Nobis
Engineering a Sustainable Future

May 9, 2017
File No. 91830.01

Ms. Alicia Caritano
Senior Associate
Perkins Eastman
50 Franklin Street, Suite 203
Boston, Massachusetts 02110

Re: Transmittal of Phase II Environmental Site Assessment
Existing Lowell High School
Perkins Eastman Project #67150.00
Lowell, Massachusetts

Dear Ms. Caritano:

Nobis Engineering, Inc. (Nobis) completed a Phase II Site Assessment (Phase II) in support of a Feasibility Study being performed by Perkins Eastman on behalf of the City of Lowell under a grant provided by the Massachusetts School Building Authority (MSBA). The Phase II was conducted on a portion of the existing Lowell High School campus, specifically the 50 Father Morissette Boulevard parcel (the Site). The Phase II was conducted to address the recommendations provided by Nobis in a Phase I Environmental Site Assessment (ESA) prepared in January 2017, which identified Recognized Environmental Conditions (RECs) associated with the historical use of the property that could potentially have resulted in the release of contaminants to the environment.

OBJECTIVE OF THE PHASE II

The objective of the Phase II was to characterize soils in potential future school demolition and/or construction areas so that soil management procedures could be developed for the project and potential cost impacts from soil remediation could be evaluated. Therefore, the scope of the Phase II investigation was limited to the 50 Father Morissette Boulevard parcel, where the February 24, 2017 *Preliminary Design Program* has contemplated extensive demolition and construction work under the Existing Lowell High School Addition/Renovation Options. RECs that were identified on other parcels, where new construction is not being considered and extensive management of soil is not anticipated, were beyond the scope of the Phase II and excluded from the assessment.

PHASE II SITE ASSESSMENT FINDINGS

Nobis advanced five soil borings at the Site in areas potentially impacted by historical industrial use. Geological descriptions of soil cores indicated that historical fill overlies native soils at the

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Site. The presence of historical fill material in the top 5 to 8 feet of soil suggests that any soils removed or displaced during future earthwork activities should be considered potentially contaminated with urban fill constituents such as polycyclic aromatic hydrocarbons (PAHs) and metals.

Ten soil samples were collected for laboratory analysis during the Phase II investigation. Two metals, arsenic and lead, were detected in soil samples at concentrations above Massachusetts Contingency Plan (MCP) "reportable concentrations", triggering notification requirements to MassDEP and suggesting the potential need for soil remediation. The concentration of arsenic detected in a soil sample collected adjacent to the National Park Service trolley tracks triggered a 2-hour notification obligation due to its proximity to the school and location within 12 inches of the ground surface. The City has undertaken an Immediate Response Action (IRA) to mitigate potential risks associated with direct contact with arsenic-impacted soils, and characterized the extent of arsenic contamination on the City property adjacent to the trolley tracks. Removal and off-site disposal of this soil is in the planning stages. The concentration of lead detected in one soil sample collected from 5.0 to 5.5 feet below ground surface exceeded reportable concentrations, triggering a 120-day notification obligation for the City.

Soil contamination observed during the Phase II can be attributed to the presence of historical fill material and historical releases from the trolley tracks that run parallel to the east wall of the Lord Building. Historical fill material typically contains elevated levels of PAHs and metals. Arsenic is commonly detected in areas where historical railroad operations have occurred, either as a constituent of pesticides, pressure treated lumber, or coal/coal ash.

POTENTIAL COST IMPACTS FROM SUBSURFACE ENVIRONMENTAL CONTAMINATION

Based on the information collected to date from the existing Lowell High School site during the Feasibility Study, it is reasonable to assume that any earthwork required to construct a new high school building on the 50 Father Morissette Boulevard parcel will involve handling of potentially contaminated soils. Soil borings advanced during the Phase II site assessment revealed the presence of 5 to 8 feet of urban fill material containing brick, concrete, coal, and ash. Fill material was observed in all five soil borings advanced during the Phase II and in all ten test pits excavated as part of the civil engineering investigation completed by others in April 2017.

Any excess soils generated during future construction activities on the 50 Father Morissette Boulevard parcel should be presumed contaminated and pre-characterized in order to determine off-site reuse/disposal options and develop appropriate health and safety protocols for construction workers. The number and location of samples should be determined based on the anticipated volume of soil expected to be managed and the anticipated locations of earthwork operations. The estimated cost associated with pre-construction environmental services including the collection and analysis of pre-characterization samples, preparation of a Soil Management Plan, and preparation of a site-specific Health and Safety Plan compliant with OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) would be $10,000 to $20,000.

Construction-phase environmental services including oversight of earth moving activities, on-site management of contaminated soil during construction, and soil shipment documentation should be provided by a Licensed Site Professional (LSP). The estimated cost for construction-phase services will vary based on the volume of soil to be managed, but is likely to be in the range of $25,000 to $50,000.

Depending upon the type of contaminants detected in pre-characterization soil samples, the levels of contamination present, and the volume of soil expected to be disturbed during construction activities, the cost of transportation and off-site reuse/disposal of excess soils is likely to be on the order of $30,000 to $300,000. On the lower end of this cost range, low levels of contamination are present (approaching background), a small volume of soil would need to be handled, and excess soils can be either reused on site or relocated to another location within the City at no cost for disposal. At the higher end of this cost range would be high concentrations of persistent contaminants such as heavy metals or polychlorinated biphenyls (PCBs) and a large volume of soil that would need to be transported to an out-of-state landfill for disposal. This order-of-magnitude cost estimate can be refined with additional data collection. This estimate is in addition to the $20,000 to $40,000 anticipated for the removal of arsenic-impacted soils identified along the railroad tracks during the Phase II.

If you have any questions on the content of this letter or the attached Phase II report, please do not hesitate to contact me at (978) 703-6029 or by email at *svetere@nobiseng.com*.

Very truly yours,

Nobis Engineering, Inc.

Stephen Vetere, PE, LSP
Director of Environmental Services

Attachments: Phase II Environmental Site Assessment, Existing Lowell High School

PHASE II ENVIRONMENTAL SITE ASSESSMENT

LOWELL HIGH SCHOOL EXISTING CONDITIONS EVALUATION
MSBA FEASIBILITY STUDY

50 FATHER MORISSETTE BOULEVARD,
LOWELL, MASSACHUSETTS

FOR

PERKINS EASTMAN
PROJECT NUMBER 67150.00

BY

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Nobis Project No. 91830.01
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Engineering a Sustainable Future

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APPENDICES

1.0 INTRODUCTION

Nobis Engineering, Inc. (Nobis) completed a Phase II Site Assessment (Phase II) in support of a Feasibility Study being performed by Perkins Eastman on behalf of the City of Lowell under a grant provided by the Massachusetts School Building Authority (MSBA). The Phase II was conducted on a portion of the existing Lowell High School campus (Figure 1), specifically the 50 Father Morissette Boulevard parcel (the Site), which is occupied by the Lord Building and an adjacent Field House (Figure 2). The Phase II was conducted to address the recommendations provided by Nobis in a Phase I Environmental Site Assessment (ESA) prepared in January 2017, which identified Recognized Environmental Conditions (RECs) associated with the historical use of the property that could potentially have resulted in the release of contaminants to the environment.

The objective of the Phase II was to characterize soils in potential future school demolition and/or construction areas so that soil management procedures could be developed for the project and potential cost impacts from soil remediation could be evaluated. Therefore, the scope of the Phase II investigation was limited to the 50 Father Morissette Boulevard parcel, where the February 24, 2017 *Preliminary Design Program* has contemplated extensive demolition and construction work under the Existing Lowell High School Addition/Renovation Options. RECs that were identified on other parcels, where new construction is not being considered and extensive management of soil is not anticipated, were beyond the scope of the Phase II and excluded from the assessment.

2.0 GENERAL SITE INFORMATION

The following sections describe the Site and surrounding properties, and include a summary of ownership history and previous environmental investigations. This discussion focuses on the 50 Father Morissette Boulevard parcel. Equivalent information about the other parcels on the existing high school campus can be found in the January 2017 Phase I ESA.

2.1 Site Location and Description

The Site is a portion of the existing Lowell High School campus located at 50 Father Morissette Boulevard in Lowell, Massachusetts. The Lowell High School campus consists of five major building/facilities, which include the Lord Building and the adjacent Field House (which are the

subject of this Phase II), the Freshman Academy, the 1922 Building, and the Steam Plant. The high school campus is bisected by the Merrimack Canal, which runs roughly southwest-northeast between the Lord Building and the 1922 Building. The Lord Building and Field House are the only buildings located northwest of the canal, on the 50 Father Morissette Boulevard parcel. As described previously, the other three parcels that comprise the high school campus were excluded from the Phase II scope of work.

The a 3.29-acre 50 Father Morissette Boulevard parcel is improved with two buildings, the approximately 143,250 square foot Lord Building and the approximately 73,310 square foot Field House (square footage as reported on property cards on file with the Lowell Assessor's Office). The two buildings are connected by a central lobby area and are both concrete block/masonry frames. The buildings are heated with natural gas via a forced hot air system. Both buildings were constructed in 1980.

The Lord Building is a slab-on-grade, three-story rectangular-shaped educational building comprised of classrooms, laboratories, a cafeteria, a kitchen, conference space, the Creegan Media Center, bathrooms, nurse's offices, Jeanne D'Arc Credit Union and ATM, storage space, a school store, a theatre, and administrative offices. The roof is steel frame with rolled composite roofing. Air handling units for the HVAC system are present on the roof of the building.

The Field House is a two-story hexagonal building with a multi-sport gymnasium, a pool, wrestling room, weight rooms, locker rooms, and furnace rooms. The basement contains a pool pump area where chlorine and carbon dioxide for the pool are stored. The Field House is located west of the Lord Building. The roof is steel frame with enamel metal shingles.

A paved access road leads from Father Morissette Boulevard on the western portion of the property to a loading dock and small parking area on the southern side of the Lord Building. The loading dock is primarily used for offloading trucks carrying food and drinks for the cafeteria.

Portions of the property that are not paved for walkways or the access road are landscaped.

According to the City of Lowell Assessor's Department, the Site is currently zoned "DMU", which is defined in Article 3 of the City of Lowell Zoning Book (adopted December 7, 2004) as a "downtown mixed-use district". The Site is located within an urban area of the City of Lowell with

mixed residential, commercial, and recreational uses. Adjacent parcels are generally commercial in nature. The topography of the Site and surrounding environs is relatively flat. According to the Site Locus Map (Figure 1), the topographic gradient decreases slightly to north/northeast. The Merrimack River is located approximately 650 feet from the Site.

2.2 Site Ownership and Usage

The Phase I ESA prepared by Nobis, dated January 2017 (Nobis, 2017), indicated that the City of Lowell School Department was the owner of the property at that time. It is Nobis' understanding that the City of Lowell School Department continues to own the parcel. The Site is operated as part of the Lowell High School, an educational institution for the City of Lowell residents. The Field House is a school-owned and operated recreational facility for physical education classes as well as intramural and interscholastic sports competition.

2.3 Site Operations History

The 50 Father Morissette Boulevard parcel, located to the northwest of the canal, was first developed in the 1820s concurrent with the development of the Merrimack Canal and the Merrimack Manufacturing Company, a former textile mill. A portion of the Merrimack Manufacturing Company mill complex occupied the northwest corner of the Site, and the remaining Site area west of the canal was occupied by tenement homes associated with the mill. A rail line entered the Site from the south, running parallel to the canal, and a spur was built running perpendicular to the canal along the southern boundary of the Site (currently the dentistry office at 75 Arcand Drive). In the 1960s, an urban renewal program resulted in the demolition of the mill and associated housing, and the streets to the west of the canal were completely reconfigured to resemble the present day layout. In 1980, the Lord Building and Field House were constructed on vacant land as improvements to the existing high school, which before this time was entirely located on the east side of the canal.

2.4 Previous Investigations and Recognized Environmental Conditions

Nobis completed a Phase I ESA of the entire Lowell High School campus in January 2017. The Phase I ESA included assessment of six parcels of land (five on the current school campus and a sixth parcel being considered for potential acquisition) located in the downtown area of Lowell,

Massachusetts, including 50 Father Morissette Boulevard. This Phase I ESA was conducted to support the MSBA Feasibility Study.

Based on the review of historical records, observations made during the site reconnaissance, and information provided in interviews with City personnel, Nobis identified the following RECs in the 2017 Phase I ESA:

- City of Lowell Fire Department records contained one index card file for Lowell High School, which indicated that the facility had a 12,600-gallon “below grade” “Faber Burner” tank located on French Street. The tank’s contents were not listed, nor was the installation date, removal date, or any sort of inspection date. The record does not provide any additional details regarding the tank. This tank may have been a storage vessel for oil that was used to fuel the boilers in the Steam Plant before it was converted to natural gas, or used to heat one of the school buildings. The exact location of this tank is unknown, but is likely to be near the Steam Plant along French Street. This REC was excluded from the Phase II investigation because it is beyond the limits of proposed demolition and construction that is currently being considered for the existing high school site, therefore potential exposure to environmental media during renovation, and costs associated with soil remediation, are expected to be minimal, if any.

- Sanborn Fire Insurance Maps show a “coal bin” in the 1950, 1952, and 1977 maps in what is now the alley between the Freshman Academy and the Steam Plant. The historical storage of coal in this vicinity may have resulted in the release of coal or coal ash to the environment. A release of coal and/or coal ash could result in detectable concentrations of semi-volatile organic compounds (SVOCs) and polycyclic aromatic hydrocarbons (PAHs) in soil. This REC was excluded from the Phase II investigation because it is beyond the limits of proposed demolition and construction that is currently being considered for the existing high school site, therefore potential exposure to environmental media during renovation, and costs associated with soil remediation, are expected to be minimal, if any.

- 50 Father Morissette Boulevard was historically part of the Merrimack Manufacturing Company property. Most of the property was used for tenement housing; however, the

northwestern corner of the property contained two buildings used as an “Old Packing Building” and “Finishing Mill”. It is possible that dyes, solvents, or other chemicals used in textile processing were used, stored, or released in this portion of the Site. Nobis advanced three soil borings in the northwestern portion of the 50 Father Morissette Boulevard parcel to investigate potential contamination resulting from the former industrial use of the Site.

- A railroad spur leading into the Merrimack Manufacturing Company was present along the southern border of the current 75 Arcand Drive property from the early 1900s until at least 1952. The railroad is not shown on the 1977 Sanborn fire insurance maps. Additionally, the rail line from which this spur originated directly abuts the Lord Building to the east. This line is still used for trolley services. Former railroad activities likely transported and handled raw materials, chemicals, and hazardous materials associated with the operation of area industry. In addition, railroad operations and maintenance activities themselves may have impacted the Site, as creosote or arsenic-laced railroad ties, herbicides, lubricating oils, diesel fuel, and diesel exhaust commonly result in releases of heavy metals, pesticides/herbicides, and petroleum-related contamination along railroad corridors. Nobis advanced two soil borings along the railroad tracks to investigate potential contamination resulting from historical operation of railroad tracks adjacent to the eastern wall of the Lord Building.

The Phase I ESA report recommended implementation of a limited subsurface investigation prior to any pre-design or construction work to evaluate whether the identified RECs have resulted in a release of contamination to the environment. The Phase II investigation was intended to provide information to assist with soil management and health and safety planning for Site workers in the event that one of the existing high school addition/renovation options were to be implemented.

3.0 2017 PHASE II FIELD INVESTIGATION PROGRAM

The 2017 Phase II field investigation included the advancement of five soil borings, classification and field screening of soil samples, collection of soil samples for laboratory analysis, and evaluation of laboratory data. The sections below summarize the field investigation activities performed in March and April 2017. Limitations of the assessment are provided in Appendix A.

3.1 DigSafe Utility Clearance

On the morning of March 17, 2017, Nobis mobilized to the Site to pre-mark drilling locations for the Phase II site assessment. Later that day, at 13:00 Nobis notified DigSafe to initiate utility clearance activities in anticipation of commencing drilling activities before the end of March. DigSafe assigned Ticket Number 20171104598 to the notification, and with the 72-hour notification requirement, a potential start date of March 22, 2017 at 13:00 was established.

3.2 Soil Boring Pre-Clearing

Prior to commencing drilling operations, Nobis reviewed historical and existing plans illustrating subsurface utility systems including water, sewer, natural gas, electrical, and fiber optic lines connected to the Lord Building and Field House. On March 28 2017, Drilex Environmental of West Boylston, Massachusetts (Drilex) pre-cleared four of the five soil boring locations using a VacMaster 4000 vacuum truck and an air knife. Soil was removed from the top 5 to 6 feet using the air knife and consolidated with the VacMaster 4000 vehicle. The cuttings were characterized by a Nobis field geologist, who oversaw the pre-clearing event. Any notable observations were recorded on the soil boring logs attached in Appendix B.

One of the soil borings was not pre-cleared. Boring location NOB-106 was not pre-cleared, as all of the subsurface utilities in the area southeast of the Lord Building follow a similar east-west orientation adjacent to the National Park Service (NPS) trolley line. By pre-clearing the location at NOB-105, also adjacent to the active NPS trolley line, Nobis and Drilex concluded that the proposed NOB-106 drilling location was clear of utilities.

Once the soil borings were adequately pre-cleared, soil cuttings were deposited back down into the borehole annulus. No excess soil cuttings were generated during the pre-clearing event.

3.3 Soil Boring Advancement and Soil Sampling

On March 29, 2017, Drilex advanced 5 overburden soil borings at the Site. Drilling activities were directed by a Nobis field geologist, who was responsible for characterizing soils and collecting soil samples for laboratory analysis. The borings were advanced using a Geoprobe® 6620 track-mounted drill rig. Borings were located on exterior portions of the 50 Father Morissette Boulevard

parcel, as shown on Figure 2. The proposed soil boring location NOB-103 was not advanced due to inability to adequately identify the locations of subsurface utilities.

During drilling activities, soil samples were collected from each boring continuously using dedicated macro-core acetate sampling sleeves. All borings were advanced from the ground surface until either a maximum depth of 15 feet was achieved, or subsurface refusal was encountered. All soil samples were characterized in the field by a Nobis geologist and screened for the presence of volatile organic compounds (VOCs) using a photo-ionization detector (PID). Field screening, geological classification, and any other pertinent observations made during soil boring advancement were recorded on boring log forms, which are included in Appendix B.

Two soil samples were collected for laboratory analysis from each soil boring: the first sample was collected from approximately 0-2 feet below ground surface (bgs), and a second sample was collected from a deeper interval either exhibiting evidence of contamination such as elevated PID field screening readings or material representative of historical fill, or a sample from the water table interface (if no evidence of contamination was observed). Soil samples were kept chilled on ice and transported under chain-of-custody until received by Con-Test Analytical Laboratories of East Longmeadow, Massachusetts for analysis. Laboratory samples were collected for VOC analysis by EPA Method 8260, volatile petroleum hydrocarbons (VPH) by the MassDEP Method, extractable petroleum hydrocarbons (EPH) and PAHs by the MassDEP Method, and Massachusetts Contingency Plan (MCP) metals analysis by EPA Methods 6010/6020.

4.0 SITE HYDROGEOLOGICAL OBSERVATIONS

Based on observations made during the 2017 subsurface soil characterization, both historical fill material and naturally-occurring soil deposits are present at the Site. Historical fill material observed at the Site generally consists of brown to dark grayish-brown poorly sorted silty sands, with varying amounts of debris materials encountered (brick, coal fragments, concrete fragments, ash, cobbles). Generally, historical building debris was not encountered as distinct lenses, but appeared in small amounts commingled with soil. Underlying native deposits were generally characterized as brown, light brown, orange, or tan sand, with low levels of silts and gravels.

Boring NOB-104 encountered refusal at 5.5 feet bgs on what appeared to be a concrete slab or foundation. This would suggest that historical building foundations or slabs could be intact below the Lord Building and adjacent Field House.

Based on soil boring moisture and/or soil staining observations, the groundwater table appears to be approximately 10-12 feet bgs. Several pockets of shallow, wet soil were observed in borings NOB-105 and NOB-106, both of which are located closest to the adjacent canal to the south. Nobis did not observe any odors, stains, or sheen on any of the saturated soil that might suggest groundwater contamination at the Site. The groundwater flow direction is believed to be toward the northeast in the direction of the Merrimack River.

5.0 2017 SOIL ANALYTICAL RESULTS

The following section presents a summary of the laboratory analytical data collected during the 2017 Phase II field investigation. Samples were collected for laboratory analysis of VOCs, VPH, EPH, PAHs, and MCP Metals. Analytical results were compared to MassDEP criteria to evaluate potential human health risks associated with the contaminant levels detected. A summary of soil analytical results is provided on Table 1. Laboratory data reports for soil samples collected during the March/April 2017 investigation are provided in Appendix C.

5.1 Applicable Regulatory Criteria

The soil sampling data were compared to several applicable state regulatory criteria, which are established in the MCP.

- Pursuant to 310 CMR 40.0361, the soil analytical results were initially screened against the MCP Reportable Concentrations of Oil and Hazardous Material in Soil (RCS-1) to establish whether the results triggered any 120-day reporting obligations to MassDEP. RCS-1 is considered applicable to the Site because it is located within 500 feet of a school.

- If a contaminant was determined to exceed RCS-1, the result was also screened against the Imminent Hazard threshold concentrations provided in 310 CMR 40.0321(2) to determine whether the results triggered a 2-hour reporting obligation to MassDEP. This requirement is considered applicable to soil samples collected from the Site between 0

and 12 inches below ground surface because it is located within 500 feet of a school and access to soils is not restricted by a fence or the presence of asphalt/concrete pavement.

Table 1 provides a comparison of analytical data to these MCP criteria.

5.2 VOC Analytical Results

Only one sample collected during the March 29, 2017 investigation contained VOC concentrations above laboratory detection limits. The soil sample collected from NOB-102 at a depth of 7-8 feet bgs was the only sample with a detection of a VOC (0.0095 mg/kg of naphthalene), significantly lower than RCS-1.

5.3 VPH Analytical Results

Only one sample collected during the March 29, 2017 investigation contained any VPH compounds above laboratory reporting limits. The soil sample collected from boring NOB-105 from a depth of 0-2 feet bgs contained low detected concentrations of C9-C12 aliphatic and C9-C10 aromatic hydrocarbon fractions. The concentrations detected are significantly lower than RCS-1.

5.4 EPH/PAH Analytical Results

Nine of the eleven soil samples collected during the March 29, 2017 investigation contained EPH hydrocarbon ranges and/or PAHs above laboratory detection limits. Most of the detected concentrations were low (above laboratory detections limits but below applicable MCP soil standards). However, three soil samples contained concentrations above RCS-1:

- The soil samples collected from NOB-102 (7-8 feet bgs), NOB-104 (5-5.5 feet bgs), and NOB-106 (0-2 feet bgs) all contained benzo(a)pyrene above RCS-1. The highest benzo(a)pyrene concentration was detected in the surface sample (0-2 feet bgs) collected from NOB-106. This soil boring was advanced adjacent to the trolley tracks at the south end of the Lord Building.

- The soil sample collected from NOB-106 (0-2 feet bgs) also contained concentrations of benzo(b)fluoranthene and dibenz(a,h)anthracene above RCS-1.

5.5 MCP Metals Analytical Results

The MCP metals analysis includes antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver, thallium, vanadium, and zinc. Each of the eleven samples collected for metals analysis during the March 29, 2017 investigation contained at least one of these metals above laboratory detection limits. The results are summarized below:

- Antimony, selenium, silver, and thallium were not detected in any of the samples analyzed.

- Lead was detected in two soil samples above RCS-1 (NOB-104 from 5-5.5 feet bgs and NOB-106 from 0-2 feet bgs). The highest lead concentration was detected in the sample collected from NOB-104 at 5-5.5 feet bgs (780 mg/kg).

- Arsenic was detected in two soil samples above RCS-1 (NOB-105 from 0-2 feet bgs and NOB-106 from 0-2 feet bgs). The highest arsenic concentration was detected in the sample collected from NOB-106 at 0-2 feet bgs (190 mg/kg). Both of these soil borings are located adjacent to the trolley tracks just south of the Lord Building.

The detection of arsenic in a surficial soil sample (0 to 2 feet below ground surface) at a concentration greater than 40 mg/kg, located adjacent to a school, in an area with unrestricted access to surficial soil, presented a potential Imminent Hazard condition and potential 2-hour release notification obligation. See Section 6.0 for a discussion of the Imminent Hazard Evaluation conducted upon receipt of the March 29, 2017 analytical data.

6.0 IMMINENT HAZARD EVALUATION

As stated previously, the arsenic concentration (190 mg/kg) detected in the surface soil sample collected from NOB-106 (0-2 feet) on March 29, 2017 presented a potential Imminent Hazard condition due to its concentration relative to the Imminent Hazard threshold established in the MCP (40 mg/kg arsenic), the fact that is was collected from a surficial sampling interval, and the fact that it is in a location within 500 feet of a school.

On April 10, 2017, immediately upon receipt of the laboratory data report for the March 29, 2017 soil samples, Nobis notified Perkins Eastman and the City of Lowell about the elevated arsenic

concentration from the sample collected from NOB-106. Based on the 0-2 foot sample interval, it could not be definitively determined whether this detection of arsenic was in the top 0-1 foot of soil, and therefore met the criteria established in 310 CMR 40.0321(2)(b) for a 2-hour release notification obligation.

Nobis returned to the Site on the morning of April 11, 2017 to collect two confirmation samples from 0-1 foot bgs in the immediate vicinity of NOB-106 (NOB-106N and NOB-106S). These soil samples were submitted to Con-Test for laboratory analysis of arsenic with a 24-hour turnaround time. On April 12, 2017 at approximately 1:00 PM, Nobis received the analytical results from NOB-106N and NOB-106S, which confirmed that the concentration of arsenic in soil within 12 inches of the ground surface exceeded the Imminent Hazard threshold, and a 2-hour reporting condition was triggered.

After consultation with the City of Lowell, Nobis provided oral notification to MassDEP at 2:21 PM on April 12, 2017. MassDEP assigned Release Tracking Number (RTN) 3-34180 and orally approved an Immediate Response Action (IRA) consisting of installation of a 6-foot high chain-link fence with signage, and additional assessment to determine the extent of arsenic contamination in soil.

7.0 PHASE II CONCLUSIONS

Nobis completed a Phase II site assessment for a portion of the existing Lowell High School campus located on 50 Father Morissette Boulevard in Lowell, Massachusetts. The following summarizes the results of subsurface investigation activities performed by Nobis.

- Nobis performed a Phase II site assessment for a portion of the existing Lowell High School campus, specifically the 50 Father Morissette Boulevard parcel, which is occupied by the Lord Building and adjacent Field House. The objective of the Phase II was to evaluate subsurface environmental conditions in portions of the existing high school site that could be impacted by potential future construction activities.

- Nobis advanced five soil borings around the north, east, and southeast perimeters of the Lord Building and Field House in areas potentially impacted by historical industrial use

(specifically near the former Merrimack Manufacturing Company mill building and the existing railroad tracks along the southern property boundary).

- Nobis field personnel recorded geological descriptions, field screened subsurface soils, and collected soil samples for laboratory analysis of VOCs, VPH, EPH, PAHs, and MCP metals. Two soil samples were collected from each soil boring for laboratory analysis: one soil sample from 0 to 2 feet bgs, and another soil sample from a deeper interval where historical fill material was encountered. If no evidence of contamination or historical fill was observed below the surface interval, Nobis collected the second soil sample from the approximate depth of the water table.

- Geological descriptions of soil samples indicate that both historical fill material and native soils exist at the Site. Several borings contained small amounts of debris, including brick, concrete fragments, coal fragments, and cobble. Boring NOB-104 encountered refusal on what is believed to be a concrete foundation or slab still in place. The presence of historical fill material in the top 5 to 8 feet of soil at the Site suggests that any soils removed or displaced during future earthwork activities should be considered potentially contaminated with urban fill constituents such as PAHs and metals.

- Soil sampling results indicate that trace to non-detect levels of volatile contamination (both VOCs and VPH) exist in the areas sampled. Therefore, no potential threat of vapor intrusion into school buildings was identified during the investigation, and volatile contaminants are unlikely to be of concern during potential future construction activities.

- The concentrations of arsenic detected in the soil samples collected from NOB-106N and NOB-106S represent a potential Imminent Hazard condition. As of the writing of this report, Nobis has notified MassDEP of this hazard on behalf of the City and IRA activities have commenced. Additional details are provided in Section 8.0.

- The concentrations of lead and arsenic detected in soil samples collected from NOB-104, NOB-105, and NOB-106 require the City to notify MassDEP of this release within 120 days of gaining knowledge.

- The concentrations of PAHs detected above RCS-1 are exempt from reporting because they can be attributed to the presence of coal fragments in the urban fill material from which the samples were collected. The concentrations of PAHs detected in soil samples collected during the Phase II are consistent with MassDEP anthropogenic background levels is soil containing coal ash associated with fill material (Table 1, MassDEP Technical Update "Background Levels of PAHs and Metals in Soil", 2002).

- Soil contamination observed during the Phase II can be attributed to the presence of historical fill material and historical releases from the trolley tracks that run parallel to the east wall of the Lord Building. Historical fill material typically contains elevated levels of PAHs and metals. Arsenic is commonly detected in areas where historical railroad operations have occurred, either as a constituent of pesticides, pressure treated lumber, or coal/coal ash.

8.0 RECOMMENDATIONS AND REQUIREMENTS

The following subsections summarize the recommendations and/or any regulatory requirements resulting from the detection of contamination at the Site.

8.1 Regulatory Reporting Requirements

2-Hour Reporting. As stated previously, on April 12, 2017, Nobis notified MassDEP of the potential Imminent Hazard condition associated with the detection of arsenic on the Lowell High School campus in a soil sample collected within 12 inches of the ground surface. MassDEP provided oral approval of an IRA consisting of the installation of a 6-foot high chain-link fence with signage and implementation of additional assessment activities. The Release Log Form posted by MassDEP to their on-line Reportable Release File Viewer is provided in Appendix D.

As of the writing of this report, IRA activities have been completed:

- On April 18, 2017, Nobis mobilized to the Site to advance 11 shallow soil borings along the east wall of the Lord Building between NOB-105 and the southeast corner of the Lord Building. Soil samples were collected from three depth intervals in each soil boring: 0-1 foot bgs, 1-3 feet bgs, and 4-5 feet bgs. Each of the 33 soil samples collected during this

investigation was submitted for laboratory analysis of arsenic. The objective of this sampling event was to delineate the vertical and horizontal extent of arsenic contamination in soil in order to develop the scope of a future Release Abatement Measure (RAM) to remove contaminated soils from the Site and achieve a Condition of No Significant Risk and a Permanent Solution. The analytical results of soil samples collected during the IRA indicate that arsenic contamination is present in soils along the entire length of the railroad corridor, but the vertical extent of arsenic contamination above RCS-1 is limited to the top 12 inches of soil.

- On April 19, 2017, the City of Lowell erected a chain-link fence to restrict access to the soils that triggered the potential Imminent Hazard condition. As a conservative measure, the City installed the fence along the entire length of the Lord Building, as opposed to restricting the fenced area to the NOB-106 area.

Nobis anticipates submittal of an IRA Completion Report after the review and evaluation of the April 18, 2017 soil sample analytical data is complete. The IRA Completion Report must be submitted to MassDEP within 60 days of notification (June 11, 2017) pursuant to 310 CMR 40.0420(8) of the MCP. Once the extent of contamination is identified, a RAM Plan must be submitted to MassDEP to describe the procedures for the removal and off-site disposal of contaminated soil, as well as the sampling plan proposed to verify the removal of arsenic contamination. Nobis recommends completion of soil remediation in time to allow for submittal of a RAM Completion Report before April 12, 2018. Submittal of the RAM Completion Report after this date will subject the City to additional MCP requirements and fees.

120-Day Reporting. As stated previously, the concentrations of lead and arsenic detected in soil samples collected from NOB-104, NOB-105, and NOB-106 exceeded RCS-1, triggering a requirement for the City to notify MassDEP within 120-days of obtaining knowledge of the release (August 10, 2017). The contamination associated with NOB-105 and NOB-106 is likely to be addressed by the RAM. The contamination associated with NOB-104 appears to be associated with the presence of historical fill material, but additional assessment is warranted to develop lines of evidence to confirm that lead contamination does not pose a significant risk to human health.

The concentrations of PAHs detected above RCS-1 are exempt from reporting because they can be attributed to the presence of coal fragments in the urban fill material from which the samples were collected.

8.2 Recommendations for Soil Remediation

In the near term, Nobis recommends excavation and off-site disposal of arsenic-contaminated soil along the southern property boundary. After removal of these soils, the arsenic, lead, and PAH contamination associated with shallow soils along the trolley tracks would be eliminated, and the Imminent Hazard would be mitigated, permitting the chain-link fence to be removed. Nobis recommends incorporating National Grid personnel into the excavation plans to ensure the adjacent natural gas line to the excavated corridor is not undermined or compromised. Close coordination with the National Park Service will also be necessary to maintain the structural integrity of the tracks and minimize interruptions in trolley service.

8.3 Recommendations for Soil Management

In the long term, in the event that one of the Existing Lowell High School Addition/Renovation Options is implemented, any soil that is removed or displaced during construction should be considered potentially contaminated. The construction cost estimate for the project should include provisions for worker safety, soil stockpiling in accordance with Section 310 CMR 40.0030 of the MCP, soil pre-characterization, and transportation/disposal of soils under the MassDEP Bill of Lading (BOL) process at an appropriately licensed facility. Any soil remediation made necessary by the renovation/construction of a new Lowell High School can likely be implemented under a Construction RAM Plan.

