<i>Batch</i>	<i>Cert.</i>
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**Volatile Organic Compounds**VPH Aliphatic/Aromatic Carbon RangesPrepared by method VPH - EPA 5030B

	C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0	5.55	5	MADEP VPH 5/2004 Rev. 1.1	29-Sep-11	29-Sep-11	mp	1119899	
	C9-C12 Aliphatic Hydrocarbons	< 25.0		µg/l	25.0	4.22	5	"	"	"	"	"	
	C9-C10 Aromatic Hydrocarbons	< 25.0		µg/l	25.0	1.12	5	"	"	"	"	"	
	Unadjusted C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0	7.10	5	"	"	"	"	"	
	Unadjusted C9-C12 Aliphatic Hydrocarbons	< 25.0		µg/l	25.0	4.68	5	"	"	"	"	"	

VPH Target AnalytesPrepared by method VPH - EPA 5030B

71-43-2	Benzene	< 5.0		µg/l	5.0	1.3	5	"	"	"	"	"	
100-41-4	Ethylbenzene	< 5.0		µg/l	5.0	1.4	5	"	"	"	"	"	
1634-04-4	Methyl tert-butyl ether	< 5.0		µg/l	5.0	1.6	5	"	"	"	"	"	
91-20-3	Naphthalene	< 5.0		µg/l	5.0	1.2	5	"	"	"	"	"	
108-88-3	Toluene	< 5.0		µg/l	5.0	1.3	5	"	"	"	"	"	
179601-23-1	m,p-Xylene	< 10.0		µg/l	10.0	2.8	5	"	"	"	"	"	
95-47-6	o-Xylene	< 5.0		µg/l	5.0	1.1	5	"	"	"	"	"	

Surrogate recoveries:

615-59-8	2,5-Dibromotoluene (FID)	105			70-130 %			"	"	"	"	"	
615-59-8	2,5-Dibromotoluene (PID)	101			70-130 %			"	"	"	"	"	

**Extractable Petroleum Hydrocarbons**EPH Aliphatic/Aromatic RangesPrepared by method SW846 3510C

	C9-C18 Aliphatic Hydrocarbons	< 103		µg/l	103	25.6	1	MADEP EPH 5/2004 R	01-Oct-11	03-Oct-11	jj	1120116	
	C19-C36 Aliphatic Hydrocarbons	< 103		µg/l	103	80.6	1	"	"	"	"	"	
	C11-C22 Aromatic Hydrocarbons	< 103		µg/l	103	56.2	1	"	"	"	"	"	
	Unadjusted C11-C22 Aromatic Hydrocarbons	< 103		µg/l	103	56.2	1	"	"	"	"	"	
	Total Petroleum Hydrocarbons	< 103		µg/l	103	56.2	1	"	"	"	"	"	
	Unadjusted Total Petroleum Hydrocarbons	< 103		µg/l	103	56.2	1	"	"	"	"	"	

EPH Diesel Target PAH AnalytesPrepared by method SW846 3510C

91-20-3	Naphthalene	< 5.15		µg/l	5.15	2.70	1	"	"	"	"	"	
91-57-6	2-Methylnaphthalene	< 5.15		µg/l	5.15	2.60	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 5.15		µg/l	5.15	3.04	1	"	"	"	"	"	
85-01-8	Phenanthrene	< 5.15		µg/l	5.15	3.49	1	"	"	"	"	"	

Surrogate recoveries:

3386-33-2	1-Chlorooctadecane	42			40-140 %			"	"	"	"	"	
84-15-1	Ortho-Terphenyl	41			40-140 %			"	"	"	"	"	
321-60-8	2-Fluorobiphenyl	50			40-140 %			"	"	"	"	"	

This laboratory report is not valid without an authorized signature on the cover page.

\* Reportable Detection Limit

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Sample Identification

MW-2

SB35995-02

Client Project #

HHCE 2011.038

Matrix

Ground Water

Collection Date/Time

21-Sep-11 15:00

Received

22-Sep-11

<i>CAS No.</i>	<i>Analyte(s)</i>	<i>Result</i>	<i>Flag</i>	<i>Units</i>	<i>*RDL</i>	<i>MDL</i>	<i>Dilution</i>	<i>Method Ref.</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Analyst</i>	<i>Batch</i>	<i>Cert.</i>
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**Volatile Organic Compounds**VPH Aliphatic/Aromatic Carbon RangesPrepared by method VPH - EPA 5030B

	C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0	5.55	5	MADEP VPH 5/2004 Rev. 1.1	29-Sep-11	29-Sep-11	mp	1119899	
	C9-C12 Aliphatic Hydrocarbons	< 25.0		µg/l	25.0	4.22	5	"	"	"	"	"	
	C9-C10 Aromatic Hydrocarbons	< 25.0		µg/l	25.0	1.12	5	"	"	"	"	"	
	Unadjusted C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0	7.10	5	"	"	"	"	"	
	Unadjusted C9-C12 Aliphatic Hydrocarbons	< 25.0		µg/l	25.0	4.68	5	"	"	"	"	"	

VPH Target AnalytesPrepared by method VPH - EPA 5030B

71-43-2	Benzene	< 5.0		µg/l	5.0	1.3	5	"	"	"	"	"	
100-41-4	Ethylbenzene	< 5.0		µg/l	5.0	1.4	5	"	"	"	"	"	
1634-04-4	Methyl tert-butyl ether	< 5.0		µg/l	5.0	1.6	5	"	"	"	"	"	
91-20-3	Naphthalene	< 5.0		µg/l	5.0	1.2	5	"	"	"	"	"	
108-88-3	Toluene	< 5.0		µg/l	5.0	1.3	5	"	"	"	"	"	
179601-23-1	m,p-Xylene	< 10.0		µg/l	10.0	2.8	5	"	"	"	"	"	
95-47-6	o-Xylene	< 5.0		µg/l	5.0	1.1	5	"	"	"	"	"	

Surrogate recoveries:

615-59-8	2,5-Dibromotoluene (FID)	114			70-130 %			"	"	"	"	"	
615-59-8	2,5-Dibromotoluene (PID)	109			70-130 %			"	"	"	"	"	

**Extractable Petroleum Hydrocarbons**EPH Aliphatic/Aromatic RangesPrepared by method SW846 3510C

	C9-C18 Aliphatic Hydrocarbons	< 104		µg/l	104	25.9	1	MADEP EPH 5/2004 R	01-Oct-11	03-Oct-11	jj	1120116	
	C19-C36 Aliphatic Hydrocarbons	< 104		µg/l	104	81.4	1	"	"	"	"	"	
	C11-C22 Aromatic Hydrocarbons	< 104		µg/l	104	56.8	1	"	"	"	"	"	
	Unadjusted C11-C22 Aromatic Hydrocarbons	< 104		µg/l	104	56.8	1	"	"	"	"	"	
	Total Petroleum Hydrocarbons	< 104		µg/l	104	56.8	1	"	"	"	"	"	
	Unadjusted Total Petroleum Hydrocarbons	< 104		µg/l	104	56.8	1	"	"	"	"	"	

EPH Diesel Target PAH AnalytesPrepared by method SW846 3510C

91-20-3	Naphthalene	< 5.21		µg/l	5.21	2.73	1	"	"	"	"	"	
91-57-6	2-Methylnaphthalene	< 5.21		µg/l	5.21	2.62	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 5.21		µg/l	5.21	3.07	1	"	"	"	"	"	
85-01-8	Phenanthrene	< 5.21		µg/l	5.21	3.53	1	"	"	"	"	"	

Surrogate recoveries:

3386-33-2	1-Chlorooctadecane	62			40-140 %			"	"	"	"	"	
84-15-1	Ortho-Terphenyl	57			40-140 %			"	"	"	"	"	
321-60-8	2-Fluorobiphenyl	57			40-140 %			"	"	"	"	"	

This laboratory report is not valid without an authorized signature on the cover page.

\* Reportable Detection Limit

Page 6 of 21

Sample Identification

MW-3  
SB35995-03

Client Project #  
HHCE 2011.038

Matrix  
Ground Water

Collection Date/Time  
21-Sep-11 14:00

Received  
22-Sep-11

<i>CAS No.</i>	<i>Analyte(s)</i>	<i>Result</i>	<i>Flag</i>	<i>Units</i>	<i>*RDL</i>	<i>MDL</i>	<i>Dilution</i>	<i>Method Ref.</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Analyst</i>	<i>Batch</i>	<i>Cert.</i>
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**Volatile Organic Compounds**VPH Aliphatic/Aromatic Carbon RangesPrepared by method VPH - EPA 5030B

	C5-C8 Aliphatic Hydrocarbons	934		µg/l	75.0	5.55	5	MADEP VPH 5/2004 Rev. 1.1	29-Sep-11	29-Sep-11	mp	1119899	
	C9-C12 Aliphatic Hydrocarbons	481		µg/l	25.0	4.22	5	"	"	"	"	"	
	C9-C10 Aromatic Hydrocarbons	198		µg/l	25.0	1.12	5	"	"	"	"	"	
	Unadjusted C5-C8 Aliphatic Hydrocarbons	949		µg/l	75.0	7.10	5	"	"	"	"	"	
	Unadjusted C9-C12 Aliphatic Hydrocarbons	678		µg/l	25.0	4.68	5	"	"	"	"	"	

VPH Target AnalytesPrepared by method VPH - EPA 5030B

71-43-2	Benzene	< 5.0		µg/l	5.0	1.3	5	"	"	"	"	"	
100-41-4	Ethylbenzene	< 5.0		µg/l	5.0	1.4	5	"	"	"	"	"	
1634-04-4	Methyl tert-butyl ether	< 5.0		µg/l	5.0	1.6	5	"	"	"	"	"	
91-20-3	Naphthalene	9.2		µg/l	5.0	1.2	5	"	"	"	"	"	
108-88-3	Toluene	< 5.0		µg/l	5.0	1.3	5	"	"	"	"	"	
179601-23-1	m,p-Xylene	< 10.0		µg/l	10.0	2.8	5	"	"	"	"	"	
95-47-6	o-Xylene	< 5.0		µg/l	5.0	1.1	5	"	"	"	"	"	

Surrogate recoveries:

615-59-8	2,5-Dibromotoluene (FID)	111			70-130 %			"	"	"	"	"	
615-59-8	2,5-Dibromotoluene (PID)	107			70-130 %			"	"	"	"	"	

**Extractable Petroleum Hydrocarbons**EPH Aliphatic/Aromatic RangesPrepared by method SW846 3510C

	C9-C18 Aliphatic Hydrocarbons	< 103		µg/l	103	25.6	1	MADEP EPH 5/2004 R	01-Oct-11	03-Oct-11	jj	1120116	
	C19-C36 Aliphatic Hydrocarbons	< 103		µg/l	103	80.6	1	"	"	"	"	"	
	C11-C22 Aromatic Hydrocarbons	123		µg/l	103	56.2	1	"	"	"	"	"	
	Unadjusted C11-C22 Aromatic Hydrocarbons	124		µg/l	103	56.2	1	"	"	"	"	"	
	Total Petroleum Hydrocarbons	164		µg/l	103	56.2	1	"	"	"	"	"	
	Unadjusted Total Petroleum Hydrocarbons	165		µg/l	103	56.2	1	"	"	"	"	"	

EPH Diesel Target PAH AnalytesPrepared by method SW846 3510C

91-20-3	Naphthalene	< 5.15		µg/l	5.15	2.70	1	"	"	"	"	"	
91-57-6	2-Methylnaphthalene	< 5.15		µg/l	5.15	2.60	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 5.15		µg/l	5.15	3.04	1	"	"	"	"	"	
85-01-8	Phenanthrene	< 5.15		µg/l	5.15	3.49	1	"	"	"	"	"	

Surrogate recoveries:

3386-33-2	1-Chlorooctadecane	59			40-140 %			"	"	"	"	"	
84-15-1	Ortho-Terphenyl	57			40-140 %			"	"	"	"	"	
321-60-8	2-Fluorobiphenyl	57			40-140 %			"	"	"	"	"	

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\* Reportable Detection Limit

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Sample Identification

MW-5  
SB35995-04

Client Project #  
HHCE 2011.038

Matrix  
Ground Water

Collection Date/Time  
21-Sep-11 16:00

Received  
22-Sep-11

<i>CAS No.</i>	<i>Analyte(s)</i>	<i>Result</i>	<i>Flag</i>	<i>Units</i>	<i>*RDL</i>	<i>MDL</i>	<i>Dilution</i>	<i>Method Ref.</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Analyst</i>	<i>Batch</i>	<i>Cert.</i>
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**Volatile Organic Compounds**VPH Aliphatic/Aromatic Carbon RangesPrepared by method VPH - EPA 5030B

	C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0	5.55	5	MADEP VPH 5/2004 Rev. 1.1	30-Sep-11	30-Sep-11	mp	1119986	
	C9-C12 Aliphatic Hydrocarbons	319		µg/l	25.0	4.22	5	"	"	"	"	"	
	C9-C10 Aromatic Hydrocarbons	171		µg/l	25.0	1.12	5	"	"	"	"	"	
	Unadjusted C5-C8 Aliphatic Hydrocarbons	109		µg/l	75.0	7.10	5	"	"	"	"	"	
	Unadjusted C9-C12 Aliphatic Hydrocarbons	490		µg/l	25.0	4.68	5	"	"	"	"	"	

VPH Target AnalytesPrepared by method VPH - EPA 5030B

71-43-2	Benzene	5.5		µg/l	5.0	1.3	5	"	"	"	"	"	
100-41-4	Ethylbenzene	26.5		µg/l	5.0	1.4	5	"	"	"	"	"	
1634-04-4	Methyl tert-butyl ether	< 5.0		µg/l	5.0	1.6	5	"	"	"	"	"	
91-20-3	Naphthalene	181		µg/l	5.0	1.2	5	"	"	"	"	"	
108-88-3	Toluene	< 5.0		µg/l	5.0	1.3	5	"	"	"	"	"	
179601-23-1	m,p-Xylene	< 10.0		µg/l	10.0	2.8	5	"	"	"	"	"	
95-47-6	o-Xylene	8.5		µg/l	5.0	1.1	5	"	"	"	"	"	

Surrogate recoveries:

615-59-8	2,5-Dibromotoluene (FID)	115			70-130 %			"	"	"	"	"	
615-59-8	2,5-Dibromotoluene (PID)	112			70-130 %			"	"	"	"	"	

**Extractable Petroleum Hydrocarbons**EPH Aliphatic/Aromatic RangesPrepared by method SW846 3510C

	C9-C18 Aliphatic Hydrocarbons	6,280		µg/l	105	26.1	1	MADEP EPH 5/2004 R	01-Oct-11	03-Oct-11	jj	1120116	
	C19-C36 Aliphatic Hydrocarbons	9,040		µg/l	105	82.3	1	"	"	"	"	"	
	C11-C22 Aromatic Hydrocarbons	5,840		µg/l	105	57.4	1	"	"	"	"	"	
	Unadjusted C11-C22 Aromatic Hydrocarbons	6,190		µg/l	105	57.4	1	"	"	"	"	"	
	Total Petroleum Hydrocarbons	21,200		µg/l	105	57.4	1	"	"	"	"	"	
	Unadjusted Total Petroleum Hydrocarbons	21,500		µg/l	105	57.4	1	"	"	"	"	"	

EPH Diesel Target PAH AnalytesPrepared by method SW846 3510C

91-20-3	Naphthalene	121		µg/l	5.26	2.76	1	"	"	"	"	"	
91-57-6	2-Methylnaphthalene	169		µg/l	5.26	2.65	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 5.26		µg/l	5.26	3.11	1	"	"	"	"	"	
85-01-8	Phenanthrene	24.1		µg/l	5.26	3.57	1	"	"	"	"	"	

Surrogate recoveries:

3386-33-2	1-Chlorooctadecane	60			40-140 %			"	"	"	"	"	
84-15-1	Ortho-Terphenyl	57			40-140 %			"	"	"	"	"	
321-60-8	2-Fluorobiphenyl	59			40-140 %			"	"	"	"	"	

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\* Reportable Detection Limit

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Sample Identification

MW-6

SB35995-05

Client Project #

HHCE 2011.038

Matrix

Ground Water

Collection Date/Time

21-Sep-11 14:00

Received

22-Sep-11

<i>CAS No.</i>	<i>Analyte(s)</i>	<i>Result</i>	<i>Flag</i>	<i>Units</i>	<i>*RDL</i>	<i>MDL</i>	<i>Dilution</i>	<i>Method Ref.</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Analyst</i>	<i>Batch</i>	<i>Cert.</i>
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**Volatile Organic Compounds**VPH Aliphatic/Aromatic Carbon RangesPrepared by method VPH - EPA 5030B

	C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0	5.55	5	MADEP VPH 5/2004 Rev. 1.1	29-Sep-11	29-Sep-11	mp	1119903	
	C9-C12 Aliphatic Hydrocarbons	< 25.0		µg/l	25.0	4.22	5	"	"	"	"	"	
	C9-C10 Aromatic Hydrocarbons	< 25.0		µg/l	25.0	1.12	5	"	"	"	"	"	
	Unadjusted C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0	7.10	5	"	"	"	"	"	
	Unadjusted C9-C12 Aliphatic Hydrocarbons	< 25.0		µg/l	25.0	4.68	5	"	"	"	"	"	

VPH Target AnalytesPrepared by method VPH - EPA 5030B

71-43-2	Benzene	< 5.0		µg/l	5.0	1.3	5	"	"	"	"	"	
100-41-4	Ethylbenzene	< 5.0		µg/l	5.0	1.4	5	"	"	"	"	"	
1634-04-4	Methyl tert-butyl ether	12.3		µg/l	5.0	1.6	5	"	"	"	"	"	
91-20-3	Naphthalene	< 5.0		µg/l	5.0	1.2	5	"	"	"	"	"	
108-88-3	Toluene	< 5.0		µg/l	5.0	1.3	5	"	"	"	"	"	
179601-23-1	m,p-Xylene	< 10.0		µg/l	10.0	2.8	5	"	"	"	"	"	
95-47-6	o-Xylene	< 5.0		µg/l	5.0	1.1	5	"	"	"	"	"	

Surrogate recoveries:

615-59-8	2,5-Dibromotoluene (FID)	85			70-130 %			"	"	"	"	"	
615-59-8	2,5-Dibromotoluene (PID)	79			70-130 %			"	"	"	"	"	

**Extractable Petroleum Hydrocarbons**EPH Aliphatic/Aromatic RangesPrepared by method SW846 3510C

	C9-C18 Aliphatic Hydrocarbons	< 105		µg/l	105	26.1	1	MADEP EPH 5/2004 R	01-Oct-11	03-Oct-11	jg	1120116	
	C19-C36 Aliphatic Hydrocarbons	< 105		µg/l	105	82.3	1	"	"	"	"	"	
	C11-C22 Aromatic Hydrocarbons	< 105		µg/l	105	57.4	1	"	"	03-Oct-11	"	"	
	Unadjusted C11-C22 Aromatic Hydrocarbons	< 105		µg/l	105	57.4	1	"	"	"	"	"	
	Total Petroleum Hydrocarbons	< 105		µg/l	105	57.4	1	"	"	03-Oct-11	"	"	
	Unadjusted Total Petroleum Hydrocarbons	< 105		µg/l	105	57.4	1	"	"	"	"	"	

EPH Diesel Target PAH AnalytesPrepared by method SW846 3510C

91-20-3	Naphthalene	< 5.26		µg/l	5.26	2.76	1	"	"	03-Oct-11	"	"	
91-57-6	2-Methylnaphthalene	< 5.26		µg/l	5.26	2.65	1	"	"	"	"	"	
83-32-9	Acenaphthene	< 5.26		µg/l	5.26	3.11	1	"	"	"	"	"	
85-01-8	Phenanthrene	< 5.26		µg/l	5.26	3.57	1	"	"	"	"	"	

Surrogate recoveries:

3386-33-2	1-Chlorooctadecane	60			40-140 %			"	"	03-Oct-11	"	"	
84-15-1	Ortho-Terphenyl	61			40-140 %			"	"	03-Oct-11	"	"	
321-60-8	2-Fluorobiphenyl	66			40-140 %			"	"	"	"	"	

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\* Reportable Detection Limit