In areas where soils are expected to be displaced by construction activities, pre-characterization soil samples should be collected to identify potential off-site reuse or disposal options. The results of these laboratory analyses will assist the Environmental Professional with recommendations for soil handling and off-site reuse/disposal, as well as identify any health and safety protocols that should be incorporated into earthwork operations. In a very general sense, the types of soils that might be encountered at the Site during construction will fall into the following classifications:

- Class A-1: Soils meet the definition of background and are suitable for reuse without restrictions. Typically this means that there are no detectable concentrations of VOCs, PCBs, or TPH; and that SVOCs and metals are present at concentrations lower than the values published in Table 1 of the MassDEP Technical Guidance Document *Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil* (May 2002).

- Class A-2: Soils contain detectable concentrations of some contaminants above background, but all contaminants are present below RCS-1. This soil is not regulated for disposal under the MCP, and is therefore eligible for off-site reuse provided that the material meets the MassDEP's anti-degradation or "similar soils" provision (310 CMR 40.0032[3][b]). This section of the MCP states that soils must not be reused at a location where "existing concentrations of oil and/or hazardous material…are significantly lower than the levels of those oil and/or hazardous materials present in the soil being disposed or reused." In other words, the soils cannot be reused at a location where they would increase the level of contamination already present at the receiving site.

- Class B-1: Soils contain concentrations of at least one contaminant above RCS-1. These soils are regulated under the MCP and, in many cases, require reporting to MassDEP (although not if the release has already been reported). These soils may be disposed in a lined or unlined landfill within Massachusetts provided that they meet the criteria established in MassDEP Policy #COMM-97-001, *Reuse and Disposal of Contaminated Soil in Massachusetts Landfills* (August 1997).

- Class B-2: Soils contain concentrations of at least one contaminant above RCS-1 and the COMM-97 reuse criteria. These soils must be transported to an out-of-state landfill for disposal.

The general information included in the section above is provided as guidance for planning purposes during the feasibility stage of this project. There are several nuances, including exemptions and variances that can be applied if specific observations of urban fill materials are made, that might be applicable to the Site as subsurface information is collected and evaluated. A Licensed Site Professional (LSP) should be involved with any soil management evaluations

that are made during pre-design or construction, to ensure compliance with all applicable environmental laws and regulations.

TABLES

Table 1
Summary of Soil Analytical Results
Lowell High School - 50 Father Morissette Blvd
Lowell, Massachusetts

SAMPLE LOCATION			NOB-101	FD-01	NOB-101	NOB-102	NOB-102	NOB-104	NOB-104	NOB-105	NOB-105	NOB-106	NOB-106	NOB-106N	NOB-106S
SAMPLE DATE			3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	4/11/2017	4/11/2017
SAMPLE DEPTH (feet bgs)			0-2 Feet	0-2 Feet	6-8 Feet	0-2 Feet	7-8 Feet	0-2 Feet	5-5.5 Feet	0-2 Feet	11-12 Feet	0-2 Feet	4-5 Feet	0-1 Foot	0-1 Foot
	RCS-1	**IH**													
MADEP-EPH-04-1.1 (mg/Kg dry)															
C9-C18 ALIPHATICS	1000		ND (11)	ND (11)	ND (12)	ND (22)	ND (11)	ND (11)	ND (11)	ND (11)	ND (16)	28	ND (11)	NT	NT
C19-C36 ALIPHATICS	3000		28	32	24	90	ND (11)	ND (11)	ND (11)	ND (11)	ND (16)	100	ND (11)	NT	NT
UNADJUSTED C11-C22 AROMATICS	~		31	33	21	76	95	21	150	55	ND (16)	320	ND (11)	NT	NT
C11-C22 AROMATICS	1000		27	29	19	71	66	18	99	45	ND (16)	260	ND (11)	NT	NT
ACENAPHTHENE	4		ND (0.11)	ND (0.11)	ND (0.12)	ND (0.22)	0.15	ND (0.11)	0.98	ND (0.11)	ND (0.16)	ND (0.23)	ND (0.11)	NT	NT
ACENAPHTHYLENE	1		ND (0.11)	ND (0.11)	ND (0.12)	ND (0.22)	0.30	ND (0.11)	0.11	0.19	ND (0.16)	0.92	ND (0.11)	NT	NT
ANTHRACENE	1000		ND (0.11)	ND (0.11)	ND (0.12)	ND (0.22)	0.54	ND (0.11)	2.0	0.14	ND (0.16)	0.73	ND (0.11)	NT	NT
BENZO(A)ANTHRACENE	7		0.24	0.29	0.15	0.37	2.3	0.23	3.7	0.68	ND (0.16)	5.1	ND (0.11)	NT	NT
BENZO(A)PYRENE	2		0.34	0.40	0.14	0.49	**2.6**	0.27	**3.2**	0.99	ND (0.16)	**4.7**	ND (0.11)	NT	NT
BENZO(B)FLUORANTHENE	7		0.35	0.39	0.20	0.58	3.3	0.33	3.7	1.5	ND (0.16)	**9.1**	ND (0.11)	NT	NT
BENZO(G,H,I)PERYLENE	1000		0.25	0.29	1.3	0.40	1.7	0.25	1.6	0.62	ND (0.16)	2.2	ND (0.11)	NT	NT
BENZO(K)FLUORANTHENE	70		0.12	0.15	ND (0.12)	ND (0.22)	1.2	0.12	1.3	0.54	ND (0.16)	3.4	ND (0.11)	NT	NT
CHRYSENE	70		0.30	0.36	0.18	0.46	2.5	0.28	4.0	0.96	ND (0.16)	6.4	ND (0.11)	NT	NT
DIBENZ(A,H)ANTHRACENE	0.7		ND (0.11)	ND (0.11)	ND (0.12)	ND (0.22)	0.41	ND (0.11)	0.51	0.19	ND (0.16)	**0.93**	ND (0.11)	NT	NT
FLUORANTHENE	1000		0.57	0.57	0.34	0.91	4.8	0.51	8.5	1.3	ND (0.16)	9.6	ND (0.11)	NT	NT
FLUORENE	1000		ND (0.11)	ND (0.11)	ND (0.12)	ND (0.22)	0.22	ND (0.11)	1.0	ND (0.11)	ND (0.16)	ND (0.23)	ND (0.11)	NT	NT
INDENO(1,2,3-CD)PYRENE	7		0.16	0.20	ND (0.12)	0.31	1.7	0.19	1.7	0.65	ND (0.16)	2.7	ND (0.11)	NT	NT
2-METHYLNAPHTHALENE	0.7		ND (0.11)	ND (0.11)	ND (0.12)	ND (0.22)	ND (0.11)	ND (0.11)	0.35	ND (0.11)	ND (0.16)	0.32	ND (0.11)	NT	NT
NAPHTHALENE	4		ND (0.11)	ND (0.11)	ND (0.12)	ND (0.22)	0.24	ND (0.11)	0.60	ND (0.11)	ND (0.16)	0.36	ND (0.11)	NT	NT
PHENANTHRENE	10		0.37	0.35	0.23	0.55	2.5	0.32	9.2	0.48	ND (0.16)	1.7	ND (0.11)	NT	NT
PYRENE	1000		0.58	0.65	0.35	0.89	4.9	0.53	8.6	1.4	ND (0.16)	11	ND (0.11)	NT	NT
MADEP-VPH-04-1.1 (mg/Kg dry)															
UNADJUSTED C5-C8 ALIPHATICS	~		ND (9.3)	ND (8.7)	ND (13)	ND (8.7)	ND (9.0)	ND (9.7)	ND (12)	ND (8.9)	ND (18)	ND (11)	ND (8.0)	NT	NT
C5-C8 ALIPHATICS	100		ND (9.3)	ND (8.7)	ND (13)	ND (8.7)	ND (9.0)	ND (9.7)	ND (12)	ND (8.9)	ND (18)	ND (11)	ND (8.0)	NT	NT
UNADJUSTED C9-C12 ALIPHATICS	~		ND (9.3)	ND (8.7)	ND (13)	ND (8.7)	ND (9.0)	ND (9.7)	ND (12)	19	ND (18)	ND (11)	ND (8.0)	NT	NT
C9-C12 ALIPHATICS	1000		ND (9.3)	ND (8.7)	ND (13)	ND (8.7)	ND (9.0)	ND (9.7)	ND (12)	9.7	ND (18)	ND (11)	ND (8.0)	NT	NT
C9-C10 AROMATICS	100		ND (9.3)	ND (8.7)	ND (13)	ND (8.7)	ND (9.0)	ND (9.7)	ND (12)	9.2	ND (18)	ND (11)	ND (8.0)	NT	NT
SW-846 6010C-D (mg/Kg dry) Metals															
ANTIMONY	20		ND (2.6)	ND (2.8)	ND (2.9)	ND (2.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (2.8)	ND (3.9)	ND (2.9)	ND (2.7)	NT	NT
ARSENIC	20	40	8.4	7.1	6.4	6.3	8.9	9.2	19	**24**	ND (3.9)	**190**	8.2	**180**	**140**
BARIUM	1000		41	35	49	53	25	30	130	28	26	31	26	NT	NT
BERYLLIUM	90		0.40	0.40	0.56	0.40	0.40	0.48	0.48	0.43	0.94	0.49	0.53	NT	NT
CADMIUM	70	60	0.37	0.36	0.30	0.52	0.37	0.43	0.80	1.0	ND (0.39)	6.6	0.34	NT	NT
CHROMIUM	100	200	15	14	10	14	12	14	31	14	9.1	18	22	NT	NT
LEAD	200		73	56	79	35	43	62	**780**	67	9.2	**230**	27	NT	NT
NICKEL	600		11	11	6.1	12	9.1	12	17	12	4.5	12	21	NT	NT
SELENIUM	400		ND (5.1)	ND (5.7)	ND (5.8)	ND (5.2)	ND (5.4)	ND (5.6)	ND (5.5)	ND (5.6)	ND (7.8)	ND (5.8)	ND (5.5)	NT	NT
SILVER	100		ND (0.51)	ND (0.57)	ND (0.58)	ND (0.52)	ND (0.54)	ND (0.56)	ND (0.55)	ND (0.56)	ND (0.78)	ND (0.58)	ND (0.55)	NT	NT
THALLIUM	8		ND (2.6)	ND (2.8)	ND (2.9)	ND (2.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (2.8)	ND (3.9)	ND (2.9)	ND (2.7)	NT	NT
VANADIUM	400		14	13	13	22	12	14	27	15	14	31	18	NT	NT
ZINC	1000		55	62	43	55	26	40	100	76	10	51	28	NT	NT
SW-846 7471B (mg/Kg dry) Metals															
MERCURY	20	300	0.040	0.032	0.074	0.045	0.062	0.073	0.67	0.085	ND (0.038)	0.26	0.027	NT	NT
SW-846 8260C (mg/Kg wet)															
ACETONE	6		ND (0.13)	ND (0.071)	ND (0.086)	ND (0.073)	ND (0.076)	ND (0.082)	ND (0.090)	ND (0.075)	ND (0.13)	ND (3.0)	ND (0.12)	NT	NT
TERT-AMYL METHYL ETHER	~		ND (0.0013)	ND (0.00071)	ND (0.00086)	ND (0.00073)	ND (0.00076)	ND (0.00082)	ND (0.00090)	ND (0.00075)	ND (0.0013)	ND (0.030)	ND (0.0012)	NT	NT
BENZENE	2		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
BROMOBENZENE	100		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
BROMOCHLOROMETHANE	~		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT

Table 1
Summary of Soil Analytical Results
Lowell High School - 50 Father Morissette Blvd
Lowell, Massachusetts

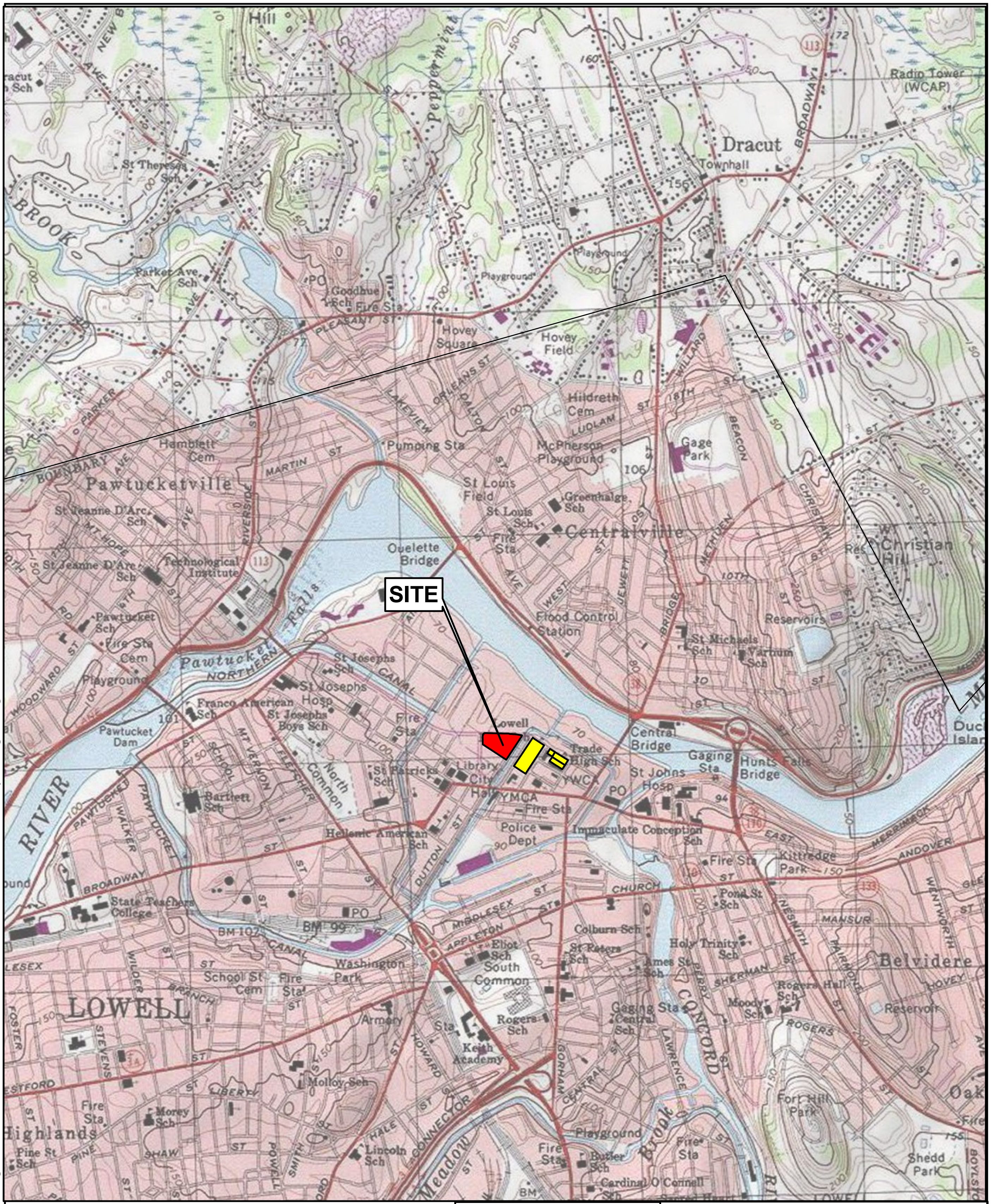
SAMPLE LOCATION			NOB-101	FD-01	NOB-101	NOB-102	NOB-102	NOB-104	NOB-104	NOB-105	NOB-105	NOB-106	NOB-106	NOB-106N	NOB-106S
SAMPLE DATE			3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	4/11/2017	4/11/2017
SAMPLE DEPTH (feet bgs)			0-2 Feet	0-2 Feet	6-8 Feet	0-2 Feet	7-8 Feet	0-2 Feet	5-5.5 Feet	0-2 Feet	11-12 Feet	0-2 Feet	4-5 Feet	0-1 Foot	0-1 Foot
	RCS-1	IH													
SW-846 8260C (mg/Kg wet)															
BROMODICHLOROMETHANE	0.1		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
BROMOFORM	0.1		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.12) *	ND (0.0023)	NT	NT
BROMOMETHANE	0.5		ND (0.013)	ND (0.0071)	ND (0.0086)	ND (0.0073)	ND (0.0076)	ND (0.0082)	ND (0.0090)	ND (0.0075)	ND (0.013)	ND (0.30)	ND (0.012)	NT	NT
2-BUTANONE (MEK)	4		ND (0.053)	ND (0.028)	ND (0.034)	ND (0.029)	ND (0.031)	ND (0.033)	ND (0.036)	ND (0.030)	ND (0.052)	ND (1.2)	ND (0.047)	NT	NT
N-BUTYLBENZENE	~		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
SEC-BUTYLBENZENE	~		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
TERT-BUTYLBENZENE	100		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
TERT-BUTYLETHYL ETHER	~		ND (0.0013)	ND (0.00071)	ND (0.00086)	ND (0.00073)	ND (0.00076)	ND (0.00082)	ND (0.00090)	ND (0.00075)	ND (0.0013)	ND (0.030)	ND (0.0012)	NT	NT
CARBON DISULFIDE	100		ND (0.0079)	ND (0.0043)	ND (0.0051)	ND (0.0044)	ND (0.0046)	ND (0.0049)	ND (0.0054)	ND (0.0045)	ND (0.0077)	ND (0.61)	ND (0.0070)	NT	NT
CARBON TETRACHLORIDE	5		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
CHLOROBENZENE	1		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
CHLORODIBROMOMETHANE	0.005		ND (0.0013)	ND (0.0014)	ND (0.00086)	ND (0.00073)	ND (0.00076)	ND (0.00082)	ND (0.00090)	ND (0.00075)	ND (0.0026)	ND (0.061) *	ND (0.0023)	NT	NT
CHLOROETHANE	100		ND (0.013)	ND (0.0071)	ND (0.0086)	ND (0.0073)	ND (0.0076)	ND (0.0082)	ND (0.0090)	ND (0.0075)	ND (0.013)	ND (0.12)	ND (0.012)	NT	NT
CHLOROFORM	0.2		ND (0.0053)	ND (0.0028)	ND (0.0034)	ND (0.0029)	ND (0.0031)	ND (0.0033)	ND (0.0036)	ND (0.0030)	ND (0.0052)	ND (0.12)	ND (0.0047)	NT	NT
CHLOROMETHANE	100		ND (0.013)	ND (0.0071)	ND (0.0086)	ND (0.0073)	ND (0.0076)	ND (0.0082)	ND (0.0090)	ND (0.0075)	ND (0.013)	ND (0.12)	ND (0.012)	NT	NT
2-CHLOROTOLUENE	100		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
4-CHLOROTOLUENE	~		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,2-DIBROMO-3-CHLOROPROPANE	10		ND (0.0026)	ND (0.0028)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0052)	ND (0.24)	ND (0.0047)	NT	NT
1,2-DIBROMOETHANE (EDB)	0.1		ND (0.0013)	ND (0.0014)	ND (0.00086)	ND (0.00073)	ND (0.00076)	ND (0.00082)	ND (0.00090)	ND (0.00075)	ND (0.0026)	ND (0.030)	ND (0.0023)	NT	NT
DIBROMOMETHANE	500		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,2-DICHLOROBENZENE	9		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,3-DICHLOROBENZENE	3		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,4-DICHLOROBENZENE	0.7		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
DICHLORODIFLUOROMETHANE	1000		ND (0.013)	ND (0.0071)	ND (0.0086)	ND (0.0073)	ND (0.0076)	ND (0.0082)	ND (0.0090)	ND (0.0075)	ND (0.013)	ND (0.12)	ND (0.012)	NT	NT
1,1-DICHLOROETHANE	0.4		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,2-DICHLOROETHANE	0.1		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,1-DICHLOROETHYLENE	3		ND (0.0053)	ND (0.0028)	ND (0.0034)	ND (0.0029)	ND (0.0031)	ND (0.0033)	ND (0.0036)	ND (0.0030)	ND (0.0052)	ND (0.061)	ND (0.0047)	NT	NT
CIS-1,2-DICHLOROETHYLENE	0.1		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
TRANS-1,2-DICHLOROETHYLENE	1		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,2-DICHLOROPROPANE	0.1		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,3-DICHLOROPROPANE	500		ND (0.0013)	ND (0.00071)	ND (0.00086)	ND (0.00073)	ND (0.00076)	ND (0.00082)	ND (0.00090)	ND (0.00075)	ND (0.0013)	ND (0.030)	ND (0.0012)	NT	NT
2,2-DICHLOROPROPANE	~		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,1-DICHLOROPROPENE	~		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.12)	ND (0.0023)	NT	NT
CIS-1,3-DICHLOROPROPENE	~		ND (0.0013)	ND (0.00071)	ND (0.00086)	ND (0.00073)	ND (0.00076)	ND (0.00082)	ND (0.00090)	ND (0.00075)	ND (0.0013)	ND (0.030)	ND (0.0012)	NT	NT
TRANS-1,3-DICHLOROPROPENE	~		ND (0.0013)	ND (0.00071)	ND (0.00086)	ND (0.00073)	ND (0.00076)	ND (0.00082)	ND (0.00090)	ND (0.00075)	ND (0.0013)	ND (0.030)	ND (0.0012)	NT	NT
DIETHYL ETHER	100		ND (0.013)	ND (0.0071)	ND (0.0086)	ND (0.0073)	ND (0.0076)	ND (0.0082)	ND (0.0090)	ND (0.0075)	ND (0.013)	ND (0.12)	ND (0.012)	NT	NT
DIISOPROPYL ETHER	100		ND (0.0013)	ND (0.00071)	ND (0.00086)	ND (0.00073)	ND (0.00076)	ND (0.00082)	ND (0.00090)	ND (0.00075)	ND (0.0013)	ND (0.030)	ND (0.0012)	NT	NT
1,4-DIOXANE	0.2		ND (0.26) *	ND (0.14)	ND (0.17)	ND (0.15)	ND (0.15)	ND (0.16)	ND (0.18)	ND (0.15)	ND (0.26) *	ND (3.0) *	ND (0.23) *	NT	NT
ETHYLBENZENE	40		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
HEXACHLOROBUTADIENE	30		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
2-HEXANONE	100		ND (0.026)	ND (0.014)	ND (0.017)	ND (0.015)	ND (0.015)	ND (0.016)	ND (0.018)	ND (0.015)	ND (0.026)	ND (0.61)	ND (0.023)	NT	NT
ISOPROPYLBENZENE	1000		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
P-ISOPROPYLTOLUENE	100		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
METHYL TERT-BUTYL ETHER (MTBE)	0.1		ND (0.0053)	ND (0.0028)	ND (0.0034)	ND (0.0029)	ND (0.0031)	ND (0.0033)	ND (0.0036)	ND (0.0030)	ND (0.0052)	ND (0.061)	ND (0.0047)	NT	NT
METHYLENE CHLORIDE	0.1		ND (0.013)	ND (0.0071)	ND (0.0086)	ND (0.0073)	ND (0.0076)	ND (0.0082)	ND (0.0090)	ND (0.0075)	ND (0.013)	ND (0.30) *	ND (0.012)	NT	NT
4-METHYL-2-PENTANONE (MIBK)	0.4		ND (0.026)	ND (0.014)	ND (0.017)	ND (0.015)	ND (0.015)	ND (0.016)	ND (0.018)	ND (0.015)	ND (0.026)	ND (0.61) *	ND (0.023)	NT	NT
NAPHTHALENE	4		ND (0.0053)	ND (0.0071)	ND (0.0034)	ND (0.0029)	0.0095	ND (0.0033)	ND (0.0036)	ND (0.0030)	ND (0.013)	ND (0.12)	ND (0.012)	NT	NT
N-PROPYLBENZENE	100		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
STYRENE	3		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT

Table 1
Summary of Soil Analytical Results
Lowell High School - 50 Father Morissette Blvd
Lowell, Massachusetts

SAMPLE LOCATION			NOB-101	FD-01	NOB-101	NOB-102	NOB-102	NOB-104	NOB-104	NOB-105	NOB-105	NOB-106	NOB-106	NOB-106N	NOB-106S
SAMPLE DATE			3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	3/29/2017	4/11/2017	4/11/2017
SAMPLE DEPTH (feet bgs)			0-2 Feet	0-2 Feet	6-8 Feet	0-2 Feet	7-8 Feet	0-2 Feet	5-5.5 Feet	0-2 Feet	11-12 Feet	0-2 Feet	4-5 Feet	0-1 Foot	0-1 Foot
	RCS-1	**IH**													
SW-846 8260C (mg/Kg wet)															
1,1,1,2-TETRACHLOROETHANE	0.1		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,1,2,2-TETRACHLOROETHANE	0.005		ND (0.0053) *	ND (0.00071)	ND (0.0034)	ND (0.0029)	ND (0.0031)	ND (0.0033)	ND (0.0018)	ND (0.0030)	ND (0.0013)	ND (0.030) *	ND (0.0012)	NT	NT
TETRACHLOROETHYLENE	1		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
TETRAHYDROFURAN	500		ND (0.013)	ND (0.0071)	ND (0.0086)	ND (0.0073)	ND (0.0076)	ND (0.0082)	ND (0.0090)	ND (0.0075)	ND (0.013)	ND (0.24)	ND (0.012)	NT	NT
TOLUENE	30		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,2,3-TRICHLOROBENZENE	~		ND (0.0026)	ND (0.0071)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.013)	ND (0.24)	ND (0.012)	NT	NT
1,2,4-TRICHLOROBENZENE	2		ND (0.0026)	ND (0.0071)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.013)	ND (0.061)	ND (0.012)	NT	NT
1,1,1-TRICHLOROETHANE	30		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,1,2-TRICHLOROETHANE	0.1		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
TRICHLOROETHYLENE	0.3		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
TRICHLOROFLUOROMETHANE	1000		ND (0.013)	ND (0.0071)	ND (0.0086)	ND (0.0073)	ND (0.0076)	ND (0.0082)	ND (0.0090)	ND (0.0075)	ND (0.013)	ND (0.12)	ND (0.012)	NT	NT
1,2,3-TRICHLOROPROPANE	100		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.12)	ND (0.0023)	NT	NT
1,2,4-TRIMETHYLBENZENE	1000		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
1,3,5-TRIMETHYLBENZENE	10		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
VINYL CHLORIDE	0.7		ND (0.013)	ND (0.0071)	ND (0.0086)	ND (0.0073)	ND (0.0076)	ND (0.0082)	ND (0.0090)	ND (0.0075)	ND (0.013)	ND (0.12)	ND (0.012)	NT	NT
M/P-XYLENE	100		ND (0.0053)	ND (0.0028)	ND (0.0034)	ND (0.0029)	ND (0.0031)	ND (0.0033)	ND (0.0036)	ND (0.0030)	ND (0.0052)	ND (0.12)	ND (0.0047)	NT	NT
O-XYLENE	100		ND (0.0026)	ND (0.0014)	ND (0.0017)	ND (0.0015)	ND (0.0015)	ND (0.0016)	ND (0.0018)	ND (0.0015)	ND (0.0026)	ND (0.061)	ND (0.0023)	NT	NT
SM 2540G (% Wt)															
% Solids	~		89.9	90.8	84.6	90.6	90.7	88.8	91.3	89.7	63.1	86.0	87.3	90.7	89.3

NOTES:
1. RCS-1 = Reportable Concentrations for Category S-1 Soil
2. RCS-2 = Reportable Concentrations for Category S-2 Soil
3. IH = Imminent Hazard Threshold established in Section 310 CMR 40.0321 of the MCP.
4. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
5. ND = Not detected above the lab reporting limits shown in parenthesis.
6. NT = Not tested.
7. ~ = No RCS-1 available
8. Shaded values exceed the applicable MCP Reportable Concentrations (RCs).
9. Black shaded values exceed the Imminent Hazard threshold and meet the other criteria for Imminent Hazard.

FIGURES



USGS Topographic Map
Lowell, Mass.
Revised 1987

0 500 1,000 2,000

Feet 1 inch = 2,000 feet

N

Nobis

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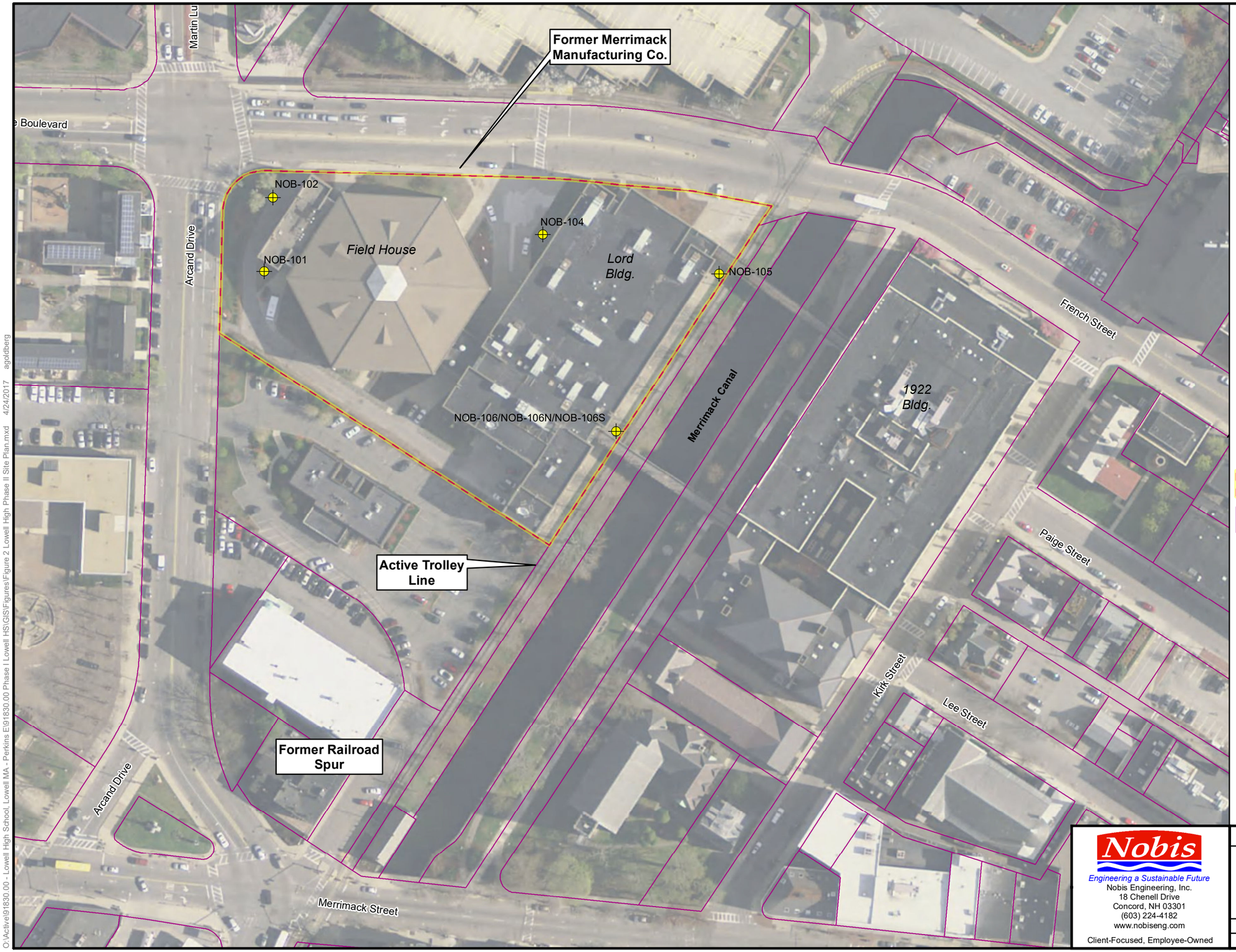
Client-Focused, Employee-Owned

FIGURE 1

LOCUS MAP
LOWELL HIGH SCHOOL
PHASE I INVESTIGATION
LOWELL, MASSACHUSETTS

PREPARED BY: AG	CHECKED BY: EJ
PROJECT NO. 91830.01	DATE: APRIL 2017

Path: O:\Active\91830.00 - Lowell High School, Lowell MA - Perkins E\91830.01 Phase II Lowell HS-Phase I Cawley\GIS\Figures\Figure 1 Locus.mxd **Date Printed:** 4/24/2017



Notes:

1. Locations of site features depicted hereon are approximate and given for illustrative purposes only.

Legend

- Existing Soil Borings
- 50 Father Morissette Blv. Parcel
- Parcels

N

0 50 100 200

Feet

1 inch = 100 feet

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FIGURE 2

PHASE II INVESTIGATION
LOWELL HIGH SCHOOL
PHASE I INVESTIGATION
LOWELL, MASSACHUSETTS

PREPARED BY: JH	CHECKED BY: EJ
PROJECT NO. 91830.00	DATE: MARCH 2017

APPENDIX A

APPENDIX A
LIMITATIONS

1) These environmental services were performed in accordance with generally accepted practices of other consultants undertaking similar assessments at the same time and in the same geographical area. The results of this assessment are based on our professional judgment and are not scientific certainties. Specifically, Nobis Engineering, Inc. does not and cannot represent that the site contains no hazardous wastes, oil or other latent conditions beyond those observed during this assessment. No other warranty, express or implied, is made.

2) The observations and conclusions presented in this report were made solely on the basis of conditions described in the report and not on scientific tasks or procedures beyond the scope of described services or the budgetary and time constraints imposed by the client.

3) Observations were made of the site as indicated in this report. Where access to portions of the site was unavailable or limited, Nobis Engineering, Inc. renders no opinion as to the presence of hazardous wastes or the presence of indirect evidence of hazardous wastes in that portion of the site.

4) No property boundary, site feature or topographic surveys of the site were performed by Nobis Engineering, Inc. unless specifically indicated in the text of the report.

5) No sampling or testing was performed for the presence of dioxins, furans, pesticides, herbicides, radon, lead paint, urea-formaldehyde, asbestos or polychlorinated biphenyls (PCBs) at the site unless specifically indicated in the text of the report.

6) Chemical analyses have been performed for specific parameters during this assessment, as described in the text of the report. Additional chemical constituents not searched for during the current study may be present in soil and/or groundwater at the site. In addition, where such analyses have been conducted by an outside laboratory, Nobis Engineering, Inc. has relied upon the data provided and has not conducted an independent evaluation of the reliability of these data.

7) This report has been prepared for the exclusive use of Perkins Eastman and the City of Lowell solely for use in an environmental evaluation of the site. This report shall not, in whole or in part, be conveyed to any other party, other than Perkins Eastman or the City of Lowell without prior written consent of Nobis Engineering, Inc.

APPENDIX B

BORING LOG

Nobis — Engineering a Sustainable Future

Project: Lowell High School Phase II ESA

Location: 50 Father Morissette Blvd, Lowell, MA

Nobis Project No.: 91830.01

Boring No.: **NOB-101**

Boring Location: See Site Plan

Checked by: S. Vetere

Date Start: March 29, 2017

Date Finish: March 29, 2017

Contractor: Drilex Environmental, Inc.

Driller: T. LaFleche

Nobis Rep.: E. Johnson

Rig Type / Model: Geoprobe 6620DT

Hammer Type: N/A

Hammer Hoist: N/A

Ground Surface Elev.:

Datum:

	Drilling Method	Sampler
Type	Geoprobe	Macro-Core Liners
Size ID (in.)	1 3/4"	1.75 x 60
Advancement	Push	Push

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft.)	Blows/ 6 in.	Ground Water	LITHOLOGY Graphic	Stratum Elev. / Depth (ft.)	SAMPLE DESCRIPTION AND REMARKS (Classification System: Modified Burmister)	NOTES
1							FILL	First 5 feet pre-cleared using vacuum excavation to avoid subsurface utilities. Excavated cuttings observed to be brown, fine to medium SAND, some cobbles, brick, and concrete fragments..	
2									
3									
4									
5									
6	S-1	36	5-10					S-1A (8"): Brown, medium SAND, little Gravel. moist. S-1B (10"): Dark brown/black, fine to medium SAND, some Silt, little Gravel, trace Brick fragments. moist.	
7							/ 6.5	S-1C (18"): Light brown, fine to medium SAND, some Silt. moist. Percentage of silt decreases with increased depth.	
8									
9							SILTY SAND		
10									
11	S-2	52	10-15				/ 11.0	S-2A (12"): Collapse material. S-2B (8"): Light brown/tan/gray, fine SAND, some Silt. wet. Orange banding observed every 2" to 3".	
12								S-2C (32"): Orange brown, fine to medium SAND. wet.	
13							SAND		
14									
15							/ 15.0		
16								Boring terminated at 15 feet.	

Soil	Percentage	Non-Soil
trace	5 - 10	very few
little	10 - 20	few
some	20 - 35	several
and	35 - 50	numerous

NOTES:

1) Samples collected from 0' - 2' and 6' - 8' for laboratory analysis. Shallow sample collected from side of pre-cleared borehole.

Soil descriptions are based on visual classifications and should be considered approximate. Stratification lines are approximate boundaries between stratums; transitions may be gradual.

BORING LOG

Nobis — Engineering a Sustainable Future

Project: Lowell High School Phase II ESA

Location: 50 Father Morissette Blvd, Lowell, MA

Nobis Project No.: 91830.01

Boring No.: **NOB-102**

Boring Location: See Site Plan

Checked by: S. Vetere

Date Start: March 29, 2017

Date Finish: March 29, 2017

Contractor: Drilex Environmental, Inc.

Driller: T. LaFleche

Nobis Rep.: E. Johnson

Rig Type / Model: Geoprobe 6620DT

Hammer Type: N/A

Hammer Hoist: N/A

Ground Surface Elev.:

Datum:

	Drilling Method	Sampler
Type	Geoprobe	Macro-Core Liners
Size ID (in.)	1 3/4"	1.75 x 60
Advancement	Push	Push

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft.)	Blows/ 6 in.	Ground Water	LITHOLOGY Graphic	Stratum Elev. / Depth (ft.)	SAMPLE DESCRIPTION AND REMARKS (Classification System: Modified Burmister)	NOTES
1								First 5 feet pre-cleared using vacuum excavation to avoid subsurface utilities. Excavated cuttings observed to be brown, fine to medium SAND.	
2									
3									
4									
5							FILL		
6	S-1	29	5-10					S-1A (22"): Brown/dark brown, fine to coarse SAND, some Gravel, trace Debris (brick, mortar, coal fragments), trace Silt. moist. (FILL).	
7								S-1B (7"): Tan, fine to medium SAND. moist. Well sorted.	
8							/ 8.0		
9									
10									
11	S-2	3	10-15					S-2: Minimal recovery, tan homogeneous fine to medium SAND. wet.	
12							SAND		
13									
14									
15							/ 15.0		
16								Boring terminated at 15 feet.	

Soil	Percentage	Non-Soil
trace	5 - 10	very few
little	10 - 20	few
some	20 - 35	several
and	35 - 50	numerous

NOTES:

1) Samples collected from 0' - 2' and 7' - 8' for laboratory analysis. Shallow sample collected from side of pre-cleared borehole.

Soil descriptions are based on visual classifications and should be considered approximate. Stratification lines are approximate boundaries between stratums; transitions may be gradual.

BORING LOG

Nobis — Engineering a Sustainable Future

Project: Lowell High School Phase II ESA

Location: 50 Father Morissette Blvd, Lowell, MA

Nobis Project No.: 91830.01

Boring No.: **NOB-104**

Boring Location: See Site Plan

Checked by: S. Vetere

Date Start: March 29, 2017

Date Finish: March 29, 2017

Contractor: Drilex Environmental, Inc.

Driller: T. LaFleche

Nobis Rep.: E. Johnson

Rig Type / Model: Geoprobe 6620DT

Hammer Type: N/A

Hammer Hoist: N/A

Ground Surface Elev.:

Datum:

	Drilling Method	Sampler
Type	Geoprobe	Macro-Core Liners
Size ID (in.)	1 3/4"	1.75 x 60
Advancement	Push	Push

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft.)	Blows/ 6 in.	Ground Water	LITHOLOGY Graphic	Stratum Elev. / Depth (ft.)	SAMPLE DESCRIPTION AND REMARKS (Classification System: Modified Burmister)	NOTES
1								First 4 feet pre-cleared using vacuum excavation to avoid subsurface utilities. Excavated cuttings observed to be brown, fine to medium SAND. Preclearing terminated prior to 5 feet when gravel/cobbles encountered.	
2									
3							FILL		
4									
5									
6	S-1	12	5-5.5				/ 5.5	S-1A (4"): Collapse material, brown medium Sand. S-1B (8"): Dark brownish gray, fine to coarse SAND and Silt. and Cobbles/Concrete fragments. moist. (FILL). Final 3-4" concrete fragments/dust. Refusal on concrete former slab or foundation. Boring terminated at 5.5 feet.	
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

Soil	Percentage	Non-Soil
trace	5 - 10	very few
little	10 - 20	few
some	20 - 35	several
and	35 - 50	numerous

NOTES:

1) Samples collected from 0' - 2' and 5' - 5.5' for laboratory analysis. Shallow sample collected from side of pre-cleared borehole.

Soil descriptions are based on visual classifications and should be considered approximate. Stratification lines are approximate boundaries between stratums; transitions may be gradual.

BORING LOG

Engineering a Sustainable Future

Project: Lowell High School Phase II ESA

Location: 50 Father Morissette Blvd, Lowell, MA

Nobis Project No.: 91830.01

Boring No.: **NOB-105**

Boring Location: See Site Plan

Checked by: S. Vetere

Date Start: March 29, 2017

Date Finish: March 29, 2017

Contractor: Drilex Environmental, Inc.

Driller: T. LaFleche

Nobis Rep.: E. Johnson

Rig Type / Model: Geoprobe 6620DT

Hammer Type: N/A

Hammer Hoist: N/A

Ground Surface Elev.:

Datum:

	Drilling Method	Sampler
Type	Geoprobe	Macro-Core Liners
Size ID (in.)	1 3/4"	1.75 x 60
Advancement	Push	Push

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft.)	Blows/ 6 in.	Ground Water	LITHOLOGY Graphic	Stratum Elev. / Depth (ft.)	SAMPLE DESCRIPTION AND REMARKS (Classification System: Modified Burmister)	NOTES
1								First 5 feet pre-cleared using vacuum excavation to avoid subsurface utilities. Excavated cuttings observed to be dark brown, fine SAND, some Silt, little medium to coarse Sand, trace Gravel.	
2									
3									
4									
5									
6	S-1	23	5-10				FILL	S-1: Light brown, fine to coarse SAND, little Silt, little Gravel. wet. Two pockets of dark brown/black SILT, potentially organic deposits at 11-12" and 16-18". Gray coarse GRAVEL observed 20"-22".	
7									
8									
9									
10									
11	S-2	29	10-15				SANDY SILT	S-2A (2"): Light brown, fine to coarse SAND, little Silt, little Gravel. S-2B (8"): Dark brown, SILT, little fine Sand, trace Clay, trace Organics. wet. Swamp odor detected. S-2C (19"): Light gray, fine SAND. wet. Well sorted. Iron/orange banding observed.	
12							/ 12.0		
13							SAND		
14									
15							/ 15.0		
16								Boring terminated at 15 feet.	

Soil	Percentage	Non-Soil
trace	5 - 10	very few
little	10 - 20	few
some	20 - 35	several
and	35 - 50	numerous

NOTES:

1) Samples collected from 0' - 2' and 11' - 12' for laboratory analysis. Shallow sample collected from side of pre-cleared borehole.

Soil descriptions are based on visual classifications and should be considered approximate. Stratification lines are approximate boundaries between stratums; transitions may be gradual.

BORING LOG

Nobis — Engineering a Sustainable Future

Project: Lowell High School Phase II ESA

Location: 50 Father Morissette Blvd, Lowell, MA

Nobis Project No.: 91830.01

Boring No.: **NOB-106**

Boring Location: See Site Plan

Checked by: S. Vetere

Date Start: March 29, 2017

Date Finish: March 29, 2017

Contractor: Drilex Environmental, Inc.

Driller: T. LaFleche

Nobis Rep.: E. Johnson

Rig Type / Model: Geoprobe 6620DT

Hammer Type: N/A

Hammer Hoist: N/A

Ground Surface Elev.:

Datum:

	Drilling Method	Sampler
Type	Geoprobe	Macro-Core Liners
Size ID (in.)	1 3/4"	1.75 x 60
Advancement	Push	Push

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft.)	Blows/ 6 in.	Ground Water	LITHOLOGY Graphic	Stratum Elev. / Depth (ft.)	SAMPLE DESCRIPTION AND REMARKS (Classification System: Modified Burmister)	NOTES
1	S-1	26	0-5					S-1A (7"): Dark brown/black, fine to medium SAND, little Organics (grass), trace Brick fragments, trace Gravel. moist. S-1B (19"): Light brown, fine to coarse SAND, little Gravel, trace Silt. moist. Material becomes wet at approximately 4 feet below grade.	
2									
3									
4							FILL		
5									
6	S-2	36	5-10					S-2A (29"): Light brown with brown lenses, fine to medium SAND, little Silt, little Gravel.	
7									
8							/ 8.0	S-2B (3"): Dark brown/black, SILT. wet. S-2C (4"): Orange, fine SAND and Silt. moist.	
9							ORGANIC DEPOSIT / 8.3		
10							SILTY SAND		
11	S-3	44	10-15				/ 10.5	S-3A (6"): Orange, fine SAND and Silt. moist. S-3B (38"): Light tan, almost white, fine to coarse SAND, little Gravel, trace Silt. wet.	
12									
13							SAND		
14									
15							/ 15.0		
16								Boring terminated at 15 feet.	

Soil	Percentage	Non-Soil
trace	5 - 10	very few
little	10 - 20	few
some	20 - 35	several
and	35 - 50	numerous

NOTES:

1) Samples collected from 0' - 2' and 6' - 8' for laboratory analysis. Shallow sample collected from side of pre-cleared borehole.

Soil descriptions are based on visual classifications and should be considered approximate. Stratification lines are approximate boundaries between stratums; transitions may be gradual.

APPENDIX C

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

April 10, 2017

Eric Johnson
Nobis Engineering
585 Middlesex Street
Lowell, MA 01851

Project Location: Lowell, MA
Client Job Number:
Project Number: 91830.01
Laboratory Work Order Number: 17C1191

Enclosed are results of analyses for samples received by the laboratory on March 30, 2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Meghan E. Kelley
Project Manager

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con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Nobis Engineering
585 Middlesex Street
Lowell, MA 01851
ATTN: Eric Johnson

REPORT DATE: 4/10/2017

PURCHASE ORDER NUMBER: MO 16-008

PROJECT NUMBER: 91830.01

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 17C1191

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

PROJECT LOCATION: Lowell, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
NOB-101 0-2	17C1191-01	Soil		MADEP-EPH-04-1.1	
				MADEP-VPH-04-1.1	
				SM 2540G	
				SW-846 6010C-D	
				SW-846 7471B	
				SW-846 8260C	
NOB-101 6-8	17C1191-02	Soil		MADEP-EPH-04-1.1	
				MADEP-VPH-04-1.1	
				SM 2540G	
				SW-846 6010C-D	
				SW-846 7471B	
				SW-846 8260C	
NOB-102 0-2	17C1191-03	Soil		MADEP-EPH-04-1.1	
				MADEP-VPH-04-1.1	
				SM 2540G	
				SW-846 6010C-D	
				SW-846 7471B	
				SW-846 8260C	
NOB-102 7-8	17C1191-04	Soil		MADEP-EPH-04-1.1	
				MADEP-VPH-04-1.1	
				SM 2540G	
				SW-846 6010C-D	
				SW-846 7471B	
				SW-846 8260C	
NOB-104 0-2	17C1191-05	Soil		MADEP-EPH-04-1.1	
				MADEP-VPH-04-1.1	
				SM 2540G	
				SW-846 6010C-D	
				SW-846 7471B	
				SW-846 8260C	
NOB-104 5-5.5	17C1191-06	Soil		MADEP-EPH-04-1.1	
				MADEP-VPH-04-1.1	
				SM 2540G	
				SW-846 6010C-D	
				SW-846 7471B	
				SW-846 8260C	

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

Nobis Engineering
585 Middlesex Street
Lowell, MA 01851
ATTN: Eric Johnson

REPORT DATE: 4/10/2017

PURCHASE ORDER NUMBER: MO 16-008

PROJECT NUMBER: 91830.01

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 17C1191

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

PROJECT LOCATION: Lowell, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
NOB-105 0-2	17C1191-07	Soil		MADEP-EPH-04-1.1	
				MADEP-VPH-04-1.1	
				SM 2540G	
				SW-846 6010C-D	
				SW-846 7471B	
				SW-846 8260C	
NOB-105 11-12	17C1191-08	Soil		MADEP-EPH-04-1.1	
				MADEP-VPH-04-1.1	
				SM 2540G	
				SW-846 6010C-D	
				SW-846 7471B	
				SW-846 8260C	
NOB-106 0-2	17C1191-09	Soil		MADEP-EPH-04-1.1	
				MADEP-VPH-04-1.1	
				SM 2540G	
				SW-846 6010C-D	
				SW-846 7471B	
				SW-846 8260C	
NOB-106 4-5	17C1191-10	Soil		MADEP-EPH-04-1.1	
				MADEP-VPH-04-1.1	
				SM 2540G	
				SW-846 6010C-D	
				SW-846 7471B	
				SW-846 8260C	
FD-01	17C1191-11	Soil		MADEP-EPH-04-1.1	
				MADEP-VPH-04-1.1	
				SM 2540G	
				SW-846 6010C-D	
				SW-846 7471B	
				SW-846 8260C	
TB-01	17C1191-12	Trip Blank Soil		SW-846 8260C	

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

CASE NARRATIVE SUMMARY

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

For method MA VPH, only hydrocarbon ranges were requested and reported.

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MADEP-VPH-04-1.1

Qualifications:

O-01

Soil/methanol ratio does not meet method specifications. Excess amount of soil. Sample was completely covered with methanol, but with less than the method-specified amount.

Analyte & Samples(s) Qualified:

17C1191-01[NOB-101 0-2], 17C1191-03[NOB-102 0-2], 17C1191-04[NOB-102 7-8], 17C1191-05[NOB-104 0-2], 17C1191-07[NOB-105 0-2], 17C1191-08[NOB-105 11-12], 17C1191-09[NOB-106 0-2], 17C1191-10[NOB-106 4-5], 17C1191-11[FD-01]

SW-846 6010C-D

Qualifications:

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Barium

17C1191-06[NOB-104 5-5.5], B173743-MS1

Lead

17C1191-06[NOB-104 5-5.5], B173743-MS1

SW-846 7471B

Qualifications:

R-02

Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.

Analyte & Samples(s) Qualified:

Mercury

17C1191-09[NOB-106 0-2], B173810-DUP1

SW-846 8260C

Qualifications:

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Bromochloromethane

B173594-BSD1

Hexachlorobutadiene

B173594-BSD1

Isopropylbenzene (Cumene)

B173524-BSD1, B173594-BSD1

sec-Butylbenzene

B173594-BSD1

Vinyl Chloride

B173532-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:

1,4-Dioxane

17C1191-08[NOB-105 11-12], 17C1191-10[NOB-106 4-5], 17C1191-11[FD-01], 17C1191-12[TB-01], B173635-BLK1, B173635-BS1, B173635-BSD1

Chloroethane

17C1191-01[NOB-101 0-2], 17C1191-02[NOB-101 6-8], 17C1191-03[NOB-102 0-2], 17C1191-04[NOB-102 7-8], 17C1191-05[NOB-104 0-2], 17C1191-07[NOB-105 0-2], B173524-BLK1, B173524-BS1, B173524-BSD1

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RL-07

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

Analyte & Samples(s) Qualified:

Bromomethane
17C1191-09[NOB-106 0-2]

Carbon Disulfide
17C1191-09[NOB-106 0-2]

Methylene Chloride
17C1191-09[NOB-106 0-2]

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:

1,1,1,2-Tetrachloroethane
17C1191-08[NOB-105 11-12], 17C1191-10[NOB-106 4-5], 17C1191-11[FD-01], 17C1191-12[TB-01], B173635-BLK1, B173635-BS1, B173635-BSD1

1,2-Dibromo-3-chloropropane (DB
17C1191-01[NOB-101 0-2], 17C1191-02[NOB-101 6-8], 17C1191-03[NOB-102 0-2], 17C1191-04[NOB-102 7-8], 17C1191-05[NOB-104 0-2], 17C1191-07[NOB-105 0-2], B173524-BLK1, B173524-BS1, B173524-BSD1

Bromoform
17C1191-08[NOB-105 11-12], 17C1191-10[NOB-106 4-5], 17C1191-11[FD-01], 17C1191-12[TB-01], B173635-BLK1, B173635-BS1, B173635-BSD1

Chlorodibromomethane
17C1191-08[NOB-105 11-12], 17C1191-10[NOB-106 4-5], 17C1191-11[FD-01], 17C1191-12[TB-01], B173635-BLK1, B173635-BS1, B173635-BSD1

Naphthalene
17C1191-01[NOB-101 0-2], 17C1191-02[NOB-101 6-8], 17C1191-03[NOB-102 0-2], 17C1191-04[NOB-102 7-8], 17C1191-05[NOB-104 0-2], 17C1191-07[NOB-105 0-2], B173524-BLK1, B173524-BS1, B173524-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
17C1191-01[NOB-101 0-2], 17C1191-02[NOB-101 6-8], 17C1191-03[NOB-102 0-2], 17C1191-04[NOB-102 7-8], 17C1191-05[NOB-104 0-2], 17C1191-06[NOB-104 5-5.5], 17C1191-07[NOB-105 0-2], 17C1191-08[NOB-105 11-12], 17C1191-09[NOB-106 0-2], 17C1191-10[NOB-106 4-5], 17C1191-11[FD-01], 17C1191-12[TB-01], B173524-BLK1, B173524-BS1, B173524-BSD1, B173532-BLK1, B173532-BS1, B173532-BSD1, B173594-BLK1, B173594-BS1, B173594-BSD1, B173635-BLK1, B173635-BS1, B173635-BSD1

Tetrahydrofuran
17C1191-01[NOB-101 0-2], 17C1191-02[NOB-101 6-8], 17C1191-03[NOB-102 0-2], 17C1191-04[NOB-102 7-8], 17C1191-05[NOB-104 0-2], 17C1191-06[NOB-104 5-5.5], 17C1191-07[NOB-105 0-2], B173524-BLK1, B173524-BS1, B173524-BSD1, B173594-BLK1, B173594-BS1, B173594-BSD1

V-20

Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

Acetone
B173594-BS1, B173594-BSD1

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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 in methanol with a soil/methanol ratio of 1:1 +/- 25% completely covered by methanol in the proper containers specified on the chain-of-custody form unless specified in this narrative.

SW-846 6010C/D SW-846 6020A/B

For NC, Metals methods SW-846 6010D and SW-846 6020B are followed, and for all other states methods SW-846 6010C and SW-846 6020A are followed.

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.

Lisa A. Worthington
Project Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-101 0-2 | Sampled: 3/29/2017 12:15

Sample ID: 17C1191-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.13	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Benzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Bromobenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Bromochloromethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Bromodichloromethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Bromoform	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Bromomethane	ND	0.013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
2-Butanone (MEK)	ND	0.053	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
n-Butylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
sec-Butylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
tert-Butylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Carbon Disulfide	ND	0.0079	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Carbon Tetrachloride	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Chlorobenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Chlorodibromomethane	ND	0.0013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Chloroethane	ND	0.013	mg/Kg dry	1	R-05	SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Chloroform	ND	0.0053	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Chloromethane	ND	0.013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
2-Chlorotoluene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
4-Chlorotoluene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0026	mg/Kg dry	1	V-05	SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,2-Dibromoethane (EDB)	ND	0.0013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Dibromomethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,2-Dichlorobenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,3-Dichlorobenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,4-Dichlorobenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,1-Dichloroethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,2-Dichloroethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,1-Dichloroethylene	ND	0.0053	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
cis-1,2-Dichloroethylene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
trans-1,2-Dichloroethylene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,2-Dichloropropane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,3-Dichloropropane	ND	0.0013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
2,2-Dichloropropane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,1-Dichloropropene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
cis-1,3-Dichloropropene	ND	0.0013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
trans-1,3-Dichloropropene	ND	0.0013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Diethyl Ether	ND	0.013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Diisopropyl Ether (DIPE)	ND	0.0013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,4-Dioxane	ND	0.26	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Ethylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-101 0-2 | Sampled: 3/29/2017 12:15

Sample ID: 17C1191-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
2-Hexanone (MBK)	ND	0.026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Isopropylbenzene (Cumene)	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0053	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Methylene Chloride	ND	0.013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Naphthalene	ND	0.0053	mg/Kg dry	1	V-05	SW-846 8260C	3/31/17	3/31/17 13:42	MFF
n-Propylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Styrene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,1,1,2-Tetrachloroethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,1,2,2-Tetrachloroethane	ND	0.0053	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Tetrachloroethylene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Tetrahydrofuran	ND	0.013	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Toluene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,2,3-Trichlorobenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,2,4-Trichlorobenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,1,1-Trichloroethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,1,2-Trichloroethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Trichloroethylene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Trichlorofluoromethane (Freon 11)	ND	0.013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,2,3-Trichloropropane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,2,4-Trimethylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
1,3,5-Trimethylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
Vinyl Chloride	ND	0.013	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
m+p Xylene	ND	0.0053	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF
o-Xylene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 13:42	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	99.9	70-130		3/31/17 13:42
Toluene-d8	107	70-130		3/31/17 13:42
4-Bromofluorobenzene	102	70-130		3/31/17 13:42

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-101 0-2 | Sampled: 3/29/2017 12:15

Sample ID: 17C1191-01

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
C19-C36 Aliphatics	28	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Unadjusted C11-C22 Aromatics	31	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
C11-C22 Aromatics	27	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Benzo(a)anthracene	0.24	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Benzo(a)pyrene	0.34	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Benzo(b)fluoranthene	0.35	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Benzo(g,h,i)perylene	0.25	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Benzo(k)fluoranthene	0.12	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Chrysene	0.30	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Fluoranthene	0.57	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Indeno(1,2,3-cd)pyrene	0.16	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Phenanthrene	0.37	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS
Pyrene	0.58	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/5/17 23:49	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Chlorooctadecane (COD)	55.5	40-140		4/5/17 23:49
o-Terphenyl (OTP)	69.8	40-140		4/5/17 23:49
2-Bromonaphthalene	79.8	40-140		4/5/17 23:49
2-Fluorobiphenyl	82.8	40-140		4/5/17 23:49

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-101 0-2 | Sampled: 3/29/2017 12:15

Sample ID: 17C1191-01

Sample Matrix: Soil

Sample Flags: O-01

Soil/Methanol Preservation Ratio: 1.37

Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	9.3	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 16:48	EEH
C5-C8 Aliphatics	ND	9.3	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 16:48	EEH
Unadjusted C9-C12 Aliphatics	ND	9.3	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 16:48	EEH
C9-C12 Aliphatics	ND	9.3	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 16:48	EEH
C9-C10 Aromatics	ND	9.3	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 16:48	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
2,5-Dibromotoluene (FID)	91.3	70-130		4/4/17 16:48
2,5-Dibromotoluene (PID)	82.2	70-130		4/4/17 16:48

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-101 0-2 | Sampled: 3/29/2017 12:15

Sample ID: 17C1191-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW
Arsenic	8.4	2.6	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW
Barium	41	2.6	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW
Beryllium	0.40	0.26	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW
Cadmium	0.37	0.26	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW
Chromium	15	0.51	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW
Lead	73	0.77	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW
Mercury	0.040	0.027	mg/Kg dry	1		SW-846 7471B	4/6/17	4/7/17 9:35	TJK
Nickel	11	0.51	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW
Selenium	ND	5.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW
Silver	ND	0.51	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW
Thallium	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW
Vanadium	14	1.0	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW
Zinc	55	1.0	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:16	QNW

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-101 0-2 | Sampled: 3/29/2017 12:15

Sample ID: 17C1191-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.9		% Wt	1		SM 2540G	3/31/17	4/3/17 7:52	MRL

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-101 6-8 | Sampled: 3/29/2017 12:00

Sample ID: 17C1191-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Benzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Bromobenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Bromochloromethane	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Bromodichloromethane	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Bromoform	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Bromomethane	ND	0.0086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
2-Butanone (MEK)	ND	0.034	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
n-Butylbenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
sec-Butylbenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
tert-Butylbenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Carbon Disulfide	ND	0.0051	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Carbon Tetrachloride	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Chlorobenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Chlorodibromomethane	ND	0.00086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Chloroethane	ND	0.0086	mg/Kg dry	1	R-05	SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Chloroform	ND	0.0034	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Chloromethane	ND	0.0086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
2-Chlorotoluene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
4-Chlorotoluene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0017	mg/Kg dry	1	V-05	SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,2-Dibromoethane (EDB)	ND	0.00086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Dibromomethane	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,2-Dichlorobenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,3-Dichlorobenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,4-Dichlorobenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.0086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,1-Dichloroethane	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,2-Dichloroethane	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,1-Dichloroethylene	ND	0.0034	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
cis-1,2-Dichloroethylene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
trans-1,2-Dichloroethylene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,2-Dichloropropane	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,3-Dichloropropane	ND	0.00086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
2,2-Dichloropropane	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,1-Dichloropropene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
cis-1,3-Dichloropropene	ND	0.00086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
trans-1,3-Dichloropropene	ND	0.00086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Diethyl Ether	ND	0.0086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Diisopropyl Ether (DIPE)	ND	0.00086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,4-Dioxane	ND	0.17	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Ethylbenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-101 6-8 | Sampled: 3/29/2017 12:00

Sample ID: 17C1191-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
2-Hexanone (MBK)	ND	0.017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Isopropylbenzene (Cumene)	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0034	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Methylene Chloride	ND	0.0086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Naphthalene	ND	0.0034	mg/Kg dry	1	V-05	SW-846 8260C	3/31/17	3/31/17 14:10	MFF
n-Propylbenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Styrene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,1,1,2-Tetrachloroethane	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,1,2,2-Tetrachloroethane	ND	0.0034	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Tetrachloroethylene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Tetrahydrofuran	ND	0.0086	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Toluene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,2,3-Trichlorobenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,2,4-Trichlorobenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,1,1-Trichloroethane	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,1,2-Trichloroethane	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Trichloroethylene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,2,3-Trichloropropane	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,2,4-Trimethylbenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
1,3,5-Trimethylbenzene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
Vinyl Chloride	ND	0.0086	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
m+p Xylene	ND	0.0034	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF
o-Xylene	ND	0.0017	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:10	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	99.5	70-130		3/31/17 14:10
Toluene-d8	105	70-130		3/31/17 14:10
4-Bromofluorobenzene	96.9	70-130		3/31/17 14:10

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-101 6-8 | Sampled: 3/29/2017 12:00

Sample ID: 17C1191-02

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
C19-C36 Aliphatics	24	12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Unadjusted C11-C22 Aromatics	21	12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
C11-C22 Aromatics	19	12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Acenaphthene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Acenaphthylene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Benzo(a)anthracene	0.15	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Benzo(a)pyrene	0.14	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Benzo(b)fluoranthene	0.20	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Benzo(g,h,i)perylene	1.3	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Benzo(k)fluoranthene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Chrysene	0.18	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Dibenz(a,h)anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Fluoranthene	0.34	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Fluorene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Indeno(1,2,3-cd)pyrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
2-Methylnaphthalene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Naphthalene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Phenanthrene	0.23	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS
Pyrene	0.35	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:09	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Chlorooctadecane (COD)	43.1	40-140		4/6/17 0:09
o-Terphenyl (OTP)	48.9	40-140		4/6/17 0:09
2-Bromonaphthalene	82.4	40-140		4/6/17 0:09
2-Fluorobiphenyl	86.9	40-140		4/6/17 0:09

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-101 6-8 | Sampled: 3/29/2017 12:00

Sample ID: 17C1191-02

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - VPH

Soil/Methanol Preservation Ratio: 1.09

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	13	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 17:17	EEH
C5-C8 Aliphatics	ND	13	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 17:17	EEH
Unadjusted C9-C12 Aliphatics	ND	13	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 17:17	EEH
C9-C12 Aliphatics	ND	13	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 17:17	EEH
C9-C10 Aromatics	ND	13	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 17:17	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
2,5-Dibromotoluene (FID)	102	70-130		4/4/17 17:17
2,5-Dibromotoluene (PID)	93.3	70-130		4/4/17 17:17

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-101 6-8 | Sampled: 3/29/2017 12:00

Sample ID: 17C1191-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.9	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW
Arsenic	6.4	2.9	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW
Barium	49	2.9	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW
Beryllium	0.56	0.29	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW
Cadmium	0.30	0.29	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW
Chromium	10	0.58	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW
Lead	79	0.86	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW
Mercury	0.074	0.029	mg/Kg dry	1		SW-846 7471B	4/6/17	4/7/17 9:37	TJK
Nickel	6.1	0.58	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW
Selenium	ND	5.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW
Silver	ND	0.58	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW
Thallium	ND	2.9	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW
Vanadium	13	1.2	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW
Zinc	43	1.2	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:21	QNW

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-101 6-8 | Sampled: 3/29/2017 12:00

Sample ID: 17C1191-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.6		% Wt	1		SM 2540G	3/31/17	4/3/17 7:52	MRL

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-102 0-2 | Sampled: 3/29/2017 10:35

Sample ID: 17C1191-03

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Benzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Bromobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Bromochloromethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Bromodichloromethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Bromoform	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Bromomethane	ND	0.0073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
2-Butanone (MEK)	ND	0.029	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
n-Butylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
sec-Butylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
tert-Butylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Carbon Disulfide	ND	0.0044	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Carbon Tetrachloride	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Chlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Chlorodibromomethane	ND	0.00073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Chloroethane	ND	0.0073	mg/Kg dry	1	R-05	SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Chloroform	ND	0.0029	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Chloromethane	ND	0.0073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
2-Chlorotoluene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
4-Chlorotoluene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0015	mg/Kg dry	1	V-05	SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,2-Dibromoethane (EDB)	ND	0.00073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Dibromomethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,2-Dichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,3-Dichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,4-Dichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.0073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,1-Dichloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,2-Dichloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,1-Dichloroethylene	ND	0.0029	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
cis-1,2-Dichloroethylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
trans-1,2-Dichloroethylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,2-Dichloropropane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,3-Dichloropropane	ND	0.00073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
2,2-Dichloropropane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,1-Dichloropropene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
cis-1,3-Dichloropropene	ND	0.00073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
trans-1,3-Dichloropropene	ND	0.00073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Diethyl Ether	ND	0.0073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Diisopropyl Ether (DIPE)	ND	0.00073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,4-Dioxane	ND	0.15	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Ethylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-102 0-2 | Sampled: 3/29/2017 10:35

Sample ID: 17C1191-03

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
2-Hexanone (MBK)	ND	0.015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Isopropylbenzene (Cumene)	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0029	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Methylene Chloride	ND	0.0073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Naphthalene	ND	0.0029	mg/Kg dry	1	V-05	SW-846 8260C	3/31/17	3/31/17 14:38	MFF
n-Propylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Styrene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,1,1,2-Tetrachloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,1,2,2-Tetrachloroethane	ND	0.0029	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Tetrachloroethylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Tetrahydrofuran	ND	0.0073	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Toluene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,2,3-Trichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,2,4-Trichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,1,1-Trichloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,1,2-Trichloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Trichloroethylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,2,3-Trichloropropane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,2,4-Trimethylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
1,3,5-Trimethylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
Vinyl Chloride	ND	0.0073	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
m+p Xylene	ND	0.0029	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF
o-Xylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 14:38	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	99.0	70-130		3/31/17 14:38
Toluene-d8	104	70-130		3/31/17 14:38
4-Bromofluorobenzene	97.5	70-130		3/31/17 14:38