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# Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119899 - VPH - EPA 5030B</b>										
<b>Blank (1119899-BLK1)</b>					<u>Prepared &amp; Analyzed: 29-Sep-11</u>					
C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0						
C9-C12 Aliphatic Hydrocarbons	< 25.0		µg/l	25.0						
C9-C10 Aromatic Hydrocarbons	< 25.0		µg/l	25.0						
Unadjusted C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0						
Unadjusted C9-C12 Aliphatic Hydrocarbons	< 25.0		µg/l	25.0						
Benzene	< 5.0		µg/l	5.0						
Ethylbenzene	< 5.0		µg/l	5.0						
Methyl tert-butyl ether	< 5.0		µg/l	5.0						
Naphthalene	< 5.0		µg/l	5.0						
Toluene	< 5.0		µg/l	5.0						
m,p-Xylene	< 10.0		µg/l	10.0						
o-Xylene	< 5.0		µg/l	5.0						
2-Methylpentane	< 5.0		µg/l	5.0						
n-Nonane	< 10.0		µg/l	10.0						
n-Pentane	< 10.0		µg/l	10.0						
1,2,4-Trimethylbenzene	< 5.0		µg/l	5.0						
2,2,4-Trimethylpentane	< 5.0		µg/l	5.0						
n-Butylcyclohexane	< 5.0		µg/l	5.0						
n-Decane	< 5.0		µg/l	5.0						
Surrogate: 2,5-Dibromotoluene (FID)	51.2		µg/l		50.0		102	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	49.6		µg/l		50.0		99	70-130		
<b>LCS (1119899-BS1)</b>					<u>Prepared &amp; Analyzed: 29-Sep-11</u>					
C5-C8 Aliphatic Hydrocarbons	60.3		µg/l		60.0		100	70-130		
C9-C12 Aliphatic Hydrocarbons	67.1		µg/l		60.0		112	70-130		
C9-C10 Aromatic Hydrocarbons	18.2		µg/l		20.0		91	70-130		
Unadjusted C5-C8 Aliphatic Hydrocarbons	196		µg/l		200		98	70-130		
Unadjusted C9-C12 Aliphatic Hydrocarbons	85.3		µg/l		80.0		107	70-130		
Benzene	18.7		µg/l		20.0		94	70-130		
Ethylbenzene	20.2		µg/l		20.0		101	70-130		
Methyl tert-butyl ether	17.4		µg/l		20.0		87	70-130		
Naphthalene	21.5		µg/l		20.0		107	70-130		
Toluene	19.4		µg/l		20.0		97	70-130		
m,p-Xylene	39.8		µg/l		40.0		100	70-130		
o-Xylene	20.4		µg/l		20.0		102	70-130		
2-Methylpentane	15.4		µg/l		20.0		77	70-130		
n-Nonane	17.9		µg/l		20.0		89	70-130		
n-Pentane	14.5		µg/l		20.0		72	70-130		
1,2,4-Trimethylbenzene	20.4		µg/l		20.0		102	70-130		
2,2,4-Trimethylpentane	18.3		µg/l		20.0		92	70-130		
n-Butylcyclohexane	18.5		µg/l		20.0		93	70-130		
n-Decane	19.8		µg/l		20.0		99	70-130		
Surrogate: 2,5-Dibromotoluene (FID)	51.4		µg/l		50.0		103	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	48.2		µg/l		50.0		96	70-130		
<b>LCS Dup (1119899-BSD1)</b>					<u>Prepared &amp; Analyzed: 29-Sep-11</u>					
C5-C8 Aliphatic Hydrocarbons	54.5		µg/l		60.0		91	70-130	10	25
C9-C12 Aliphatic Hydrocarbons	61.3		µg/l		60.0		102	70-130	9	25
C9-C10 Aromatic Hydrocarbons	17.0		µg/l		20.0		85	70-130	7	25
Unadjusted C5-C8 Aliphatic Hydrocarbons	181		µg/l		200		91	70-130	8	25
Unadjusted C9-C12 Aliphatic Hydrocarbons	78.3		µg/l		80.0		98	70-130	9	25

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\* Reportable Detection Limit

# Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119899 - VPH - EPA 5030B</b>										
<b>LCS Dup (1119899-BSD1)</b>					<u>Prepared &amp; Analyzed: 29-Sep-11</u>					
Benzene	17.5		µg/l		20.0		87	70-130	7	25
Ethylbenzene	18.7		µg/l		20.0		94	70-130	8	25
Methyl tert-butyl ether	16.7		µg/l		20.0		84	70-130	4	25
Naphthalene	20.4		µg/l		20.0		102	70-130	5	25
Toluene	18.0		µg/l		20.0		90	70-130	7	25
m,p-Xylene	36.9		µg/l		40.0		92	70-130	8	25
o-Xylene	19.0		µg/l		20.0		95	70-130	7	25
2-Methylpentane	14.5		µg/l		20.0		73	70-130	5	25
n-Nonane	16.9		µg/l		20.0		85	70-130	6	25
n-Pentane	14.2		µg/l		20.0		71	70-130	2	25
1,2,4-Trimethylbenzene	18.9		µg/l		20.0		95	70-130	7	25
2,2,4-Trimethylpentane	16.8		µg/l		20.0		84	70-130	8	25
n-Butylcyclohexane	17.1		µg/l		20.0		85	70-130	8	25
n-Decane	17.9		µg/l		20.0		89	70-130	10	25
Surrogate: 2,5-Dibromotoluene (FID)	51.3		µg/l		50.0		103	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	47.2		µg/l		50.0		94	70-130		
<b>Duplicate (1119899-DUP1)</b>					<b>Source: SB35995-01</b>		<u>Prepared &amp; Analyzed: 29-Sep-11</u>			
C5-C8 Aliphatic Hydrocarbons	50.4	J	µg/l	75.0		53.5			6	50
C9-C12 Aliphatic Hydrocarbons	14.9	J	µg/l	25.0		14.9			0.4	50
C9-C10 Aromatic Hydrocarbons	6.00	J	µg/l	25.0		6.00			0	50
Unadjusted C5-C8 Aliphatic Hydrocarbons	50.4	J	µg/l	75.0		53.5			6	50
Unadjusted C9-C12 Aliphatic Hydrocarbons	20.9	J	µg/l	25.0		20.9			0.3	50
Benzene	< 5.0		µg/l	5.0		BRL				50
Ethylbenzene	< 5.0		µg/l	5.0		BRL				50
Methyl tert-butyl ether	< 5.0		µg/l	5.0		BRL				50
Naphthalene	< 5.0		µg/l	5.0		BRL				50
Toluene	< 5.0		µg/l	5.0		BRL				50
m,p-Xylene	< 10.0		µg/l	10.0		BRL				50
o-Xylene	< 5.0		µg/l	5.0		BRL				50
Surrogate: 2,5-Dibromotoluene (FID)	56.6		µg/l		50.0		113	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	54.1		µg/l		50.0		108	70-130		
<b>Matrix Spike (1119899-MS1)</b>					<b>Source: SB35995-01</b>		<u>Prepared &amp; Analyzed: 29-Sep-11</u>			
Benzene	18.8		µg/l		20.0	BRL	94	70-130		
Ethylbenzene	20.0		µg/l		20.0	BRL	100	70-130		
Methyl tert-butyl ether	19.2		µg/l		20.0	BRL	96	70-130		
Naphthalene	21.3		µg/l		20.0	BRL	107	70-130		
Toluene	19.4		µg/l		20.0	BRL	97	70-130		
m,p-Xylene	39.6		µg/l		40.0	BRL	99	70-130		
o-Xylene	20.5		µg/l		20.0	BRL	102	70-130		
2-Methylpentane	16.3		µg/l		20.0	BRL	82	70-130		
n-Nonane	20.2		µg/l		20.0	BRL	101	70-130		
n-Pentane	14.4		µg/l		20.0	BRL	72	70-130		
1,2,4-Trimethylbenzene	20.4		µg/l		20.0	BRL	102	70-130		
2,2,4-Trimethylpentane	19.5		µg/l		20.0	BRL	98	70-130		
n-Butylcyclohexane	20.9		µg/l		20.0	BRL	104	70-130		
n-Decane	21.7		µg/l		20.0	BRL	108	70-130		
Surrogate: 2,5-Dibromotoluene (FID)	52.6		µg/l		50.0		105	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	48.1		µg/l		50.0		96	70-130		

## Batch 1119903 - VPH - EPA 5030B

**Blank (1119903-BLK1)**

Prepared & Analyzed: 29-Sep-11

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\* Reportable Detection Limit

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# Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119903 - VPH - EPA 5030B</b>										
<b>Blank (1119903-BLK1)</b>					<u>Prepared &amp; Analyzed: 29-Sep-11</u>					
C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0						
C9-C12 Aliphatic Hydrocarbons	< 25.0		µg/l	25.0						
C9-C10 Aromatic Hydrocarbons	< 25.0		µg/l	25.0						
Unadjusted C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0						
Unadjusted C9-C12 Aliphatic Hydrocarbons	< 25.0		µg/l	25.0						
Benzene	< 5.0		µg/l	5.0						
Ethylbenzene	< 5.0		µg/l	5.0						
Methyl tert-butyl ether	< 5.0		µg/l	5.0						
Naphthalene	< 5.0		µg/l	5.0						
Toluene	< 5.0		µg/l	5.0						
m,p-Xylene	< 10.0		µg/l	10.0						
o-Xylene	< 5.0		µg/l	5.0						
2-Methylpentane	< 5.0		µg/l	5.0						
n-Nonane	< 10.0		µg/l	10.0						
n-Pentane	< 10.0		µg/l	10.0						
1,2,4-Trimethylbenzene	< 5.0		µg/l	5.0						
2,2,4-Trimethylpentane	< 5.0		µg/l	5.0						
n-Butylcyclohexane	< 5.0		µg/l	5.0						
n-Decane	< 5.0		µg/l	5.0						
Surrogate: 2,5-Dibromotoluene (FID)	43.7		µg/l		50.0		87	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	41.1		µg/l		50.0		82	70-130		
<b>LCS (1119903-BS1)</b>					<u>Prepared &amp; Analyzed: 29-Sep-11</u>					
C5-C8 Aliphatic Hydrocarbons	60.2		µg/l		60.0		100	70-130		
C9-C12 Aliphatic Hydrocarbons	56.6		µg/l		60.0		94	70-130		
C9-C10 Aromatic Hydrocarbons	17.0		µg/l		20.0		85	70-130		
Unadjusted C5-C8 Aliphatic Hydrocarbons	189		µg/l		200		95	70-130		
Unadjusted C9-C12 Aliphatic Hydrocarbons	73.5		µg/l		80.0		92	70-130		
Benzene	19.3		µg/l		20.0		97	70-130		
Ethylbenzene	18.5		µg/l		20.0		92	70-130		
Methyl tert-butyl ether	18.9		µg/l		20.0		95	70-130		
Naphthalene	17.4		µg/l		20.0		87	70-130		
Toluene	18.6		µg/l		20.0		93	70-130		
m,p-Xylene	35.9		µg/l		40.0		90	70-130		
o-Xylene	17.8		µg/l		20.0		89	70-130		
2-Methylpentane	19.4		µg/l		20.0		97	70-130		
n-Nonane	17.3		µg/l		20.0		86	70-130		
n-Pentane	16.9		µg/l		20.0		84	70-130		
1,2,4-Trimethylbenzene	17.8		µg/l		20.0		89	70-130		
2,2,4-Trimethylpentane	21.0		µg/l		20.0		105	70-130		
n-Butylcyclohexane	19.7		µg/l		20.0		98	70-130		
n-Decane	17.9		µg/l		20.0		89	70-130		
Surrogate: 2,5-Dibromotoluene (FID)	50.5		µg/l		50.0		101	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	44.9		µg/l		50.0		90	70-130		
<b>LCS Dup (1119903-BSD1)</b>					<u>Prepared &amp; Analyzed: 29-Sep-11</u>					
C5-C8 Aliphatic Hydrocarbons	56.3		µg/l		60.0		94	70-130	7	25
C9-C12 Aliphatic Hydrocarbons	54.6		µg/l		60.0		91	70-130	4	25
C9-C10 Aromatic Hydrocarbons	17.5		µg/l		20.0		87	70-130	3	25
Unadjusted C5-C8 Aliphatic Hydrocarbons	185		µg/l		200		92	70-130	2	25
Unadjusted C9-C12 Aliphatic Hydrocarbons	72.1		µg/l		80.0		90	70-130	2	25

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\* Reportable Detection Limit

# Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119903 - VPH - EPA 5030B</b>										
<b>LCS Dup (1119903-BSD1)</b>					<u>Prepared &amp; Analyzed: 29-Sep-11</u>					
Benzene	18.1		µg/l		20.0		90	70-130	7	25
Ethylbenzene	18.9		µg/l		20.0		95	70-130	2	25
Methyl tert-butyl ether	17.4		µg/l		20.0		87	70-130	8	25
Naphthalene	18.0		µg/l		20.0		90	70-130	4	25
Toluene	18.4		µg/l		20.0		92	70-130	0.9	25
m,p-Xylene	37.2		µg/l		40.0		93	70-130	4	25
o-Xylene	18.6		µg/l		20.0		93	70-130	4	25
2-Methylpentane	17.4		µg/l		20.0		87	70-130	11	25
n-Nonane	17.3		µg/l		20.0		86	70-130	0.02	25
n-Pentane	15.1		µg/l		20.0		76	70-130	11	25
1,2,4-Trimethylbenzene	18.6		µg/l		20.0		93	70-130	5	25
2,2,4-Trimethylpentane	19.0		µg/l		20.0		95	70-130	10	25
n-Butylcyclohexane	19.3		µg/l		20.0		97	70-130	2	25
n-Decane	16.8		µg/l		20.0		84	70-130	6	25
Surrogate: 2,5-Dibromotoluene (FID)	52.9		µg/l		50.0		106	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	46.3		µg/l		50.0		93	70-130		
<b>Batch 1119986 - VPH - EPA 5030B</b>										
<b>Blank (1119986-BLK1)</b>					<u>Prepared &amp; Analyzed: 30-Sep-11</u>					
C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0						
C9-C12 Aliphatic Hydrocarbons	< 25.0		µg/l	25.0						
C9-C10 Aromatic Hydrocarbons	< 25.0		µg/l	25.0						
Unadjusted C5-C8 Aliphatic Hydrocarbons	< 75.0		µg/l	75.0						
Unadjusted C9-C12 Aliphatic Hydrocarbons	< 25.0		µg/l	25.0						
Benzene	< 5.0		µg/l	5.0						
Ethylbenzene	< 5.0		µg/l	5.0						
Methyl tert-butyl ether	< 5.0		µg/l	5.0						
Naphthalene	< 5.0		µg/l	5.0						
Toluene	< 5.0		µg/l	5.0						
m,p-Xylene	< 10.0		µg/l	10.0						
o-Xylene	< 5.0		µg/l	5.0						
2-Methylpentane	< 5.0		µg/l	5.0						
n-Nonane	< 10.0		µg/l	10.0						
n-Pentane	< 10.0		µg/l	10.0						
1,2,4-Trimethylbenzene	< 5.0		µg/l	5.0						
2,2,4-Trimethylpentane	< 5.0		µg/l	5.0						
n-Butylcyclohexane	< 5.0		µg/l	5.0						
n-Decane	< 5.0		µg/l	5.0						
Surrogate: 2,5-Dibromotoluene (FID)	51.0		µg/l		50.0		102	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	48.7		µg/l		50.0		97	70-130		
<b>LCS (1119986-BS1)</b>					<u>Prepared &amp; Analyzed: 30-Sep-11</u>					
C5-C8 Aliphatic Hydrocarbons	50.3		µg/l		60.0		84	70-130		
C9-C12 Aliphatic Hydrocarbons	61.3		µg/l		60.0		102	70-130		
C9-C10 Aromatic Hydrocarbons	18.8		µg/l		20.0		94	70-130		
Unadjusted C5-C8 Aliphatic Hydrocarbons	186		µg/l		200		93	70-130		
Unadjusted C9-C12 Aliphatic Hydrocarbons	80.1		µg/l		80.0		100	70-130		
Benzene	18.9		µg/l		20.0		95	70-130		
Ethylbenzene	20.5		µg/l		20.0		103	70-130		
Methyl tert-butyl ether	16.1		µg/l		20.0		80	70-130		
Naphthalene	21.3		µg/l		20.0		107	70-130		

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\* Reportable Detection Limit

# Volatile Organic Compounds - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1119986 - VPH - EPA 5030B</b>										
<b>LCS (1119986-BS1)</b>					<u>Prepared &amp; Analyzed: 30-Sep-11</u>					
Toluene	19.7		µg/l		20.0		98	70-130		
m,p-Xylene	40.4		µg/l		40.0		101	70-130		
o-Xylene	20.5		µg/l		20.0		103	70-130		
2-Methylpentane	17.1		µg/l		20.0		86	70-130		
n-Nonane	19.5		µg/l		20.0		97	70-130		
n-Pentane	15.4		µg/l		20.0		77	70-130		
1,2,4-Trimethylbenzene	20.6		µg/l		20.0		103	70-130		
2,2,4-Trimethylpentane	19.1		µg/l		20.0		96	70-130		
n-Butylcyclohexane	19.9		µg/l		20.0		99	70-130		
n-Decane	21.4		µg/l		20.0		107	70-130		
Surrogate: 2,5-Dibromotoluene (FID)	54.0		µg/l		50.0		108	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	50.2		µg/l		50.0		100	70-130		
<b>LCS Dup (1119986-BSD1)</b>					<u>Prepared &amp; Analyzed: 30-Sep-11</u>					
C5-C8 Aliphatic Hydrocarbons	54.3		µg/l		60.0		90	70-130	8	25
C9-C12 Aliphatic Hydrocarbons	66.0		µg/l		60.0		110	70-130	7	25
C9-C10 Aromatic Hydrocarbons	18.2		µg/l		20.0		91	70-130	3	25
Unadjusted C5-C8 Aliphatic Hydrocarbons	189		µg/l		200		94	70-130	1	25
Unadjusted C9-C12 Aliphatic Hydrocarbons	84.2		µg/l		80.0		105	70-130	5	25
Benzene	18.5		µg/l		20.0		93	70-130	2	25
Ethylbenzene	20.0		µg/l		20.0		100	70-130	2	25
Methyl tert-butyl ether	16.8		µg/l		20.0		84	70-130	5	25
Naphthalene	20.2		µg/l		20.0		101	70-130	5	25
Toluene	19.3		µg/l		20.0		96	70-130	2	25
m,p-Xylene	39.6		µg/l		40.0		99	70-130	2	25
o-Xylene	20.1		µg/l		20.0		101	70-130	2	25
2-Methylpentane	16.5		µg/l		20.0		82	70-130	4	25
n-Nonane	18.4		µg/l		20.0		92	70-130	6	25
n-Pentane	15.2		µg/l		20.0		76	70-130	2	25
1,2,4-Trimethylbenzene	20.2		µg/l		20.0		101	70-130	2	25
2,2,4-Trimethylpentane	19.2		µg/l		20.0		96	70-130	0.5	25
n-Butylcyclohexane	19.5		µg/l		20.0		97	70-130	2	25
n-Decane	20.4		µg/l		20.0		102	70-130	5	25
Surrogate: 2,5-Dibromotoluene (FID)	53.2		µg/l		50.0		106	70-130		
Surrogate: 2,5-Dibromotoluene (PID)	49.5		µg/l		50.0		99	70-130		