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-102 0-2 | Sampled: 3/29/2017 10:35

Sample ID: 17C1191-03

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
C19-C36 Aliphatics	90	22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Unadjusted C11-C22 Aromatics	76	22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
C11-C22 Aromatics	71	22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Acenaphthene	ND	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Acenaphthylene	ND	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Anthracene	ND	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Benzo(a)anthracene	0.37	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Benzo(a)pyrene	0.49	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Benzo(b)fluoranthene	0.58	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Benzo(g,h,i)perylene	0.40	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Benzo(k)fluoranthene	ND	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Chrysene	0.46	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Dibenz(a,h)anthracene	ND	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Fluoranthene	0.91	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Fluorene	ND	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Indeno(1,2,3-cd)pyrene	0.31	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
2-Methylnaphthalene	ND	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Naphthalene	ND	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Phenanthrene	0.55	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS
Pyrene	0.89	0.22	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:29	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Chlorooctadecane (COD)	55.3	40-140		4/6/17 0:29
o-Terphenyl (OTP)	64.4	40-140		4/6/17 0:29
2-Bromonaphthalene	85.1	40-140		4/6/17 0:29
2-Fluorobiphenyl	88.6	40-140		4/6/17 0:29

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-102 0-2 | Sampled: 3/29/2017 10:35

Sample ID: 17C1191-03

Sample Matrix: Soil

Sample Flags: O-01

Soil/Methanol Preservation Ratio: 1.44

Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	8.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 17:46	EEH
C5-C8 Aliphatics	ND	8.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 17:46	EEH
Unadjusted C9-C12 Aliphatics	ND	8.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 17:46	EEH
C9-C12 Aliphatics	ND	8.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 17:46	EEH
C9-C10 Aromatics	ND	8.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 17:46	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
2,5-Dibromotoluene (FID)	98.3	70-130		4/4/17 17:46
2,5-Dibromotoluene (PID)	88.9	70-130		4/4/17 17:46

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-102 0-2 | Sampled: 3/29/2017 10:35

Sample ID: 17C1191-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW
Arsenic	6.3	2.6	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW
Barium	53	2.6	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW
Beryllium	0.40	0.26	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW
Cadmium	0.52	0.26	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW
Chromium	14	0.52	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW
Lead	35	0.79	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW
Mercury	0.045	0.027	mg/Kg dry	1		SW-846 7471B	4/6/17	4/7/17 9:38	TJK
Nickel	12	0.52	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW
Selenium	ND	5.2	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW
Silver	ND	0.52	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW
Thallium	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW
Vanadium	22	1.0	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW
Zinc	55	1.0	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:26	QNW

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-102 0-2 | Sampled: 3/29/2017 10:35

Sample ID: 17C1191-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.6		% Wt	1		SM 2540G	3/31/17	4/3/17 7:52	MRL

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-102 7-8 | Sampled: 3/29/2017 10:55

Sample ID: 17C1191-04

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Benzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Bromobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Bromochloromethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Bromodichloromethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Bromoform	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Bromomethane	ND	0.0076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
2-Butanone (MEK)	ND	0.031	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
n-Butylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
sec-Butylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
tert-Butylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Carbon Disulfide	ND	0.0046	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Carbon Tetrachloride	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Chlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Chlorodibromomethane	ND	0.00076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Chloroethane	ND	0.0076	mg/Kg dry	1	R-05	SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Chloroform	ND	0.0031	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Chloromethane	ND	0.0076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
2-Chlorotoluene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
4-Chlorotoluene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0015	mg/Kg dry	1	V-05	SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,2-Dibromoethane (EDB)	ND	0.00076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Dibromomethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,2-Dichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,3-Dichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,4-Dichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.0076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,1-Dichloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,2-Dichloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,1-Dichloroethylene	ND	0.0031	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
cis-1,2-Dichloroethylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
trans-1,2-Dichloroethylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,2-Dichloropropane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,3-Dichloropropane	ND	0.00076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
2,2-Dichloropropane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,1-Dichloropropene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
cis-1,3-Dichloropropene	ND	0.00076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
trans-1,3-Dichloropropene	ND	0.00076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Diethyl Ether	ND	0.0076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Diisopropyl Ether (DIPE)	ND	0.00076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,4-Dioxane	ND	0.15	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Ethylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-102 7-8 | Sampled: 3/29/2017 10:55

Sample ID: 17C1191-04

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
2-Hexanone (MBK)	ND	0.015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Isopropylbenzene (Cumene)	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0031	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Methylene Chloride	ND	0.0076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Naphthalene	0.0095	0.0031	mg/Kg dry	1	V-05	SW-846 8260C	3/31/17	3/31/17 15:07	MFF
n-Propylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Styrene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,1,1,2-Tetrachloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,1,2,2-Tetrachloroethane	ND	0.0031	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Tetrachloroethylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Tetrahydrofuran	ND	0.0076	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Toluene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,2,3-Trichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,2,4-Trichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,1,1-Trichloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,1,2-Trichloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Trichloroethylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,2,3-Trichloropropane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,2,4-Trimethylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
1,3,5-Trimethylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
Vinyl Chloride	ND	0.0076	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
m+p Xylene	ND	0.0031	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF
o-Xylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:07	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	99.1	70-130		3/31/17 15:07
Toluene-d8	106	70-130		3/31/17 15:07
4-Bromofluorobenzene	97.3	70-130		3/31/17 15:07

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-102 7-8 | Sampled: 3/29/2017 10:55

Sample ID: 17C1191-04

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Unadjusted C11-C22 Aromatics	95	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
C11-C22 Aromatics	66	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Acenaphthene	0.15	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Acenaphthylene	0.30	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Anthracene	0.54	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Benzo(a)anthracene	2.3	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Benzo(a)pyrene	2.6	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Benzo(b)fluoranthene	3.3	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Benzo(g,h,i)perylene	1.7	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Benzo(k)fluoranthene	1.2	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Chrysene	2.5	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Dibenz(a,h)anthracene	0.41	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Fluoranthene	4.8	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Fluorene	0.22	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Indeno(1,2,3-cd)pyrene	1.7	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Naphthalene	0.24	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Phenanthrene	2.5	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS
Pyrene	4.9	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 0:48	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Chlorooctadecane (COD)	52.6	40-140		4/6/17 0:48
o-Terphenyl (OTP)	65.0	40-140		4/6/17 0:48
2-Bromonaphthalene	91.3	40-140		4/6/17 0:48
2-Fluorobiphenyl	94.3	40-140		4/6/17 0:48

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-102 7-8 | Sampled: 3/29/2017 10:55

Sample ID: 17C1191-04

Sample Matrix: Soil

Sample Flags: O-01

Soil/Methanol Preservation Ratio: 1.39

Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	9.0	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 18:15	EEH
C5-C8 Aliphatics	ND	9.0	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 18:15	EEH
Unadjusted C9-C12 Aliphatics	ND	9.0	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 18:15	EEH
C9-C12 Aliphatics	ND	9.0	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 18:15	EEH
C9-C10 Aromatics	ND	9.0	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 18:15	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
2,5-Dibromotoluene (FID)	99.3	70-130		4/4/17 18:15
2,5-Dibromotoluene (PID)	89.0	70-130		4/4/17 18:15

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-102 7-8 | Sampled: 3/29/2017 10:55

Sample ID: 17C1191-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW
Arsenic	8.9	2.7	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW
Barium	25	2.7	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW
Beryllium	0.40	0.27	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW
Cadmium	0.37	0.27	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW
Chromium	12	0.54	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW
Lead	43	0.81	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW
Mercury	0.062	0.027	mg/Kg dry	1		SW-846 7471B	4/6/17	4/7/17 9:39	TJK
Nickel	9.1	0.54	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW
Selenium	ND	5.4	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW
Silver	ND	0.54	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW
Thallium	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW
Vanadium	12	1.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW
Zinc	26	1.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:31	QNW

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-102 7-8 | Sampled: 3/29/2017 10:55

Sample ID: 17C1191-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.7		% Wt	1		SM 2540G	3/31/17	4/3/17 7:52	MRL

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-104 0-2 | Sampled: 3/29/2017 09:45

Sample ID: 17C1191-05

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Benzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Bromobenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Bromochloromethane	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Bromodichloromethane	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Bromoform	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Bromomethane	ND	0.0082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
2-Butanone (MEK)	ND	0.033	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
n-Butylbenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
sec-Butylbenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
tert-Butylbenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Carbon Disulfide	ND	0.0049	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Carbon Tetrachloride	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Chlorobenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Chlorodibromomethane	ND	0.00082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Chloroethane	ND	0.0082	mg/Kg dry	1	R-05	SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Chloroform	ND	0.0033	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Chloromethane	ND	0.0082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
2-Chlorotoluene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
4-Chlorotoluene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0016	mg/Kg dry	1	V-05	SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,2-Dibromoethane (EDB)	ND	0.00082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Dibromomethane	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,2-Dichlorobenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,3-Dichlorobenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,4-Dichlorobenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.0082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,1-Dichloroethane	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,2-Dichloroethane	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,1-Dichloroethylene	ND	0.0033	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
cis-1,2-Dichloroethylene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
trans-1,2-Dichloroethylene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,2-Dichloropropane	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,3-Dichloropropane	ND	0.00082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
2,2-Dichloropropane	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,1-Dichloropropene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
cis-1,3-Dichloropropene	ND	0.00082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
trans-1,3-Dichloropropene	ND	0.00082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Diethyl Ether	ND	0.0082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Diisopropyl Ether (DIPE)	ND	0.00082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,4-Dioxane	ND	0.16	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Ethylbenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-104 0-2 | Sampled: 3/29/2017 09:45

Sample ID: 17C1191-05

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
2-Hexanone (MBK)	ND	0.016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Isopropylbenzene (Cumene)	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0033	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Methylene Chloride	ND	0.0082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Naphthalene	ND	0.0033	mg/Kg dry	1	V-05	SW-846 8260C	3/31/17	3/31/17 15:35	MFF
n-Propylbenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Styrene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,1,1,2-Tetrachloroethane	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,1,2,2-Tetrachloroethane	ND	0.0033	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Tetrachloroethylene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Tetrahydrofuran	ND	0.0082	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Toluene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,2,3-Trichlorobenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,2,4-Trichlorobenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,1,1-Trichloroethane	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,1,2-Trichloroethane	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Trichloroethylene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,2,3-Trichloropropane	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,2,4-Trimethylbenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
1,3,5-Trimethylbenzene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
Vinyl Chloride	ND	0.0082	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
m+p Xylene	ND	0.0033	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF
o-Xylene	ND	0.0016	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 15:35	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	102	70-130		3/31/17 15:35
Toluene-d8	105	70-130		3/31/17 15:35
4-Bromofluorobenzene	94.9	70-130		3/31/17 15:35

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-104 0-2 | Sampled: 3/29/2017 09:45

Sample ID: 17C1191-05

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Unadjusted C11-C22 Aromatics	21	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
C11-C22 Aromatics	18	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Benzo(a)anthracene	0.23	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Benzo(a)pyrene	0.27	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Benzo(b)fluoranthene	0.33	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Benzo(g,h,i)perylene	0.25	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Benzo(k)fluoranthene	0.12	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Chrysene	0.28	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Fluoranthene	0.51	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Indeno(1,2,3-cd)pyrene	0.19	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Phenanthrene	0.32	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS
Pyrene	0.53	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:08	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Chlorooctadecane (COD)	62.1	40-140		4/6/17 1:08
o-Terphenyl (OTP)	73.6	40-140		4/6/17 1:08
2-Bromonaphthalene	82.5	40-140		4/6/17 1:08
2-Fluorobiphenyl	85.0	40-140		4/6/17 1:08

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-104 0-2 | Sampled: 3/29/2017 09:45

Sample ID: 17C1191-05

Sample Matrix: Soil

Sample Flags: O-01

Soil/Methanol Preservation Ratio: 1.44

Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	9.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 18:44	EEH
C5-C8 Aliphatics	ND	9.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 18:44	EEH
Unadjusted C9-C12 Aliphatics	ND	9.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 18:44	EEH
C9-C12 Aliphatics	ND	9.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 18:44	EEH
C9-C10 Aromatics	ND	9.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 18:44	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
2,5-Dibromotoluene (FID)	85.5	70-130		4/4/17 18:44
2,5-Dibromotoluene (PID)	77.6	70-130		4/4/17 18:44

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-104 0-2 | Sampled: 3/29/2017 09:45

Sample ID: 17C1191-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW
Arsenic	9.2	2.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW
Barium	30	2.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW
Beryllium	0.48	0.28	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW
Cadmium	0.43	0.28	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW
Chromium	14	0.56	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW
Lead	62	0.84	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW
Mercury	0.073	0.027	mg/Kg dry	1		SW-846 7471B	4/6/17	4/7/17 9:44	TJK
Nickel	12	0.56	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW
Selenium	ND	5.6	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW
Silver	ND	0.56	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW
Thallium	ND	2.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW
Vanadium	14	1.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW
Zinc	40	1.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:11	QNW

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-104 0-2 | Sampled: 3/29/2017 09:45

Sample ID: 17C1191-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.8		% Wt	1		SM 2540G	3/31/17	4/3/17 7:52	MRL

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-104 5-5.5 | Sampled: 3/29/2017 09:55

Sample ID: 17C1191-06

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Benzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Bromobenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Bromochloromethane	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Bromodichloromethane	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Bromoform	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Bromomethane	ND	0.0090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
2-Butanone (MEK)	ND	0.036	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
n-Butylbenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
sec-Butylbenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
tert-Butylbenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Carbon Disulfide	ND	0.0054	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Carbon Tetrachloride	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Chlorobenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Chlorodibromomethane	ND	0.00090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Chloroethane	ND	0.0090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Chloroform	ND	0.0036	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Chloromethane	ND	0.0090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
2-Chlorotoluene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
4-Chlorotoluene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,2-Dibromoethane (EDB)	ND	0.00090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Dibromomethane	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,2-Dichlorobenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,3-Dichlorobenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,4-Dichlorobenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.0090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,1-Dichloroethane	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,2-Dichloroethane	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,1-Dichloroethylene	ND	0.0036	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
cis-1,2-Dichloroethylene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
trans-1,2-Dichloroethylene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,2-Dichloropropane	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,3-Dichloropropane	ND	0.00090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
2,2-Dichloropropane	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,1-Dichloropropene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
cis-1,3-Dichloropropene	ND	0.00090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
trans-1,3-Dichloropropene	ND	0.00090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Diethyl Ether	ND	0.0090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Diisopropyl Ether (DIPE)	ND	0.00090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,4-Dioxane	ND	0.18	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Ethylbenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-104 5-5.5 | Sampled: 3/29/2017 09:55

Sample ID: 17C1191-06

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
2-Hexanone (MBK)	ND	0.018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Isopropylbenzene (Cumene)	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0036	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Methylene Chloride	ND	0.0090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Naphthalene	ND	0.0036	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
n-Propylbenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Styrene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,1,1,2-Tetrachloroethane	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,1,2,2-Tetrachloroethane	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Tetrachloroethylene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Tetrahydrofuran	ND	0.0090	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Toluene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,2,3-Trichlorobenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,2,4-Trichlorobenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,1,1-Trichloroethane	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,1,2-Trichloroethane	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Trichloroethylene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,2,3-Trichloropropane	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,2,4-Trimethylbenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
1,3,5-Trimethylbenzene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
Vinyl Chloride	ND	0.0090	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
m+p Xylene	ND	0.0036	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF
o-Xylene	ND	0.0018	mg/Kg dry	1		SW-846 8260C	3/31/17	4/3/17 10:33	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	97.5	70-130		4/3/17 10:33
Toluene-d8	105	70-130		4/3/17 10:33
4-Bromofluorobenzene	91.0	70-130		4/3/17 10:33

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-104 5-5.5 | Sampled: 3/29/2017 09:55

Sample ID: 17C1191-06

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Unadjusted C11-C22 Aromatics	150	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
C11-C22 Aromatics	99	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Acenaphthene	0.98	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Acenaphthylene	0.11	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Anthracene	2.0	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Benzo(a)anthracene	3.7	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Benzo(a)pyrene	3.2	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Benzo(b)fluoranthene	3.7	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Benzo(g,h,i)perylene	1.6	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Benzo(k)fluoranthene	1.3	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Chrysene	4.0	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Dibenz(a,h)anthracene	0.51	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Fluoranthene	8.5	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Fluorene	1.0	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Indeno(1,2,3-cd)pyrene	1.7	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
2-Methylnaphthalene	0.35	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Naphthalene	0.60	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Phenanthrene	9.2	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS
Pyrene	8.6	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:28	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Chlorooctadecane (COD)	56.6	40-140		4/6/17 1:28
o-Terphenyl (OTP)	66.1	40-140		4/6/17 1:28
2-Bromonaphthalene	85.4	40-140		4/6/17 1:28
2-Fluorobiphenyl	86.8	40-140		4/6/17 1:28

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-104 5-5.5 | Sampled: 3/29/2017 09:55

Sample ID: 17C1191-06

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - VPH

Soil/Methanol Preservation Ratio: 1.04

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	12	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 19:14	EEH
C5-C8 Aliphatics	ND	12	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 19:14	EEH
Unadjusted C9-C12 Aliphatics	ND	12	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 19:14	EEH
C9-C12 Aliphatics	ND	12	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 19:14	EEH
C9-C10 Aromatics	ND	12	mg/Kg dry	1		MADEP-VPH-04-1.1	4/4/17	4/4/17 19:14	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
2,5-Dibromotoluene (FID)	82.6	70-130		4/4/17 19:14
2,5-Dibromotoluene (PID)	71.6	70-130		4/4/17 19:14

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-104 5-5.5 | Sampled: 3/29/2017 09:55

Sample ID: 17C1191-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW
Arsenic	19	2.7	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW
Barium	130	2.7	mg/Kg dry	1	MS-19	SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW
Beryllium	0.48	0.27	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW
Cadmium	0.80	0.27	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW
Chromium	31	0.55	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW
Lead	780	0.82	mg/Kg dry	1	MS-19	SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW
Mercury	0.67	0.14	mg/Kg dry	5		SW-846 7471B	4/6/17	4/7/17 10:33	TJK
Nickel	17	0.55	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW
Selenium	ND	5.5	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW
Silver	ND	0.55	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW
Thallium	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW
Vanadium	27	1.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW
Zinc	100	1.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 16:11	QNW

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-104 5-5.5 | Sampled: 3/29/2017 09:55

Sample ID: 17C1191-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.3		% Wt	1		SM 2540G	3/31/17	4/3/17 7:52	MRL

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-105 0-2 | Sampled: 3/29/2017 08:40

Sample ID: 17C1191-07

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Benzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Bromobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Bromochloromethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Bromodichloromethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Bromoform	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Bromomethane	ND	0.0075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
2-Butanone (MEK)	ND	0.030	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
n-Butylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
sec-Butylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
tert-Butylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Carbon Disulfide	ND	0.0045	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Carbon Tetrachloride	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Chlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Chlorodibromomethane	ND	0.00075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Chloroethane	ND	0.0075	mg/Kg dry	1	R-05	SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Chloroform	ND	0.0030	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Chloromethane	ND	0.0075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
2-Chlorotoluene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
4-Chlorotoluene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0015	mg/Kg dry	1	V-05	SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,2-Dibromoethane (EDB)	ND	0.00075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Dibromomethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,2-Dichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,3-Dichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,4-Dichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.0075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,1-Dichloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,2-Dichloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,1-Dichloroethylene	ND	0.0030	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
cis-1,2-Dichloroethylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
trans-1,2-Dichloroethylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,2-Dichloropropane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,3-Dichloropropane	ND	0.00075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
2,2-Dichloropropane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,1-Dichloropropene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
cis-1,3-Dichloropropene	ND	0.00075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
trans-1,3-Dichloropropene	ND	0.00075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Diethyl Ether	ND	0.0075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Diisopropyl Ether (DIPE)	ND	0.00075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,4-Dioxane	ND	0.15	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Ethylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-105 0-2 | Sampled: 3/29/2017 08:40

Sample ID: 17C1191-07

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
2-Hexanone (MBK)	ND	0.015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Isopropylbenzene (Cumene)	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0030	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Methylene Chloride	ND	0.0075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Naphthalene	ND	0.0030	mg/Kg dry	1	V-05	SW-846 8260C	3/31/17	3/31/17 16:32	MFF
n-Propylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Styrene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,1,1,2-Tetrachloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,1,2,2-Tetrachloroethane	ND	0.0030	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Tetrachloroethylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Tetrahydrofuran	ND	0.0075	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Toluene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,2,3-Trichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,2,4-Trichlorobenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,1,1-Trichloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,1,2-Trichloroethane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Trichloroethylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,2,3-Trichloropropane	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,2,4-Trimethylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
1,3,5-Trimethylbenzene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
Vinyl Chloride	ND	0.0075	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
m+p Xylene	ND	0.0030	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF
o-Xylene	ND	0.0015	mg/Kg dry	1		SW-846 8260C	3/31/17	3/31/17 16:32	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	102	70-130		3/31/17 16:32
Toluene-d8	103	70-130		3/31/17 16:32
4-Bromofluorobenzene	92.4	70-130		3/31/17 16:32

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-105 0-2 | Sampled: 3/29/2017 08:40

Sample ID: 17C1191-07

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Unadjusted C11-C22 Aromatics	55	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
C11-C22 Aromatics	45	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Acenaphthylene	0.19	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Anthracene	0.14	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Benzo(a)anthracene	0.68	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Benzo(a)pyrene	0.99	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Benzo(b)fluoranthene	1.5	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Benzo(g,h,i)perylene	0.62	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Benzo(k)fluoranthene	0.54	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Chrysene	0.96	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Dibenz(a,h)anthracene	0.19	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Fluoranthene	1.3	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Indeno(1,2,3-cd)pyrene	0.65	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Phenanthrene	0.48	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS
Pyrene	1.4	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 1:48	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Chlorooctadecane (COD)	51.3	40-140		4/6/17 1:48
o-Terphenyl (OTP)	64.3	40-140		4/6/17 1:48
2-Bromonaphthalene	86.8	40-140		4/6/17 1:48
2-Fluorobiphenyl	92.6	40-140		4/6/17 1:48

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-105 0-2 | Sampled: 3/29/2017 08:40

Sample ID: 17C1191-07

Sample Matrix: Soil

Sample Flags: O-01

Soil/Methanol Preservation Ratio: 1.46

Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	8.9	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 15:16	EEH
C5-C8 Aliphatics	ND	8.9	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 15:16	EEH
Unadjusted C9-C12 Aliphatics	19	8.9	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 15:16	EEH
C9-C12 Aliphatics	9.7	8.9	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 15:16	EEH
C9-C10 Aromatics	9.2	8.9	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 15:16	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
2,5-Dibromotoluene (FID)	104	70-130		4/5/17	15:16
2,5-Dibromotoluene (PID)	92.3	70-130		4/5/17	15:16

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-105 0-2 | Sampled: 3/29/2017 08:40

Sample ID: 17C1191-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW
Arsenic	24	2.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW
Barium	28	2.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW
Beryllium	0.43	0.28	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW
Cadmium	1.0	0.28	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW
Chromium	14	0.56	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW
Lead	67	0.84	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW
Mercury	0.085	0.027	mg/Kg dry	1		SW-846 7471B	4/6/17	4/7/17 9:47	TJK
Nickel	12	0.56	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW
Selenium	ND	5.6	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW
Silver	ND	0.56	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW
Thallium	ND	2.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW
Vanadium	15	1.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW
Zinc	76	1.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:16	QNW

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-105 0-2 | Sampled: 3/29/2017 08:40

Sample ID: 17C1191-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.7		% Wt	1		SM 2540G	3/31/17	4/3/17 7:52	MRL

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-105 11-12 | Sampled: 3/29/2017 09:30

Sample ID: 17C1191-08

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.13	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Benzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Bromobenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Bromochloromethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Bromodichloromethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Bromoform	ND	0.0026	mg/Kg dry	1	V-05	SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Bromomethane	ND	0.013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
2-Butanone (MEK)	ND	0.052	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
n-Butylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
sec-Butylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
tert-Butylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Carbon Disulfide	ND	0.0077	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Carbon Tetrachloride	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Chlorobenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Chlorodibromomethane	ND	0.0026	mg/Kg dry	1	V-05	SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Chloroethane	ND	0.013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Chloroform	ND	0.0052	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Chloromethane	ND	0.013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
2-Chlorotoluene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
4-Chlorotoluene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0052	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,2-Dibromoethane (EDB)	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Dibromomethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,2-Dichlorobenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,3-Dichlorobenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,4-Dichlorobenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,1-Dichloroethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,2-Dichloroethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,1-Dichloroethylene	ND	0.0052	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
cis-1,2-Dichloroethylene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
trans-1,2-Dichloroethylene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,2-Dichloropropane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,3-Dichloropropane	ND	0.0013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
2,2-Dichloropropane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,1-Dichloropropene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
cis-1,3-Dichloropropene	ND	0.0013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
trans-1,3-Dichloropropene	ND	0.0013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Diethyl Ether	ND	0.013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Diisopropyl Ether (DIPE)	ND	0.0013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,4-Dioxane	ND	0.26	mg/Kg dry	1	R-05, V-16	SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Ethylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-105 11-12 | Sampled: 3/29/2017 09:30

Sample ID: 17C1191-08

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
2-Hexanone (MBK)	ND	0.026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Isopropylbenzene (Cumene)	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0052	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Methylene Chloride	ND	0.013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Naphthalene	ND	0.013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
n-Propylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Styrene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,1,1,2-Tetrachloroethane	ND	0.0026	mg/Kg dry	1	V-05	SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,1,2,2-Tetrachloroethane	ND	0.0013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Tetrachloroethylene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Tetrahydrofuran	ND	0.013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Toluene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,2,3-Trichlorobenzene	ND	0.013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,2,4-Trichlorobenzene	ND	0.013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,1,1-Trichloroethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,1,2-Trichloroethane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Trichloroethylene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Trichlorofluoromethane (Freon 11)	ND	0.013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,2,3-Trichloropropane	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,2,4-Trimethylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
1,3,5-Trimethylbenzene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
Vinyl Chloride	ND	0.013	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
m+p Xylene	ND	0.0052	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF
o-Xylene	ND	0.0026	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 14:21	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	103	70-130		4/3/17 14:21
Toluene-d8	98.2	70-130		4/3/17 14:21
4-Bromofluorobenzene	99.1	70-130		4/3/17 14:21

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-105 11-12 | Sampled: 3/29/2017 09:30

Sample ID: 17C1191-08

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
C19-C36 Aliphatics	ND	16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Unadjusted C11-C22 Aromatics	ND	16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
C11-C22 Aromatics	ND	16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Acenaphthene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Acenaphthylene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Anthracene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Benzo(a)anthracene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Benzo(a)pyrene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Benzo(b)fluoranthene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Benzo(g,h,i)perylene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Benzo(k)fluoranthene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Chrysene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Dibenz(a,h)anthracene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Fluoranthene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Fluorene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Indeno(1,2,3-cd)pyrene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
2-Methylnaphthalene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Naphthalene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Phenanthrene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS
Pyrene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:25	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Chlorooctadecane (COD)	47.8	40-140		4/6/17 11:25
o-Terphenyl (OTP)	52.5	40-140		4/6/17 11:25
2-Bromonaphthalene	82.8	40-140		4/6/17 11:25
2-Fluorobiphenyl	90.9	40-140		4/6/17 11:25

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-105 11-12 | Sampled: 3/29/2017 09:30

Sample ID: 17C1191-08

Sample Matrix: Soil

Sample Flags: O-01

Soil/Methanol Preservation Ratio: 1.35

Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	18	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 15:45	EEH
C5-C8 Aliphatics	ND	18	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 15:45	EEH
Unadjusted C9-C12 Aliphatics	ND	18	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 15:45	EEH
C9-C12 Aliphatics	ND	18	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 15:45	EEH
C9-C10 Aromatics	ND	18	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 15:45	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
2,5-Dibromotoluene (FID)	107	70-130		4/5/17 15:45	
2,5-Dibromotoluene (PID)	95.2	70-130		4/5/17 15:45	

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-105 11-12 | Sampled: 3/29/2017 09:30

Sample ID: 17C1191-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	3.9	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW
Arsenic	ND	3.9	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW
Barium	26	3.9	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW
Beryllium	0.94	0.39	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW
Cadmium	ND	0.39	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW
Chromium	9.1	0.78	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW
Lead	9.2	1.2	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW
Mercury	ND	0.038	mg/Kg dry	1		SW-846 7471B	4/6/17	4/7/17 9:48	TJK
Nickel	4.5	0.78	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW
Selenium	ND	7.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW
Silver	ND	0.78	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW
Thallium	ND	3.9	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW
Vanadium	14	1.6	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW
Zinc	10	1.6	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:21	QNW

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-105 11-12 | Sampled: 3/29/2017 09:30

Sample ID: 17C1191-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	63.1		% Wt	1		SM 2540G	3/31/17	4/3/17 7:52	MRL

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-106 0-2 | Sampled: 3/29/2017 09:10

Sample ID: 17C1191-09

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	3.0	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
tert-Amyl Methyl Ether (TAME)	ND	0.030	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Benzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Bromobenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Bromochloromethane	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Bromodichloromethane	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Bromoform	ND	0.12	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Bromomethane	ND	0.30	mg/Kg dry	1	RL-07	SW-846 8260C	3/31/17	4/5/17 14:46	EEH
2-Butanone (MEK)	ND	1.2	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
n-Butylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
sec-Butylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
tert-Butylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
tert-Butyl Ethyl Ether (TBEE)	ND	0.030	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Carbon Disulfide	ND	0.61	mg/Kg dry	1	RL-07	SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Carbon Tetrachloride	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Chlorobenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Chlorodibromomethane	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Chloroethane	ND	0.12	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Chloroform	ND	0.12	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Chloromethane	ND	0.12	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
2-Chlorotoluene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
4-Chlorotoluene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.24	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,2-Dibromoethane (EDB)	ND	0.030	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Dibromomethane	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,2-Dichlorobenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,3-Dichlorobenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,4-Dichlorobenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Dichlorodifluoromethane (Freon 12)	ND	0.12	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,1-Dichloroethane	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,2-Dichloroethane	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,1-Dichloroethylene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
cis-1,2-Dichloroethylene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
trans-1,2-Dichloroethylene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,2-Dichloropropane	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,3-Dichloropropane	ND	0.030	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
2,2-Dichloropropane	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,1-Dichloropropene	ND	0.12	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
cis-1,3-Dichloropropene	ND	0.030	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
trans-1,3-Dichloropropene	ND	0.030	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Diethyl Ether	ND	0.12	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Diisopropyl Ether (DIPE)	ND	0.030	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,4-Dioxane	ND	3.0	mg/Kg dry	1	V-16	SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Ethylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-106 0-2 | Sampled: 3/29/2017 09:10

Sample ID: 17C1191-09

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
2-Hexanone (MBK)	ND	0.61	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Isopropylbenzene (Cumene)	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
p-Isopropyltoluene (p-Cymene)	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Methyl tert-Butyl Ether (MTBE)	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Methylene Chloride	ND	0.30	mg/Kg dry	1	RL-07	SW-846 8260C	3/31/17	4/5/17 14:46	EEH
4-Methyl-2-pentanone (MIBK)	ND	0.61	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Naphthalene	ND	0.12	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
n-Propylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Styrene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,1,1,2-Tetrachloroethane	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,1,2,2-Tetrachloroethane	ND	0.030	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Tetrachloroethylene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Tetrahydrofuran	ND	0.24	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Toluene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,2,3-Trichlorobenzene	ND	0.24	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,2,4-Trichlorobenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,1,1-Trichloroethane	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,1,2-Trichloroethane	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Trichloroethylene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Trichlorofluoromethane (Freon 11)	ND	0.12	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,2,3-Trichloropropane	ND	0.12	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,2,4-Trimethylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
1,3,5-Trimethylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
Vinyl Chloride	ND	0.12	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
m+p Xylene	ND	0.12	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH
o-Xylene	ND	0.061	mg/Kg dry	1		SW-846 8260C	3/31/17	4/5/17 14:46	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	104	70-130		4/5/17 14:46
Toluene-d8	101	70-130		4/5/17 14:46
4-Bromofluorobenzene	98.8	70-130		4/5/17 14:46

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-106 0-2 | Sampled: 3/29/2017 09:10

Sample ID: 17C1191-09

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	28	23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
C19-C36 Aliphatics	100	23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Unadjusted C11-C22 Aromatics	320	23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
C11-C22 Aromatics	260	23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Acenaphthene	ND	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Acenaphthylene	0.92	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Anthracene	0.73	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Benzo(a)anthracene	5.1	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Benzo(a)pyrene	4.7	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Benzo(b)fluoranthene	9.1	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Benzo(g,h,i)perylene	2.2	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Benzo(k)fluoranthene	3.4	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Chrysene	6.4	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Dibenz(a,h)anthracene	0.93	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Fluoranthene	9.6	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Fluorene	ND	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Indeno(1,2,3-cd)pyrene	2.7	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
2-Methylnaphthalene	0.32	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Naphthalene	0.36	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Phenanthrene	1.7	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS
Pyrene	11	0.23	mg/Kg dry	2		MADEP-EPH-04-1.1	3/31/17	4/6/17 11:45	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Chlorooctadecane (COD)	48.9	40-140		4/6/17 11:45
o-Terphenyl (OTP)	53.6	40-140		4/6/17 11:45
2-Bromonaphthalene	80.7	40-140		4/6/17 11:45
2-Fluorobiphenyl	86.4	40-140		4/6/17 11:45

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-106 0-2 | Sampled: 3/29/2017 09:10

Sample ID: 17C1191-09

Sample Matrix: Soil

Sample Flags: O-01

Soil/Methanol Preservation Ratio: 1.28

Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	11	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 16:14	EEH
C5-C8 Aliphatics	ND	11	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 16:14	EEH
Unadjusted C9-C12 Aliphatics	ND	11	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 16:14	EEH
C9-C12 Aliphatics	ND	11	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 16:14	EEH
C9-C10 Aromatics	ND	11	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 16:14	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
2,5-Dibromotoluene (FID)	98.4	70-130		4/5/17	16:14
2,5-Dibromotoluene (PID)	88.2	70-130		4/5/17	16:14

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-106 0-2 | Sampled: 3/29/2017 09:10

Sample ID: 17C1191-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.9	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW
Arsenic	190	2.9	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW
Barium	31	2.9	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW
Beryllium	0.49	0.29	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW
Cadmium	6.6	0.29	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW
Chromium	18	0.58	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW
Lead	230	0.88	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW
Mercury	0.26	0.029	mg/Kg dry	1	R-02	SW-846 7471B	4/6/17	4/7/17 10:07	TJK
Nickel	12	0.58	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW
Selenium	ND	5.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW
Silver	ND	0.58	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW
Thallium	ND	2.9	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW
Vanadium	31	1.2	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW
Zinc	51	1.2	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:26	QNW

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-106 0-2 | Sampled: 3/29/2017 09:10

Sample ID: 17C1191-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.0		% Wt	1		SM 2540G	3/31/17	4/3/17 7:52	MRL

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-106 4-5 | Sampled: 3/29/2017 09:20

Sample ID: 17C1191-10

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Benzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Bromobenzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Bromochloromethane	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Bromodichloromethane	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Bromoform	ND	0.0023	mg/Kg dry	1	V-05	SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Bromomethane	ND	0.012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
2-Butanone (MEK)	ND	0.047	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
n-Butylbenzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
sec-Butylbenzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
tert-Butylbenzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Carbon Disulfide	ND	0.0070	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Carbon Tetrachloride	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Chlorobenzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Chlorodibromomethane	ND	0.0023	mg/Kg dry	1	V-05	SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Chloroethane	ND	0.012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Chloroform	ND	0.0047	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Chloromethane	ND	0.012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
2-Chlorotoluene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
4-Chlorotoluene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0047	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,2-Dibromoethane (EDB)	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Dibromomethane	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,2-Dichlorobenzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,3-Dichlorobenzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,4-Dichlorobenzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,1-Dichloroethane	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,2-Dichloroethane	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,1-Dichloroethylene	ND	0.0047	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
cis-1,2-Dichloroethylene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
trans-1,2-Dichloroethylene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,2-Dichloropropane	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,3-Dichloropropane	ND	0.0012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
2,2-Dichloropropane	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,1-Dichloropropene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
cis-1,3-Dichloropropene	ND	0.0012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
trans-1,3-Dichloropropene	ND	0.0012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Diethyl Ether	ND	0.012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Diisopropyl Ether (DIPE)	ND	0.0012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,4-Dioxane	ND	0.23	mg/Kg dry	1	R-05, V-16	SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Ethylbenzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-106 4-5 | Sampled: 3/29/2017 09:20

Sample ID: 17C1191-10

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
2-Hexanone (MBK)	ND	0.023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Isopropylbenzene (Cumene)	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0047	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Methylene Chloride	ND	0.012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Naphthalene	ND	0.012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
n-Propylbenzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Styrene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,1,1,2-Tetrachloroethane	ND	0.0023	mg/Kg dry	1	V-05	SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Tetrachloroethylene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Tetrahydrofuran	ND	0.012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Toluene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,2,3-Trichlorobenzene	ND	0.012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,2,4-Trichlorobenzene	ND	0.012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,1,1-Trichloroethane	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,1,2-Trichloroethane	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Trichloroethylene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,2,3-Trichloropropane	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,2,4-Trimethylbenzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
1,3,5-Trimethylbenzene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
Vinyl Chloride	ND	0.012	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
m+p Xylene	ND	0.0047	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF
o-Xylene	ND	0.0023	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:15	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	101	70-130		4/3/17 15:15
Toluene-d8	98.2	70-130		4/3/17 15:15
4-Bromofluorobenzene	98.3	70-130		4/3/17 15:15

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-106 4-5 | Sampled: 3/29/2017 09:20

Sample ID: 17C1191-10

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Unadjusted C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Benzo(b)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Phenanthrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS
Pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:05	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Chlorooctadecane (COD)	69.9	40-140		4/6/17 12:05
o-Terphenyl (OTP)	77.0	40-140		4/6/17 12:05
2-Bromonaphthalene	86.1	40-140		4/6/17 12:05
2-Fluorobiphenyl	86.9	40-140		4/6/17 12:05

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-106 4-5 | Sampled: 3/29/2017 09:20

Sample ID: 17C1191-10

Sample Matrix: Soil

Sample Flags: O-01

Soil/Methanol Preservation Ratio: 1.75

Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	8.0	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 16:43	EEH
C5-C8 Aliphatics	ND	8.0	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 16:43	EEH
Unadjusted C9-C12 Aliphatics	ND	8.0	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 16:43	EEH
C9-C12 Aliphatics	ND	8.0	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 16:43	EEH
C9-C10 Aromatics	ND	8.0	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 16:43	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
2,5-Dibromotoluene (FID)	117	70-130		4/5/17 16:43
2,5-Dibromotoluene (PID)	104	70-130		4/5/17 16:43

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-106 4-5 | Sampled: 3/29/2017 09:20

Sample ID: 17C1191-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW
Arsenic	8.2	2.7	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW
Barium	26	2.7	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW
Beryllium	0.53	0.27	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW
Cadmium	0.34	0.27	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW
Chromium	22	0.55	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW
Lead	27	0.82	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW
Mercury	0.027	0.027	mg/Kg dry	1		SW-846 7471B	4/6/17	4/7/17 9:49	TJK
Nickel	21	0.55	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW
Selenium	ND	5.5	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW
Silver	ND	0.55	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW
Thallium	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW
Vanadium	18	1.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW
Zinc	28	1.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:31	QNW

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: NOB-106 4-5 | Sampled: 3/29/2017 09:20

Sample ID: 17C1191-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.3		% Wt	1		SM 2540G	3/31/17	4/3/17 7:52	MRL

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Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: FD-01 | Sampled: 3/29/2017 15:00

Sample ID: 17C1191-11

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Benzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Bromobenzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Bromochloromethane	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Bromodichloromethane	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Bromoform	ND	0.0014	mg/Kg dry	1	V-05	SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Bromomethane	ND	0.0071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
2-Butanone (MEK)	ND	0.028	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
n-Butylbenzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
sec-Butylbenzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
tert-Butylbenzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Carbon Disulfide	ND	0.0043	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Carbon Tetrachloride	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Chlorobenzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Chlorodibromomethane	ND	0.0014	mg/Kg dry	1	V-05	SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Chloroethane	ND	0.0071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Chloroform	ND	0.0028	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Chloromethane	ND	0.0071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
2-Chlorotoluene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
4-Chlorotoluene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0028	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,2-Dibromoethane (EDB)	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Dibromomethane	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,2-Dichlorobenzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,3-Dichlorobenzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,4-Dichlorobenzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.0071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,1-Dichloroethane	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,2-Dichloroethane	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,1-Dichloroethylene	ND	0.0028	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
cis-1,2-Dichloroethylene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
trans-1,2-Dichloroethylene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,2-Dichloropropane	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,3-Dichloropropane	ND	0.00071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
2,2-Dichloropropane	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,1-Dichloropropene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
cis-1,3-Dichloropropene	ND	0.00071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
trans-1,3-Dichloropropene	ND	0.00071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Diethyl Ether	ND	0.0071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Diisopropyl Ether (DIPE)	ND	0.00071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,4-Dioxane	ND	0.14	mg/Kg dry	1	R-05, V-16	SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Ethylbenzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: FD-01 | Sampled: 3/29/2017 15:00

Sample ID: 17C1191-11

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
2-Hexanone (MBK)	ND	0.014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Isopropylbenzene (Cumene)	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0028	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Methylene Chloride	ND	0.0071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Naphthalene	ND	0.0071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
n-Propylbenzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Styrene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,1,1,2-Tetrachloroethane	ND	0.0014	mg/Kg dry	1	V-05	SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,1,2,2-Tetrachloroethane	ND	0.00071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Tetrachloroethylene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Tetrahydrofuran	ND	0.0071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Toluene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,2,3-Trichlorobenzene	ND	0.0071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,2,4-Trichlorobenzene	ND	0.0071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,1,1-Trichloroethane	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,1,2-Trichloroethane	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Trichloroethylene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,2,3-Trichloropropane	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,2,4-Trimethylbenzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
1,3,5-Trimethylbenzene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
Vinyl Chloride	ND	0.0071	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
m+p Xylene	ND	0.0028	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF
o-Xylene	ND	0.0014	mg/Kg dry	1		SW-846 8260C	4/3/17	4/3/17 15:42	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	103	70-130		4/3/17 15:42
Toluene-d8	100	70-130		4/3/17 15:42
4-Bromofluorobenzene	101	70-130		4/3/17 15:42

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: FD-01 | Sampled: 3/29/2017 15:00

Sample ID: 17C1191-11

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
C19-C36 Aliphatics	32	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Unadjusted C11-C22 Aromatics	33	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
C11-C22 Aromatics	29	11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Benzo(a)anthracene	0.29	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Benzo(a)pyrene	0.40	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Benzo(b)fluoranthene	0.39	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Benzo(g,h,i)perylene	0.29	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Benzo(k)fluoranthene	0.15	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Chrysene	0.36	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Fluoranthene	0.57	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Indeno(1,2,3-cd)pyrene	0.20	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Phenanthrene	0.35	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS
Pyrene	0.65	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	3/31/17	4/6/17 12:25	SCS

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Chlorooctadecane (COD)	68.5	40-140		4/6/17 12:25
o-Terphenyl (OTP)	79.4	40-140		4/6/17 12:25
2-Bromonaphthalene	86.5	40-140		4/6/17 12:25
2-Fluorobiphenyl	90.6	40-140		4/6/17 12:25

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: FD-01 | Sampled: 3/29/2017 15:00

Sample ID: 17C1191-11

Sample Matrix: Soil

Sample Flags: O-01

Soil/Methanol Preservation Ratio: 1.44

Petroleum Hydrocarbons Analyses - VPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Unadjusted C5-C8 Aliphatics	ND	8.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 17:12	EEH
C5-C8 Aliphatics	ND	8.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 17:12	EEH
Unadjusted C9-C12 Aliphatics	ND	8.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 17:12	EEH
C9-C12 Aliphatics	ND	8.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 17:12	EEH
C9-C10 Aromatics	ND	8.7	mg/Kg dry	1		MADEP-VPH-04-1.1	4/5/17	4/5/17 17:12	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
2,5-Dibromotoluene (FID)	103	70-130		4/5/17	17:12
2,5-Dibromotoluene (PID)	93.1	70-130		4/5/17	17:12

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: FD-01 | Sampled: 3/29/2017 15:00

Sample ID: 17C1191-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW
Arsenic	7.1	2.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW
Barium	35	2.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW
Beryllium	0.40	0.28	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW
Cadmium	0.36	0.28	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW
Chromium	14	0.57	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW
Lead	56	0.85	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW
Mercury	0.032	0.027	mg/Kg dry	1		SW-846 7471B	4/6/17	4/7/17 9:51	TJK
Nickel	11	0.57	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW
Selenium	ND	5.7	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW
Silver	ND	0.57	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW
Thallium	ND	2.8	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW
Vanadium	13	1.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW
Zinc	62	1.1	mg/Kg dry	1		SW-846 6010C-D	4/4/17	4/5/17 17:36	QNW

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

Project Location: Lowell, MA
Sample Description:
Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: FD-01
Sampled: 3/29/2017 15:00

Sample ID: 17C1191-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.8		% Wt	1		SM 2540G	3/31/17	4/3/17 7:52	MRL

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: TB-01 | Sampled: 3/29/2017 07:00

Sample ID: 17C1191-12

Sample Matrix: Trip Blank Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.10	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Benzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Bromobenzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Bromochloromethane	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Bromodichloromethane	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Bromoform	ND	0.0020	mg/Kg wet	1	V-05	SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Bromomethane	ND	0.010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
2-Butanone (MEK)	ND	0.040	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
n-Butylbenzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
sec-Butylbenzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
tert-Butylbenzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Carbon Disulfide	ND	0.0060	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Carbon Tetrachloride	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Chlorobenzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Chlorodibromomethane	ND	0.0020	mg/Kg wet	1	V-05	SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Chloroethane	ND	0.010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Chloroform	ND	0.0040	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Chloromethane	ND	0.010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
2-Chlorotoluene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
4-Chlorotoluene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0040	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,2-Dibromoethane (EDB)	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Dibromomethane	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,1-Dichloroethane	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,2-Dichloroethane	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,2-Dichloropropane	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,3-Dichloropropane	ND	0.0010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
2,2-Dichloropropane	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,1-Dichloropropene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
trans-1,3-Dichloropropene	ND	0.0010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Diethyl Ether	ND	0.010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Diisopropyl Ether (DIPE)	ND	0.0010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,4-Dioxane	ND	0.20	mg/Kg wet	1	R-05, V-16	SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Ethylbenzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF

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

Project Location: Lowell, MA | Sample Description: | Work Order: 17C1191

Date Received: 3/30/2017

Field Sample #: TB-01 | Sampled: 3/29/2017 07:00

Sample ID: 17C1191-12

Sample Matrix: Trip Blank Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Hexachlorobutadiene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
2-Hexanone (MBK)	ND	0.020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Methylene Chloride	ND	0.010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Naphthalene	ND	0.010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
n-Propylbenzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Styrene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,1,1,2-Tetrachloroethane	ND	0.0020	mg/Kg wet	1	V-05	SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Tetrachloroethylene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Tetrahydrofuran	ND	0.010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Toluene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,2,3-Trichlorobenzene	ND	0.010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,2,4-Trichlorobenzene	ND	0.010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Trichloroethylene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,2,3-Trichloropropane	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,2,4-Trimethylbenzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
1,3,5-Trimethylbenzene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
Vinyl Chloride	ND	0.010	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
m+p Xylene	ND	0.0040	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF
o-Xylene	ND	0.0020	mg/Kg wet	1		SW-846 8260C	4/3/17	4/3/17 16:09	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	81.5	70-130		4/3/17 16:09
Toluene-d8	99.2	70-130		4/3/17 16:09
4-Bromofluorobenzene	92.5	70-130		4/3/17 16:09

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Sample Extraction Data

Prep Method: SW-846 3546-MADEP-EPH-04-1.1

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17C1191-01 [NOB-101 0-2]	B173507	20.0	2.00	03/31/17
17C1191-02 [NOB-101 6-8]	B173507	20.0	2.00	03/31/17
17C1191-03 [NOB-102 0-2]	B173507	20.0	2.00	03/31/17
17C1191-04 [NOB-102 7-8]	B173507	20.0	2.00	03/31/17
17C1191-05 [NOB-104 0-2]	B173507	20.0	2.00	03/31/17
17C1191-06 [NOB-104 5-5.5]	B173507	20.0	2.00	03/31/17
17C1191-07 [NOB-105 0-2]	B173507	20.0	2.00	03/31/17
17C1191-08 [NOB-105 11-12]	B173507	20.0	2.00	03/31/17
17C1191-09 [NOB-106 0-2]	B173507	20.0	2.00	03/31/17
17C1191-10 [NOB-106 4-5]	B173507	20.0	2.00	03/31/17
17C1191-11 [FD-01]	B173507	20.0	2.00	03/31/17

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

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17C1191-01 [NOB-101 0-2]	B173753	20.5	17.2	04/04/17
17C1191-02 [NOB-101 6-8]	B173753	16.4	17.6	04/04/17
17C1191-03 [NOB-102 0-2]	B173753	21.6	17.1	04/04/17
17C1191-04 [NOB-102 7-8]	B173753	20.9	17.0	04/04/17
17C1191-05 [NOB-104 0-2]	B173753	6.70	5.80	04/04/17
17C1191-06 [NOB-104 5-5.5]	B173753	5.20	5.50	04/04/17

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

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17C1191-07 [NOB-105 0-2]	B173829	7.30	5.80	04/05/17
17C1191-08 [NOB-105 11-12]	B173829	6.70	7.50	04/05/17
17C1191-09 [NOB-106 0-2]	B173829	6.40	6.10	04/05/17
17C1191-10 [NOB-106 4-5]	B173829	8.70	6.10	04/05/17
17C1191-11 [FD-01]	B173829	7.20	5.70	04/05/17

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
17C1191-01 [NOB-101 0-2]	B173503	03/31/17
17C1191-02 [NOB-101 6-8]	B173503	03/31/17
17C1191-03 [NOB-102 0-2]	B173503	03/31/17
17C1191-04 [NOB-102 7-8]	B173503	03/31/17
17C1191-05 [NOB-104 0-2]	B173503	03/31/17
17C1191-06 [NOB-104 5-5.5]	B173503	03/31/17
17C1191-07 [NOB-105 0-2]	B173503	03/31/17
17C1191-08 [NOB-105 11-12]	B173503	03/31/17
17C1191-09 [NOB-106 0-2]	B173503	03/31/17
17C1191-10 [NOB-106 4-5]	B173503	03/31/17
17C1191-11 [FD-01]	B173503	03/31/17

Prep Method: SW-846 3051-SW-846 6010C-D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17C1191-01 [NOB-101 0-2]	B173743	1.08	50.0	04/04/17

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Sample Extraction Data

Prep Method: SW-846 3051-SW-846 6010C-D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17C1191-02 [NOB-101 6-8]	B173743	1.03	50.0	04/04/17
17C1191-03 [NOB-102 0-2]	B173743	1.05	50.0	04/04/17
17C1191-04 [NOB-102 7-8]	B173743	1.02	50.0	04/04/17
17C1191-05 [NOB-104 0-2]	B173743	1.01	50.0	04/04/17
17C1191-06 [NOB-104 5-5.5]	B173743	1.00	50.0	04/04/17
17C1191-07 [NOB-105 0-2]	B173743	0.998	50.0	04/04/17
17C1191-08 [NOB-105 11-12]	B173743	1.02	50.0	04/04/17
17C1191-09 [NOB-106 0-2]	B173743	0.994	50.0	04/04/17
17C1191-10 [NOB-106 4-5]	B173743	1.04	50.0	04/04/17
17C1191-11 [FD-01]	B173743	0.969	50.0	04/04/17

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17C1191-01 [NOB-101 0-2]	B173810	0.609	50.0	04/06/17
17C1191-02 [NOB-101 6-8]	B173810	0.611	50.0	04/06/17
17C1191-03 [NOB-102 0-2]	B173810	0.620	50.0	04/06/17
17C1191-04 [NOB-102 7-8]	B173810	0.609	50.0	04/06/17
17C1191-05 [NOB-104 0-2]	B173810	0.616	50.0	04/06/17
17C1191-06 [NOB-104 5-5.5]	B173810	0.593	50.0	04/06/17
17C1191-07 [NOB-105 0-2]	B173810	0.617	50.0	04/06/17
17C1191-08 [NOB-105 11-12]	B173810	0.620	50.0	04/06/17
17C1191-09 [NOB-106 0-2]	B173810	0.594	50.0	04/06/17
17C1191-10 [NOB-106 4-5]	B173810	0.629	50.0	04/06/17
17C1191-11 [FD-01]	B173810	0.609	50.0	04/06/17

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17C1191-01 [NOB-101 0-2]	B173524	4.23	10.0	03/31/17
17C1191-02 [NOB-101 6-8]	B173524	6.89	10.0	03/31/17
17C1191-03 [NOB-102 0-2]	B173524	7.56	10.0	03/31/17
17C1191-04 [NOB-102 7-8]	B173524	7.21	10.0	03/31/17
17C1191-05 [NOB-104 0-2]	B173524	6.87	10.0	03/31/17
17C1191-07 [NOB-105 0-2]	B173524	7.46	10.0	03/31/17

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Sample Amount(g)	Methanol Volume(mL)	Methanol Aliquot(mL)	Final Volume(mL)	Date
17C1191-09 [NOB-106 0-2]	B173532	16.6	17.3	1	50	03/31/17

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17C1191-06 [NOB-104 5-5.5]	B173594	6.08	10.0	03/31/17

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date

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Sample Extraction Data

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17C1191-08 [NOB-105 11-12]	B173635	6.14	10.0	04/03/17
17C1191-10 [NOB-106 4-5]	B173635	4.90	10.0	04/03/17
17C1191-11 [FD-01]	B173635	7.74	10.0	04/03/17
17C1191-12 [TB-01]	B173635	5.00	10.0	04/03/17

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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
Batch B173524 - SW-846 5035										
Blank (B173524-BLK1)				Prepared & Analyzed: 03/31/17						
Acetone	ND	0.10	mg/Kg wet							
tert-Amyl Methyl Ether (TAME)	ND	0.0010	mg/Kg wet							
Benzene	ND	0.0020	mg/Kg wet							
Bromobenzene	ND	0.0020	mg/Kg wet							
Bromochloromethane	ND	0.0020	mg/Kg wet							
Bromodichloromethane	ND	0.0020	mg/Kg wet							
Bromoform	ND	0.0020	mg/Kg wet							
Bromomethane	ND	0.010	mg/Kg wet							
2-Butanone (MEK)	ND	0.040	mg/Kg wet							
n-Butylbenzene	ND	0.0020	mg/Kg wet							
sec-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	mg/Kg wet							
Carbon Disulfide	ND	0.0060	mg/Kg wet							
Carbon Tetrachloride	ND	0.0020	mg/Kg wet							
Chlorobenzene	ND	0.0020	mg/Kg wet							
Chlorodibromomethane	ND	0.0010	mg/Kg wet							
Chloroethane	ND	0.010	mg/Kg wet							R-05
Chloroform	ND	0.0040	mg/Kg wet							
Chloromethane	ND	0.010	mg/Kg wet							
2-Chlorotoluene	ND	0.0020	mg/Kg wet							
4-Chlorotoluene	ND	0.0020	mg/Kg wet							
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0020	mg/Kg wet							V-05
1,2-Dibromoethane (EDB)	ND	0.0010	mg/Kg wet							
Dibromomethane	ND	0.0020	mg/Kg wet							
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet							
Dichlorodifluoromethane (Freon 12)	ND	0.010	mg/Kg wet							
1,1-Dichloroethane	ND	0.0020	mg/Kg wet							
1,2-Dichloroethane	ND	0.0020	mg/Kg wet							
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet							
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
1,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,3-Dichloropropane	ND	0.0010	mg/Kg wet							
2,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,1-Dichloropropene	ND	0.0020	mg/Kg wet							
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
trans-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
Diethyl Ether	ND	0.010	mg/Kg wet							
Diisopropyl Ether (DIPE)	ND	0.0010	mg/Kg wet							
1,4-Dioxane	ND	0.10	mg/Kg wet							V-16
Ethylbenzene	ND	0.0020	mg/Kg wet							
Hexachlorobutadiene	ND	0.0020	mg/Kg wet							
2-Hexanone (MBK)	ND	0.020	mg/Kg wet							
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet							
p-Isopropyltoluene (p-Cymene)	ND	0.0020	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet							
Methylene Chloride	ND	0.010	mg/Kg wet							
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet							
Naphthalene	ND	0.0040	mg/Kg wet							V-05

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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	
Batch B173524 - SW-846 5035											
Blank (B173524-BLK1)				Prepared & Analyzed: 03/31/17							
n-Propylbenzene	ND	0.0020	mg/Kg wet								
Styrene	ND	0.0020	mg/Kg wet								
1,1,1,2-Tetrachloroethane	ND	0.0020	mg/Kg wet								
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet								
Tetrachloroethylene	ND	0.0020	mg/Kg wet								
Tetrahydrofuran	ND	0.010	mg/Kg wet							V-16	
Toluene	ND	0.0020	mg/Kg wet								
1,2,3-Trichlorobenzene	ND	0.0020	mg/Kg wet								
1,2,4-Trichlorobenzene	ND	0.0020	mg/Kg wet								
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet								
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet								
Trichloroethylene	ND	0.0020	mg/Kg wet								
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet								
1,2,3-Trichloropropane	ND	0.0020	mg/Kg wet								
1,2,4-Trimethylbenzene	ND	0.0020	mg/Kg wet								
1,3,5-Trimethylbenzene	ND	0.0020	mg/Kg wet								
Vinyl Chloride	ND	0.010	mg/Kg wet								
m+p Xylene	ND	0.0040	mg/Kg wet								
o-Xylene	ND	0.0020	mg/Kg wet								
Surrogate: 1,2-Dichloroethane-d4	*0.0473*		mg/Kg wet	0.0500		94.5	70-130				
Surrogate: Toluene-d8	*0.0508*		mg/Kg wet	0.0500		102	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0499*		mg/Kg wet	0.0500		99.8	70-130				
LCS (B173524-BS1)				Prepared & Analyzed: 03/31/17							
Acetone	0.186	0.10	mg/Kg wet	0.200		93.2	40-160				†
tert-Amyl Methyl Ether (TAME)	0.0196	0.0010	mg/Kg wet	0.0200		97.8	70-130				
Benzene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130				
Bromobenzene	0.0183	0.0020	mg/Kg wet	0.0200		91.6	70-130				
Bromochloromethane	0.0235	0.0020	mg/Kg wet	0.0200		118	70-130				
Bromodichloromethane	0.0195	0.0020	mg/Kg wet	0.0200		97.4	70-130				
Bromoform	0.0203	0.0020	mg/Kg wet	0.0200		101	70-130				
Bromomethane	0.0171	0.010	mg/Kg wet	0.0200		85.5	40-160				†
2-Butanone (MEK)	0.172	0.040	mg/Kg wet	0.200		86.0	40-160				†
n-Butylbenzene	0.0187	0.0020	mg/Kg wet	0.0200		93.4	70-130				
sec-Butylbenzene	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130				
tert-Butylbenzene	0.0198	0.0020	mg/Kg wet	0.0200		99.0	70-130				
tert-Butyl Ethyl Ether (TBEE)	0.0193	0.0010	mg/Kg wet	0.0200		96.5	70-130				
Carbon Disulfide	0.0224	0.0060	mg/Kg wet	0.0200		112	70-130				
Carbon Tetrachloride	0.0215	0.0020	mg/Kg wet	0.0200		108	70-130				
Chlorobenzene	0.0198	0.0020	mg/Kg wet	0.0200		99.0	70-130				
Chlorodibromomethane	0.0221	0.0010	mg/Kg wet	0.0200		110	70-130				
Chloroethane	0.0169	0.010	mg/Kg wet	0.0200		84.6	70-130			R-05	
Chloroform	0.0196	0.0040	mg/Kg wet	0.0200		98.0	70-130				
Chloromethane	0.0146	0.010	mg/Kg wet	0.0200		73.1	40-160				†
2-Chlorotoluene	0.0202	0.0020	mg/Kg wet	0.0200		101	70-130				
4-Chlorotoluene	0.0194	0.0020	mg/Kg wet	0.0200		96.8	70-130				
1,2-Dibromo-3-chloropropane (DBCP)	0.0198	0.0020	mg/Kg wet	0.0200		98.8	70-130			V-05	
1,2-Dibromoethane (EDB)	0.0211	0.0010	mg/Kg wet	0.0200		106	70-130				
Dibromomethane	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130				
1,2-Dichlorobenzene	0.0195	0.0020	mg/Kg wet	0.0200		97.6	70-130				
1,3-Dichlorobenzene	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130				
1,4-Dichlorobenzene	0.0194	0.0020	mg/Kg wet	0.0200		96.8	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	
Batch B173524 - SW-846 5035											
LCS (B173524-BS1)				Prepared & Analyzed: 03/31/17							
Dichlorodifluoromethane (Freon 12)	0.0188	0.010	mg/Kg wet	0.0200		94.1	40-160				†
1,1-Dichloroethane	0.0201	0.0020	mg/Kg wet	0.0200		101	70-130				
1,2-Dichloroethane	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130				
1,1-Dichloroethylene	0.0208	0.0040	mg/Kg wet	0.0200		104	70-130				
cis-1,2-Dichloroethylene	0.0188	0.0020	mg/Kg wet	0.0200		93.9	70-130				
trans-1,2-Dichloroethylene	0.0228	0.0020	mg/Kg wet	0.0200		114	70-130				
1,2-Dichloropropane	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130				
1,3-Dichloropropane	0.0205	0.0010	mg/Kg wet	0.0200		102	70-130				
2,2-Dichloropropane	0.0195	0.0020	mg/Kg wet	0.0200		97.7	70-130				
1,1-Dichloropropene	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130				
cis-1,3-Dichloropropene	0.0191	0.0010	mg/Kg wet	0.0200		95.6	70-130				
trans-1,3-Dichloropropene	0.0204	0.0010	mg/Kg wet	0.0200		102	70-130				
Diethyl Ether	0.0209	0.010	mg/Kg wet	0.0200		104	70-130				
Diisopropyl Ether (DIPE)	0.0174	0.0010	mg/Kg wet	0.0200		87.0	70-130				
1,4-Dioxane	0.227	0.10	mg/Kg wet	0.200		113	40-160			V-16	†
Ethylbenzene	0.0192	0.0020	mg/Kg wet	0.0200		95.8	70-130				
Hexachlorobutadiene	0.0200	0.0020	mg/Kg wet	0.0200		100	70-130				
2-Hexanone (MBK)	0.190	0.020	mg/Kg wet	0.200		94.8	40-160				†
Isopropylbenzene (Cumene)	0.0226	0.0020	mg/Kg wet	0.0200		113	70-130				
p-Isopropyltoluene (p-Cymene)	0.0193	0.0020	mg/Kg wet	0.0200		96.5	70-130				
Methyl tert-Butyl Ether (MTBE)	0.0199	0.0040	mg/Kg wet	0.0200		99.6	70-130				
Methylene Chloride	0.0199	0.010	mg/Kg wet	0.0200		99.4	70-130				
4-Methyl-2-pentanone (MIBK)	0.190	0.020	mg/Kg wet	0.200		94.9	40-160				†
Naphthalene	0.0179	0.0040	mg/Kg wet	0.0200		89.5	70-130			V-05	
n-Propylbenzene	0.0200	0.0020	mg/Kg wet	0.0200		100	70-130				
Styrene	0.0193	0.0020	mg/Kg wet	0.0200		96.7	70-130				
1,1,1,2-Tetrachloroethane	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130				
1,1,2,2-Tetrachloroethane	0.0201	0.0010	mg/Kg wet	0.0200		101	70-130				
Tetrachloroethylene	0.0224	0.0020	mg/Kg wet	0.0200		112	70-130				
Tetrahydrofuran	0.0180	0.010	mg/Kg wet	0.0200		90.2	70-130			V-16	
Toluene	0.0215	0.0020	mg/Kg wet	0.0200		108	70-130				
1,2,3-Trichlorobenzene	0.0190	0.0020	mg/Kg wet	0.0200		95.2	70-130				
1,2,4-Trichlorobenzene	0.0186	0.0020	mg/Kg wet	0.0200		92.8	70-130				
1,1,1-Trichloroethane	0.0213	0.0020	mg/Kg wet	0.0200		107	70-130				
1,1,2-Trichloroethane	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130				
Trichloroethylene	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130				
Trichlorofluoromethane (Freon 11)	0.0220	0.010	mg/Kg wet	0.0200		110	70-130				
1,2,3-Trichloropropane	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130				
1,2,4-Trimethylbenzene	0.0190	0.0020	mg/Kg wet	0.0200		94.9	70-130				
1,3,5-Trimethylbenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.5	70-130				
Vinyl Chloride	0.0177	0.010	mg/Kg wet	0.0200		88.7	70-130				
m+p Xylene	0.0395	0.0040	mg/Kg wet	0.0400		98.6	70-130				
o-Xylene	0.0196	0.0020	mg/Kg wet	0.0200		97.8	70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0465*		mg/Kg wet	0.0500		93.0	70-130				
Surrogate: Toluene-d8	*0.0511*		mg/Kg wet	0.0500		102	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0496*		mg/Kg wet	0.0500		99.3	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	
Batch B173524 - SW-846 5035													
LCS Dup (B173524-BSD1)				Prepared & Analyzed: 03/31/17									
Acetone	0.195	0.10	mg/Kg wet	0.200		97.4		40-160	4.45		20		†
tert-Amyl Methyl Ether (TAME)	0.0197	0.0010	mg/Kg wet	0.0200		98.5		70-130	0.713		20		
Benzene	0.0211	0.0020	mg/Kg wet	0.0200		105		70-130	2.99		20		
Bromobenzene	0.0209	0.0020	mg/Kg wet	0.0200		105		70-130	13.3		20		
Bromochloromethane	0.0248	0.0020	mg/Kg wet	0.0200		124		70-130	5.22		20		
Bromodichloromethane	0.0203	0.0020	mg/Kg wet	0.0200		102		70-130	4.32		20		
Bromoform	0.0244	0.0020	mg/Kg wet	0.0200		122		70-130	18.7		20		
Bromomethane	0.0184	0.010	mg/Kg wet	0.0200		92.1		40-160	7.43		20		†
2-Butanone (MEK)	0.185	0.040	mg/Kg wet	0.200		92.5		40-160	7.32		20		†
n-Butylbenzene	0.0198	0.0020	mg/Kg wet	0.0200		99.1		70-130	5.92		20		
sec-Butylbenzene	0.0227	0.0020	mg/Kg wet	0.0200		114		70-130	6.93		20		
tert-Butylbenzene	0.0207	0.0020	mg/Kg wet	0.0200		103		70-130	4.35		20		
tert-Butyl Ethyl Ether (TBEE)	0.0201	0.0010	mg/Kg wet	0.0200		100		70-130	3.86		20		
Carbon Disulfide	0.0230	0.0060	mg/Kg wet	0.0200		115		70-130	2.82		20		
Carbon Tetrachloride	0.0215	0.0020	mg/Kg wet	0.0200		107		70-130	0.186		20		
Chlorobenzene	0.0209	0.0020	mg/Kg wet	0.0200		105		70-130	5.60		20		
Chlorodibromomethane	0.0235	0.0010	mg/Kg wet	0.0200		117		70-130	6.15		20		
Chloroethane	0.0220	0.010	mg/Kg wet	0.0200		110		70-130	**26.3**	*	20	R-05	
Chloroform	0.0206	0.0040	mg/Kg wet	0.0200		103		70-130	5.17		20		
Chloromethane	0.0146	0.010	mg/Kg wet	0.0200		72.9		40-160	0.274		20		†
2-Chlorotoluene	0.0218	0.0020	mg/Kg wet	0.0200		109		70-130	7.81		20		
4-Chlorotoluene	0.0207	0.0020	mg/Kg wet	0.0200		104		70-130	6.88		20		
1,2-Dibromo-3-chloropropane (DBCP)	0.0212	0.0020	mg/Kg wet	0.0200		106		70-130	6.84		20	V-05	
1,2-Dibromoethane (EDB)	0.0220	0.0010	mg/Kg wet	0.0200		110		70-130	4.17		20		
Dibromomethane	0.0219	0.0020	mg/Kg wet	0.0200		109		70-130	4.96		20		
1,2-Dichlorobenzene	0.0208	0.0020	mg/Kg wet	0.0200		104		70-130	6.45		20		
1,3-Dichlorobenzene	0.0212	0.0020	mg/Kg wet	0.0200		106		70-130	5.53		20		
1,4-Dichlorobenzene	0.0206	0.0020	mg/Kg wet	0.0200		103		70-130	6.11		20		
Dichlorodifluoromethane (Freon 12)	0.0170	0.010	mg/Kg wet	0.0200		85.2		40-160	9.93		20		†
1,1-Dichloroethane	0.0212	0.0020	mg/Kg wet	0.0200		106		70-130	5.04		20		
1,2-Dichloroethane	0.0213	0.0020	mg/Kg wet	0.0200		106		70-130	0.659		20		
1,1-Dichloroethylene	0.0211	0.0040	mg/Kg wet	0.0200		105		70-130	1.24		20		
cis-1,2-Dichloroethylene	0.0192	0.0020	mg/Kg wet	0.0200		95.8		70-130	2.00		20		
trans-1,2-Dichloroethylene	0.0232	0.0020	mg/Kg wet	0.0200		116		70-130	1.65		20		
1,2-Dichloropropane	0.0211	0.0020	mg/Kg wet	0.0200		106		70-130	2.50		20		
1,3-Dichloropropane	0.0209	0.0010	mg/Kg wet	0.0200		104		70-130	1.84		20		
2,2-Dichloropropane	0.0206	0.0020	mg/Kg wet	0.0200		103		70-130	5.48		20		
1,1-Dichloropropene	0.0209	0.0020	mg/Kg wet	0.0200		105		70-130	2.51		20		
cis-1,3-Dichloropropene	0.0200	0.0010	mg/Kg wet	0.0200		100		70-130	4.60		20		
trans-1,3-Dichloropropene	0.0217	0.0010	mg/Kg wet	0.0200		108		70-130	6.28		20		
Diethyl Ether	0.0213	0.010	mg/Kg wet	0.0200		107		70-130	2.09		20		
Diisopropyl Ether (DIPE)	0.0178	0.0010	mg/Kg wet	0.0200		89.2		70-130	2.50		20		
1,4-Dioxane	0.226	0.10	mg/Kg wet	0.200		113		40-160	0.495		20	V-16	†
Ethylbenzene	0.0206	0.0020	mg/Kg wet	0.0200		103		70-130	7.44		20		
Hexachlorobutadiene	0.0221	0.0020	mg/Kg wet	0.0200		110		70-130	9.79		20		
2-Hexanone (MBK)	0.203	0.020	mg/Kg wet	0.200		102		40-160	6.91		20		†
Isopropylbenzene (Cumene)	0.0267	0.0020	mg/Kg wet	0.0200		**134**	*	70-130	16.9		20	L-07	
p-Isopropyltoluene (p-Cymene)	0.0208	0.0020	mg/Kg wet	0.0200		104		70-130	7.39		20		
Methyl tert-Butyl Ether (MTBE)	0.0204	0.0040	mg/Kg wet	0.0200		102		70-130	2.48		20		
Methylene Chloride	0.0200	0.010	mg/Kg wet	0.0200		99.8		70-130	0.402		20		
4-Methyl-2-pentanone (MIBK)	0.205	0.020	mg/Kg wet	0.200		102		40-160	7.67		20		†
Naphthalene	0.0200	0.0040	mg/Kg wet	0.0200		100		70-130	11.3		20	V-05	