# Extractable Petroleum Hydrocarbons - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1120116 - SW846 3510C</b>										
<b>Blank (1120116-BLK1)</b>					Prepared: 01-Oct-11 Analyzed: 03-Oct-11					
C9-C18 Aliphatic Hydrocarbons	< 50.0		µg/l	50.0						
C19-C36 Aliphatic Hydrocarbons	< 50.0		µg/l	50.0						
C11-C22 Aromatic Hydrocarbons	< 50.0		µg/l	50.0						
Unadjusted C11-C22 Aromatic Hydrocarbons	< 50.0		µg/l	50.0						
Total Petroleum Hydrocarbons	< 50.0		µg/l	50.0						
Unadjusted Total Petroleum Hydrocarbons	< 50.0		µg/l	50.0						
Naphthalene	< 2.50		µg/l	2.50						
2-Methylnaphthalene	< 2.50		µg/l	2.50						
Acenaphthene	< 2.50		µg/l	2.50						
Phenanthrene	< 2.50		µg/l	2.50						
Anthracene	< 2.50		µg/l	2.50						
Pyrene	< 2.50		µg/l	2.50						
Chrysene	< 2.50		µg/l	2.50						
n-Nonane (C9)	< 2.50		µg/l	2.50						
n-Decane	< 2.50		µg/l	2.50						
n-Dodecane	< 2.50		µg/l	2.50						
n-Tetradecane	< 2.50		µg/l	2.50						
n-Hexadecane	< 2.50		µg/l	2.50						
n-Octadecane	< 2.50		µg/l	2.50						
n-Nonadecane	< 2.50		µg/l	2.50						
n-Eicosane	< 2.50		µg/l	2.50						
n-Docosane	< 2.50		µg/l	2.50						
n-Tetracosane	< 2.50		µg/l	2.50						
n-Hexacosane	< 2.50		µg/l	2.50						
n-Octacosane	< 2.50		µg/l	2.50						
n-Triacontane	< 2.50		µg/l	2.50						
n-Hexatriacontane	< 2.50		µg/l	2.50						
Naphthalene (aliphatic fraction)	<b>0.00</b>		µg/l							
2-Methylnaphthalene (aliphatic fraction)	<b>0.00</b>		µg/l							
Surrogate: 1-Chlorooctadecane	30.8		µg/l		50.0		62	40-140		
Surrogate: Ortho-Terphenyl	24.3		µg/l		50.0		49	40-140		
Surrogate: 2-Fluorobiphenyl	19.1		µg/l		40.0		48	40-140		
<b>LCS (1120116-BS1)</b>					Prepared: 01-Oct-11 Analyzed: 03-Oct-11					
C9-C18 Aliphatic Hydrocarbons	<b>316</b>		µg/l	50.0	600		53	40-140		
C19-C36 Aliphatic Hydrocarbons	<b>711</b>		µg/l	50.0	800		89	40-140		
C11-C22 Aromatic Hydrocarbons	<b>780</b>		µg/l	50.0	1700		46	40-140		
Naphthalene	<b>49.4</b>		µg/l	2.50	100		49	40-140		
2-Methylnaphthalene	<b>52.4</b>		µg/l	2.50	100		52	40-140		
Acenaphthene	<b>58.1</b>		µg/l	2.50	100		58	40-140		
Phenanthrene	<b>62.3</b>		µg/l	2.50	100		62	40-140		
Anthracene	<b>63.9</b>		µg/l	2.50	100		64	40-140		
Pyrene	<b>62.9</b>		µg/l	2.50	100		63	40-140		
Chrysene	<b>64.5</b>		µg/l	2.50	100		65	40-140		
n-Nonane (C9)	<b>30.6</b>		µg/l	2.50	100		31	30-140		
n-Decane	<b>40.2</b>		µg/l	2.50	100		40	40-140		
n-Dodecane	<b>49.2</b>		µg/l	2.50	100		49	40-140		
n-Tetradecane	<b>59.5</b>		µg/l	2.50	100		59	40-140		
n-Hexadecane	<b>67.9</b>		µg/l	2.50	100		68	40-140		
n-Octadecane	<b>72.6</b>		µg/l	2.50	100		73	40-140		
n-Nonadecane	<b>74.6</b>		µg/l	2.50	100		75	40-140		
n-Eicosane	<b>76.4</b>		µg/l	2.50	100		76	40-140		

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\* Reportable Detection Limit

# Extractable Petroleum Hydrocarbons - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1120116 - SW846 3510C</b>										
<b>LCS (1120116-BS1)</b>					Prepared: 01-Oct-11 Analyzed: 03-Oct-11					
n-Docosane	79.1		µg/l	2.50	100		79	40-140		
n-Tetracosane	79.4		µg/l	2.50	100		79	40-140		
n-Hexacosane	80.2		µg/l	2.50	100		80	40-140		
n-Octacosane	82.0		µg/l	2.50	100		82	40-140		
n-Triacontane	78.4		µg/l	2.50	100		78	40-140		
n-Hexatriacontane	49.2		µg/l	2.50	100		49	40-140		
Naphthalene (aliphatic fraction)	0.000100		µg/l		10000		0.000001	0-200		
2-Methylnaphthalene (aliphatic fraction)	0.000100		µg/l		10000		0.000001	0-200		
Surrogate: 1-Chlorooctadecane	33.8		µg/l		50.0		68	40-140		
Surrogate: Ortho-Terphenyl	33.7		µg/l		50.0		67	40-140		
Surrogate: 2-Fluorobiphenyl	21.5		µg/l		40.0		54	40-140		
Naphthalene Breakthrough	0.00		%					0-5		
2-Methylnaphthalene Breakthrough	0.00		%					0-5		
<b>LCS (1120116-BS2)</b>					Prepared: 01-Oct-11 Analyzed: 03-Oct-11					
C9-C18 Aliphatic Hydrocarbons	387		µg/l	50.0	600		64	40-140		
C19-C36 Aliphatic Hydrocarbons	717		µg/l	50.0	800		90	40-140		
C11-C22 Aromatic Hydrocarbons	860		µg/l	50.0	1700		51	40-140		
Naphthalene	51.9		µg/l	2.50	100		52	40-140		
2-Methylnaphthalene	55.5		µg/l	2.50	100		56	40-140		
Acenaphthene	61.5		µg/l	2.50	100		62	40-140		
Phenanthrene	67.6		µg/l	2.50	100		68	40-140		
Anthracene	73.6		µg/l	2.50	100		74	40-140		
Pyrene	69.8		µg/l	2.50	100		70	40-140		
Chrysene	69.6		µg/l	2.50	100		70	40-140		
n-Nonane (C9)	47.2		µg/l	2.50	100		47	30-140		
n-Decane	54.7		µg/l	2.50	100		55	40-140		
n-Dodecane	60.3		µg/l	2.50	100		60	40-140		
n-Tetradecane	67.6		µg/l	2.50	100		68	40-140		
n-Hexadecane	73.3		µg/l	2.50	100		73	40-140		
n-Octadecane	76.1		µg/l	2.50	100		76	40-140		
n-Nonadecane	77.3		µg/l	2.50	100		77	40-140		
n-Eicosane	78.6		µg/l	2.50	100		79	40-140		
n-Docosane	81.4		µg/l	2.50	100		81	40-140		
n-Tetracosane	81.7		µg/l	2.50	100		82	40-140		
n-Hexacosane	82.5		µg/l	2.50	100		83	40-140		
n-Octacosane	84.3		µg/l	2.50	100		84	40-140		
n-Triacontane	80.6		µg/l	2.50	100		81	40-140		
n-Hexatriacontane	51.6		µg/l	2.50	100		52	40-140		
Naphthalene (aliphatic fraction)	0.00		µg/l		100			0-200		
2-Methylnaphthalene (aliphatic fraction)	0.00		µg/l		100			0-200		
Surrogate: 1-Chlorooctadecane	35.5		µg/l		50.0		71	40-140		
Surrogate: Ortho-Terphenyl	36.2		µg/l		50.0		72	40-140		
Surrogate: 2-Fluorobiphenyl	23.4		µg/l		40.0		58	40-140		
Naphthalene Breakthrough	0.00		%					0-5		
2-Methylnaphthalene Breakthrough	0.00		%					0-5		
<b>LCS Dup (1120116-BSD1)</b>					Prepared: 01-Oct-11 Analyzed: 03-Oct-11					
C9-C18 Aliphatic Hydrocarbons	407		µg/l	50.0	600		68	40-140	25	25
C19-C36 Aliphatic Hydrocarbons	770		µg/l	50.0	800		96	40-140	8	25
C11-C22 Aromatic Hydrocarbons	880		µg/l	50.0	1700		52	40-140	12	25
Naphthalene	56.6		µg/l	2.50	100		57	40-140	14	25

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\* Reportable Detection Limit



# Extractable Petroleum Hydrocarbons - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1120116 - SW846 3510C</b>										
<b>LCS Dup (1120116-BSD1)</b>					<u>Prepared: 01-Oct-11 Analyzed: 03-Oct-11</u>					
2-Methylnaphthalene	61.2		µg/l	2.50	100		61	40-140	15	25
Acenaphthene	64.6		µg/l	2.50	100		65	40-140	11	25
Phenanthrene	70.0		µg/l	2.50	100		70	40-140	12	25
Anthracene	68.8		µg/l	2.50	100		69	40-140	7	25
Pyrene	70.4		µg/l	2.50	100		70	40-140	11	25
Chrysene	68.4		µg/l	2.50	100		68	40-140	6	25
n-Nonane (C9)	45.8	QR2	µg/l	2.50	100		46	30-140	40	25
n-Decane	53.8	QR2	µg/l	2.50	100		54	40-140	29	25
n-Dodecane	60.1		µg/l	2.50	100		60	40-140	20	25
n-Tetradecane	68.0		µg/l	2.50	100		68	40-140	13	25
n-Hexadecane	74.6		µg/l	2.50	100		75	40-140	9	25
n-Octadecane	77.8		µg/l	2.50	100		78	40-140	7	25
n-Nonadecane	79.5		µg/l	2.50	100		79	40-140	6	25
n-Eicosane	80.8		µg/l	2.50	100		81	40-140	6	25
n-Docosane	83.7		µg/l	2.50	100		84	40-140	6	25
n-Tetracosane	83.9		µg/l	2.50	100		84	40-140	5	25
n-Hexacosane	84.1		µg/l	2.50	100		84	40-140	5	25
n-Octacosane	86.5		µg/l	2.50	100		86	40-140	5	25
n-Triacontane	84.5		µg/l	2.50	100		84	40-140	7	25
n-Hexatriacontane	86.0	QR2	µg/l	2.50	100		86	40-140	54	25
Naphthalene (aliphatic fraction)	0.00		µg/l		10000			0-200		200
2-Methylnaphthalene (aliphatic fraction)	0.00		µg/l		10000			0-200		200
Surrogate: 1-Chlorooctadecane	42.5		µg/l		50.0		85	40-140		
Surrogate: Ortho-Terphenyl	36.9		µg/l		50.0		74	40-140		
Surrogate: 2-Fluorobiphenyl	33.0		µg/l		40.0		82	40-140		
Naphthalene Breakthrough	0.00		%					0-5		
2-Methylnaphthalene Breakthrough	0.00		%					0-5		

## Extractable Petroleum Hydrocarbons - CCV Evaluation Report

Analyte(s)	Average RF	CCRF	% D	Limit
<b>Batch S108923</b>				
<b><u>Calibration Check (S108923-CCV1)</u></b>				
C9-C18 Aliphatic Hydrocarbons	1.077597E+08	1.137688E+08	14.8	25
C19-C36 Aliphatic Hydrocarbons	1.129792E+08	1.074794E+08	17.0	25
C11-C22 Aromatic Hydrocarbons	24.56243	19.49478	-11.2	25
Naphthalene	8.003419	8.690592	8.6	25
2-Methylnaphthalene	5.351536	5.879855	9.9	25
Acenaphthene	4.869087	5.204874	6.9	25
Phenanthrene	7.874853	8.273963	5.1	25
Anthracene	6.981425	5.920346	-15.2	25
Pyrene	8.513716	8.945573	5.1	25
Chrysene	7.586051	8.421078	11.0	25
n-Decane	102864.8	112818.3	9.7	25
n-Dodecane	103161.7	113429.1	10.0	25
n-Hexadecane	100979	112383.7	11.3	25
n-Nonane (C9)	103134.8	111583.2	8.2	30
n-Octadecane	98980.42	110304.9	11.4	25
n-Tetradecane	101806.9	113282.3	11.3	25
n-Eicosane	95375.55	109180.7	14.5	25
n-Nonadecane	97472.38	110043.1	12.9	25
n-Docosane	93276.75	109714.4	17.6	25
n-Octacosane	88486.73	108495.8	22.6	25
n-Tetracosane	91785.2	108193.4	17.9	25
n-Hexacosane	91457.1	109114.8	19.3	25
n-Triacontane	90872.17	108688.5	19.6	25
n-Hexatriacontane	88235.92	100134.8	13.5	25

## Volatile Organic Compounds - CCV Evaluation Report

Analyte(s)	Average RF	CCRF	% D	Limit
<b>Batch S108828</b>				
<b><u>Calibration Check (S108828-CCV1)</u></b>				
Benzene	103819	108949.8	4.9	25
Ethylbenzene	68517.78	75458.68	10.1	25
Methyl tert-butyl ether	37800.12	39417.94	4.3	25
Naphthalene	63931.34	63188.04	-1.2	25
Toluene	84080.87	89902.32	6.9	25
m,p-Xylene	82053.67	88517.37	7.9	25
o-Xylene	70333.24	75294.6	7.1	25
2-Methylpentane	20844.22	23429.26	12.4	25
n-Nonane	17805.01	18072.96	1.5	30
n-Pentane	20034.37	22836.46	14.0	25
1,2,4-Trimethylbenzene	64784.58	69605.46	7.4	25
2,2,4-Trimethylpentane	21412.03	24232.08	13.2	25
n-Butylcyclohexane	18335.56	18463.18	0.7	25
n-Decane	13379.33	14691.28	9.8	25
<b><u>Calibration Check (S108828-CCV2)</u></b>				
Benzene	103819	110945	6.9	25
Ethylbenzene	68517.78	76420.8	11.5	25
Methyl tert-butyl ether	37800.12	41427.3	9.6	25
Naphthalene	63931.34	65075.22	1.8	25
Toluene	84080.87	91778.3	9.2	25
m,p-Xylene	82053.67	89755.74	9.4	25
o-Xylene	70333.24	76391	8.6	25
2-Methylpentane	20844.22	23407.74	12.3	25
n-Nonane	17805.01	19403.58	9.0	30
n-Pentane	20034.37	22671.92	13.2	25
1,2,4-Trimethylbenzene	64784.58	70466.3	8.8	25
2,2,4-Trimethylpentane	21412.03	24234.22	13.2	25
n-Butylcyclohexane	18335.56	19647.1	7.2	25
n-Decane	13379.33	15982.16	19.5	25
<b>Batch S108829</b>				
<b><u>Calibration Check (S108829-CCV1)</u></b>				
Benzene	156193.6	145590.7	-6.8	25
Ethylbenzene	73221.19	73680.96	0.6	25
Methyl tert-butyl ether	93026.18	79246.08	-14.8	25
Naphthalene	73930.95	64539.9	-12.7	25
Toluene	104529.6	99028.78	-5.3	25
m,p-Xylene	81483.58	80765.5	-0.9	25
o-Xylene	69127.04	66937.78	-3.2	25
2-Methylpentane	45567.46	52870.96	16.0	25
n-Nonane	27809.25	27850.76	0.1	30
n-Pentane	42116.88	47678.68	13.2	25
1,2,4-Trimethylbenzene	68262.81	66014.46	-3.3	25
2,2,4-Trimethylpentane	42940.56	47689.54	11.1	25
n-Butylcyclohexane	26064.71	26124.66	0.2	25
n-Decane	21769.87	19649	-9.7	25
<b><u>Calibration Check (S108829-CCV2)</u></b>				
Benzene	156193.6	150187.8	-3.8	25
Ethylbenzene	73221.19	76763.66	4.8	25
Methyl tert-butyl ether	93026.18	84086.98	-9.6	25
Naphthalene	73930.95	71500.02	-3.3	25
Toluene	104529.6	102803.7	-1.7	25

*This laboratory report is not valid without an authorized signature on the cover page.*

\* Reportable Detection Limit

Page 19 of 21

## Volatile Organic Compounds - CCV Evaluation Report

Analyte(s)	Average RF	CCRF	% D	Limit
<b>Batch S108829</b>				
<b><u>Calibration Check (S108829-CCV2)</u></b>				
m,p-Xylene	81483.58	84786.66	4.1	25
o-Xylene	69127.04	70412.76	1.9	25
2-Methylpentane	45567.46	54252.24	19.1	25
n-Nonane	27809.25	31766	14.2	30
n-Pentane	42116.88	49135.06	16.7	25
1,2,4-Trimethylbenzene	68262.81	69192.84	1.4	25
2,2,4-Trimethylpentane	42940.56	50313.5	17.2	25
n-Butylcyclohexane	26064.71	29720.24	14.0	25
n-Decane	21769.87	23578.6	8.3	25
<b>Batch S108843</b>				
<b><u>Calibration Check (S108843-CCV1)</u></b>				
Benzene	103819	110945	6.9	25
Ethylbenzene	68517.78	76420.8	11.5	25
Methyl tert-butyl ether	37800.12	41427.3	9.6	25
Naphthalene	63931.34	65075.22	1.8	25
Toluene	84080.87	91778.3	9.2	25
m,p-Xylene	82053.67	89755.74	9.4	25
o-Xylene	70333.24	76391	8.6	25
2-Methylpentane	20844.22	23407.74	12.3	25
n-Nonane	17805.01	19403.58	9.0	30
n-Pentane	20034.37	22671.92	13.2	25
1,2,4-Trimethylbenzene	64784.58	70466.3	8.8	25
2,2,4-Trimethylpentane	21412.03	24234.22	13.2	25
n-Butylcyclohexane	18335.56	19647.1	7.2	25
n-Decane	13379.33	15982.16	19.5	25
<b><u>Calibration Check (S108843-CCV2)</u></b>				
Benzene	103819	108764.3	4.8	25
Ethylbenzene	68517.78	74396.1	8.6	25
Methyl tert-butyl ether	37800.12	40292.1	6.6	25
Naphthalene	63931.34	63712.38	-0.3	25
Toluene	84080.87	89302.7	6.2	25
m,p-Xylene	82053.67	87203.54	6.3	25
o-Xylene	70333.24	75098.7	6.8	25
2-Methylpentane	20844.22	21837.3	4.8	25
n-Nonane	17805.01	15069.44	-15.4	30
n-Pentane	20034.37	21118.88	5.4	25
1,2,4-Trimethylbenzene	64784.58	68802.56	6.2	25
2,2,4-Trimethylpentane	21412.03	22270.08	4.0	25
n-Butylcyclohexane	18335.56	15975.78	-12.9	25
n-Decane	13379.33	12021.28	-10.2	25

## Notes and Definitions

QR2	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).

A Matrix Spike and Matrix Spike Duplicate (MS/MSD) for MADEP EPH CAM may not have been analyzed with the samples in this work order. According to the method these spikes are performed only when requested by the client. If requested the spike recoveries are included in the batch QC data.

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

Validated by:  
Kimberly Wisk



# CHAIN OF CUSTODY RECORD

Page 1 of 1

## Special Handling:

- ☒ Standard TAT - 7 to 10 business days
- ☐ Rush TAT - Date Needed:
- All TATs subject to laboratory approval.
- Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report to: Walter B. Hermenan  
Hermenan Engineering  
6 Thomas Road  
Berkley, MA 02779

Invoice to: Walter B. Hermenan  
Hermenan Engineering  
PO BOX 909  
Assonet, MA 02702

Project No.: IHCE 2011.038  
Site Name: Broadway Henry LLC  
Location: 30-44 Broadway, Somerville, MA  
Sample(s): Walter B. Hermenan

G=Grab C=Composite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	Containers:	Analyses:	QA Reporting Notes: (check if needed)
359AS.61	MW-1	9/21/2011	13:00	G	Groundwater	2	EPH w/4 PAHs VPH w/ TACs	<input checked="" type="checkbox"/> Provide MA DEP MCP CAM Report <input type="checkbox"/> Provide CT DPH RCP Report QA/QC Reporting Levels Standard
4	MW-1	9/21/2011	13:00	G	Groundwater	3		State specific reporting standards
4	MW-2	9/21/2011	15:00	G	Groundwater	1		
4	MW-2	9/21/2011	15:00	G	Groundwater	3		
4	MW-3	9/21/2011	14:00	G	Groundwater	3		
4	MW-3	9/21/2011	14:00	G	Groundwater	2		
4	MW-5	9/21/2011	16:00	G	Groundwater	1		
4	MW-5	9/21/2011	16:00	G	Groundwater	3		
4	MW-6	9/21/2011	14:00	G	Groundwater	3		
4	MW-6	9/21/2011	14:00	G	Groundwater	1		

RESULTS NEEDED BY 10/4/11 PLEASE! THANK YOU.

<input type="checkbox"/> Ambient <input checked="" type="checkbox"/> Refrigerated <input type="checkbox"/> Fridge temp _____ °C <input type="checkbox"/> Freezer temp _____ °C	Relinquished by: <i>[Signature]</i> Received by: <i>[Signature]</i> Date: 9-22-11 Time: 12:00 Temp: 4 9/22/11 17:00 05
---	---

SR 359ASm  
COC # 1297

## **APPENDIX D**

November 17, 2011

Department of Environmental Protection  
Northeast Regional Office  
Emergency Response Branch  
Metropolitan Boston - Northeast Regional Office  
205B Lowell Street  
Wilmington, MA 01887

RE: **PRP Certification Statements**  
38 Broadway  
Somerville, MA 02145  
MADEP RTN 3-30424

Dear Department,

Regarding PRP Certification Statements, I authorize my LSP, Walter Hermenau, to act as my agent for response actions at the above referenced site (RTN 3-30424).

Please do not hesitate to call if you have any questions or require additional information.

Sincerely,

Martin Henry  
Broadway Henry LLC

cc: Walter Hermenau, LSP



**MEMORANDUM****To:** Ben Rogan  
Highland Development**CC:** Edward Giordano, PG, LSP**From:** Matthew Wilson**Date:** 12/9/2015**Re:** 30-44 Broadway – Groundwater Sampling Results and Document Review

This Memo has been prepared to provide an update of subsurface investigation activities conducted at the Former Gasoline Station site located at 38 Broadway, Somerville, MA (the Site). The memo includes a brief summary of events related to the sampling of existing groundwater monitoring wells on the Site. Additional assessments were conducted in an effort to assess site conditions relative to the presence of non-aqueous phase liquid (NAPL) previously documented in the Phase I Initial Site Investigation (ISI) and Tier Classification prepared by Hermenau & Hermenau Consulting Engineers (H&HCE) and dated November 8, 2012.

**Activities:**

On November 24, 2015, EBI collected groundwater samples, gauged each well for NAPL using an oil/water interface probe. A total of six (6) monitoring wells were previously installed at the Site in 2011 and were designated MW-1 through MW-6, respectively. Refer to the attached Site Plan for sampling locations. Groundwater samples were collected using a peristaltic pump following low-flow protocols and samples from MW-1, MW-2, MW-3 and MW-6 were submitted for laboratory analysis of EPH with target PAHs and VPH with target VOCs via the MassDEP Methods as well as VOCs via the EPA 8260 method.

Depth to water was recorded to be between 5.26 and 11.23 feet bgs in the six wells and one of the six wells had measurable amounts of NAPL. Approximately 1.20 feet of NAPL was measured in MW-4. EBI purged the NAPL from MW-4 using a peristaltic pump and collected the product in a 55-gallon drum stored on-Site for the purpose of collecting oily water and/or oil impacted soils. Approximately 275 mL of NAPL was recovered.

Groundwater samples were not collected from MW-4 due to the presence of NAPL in the monitoring well. EBI attempted to collect groundwater samples from MW-5; however, not enough water was available to collect a sample due to poor recharge of the well. EBI observed a slight sheen and petroleum odor on the purge water from MW-5.

**Analytical Results:**

According to the laboratory analytical results for groundwater, no VPH/EPH constituents or target PAHs were detected above the laboratory reporting limits any of the four samples submitted for analysis. A total of four VOCs (this includes the target VOCs from the VPH analysis) were detected above the laboratory reporting limits in two samples submitted for analysis. However, all contaminants were reported at concentrations below the applicable MCP RCs for the RCGW-2 category.

Refer to the attached Tables for a summary groundwater laboratory analytical data and gauging data. A copy of the laboratory analytical report is also provided.

**Historical Reports:**

A MCP Phase I ISI and Tier Classification report was prepared for the Site by H&HCE of Assonet, MA on behalf of Broadway Henry, LLC (the current owner) and submitted to the MassDEP in November 2012. The report summarized the findings of an ASTM Phase I Environmental Site Assessment (ESA) prepared by IES, Inc. in February 2011 as well as subsurface investigations conducted at the Site. The conclusions presented in the Phase I ISI are as follows:

- The Site was historically used as a gasoline service station from the 1930's to approximately 1960.
- According to Fire Department records all associated tanks were reportedly removed in 1960.
- Two former in-ground piston hydraulic lifts and a former oil pit within the garage were supposedly removed/filled prior to 1988.
- A potential small UST is located adjacent the eastern side of the 38 Broadway Garage.
- Subsurface investigations identified EPH/VPH constituents and/or target analytes compounds in soil at concentrations above the applicable RCS-I standards.
- LNAPL in MW-4 triggered a 72-hour reporting condition and Immediate Response Action (IRA) activities were initiated consisting of product gauging and recovery.
- The report concluded by stating that comprehensive response actions are necessary to reach a condition of no significant risk.

**Conclusions:**

No new reportable conditions were identified as a result of the November 24, 2015 groundwater sampling round. Oil and/or Hazardous Materials (OHM) in the form of LNAPL are still present in a groundwater monitoring well (MW-4) at the Site at a volume that exceeds the applicable MCP standards. No other OHM in groundwater at the Site was reported above the applicable RCGW-2 Standards from the November sampling round. However, a sample could not be collected from MW-5, and previous reports documented the presence of OHM (EPH constituents) above the RCGW-2 standards at this location. Due to the presence of LNAPL immediately upgradient and the observed impacts to the water during field activities, it is likely that groundwater in the vicinity at MW-5 is still impacted by petroleum constituents above applicable standards.

The Site is currently a Disposal Site with the Release Tracking Number (RTN) 3-30424 due to the presence of NAPL and elevated levels of OHM in soil and groundwater, as documented by H&HCE. Additional subsurface investigations including soil, groundwater and soil vapor sampling may be warranted to adequately assess the nature and extent of contamination. Also, additional work may be needed to bring the Site into compliance with the MCP regarding the open IRA at the Site.

If you should have any questions or require additional information, please do not hesitate to contact the undersigned below.

Sincerely,



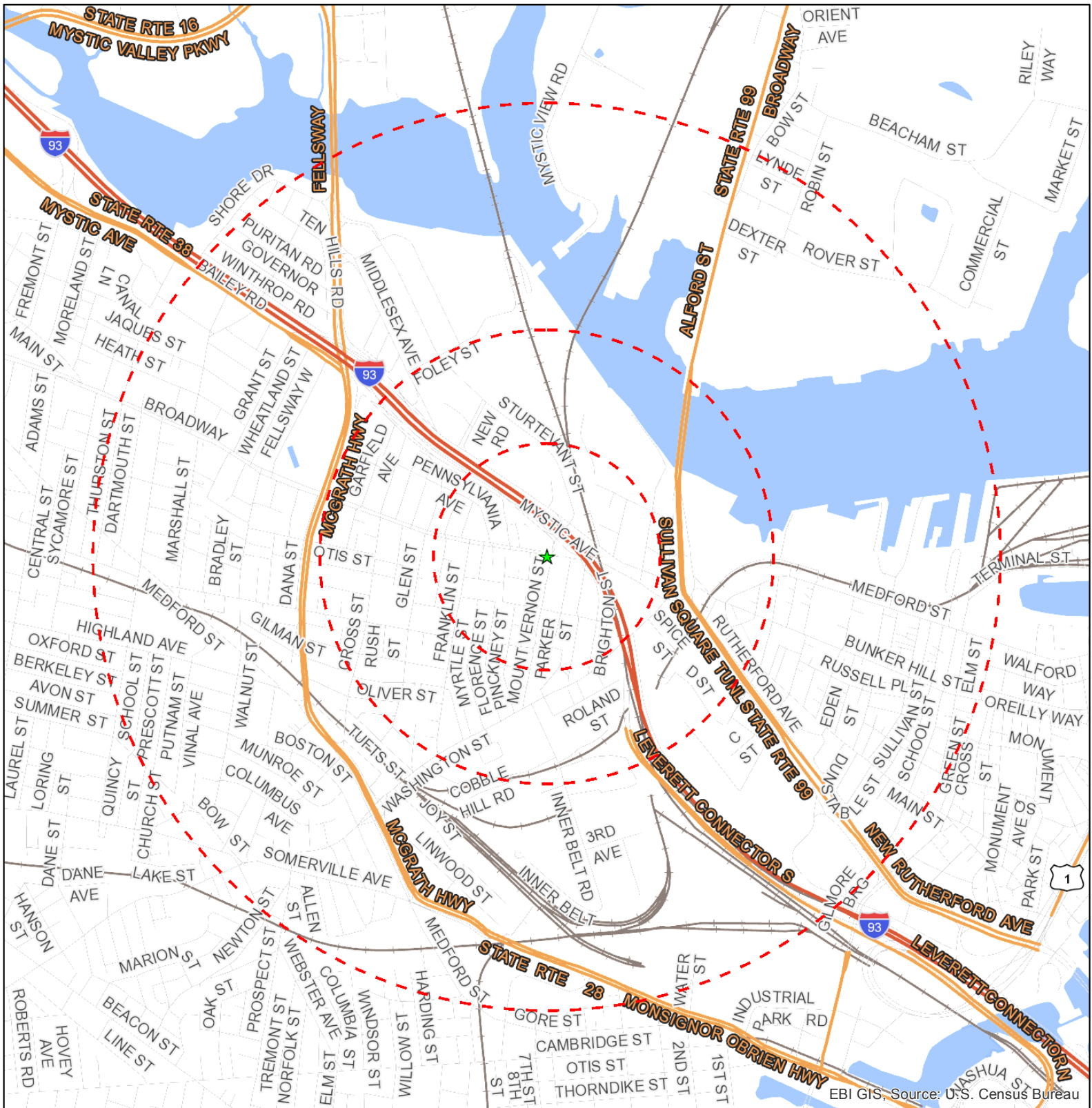
Matthew Wilson  
Project Scientist  
[mwilson@ebiconsulting.com](mailto:mwilson@ebiconsulting.com)  
781-425-5104



Edward F Giordano, PG, LSP  
Sr. Project Manager  
[egiordano@ebiconsulting.com](mailto:egiordano@ebiconsulting.com)  
781-418-2316

Attachments:    Figures  
                     Tables  
                     Laboratory Analytical Reports

## Figures



## Legend

- ★ Project Site
- ⬢ Site Radius at 1/4, 1/2 and 1 mile

Source: Selected data from ESRI, EBI & USGS

Date: 12/9/2015

**Figure 1: Site Location Map**

0 500 1,000 2,000 3,000 Feet

**FORMER GASOLINE STATION (30-44 BROADWAY)**  
**30-44 BROADWAY**  
**SOMERVILLE, MA 02145**





### Legend

- ★ Project Site
- Site Radius at 1/4, 1/2 and 1 mile

Source: Selected data from ESRI, EBI & USGS



Date: 12/9/2015

USGS 24K Quad: Boston North, MA 1980, Boston South, MA 1980

Figure 2 - Topographic Map

**FORMER GASOLINE STATION (30-44 BROADWAY)**  
**30-44 BROADWAY**  
**SOMERVILLE, MA 02145**

0 500 1,000 2,000 3,000 Feet



# MassDEP - Bureau of Waste Site Cleanup

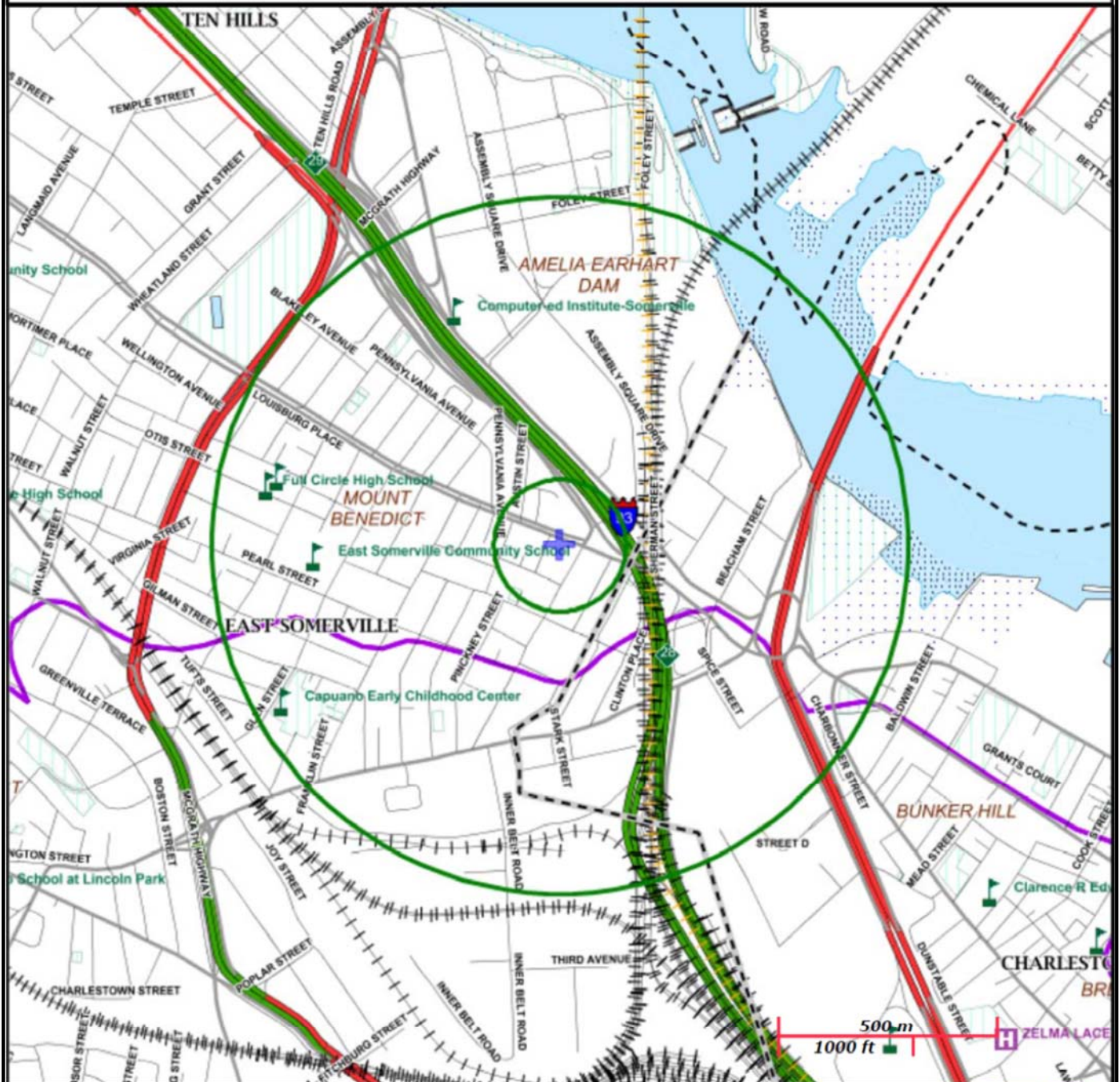
**Site Information:**  
FORMER GASOLINE STATION  
30-44 BROADWAY SOMERVILLE, MA  
3-000030424  
**NAD83 UTM Meters:**  
5219011mN, -7912532mE (Zone: 18)  
November 19, 2015

## Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at:  
<http://www.mass.gov/mgis/>



**MassDEP**  
Commonwealth of Massachusetts  
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail  
Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct  
Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam  
Aquifers: Medium Yield, High Yield, EPA Sole Source  
Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A  
Hydrography: Open Water, PWS Reservoir, Tidal Flat  
Wetlands: Freshwater, Saltwater, Cranberry Bog  
FEMA 100yr Floodplain; Protected Open Space; ACEC  
Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential  
Solid Waste Landfill; PWS: Com. GW, SW, Emerg., Non-Com.

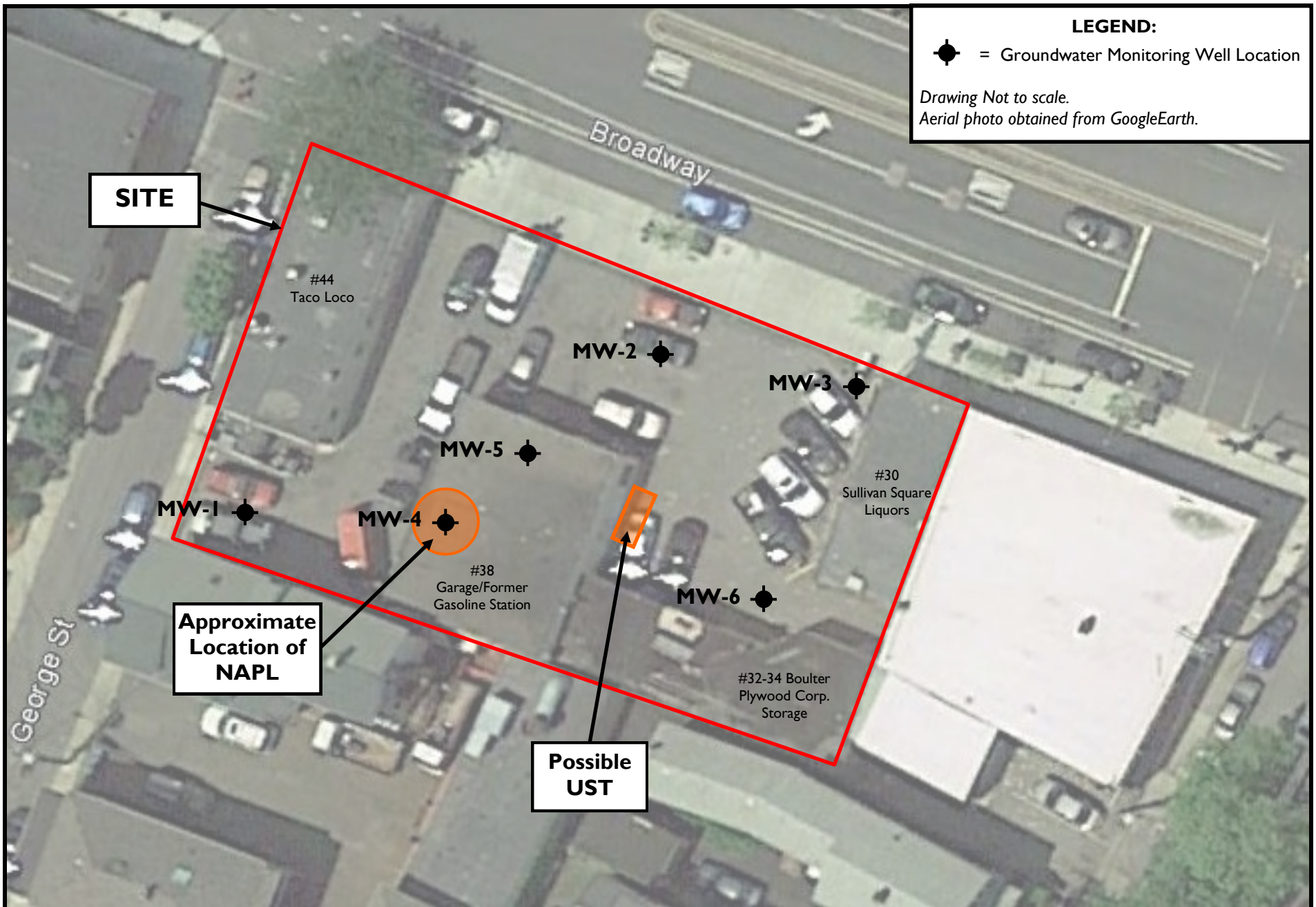
**FIGURE 3: MASSDEP PHASE I SITE ASSESSMENT MAP**  
**30-44 BROADWAY, SOMERVILLE, MA**  
**RTNs 3-30424**

EBI PN: 5115000078



**EBI Consulting**  
environmental | engineering | due diligence





## Tables



**Table I**  
**Groundwater Analytical Data Summary**  
**30-44 Broadway Somerville, MA**

Parameter	Reportable Concentrations	MCP - Method 1 Cleanup Standards		SAMPLING LOCATION			
	RCGW-2	GW-2	GW-3	MW-1	MW-2	MW-3	MW-6
Sampling Date				11/24/2015	11/24/2015	11/24/2015	11/24/2015
Laboratory Report				15K1197	15K1197	15K1197	15K1197
<b>MADEP-EPH-04-1.1 (µg/L)</b>							
C9-C18 ALIPHATICS	5000	5000	50000	ND (100)	ND (100)	ND (100)	ND (100)
C19-C36 ALIPHATICS	50000	~	50000	ND (100)	ND (100)	ND (100)	ND (100)
C11-C22 AROMATICS	5000	50000	5000	ND (100)	ND (100)	ND (100)	ND (100)
<b>MADEP-VPH-04-1.1 (µg/L)</b>							
C5-C8 ALIPHATICS	3000	3000	50000	ND (100)	ND (100)	ND (100)	ND (500)
C9-C12 ALIPHATICS	5000	5000	50000	ND (100)	ND (100)	ND (100)	ND (500)
C9-C10 AROMATICS	4000	4000	50000	ND (100)	ND (100)	ND (100)	ND (500)
METHYL TERT-BUTYL ETHER (MTBE)	5000	50000	50000	ND (1.0)	5.1	ND (1.0)	ND (5.0)
O-XYLENE	3000	3000	5000	ND (1.0)	ND (1.0)	ND (1.0)	10
<b>SW-846 8260C (µg/L) VOCs</b>							
BROMOMETHANE	7	7	800	ND (5.0)	ND (5.0)	ND (5.0)	ND (4.7) *
CARBON TETRACHLORIDE	2	2	5000	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.6)*
2-CHLOROTOLUENE	10000	~	~	ND (1.0)	ND (1.0)	ND (1.0)	90
1,2-DIBROMOETHANE (EDB)	2	2	50000	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.44) *
CIS-1,2-DICHLOROETHYLENE	20	20	50000	ND (1.0)	7.5	ND (1.0)	ND (5.0)
1,2-DICHLOROPROPANE	3	3	50000	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.65) *
METHYL TERT-BUTYL ETHER (MTBE)	5000	50000	50000	ND (1.0)	4.3	ND (1.0)	ND (5.0)
VINYL CHLORIDE	2	2	50000	ND (2.0)	ND (2.0)	ND (2.0)	ND (0.66) *
O-XYLENE	3000	3000	5000	ND (1.0)	ND (1.0)	ND (1.0)	8.2

NOTES:

1. ND = Not detected above the lab reporting limits or method detection limits (indicated with "\*\*\*") shown in parenthesis.
2. NT = Not tested.
3. ~ = No Method 1 Standard or UCL available
4. Shaded values exceed the MCP Reportable Concentrations (RCs).
5. Bolded values exceed the Method 1 Cleanup Standards.