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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
Batch B173524 - SW-846 5035										
LCS Dup (B173524-BSD1)				Prepared & Analyzed: 03/31/17						
n-Propylbenzene	0.0235	0.0020	mg/Kg wet	0.0200		117	70-130	15.8	20	
Styrene	0.0228	0.0020	mg/Kg wet	0.0200		114	70-130	16.4	20	
1,1,1,2-Tetrachloroethane	0.0217	0.0020	mg/Kg wet	0.0200		109	70-130	3.65	20	
1,1,2,2-Tetrachloroethane	0.0227	0.0010	mg/Kg wet	0.0200		113	70-130	11.9	20	
Tetrachloroethylene	0.0230	0.0020	mg/Kg wet	0.0200		115	70-130	2.73	20	
Tetrahydrofuran	0.0190	0.010	mg/Kg wet	0.0200		95.1	70-130	5.29	20	V-16
Toluene	0.0217	0.0020	mg/Kg wet	0.0200		109	70-130	0.925	20	
1,2,3-Trichlorobenzene	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130	6.90	20	
1,2,4-Trichlorobenzene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130	9.84	20	
1,1,1-Trichloroethane	0.0219	0.0020	mg/Kg wet	0.0200		110	70-130	2.77	20	
1,1,2-Trichloroethane	0.0209	0.0020	mg/Kg wet	0.0200		105	70-130	1.64	20	
Trichloroethylene	0.0217	0.0020	mg/Kg wet	0.0200		108	70-130	4.05	20	
Trichlorofluoromethane (Freon 11)	0.0224	0.010	mg/Kg wet	0.0200		112	70-130	1.89	20	
1,2,3-Trichloropropane	0.0229	0.0020	mg/Kg wet	0.0200		115	70-130	11.9	20	
1,2,4-Trimethylbenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.7	70-130	4.93	20	
1,3,5-Trimethylbenzene	0.0215	0.0020	mg/Kg wet	0.0200		107	70-130	7.54	20	
Vinyl Chloride	0.0180	0.010	mg/Kg wet	0.0200		90.0	70-130	1.45	20	
m+p Xylene	0.0416	0.0040	mg/Kg wet	0.0400		104	70-130	5.38	20	
o-Xylene	0.0222	0.0020	mg/Kg wet	0.0200		111	70-130	12.7	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0471*		mg/Kg wet	0.0500		94.1	70-130			
Surrogate: Toluene-d8	*0.0511*		mg/Kg wet	0.0500		102	70-130			
Surrogate: 4-Bromofluorobenzene	*0.0544*		mg/Kg wet	0.0500		109	70-130			
Batch B173532 - SW-846 5035										
Blank (B173532-BLK1)				Prepared: 03/31/17 Analyzed: 04/05/17						
Acetone	ND	2.5	mg/Kg wet							
tert-Amyl Methyl Ether (TAME)	ND	0.025	mg/Kg wet							
Benzene	ND	0.050	mg/Kg wet							
Bromobenzene	ND	0.050	mg/Kg wet							
Bromochloromethane	ND	0.050	mg/Kg wet							
Bromodichloromethane	ND	0.050	mg/Kg wet							
Bromoform	ND	0.10	mg/Kg wet							
Bromomethane	ND	0.25	mg/Kg wet							
2-Butanone (MEK)	ND	1.0	mg/Kg wet							
n-Butylbenzene	ND	0.050	mg/Kg wet							
sec-Butylbenzene	ND	0.050	mg/Kg wet							
tert-Butylbenzene	ND	0.050	mg/Kg wet							
tert-Butyl Ethyl Ether (TBEE)	ND	0.025	mg/Kg wet							
Carbon Disulfide	ND	0.50	mg/Kg wet							
Carbon Tetrachloride	ND	0.050	mg/Kg wet							
Chlorobenzene	ND	0.050	mg/Kg wet							
Chlorodibromomethane	ND	0.050	mg/Kg wet							
Chloroethane	ND	0.10	mg/Kg wet							
Chloroform	ND	0.10	mg/Kg wet							
Chloromethane	ND	0.10	mg/Kg wet							
2-Chlorotoluene	ND	0.050	mg/Kg wet							
4-Chlorotoluene	ND	0.050	mg/Kg wet							
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.20	mg/Kg wet							
1,2-Dibromoethane (EDB)	ND	0.025	mg/Kg wet							
Dibromomethane	ND	0.050	mg/Kg wet							
1,2-Dichlorobenzene	ND	0.050	mg/Kg wet							
1,3-Dichlorobenzene	ND	0.050	mg/Kg wet							

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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
Batch B173532 - SW-846 5035										
Blank (B173532-BLK1)				Prepared: 03/31/17 Analyzed: 04/05/17						
1,4-Dichlorobenzene	ND	0.050	mg/Kg wet							
Dichlorodifluoromethane (Freon 12)	ND	0.10	mg/Kg wet							
1,1-Dichloroethane	ND	0.050	mg/Kg wet							
1,2-Dichloroethane	ND	0.050	mg/Kg wet							
1,1-Dichloroethylene	ND	0.050	mg/Kg wet							
cis-1,2-Dichloroethylene	ND	0.050	mg/Kg wet							
trans-1,2-Dichloroethylene	ND	0.050	mg/Kg wet							
1,2-Dichloropropane	ND	0.050	mg/Kg wet							
1,3-Dichloropropane	ND	0.025	mg/Kg wet							
2,2-Dichloropropane	ND	0.050	mg/Kg wet							
1,1-Dichloropropene	ND	0.10	mg/Kg wet							
cis-1,3-Dichloropropene	ND	0.025	mg/Kg wet							
trans-1,3-Dichloropropene	ND	0.025	mg/Kg wet							
Diethyl Ether	ND	0.10	mg/Kg wet							
Diisopropyl Ether (DIPE)	ND	0.025	mg/Kg wet							
1,4-Dioxane	ND	2.5	mg/Kg wet							V-16
Ethylbenzene	ND	0.050	mg/Kg wet							
Hexachlorobutadiene	ND	0.050	mg/Kg wet							
2-Hexanone (MBK)	ND	0.50	mg/Kg wet							
Isopropylbenzene (Cumene)	ND	0.050	mg/Kg wet							
p-Isopropyltoluene (p-Cymene)	ND	0.050	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.050	mg/Kg wet							
Methylene Chloride	ND	0.25	mg/Kg wet							
4-Methyl-2-pentanone (MIBK)	ND	0.50	mg/Kg wet							
Naphthalene	ND	0.10	mg/Kg wet							
n-Propylbenzene	ND	0.050	mg/Kg wet							
Styrene	ND	0.050	mg/Kg wet							
1,1,1,2-Tetrachloroethane	ND	0.050	mg/Kg wet							
1,1,2,2-Tetrachloroethane	ND	0.025	mg/Kg wet							
Tetrachloroethylene	ND	0.050	mg/Kg wet							
Tetrahydrofuran	ND	0.20	mg/Kg wet							
Toluene	ND	0.050	mg/Kg wet							
1,2,3-Trichlorobenzene	ND	0.20	mg/Kg wet							
1,2,4-Trichlorobenzene	ND	0.050	mg/Kg wet							
1,1,1-Trichloroethane	ND	0.050	mg/Kg wet							
1,1,2-Trichloroethane	ND	0.050	mg/Kg wet							
Trichloroethylene	ND	0.050	mg/Kg wet							
Trichlorofluoromethane (Freon 11)	ND	0.10	mg/Kg wet							
1,2,3-Trichloropropane	ND	0.10	mg/Kg wet							
1,2,4-Trimethylbenzene	ND	0.050	mg/Kg wet							
1,3,5-Trimethylbenzene	ND	0.050	mg/Kg wet							
Vinyl Chloride	ND	0.10	mg/Kg wet							
m+p Xylene	ND	0.10	mg/Kg wet							
o-Xylene	ND	0.050	mg/Kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0248*		mg/Kg wet	0.0250		99.2	70-130			
Surrogate: Toluene-d8	*0.0251*		mg/Kg wet	0.0250		101	70-130			
Surrogate: 4-Bromofluorobenzene	*0.0237*		mg/Kg wet	0.0250		94.8	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	
Batch B173532 - SW-846 5035											
LCS (B173532-BS1)				Prepared: 03/31/17 Analyzed: 04/05/17							
Acetone	0.0940	0.057	mg/Kg wet	0.113		83.0	40-160				†
tert-Amyl Methyl Ether (TAME)	0.0103	0.00057	mg/Kg wet	0.0113		91.3	70-130				
Benzene	0.0112	0.0011	mg/Kg wet	0.0113		98.8	70-130				
Bromobenzene	0.0116	0.0011	mg/Kg wet	0.0113		102	70-130				
Bromochloromethane	0.0121	0.0011	mg/Kg wet	0.0113		107	70-130				
Bromodichloromethane	0.0111	0.0011	mg/Kg wet	0.0113		98.0	70-130				
Bromoform	0.0113	0.0023	mg/Kg wet	0.0113		100	70-130				
Bromomethane	0.00479	0.0057	mg/Kg wet	0.0113		42.3	40-160			L-14	†
2-Butanone (MEK)	0.110	0.023	mg/Kg wet	0.113		96.7	40-160				†
n-Butylbenzene	0.0133	0.0011	mg/Kg wet	0.0113		117	70-130				
sec-Butylbenzene	0.0124	0.0011	mg/Kg wet	0.0113		110	70-130				
tert-Butylbenzene	0.0122	0.0011	mg/Kg wet	0.0113		108	70-130				
tert-Butyl Ethyl Ether (TBEE)	0.0113	0.00057	mg/Kg wet	0.0113		100	70-130				
Carbon Disulfide	0.0124	0.011	mg/Kg wet	0.0113		109	70-130				
Carbon Tetrachloride	0.0115	0.0011	mg/Kg wet	0.0113		101	70-130				
Chlorobenzene	0.0112	0.0011	mg/Kg wet	0.0113		98.5	70-130				
Chlorodibromomethane	0.0106	0.0011	mg/Kg wet	0.0113		93.4	70-130				
Chloroethane	0.00988	0.0023	mg/Kg wet	0.0113		87.2	70-130				
Chloroform	0.0111	0.0023	mg/Kg wet	0.0113		97.9	70-130				
Chloromethane	0.00491	0.0023	mg/Kg wet	0.0113		43.3	40-160			L-14	†
2-Chlorotoluene	0.00992	0.0011	mg/Kg wet	0.0113		87.5	70-130				
4-Chlorotoluene	0.0111	0.0011	mg/Kg wet	0.0113		97.7	70-130				
1,2-Dibromo-3-chloropropane (DBCP)	0.0107	0.0045	mg/Kg wet	0.0113		94.0	70-130				
1,2-Dibromoethane (EDB)	0.0112	0.00057	mg/Kg wet	0.0113		98.5	70-130				
Dibromomethane	0.0111	0.0011	mg/Kg wet	0.0113		98.0	70-130				
1,2-Dichlorobenzene	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130				
1,3-Dichlorobenzene	0.0118	0.0011	mg/Kg wet	0.0113		104	70-130				
1,4-Dichlorobenzene	0.0112	0.0011	mg/Kg wet	0.0113		98.6	70-130				
Dichlorodifluoromethane (Freon 12)	0.00638	0.0023	mg/Kg wet	0.0113		56.3	40-160			L-14	†
1,1-Dichloroethane	0.0125	0.0011	mg/Kg wet	0.0113		110	70-130				
1,2-Dichloroethane	0.0103	0.0011	mg/Kg wet	0.0113		90.6	70-130				
1,1-Dichloroethylene	0.00933	0.0011	mg/Kg wet	0.0113		82.3	70-130				
cis-1,2-Dichloroethylene	0.0117	0.0011	mg/Kg wet	0.0113		103	70-130				
trans-1,2-Dichloroethylene	0.0115	0.0011	mg/Kg wet	0.0113		102	70-130				
1,2-Dichloropropane	0.0112	0.0011	mg/Kg wet	0.0113		99.0	70-130				
1,3-Dichloropropane	0.0107	0.00057	mg/Kg wet	0.0113		94.5	70-130				
2,2-Dichloropropane	0.0132	0.0011	mg/Kg wet	0.0113		116	70-130				
1,1-Dichloropropene	0.0115	0.0023	mg/Kg wet	0.0113		101	70-130				
cis-1,3-Dichloropropene	0.0122	0.00057	mg/Kg wet	0.0113		108	70-130				
trans-1,3-Dichloropropene	0.0116	0.00057	mg/Kg wet	0.0113		102	70-130				
Diethyl Ether	0.00994	0.0023	mg/Kg wet	0.0113		87.7	70-130				
Diisopropyl Ether (DIPE)	0.0118	0.00057	mg/Kg wet	0.0113		104	70-130				
1,4-Dioxane	0.114	0.057	mg/Kg wet	0.113		100	40-160			V-16	†
Ethylbenzene	0.0115	0.0011	mg/Kg wet	0.0113		101	70-130				
Hexachlorobutadiene	0.0135	0.0011	mg/Kg wet	0.0113		119	70-130				
2-Hexanone (MBK)	0.113	0.011	mg/Kg wet	0.113		99.3	40-160				†
Isopropylbenzene (Cumene)	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130				
p-Isopropyltoluene (p-Cymene)	0.0124	0.0011	mg/Kg wet	0.0113		109	70-130				
Methyl tert-Butyl Ether (MTBE)	0.0111	0.0011	mg/Kg wet	0.0113		98.0	70-130				
Methylene Chloride	0.00923	0.0057	mg/Kg wet	0.0113		81.4	70-130				
4-Methyl-2-pentanone (MIBK)	0.110	0.011	mg/Kg wet	0.113		97.2	40-160				†
Naphthalene	0.0120	0.0023	mg/Kg wet	0.0113		106	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	
Batch B173532 - SW-846 5035											
LCS (B173532-BS1)				Prepared: 03/31/17 Analyzed: 04/05/17							
n-Propylbenzene	0.0117	0.0011	mg/Kg wet	0.0113		103	70-130				
Styrene	0.0114	0.0011	mg/Kg wet	0.0113		101	70-130				
1,1,1,2-Tetrachloroethane	0.0114	0.0011	mg/Kg wet	0.0113		101	70-130				
1,1,2,2-Tetrachloroethane	0.0115	0.00057	mg/Kg wet	0.0113		102	70-130				
Tetrachloroethylene	0.0116	0.0011	mg/Kg wet	0.0113		102	70-130				
Tetrahydrofuran	0.0113	0.0045	mg/Kg wet	0.0113		100	70-130				
Toluene	0.0112	0.0011	mg/Kg wet	0.0113		98.5	70-130				
1,2,3-Trichlorobenzene	0.0126	0.0045	mg/Kg wet	0.0113		111	70-130				
1,2,4-Trichlorobenzene	0.0124	0.0011	mg/Kg wet	0.0113		110	70-130				
1,1,1-Trichloroethane	0.0112	0.0011	mg/Kg wet	0.0113		99.0	70-130				
1,1,2-Trichloroethane	0.0111	0.0011	mg/Kg wet	0.0113		98.1	70-130				
Trichloroethylene	0.0115	0.0011	mg/Kg wet	0.0113		102	70-130				
Trichlorofluoromethane (Freon 11)	0.00806	0.0023	mg/Kg wet	0.0113		71.1	70-130				
1,2,3-Trichloropropane	0.0109	0.0023	mg/Kg wet	0.0113		95.9	70-130				
1,2,4-Trimethylbenzene	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130				
1,3,5-Trimethylbenzene	0.0117	0.0011	mg/Kg wet	0.0113		104	70-130				
Vinyl Chloride	0.00793	0.0023	mg/Kg wet	0.0113		70.0	70-130				
m+p Xylene	0.0230	0.0023	mg/Kg wet	0.0227		101	70-130				
o-Xylene	0.0113	0.0011	mg/Kg wet	0.0113		100	70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0288*		mg/Kg wet	0.0283		102	70-130				
Surrogate: Toluene-d8	*0.0287*		mg/Kg wet	0.0283		101	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0283*		mg/Kg wet	0.0283		100	70-130				
LCS Dup (B173532-BSD1)				Prepared: 03/31/17 Analyzed: 04/05/17							
Acetone	0.100	0.057	mg/Kg wet	0.113		88.3	40-160	6.20	20		†
tert-Amyl Methyl Ether (TAME)	0.0105	0.00057	mg/Kg wet	0.0113		92.3	70-130	1.09	20		
Benzene	0.0112	0.0011	mg/Kg wet	0.0113		98.9	70-130	0.101	20		
Bromobenzene	0.0114	0.0011	mg/Kg wet	0.0113		100	70-130	1.68	20		
Bromochloromethane	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130	0.658	20		
Bromodichloromethane	0.0114	0.0011	mg/Kg wet	0.0113		101	70-130	2.82	20		
Bromoform	0.0109	0.0023	mg/Kg wet	0.0113		96.4	70-130	3.67	20		
Bromomethane	0.00511	0.0057	mg/Kg wet	0.0113		45.1	40-160	6.41	20	L-14	†
2-Butanone (MEK)	0.114	0.023	mg/Kg wet	0.113		101	40-160	4.24	20		†
n-Butylbenzene	0.0131	0.0011	mg/Kg wet	0.0113		115	70-130	1.72	20		
sec-Butylbenzene	0.0122	0.0011	mg/Kg wet	0.0113		108	70-130	1.56	20		
tert-Butylbenzene	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130	1.59	20		
tert-Butyl Ethyl Ether (TBEE)	0.0113	0.00057	mg/Kg wet	0.0113		99.5	70-130	0.601	20		
Carbon Disulfide	0.0117	0.011	mg/Kg wet	0.0113		103	70-130	6.03	20		
Carbon Tetrachloride	0.0113	0.0011	mg/Kg wet	0.0113		99.9	70-130	1.19	20		
Chlorobenzene	0.0110	0.0011	mg/Kg wet	0.0113		97.1	70-130	1.43	20		
Chlorodibromomethane	0.0108	0.0011	mg/Kg wet	0.0113		95.2	70-130	1.91	20		
Chloroethane	0.0102	0.0023	mg/Kg wet	0.0113		90.2	70-130	3.38	20		
Chloroform	0.0109	0.0023	mg/Kg wet	0.0113		96.3	70-130	1.65	20		
Chloromethane	0.00510	0.0023	mg/Kg wet	0.0113		45.0	40-160	3.85	20	L-14	†
2-Chlorotoluene	0.00961	0.0011	mg/Kg wet	0.0113		84.8	70-130	3.13	20		
4-Chlorotoluene	0.0110	0.0011	mg/Kg wet	0.0113		96.9	70-130	0.822	20		
1,2-Dibromo-3-chloropropane (DBCP)	0.0114	0.0045	mg/Kg wet	0.0113		100	70-130	6.58	20		
1,2-Dibromoethane (EDB)	0.0110	0.00057	mg/Kg wet	0.0113		97.1	70-130	1.43	20		
Dibromomethane	0.0114	0.0011	mg/Kg wet	0.0113		100	70-130	2.22	20		
1,2-Dichlorobenzene	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130	0.666	20		
1,3-Dichlorobenzene	0.0118	0.0011	mg/Kg wet	0.0113		104	70-130	0.00	20		
1,4-Dichlorobenzene	0.0116	0.0011	mg/Kg wet	0.0113		102	70-130	3.68	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	
Batch B173532 - SW-846 5035												
LCS Dup (B173532-BSD1)				Prepared: 03/31/17 Analyzed: 04/05/17								
Dichlorodifluoromethane (Freon 12)	0.00643	0.0023	mg/Kg wet	0.0113		56.7		40-160	0.708	20	L-14	†
1,1-Dichloroethane	0.0124	0.0011	mg/Kg wet	0.0113		110		70-130	0.636	20		
1,2-Dichloroethane	0.0102	0.0011	mg/Kg wet	0.0113		90.3		70-130	0.332	20		
1,1-Dichloroethylene	0.00921	0.0011	mg/Kg wet	0.0113		81.3		70-130	1.22	20		
cis-1,2-Dichloroethylene	0.0116	0.0011	mg/Kg wet	0.0113		102		70-130	1.27	20		
trans-1,2-Dichloroethylene	0.0117	0.0011	mg/Kg wet	0.0113		104		70-130	1.85	20		
1,2-Dichloropropane	0.0109	0.0011	mg/Kg wet	0.0113		96.1		70-130	2.97	20		
1,3-Dichloropropane	0.0109	0.00057	mg/Kg wet	0.0113		95.9		70-130	1.47	20		
2,2-Dichloropropane	0.0129	0.0011	mg/Kg wet	0.0113		114		70-130	2.09	20		
1,1-Dichloropropene	0.0112	0.0023	mg/Kg wet	0.0113		98.9		70-130	2.50	20		
cis-1,3-Dichloropropene	0.0122	0.00057	mg/Kg wet	0.0113		107		70-130	0.279	20		
trans-1,3-Dichloropropene	0.0114	0.00057	mg/Kg wet	0.0113		100		70-130	2.07	20		
Diethyl Ether	0.0103	0.0023	mg/Kg wet	0.0113		91.0		70-130	3.69	20		
Diisopropyl Ether (DIPE)	0.0117	0.00057	mg/Kg wet	0.0113		103		70-130	1.25	20		
1,4-Dioxane	0.118	0.057	mg/Kg wet	0.113		105		40-160	4.19	20	V-16	†
Ethylbenzene	0.0112	0.0011	mg/Kg wet	0.0113		98.7		70-130	2.70	20		
Hexachlorobutadiene	0.0131	0.0011	mg/Kg wet	0.0113		115		70-130	2.91	20		
2-Hexanone (MBK)	0.115	0.011	mg/Kg wet	0.113		101		40-160	1.72	20		†
Isopropylbenzene (Cumene)	0.0117	0.0011	mg/Kg wet	0.0113		103		70-130	1.63	20		
p-Isopropyltoluene (p-Cymene)	0.0122	0.0011	mg/Kg wet	0.0113		108		70-130	1.20	20		
Methyl tert-Butyl Ether (MTBE)	0.0111	0.0011	mg/Kg wet	0.0113		97.6		70-130	0.409	20		
Methylene Chloride	0.00949	0.0057	mg/Kg wet	0.0113		83.7		70-130	2.79	20		
4-Methyl-2-pentanone (MIBK)	0.112	0.011	mg/Kg wet	0.113		99.0		40-160	1.82	20		†
Naphthalene	0.0122	0.0023	mg/Kg wet	0.0113		108		70-130	1.78	20		
n-Propylbenzene	0.0116	0.0011	mg/Kg wet	0.0113		102		70-130	0.972	20		
Styrene	0.0111	0.0011	mg/Kg wet	0.0113		97.9		70-130	3.12	20		
1,1,1,2-Tetrachloroethane	0.0116	0.0011	mg/Kg wet	0.0113		102		70-130	1.28	20		
1,1,2,2-Tetrachloroethane	0.0114	0.00057	mg/Kg wet	0.0113		101		70-130	0.791	20		
Tetrachloroethylene	0.0113	0.0011	mg/Kg wet	0.0113		99.6		70-130	2.38	20		
Tetrahydrofuran	0.0119	0.0045	mg/Kg wet	0.0113		105		70-130	5.16	20		
Toluene	0.0112	0.0011	mg/Kg wet	0.0113		98.9		70-130	0.405	20		
1,2,3-Trichlorobenzene	0.0128	0.0045	mg/Kg wet	0.0113		113		70-130	1.16	20		
1,2,4-Trichlorobenzene	0.0125	0.0011	mg/Kg wet	0.0113		110		70-130	0.727	20		
1,1,1-Trichloroethane	0.0112	0.0011	mg/Kg wet	0.0113		98.9		70-130	0.101	20		
1,1,2-Trichloroethane	0.0113	0.0011	mg/Kg wet	0.0113		99.9		70-130	1.82	20		
Trichloroethylene	0.0111	0.0011	mg/Kg wet	0.0113		98.3		70-130	3.20	20		
Trichlorofluoromethane (Freon 11)	0.00797	0.0023	mg/Kg wet	0.0113		70.3		70-130	1.13	20		
1,2,3-Trichloropropane	0.0107	0.0023	mg/Kg wet	0.0113		94.7		70-130	1.26	20		
1,2,4-Trimethylbenzene	0.0120	0.0011	mg/Kg wet	0.0113		106		70-130	0.0941	20		
1,3,5-Trimethylbenzene	0.0113	0.0011	mg/Kg wet	0.0113		99.6		70-130	3.94	20		
Vinyl Chloride	0.00764	0.0023	mg/Kg wet	0.0113		**67.4**	*	70-130	3.78	20	L-07	
m+p Xylene	0.0228	0.0023	mg/Kg wet	0.0227		101		70-130	0.593	20		
o-Xylene	0.0111	0.0011	mg/Kg wet	0.0113		97.8		70-130	2.22	20		
Surrogate: 1,2-Dichloroethane-d4	*0.0294*		mg/Kg wet	0.0283		104		70-130				
Surrogate: Toluene-d8	*0.0282*		mg/Kg wet	0.0283		99.6		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0280*		mg/Kg wet	0.0283		98.9		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
Batch B173594 - SW-846 5035										
Blank (B173594-BLK1)				Prepared & Analyzed: 04/03/17						
Acetone	ND	0.10	mg/Kg wet							
tert-Amyl Methyl Ether (TAME)	ND	0.0010	mg/Kg wet							
Benzene	ND	0.0020	mg/Kg wet							
Bromobenzene	ND	0.0020	mg/Kg wet							
Bromochloromethane	ND	0.0020	mg/Kg wet							
Bromodichloromethane	ND	0.0020	mg/Kg wet							
Bromoform	ND	0.0020	mg/Kg wet							
Bromomethane	ND	0.010	mg/Kg wet							
2-Butanone (MEK)	ND	0.040	mg/Kg wet							
n-Butylbenzene	ND	0.0020	mg/Kg wet							
sec-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	mg/Kg wet							
Carbon Disulfide	ND	0.0060	mg/Kg wet							
Carbon Tetrachloride	ND	0.0020	mg/Kg wet							
Chlorobenzene	ND	0.0020	mg/Kg wet							
Chlorodibromomethane	ND	0.0010	mg/Kg wet							
Chloroethane	ND	0.010	mg/Kg wet							
Chloroform	ND	0.0040	mg/Kg wet							
Chloromethane	ND	0.010	mg/Kg wet							
2-Chlorotoluene	ND	0.0020	mg/Kg wet							
4-Chlorotoluene	ND	0.0020	mg/Kg wet							
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0020	mg/Kg wet							
1,2-Dibromoethane (EDB)	ND	0.0010	mg/Kg wet							
Dibromomethane	ND	0.0020	mg/Kg wet							
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet							
Dichlorodifluoromethane (Freon 12)	ND	0.010	mg/Kg wet							
1,1-Dichloroethane	ND	0.0020	mg/Kg wet							
1,2-Dichloroethane	ND	0.0020	mg/Kg wet							
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet							
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
1,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,3-Dichloropropane	ND	0.0010	mg/Kg wet							
2,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,1-Dichloropropene	ND	0.0020	mg/Kg wet							
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
trans-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
Diethyl Ether	ND	0.010	mg/Kg wet							
Diisopropyl Ether (DIPE)	ND	0.0010	mg/Kg wet							
1,4-Dioxane	ND	0.10	mg/Kg wet							V-16
Ethylbenzene	ND	0.0020	mg/Kg wet							
Hexachlorobutadiene	ND	0.0020	mg/Kg wet							
2-Hexanone (MBK)	ND	0.020	mg/Kg wet							
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet							
p-Isopropyltoluene (p-Cymene)	ND	0.0020	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet							
Methylene Chloride	ND	0.010	mg/Kg wet							
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet							
Naphthalene	ND	0.0040	mg/Kg wet							