**TABLE 2**  
**Groundwater Gauging and Elevation Data Summary**  
**30-44 Broadway Somerville, MA**

Sample ID	Total Depth (feet)	Well Diameter (inches)	Measuring Point Elevation (feet)	Date	Depth to NAPL (feet)	Depth to Water (feet)	Apparent LNAPL (feet)	Groundwater Elevation (feet)
MW-1	14.05	2	100.75	9/20/2011	-	8.55	-	92.20
				11/1/2011	-	7.56	-	93.19
				10/30/2012	-	9.87	-	90.88
				11/24/2015	-	7.89	-	92.86
MW-2	14.45	2	99.02	9/20/2011	-	12.07	-	86.95
				11/1/2011	-	11.21	-	87.81
				10/30/2012	-	13.39	-	85.63
				11/24/2015	-	11.23	-	87.79
MW-3	13.90	2	98.59	9/20/2011	-	9.01	-	89.58
				11/1/2011	-	8.18	-	90.41
				10/30/2012	-	10.33	-	88.26
				11/24/2015	-	6.84	-	91.75
MW-4	15.00	1	99.27	9/20/2011	-	5.85	-	93.42
				11/1/2011	5.50	10.76	5.26	88.51
				11/21/2011	9.85	11.86	2.01	87.41
				10/30/2012	10.34	10.90	0.56	88.37
				11/24/2015	10.12	11.32	1.20	87.95
MW-5	13.83	1	99.25	9/20/2011	-	5.72	-	93.53
				11/1/2011	-	2.92	-	96.33
				10/30/2012	-	7.04	-	92.21
				11/24/2015	-	7.64	-	91.61
MW-6	11.18	1	98.12	9/20/2011	-	6.80	-	91.32
				11/1/2011	-	5.95	-	92.17
				10/30/2012	-	8.12	-	90.00
				11/24/2015	-	5.26	-	92.86

Notes:

Measuring Point Elevation taken from top of PVC riser, unless otherwise noted.

Well head elevations and gauging data prior to 11/24/2015 obtained from H&HCE November 8, 2012 Phase I ISI Report

LNAPL = Light non-aqueous phase liquid

## **Laboratory Analytical Reports**

December 8, 2015

Matt Wilson  
EBI Consultants  
21 B Street  
Burlington, MA 01803

Project Location: Broadway., Somerville, MA  
Client Job Number:  
Project Number: 5115000078  
Laboratory Work Order Number: 15K1197

Enclosed are results of analyses for samples received by the laboratory on November 24, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Meghan E. Kelley". The signature is written in a cursive, flowing style.

Meghan E. Kelley  
Project Manager

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39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

EBI Consultants  
21 B Street  
Burlington, MA 01803  
ATTN: Matt Wilson

REPORT DATE: 12/8/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 5115000078

**ANALYTICAL SUMMARY**

WORK ORDER NUMBER: 15K1197

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Broadway., Somerville, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
MW-1	15K1197-01	Ground Water		MADEP-EPH-04-1.1 MADEP-VPH-04-1.1 SW-846 8260C	
MW-2	15K1197-02	Ground Water		MADEP-EPH-04-1.1 MADEP-VPH-04-1.1 SW-846 8260C	
MW-3	15K1197-03	Ground Water		MADEP-EPH-04-1.1 MADEP-VPH-04-1.1 SW-846 8260C	
MW-6	15K1197-04	Ground Water		MADEP-EPH-04-1.1 MADEP-VPH-04-1.1 SW-846 8260C	

#### CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

REVISED REPORT - 12/8/2015 - 8260 reported down to the MDL, narrative note updated.

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**MADEP-EPH-04-1.1****Qualifications:****L-07A**

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD outside of control limits. Reduced precision anticipated for any reported result for this compound.

**Analyte & Samples(s) Qualified:****n-Decane**

B136551-BSD1

**n-Nonane**

B136551-BSD1

**R-05**

Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.

**Analyte & Samples(s) Qualified:****C11-C22 Aromatics**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3], 15K1197-04[MW-6], B136551-BLK1

**C19-C36 Aliphatics**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3], 15K1197-04[MW-6], B136551-BLK1

**C9-C18 Aliphatics**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3], 15K1197-04[MW-6], B136551-BLK1

**Naphthalene**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3], 15K1197-04[MW-6], B136551-BLK1, B136551-BS1, B136551-BSD1

**n-Decane**

B136551-BLK1, B136551-BS1

**n-Dodecane**

B136551-BLK1, B136551-BS1, B136551-BSD1

**n-Nonane**

B136551-BLK1, B136551-BS1

**Unadjusted C11-C22 Aromatics**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3], 15K1197-04[MW-6], B136551-BLK1

**MADEP-VPH-04-1.1****Qualifications:****RL-14**

Elevated reporting limit due to foaming sample matrix. MA CAM reporting limit not met.

**Analyte & Samples(s) Qualified:**

15K1197-04[MW-6]

**SW-846 8260C****Qualifications:****L-04**

Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.

**Analyte & Samples(s) Qualified:****Acetone**

B136679-BS1, B136679-BSD1

**RL-07**

Elevated reporting limit based on lowest point in calibration.  
MA CAM reporting limit not met.

**Analyte & Samples(s) Qualified:****Bromomethane**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3]

**Carbon Disulfide**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3]

**Methylene Chloride**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3]



**RL-14**

Elevated reporting limit due to foaming sample matrix. MA CAM reporting limit not met.

**Analyte & Samples(s) Qualified:**

15K1197-04[MW-6]

**V-05**

Continuing calibration did not meet method specifications and was biased on the low side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the low side.

**Analyte & Samples(s) Qualified:****1,1,2,2-Tetrachloroethane**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3], 15K1197-04[MW-6], B136679-BLK1, B136679-BS1, B136679-BSD1

**2,2-Dichloropropane**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3], 15K1197-04[MW-6], B136679-BLK1, B136679-BS1, B136679-BSD1

**2-Hexanone (MBK)**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3], 15K1197-04[MW-6], B136679-BLK1, B136679-BS1, B136679-BSD1

**Acetone**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3], 15K1197-04[MW-6], B136679-BLK1, B136679-BS1, B136679-BSD1

**Bromomethane**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3], 15K1197-04[MW-6], B136679-BLK1, B136679-BS1, B136679-BSD1

**V-16**

Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy may be associated with reported result.

**Analyte & Samples(s) Qualified:****1,4-Dioxane**

15K1197-01[MW-1], 15K1197-02[MW-2], 15K1197-03[MW-3], 15K1197-04[MW-6], B136679-BLK1, B136679-BS1, B136679-BSD1

**MADEP-EPH-04-1.1**

SPE cartridge contamination with non-petroleum compounds, if present, is verified by GC/MS in each method blank per extraction batch and excluded from C11-C22 aromatic range fraction in all samples in the batch. No significant modifications were made to the method.

**MADEP-VPH-04-1.1**

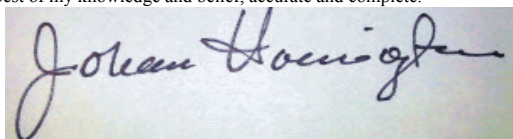
No significant modifications were made to the method. All VPH samples were received preserved properly at pH <2 in the proper containers as specified on the chain-of-custody form unless specified in this narrative.

**SW-846 8260C**

Laboratory control sample recoveries for required MCP Data Enhancement 8260 compounds were all within limits specified by the method except for "difficult analytes" where recovery control limits of 40-160% are used and/or unless otherwise listed in this narrative. Difficult analytes: MIBK, MEK, acetone, 1,4-dioxane, chloromethane, dichlorodifluoromethane, 2-hexanone, and bromomethane.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and 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.



Johanna K. Harrington

Manager, Laboratory Reporting

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-1

Sampled: 11/24/2015 10:05

Sample ID: 15K1197-01

Sample Matrix: Ground Water

## Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	10	4.9	µg/L	1	V-05	SW-846 8260C	12/2/15	12/3/15 6:35	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.50	0.091	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Benzene	ND	1.0	0.079	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Bromobenzene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Bromochloromethane	ND	1.0	0.22	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Bromodichloromethane	ND	1.0	0.088	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Bromoform	ND	1.0	0.21	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Bromomethane	ND	5.0	0.94	µg/L	1	RL-07, V-05	SW-846 8260C	12/2/15	12/3/15 6:35	MFF
2-Butanone (MEK)	ND	10	2.4	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
n-Butylbenzene	ND	1.0	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
sec-Butylbenzene	ND	1.0	0.11	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
tert-Butylbenzene	ND	1.0	0.11	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	0.075	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Carbon Disulfide	ND	5.0	1.0	µg/L	1	RL-07	SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Carbon Tetrachloride	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Chlorobenzene	ND	1.0	0.16	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Chlorodibromomethane	ND	0.50	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Chloroethane	ND	2.0	0.28	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Chloroform	ND	2.0	0.22	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Chloromethane	ND	2.0	0.32	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
2-Chlorotoluene	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
4-Chlorotoluene	ND	1.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	0.34	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,2-Dibromoethane (EDB)	ND	0.50	0.089	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Dibromomethane	ND	1.0	0.16	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,2-Dichlorobenzene	ND	1.0	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,3-Dichlorobenzene	ND	1.0	0.17	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,4-Dichlorobenzene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Dichlorodifluoromethane (Freon 12)	ND	2.0	0.18	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,1-Dichloroethane	ND	1.0	0.16	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,2-Dichloroethane	ND	1.0	0.19	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,1-Dichloroethylene	ND	1.0	0.21	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
cis-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
trans-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,2-Dichloropropane	ND	1.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,3-Dichloropropane	ND	0.50	0.11	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
2,2-Dichloropropane	ND	1.0	0.16	µg/L	1	V-05	SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,1-Dichloropropene	ND	0.50	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
cis-1,3-Dichloropropene	ND	0.40	0.062	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
trans-1,3-Dichloropropene	ND	0.40	0.11	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Diethyl Ether	ND	2.0	0.22	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Diisopropyl Ether (DIPE)	ND	0.50	0.18	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,4-Dioxane	ND	50	26	µg/L	1	V-16	SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Ethylbenzene	ND	1.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-1

Sampled: 11/24/2015 10:05

Sample ID: 15K1197-01

Sample Matrix: Ground Water

## Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.50	0.17	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
2-Hexanone (MBK)	ND	10	1.5	µg/L	1	V-05	SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Isopropylbenzene (Cumene)	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
p-Isopropyltoluene (p-Cymene)	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Methyl tert-Butyl Ether (MTBE)	ND	1.0	0.090	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Methylene Chloride	ND	5.0	3.2	µg/L	1	RL-07	SW-846 8260C	12/2/15	12/3/15 6:35	MFF
4-Methyl-2-pentanone (MIBK)	ND	10	1.5	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Naphthalene	ND	2.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
n-Propylbenzene	ND	1.0	0.11	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Styrene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,1,1,2-Tetrachloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,1,2,2-Tetrachloroethane	ND	0.50	0.13	µg/L	1	V-05	SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Tetrachloroethylene	ND	1.0	0.17	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Tetrahydrofuran	ND	2.0	1.1	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Toluene	ND	1.0	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,2,3-Trichlorobenzene	ND	2.0	0.14	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,2,4-Trichlorobenzene	ND	1.0	0.19	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,1,1-Trichloroethane	ND	1.0	0.094	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,1,2-Trichloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Trichloroethylene	ND	1.0	0.20	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Trichlorofluoromethane (Freon 11)	ND	2.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,2,3-Trichloropropane	ND	2.0	0.19	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,2,4-Trimethylbenzene	ND	1.0	0.18	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
1,3,5-Trimethylbenzene	ND	1.0	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
Vinyl Chloride	ND	2.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
m+p Xylene	ND	2.0	0.25	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF
o-Xylene	ND	1.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 6:35	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual
1,2-Dichloroethane-d4	109	70-130	12/3/15 6:35
Toluene-d8	99.2	70-130	12/3/15 6:35
4-Bromofluorobenzene	82.8	70-130	12/3/15 6:35

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-1

Sampled: 11/24/2015 10:05

Sample ID: 15K1197-01

Sample Matrix: Ground Water

### Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
C19-C36 Aliphatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Unadjusted C11-C22 Aromatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
C11-C22 Aromatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Acenaphthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Acenaphthylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Benzo(a)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Benzo(a)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Benzo(b)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Benzo(g,h,i)perylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Benzo(k)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Chrysene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Dibenz(a,h)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Fluorene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
2-Methylnaphthalene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Naphthalene	ND	2.0	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Phenanthrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS
Pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:34	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	67.4	40-140	
o-Terphenyl (OTP)	82.3	40-140	
2-Bromonaphthalene	92.8	40-140	
2-Fluorobiphenyl	90.8	40-140	

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-1

Sampled: 11/24/2015 10:05

Sample ID: 15K1197-01

Sample Matrix: Ground Water

Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 21:39	EEH
C5-C8 Aliphatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 21:39	EEH
Unadjusted C9-C12 Aliphatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 21:39	EEH
C9-C12 Aliphatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 21:39	EEH
C9-C10 Aromatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 21:39	EEH
Benzene	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 21:39	EEH
Ethylbenzene	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 21:39	EEH
Methyl tert-Butyl Ether (MTBE)	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 21:39	EEH
Naphthalene	ND	5.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 21:39	EEH
Toluene	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 21:39	EEH
m+p Xylene	ND	2.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 21:39	EEH
o-Xylene	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 21:39	EEH
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
2,5-Dibromotoluene (FID)	92.5	70-130							
2,5-Dibromotoluene (PID)	104	70-130							

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-2

Sampled: 11/24/2015 11:00

Sample ID: 15K1197-02

Sample Matrix: Ground Water

## Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	10	4.9	µg/L	1	V-05	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.50	0.091	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Benzene	0.44	1.0	0.079	µg/L	1	J	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Bromobenzene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Bromochloromethane	ND	1.0	0.22	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Bromodichloromethane	ND	1.0	0.088	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Bromoform	ND	1.0	0.21	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Bromomethane	ND	5.0	0.94	µg/L	1	RL-07, V-05	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
2-Butanone (MEK)	ND	10	2.4	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
n-Butylbenzene	ND	1.0	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
sec-Butylbenzene	0.71	1.0	0.11	µg/L	1	J	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
tert-Butylbenzene	ND	1.0	0.11	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	0.075	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Carbon Disulfide	ND	5.0	1.0	µg/L	1	RL-07	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Carbon Tetrachloride	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Chlorobenzene	ND	1.0	0.16	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Chlorodibromomethane	ND	0.50	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Chloroethane	ND	2.0	0.28	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Chloroform	ND	2.0	0.22	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Chloromethane	ND	2.0	0.32	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
2-Chlorotoluene	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
4-Chlorotoluene	ND	1.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	0.34	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,2-Dibromoethane (EDB)	ND	0.50	0.089	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Dibromomethane	ND	1.0	0.16	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,2-Dichlorobenzene	0.62	1.0	0.10	µg/L	1	J	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,3-Dichlorobenzene	ND	1.0	0.17	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,4-Dichlorobenzene	0.62	1.0	0.15	µg/L	1	J	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Dichlorodifluoromethane (Freon 12)	ND	2.0	0.18	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,1-Dichloroethane	ND	1.0	0.16	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,2-Dichloroethane	ND	1.0	0.19	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,1-Dichloroethylene	ND	1.0	0.21	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
cis-1,2-Dichloroethylene	7.5	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
trans-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,2-Dichloropropane	ND	1.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,3-Dichloropropane	ND	0.50	0.11	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
2,2-Dichloropropane	ND	1.0	0.16	µg/L	1	V-05	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,1-Dichloropropene	ND	0.50	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
cis-1,3-Dichloropropene	ND	0.40	0.062	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
trans-1,3-Dichloropropene	ND	0.40	0.11	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Diethyl Ether	0.33	2.0	0.22	µg/L	1	J	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Diisopropyl Ether (DIPE)	ND	0.50	0.18	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,4-Dioxane	ND	50	26	µg/L	1	V-16	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Ethylbenzene	ND	1.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-2

Sampled: 11/24/2015 11:00

Sample ID: 15K1197-02

Sample Matrix: Ground Water

## Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.50	0.17	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
2-Hexanone (MBK)	ND	10	1.5	µg/L	1	V-05	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Isopropylbenzene (Cumene)	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
p-Isopropyltoluene (p-Cymene)	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Methyl tert-Butyl Ether (MTBE)	4.3	1.0	0.090	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Methylene Chloride	ND	5.0	3.2	µg/L	1	RL-07	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
4-Methyl-2-pentanone (MIBK)	ND	10	1.5	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Naphthalene	ND	2.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
n-Propylbenzene	ND	1.0	0.11	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Styrene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,1,1,2-Tetrachloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,1,2,2-Tetrachloroethane	ND	0.50	0.13	µg/L	1	V-05	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Tetrachloroethylene	ND	1.0	0.17	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Tetrahydrofuran	ND	2.0	1.1	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Toluene	ND	1.0	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,2,3-Trichlorobenzene	ND	2.0	0.14	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,2,4-Trichlorobenzene	ND	1.0	0.19	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,1,1-Trichloroethane	ND	1.0	0.094	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,1,2-Trichloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Trichloroethylene	0.62	1.0	0.20	µg/L	1	J	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Trichlorofluoromethane (Freon 11)	ND	2.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,2,3-Trichloropropane	ND	2.0	0.19	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,2,4-Trimethylbenzene	ND	1.0	0.18	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
1,3,5-Trimethylbenzene	ND	1.0	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
Vinyl Chloride	0.36	2.0	0.13	µg/L	1	J	SW-846 8260C	12/2/15	12/3/15 7:01	MFF
m+p Xylene	ND	2.0	0.25	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF
o-Xylene	ND	1.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:01	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual
1,2-Dichloroethane-d4	110	70-130	
Toluene-d8	100	70-130	
4-Bromofluorobenzene	84.0	70-130	

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-2

Sampled: 11/24/2015 11:00

Sample ID: 15K1197-02

Sample Matrix: Ground Water

### Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
C19-C36 Aliphatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Unadjusted C11-C22 Aromatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
C11-C22 Aromatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Acenaphthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Acenaphthylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Benzo(a)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Benzo(a)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Benzo(b)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Benzo(g,h,i)perylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Benzo(k)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Chrysene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Dibenz(a,h)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Fluorene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
2-Methylnaphthalene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Naphthalene	ND	2.0	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Phenanthrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS
Pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 22:54	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	69.6	40-140	
o-Terphenyl (OTP)	86.4	40-140	
2-Bromonaphthalene	91.2	40-140	
2-Fluorobiphenyl	90.4	40-140	



39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-2

Sampled: 11/24/2015 11:00

Sample ID: 15K1197-02

Sample Matrix: Ground Water

Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:14	EEH
C5-C8 Aliphatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:14	EEH
Unadjusted C9-C12 Aliphatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:14	EEH
C9-C12 Aliphatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:14	EEH
C9-C10 Aromatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:14	EEH
Benzene	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:14	EEH
Ethylbenzene	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:14	EEH
Methyl tert-Butyl Ether (MTBE)	5.1	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:14	EEH
Naphthalene	ND	5.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:14	EEH
Toluene	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:14	EEH
m+p Xylene	ND	2.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:14	EEH
o-Xylene	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:14	EEH
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
2,5-Dibromotoluene (FID)	83.5	70-130							
2,5-Dibromotoluene (PID)	94.3	70-130							