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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	
Batch B173594 - SW-846 5035											
Blank (B173594-BLK1)				Prepared & Analyzed: 04/03/17							
n-Propylbenzene	ND	0.0020	mg/Kg wet								
Styrene	ND	0.0020	mg/Kg wet								
1,1,1,2-Tetrachloroethane	ND	0.0020	mg/Kg wet								
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet								
Tetrachloroethylene	ND	0.0020	mg/Kg wet								
Tetrahydrofuran	ND	0.010	mg/Kg wet							V-16	
Toluene	ND	0.0020	mg/Kg wet								
1,2,3-Trichlorobenzene	ND	0.0020	mg/Kg wet								
1,2,4-Trichlorobenzene	ND	0.0020	mg/Kg wet								
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet								
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet								
Trichloroethylene	ND	0.0020	mg/Kg wet								
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet								
1,2,3-Trichloropropane	ND	0.0020	mg/Kg wet								
1,2,4-Trimethylbenzene	ND	0.0020	mg/Kg wet								
1,3,5-Trimethylbenzene	ND	0.0020	mg/Kg wet								
Vinyl Chloride	ND	0.010	mg/Kg wet								
m+p Xylene	ND	0.0040	mg/Kg wet								
o-Xylene	ND	0.0020	mg/Kg wet								
Surrogate: 1,2-Dichloroethane-d4	*0.0542*		mg/Kg wet	0.0500		108	70-130				
Surrogate: Toluene-d8	*0.0538*		mg/Kg wet	0.0500		108	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0503*		mg/Kg wet	0.0500		101	70-130				
LCS (B173594-BS1)				Prepared & Analyzed: 04/03/17							
Acetone	0.197	0.10	mg/Kg wet	0.200		98.4	40-160			V-20	†
tert-Amyl Methyl Ether (TAME)	0.0209	0.0010	mg/Kg wet	0.0200		105	70-130				
Benzene	0.0221	0.0020	mg/Kg wet	0.0200		110	70-130				
Bromobenzene	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130				
Bromochloromethane	0.0261	0.0020	mg/Kg wet	0.0200		130	70-130				
Bromodichloromethane	0.0205	0.0020	mg/Kg wet	0.0200		103	70-130				
Bromoform	0.0225	0.0020	mg/Kg wet	0.0200		112	70-130				
Bromomethane	0.0195	0.010	mg/Kg wet	0.0200		97.4	40-160				†
2-Butanone (MEK)	0.189	0.040	mg/Kg wet	0.200		94.6	40-160				†
n-Butylbenzene	0.0214	0.0020	mg/Kg wet	0.0200		107	70-130				
sec-Butylbenzene	0.0235	0.0020	mg/Kg wet	0.0200		118	70-130				
tert-Butylbenzene	0.0220	0.0020	mg/Kg wet	0.0200		110	70-130				
tert-Butyl Ethyl Ether (TBEE)	0.0213	0.0010	mg/Kg wet	0.0200		106	70-130				
Carbon Disulfide	0.0236	0.0060	mg/Kg wet	0.0200		118	70-130				
Carbon Tetrachloride	0.0236	0.0020	mg/Kg wet	0.0200		118	70-130				
Chlorobenzene	0.0222	0.0020	mg/Kg wet	0.0200		111	70-130				
Chlorodibromomethane	0.0235	0.0010	mg/Kg wet	0.0200		117	70-130				
Chloroethane	0.0211	0.010	mg/Kg wet	0.0200		105	70-130				
Chloroform	0.0217	0.0040	mg/Kg wet	0.0200		109	70-130				
Chloromethane	0.0155	0.010	mg/Kg wet	0.0200		77.7	40-160				†
2-Chlorotoluene	0.0221	0.0020	mg/Kg wet	0.0200		110	70-130				
4-Chlorotoluene	0.0215	0.0020	mg/Kg wet	0.0200		107	70-130				
1,2-Dibromo-3-chloropropane (DBCP)	0.0220	0.0020	mg/Kg wet	0.0200		110	70-130				
1,2-Dibromoethane (EDB)	0.0221	0.0010	mg/Kg wet	0.0200		110	70-130				
Dibromomethane	0.0214	0.0020	mg/Kg wet	0.0200		107	70-130				
1,2-Dichlorobenzene	0.0225	0.0020	mg/Kg wet	0.0200		112	70-130				
1,3-Dichlorobenzene	0.0218	0.0020	mg/Kg wet	0.0200		109	70-130				
1,4-Dichlorobenzene	0.0215	0.0020	mg/Kg wet	0.0200		108	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	
Batch B173594 - SW-846 5035											
LCS (B173594-BS1)				Prepared & Analyzed: 04/03/17							
Dichlorodifluoromethane (Freon 12)	0.0181	0.010	mg/Kg wet	0.0200		90.3	40-160				†
1,1-Dichloroethane	0.0230	0.0020	mg/Kg wet	0.0200		115	70-130				
1,2-Dichloroethane	0.0216	0.0020	mg/Kg wet	0.0200		108	70-130				
1,1-Dichloroethylene	0.0223	0.0040	mg/Kg wet	0.0200		111	70-130				
cis-1,2-Dichloroethylene	0.0211	0.0020	mg/Kg wet	0.0200		106	70-130				
trans-1,2-Dichloroethylene	0.0244	0.0020	mg/Kg wet	0.0200		122	70-130				
1,2-Dichloropropane	0.0219	0.0020	mg/Kg wet	0.0200		110	70-130				
1,3-Dichloropropane	0.0208	0.0010	mg/Kg wet	0.0200		104	70-130				
2,2-Dichloropropane	0.0226	0.0020	mg/Kg wet	0.0200		113	70-130				
1,1-Dichloropropene	0.0220	0.0020	mg/Kg wet	0.0200		110	70-130				
cis-1,3-Dichloropropene	0.0203	0.0010	mg/Kg wet	0.0200		102	70-130				
trans-1,3-Dichloropropene	0.0213	0.0010	mg/Kg wet	0.0200		106	70-130				
Diethyl Ether	0.0227	0.010	mg/Kg wet	0.0200		114	70-130				
Diisopropyl Ether (DIPE)	0.0192	0.0010	mg/Kg wet	0.0200		96.1	70-130				
1,4-Dioxane	0.269	0.10	mg/Kg wet	0.200		135	40-160			V-16, L-14	†
Ethylbenzene	0.0214	0.0020	mg/Kg wet	0.0200		107	70-130				
Hexachlorobutadiene	0.0239	0.0020	mg/Kg wet	0.0200		120	70-130				
2-Hexanone (MBK)	0.200	0.020	mg/Kg wet	0.200		99.9	40-160				†
Isopropylbenzene (Cumene)	0.0250	0.0020	mg/Kg wet	0.0200		125	70-130				
p-Isopropyltoluene (p-Cymene)	0.0214	0.0020	mg/Kg wet	0.0200		107	70-130				
Methyl tert-Butyl Ether (MTBE)	0.0216	0.0040	mg/Kg wet	0.0200		108	70-130				
Methylene Chloride	0.0215	0.010	mg/Kg wet	0.0200		108	70-130				
4-Methyl-2-pentanone (MIBK)	0.201	0.020	mg/Kg wet	0.200		101	40-160				†
Naphthalene	0.0209	0.0040	mg/Kg wet	0.0200		104	70-130				
n-Propylbenzene	0.0221	0.0020	mg/Kg wet	0.0200		110	70-130				
Styrene	0.0215	0.0020	mg/Kg wet	0.0200		107	70-130				
1,1,1,2-Tetrachloroethane	0.0231	0.0020	mg/Kg wet	0.0200		116	70-130				
1,1,2,2-Tetrachloroethane	0.0221	0.0010	mg/Kg wet	0.0200		111	70-130				
Tetrachloroethylene	0.0232	0.0020	mg/Kg wet	0.0200		116	70-130				
Tetrahydrofuran	0.0201	0.010	mg/Kg wet	0.0200		100	70-130			V-16	
Toluene	0.0223	0.0020	mg/Kg wet	0.0200		111	70-130				
1,2,3-Trichlorobenzene	0.0215	0.0020	mg/Kg wet	0.0200		108	70-130				
1,2,4-Trichlorobenzene	0.0219	0.0020	mg/Kg wet	0.0200		110	70-130				
1,1,1-Trichloroethane	0.0237	0.0020	mg/Kg wet	0.0200		118	70-130				
1,1,2-Trichloroethane	0.0209	0.0020	mg/Kg wet	0.0200		104	70-130				
Trichloroethylene	0.0222	0.0020	mg/Kg wet	0.0200		111	70-130				
Trichlorofluoromethane (Freon 11)	0.0239	0.010	mg/Kg wet	0.0200		119	70-130				
1,2,3-Trichloropropane	0.0224	0.0020	mg/Kg wet	0.0200		112	70-130				
1,2,4-Trimethylbenzene	0.0207	0.0020	mg/Kg wet	0.0200		104	70-130				
1,3,5-Trimethylbenzene	0.0224	0.0020	mg/Kg wet	0.0200		112	70-130				
Vinyl Chloride	0.0194	0.010	mg/Kg wet	0.0200		96.8	70-130				
m+p Xylene	0.0434	0.0040	mg/Kg wet	0.0400		108	70-130				
o-Xylene	0.0214	0.0020	mg/Kg wet	0.0200		107	70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0535*		mg/Kg wet	0.0500		107	70-130				
Surrogate: Toluene-d8	*0.0531*		mg/Kg wet	0.0500		106	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0521*		mg/Kg wet	0.0500		104	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	
Batch B173594 - SW-846 5035												
LCS Dup (B173594-BSD1)				Prepared & Analyzed: 04/03/17								
Acetone	0.217	0.10	mg/Kg wet	0.200		109		40-160	9.93	20	V-20	†
tert-Amyl Methyl Ether (TAME)	0.0228	0.0010	mg/Kg wet	0.0200		114		70-130	8.68	20		
Benzene	0.0241	0.0020	mg/Kg wet	0.0200		121		70-130	8.83	20		
Bromobenzene	0.0227	0.0020	mg/Kg wet	0.0200		114		70-130	7.02	20		
Bromochloromethane	0.0293	0.0020	mg/Kg wet	0.0200		**146**	*	70-130	11.4	20	L-07	
Bromodichloromethane	0.0222	0.0020	mg/Kg wet	0.0200		111		70-130	7.68	20		
Bromoform	0.0254	0.0020	mg/Kg wet	0.0200		127		70-130	12.2	20		
Bromomethane	0.0192	0.010	mg/Kg wet	0.0200		96.2		40-160	1.24	20		†
2-Butanone (MEK)	0.215	0.040	mg/Kg wet	0.200		108		40-160	12.8	20		†
n-Butylbenzene	0.0235	0.0020	mg/Kg wet	0.0200		118		70-130	9.54	20		
sec-Butylbenzene	0.0261	0.0020	mg/Kg wet	0.0200		**131**	*	70-130	10.4	20	L-07	
tert-Butylbenzene	0.0249	0.0020	mg/Kg wet	0.0200		124		70-130	12.2	20		
tert-Butyl Ethyl Ether (TBEE)	0.0222	0.0010	mg/Kg wet	0.0200		111		70-130	4.32	20		
Carbon Disulfide	0.0235	0.0060	mg/Kg wet	0.0200		118		70-130	0.255	20		
Carbon Tetrachloride	0.0244	0.0020	mg/Kg wet	0.0200		122		70-130	3.58	20		
Chlorobenzene	0.0239	0.0020	mg/Kg wet	0.0200		119		70-130	7.29	20		
Chlorodibromomethane	0.0258	0.0010	mg/Kg wet	0.0200		129		70-130	9.58	20		
Chloroethane	0.0219	0.010	mg/Kg wet	0.0200		110		70-130	3.82	20		
Chloroform	0.0233	0.0040	mg/Kg wet	0.0200		116		70-130	6.93	20		
Chloromethane	0.0159	0.010	mg/Kg wet	0.0200		79.3		40-160	2.04	20		†
2-Chlorotoluene	0.0241	0.0020	mg/Kg wet	0.0200		121		70-130	8.92	20		
4-Chlorotoluene	0.0231	0.0020	mg/Kg wet	0.0200		115		70-130	7.27	20		
1,2-Dibromo-3-chloropropane (DBCP)	0.0249	0.0020	mg/Kg wet	0.0200		124		70-130	12.3	20		
1,2-Dibromoethane (EDB)	0.0243	0.0010	mg/Kg wet	0.0200		122		70-130	9.56	20		
Dibromomethane	0.0239	0.0020	mg/Kg wet	0.0200		119		70-130	11.1	20		
1,2-Dichlorobenzene	0.0247	0.0020	mg/Kg wet	0.0200		124		70-130	9.57	20		
1,3-Dichlorobenzene	0.0245	0.0020	mg/Kg wet	0.0200		123		70-130	11.6	20		
1,4-Dichlorobenzene	0.0242	0.0020	mg/Kg wet	0.0200		121		70-130	12.0	20		
Dichlorodifluoromethane (Freon 12)	0.0184	0.010	mg/Kg wet	0.0200		91.9		40-160	1.76	20		†
1,1-Dichloroethane	0.0229	0.0020	mg/Kg wet	0.0200		115		70-130	0.348	20		
1,2-Dichloroethane	0.0241	0.0020	mg/Kg wet	0.0200		120		70-130	11.0	20		
1,1-Dichloroethylene	0.0229	0.0040	mg/Kg wet	0.0200		114		70-130	2.66	20		
cis-1,2-Dichloroethylene	0.0222	0.0020	mg/Kg wet	0.0200		111		70-130	4.81	20		
trans-1,2-Dichloroethylene	0.0251	0.0020	mg/Kg wet	0.0200		125		70-130	2.58	20		
1,2-Dichloropropane	0.0231	0.0020	mg/Kg wet	0.0200		115		70-130	5.07	20		
1,3-Dichloropropane	0.0232	0.0010	mg/Kg wet	0.0200		116		70-130	10.9	20		
2,2-Dichloropropane	0.0231	0.0020	mg/Kg wet	0.0200		115		70-130	1.93	20		
1,1-Dichloropropene	0.0229	0.0020	mg/Kg wet	0.0200		115		70-130	4.27	20		
cis-1,3-Dichloropropene	0.0220	0.0010	mg/Kg wet	0.0200		110		70-130	7.76	20		
trans-1,3-Dichloropropene	0.0235	0.0010	mg/Kg wet	0.0200		118		70-130	9.99	20		
Diethyl Ether	0.0238	0.010	mg/Kg wet	0.0200		119		70-130	4.56	20		
Diisopropyl Ether (DIPE)	0.0204	0.0010	mg/Kg wet	0.0200		102		70-130	6.05	20		
1,4-Dioxane	0.269	0.10	mg/Kg wet	0.200		134		40-160	0.111	20	L-14, V-16	†
Ethylbenzene	0.0233	0.0020	mg/Kg wet	0.0200		116		70-130	8.24	20		
Hexachlorobutadiene	0.0269	0.0020	mg/Kg wet	0.0200		**134**	*	70-130	11.7	20	L-07	
2-Hexanone (MBK)	0.218	0.020	mg/Kg wet	0.200		109		40-160	8.83	20		†
Isopropylbenzene (Cumene)	0.0272	0.0020	mg/Kg wet	0.0200		**136**	*	70-130	8.44	20	L-07	
p-Isopropyltoluene (p-Cymene)	0.0243	0.0020	mg/Kg wet	0.0200		122		70-130	12.5	20		
Methyl tert-Butyl Ether (MTBE)	0.0227	0.0040	mg/Kg wet	0.0200		113		70-130	4.88	20		
Methylene Chloride	0.0219	0.010	mg/Kg wet	0.0200		110		70-130	1.66	20		
4-Methyl-2-pentanone (MIBK)	0.221	0.020	mg/Kg wet	0.200		110		40-160	9.37	20		†
Naphthalene	0.0229	0.0040	mg/Kg wet	0.0200		114		70-130	9.24	20		

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B173594 - SW-846 5035										
LCS Dup (B173594-BSD1)				Prepared & Analyzed: 04/03/17						
n-Propylbenzene	0.0241	0.0020	mg/Kg wet	0.0200		121	70-130	8.82	20	
Styrene	0.0238	0.0020	mg/Kg wet	0.0200		119	70-130	10.1	20	
1,1,1,2-Tetrachloroethane	0.0247	0.0020	mg/Kg wet	0.0200		123	70-130	6.53	20	
1,1,2,2-Tetrachloroethane	0.0243	0.0010	mg/Kg wet	0.0200		121	70-130	9.14	20	
Tetrachloroethylene	0.0254	0.0020	mg/Kg wet	0.0200		127	70-130	8.97	20	
Tetrahydrofuran	0.0208	0.010	mg/Kg wet	0.0200		104	70-130	3.72	20	V-16
Toluene	0.0240	0.0020	mg/Kg wet	0.0200		120	70-130	7.27	20	
1,2,3-Trichlorobenzene	0.0238	0.0020	mg/Kg wet	0.0200		119	70-130	10.1	20	
1,2,4-Trichlorobenzene	0.0237	0.0020	mg/Kg wet	0.0200		118	70-130	7.72	20	
1,1,1-Trichloroethane	0.0250	0.0020	mg/Kg wet	0.0200		125	70-130	5.26	20	
1,1,2-Trichloroethane	0.0234	0.0020	mg/Kg wet	0.0200		117	70-130	11.6	20	
Trichloroethylene	0.0236	0.0020	mg/Kg wet	0.0200		118	70-130	5.94	20	
Trichlorofluoromethane (Freon 11)	0.0242	0.010	mg/Kg wet	0.0200		121	70-130	1.25	20	
1,2,3-Trichloropropane	0.0246	0.0020	mg/Kg wet	0.0200		123	70-130	9.35	20	
1,2,4-Trimethylbenzene	0.0236	0.0020	mg/Kg wet	0.0200		118	70-130	13.1	20	
1,3,5-Trimethylbenzene	0.0244	0.0020	mg/Kg wet	0.0200		122	70-130	8.80	20	
Vinyl Chloride	0.0174	0.010	mg/Kg wet	0.0200		86.9	70-130	10.8	20	
m+p Xylene	0.0475	0.0040	mg/Kg wet	0.0400		119	70-130	9.15	20	
o-Xylene	0.0235	0.0020	mg/Kg wet	0.0200		117	70-130	9.28	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0540*		mg/Kg wet	0.0500		108	70-130			
Surrogate: Toluene-d8	*0.0538*		mg/Kg wet	0.0500		108	70-130			
Surrogate: 4-Bromofluorobenzene	*0.0511*		mg/Kg wet	0.0500		102	70-130			
Batch B173635 - SW-846 5035										
Blank (B173635-BLK1)				Prepared & Analyzed: 04/03/17						
Acetone	ND	0.10	mg/Kg wet							
tert-Amyl Methyl Ether (TAME)	ND	0.0010	mg/Kg wet							
Benzene	ND	0.0020	mg/Kg wet							
Bromobenzene	ND	0.0020	mg/Kg wet							
Bromochloromethane	ND	0.0020	mg/Kg wet							
Bromodichloromethane	ND	0.0020	mg/Kg wet							
Bromoform	ND	0.0020	mg/Kg wet							V-05
Bromomethane	ND	0.010	mg/Kg wet							
2-Butanone (MEK)	ND	0.040	mg/Kg wet							
n-Butylbenzene	ND	0.0020	mg/Kg wet							
sec-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	mg/Kg wet							
Carbon Disulfide	ND	0.0060	mg/Kg wet							
Carbon Tetrachloride	ND	0.0020	mg/Kg wet							
Chlorobenzene	ND	0.0020	mg/Kg wet							
Chlorodibromomethane	ND	0.0010	mg/Kg wet							V-05
Chloroethane	ND	0.010	mg/Kg wet							
Chloroform	ND	0.0040	mg/Kg wet							
Chloromethane	ND	0.010	mg/Kg wet							
2-Chlorotoluene	ND	0.0020	mg/Kg wet							
4-Chlorotoluene	ND	0.0020	mg/Kg wet							
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0020	mg/Kg wet							
1,2-Dibromoethane (EDB)	ND	0.0010	mg/Kg wet							
Dibromomethane	ND	0.0020	mg/Kg wet							
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet							

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B173635 - SW-846 5035										
Blank (B173635-BLK1)				Prepared & Analyzed: 04/03/17						
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet							
Dichlorodifluoromethane (Freon 12)	ND	0.010	mg/Kg wet							
1,1-Dichloroethane	ND	0.0020	mg/Kg wet							
1,2-Dichloroethane	ND	0.0020	mg/Kg wet							
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet							
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
1,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,3-Dichloropropane	ND	0.0010	mg/Kg wet							
2,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,1-Dichloropropene	ND	0.0020	mg/Kg wet							
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
trans-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
Diethyl Ether	ND	0.010	mg/Kg wet							
Diisopropyl Ether (DIPE)	ND	0.0010	mg/Kg wet							
1,4-Dioxane	ND	0.10	mg/Kg wet							R-05, V-16
Ethylbenzene	ND	0.0020	mg/Kg wet							
Hexachlorobutadiene	ND	0.0020	mg/Kg wet							
2-Hexanone (MBK)	ND	0.020	mg/Kg wet							
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet							
p-Isopropyltoluene (p-Cymene)	ND	0.0020	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet							
Methylene Chloride	ND	0.010	mg/Kg wet							
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet							
Naphthalene	ND	0.0040	mg/Kg wet							
n-Propylbenzene	ND	0.0020	mg/Kg wet							
Styrene	ND	0.0020	mg/Kg wet							
1,1,1,2-Tetrachloroethane	ND	0.0020	mg/Kg wet							V-05
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet							
Tetrachloroethylene	ND	0.0020	mg/Kg wet							
Tetrahydrofuran	ND	0.010	mg/Kg wet							
Toluene	ND	0.0020	mg/Kg wet							
1,2,3-Trichlorobenzene	ND	0.0020	mg/Kg wet							
1,2,4-Trichlorobenzene	ND	0.0020	mg/Kg wet							
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet							
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet							
Trichloroethylene	ND	0.0020	mg/Kg wet							
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet							
1,2,3-Trichloropropane	ND	0.0020	mg/Kg wet							
1,2,4-Trimethylbenzene	ND	0.0020	mg/Kg wet							
1,3,5-Trimethylbenzene	ND	0.0020	mg/Kg wet							
Vinyl Chloride	ND	0.010	mg/Kg wet							
m+p Xylene	ND	0.0040	mg/Kg wet							
o-Xylene	ND	0.0020	mg/Kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0504*		mg/Kg wet	0.0500		101	70-130			
Surrogate: Toluene-d8	*0.0496*		mg/Kg wet	0.0500		99.3	70-130			
Surrogate: 4-Bromofluorobenzene	*0.0505*		mg/Kg wet	0.0500		101	70-130			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B173635 - SW-846 5035											
LCS (B173635-BS1)				Prepared & Analyzed: 04/03/17							
Acetone	0.140	0.10	mg/Kg wet	0.200		70.2	40-160				†
tert-Amyl Methyl Ether (TAME)	0.0180	0.0010	mg/Kg wet	0.0200		90.2	70-130				
Benzene	0.0186	0.0020	mg/Kg wet	0.0200		93.2	70-130				
Bromobenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.7	70-130				
Bromochloromethane	0.0205	0.0020	mg/Kg wet	0.0200		103	70-130				
Bromodichloromethane	0.0184	0.0020	mg/Kg wet	0.0200		92.2	70-130				
Bromoform	0.0163	0.0020	mg/Kg wet	0.0200		81.7	70-130			V-05	
Bromomethane	0.0143	0.010	mg/Kg wet	0.0200		71.3	40-160				†
2-Butanone (MEK)	0.151	0.040	mg/Kg wet	0.200		75.3	40-160				†
n-Butylbenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.6	70-130				
sec-Butylbenzene	0.0193	0.0020	mg/Kg wet	0.0200		96.5	70-130				
tert-Butylbenzene	0.0192	0.0020	mg/Kg wet	0.0200		96.0	70-130				
tert-Butyl Ethyl Ether (TBEE)	0.0182	0.0010	mg/Kg wet	0.0200		91.1	70-130				
Carbon Disulfide	0.0228	0.0060	mg/Kg wet	0.0200		114	70-130				
Carbon Tetrachloride	0.0176	0.0020	mg/Kg wet	0.0200		87.9	70-130				
Chlorobenzene	0.0194	0.0020	mg/Kg wet	0.0200		97.1	70-130				
Chlorodibromomethane	0.0175	0.0010	mg/Kg wet	0.0200		87.3	70-130			V-05	
Chloroethane	0.0155	0.010	mg/Kg wet	0.0200		77.3	70-130				
Chloroform	0.0198	0.0040	mg/Kg wet	0.0200		99.1	70-130				
Chloromethane	0.0138	0.010	mg/Kg wet	0.0200		69.2	40-160			L-14	†
2-Chlorotoluene	0.0199	0.0020	mg/Kg wet	0.0200		99.3	70-130				
4-Chlorotoluene	0.0196	0.0020	mg/Kg wet	0.0200		98.2	70-130				
1,2-Dibromo-3-chloropropane (DBCP)	0.0157	0.0020	mg/Kg wet	0.0200		78.5	70-130				
1,2-Dibromoethane (EDB)	0.0195	0.0010	mg/Kg wet	0.0200		97.4	70-130				
Dibromomethane	0.0199	0.0020	mg/Kg wet	0.0200		99.5	70-130				
1,2-Dichlorobenzene	0.0193	0.0020	mg/Kg wet	0.0200		96.7	70-130				
1,3-Dichlorobenzene	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130				
1,4-Dichlorobenzene	0.0185	0.0020	mg/Kg wet	0.0200		92.7	70-130				
Dichlorodifluoromethane (Freon 12)	0.0141	0.010	mg/Kg wet	0.0200		70.3	40-160				†
1,1-Dichloroethane	0.0207	0.0020	mg/Kg wet	0.0200		104	70-130				
1,2-Dichloroethane	0.0199	0.0020	mg/Kg wet	0.0200		99.7	70-130				
1,1-Dichloroethylene	0.0193	0.0040	mg/Kg wet	0.0200		96.6	70-130				
cis-1,2-Dichloroethylene	0.0192	0.0020	mg/Kg wet	0.0200		96.0	70-130				
trans-1,2-Dichloroethylene	0.0194	0.0020	mg/Kg wet	0.0200		96.8	70-130				
1,2-Dichloropropane	0.0191	0.0020	mg/Kg wet	0.0200		95.3	70-130				
1,3-Dichloropropane	0.0192	0.0010	mg/Kg wet	0.0200		95.9	70-130				
2,2-Dichloropropane	0.0187	0.0020	mg/Kg wet	0.0200		93.3	70-130				
1,1-Dichloropropene	0.0195	0.0020	mg/Kg wet	0.0200		97.7	70-130				
cis-1,3-Dichloropropene	0.0175	0.0010	mg/Kg wet	0.0200		87.7	70-130				
trans-1,3-Dichloropropene	0.0177	0.0010	mg/Kg wet	0.0200		88.5	70-130				
Diethyl Ether	0.0174	0.010	mg/Kg wet	0.0200		87.1	70-130				
Diisopropyl Ether (DIPE)	0.0180	0.0010	mg/Kg wet	0.0200		89.9	70-130				
1,4-Dioxane	0.257	0.10	mg/Kg wet	0.200		129	40-160			R-05, V-16	†
Ethylbenzene	0.0197	0.0020	mg/Kg wet	0.0200		98.7	70-130				
Hexachlorobutadiene	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130				
2-Hexanone (MBK)	0.158	0.020	mg/Kg wet	0.200		78.8	40-160				†
Isopropylbenzene (Cumene)	0.0214	0.0020	mg/Kg wet	0.0200		107	70-130				
p-Isopropyltoluene (p-Cymene)	0.0196	0.0020	mg/Kg wet	0.0200		97.9	70-130				
Methyl tert-Butyl Ether (MTBE)	0.0178	0.0040	mg/Kg wet	0.0200		89.1	70-130				
Methylene Chloride	0.0188	0.010	mg/Kg wet	0.0200		94.1	70-130				
4-Methyl-2-pentanone (MIBK)	0.175	0.020	mg/Kg wet	0.200		87.7	40-160				†
Naphthalene	0.0184	0.0040	mg/Kg wet	0.0200		92.1	70-130				