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-3

Sampled: 11/24/2015 12:01

Sample ID: 15K1197-03

Sample Matrix: Ground Water

## Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	10	4.9	µg/L	1	V-05	SW-846 8260C	12/2/15	12/3/15 7:27	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.50	0.091	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Benzene	ND	1.0	0.079	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Bromobenzene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Bromochloromethane	ND	1.0	0.22	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Bromodichloromethane	ND	1.0	0.088	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Bromoform	ND	1.0	0.21	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Bromomethane	ND	5.0	0.94	µg/L	1	RL-07, V-05	SW-846 8260C	12/2/15	12/3/15 7:27	MFF
2-Butanone (MEK)	ND	10	2.4	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
n-Butylbenzene	0.47	1.0	0.10	µg/L	1	J	SW-846 8260C	12/2/15	12/3/15 7:27	MFF
sec-Butylbenzene	0.60	1.0	0.11	µg/L	1	J	SW-846 8260C	12/2/15	12/3/15 7:27	MFF
tert-Butylbenzene	ND	1.0	0.11	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	0.075	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Carbon Disulfide	ND	5.0	1.0	µg/L	1	RL-07	SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Carbon Tetrachloride	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Chlorobenzene	ND	1.0	0.16	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Chlorodibromomethane	ND	0.50	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Chloroethane	ND	2.0	0.28	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Chloroform	ND	2.0	0.22	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Chloromethane	ND	2.0	0.32	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
2-Chlorotoluene	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
4-Chlorotoluene	ND	1.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	0.34	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,2-Dibromoethane (EDB)	ND	0.50	0.089	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Dibromomethane	ND	1.0	0.16	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,2-Dichlorobenzene	ND	1.0	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,3-Dichlorobenzene	ND	1.0	0.17	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,4-Dichlorobenzene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Dichlorodifluoromethane (Freon 12)	ND	2.0	0.18	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,1-Dichloroethane	ND	1.0	0.16	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,2-Dichloroethane	ND	1.0	0.19	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,1-Dichloroethylene	ND	1.0	0.21	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
cis-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
trans-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,2-Dichloropropane	ND	1.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,3-Dichloropropane	ND	0.50	0.11	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
2,2-Dichloropropane	ND	1.0	0.16	µg/L	1	V-05	SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,1-Dichloropropene	ND	0.50	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
cis-1,3-Dichloropropene	ND	0.40	0.062	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
trans-1,3-Dichloropropene	ND	0.40	0.11	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Diethyl Ether	ND	2.0	0.22	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Diisopropyl Ether (DIPE)	ND	0.50	0.18	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,4-Dioxane	ND	50	26	µg/L	1	V-16	SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Ethylbenzene	ND	1.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-3

Sampled: 11/24/2015 12:01

Sample ID: 15K1197-03

Sample Matrix: Ground Water

## Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.50	0.17	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
2-Hexanone (MBK)	ND	10	1.5	µg/L	1	V-05	SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Isopropylbenzene (Cumene)	0.61	1.0	0.12	µg/L	1	J	SW-846 8260C	12/2/15	12/3/15 7:27	MFF
p-Isopropyltoluene (p-Cymene)	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Methyl tert-Butyl Ether (MTBE)	ND	1.0	0.090	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Methylene Chloride	ND	5.0	3.2	µg/L	1	RL-07	SW-846 8260C	12/2/15	12/3/15 7:27	MFF
4-Methyl-2-pentanone (MIBK)	ND	10	1.5	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Naphthalene	ND	2.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
n-Propylbenzene	0.36	1.0	0.11	µg/L	1	J	SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Styrene	ND	1.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,1,1,2-Tetrachloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,1,2,2-Tetrachloroethane	ND	0.50	0.13	µg/L	1	V-05	SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Tetrachloroethylene	ND	1.0	0.17	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Tetrahydrofuran	ND	2.0	1.1	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Toluene	ND	1.0	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,2,3-Trichlorobenzene	ND	2.0	0.14	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,2,4-Trichlorobenzene	ND	1.0	0.19	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,1,1-Trichloroethane	ND	1.0	0.094	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,1,2-Trichloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Trichloroethylene	ND	1.0	0.20	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Trichlorofluoromethane (Freon 11)	ND	2.0	0.15	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,2,3-Trichloropropane	ND	2.0	0.19	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,2,4-Trimethylbenzene	ND	1.0	0.18	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
1,3,5-Trimethylbenzene	ND	1.0	0.10	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
Vinyl Chloride	ND	2.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
m+p Xylene	ND	2.0	0.25	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF
o-Xylene	ND	1.0	0.13	µg/L	1		SW-846 8260C	12/2/15	12/3/15 7:27	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual
1,2-Dichloroethane-d4	112	70-130	12/3/15 7:27
Toluene-d8	101	70-130	12/3/15 7:27
4-Bromofluorobenzene	84.8	70-130	12/3/15 7:27

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-3

Sampled: 11/24/2015 12:01

Sample ID: 15K1197-03

Sample Matrix: Ground Water

### Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
C19-C36 Aliphatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Unadjusted C11-C22 Aromatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
C11-C22 Aromatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Acenaphthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Acenaphthylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Benzo(a)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Benzo(a)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Benzo(b)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Benzo(g,h,i)perylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Benzo(k)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Chrysene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Dibenz(a,h)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Fluorene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
2-Methylnaphthalene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Naphthalene	ND	2.0	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Phenanthrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS
Pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:13	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	63.5	40-140	
o-Terphenyl (OTP)	71.2	40-140	
2-Bromonaphthalene	94.9	40-140	
2-Fluorobiphenyl	93.0	40-140	

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-3

Sampled: 11/24/2015 12:01

Sample ID: 15K1197-03

Sample Matrix: Ground Water

### Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:50	EEH
C5-C8 Aliphatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:50	EEH
Unadjusted C9-C12 Aliphatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:50	EEH
C9-C12 Aliphatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:50	EEH
C9-C10 Aromatics	ND	100	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:50	EEH
Benzene	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:50	EEH
Ethylbenzene	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:50	EEH
Methyl tert-Butyl Ether (MTBE)	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:50	EEH
Naphthalene	ND	5.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:50	EEH
Toluene	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:50	EEH
m+p Xylene	ND	2.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:50	EEH
o-Xylene	ND	1.0	µg/L	1		MADEP-VPH-04-1.1	12/2/15	12/2/15 22:50	EEH
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
2,5-Dibromotoluene (FID)	88.9	70-130							
2,5-Dibromotoluene (PID)	97.7	70-130							

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-6

Sampled: 11/24/2015 13:25

Sample ID: 15K1197-04

Sample Matrix: Ground Water

Sample Flags: RL-14

## Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	50	24	µg/L	5	V-05	SW-846 8260C	12/2/15	12/3/15 7:53	MFF
tert-Amyl Methyl Ether (TAME)	ND	2.5	0.46	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Benzene	ND	5.0	0.40	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Bromobenzene	ND	5.0	0.75	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Bromochloromethane	ND	5.0	1.1	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Bromodichloromethane	ND	5.0	0.44	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Bromoform	ND	5.0	1.0	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Bromomethane	ND	25	4.7	µg/L	5	V-05	SW-846 8260C	12/2/15	12/3/15 7:53	MFF
2-Butanone (MEK)	ND	50	12	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
n-Butylbenzene	ND	5.0	0.50	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
sec-Butylbenzene	ND	5.0	0.55	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
tert-Butylbenzene	ND	5.0	0.55	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	2.5	0.38	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Carbon Disulfide	ND	25	5.1	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Carbon Tetrachloride	ND	5.0	0.60	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Chlorobenzene	ND	5.0	0.80	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Chlorodibromomethane	ND	2.5	0.50	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Chloroethane	ND	10	1.4	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Chloroform	ND	10	1.1	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Chloromethane	ND	10	1.6	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
2-Chlorotoluene	90	5.0	0.60	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
4-Chlorotoluene	ND	5.0	0.65	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	10	1.7	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,2-Dibromoethane (EDB)	ND	2.5	0.44	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Dibromomethane	ND	5.0	0.80	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,2-Dichlorobenzene	ND	5.0	0.50	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,3-Dichlorobenzene	ND	5.0	0.85	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,4-Dichlorobenzene	ND	5.0	0.75	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Dichlorodifluoromethane (Freon 12)	ND	10	0.90	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,1-Dichloroethane	ND	5.0	0.79	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,2-Dichloroethane	ND	5.0	0.97	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,1-Dichloroethylene	ND	5.0	1.0	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
cis-1,2-Dichloroethylene	ND	5.0	0.74	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
trans-1,2-Dichloroethylene	ND	5.0	0.75	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,2-Dichloropropane	ND	5.0	0.65	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,3-Dichloropropane	ND	2.5	0.55	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
2,2-Dichloropropane	ND	5.0	0.80	µg/L	5	V-05	SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,1-Dichloropropene	ND	2.5	0.64	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
cis-1,3-Dichloropropene	ND	2.0	0.31	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
trans-1,3-Dichloropropene	ND	2.0	0.55	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Diethyl Ether	ND	10	1.1	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Diisopropyl Ether (DIPE)	ND	2.5	0.90	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,4-Dioxane	ND	250	130	µg/L	5	V-16	SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Ethylbenzene	0.95	5.0	0.65	µg/L	5	J	SW-846 8260C	12/2/15	12/3/15 7:53	MFF

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-6

Sampled: 11/24/2015 13:25

Sample ID: 15K1197-04

Sample Matrix: Ground Water

Sample Flags: RL-14

## Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	2.5	0.85	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
2-Hexanone (MBK)	ND	50	7.6	µg/L	5	V-05	SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Isopropylbenzene (Cumene)	ND	5.0	0.60	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
p-Isopropyltoluene (p-Cymene)	ND	5.0	0.62	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Methyl tert-Butyl Ether (MTBE)	ND	5.0	0.45	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Methylene Chloride	ND	25	16	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
4-Methyl-2-pentanone (MIBK)	ND	50	7.3	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Naphthalene	ND	10	0.60	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
n-Propylbenzene	ND	5.0	0.55	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Styrene	ND	5.0	0.75	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,1,1,2-Tetrachloroethane	ND	5.0	0.60	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,1,2,2-Tetrachloroethane	ND	2.5	0.65	µg/L	5	V-05	SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Tetrachloroethylene	ND	5.0	0.85	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Tetrahydrofuran	ND	10	5.4	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Toluene	ND	5.0	0.50	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,2,3-Trichlorobenzene	ND	10	0.70	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,2,4-Trichlorobenzene	ND	5.0	0.95	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,1,1-Trichloroethane	ND	5.0	0.47	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,1,2-Trichloroethane	ND	5.0	0.58	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Trichloroethylene	ND	5.0	1.0	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Trichlorofluoromethane (Freon 11)	ND	10	0.74	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,2,3-Trichloropropane	ND	10	0.95	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,2,4-Trimethylbenzene	1.2	5.0	0.90	µg/L	5	J	SW-846 8260C	12/2/15	12/3/15 7:53	MFF
1,3,5-Trimethylbenzene	ND	5.0	0.50	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
Vinyl Chloride	ND	10	0.66	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF
m+p Xylene	1.8	10	1.2	µg/L	5	J	SW-846 8260C	12/2/15	12/3/15 7:53	MFF
o-Xylene	8.2	5.0	0.65	µg/L	5		SW-846 8260C	12/2/15	12/3/15 7:53	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual
1,2-Dichloroethane-d4	111	70-130	
Toluene-d8	98.6	70-130	
4-Bromofluorobenzene	81.7	70-130	

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-6

Sampled: 11/24/2015 13:25

Sample ID: 15K1197-04

Sample Matrix: Ground Water

**Petroleum Hydrocarbons Analyses - EPH**

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
C19-C36 Aliphatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Unadjusted C11-C22 Aromatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
C11-C22 Aromatics	ND	100	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Acenaphthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Acenaphthylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Benzo(a)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Benzo(a)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Benzo(b)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Benzo(g,h,i)perylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Benzo(k)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Chrysene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Dibenz(a,h)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Fluorene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
2-Methylnaphthalene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Naphthalene	ND	2.0	µg/L	1	R-05	MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Phenanthrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS
Pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	12/1/15	12/2/15 23:32	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	46.4	40-140	12/2/15 23:32
o-Terphenyl (OTP)	71.6	40-140	12/2/15 23:32
2-Bromonaphthalene	88.0	40-140	12/2/15 23:32
2-Fluorobiphenyl	87.6	40-140	12/2/15 23:32



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Project Location: Broadway., Somerville, MA

Sample Description:

Work Order: 15K1197

Date Received: 11/24/2015

Field Sample #: MW-6

Sampled: 11/24/2015 13:25

Sample ID: 15K1197-04

Sample Matrix: Ground Water

Sample Flags: RL-14

### Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	500	µg/L	5		MADEP-VPH-04-1.1	12/2/15	12/2/15 23:26	EEH
C5-C8 Aliphatics	ND	500	µg/L	5		MADEP-VPH-04-1.1	12/2/15	12/2/15 23:26	EEH
Unadjusted C9-C12 Aliphatics	ND	500	µg/L	5		MADEP-VPH-04-1.1	12/2/15	12/2/15 23:26	EEH
C9-C12 Aliphatics	ND	500	µg/L	5		MADEP-VPH-04-1.1	12/2/15	12/2/15 23:26	EEH
C9-C10 Aromatics	ND	500	µg/L	5		MADEP-VPH-04-1.1	12/2/15	12/2/15 23:26	EEH
Benzene	ND	5.0	µg/L	5		MADEP-VPH-04-1.1	12/2/15	12/2/15 23:26	EEH
Ethylbenzene	ND	5.0	µg/L	5		MADEP-VPH-04-1.1	12/2/15	12/2/15 23:26	EEH
Methyl tert-Butyl Ether (MTBE)	ND	5.0	µg/L	5		MADEP-VPH-04-1.1	12/2/15	12/2/15 23:26	EEH
Naphthalene	ND	25	µg/L	5		MADEP-VPH-04-1.1	12/2/15	12/2/15 23:26	EEH
Toluene	ND	5.0	µg/L	5		MADEP-VPH-04-1.1	12/2/15	12/2/15 23:26	EEH
m+p Xylene	ND	10	µg/L	5		MADEP-VPH-04-1.1	12/2/15	12/2/15 23:26	EEH
o-Xylene	10	5.0	µg/L	5		MADEP-VPH-04-1.1	12/2/15	12/2/15 23:26	EEH
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
2,5-Dibromotoluene (FID)	87.0	70-130							
2,5-Dibromotoluene (PID)	98.3	70-130							

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### Sample Extraction Data

Prep Method: SW-846 3510C-MADEP-EPH-04-1.1

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
15K1197-01 [MW-1]	B136551	1000	2.00	12/01/15
15K1197-02 [MW-2]	B136551	1000	2.00	12/01/15
15K1197-03 [MW-3]	B136551	1000	2.00	12/01/15
15K1197-04 [MW-6]	B136551	1000	2.00	12/01/15

Prep Method: MA VPH-MADEP-VPH-04-1.1

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
15K1197-01 [MW-1]	B136675	5	5.00	12/02/15
15K1197-02 [MW-2]	B136675	5	5.00	12/02/15
15K1197-03 [MW-3]	B136675	5	5.00	12/02/15
15K1197-04 [MW-6]	B136675	1	5.00	12/02/15

Prep Method: SW-846 5030B-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
15K1197-01 [MW-1]	B136679	5	5.00	12/02/15
15K1197-02 [MW-2]	B136679	5	5.00	12/02/15
15K1197-03 [MW-3]	B136679	5	5.00	12/02/15
15K1197-04 [MW-6]	B136679	1	5.00	12/02/15

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**QUALITY CONTROL**
**Volatile Organic Compounds by GC/MS - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B136679 - SW-846 5030B</b>										
<b>Blank (B136679-BLK1)</b>				Prepared & Analyzed: 12/02/15						
Acetone	ND	10	µg/L							V-05
tert-Amyl Methyl Ether (TAME)	ND	0.50	µg/L							
Benzene	ND	1.0	µg/L							
Bromobenzene	ND	1.0	µg/L							
Bromochloromethane	ND	1.0	µg/L							
Bromodichloromethane	ND	1.0	µg/L							
Bromoform	ND	1.0	µg/L							
Bromomethane	ND	2.0	µg/L							V-05
2-Butanone (MEK)	ND	10	µg/L							
n-Butylbenzene	ND	1.0	µg/L							
sec-Butylbenzene	ND	1.0	µg/L							
tert-Butylbenzene	ND	1.0	µg/L							
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	µg/L							
Carbon Disulfide	ND	5.0	µg/L							
Carbon Tetrachloride	ND	1.0	µg/L							
Chlorobenzene	ND	1.0	µg/L							
Chlorodibromomethane	ND	0.50	µg/L							
Chloroethane	ND	2.0	µg/L							
Chloroform	ND	2.0	µg/L							
Chloromethane	ND	2.0	µg/L							
2-Chlorotoluene	ND	1.0	µg/L							
4-Chlorotoluene	ND	1.0	µg/L							
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	µg/L							
1,2-Dibromoethane (EDB)	ND	0.50	µg/L							
Dibromomethane	ND	1.0	µg/L							
1,2-Dichlorobenzene	ND	1.0	µg/L							
1,3-Dichlorobenzene	ND	1.0	µg/L							
1,4-Dichlorobenzene	ND	1.0	µg/L							
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L							
1,1-Dichloroethane	ND	1.0	µg/L							
1,2-Dichloroethane	ND	1.0	µg/L							
1,1-Dichloroethylene	ND	1.0	µg/L							
cis-1,2-Dichloroethylene	ND	1.0	µg/L							
trans-1,2-Dichloroethylene	ND	1.0	µg/L							
1,2-Dichloropropane	ND	1.0	µg/L							
1,3-Dichloropropane	ND	0.50	µg/L							
2,2-Dichloropropane	ND	1.0	µg/L							V-05
1,1-Dichloropropene	ND	0.50	µg/L							
cis-1,3-Dichloropropene	ND	0.40	µg/L							
trans-1,3-Dichloropropene	ND	0.40	µg/L							
Diethyl Ether	ND	2.0	µg/L							
Diisopropyl Ether (DIPE)	ND	0.50	µg/L							
1,4-Dioxane	ND	50	µg/L							V-16
Ethylbenzene	ND	1.0	µg/L							
Hexachlorobutadiene	ND	0.50	µg/L							
2-Hexanone (MBK)	ND	10	µg/L							V-05
Isopropylbenzene (Cumene)	ND	1.0	µg/L							
p-Isopropyltoluene (p-Cymene)	ND	1.0	µg/L							
Methyl tert-Butyl Ether (MTBE)	ND	1.0	µg/L							
Methylene Chloride	ND	5.0	µg/L							
4-Methyl-2-pentanone (MIBK)	ND	10	µg/L							
Naphthalene	ND	2.0	µg/L							

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# QUALITY CONTROL

## Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B136679 - SW-846 5030B</b>										
<b>Blank (B136679-BLK1)</b>										
Prepared & Analyzed: 12/02/15										
n-Propylbenzene	ND	1.0	µg/L							
Styrene	ND	1.0	µg/L							
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L							
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L							V-05
Tetrachloroethylene	ND	1.0	µg/L							
Tetrahydrofuran	ND	2.0	µg/L							
Toluene	ND	1.0	µg/L							
1,2,3-Trichlorobenzene	ND	2.0	µg/L							
1,2,4-Trichlorobenzene	ND	1.0	µg/L							
1,1,1-Trichloroethane	ND	1.0	µg/L							
1,1,2-Trichloroethane	ND	1.0	µg/L							
Trichloroethylene	ND	1.0	µg/L							
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L							
1,2,3-Trichloropropane	ND	2.0	µg/L							
1,2,4-Trimethylbenzene	ND	1.0	µg/L							
1,3,5-Trimethylbenzene	ND	1.0	µg/L							
Vinyl Chloride	ND	2.0	µg/L							
m+p Xylene	ND	2.0	µg/L							
o-Xylene	ND	1.0	µg/L							
Surrogate: 1,2-Dichloroethane-d4	27.8		µg/L	25.0		111	70-130			
Surrogate: Toluene-d8	25.4		µg/L	25.0		101	70-130			
Surrogate: 4-Bromofluorobenzene	20.3		µg/L	25.0		81.1	70-130			
<b>LCS (B136679-BS1)</b>										
Prepared & Analyzed: 12/02/15										
Acetone	50.1	10	µg/L	100		50.1	40-160			L-04, V-05 †
tert-Amyl Methyl Ether (TAME)	7.93	0.50	µg/L	10.0		79.3	70-130			
Benzene	10.5	1.0	µg/L	10.0		105	70-130			
Bromobenzene	9.29	1.0	µg/L	10.0		92.9	70-130			
Bromochloromethane	11.1	1.0	µg/L	10.0		111	70-130			
Bromodichloromethane	9.52	1.0	µg/L	10.0		95.2	70-130			
Bromoform	8.22	1.0	µg/L	10.0		82.2	70-130			
Bromomethane	7.86	2.0	µg/L	10.0		78.6	40-160			V-05 †
2-Butanone (MEK)	80.3	10	µg/L	100		80.3	40-160			†
n-Butylbenzene	8.71	1.0	µg/L	10.0		87.1	70-130			
sec-Butylbenzene	9.33	1.0	µg/L	10.0		93.3	70-130			
tert-Butylbenzene	8.56	1.0	µg/L	10.0		85.6	70-130			
tert-Butyl Ethyl Ether (TBEE)	8.54	0.50	µg/L	10.0		85.4	70-130			
Carbon Disulfide	10.6	5.0	µg/L	10.0		106	70-130			
Carbon Tetrachloride	10.2	1.0	µg/L	10.0		102	70-130			
Chlorobenzene	9.55	1.0	µg/L	10.0		95.5	70-130			
Chlorodibromomethane	8.97	0.50	µg/L	10.0		89.7	70-130			
Chloroethane	9.97	2.0	µg/L	10.0		99.7	70-130			
Chloroform	10.6	2.0	µg/L	10.0		106	70-130			
Chloromethane	11.0	2.0	µg/L	10.0		110	40-160			†
2-Chlorotoluene	9.31	1.0	µg/L	10.0		93.1	70-130			
4-Chlorotoluene	9.08	1.0	µg/L	10.0		90.8	70-130			
1,2-Dibromo-3-chloropropane (DBCP)	8.08	2.0	µg/L	10.0		80.8	70-130			
1,2-Dibromoethane (EDB)	9.77	0.50	µg/L	10.0		97.7	70-130			
Dibromomethane	10.4	1.0	µg/L	10.0		104	70-130			
1,2-Dichlorobenzene	9.32	1.0	µg/L	10.0		93.2	70-130			
1,3-Dichlorobenzene	9.52	1.0	µg/L	10.0		95.2	70-130			
1,4-Dichlorobenzene	9.69	1.0	µg/L	10.0		96.9	70-130			

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

**QUALITY CONTROL**
**Volatile Organic Compounds by GC/MS - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B136679 - SW-846 5030B</b>										
<b>LCS (B136679-BS1)</b>				Prepared & Analyzed: 12/02/15						
Dichlorodifluoromethane (Freon 12)	8.65	2.0	µg/L	10.0		86.5	40-160			†
1,1-Dichloroethane	10.8	1.0	µg/L	10.0		108	70-130			
1,2-Dichloroethane	11.5	1.0	µg/L	10.0		115	70-130			
1,1-Dichloroethylene	10.0	1.0	µg/L	10.0		100	70-130			
cis-1,2-Dichloroethylene	10.1	1.0	µg/L	10.0		101	70-130			
trans-1,2-Dichloroethylene	10.7	1.0	µg/L	10.0		107	70-130			
1,2-Dichloropropane	10.9	1.0	µg/L	10.0		109	70-130			
1,3-Dichloropropane	9.84	0.50	µg/L	10.0		98.4	70-130			
2,2-Dichloropropane	7.67	1.0	µg/L	10.0		76.7	70-130			V-05
1,1-Dichloropropene	10.6	0.50	µg/L	10.0		106	70-130			
cis-1,3-Dichloropropene	9.48	0.40	µg/L	10.0		94.8	70-130			
trans-1,3-Dichloropropene	10.0	0.40	µg/L	10.0		100	70-130			
Diethyl Ether	10.1	2.0	µg/L	10.0		101	70-130			
Diisopropyl Ether (DIPE)	8.96	0.50	µg/L	10.0		89.6	70-130			
1,4-Dioxane	70.0	50	µg/L	100		70.0	40-160			V-16 †
Ethylbenzene	9.26	1.0	µg/L	10.0		92.6	70-130			
Hexachlorobutadiene	8.11	0.50	µg/L	10.0		81.1	70-130			
2-Hexanone (MBK)	79.3	10	µg/L	100		79.3	40-160			V-05 †
Isopropylbenzene (Cumene)	8.79	1.0	µg/L	10.0		87.9	70-130			
p-Isopropyltoluene (p-Cymene)	9.01	1.0	µg/L	10.0		90.1	70-130			
Methyl tert-Butyl Ether (MTBE)	8.22	1.0	µg/L	10.0		82.2	70-130			
Methylene Chloride	10.7	5.0	µg/L	10.0		107	70-130			
4-Methyl-2-pentanone (MIBK)	83.6	10	µg/L	100		83.6	40-160			†
Naphthalene	7.86	2.0	µg/L	10.0		78.6	70-130			
n-Propylbenzene	9.27	1.0	µg/L	10.0		92.7	70-130			
Styrene	8.61	1.0	µg/L	10.0		86.1	70-130			
1,1,1,2-Tetrachloroethane	9.80	1.0	µg/L	10.0		98.0	70-130			
1,1,2,2-Tetrachloroethane	7.18	0.50	µg/L	10.0		71.8	70-130			V-05
Tetrachloroethylene	9.91	1.0	µg/L	10.0		99.1	70-130			
Tetrahydrofuran	8.76	2.0	µg/L	10.0		87.6	70-130			
Toluene	10.4	1.0	µg/L	10.0		104	70-130			
1,2,3-Trichlorobenzene	8.59	2.0	µg/L	10.0		85.9	70-130			
1,2,4-Trichlorobenzene	8.26	1.0	µg/L	10.0		82.6	70-130			
1,1,1-Trichloroethane	10.0	1.0	µg/L	10.0		100	70-130			
1,1,2-Trichloroethane	10.0	1.0	µg/L	10.0		100	70-130			
Trichloroethylene	12.0	1.0	µg/L	10.0		120	70-130			
Trichlorofluoromethane (Freon 11)	10.5	2.0	µg/L	10.0		105	70-130			
1,2,3-Trichloropropane	8.59	2.0	µg/L	10.0		85.9	70-130			
1,2,4-Trimethylbenzene	8.67	1.0	µg/L	10.0		86.7	70-130			
1,3,5-Trimethylbenzene	8.67	1.0	µg/L	10.0		86.7	70-130			
Vinyl Chloride	10.7	2.0	µg/L	10.0		107	70-130			
m+p Xylene	18.1	2.0	µg/L	20.0		90.6	70-130			
o-Xylene	8.72	1.0	µg/L	10.0		87.2	70-130			
Surrogate: 1,2-Dichloroethane-d4	27.0		µg/L	25.0		108	70-130			
Surrogate: Toluene-d8	26.0		µg/L	25.0		104	70-130			
Surrogate: 4-Bromofluorobenzene	22.4		µg/L	25.0		89.4	70-130			

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**QUALITY CONTROL**
**Volatile Organic Compounds by GC/MS - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B136679 - SW-846 5030B</b>										
<b>LCS Dup (B136679-BSD1)</b>				Prepared & Analyzed: 12/02/15						
Acetone	51.0	10	µg/L	100		51.0	40-160	1.84	20	L-04, V-05 †
tert-Amyl Methyl Ether (TAME)	8.65	0.50	µg/L	10.0		86.5	70-130	8.69	20	
Benzene	11.3	1.0	µg/L	10.0		113	70-130	7.53	20	
Bromobenzene	9.35	1.0	µg/L	10.0		93.5	70-130	0.644	20	
Bromochloromethane	11.8	1.0	µg/L	10.0		118	70-130	6.20	20	
Bromodichloromethane	10.1	1.0	µg/L	10.0		101	70-130	5.62	20	
Bromoform	7.70	1.0	µg/L	10.0		77.0	70-130	6.53	20	
Bromomethane	8.92	2.0	µg/L	10.0		89.2	40-160	12.6	20	V-05 †
2-Butanone (MEK)	82.1	10	µg/L	100		82.1	40-160	2.23	20	†
n-Butylbenzene	9.49	1.0	µg/L	10.0		94.9	70-130	8.57	20	
sec-Butylbenzene	9.58	1.0	µg/L	10.0		95.8	70-130	2.64	20	
tert-Butylbenzene	9.22	1.0	µg/L	10.0		92.2	70-130	7.42	20	
tert-Butyl Ethyl Ether (TBEE)	9.00	0.50	µg/L	10.0		90.0	70-130	5.25	20	
Carbon Disulfide	10.4	5.0	µg/L	10.0		104	70-130	1.71	20	
Carbon Tetrachloride	11.2	1.0	µg/L	10.0		112	70-130	8.77	20	
Chlorobenzene	9.99	1.0	µg/L	10.0		99.9	70-130	4.50	20	
Chlorodibromomethane	9.34	0.50	µg/L	10.0		93.4	70-130	4.04	20	
Chloroethane	11.1	2.0	µg/L	10.0		111	70-130	10.6	20	
Chloroform	10.6	2.0	µg/L	10.0		106	70-130	0.849	20	
Chloromethane	11.0	2.0	µg/L	10.0		110	40-160	0.0906	20	†
2-Chlorotoluene	9.71	1.0	µg/L	10.0		97.1	70-130	4.21	20	
4-Chlorotoluene	9.42	1.0	µg/L	10.0		94.2	70-130	3.68	20	
1,2-Dibromo-3-chloropropane (DBCP)	8.04	2.0	µg/L	10.0		80.4	70-130	0.496	20	
1,2-Dibromoethane (EDB)	10.3	0.50	µg/L	10.0		103	70-130	5.48	20	
Dibromomethane	11.1	1.0	µg/L	10.0		111	70-130	6.44	20	
1,2-Dichlorobenzene	9.63	1.0	µg/L	10.0		96.3	70-130	3.27	20	
1,3-Dichlorobenzene	9.77	1.0	µg/L	10.0		97.7	70-130	2.59	20	
1,4-Dichlorobenzene	9.45	1.0	µg/L	10.0		94.5	70-130	2.51	20	
Dichlorodifluoromethane (Freon 12)	9.43	2.0	µg/L	10.0		94.3	40-160	8.63	20	†
1,1-Dichloroethane	11.9	1.0	µg/L	10.0		119	70-130	9.43	20	
1,2-Dichloroethane	11.6	1.0	µg/L	10.0		116	70-130	0.607	20	
1,1-Dichloroethylene	9.97	1.0	µg/L	10.0		99.7	70-130	0.400	20	
cis-1,2-Dichloroethylene	11.0	1.0	µg/L	10.0		110	70-130	8.05	20	
trans-1,2-Dichloroethylene	11.1	1.0	µg/L	10.0		111	70-130	4.31	20	
1,2-Dichloropropane	11.4	1.0	µg/L	10.0		114	70-130	4.38	20	
1,3-Dichloropropane	9.81	0.50	µg/L	10.0		98.1	70-130	0.305	20	
2,2-Dichloropropane	8.14	1.0	µg/L	10.0		81.4	70-130	5.95	20	V-05
1,1-Dichloropropene	11.3	0.50	µg/L	10.0		113	70-130	7.12	20	
cis-1,3-Dichloropropene	9.54	0.40	µg/L	10.0		95.4	70-130	0.631	20	
trans-1,3-Dichloropropene	10.8	0.40	µg/L	10.0		108	70-130	7.19	20	
Diethyl Ether	10.8	2.0	µg/L	10.0		108	70-130	6.98	20	
Diisopropyl Ether (DIPE)	9.52	0.50	µg/L	10.0		95.2	70-130	6.06	20	
1,4-Dioxane	75.4	50	µg/L	100		75.4	40-160	7.44	20	V-16 †
Ethylbenzene	9.34	1.0	µg/L	10.0		93.4	70-130	0.860	20	
Hexachlorobutadiene	8.77	0.50	µg/L	10.0		87.7	70-130	7.82	20	
2-Hexanone (MBK)	79.1	10	µg/L	100		79.1	40-160	0.265	20	V-05 †
Isopropylbenzene (Cumene)	9.04	1.0	µg/L	10.0		90.4	70-130	2.80	20	
p-Isopropyltoluene (p-Cymene)	9.24	1.0	µg/L	10.0		92.4	70-130	2.52	20	
Methyl tert-Butyl Ether (MTBE)	8.78	1.0	µg/L	10.0		87.8	70-130	6.59	20	
Methylene Chloride	11.4	5.0	µg/L	10.0		114	70-130	6.45	20	
4-Methyl-2-pentanone (MIBK)	82.7	10	µg/L	100		82.7	40-160	1.08	20	†
Naphthalene	7.99	2.0	µg/L	10.0		79.9	70-130	1.64	20	

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**QUALITY CONTROL**
**Volatile Organic Compounds by GC/MS - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B136679 - SW-846 5030B</b>										
<b>LCS Dup (B136679-BSD1)</b>				Prepared & Analyzed: 12/02/15						
n-Propylbenzene	9.47	1.0	µg/L	10.0		94.7	70-130	2.13	20	
Styrene	8.79	1.0	µg/L	10.0		87.9	70-130	2.07	20	
1,1,1,2-Tetrachloroethane	9.51	1.0	µg/L	10.0		95.1	70-130	3.00	20	
1,1,2,2-Tetrachloroethane	7.37	0.50	µg/L	10.0		73.7	70-130	2.61	20	V-05
Tetrachloroethylene	10.2	1.0	µg/L	10.0		102	70-130	2.98	20	
Tetrahydrofuran	8.95	2.0	µg/L	10.0		89.5	70-130	2.15	20	
Toluene	11.0	1.0	µg/L	10.0		110	70-130	6.45	20	
1,2,3-Trichlorobenzene	8.63	2.0	µg/L	10.0		86.3	70-130	0.465	20	
1,2,4-Trichlorobenzene	8.77	1.0	µg/L	10.0		87.7	70-130	5.99	20	
1,1,1-Trichloroethane	10.6	1.0	µg/L	10.0		106	70-130	6.20	20	
1,1,2-Trichloroethane	10.8	1.0	µg/L	10.0		108	70-130	7.50	20	
Trichloroethylene	12.6	1.0	µg/L	10.0		126	70-130	4.89	20	
Trichlorofluoromethane (Freon 11)	12.0	2.0	µg/L	10.0		120	70-130	13.1	20	
1,2,3-Trichloropropane	7.97	2.0	µg/L	10.0		79.7	70-130	7.49	20	
1,2,4-Trimethylbenzene	8.94	1.0	µg/L	10.0		89.4	70-130	3.07	20	
1,3,5-Trimethylbenzene	8.79	1.0	µg/L	10.0		87.9	70-130	1.37	20	
Vinyl Chloride	10.8	2.0	µg/L	10.0		108	70-130	1.21	20	
m+p Xylene	18.4	2.0	µg/L	20.0		91.9	70-130	1.48	20	
o-Xylene	8.85	1.0	µg/L	10.0		88.5	70-130	1.48	20	
Surrogate: 1,2-Dichloroethane-d4	27.7		µg/L	25.0		111	70-130			
Surrogate: Toluene-d8	26.4		µg/L	25.0		106	70-130			
Surrogate: 4-Bromofluorobenzene	22.2		µg/L	25.0		88.6	70-130			

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**QUALITY CONTROL**
**Petroleum Hydrocarbons Analyses - EPH - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B136551 - SW-846 3510C**
**Blank (B136551-BLK1)**

Prepared: 12/01/15 Analyzed: 12/02/15

C9-C18 Aliphatics	ND	100	µg/L							R-05
C19-C36 Aliphatics	ND	100	µg/L							R-05
Unadjusted C11-C22 Aromatics	ND	100	µg/L							R-05
C11-C22 Aromatics	ND	100	µg/L							R-05
Acenaphthene	ND	2.0	µg/L							
Acenaphthylene	ND	2.0	µg/L							
Anthracene	ND	2.0	µg/L							
Benzo(a)anthracene	ND	2.0	µg/L							
Benzo(a)pyrene	ND	2.0	µg/L							
Benzo(b)fluoranthene	ND	2.0	µg/L							
Benzo(g,h,i)perylene	ND	2.0	µg/L							
Benzo(k)fluoranthene	ND	2.0	µg/L							
Chrysene	ND	2.0	µg/L							
Dibenz(a,h)anthracene	ND	2.0	µg/L							
Fluoranthene	ND	2.0	µg/L							
Fluorene	ND	2.0	µg/L							
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L							
2-Methylnaphthalene	ND	2.0	µg/L							
Naphthalene	ND	2.0	µg/L							R-05
Phenanthrene	ND	2.0	µg/L							
Pyrene	ND	2.0	µg/L							
n-Decane	ND	2.0	µg/L							R-05
n-Docosane	ND	2.0	µg/L							
n-Dodecane	ND	2.0	µg/L							R-05
n-Eicosane	ND	2.0	µg/L							
n-Hexacosane	ND	2.0	µg/L							
n-Hexadecane	ND	2.0	µg/L							
n-Hexatriacontane	ND	2.0	µg/L							
n-Nonadecane	ND	2.0	µg/L							
n-Nonane	ND	2.0	µg/L							R-05
n-Octacosane	ND	2.0	µg/L							
n-Octadecane	ND	2.0	µg/L							
n-Tetracosane	ND	2.0	µg/L							
n-Tetradecane	ND	2.0	µg/L							
n-Triacontane	ND	2.0	µg/L							
Naphthalene-aliphatic fraction	ND	2.0	µg/L							
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L							
Surrogate: Chlorooctadecane (COD)	76.6		µg/L	99.8		76.7	40-140			
Surrogate: o-Terphenyl (OTP)	89.0		µg/L	100		89.0	40-140			
Surrogate: 2-Bromonaphthalene	93.4		µg/L	100		93.4	40-140			
Surrogate: 2-Fluorobiphenyl	92.4		µg/L	100		92.4	40-140			

**LCS (B136551-BS1)**

Prepared: 12/01/15 Analyzed: 12/02/15

Acenaphthene	87.4	2.0	µg/L	100		87.4	40-140			
Acenaphthylene	85.0	2.0	µg/L	100		85.0	40-140			
Anthracene	96.2	2.0	µg/L	100		96.2	40-140			
Benzo(a)anthracene	95.6	2.0	µg/L	100		95.6	40-140			
Benzo(a)pyrene	91.5	2.0	µg/L	100		91.5	40-140			
Benzo(b)fluoranthene	92.5	2.0	µg/L	100		92.5	40-140			
Benzo(g,h,i)perylene	92.4	2.0	µg/L	100		92.4	40-140			
Benzo(k)fluoranthene	92.0	2.0	µg/L	100		92.0	40-140			
Chrysene	96.1	2.0	µg/L	100		96.1	40-140			



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**QUALITY CONTROL**
**Petroleum Hydrocarbons Analyses - EPH - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B136551 - SW-846 3510C</b>										
<b>LCS (B136551-BS1)</b>					Prepared: 12/01/15 Analyzed: 12/02/15					
Dibenz(a,h)anthracene	94.1	2.0	µg/L	100		94.1	40-140			
Fluoranthene	97.0	2.0	µg/L	100		97.0	40-140			
Fluorene	91.2	2.0	µg/L	100		91.2	40-140			
Indeno(1,2,3-cd)pyrene	90.9	2.0	µg/L	100		90.9	40-140			
2-Methylnaphthalene	80.4	2.0	µg/L	100		80.4	40-140			
Naphthalene	68.4	2.0	µg/L	100		68.4	40-140			R-05
Phenanthrene	95.9	2.0	µg/L	100		95.9	40-140			
Pyrene	96.9	2.0	µg/L	100		96.9	40-140			
n-Decane	47.0	2.0	µg/L	100		47.0	40-140			R-05
n-Docosane	95.3	2.0	µg/L	100		95.3	40-140			
n-Dodecane	70.0	2.0	µg/L	100		70.0	40-140			R-05
n-Eicosane	94.9	2.0	µg/L	100		94.9	40-140			
n-Hexacosane	89.1	2.0	µg/L	100		89.1	40-140			
n-Hexadecane	91.7	2.0	µg/L	100		91.7	40-140			
n-Hexatriacontane	93.5	2.0	µg/L	100		93.5	40-140			
n-Nonadecane	92.6	2.0	µg/L	100		92.6	40-140			
n-Nonane	33.2	2.0	µg/L	100		33.2	30-140			R-05
n-Octacosane	89.4	2.0	µg/L	100		89.4	40-140			
n-Octadecane	92.7	2.0	µg/L	100		92.7	40-140			
n-Tetracosane	97.4	2.0	µg/L	100		97.4	40-140			
n-Tetradecane	83.6	2.0	µg/L	100		83.6	40-140			
n-Triacontane	89.1	2.0	µg/L	100		89.1	40-140			
Naphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
Surrogate: Chlorooctadecane (COD)	76.0		µg/L	99.8		76.2	40-140			
Surrogate: o-Terphenyl (OTP)	86.9		µg/L	100		86.9	40-140			
Surrogate: 2-Bromonaphthalene	89.6		µg/L	100		89.6	40-140			
Surrogate: 2-Fluorobiphenyl	89.9		µg/L	100		89.9	40-140			
<b>LCS Dup (B136551-BSD1)</b>					Prepared: 12/01/15 Analyzed: 12/02/15					
Acenaphthene	82.5	2.0	µg/L	100		82.5	40-140	5.77	25	
Acenaphthylene	79.7	2.0	µg/L	100		79.7	40-140	6.51	25	
Anthracene	94.4	2.0	µg/L	100		94.4	40-140	1.85	25	
Benzo(a)anthracene	93.2	2.0	µg/L	100		93.2	40-140	2.58	25	
Benzo(a)pyrene	89.7	2.0	µg/L	100		89.7	40-140	1.99	25	
Benzo(b)fluoranthene	90.4	2.0	µg/L	100		90.4	40-140	2.35	25	
Benzo(g,h,i)perylene	90.9	2.0	µg/L	100		90.9	40-140	1.56	25	
Benzo(k)fluoranthene	89.9	2.0	µg/L	100		89.9	40-140	2.32	25	
Chrysene	93.7	2.0	µg/L	100		93.7	40-140	2.58	25	
Dibenz(a,h)anthracene	92.3	2.0	µg/L	100		92.3	40-140	1.90	25	
Fluoranthene	94.8	2.0	µg/L	100		94.8	40-140	2.38	25	
Fluorene	88.7	2.0	µg/L	100		88.7	40-140	2.82	25	
Indeno(1,2,3-cd)pyrene	89.7	2.0	µg/L	100		89.7	40-140	1.35	25	
2-Methylnaphthalene	65.8	2.0	µg/L	100		65.8	40-140	19.9	25	
Naphthalene	51.7	2.0	µg/L	100		51.7	40-140	27.9 *	25	R-05
Phenanthrene	94.2	2.0	µg/L	100		94.2	40-140	1.79	25	
Pyrene	94.6	2.0	µg/L	100		94.6	40-140	2.40	25	
<b>n-Decane</b>	21.5	2.0	µg/L	100		21.5 *	40-140	74.3 *	25	L-07A
n-Docosane	98.5	2.0	µg/L	100		98.5	40-140	3.28	25	
n-Dodecane	47.6	2.0	µg/L	100		47.6	40-140	38.1 *	25	R-05
n-Eicosane	94.3	2.0	µg/L	100		94.3	40-140	0.605	25	
n-Hexacosane	91.9	2.0	µg/L	100		91.9	40-140	3.02	25	

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# QUALITY CONTROL

## Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B136551 - SW-846 3510C</b>										
<b>LCS Dup (B136551-BSD1)</b>					Prepared: 12/01/15 Analyzed: 12/02/15					
n-Hexadecane	91.9	2.0	µg/L	100		91.9	40-140	0.120	25	
n-Hexatriacontane	95.6	2.0	µg/L	100		95.6	40-140	2.21	25	
n-Nonadecane	94.6	2.0	µg/L	100		94.6	40-140	2.18	25	
<b>n-Nonane</b>	11.5	2.0	µg/L	100		<b>11.5</b>	<b>*</b> 30-140	<b>96.8</b>	<b>*</b> 25	L-07A
n-Octacosane	92.1	2.0	µg/L	100		92.1	40-140	2.96	25	
n-Octadecane	94.5	2.0	µg/L	100		94.5	40-140	1.92	25	
n-Tetracosane	100	2.0	µg/L	100		100	40-140	2.83	25	
n-Tetradecane	78.3	2.0	µg/L	100		78.3	40-140	6.58	25	
n-Triacontane	91.7	2.0	µg/L	100		91.7	40-140	2.92	25	
Naphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
Surrogate: Chlorooctadecane (COD)	79.2		µg/L	99.8		79.4	40-140			
Surrogate: o-Terphenyl (OTP)	84.4		µg/L	100		84.4	40-140			
Surrogate: 2-Bromonaphthalene	91.0		µg/L	100		91.0	40-140			
Surrogate: 2-Fluorobiphenyl	90.0		µg/L	100		90.0	40-140			

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**QUALITY CONTROL**
**Petroleum Hydrocarbons Analyses - VPH - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B136675 - MA VPH**
**Blank (B136675-BLK1)**

Prepared &amp; Analyzed: 12/02/15

Unadjusted C5-C8 Aliphatics	ND	100	µg/L							
C5-C8 Aliphatics	ND	100	µg/L							
Unadjusted C9-C12 Aliphatics	ND	100	µg/L							
C9-C12 Aliphatics	ND	100	µg/L							
C9-C10 Aromatics	ND	100	µg/L							
Benzene	ND	1.0	µg/L							
Butylcyclohexane	ND	1.0	µg/L							
Decane	ND	1.0	µg/L							
Ethylbenzene	ND	1.0	µg/L							
Methyl tert-Butyl Ether (MTBE)	ND	1.0	µg/L							
2-Methylpentane	ND	1.0	µg/L							
Naphthalene	ND	5.0	µg/L							
Nonane	ND	1.0	µg/L							
Pentane	ND	1.0	µg/L							
Toluene	ND	1.0	µg/L							
1,2,4-Trimethylbenzene	ND	1.0	µg/L							
2,2,4-Trimethylpentane	ND	1.0	µg/L							
m+p Xylene	ND	2.0	µg/L							
o-Xylene	ND	1.0	µg/L							
Surrogate: 2,5-Dibromotoluene (FID)	35.2		µg/L	40.0		87.9	70-130			
Surrogate: 2,5-Dibromotoluene (PID)	38.2		µg/L	40.0		95.5	70-130			

**LCS (B136675-BS1)**

Prepared &amp; Analyzed: 12/02/15

Benzene	84.8	1.0	µg/L	100		84.8	70-130			
Butylcyclohexane	92.7	1.0	µg/L	100		92.7	70-130			
Decane	105	1.0	µg/L	100		105	70-130			
Ethylbenzene	92.9	1.0	µg/L	100		92.9	70-130			
Methyl tert-Butyl Ether (MTBE)	102	1.0	µg/L	100		102	70-130			
2-Methylpentane	107	1.0	µg/L	100		107	70-130			
Naphthalene	97.3	5.0	µg/L	100		97.3	70-130			
Nonane	99.8	1.0	µg/L	100		99.8	30-130			
Pentane	87.2	1.0	µg/L	100		87.2	70-130			
Toluene	92.6	1.0	µg/L	100		92.6	70-130			
1,2,4-Trimethylbenzene	86.6	1.0	µg/L	100		86.6	70-130			
2,2,4-Trimethylpentane	99.4	1.0	µg/L	100		99.4	70-130			
m+p Xylene	182	2.0	µg/L	200		91.0	70-130			
o-Xylene	90.4	1.0	µg/L	100		90.4	70-130			
Surrogate: 2,5-Dibromotoluene (FID)	39.8		µg/L	40.0		99.6	70-130			
Surrogate: 2,5-Dibromotoluene (PID)	43.7		µg/L	40.0		109	70-130			

**LCS Dup (B136675-BS1)**

Prepared &amp; Analyzed: 12/02/15

Benzene	83.9	1.0	µg/L	100		83.9	70-130	1.13	25	
Butylcyclohexane	93.8	1.0	µg/L	100		93.8	70-130	1.27	25	
Decane	106	1.0	µg/L	100		106	70-130	1.09	25	
Ethylbenzene	93.2	1.0	µg/L	100		93.2	70-130	0.383	25	
Methyl tert-Butyl Ether (MTBE)	100	1.0	µg/L	100		100	70-130	1.48	25	
2-Methylpentane	103	1.0	µg/L	100		103	70-130	3.19	25	
Naphthalene	96.3	5.0	µg/L	100		96.3	70-130	0.968	25	
Nonane	100	1.0	µg/L	100		100	30-130	0.182	25	
Pentane	81.0	1.0	µg/L	100		81.0	70-130	7.29	25	
Toluene	92.5	1.0	µg/L	100		92.5	70-130	0.171	25	
1,2,4-Trimethylbenzene	88.3	1.0	µg/L	100		88.3	70-130	1.98	25	

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# QUALITY CONTROL

## Petroleum Hydrocarbons Analyses - VPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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### Batch B136675 - MA VPH

#### LCS Dup (B136675-BSD1)

Prepared & Analyzed: 12/02/15

2,2,4-Trimethylpentane	96.8	1.0	µg/L	100		96.8	70-130	2.60	25	
m+p Xylene	183	2.0	µg/L	200		91.6	70-130	0.743	25	
o-Xylene	91.5	1.0	µg/L	100		91.5	70-130	1.31	25	
Surrogate: 2,5-Dibromotoluene (FID)	38.3		µg/L	40.0		95.6	70-130			
Surrogate: 2,5-Dibromotoluene (PID)	41.6		µg/L	40.0		104	70-130			

# FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-04	Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.
L-07A	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD outside of control limits. Reduced precision anticipated for any reported result for this compound.
R-05	Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.
RL-07	Elevated reporting limit based on lowest point in calibration.
	MA CAM reporting limit not met.
RL-14	Elevated reporting limit due to foaming sample matrix. MA CAM reporting limit not met.
V-05	Continuing calibration did not meet method specifications and was biased on the low side for this compound.
	Increased uncertainty is associated with the reported value which is likely to be biased on the low side.
V-16	Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy may be associated with reported result.

# CERTIFICATIONS

## Certified Analyses included in this Report

Analyte	Certifications
<b>MADEP-EPH-04-1.1 in Water</b>	
C9-C18 Aliphatics	CT,NC,WA,ME,NH-P
C19-C36 Aliphatics	CT,NC,WA,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,WA,ME,NH-P
C11-C22 Aromatics	CT,NC,WA,ME,NH-P
Acenaphthene	CT,NC,WA,ME,NH-P
Acenaphthylene	CT,NC,WA,ME,NH-P
Anthracene	CT,NC,WA,ME,NH-P
Benzo(a)anthracene	CT,NC,WA,ME,NH-P
Benzo(a)pyrene	CT,NC,WA,ME,NH-P
Benzo(b)fluoranthene	CT,NC,WA,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,WA,ME,NH-P
Benzo(k)fluoranthene	CT,NC,WA,ME,NH-P
Chrysene	CT,NC,WA,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,WA,ME,NH-P
Fluoranthene	CT,NC,WA,ME,NH-P
Fluorene	CT,NC,WA,ME
Indeno(1,2,3-cd)pyrene	CT,NC,WA,ME,NH-P
2-Methylnaphthalene	CT,NC,WA,ME
Naphthalene	CT,NC,WA,ME,NH-P
Phenanthrene	CT,NC,WA,ME,NH-P
Pyrene	CT,NC,WA,ME,NH-P
<b>MADEP-VPH-04-1.1 in Water</b>	
Unadjusted C5-C8 Aliphatics	CT,NC,WA,ME,NH-P
C5-C8 Aliphatics	CT,NC,WA,ME,NH-P
Unadjusted C9-C12 Aliphatics	CT,NC,WA,ME,NH-P
C9-C12 Aliphatics	CT,NC,WA,ME,NH-P
C9-C10 Aromatics	CT,NC,WA,ME,NH-P
Benzene	CT,NC,WA,ME,NH-P
Ethylbenzene	CT,NC,WA,ME,NH-P
Methyl tert-Butyl Ether (MTBE)	CT,NC,WA,ME,NH-P
Naphthalene	CT,NC,WA,ME,NH-P
Toluene	CT,NC,WA,ME,NH-P
m+p Xylene	CT,NC,WA,ME,NH-P
o-Xylene	CT,NC,WA,ME,NH-P
<b>SW-846 8260C in Water</b>	
Acetone	CT,NH,NY,ME
tert-Amyl Methyl Ether (TAME)	NH,NY,ME
Benzene	CT,NH,NY,ME
Bromobenzene	ME
Bromochloromethane	NH,NY,ME
Bromodichloromethane	CT,NH,NY,ME
Bromoform	CT,NH,NY,ME
Bromomethane	CT,NH,NY,ME
2-Butanone (MEK)	CT,NH,NY,ME
n-Butylbenzene	NY,ME
sec-Butylbenzene	NY,ME

# CERTIFICATIONS

## Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 8260C in Water</i>	
tert-Butylbenzene	NY,ME
tert-Butyl Ethyl Ether (TBEE)	NH,NY,ME
Carbon Disulfide	CT,NH,NY,ME
Carbon Tetrachloride	CT,NH,NY,ME
Chlorobenzene	CT,NH,NY,ME
Chlorodibromomethane	CT,NH,NY,ME
Chloroethane	CT,NH,NY,ME
Chloroform	CT,NH,NY,ME
Chloromethane	CT,NH,NY,ME
2-Chlorotoluene	NY,ME
4-Chlorotoluene	NY,ME
Dibromomethane	NH,NY,ME
1,2-Dichlorobenzene	CT,NY,ME
1,3-Dichlorobenzene	CT,NH,NY,ME
1,4-Dichlorobenzene	CT,NH,NY,ME
Dichlorodifluoromethane (Freon 12)	NH,NY,ME
1,1-Dichloroethane	CT,NH,NY,ME
1,2-Dichloroethane	CT,NH,NY,ME
1,1-Dichloroethylene	CT,NH,NY,ME
cis-1,2-Dichloroethylene	NY,ME
trans-1,2-Dichloroethylene	CT,NH,NY,ME
1,2-Dichloropropane	CT,NH,NY,ME
1,3-Dichloropropane	NY,ME
2,2-Dichloropropane	NH,NY,ME
1,1-Dichloropropene	NH,NY,ME
cis-1,3-Dichloropropene	CT,NH,NY,ME
trans-1,3-Dichloropropene	CT,NH,NY,ME
Diisopropyl Ether (DIPE)	NH,NY,ME
Ethylbenzene	CT,NH,NY,ME
Hexachlorobutadiene	CT,NH,NY,ME
2-Hexanone (MBK)	CT,NH,NY,ME
Isopropylbenzene (Cumene)	NY,ME
p-Isopropyltoluene (p-Cymene)	CT,NH,NY,ME
Methyl tert-Butyl Ether (MTBE)	CT,NH,NY,ME
Methylene Chloride	CT,NH,NY,ME
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,ME
Naphthalene	NH,NY,ME
n-Propylbenzene	CT,NH,NY,ME
Styrene	CT,NH,NY,ME
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME
Tetrachloroethylene	CT,NH,NY,ME
Toluene	CT,NH,NY,ME
1,2,3-Trichlorobenzene	NH,NY,ME
1,2,4-Trichlorobenzene	CT,NH,NY,ME
1,1,1-Trichloroethane	CT,NH,NY,ME
1,1,2-Trichloroethane	CT,NH,NY,ME

# CERTIFICATIONS

## Certified Analyses included in this Report

Analyte	Certifications
<b>SW-846 8260C in Water</b>	
Trichloroethylene	CT,NH,NY,ME
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME
1,2,3-Trichloropropane	NH,NY,ME
1,2,4-Trimethylbenzene	NY,ME
1,3,5-Trimethylbenzene	NY,ME
Vinyl Chloride	CT,NH,NY,ME
m+p Xylene	CT,NH,NY,ME
o-Xylene	CT,NH,NY,ME

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2016
CT	Connecticut Department of Public Health	PH-0567	09/30/2017
NY	New York State Department of Health	10899 NELAP	04/1/2016
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	06/30/2016
FL	Florida Department of Health	E871027 NELAP	06/30/2016
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2016
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2017
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2016





## CHAIN OF CUSTODY RECORD

39 Spruce Street  
East longmeadow, MA 01028

Page of

Telephone: 781/475-0700

Project # 5/1500078

Client PO#

☐ FAX ☒ EMAIL ☐ WEBSITE

Fax #

Email: [mwilson@elc.ca](mailto:mwilson@elc.ca)

☐ yes ☐ no

[illegible]

Comments: AID Project is "Highland-Broadway"

Unwashed by: (signature)	1/20/15-1440	Date/Time:
Received by: (signature)	1/24	Date/Time: 2:45
Unwashed by: (signature)	4/24	Date/Time: 7:05
Received by: (signature)	1/24/15 4.8	Date/Time: 19:05

**Turnaround <sup>††</sup>**  
☐ 7-Day  
☐ 10-Day  
☒ Other 3  
RUSH <sup>†</sup>  
<sup>†</sup>24-Hr ☐ <sup>†</sup>48-Hr  
<sup>††</sup>72-Hr ☐ <sup>†</sup>4-Day  
 require lab approval

Detection Limit Requirements

mp Gw-2

Connecticut

†24-Hr □ †48-Hr  
†72-Hr □ †4-Day  
Require lab approval

## Is your project MCP or RCP?

☒ MCP Form Required  
☐ RCP Form Required  
☐ MA State DW Form Required

☐ MA State DW Form Required PWSID #

WILLIAMS, INC.  
IN ACCO. &  
NELAC & AI



Notes:

**WBE/NBE Certified**

COMPLETELY OR

**CHAIN IF THIS FORM IS NOT FILLED OUT COMPLETELY OR**

PLEASE RE-CAREEN NOT TO CONTAMINATE THIS DOCUMENT

**INCORRECT. TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.**

39 Spruce St.  
East Longmeadow, MA. 01028  
P: 413-525-2332  
F: 413-525-6405  
www.contestlabs.com



Page 1 of 2



## Sample Receipt Checklist

CLIENT NAME: EBT RECEIVED BY: VP DATE: 11/24/15

1) Was the chain(s) of custody relinquished and signed? Yes No No CoC Included

2) Does the chain agree with the samples? Yes No

If not, explain:

3) Are all the samples in good condition? Yes No

If not, explain:

4) How were the samples received:

On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? Yes No N/A

Temperature °C by Temp blank \_\_\_\_\_ Temperature °C by Temp gun 4.8

5) Are there Dissolved samples for the lab to filter? Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

6) Are there any RUSH or SHORT HOLDING TIME samples? Yes No

Who was notified \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

7) Location where samples are stored:

19

Permission to subcontract samples? Yes No  
(Walk-in clients only) if not already approved  
Client Signature: \_\_\_\_\_

8) Do all samples have the proper Acid pH: Yes No N/A

9) Do all samples have the proper Base pH: Yes No N/A

10) Was the PC notified of any discrepancies with the CoC vs the samples: Yes No N/A

### Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber	<u>8</u>	8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below	<u>24</u>	Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl 24 # Methanol \_\_\_\_\_  
# Bisulfate \_\_\_\_\_ # DI Water \_\_\_\_\_  
# Thiosulfate \_\_\_\_\_ Unpreserved \_\_\_\_\_

Time and Date Frozen:

Doc# 277

Rev. 4 August 2013

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Any False statement will be brought to the attention of the Chain of Custody		Answer (True/False)	Comment
	T/F/NA			
1) The cooler's custody seal, if present, is intact.			NA	
2) The cooler or samples do not appear to have been compromised or tampered with.			T	
3) Samples were received on ice.			T	
4) Cooler Temperature is acceptable.			T	
5) Cooler Temperature is recorded.			T	
6) COC is filled out in ink and legible.			T	
7) COC is filled out with all pertinent information.			T	
8) Field Sampler's name present on COC.			T	
9) There are no discrepancies between the sample IDs on the container and the COC.			T	
10) Samples are received within Holding Time.			T	
11) Sample containers have legible labels.			T	
12) Containers are not broken or leaking.			T	
13) Air Cassettes are not broken/open.			NA	
14) Sample collection date/times are provided.			T	
15) Appropriate sample containers are used.			T	
16) Proper collection media used.			T	
17) No headspace sample bottles are completely filled.			T	
18) There is sufficient volume for all requested analyses, including any requested MS/MSDs.			T	
19) Trip blanks provided if applicable.			NA	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.			T	
21) Samples do not require splitting or compositing.			T	

Who notified of False statements?  
Log-In Technician Initials: V?

Date/Time:  
Date/Time: 11/24/15 1905

Doc #277 Rev. 4 August 2013

## MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory

Project #: 15K1197

Project Location: Broadway., Somerville, MA

RTN:

This Form provides certifications for the following data set: [list Laboratory Sample ID Number(s)]

15K1197-01 thru 15K1197-04

Matrices: Water

**CAM Protocol (check all that below)**

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

**Affirmative response to Questions A through F is required for "Presumptive Certainty" status**

<b>A</b>	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <sup>1</sup>
<b>B</b>	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <sup>1</sup>
<b>C</b>	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <sup>1</sup>
<b>D</b>	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <sup>1</sup>
<b>E a</b>	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <sup>1</sup>
<b>E b</b>	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	<input type="checkbox"/> Yes <input type="checkbox"/> No <sup>1</sup>
<b>F</b>	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all No responses to Questions A through E)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <sup>1</sup>

**A response to questions G, H and I below is required for "Presumptive Certainty" status**

<b>G</b>	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <sup>1</sup>
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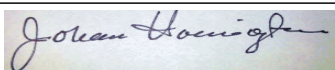
**Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**

<b>H</b>	Were all QC performance standards specified in the CAM protocol(s) achieved?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <sup>1</sup>
<b>I</b>	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <sup>1</sup>

<sup>1</sup> All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

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

Signature: \_\_\_\_\_



Position: Manager, Laboratory Reporting

Printed Name: Johanna K. Harrington

Date: 12/04/15