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B173635 - SW-846 5035											
LCS (B173635-BS1)				Prepared & Analyzed: 04/03/17							
n-Propylbenzene	0.0202	0.0020	mg/Kg wet	0.0200		101	70-130				
Styrene	0.0196	0.0020	mg/Kg wet	0.0200		98.2	70-130				
1,1,1,2-Tetrachloroethane	0.0165	0.0020	mg/Kg wet	0.0200		82.4	70-130			V-05	
1,1,2,2-Tetrachloroethane	0.0198	0.0010	mg/Kg wet	0.0200		99.2	70-130				
Tetrachloroethylene	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130				
Tetrahydrofuran	0.0171	0.010	mg/Kg wet	0.0200		85.6	70-130				
Toluene	0.0185	0.0020	mg/Kg wet	0.0200		92.4	70-130				
1,2,3-Trichlorobenzene	0.0193	0.0020	mg/Kg wet	0.0200		96.6	70-130				
1,2,4-Trichlorobenzene	0.0185	0.0020	mg/Kg wet	0.0200		92.6	70-130				
1,1,1-Trichloroethane	0.0197	0.0020	mg/Kg wet	0.0200		98.5	70-130				
1,1,2-Trichloroethane	0.0189	0.0020	mg/Kg wet	0.0200		94.6	70-130				
Trichloroethylene	0.0188	0.0020	mg/Kg wet	0.0200		93.8	70-130				
Trichlorofluoromethane (Freon 11)	0.0178	0.010	mg/Kg wet	0.0200		89.2	70-130				
1,2,3-Trichloropropane	0.0188	0.0020	mg/Kg wet	0.0200		93.8	70-130				
1,2,4-Trimethylbenzene	0.0183	0.0020	mg/Kg wet	0.0200		91.6	70-130				
1,3,5-Trimethylbenzene	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130				
Vinyl Chloride	0.0156	0.010	mg/Kg wet	0.0200		77.8	70-130				
m+p Xylene	0.0384	0.0040	mg/Kg wet	0.0400		96.1	70-130				
o-Xylene	0.0193	0.0020	mg/Kg wet	0.0200		96.3	70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0521*		mg/Kg wet	0.0500		104	70-130				
Surrogate: Toluene-d8	*0.0502*		mg/Kg wet	0.0500		100	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0518*		mg/Kg wet	0.0500		104	70-130				
LCS Dup (B173635-BSD1)				Prepared & Analyzed: 04/03/17							
Acetone	0.133	0.10	mg/Kg wet	0.200		66.6	40-160	5.34	20	L-14	†
tert-Amyl Methyl Ether (TAME)	0.0178	0.0010	mg/Kg wet	0.0200		89.0	70-130	1.34	20		
Benzene	0.0185	0.0020	mg/Kg wet	0.0200		92.7	70-130	0.538	20		
Bromobenzene	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	4.13	20		
Bromochloromethane	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130	0.195	20		
Bromodichloromethane	0.0195	0.0020	mg/Kg wet	0.0200		97.3	70-130	5.38	20		
Bromoform	0.0164	0.0020	mg/Kg wet	0.0200		82.2	70-130	0.610	20	V-05	
Bromomethane	0.0150	0.010	mg/Kg wet	0.0200		74.8	40-160	4.79	20		†
2-Butanone (MEK)	0.150	0.040	mg/Kg wet	0.200		75.2	40-160	0.213	20		†
n-Butylbenzene	0.0205	0.0020	mg/Kg wet	0.0200		103	70-130	3.06	20		
sec-Butylbenzene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130	5.84	20		
tert-Butylbenzene	0.0200	0.0020	mg/Kg wet	0.0200		99.9	70-130	3.98	20		
tert-Butyl Ethyl Ether (TBEE)	0.0183	0.0010	mg/Kg wet	0.0200		91.3	70-130	0.219	20		
Carbon Disulfide	0.0224	0.0060	mg/Kg wet	0.0200		112	70-130	1.86	20		
Carbon Tetrachloride	0.0172	0.0020	mg/Kg wet	0.0200		85.9	70-130	2.30	20		
Chlorobenzene	0.0203	0.0020	mg/Kg wet	0.0200		102	70-130	4.43	20		
Chlorodibromomethane	0.0180	0.0010	mg/Kg wet	0.0200		90.2	70-130	3.27	20	V-05	
Chloroethane	0.0162	0.010	mg/Kg wet	0.0200		81.0	70-130	4.67	20		
Chloroform	0.0195	0.0040	mg/Kg wet	0.0200		97.3	70-130	1.83	20		
Chloromethane	0.0140	0.010	mg/Kg wet	0.0200		69.9	40-160	1.01	20	L-14	†
2-Chlorotoluene	0.0200	0.0020	mg/Kg wet	0.0200		100	70-130	0.902	20		
4-Chlorotoluene	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	5.74	20		
1,2-Dibromo-3-chloropropane (DBCP)	0.0156	0.0020	mg/Kg wet	0.0200		78.2	70-130	0.383	20		
1,2-Dibromoethane (EDB)	0.0195	0.0010	mg/Kg wet	0.0200		97.3	70-130	0.103	20		
Dibromomethane	0.0197	0.0020	mg/Kg wet	0.0200		98.5	70-130	1.01	20		
1,2-Dichlorobenzene	0.0198	0.0020	mg/Kg wet	0.0200		99.2	70-130	2.55	20		
1,3-Dichlorobenzene	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130	2.65	20		
1,4-Dichlorobenzene	0.0193	0.0020	mg/Kg wet	0.0200		96.7	70-130	4.22	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	
Batch B173635 - SW-846 5035												
LCS Dup (B173635-BSD1)				Prepared & Analyzed: 04/03/17								
Dichlorodifluoromethane (Freon 12)	0.0142	0.010	mg/Kg wet	0.0200		71.0	40-160	0.991		20		†
1,1-Dichloroethane	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	0.193		20		
1,2-Dichloroethane	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130	2.48		20		
1,1-Dichloroethylene	0.0191	0.0040	mg/Kg wet	0.0200		95.5	70-130	1.15		20		
cis-1,2-Dichloroethylene	0.0196	0.0020	mg/Kg wet	0.0200		98.2	70-130	2.27		20		
trans-1,2-Dichloroethylene	0.0187	0.0020	mg/Kg wet	0.0200		93.4	70-130	3.58		20		
1,2-Dichloropropane	0.0188	0.0020	mg/Kg wet	0.0200		93.9	70-130	1.48		20		
1,3-Dichloropropane	0.0192	0.0010	mg/Kg wet	0.0200		96.1	70-130	0.208		20		
2,2-Dichloropropane	0.0180	0.0020	mg/Kg wet	0.0200		89.8	70-130	3.82		20		
1,1-Dichloropropene	0.0196	0.0020	mg/Kg wet	0.0200		98.2	70-130	0.510		20		
cis-1,3-Dichloropropene	0.0170	0.0010	mg/Kg wet	0.0200		85.2	70-130	2.89		20		
trans-1,3-Dichloropropene	0.0179	0.0010	mg/Kg wet	0.0200		89.3	70-130	0.900		20		
Diethyl Ether	0.0170	0.010	mg/Kg wet	0.0200		85.2	70-130	2.21		20		
Diisopropyl Ether (DIPE)	0.0178	0.0010	mg/Kg wet	0.0200		89.0	70-130	1.01		20		
1,4-Dioxane	0.206	0.10	mg/Kg wet	0.200		103	40-160	**22.1**	*	20	R-05, V-16	†
Ethylbenzene	0.0203	0.0020	mg/Kg wet	0.0200		101	70-130	2.60		20		
Hexachlorobutadiene	0.0222	0.0020	mg/Kg wet	0.0200		111	70-130	4.42		20		
2-Hexanone (MBK)	0.159	0.020	mg/Kg wet	0.200		79.5	40-160	0.897		20		†
Isopropylbenzene (Cumene)	0.0225	0.0020	mg/Kg wet	0.0200		112	70-130	4.74		20		
p-Isopropyltoluene (p-Cymene)	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130	2.42		20		
Methyl tert-Butyl Ether (MTBE)	0.0179	0.0040	mg/Kg wet	0.0200		89.5	70-130	0.448		20		
Methylene Chloride	0.0191	0.010	mg/Kg wet	0.0200		95.6	70-130	1.58		20		
4-Methyl-2-pentanone (MIBK)	0.179	0.020	mg/Kg wet	0.200		89.7	40-160	2.21		20		†
Naphthalene	0.0182	0.0040	mg/Kg wet	0.0200		90.8	70-130	1.42		20		
n-Propylbenzene	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	3.03		20		
Styrene	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130	4.97		20		
1,1,1,2-Tetrachloroethane	0.0180	0.0020	mg/Kg wet	0.0200		90.2	70-130	9.04		20	V-05	
1,1,2,2-Tetrachloroethane	0.0209	0.0010	mg/Kg wet	0.0200		105	70-130	5.39		20		
Tetrachloroethylene	0.0213	0.0020	mg/Kg wet	0.0200		106	70-130	1.61		20		
Tetrahydrofuran	0.0171	0.010	mg/Kg wet	0.0200		85.3	70-130	0.351		20		
Toluene	0.0192	0.0020	mg/Kg wet	0.0200		95.9	70-130	3.72		20		
1,2,3-Trichlorobenzene	0.0185	0.0020	mg/Kg wet	0.0200		92.6	70-130	4.23		20		
1,2,4-Trichlorobenzene	0.0176	0.0020	mg/Kg wet	0.0200		88.2	70-130	4.87		20		
1,1,1-Trichloroethane	0.0189	0.0020	mg/Kg wet	0.0200		94.4	70-130	4.25		20		
1,1,2-Trichloroethane	0.0193	0.0020	mg/Kg wet	0.0200		96.7	70-130	2.20		20		
Trichloroethylene	0.0203	0.0020	mg/Kg wet	0.0200		101	70-130	7.79		20		
Trichlorofluoromethane (Freon 11)	0.0177	0.010	mg/Kg wet	0.0200		88.4	70-130	0.901		20		
1,2,3-Trichloropropane	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130	8.18		20		
1,2,4-Trimethylbenzene	0.0189	0.0020	mg/Kg wet	0.0200		94.7	70-130	3.33		20		
1,3,5-Trimethylbenzene	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130	4.19		20		
Vinyl Chloride	0.0155	0.010	mg/Kg wet	0.0200		77.6	70-130	0.257		20		
m+p Xylene	0.0399	0.0040	mg/Kg wet	0.0400		99.7	70-130	3.68		20		
o-Xylene	0.0203	0.0020	mg/Kg wet	0.0200		101	70-130	5.06		20		
Surrogate: 1,2-Dichloroethane-d4	*0.0494*		mg/Kg wet	0.0500		98.8	70-130					
Surrogate: Toluene-d8	*0.0489*		mg/Kg wet	0.0500		97.7	70-130					
Surrogate: 4-Bromofluorobenzene	*0.0516*		mg/Kg wet	0.0500		103	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
Batch B173507 - SW-846 3546										
Blank (B173507-BLK1)				Prepared: 03/31/17 Analyzed: 04/03/17						
C9-C18 Aliphatics	ND	10	mg/Kg wet							
C19-C36 Aliphatics	ND	10	mg/Kg wet							
Unadjusted C11-C22 Aromatics	ND	10	mg/Kg wet							
C11-C22 Aromatics	ND	10	mg/Kg wet							
Acenaphthene	ND	0.10	mg/Kg wet							
Acenaphthylene	ND	0.10	mg/Kg wet							
Anthracene	ND	0.10	mg/Kg wet							
Benzo(a)anthracene	ND	0.10	mg/Kg wet							
Benzo(a)pyrene	ND	0.10	mg/Kg wet							
Benzo(b)fluoranthene	ND	0.10	mg/Kg wet							
Benzo(g,h,i)perylene	ND	0.10	mg/Kg wet							
Benzo(k)fluoranthene	ND	0.10	mg/Kg wet							
Chrysene	ND	0.10	mg/Kg wet							
Dibenz(a,h)anthracene	ND	0.10	mg/Kg wet							
Fluoranthene	ND	0.10	mg/Kg wet							
Fluorene	ND	0.10	mg/Kg wet							
Indeno(1,2,3-cd)pyrene	ND	0.10	mg/Kg wet							
2-Methylnaphthalene	ND	0.10	mg/Kg wet							
Naphthalene	ND	0.10	mg/Kg wet							
Phenanthrene	ND	0.10	mg/Kg wet							
Pyrene	ND	0.10	mg/Kg wet							
n-Decane	ND	0.10	mg/Kg wet							
n-Docosane	ND	0.10	mg/Kg wet							
n-Dodecane	ND	0.10	mg/Kg wet							
n-Eicosane	ND	0.10	mg/Kg wet							
n-Hexacosane	ND	0.10	mg/Kg wet							
n-Hexadecane	ND	0.10	mg/Kg wet							
n-Hexatriacontane	ND	0.10	mg/Kg wet							
n-Nonadecane	ND	0.10	mg/Kg wet							
n-Nonane	ND	0.10	mg/Kg wet							
n-Octacosane	ND	0.10	mg/Kg wet							
n-Octadecane	ND	0.10	mg/Kg wet							
n-Tetracosane	ND	0.10	mg/Kg wet							
n-Tetradecane	ND	0.10	mg/Kg wet							
n-Triacontane	ND	0.10	mg/Kg wet							
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet							
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet							
Surrogate: Chlorooctadecane (COD)	*3.41*		mg/Kg wet	5.00		68.1	40-140			
Surrogate: o-Terphenyl (OTP)	*3.82*		mg/Kg wet	5.00		76.5	40-140			
Surrogate: 2-Bromonaphthalene	*3.76*		mg/Kg wet	5.00		75.2	40-140			
Surrogate: 2-Fluorobiphenyl	*4.11*		mg/Kg wet	5.00		82.2	40-140			
LCS (B173507-BS1)				Prepared: 03/31/17 Analyzed: 04/03/17						
C9-C18 Aliphatics	25.3	10	mg/Kg wet	30.0		84.3	40-140			
C19-C36 Aliphatics	38.7	10	mg/Kg wet	40.0		96.7	40-140			
Acenaphthene	3.73	0.10	mg/Kg wet	5.00		74.6	40-140			
Acenaphthylene	3.54	0.10	mg/Kg wet	5.00		70.9	40-140			
Anthracene	4.01	0.10	mg/Kg wet	5.00		80.3	40-140			
Benzo(a)anthracene	3.97	0.10	mg/Kg wet	5.00		79.3	40-140			
Benzo(a)pyrene	3.87	0.10	mg/Kg wet	5.00		77.4	40-140			
Benzo(b)fluoranthene	3.93	0.10	mg/Kg wet	5.00		78.6	40-140			
Benzo(g,h,i)perylene	3.69	0.10	mg/Kg wet	5.00		73.8	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
Batch B173507 - SW-846 3546										
LCS (B173507-BS1)				Prepared: 03/31/17 Analyzed: 04/03/17						
Benzo(k)fluoranthene	3.87	0.10	mg/Kg wet	5.00		77.3	40-140			
Chrysene	3.97	0.10	mg/Kg wet	5.00		79.3	40-140			
Dibenz(a,h)anthracene	3.97	0.10	mg/Kg wet	5.00		79.4	40-140			
Fluoranthene	3.95	0.10	mg/Kg wet	5.00		79.0	40-140			
Fluorene	3.79	0.10	mg/Kg wet	5.00		75.8	40-140			
Indeno(1,2,3-cd)pyrene	3.80	0.10	mg/Kg wet	5.00		76.0	40-140			
2-Methylnaphthalene	3.34	0.10	mg/Kg wet	5.00		66.8	40-140			
Naphthalene	3.14	0.10	mg/Kg wet	5.00		62.8	40-140			
Phenanthrene	3.89	0.10	mg/Kg wet	5.00		77.8	40-140			
Pyrene	3.96	0.10	mg/Kg wet	5.00		79.2	40-140			
n-Decane	2.53	0.10	mg/Kg wet	5.00		50.6	40-140			
n-Docosane	3.93	0.10	mg/Kg wet	5.00		78.5	40-140			
n-Dodecane	3.10	0.10	mg/Kg wet	5.00		62.0	40-140			
n-Eicosane	3.92	0.10	mg/Kg wet	5.00		78.4	40-140			
n-Hexacosane	3.83	0.10	mg/Kg wet	5.00		76.6	40-140			
n-Hexadecane	4.03	0.10	mg/Kg wet	5.00		80.5	40-140			
n-Hexatriacontane	4.22	0.10	mg/Kg wet	5.00		84.4	40-140			
n-Nonadecane	3.94	0.10	mg/Kg wet	5.00		78.9	40-140			
n-Nonane	1.90	0.10	mg/Kg wet	5.00		38.1	30-140			
n-Octacosane	3.74	0.10	mg/Kg wet	5.00		74.7	40-140			
n-Octadecane	4.17	0.10	mg/Kg wet	5.00		83.3	40-140			
n-Tetracosane	3.95	0.10	mg/Kg wet	5.00		79.0	40-140			
n-Tetradecane	3.68	0.10	mg/Kg wet	5.00		73.6	40-140			
n-Triacontane	3.79	0.10	mg/Kg wet	5.00		75.8	40-140			
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
Surrogate: Chlorooctadecane (COD)	*3.35*		mg/Kg wet	5.00		66.9	40-140			
Surrogate: o-Terphenyl (OTP)	*3.80*		mg/Kg wet	5.00		75.9	40-140			
Surrogate: 2-Bromonaphthalene	*4.11*		mg/Kg wet	5.00		82.2	40-140			
Surrogate: 2-Fluorobiphenyl	*3.90*		mg/Kg wet	5.00		78.1	40-140			
LCS Dup (B173507-BSD1)				Prepared: 03/31/17 Analyzed: 04/03/17						
C9-C18 Aliphatics	24.7	10	mg/Kg wet	30.0		82.4	40-140	2.36	25	
C19-C36 Aliphatics	38.3	10	mg/Kg wet	40.0		95.7	40-140	1.08	25	
Acenaphthene	3.82	0.10	mg/Kg wet	5.00		76.5	40-140	2.40	25	
Acenaphthylene	3.62	0.10	mg/Kg wet	5.00		72.5	40-140	2.22	25	
Anthracene	4.09	0.10	mg/Kg wet	5.00		81.8	40-140	1.82	25	
Benzo(a)anthracene	4.04	0.10	mg/Kg wet	5.00		80.8	40-140	1.88	25	
Benzo(a)pyrene	3.94	0.10	mg/Kg wet	5.00		78.8	40-140	1.71	25	
Benzo(b)fluoranthene	3.98	0.10	mg/Kg wet	5.00		79.6	40-140	1.27	25	
Benzo(g,h,i)perylene	3.81	0.10	mg/Kg wet	5.00		76.3	40-140	3.30	25	
Benzo(k)fluoranthene	3.94	0.10	mg/Kg wet	5.00		78.9	40-140	2.02	25	
Chrysene	4.05	0.10	mg/Kg wet	5.00		81.0	40-140	2.08	25	
Dibenz(a,h)anthracene	4.06	0.10	mg/Kg wet	5.00		81.3	40-140	2.29	25	
Fluoranthene	4.03	0.10	mg/Kg wet	5.00		80.5	40-140	1.87	25	
Fluorene	3.88	0.10	mg/Kg wet	5.00		77.7	40-140	2.42	25	
Indeno(1,2,3-cd)pyrene	3.87	0.10	mg/Kg wet	5.00		77.3	40-140	1.70	25	
2-Methylnaphthalene	3.41	0.10	mg/Kg wet	5.00		68.1	40-140	1.96	25	
Naphthalene	3.21	0.10	mg/Kg wet	5.00		64.1	40-140	2.05	25	
Phenanthrene	3.96	0.10	mg/Kg wet	5.00		79.3	40-140	1.94	25	
Pyrene	4.03	0.10	mg/Kg wet	5.00		80.7	40-140	1.85	25	
n-Decane	2.55	0.10	mg/Kg wet	5.00		51.0	40-140	0.822	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
Batch B173507 - SW-846 3546										
LCS Dup (B173507-BSD1)				Prepared: 03/31/17 Analyzed: 04/03/17						
n-Docosane	3.91	0.10	mg/Kg wet	5.00		78.1	40-140	0.490	25	
n-Dodecane	3.08	0.10	mg/Kg wet	5.00		61.6	40-140	0.625	25	
n-Eicosane	3.90	0.10	mg/Kg wet	5.00		78.0	40-140	0.547	25	
n-Hexacosane	3.82	0.10	mg/Kg wet	5.00		76.5	40-140	0.183	25	
n-Hexadecane	4.00	0.10	mg/Kg wet	5.00		79.9	40-140	0.763	25	
n-Hexatriacontane	4.20	0.10	mg/Kg wet	5.00		84.0	40-140	0.482	25	
n-Nonadecane	3.91	0.10	mg/Kg wet	5.00		78.3	40-140	0.787	25	
n-Nonane	2.00	0.10	mg/Kg wet	5.00		39.9	30-140	4.78	25	
n-Octacosane	3.73	0.10	mg/Kg wet	5.00		74.7	40-140	0.0214	25	
n-Octadecane	4.15	0.10	mg/Kg wet	5.00		83.0	40-140	0.378	25	
n-Tetracosane	3.94	0.10	mg/Kg wet	5.00		78.8	40-140	0.362	25	
n-Tetradecane	3.68	0.10	mg/Kg wet	5.00		73.6	40-140	0.0679	25	
n-Triacontane	3.80	0.10	mg/Kg wet	5.00		76.1	40-140	0.337	25	
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
Surrogate: Chlorooctadecane (COD)	*3.25*		mg/Kg wet	5.00		65.1	40-140			
Surrogate: o-Terphenyl (OTP)	*3.83*		mg/Kg wet	5.00		76.6	40-140			
Surrogate: 2-Bromonaphthalene	*4.11*		mg/Kg wet	5.00		82.2	40-140			
Surrogate: 2-Fluorobiphenyl	*3.94*		mg/Kg wet	5.00		78.8	40-140			
Matrix Spike (B173507-MS1)	**Source: 17C1191-01**			Prepared: 03/31/17 Analyzed: 04/06/17						
C9-C18 Aliphatics	31.0	11	mg/Kg dry	33.4	8.91	66.3	40-140			
C19-C36 Aliphatics	66.3	11	mg/Kg dry	44.5	27.7	86.7	40-140			
Unadjusted C11-C22 Aromatics	102	11	mg/Kg dry	94.5	30.6	75.4	40-140			
Acenaphthene	4.40	0.11	mg/Kg dry	5.56	ND	79.1	40-140			
Acenaphthylene	4.22	0.11	mg/Kg dry	5.56	ND	75.8	40-140			
Anthracene	4.32	0.11	mg/Kg dry	5.56	0.0768	76.3	40-140			
Benzo(a)anthracene	4.43	0.11	mg/Kg dry	5.56	0.236	75.4	40-140			
Benzo(a)pyrene	4.35	0.11	mg/Kg dry	5.56	0.345	72.0	40-140			
Benzo(b)fluoranthene	4.41	0.11	mg/Kg dry	5.56	0.350	72.9	40-140			
Benzo(g,h,i)perylene	4.15	0.11	mg/Kg dry	5.56	0.253	70.0	40-140			
Benzo(k)fluoranthene	4.20	0.11	mg/Kg dry	5.56	0.122	73.3	40-140			
Chrysene	4.47	0.11	mg/Kg dry	5.56	0.298	75.1	40-140			
Dibenz(a,h)anthracene	4.20	0.11	mg/Kg dry	5.56	ND	75.5	40-140			
Fluoranthene	4.70	0.11	mg/Kg dry	5.56	0.566	74.4	40-140			
Fluorene	4.33	0.11	mg/Kg dry	5.56	ND	77.8	40-140			
Indeno(1,2,3-cd)pyrene	4.09	0.11	mg/Kg dry	5.56	0.162	70.7	40-140			
2-Methylnaphthalene	4.04	0.11	mg/Kg dry	5.56	ND	72.7	40-140			
Naphthalene	3.73	0.11	mg/Kg dry	5.56	ND	67.1	40-140			
Phenanthrene	4.50	0.11	mg/Kg dry	5.56	0.374	74.2	40-140			
Pyrene	4.69	0.11	mg/Kg dry	5.56	0.582	73.9	40-140			
n-Nonane	2.11	0.11	mg/Kg dry	5.56	ND	37.9	30-140			
Surrogate: Chlorooctadecane (COD)	*3.53*		mg/Kg dry	5.56		63.4	40-140			
Surrogate: o-Terphenyl (OTP)	*4.11*		mg/Kg dry	5.56		73.9	40-140			
Surrogate: 2-Bromonaphthalene	*4.54*		mg/Kg dry	5.56		81.7	40-140			
Surrogate: 2-Fluorobiphenyl	*5.00*		mg/Kg dry	5.56		90.0	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
Batch B173507 - SW-846 3546										
Matrix Spike Dup (B173507-MSD1)	**Source: 17C1191-01**		Prepared: 03/31/17 Analyzed: 04/06/17							
C9-C18 Aliphatics	29.7	11	mg/Kg dry	33.4	8.91	62.2	40-140	4.51	50	
C19-C36 Aliphatics	59.4	11	mg/Kg dry	44.5	27.7	71.2	40-140	11.0	50	
Unadjusted C11-C22 Aromatics	108	11	mg/Kg dry	94.5	30.6	81.4	40-140	5.43	50	
Acenaphthene	4.07	0.11	mg/Kg dry	5.56	ND	73.2	40-140	7.69	50	
Acenaphthylene	3.93	0.11	mg/Kg dry	5.56	ND	70.7	40-140	6.92	50	
Anthracene	4.06	0.11	mg/Kg dry	5.56	0.0768	71.6	40-140	6.16	50	
Benzo(a)anthracene	4.30	0.11	mg/Kg dry	5.56	0.236	73.0	40-140	3.10	50	
Benzo(a)pyrene	4.16	0.11	mg/Kg dry	5.56	0.345	68.6	40-140	4.36	50	
Benzo(b)fluoranthene	4.24	0.11	mg/Kg dry	5.56	0.350	69.9	40-140	3.88	50	
Benzo(g,h,i)perylene	3.92	0.11	mg/Kg dry	5.56	0.253	65.9	40-140	5.70	50	
Benzo(k)fluoranthene	3.95	0.11	mg/Kg dry	5.56	0.122	68.9	40-140	5.92	50	
Chrysene	4.36	0.11	mg/Kg dry	5.56	0.298	73.0	40-140	2.62	50	
Dibenz(a,h)anthracene	3.88	0.11	mg/Kg dry	5.56	ND	69.7	40-140	7.97	50	
Fluoranthene	4.73	0.11	mg/Kg dry	5.56	0.566	75.0	40-140	0.693	50	
Fluorene	4.06	0.11	mg/Kg dry	5.56	ND	73.0	40-140	6.31	50	
Indeno(1,2,3-cd)pyrene	3.85	0.11	mg/Kg dry	5.56	0.162	66.3	40-140	6.20	50	
2-Methylnaphthalene	3.67	0.11	mg/Kg dry	5.56	ND	66.0	40-140	9.69	50	
Naphthalene	3.38	0.11	mg/Kg dry	5.56	ND	60.8	40-140	9.80	50	
Phenanthrene	4.61	0.11	mg/Kg dry	5.56	0.374	76.2	40-140	2.37	50	
Pyrene	4.82	0.11	mg/Kg dry	5.56	0.582	76.1	40-140	2.55	50	
n-Nonane	2.13	0.11	mg/Kg dry	5.56	ND	38.3	30-140	0.982	50	
Surrogate: Chlorooctadecane (COD)	*3.20*		mg/Kg dry	5.56		57.5	40-140			
Surrogate: o-Terphenyl (OTP)	*3.85*		mg/Kg dry	5.56		69.3	40-140			
Surrogate: 2-Bromonaphthalene	*4.69*		mg/Kg dry	5.56		84.3	40-140			
Surrogate: 2-Fluorobiphenyl	*5.02*		mg/Kg dry	5.56		90.3	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
Batch B173753 - MA VPH										
Blank (B173753-BLK1)				Prepared & Analyzed: 04/04/17						
Unadjusted C5-C8 Aliphatics	ND	10	mg/Kg wet							
C5-C8 Aliphatics	ND	10	mg/Kg wet							
Unadjusted C9-C12 Aliphatics	ND	10	mg/Kg wet							
C9-C12 Aliphatics	ND	10	mg/Kg wet							
C9-C10 Aromatics	ND	10	mg/Kg wet							
Benzene	ND	0.050	mg/Kg wet							
Butylcyclohexane	ND	0.050	mg/Kg wet							
Decane	ND	0.050	mg/Kg wet							
Ethylbenzene	ND	0.050	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.050	mg/Kg wet							
2-Methylpentane	ND	0.050	mg/Kg wet							
Naphthalene	ND	0.50	mg/Kg wet							
Nonane	ND	0.050	mg/Kg wet							
Pentane	ND	0.050	mg/Kg wet							
Toluene	ND	0.050	mg/Kg wet							
1,2,4-Trimethylbenzene	ND	0.050	mg/Kg wet							
2,2,4-Trimethylpentane	ND	0.050	mg/Kg wet							
m+p Xylene	ND	0.10	mg/Kg wet							
o-Xylene	ND	0.050	mg/Kg wet							
Surrogate: 2,5-Dibromotoluene (FID)	*2.94*		mg/Kg wet	3.33		88.3	70-130			
Surrogate: 2,5-Dibromotoluene (PID)	*2.72*		mg/Kg wet	3.33		81.5	70-130			
LCS (B173753-BS1)				Prepared & Analyzed: 04/04/17						
Benzene	0.100	0.0010	mg/Kg wet	0.100		100	70-130			
Butylcyclohexane	0.0829	0.0010	mg/Kg wet	0.100		82.9	70-130			
Decane	0.0856	0.0010	mg/Kg wet	0.100		85.6	70-130			
Ethylbenzene	0.0985	0.0010	mg/Kg wet	0.100		98.5	70-130			
Methyl tert-Butyl Ether (MTBE)	0.0955	0.0010	mg/Kg wet	0.100		95.5	70-130			
2-Methylpentane	0.110	0.0010	mg/Kg wet	0.100		110	70-130			
Naphthalene	0.100	0.010	mg/Kg wet	0.100		100	70-130			
Nonane	0.0813	0.0010	mg/Kg wet	0.100		81.3	30-130			
Pentane	0.121	0.0010	mg/Kg wet	0.100		121	70-130			
Toluene	0.0995	0.0010	mg/Kg wet	0.100		99.5	70-130			
1,2,4-Trimethylbenzene	0.0950	0.0010	mg/Kg wet	0.100		95.0	70-130			
2,2,4-Trimethylpentane	0.0882	0.0010	mg/Kg wet	0.100		88.2	70-130			
m+p Xylene	0.196	0.0020	mg/Kg wet	0.200		97.9	70-130			
o-Xylene	0.0977	0.0010	mg/Kg wet	0.100		97.7	70-130			
Surrogate: 2,5-Dibromotoluene (FID)	*0.0428*		mg/Kg wet	0.0400		107	70-130			
Surrogate: 2,5-Dibromotoluene (PID)	*0.0429*		mg/Kg wet	0.0400		107	70-130			
LCS Dup (B173753-BSD1)				Prepared & Analyzed: 04/04/17						
Benzene	0.100	0.0010	mg/Kg wet	0.100		100	70-130	0.212	25	
Butylcyclohexane	0.0825	0.0010	mg/Kg wet	0.100		82.5	70-130	0.452	25	
Decane	0.0872	0.0010	mg/Kg wet	0.100		87.2	70-130	1.89	25	
Ethylbenzene	0.0983	0.0010	mg/Kg wet	0.100		98.3	70-130	0.149	25	
Methyl tert-Butyl Ether (MTBE)	0.0955	0.0010	mg/Kg wet	0.100		95.5	70-130	0.0251	25	
2-Methylpentane	0.107	0.0010	mg/Kg wet	0.100		107	70-130	2.91	25	
Naphthalene	0.0989	0.010	mg/Kg wet	0.100		98.9	70-130	1.28	25	
Nonane	0.0819	0.0010	mg/Kg wet	0.100		81.9	30-130	0.712	25	
Pentane	0.117	0.0010	mg/Kg wet	0.100		117	70-130	3.45	25	
Toluene	0.0997	0.0010	mg/Kg wet	0.100		99.7	70-130	0.258	25	
1,2,4-Trimethylbenzene	0.0949	0.0010	mg/Kg wet	0.100		94.9	70-130	0.101	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
Batch B173753 - MA VPH										
LCS Dup (B173753-BSD1)				Prepared & Analyzed: 04/04/17						
2,2,4-Trimethylpentane	0.0858	0.0010	mg/Kg wet	0.100		85.8	70-130	2.67	25	
m+p Xylene	0.196	0.0020	mg/Kg wet	0.200		97.8	70-130	0.0496	25	
o-Xylene	0.0980	0.0010	mg/Kg wet	0.100		98.0	70-130	0.255	25	
Surrogate: 2,5-Dibromotoluene (FID)	*0.0450*		mg/Kg wet	0.0400		113	70-130			
Surrogate: 2,5-Dibromotoluene (PID)	*0.0456*		mg/Kg wet	0.0400		114	70-130			
Batch B173829 - MA VPH										
Blank (B173829-BLK1)				Prepared & Analyzed: 04/05/17						
Unadjusted C5-C8 Aliphatics	ND	10	mg/Kg wet							
C5-C8 Aliphatics	ND	10	mg/Kg wet							
Unadjusted C9-C12 Aliphatics	ND	10	mg/Kg wet							
C9-C12 Aliphatics	ND	10	mg/Kg wet							
C9-C10 Aromatics	ND	10	mg/Kg wet							
Benzene	ND	0.050	mg/Kg wet							
Butylcyclohexane	ND	0.050	mg/Kg wet							
Decane	ND	0.050	mg/Kg wet							
Ethylbenzene	ND	0.050	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.050	mg/Kg wet							
2-Methylpentane	ND	0.050	mg/Kg wet							
Naphthalene	ND	0.50	mg/Kg wet							
Nonane	ND	0.050	mg/Kg wet							
Pentane	ND	0.050	mg/Kg wet							
Toluene	ND	0.050	mg/Kg wet							
1,2,4-Trimethylbenzene	ND	0.050	mg/Kg wet							
2,2,4-Trimethylpentane	ND	0.050	mg/Kg wet							
m+p Xylene	ND	0.10	mg/Kg wet							
o-Xylene	ND	0.050	mg/Kg wet							
Surrogate: 2,5-Dibromotoluene (FID)	*2.99*		mg/Kg wet	3.33		89.6	70-130			
Surrogate: 2,5-Dibromotoluene (PID)	*2.72*		mg/Kg wet	3.33		81.5	70-130			
LCS (B173829-BS1)				Prepared & Analyzed: 04/05/17						
Benzene	0.0866	0.0010	mg/Kg wet	0.100		86.6	70-130			
Butylcyclohexane	0.0738	0.0010	mg/Kg wet	0.100		73.8	70-130			
Decane	0.0776	0.0010	mg/Kg wet	0.100		77.6	70-130			
Ethylbenzene	0.0846	0.0010	mg/Kg wet	0.100		84.6	70-130			
Methyl tert-Butyl Ether (MTBE)	0.0863	0.0010	mg/Kg wet	0.100		86.3	70-130			
2-Methylpentane	0.0906	0.0010	mg/Kg wet	0.100		90.6	70-130			
Naphthalene	0.0878	0.010	mg/Kg wet	0.100		87.8	70-130			
Nonane	0.0729	0.0010	mg/Kg wet	0.100		72.9	30-130			
Pentane	0.0960	0.0010	mg/Kg wet	0.100		96.0	70-130			
Toluene	0.0861	0.0010	mg/Kg wet	0.100		86.1	70-130			
1,2,4-Trimethylbenzene	0.0824	0.0010	mg/Kg wet	0.100		82.4	70-130			
2,2,4-Trimethylpentane	0.0723	0.0010	mg/Kg wet	0.100		72.3	70-130			
m+p Xylene	0.169	0.0020	mg/Kg wet	0.200		84.5	70-130			
o-Xylene	0.0850	0.0010	mg/Kg wet	0.100		85.0	70-130			
Surrogate: 2,5-Dibromotoluene (FID)	*0.0412*		mg/Kg wet	0.0400		103	70-130			
Surrogate: 2,5-Dibromotoluene (PID)	*0.0418*		mg/Kg wet	0.0400		104	70-130			

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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
Batch B173829 - MA VPH										
LCS Dup (B173829-BSD1)				Prepared & Analyzed: 04/05/17						
Benzene	0.0900	0.0010	mg/Kg wet	0.100		90.0	70-130	3.76	25	
Butylcyclohexane	0.0757	0.0010	mg/Kg wet	0.100		75.7	70-130	2.42	25	
Decane	0.0810	0.0010	mg/Kg wet	0.100		81.0	70-130	4.32	25	
Ethylbenzene	0.0878	0.0010	mg/Kg wet	0.100		87.8	70-130	3.75	25	
Methyl tert-Butyl Ether (MTBE)	0.0892	0.0010	mg/Kg wet	0.100		89.2	70-130	3.21	25	
2-Methylpentane	0.0916	0.0010	mg/Kg wet	0.100		91.6	70-130	1.09	25	
Naphthalene	0.0916	0.010	mg/Kg wet	0.100		91.6	70-130	4.17	25	
Nonane	0.0747	0.0010	mg/Kg wet	0.100		74.7	30-130	2.43	25	
Pentane	0.100	0.0010	mg/Kg wet	0.100		100	70-130	4.24	25	
Toluene	0.0892	0.0010	mg/Kg wet	0.100		89.2	70-130	3.60	25	
1,2,4-Trimethylbenzene	0.0851	0.0010	mg/Kg wet	0.100		85.1	70-130	3.24	25	
2,2,4-Trimethylpentane	0.0743	0.0010	mg/Kg wet	0.100		74.3	70-130	2.83	25	
m+p Xylene	0.175	0.0020	mg/Kg wet	0.200		87.5	70-130	3.49	25	
o-Xylene	0.0879	0.0010	mg/Kg wet	0.100		87.9	70-130	3.37	25	
Surrogate: 2,5-Dibromotoluene (FID)	*0.0421*		mg/Kg wet	0.0400		105	70-130			
Surrogate: 2,5-Dibromotoluene (PID)	*0.0428*		mg/Kg wet	0.0400		107	70-130			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B173743 - SW-846 3051										
Blank (B173743-BLK1)				Prepared: 04/04/17 Analyzed: 04/05/17						
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Chromium	ND	0.50	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Selenium	ND	5.0	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B173743-BS1)				Prepared: 04/04/17 Analyzed: 04/05/17						
Antimony	152	5.0	mg/Kg wet	88.2		172	0-210.3			
Arsenic	57.9	5.0	mg/Kg wet	57.0		102	77.8-122.1			
Barium	102	5.0	mg/Kg wet	110		93.1	82-117.4			
Beryllium	72.9	0.50	mg/Kg wet	67.5		108	82.3-117.7			
Cadmium	73.0	0.50	mg/Kg wet	77.8		93.9	81.9-118.2			
Chromium	62.6	1.0	mg/Kg wet	65.0		96.3	78.7-120.6			
Lead	79.3	1.5	mg/Kg wet	85.6		92.7	82.4-117.8			
Nickel	58.6	1.0	mg/Kg wet	61.3		95.7	82.2-117.8			
Selenium	75.5	10	mg/Kg wet	78.9		95.7	77.1-122.3			
Silver	52.1	1.0	mg/Kg wet	54.2		96.1	74.3-125.4			
Thallium	167	5.0	mg/Kg wet	178		93.6	78.2-121.6			
Vanadium	54.7	2.0	mg/Kg wet	56.3		97.2	64.8-135.2			
Zinc	199	2.0	mg/Kg wet	198		100	79.7-120.8			
LCS Dup (B173743-BSD1)				Prepared: 04/04/17 Analyzed: 04/05/17						
Antimony	150	5.0	mg/Kg wet	88.2		170	0-210.3	0.748	30	
Arsenic	56.5	5.0	mg/Kg wet	57.0		99.2	77.8-122.1	2.31	30	
Barium	97.4	5.0	mg/Kg wet	110		88.6	82-117.4	4.98	30	
Beryllium	71.4	0.50	mg/Kg wet	67.5		106	82.3-117.7	2.11	30	
Cadmium	73.8	0.50	mg/Kg wet	77.8		94.9	81.9-118.2	1.09	30	
Chromium	62.2	1.0	mg/Kg wet	65.0		95.7	78.7-120.6	0.645	30	
Lead	76.8	1.5	mg/Kg wet	85.6		89.8	82.4-117.8	3.18	30	
Nickel	58.5	1.0	mg/Kg wet	61.3		95.5	82.2-117.8	0.218	30	
Selenium	73.1	10	mg/Kg wet	78.9		92.7	77.1-122.3	3.15	30	
Silver	51.2	1.0	mg/Kg wet	54.2		94.5	74.3-125.4	1.59	30	
Thallium	168	5.0	mg/Kg wet	178		94.1	78.2-121.6	0.609	30	
Vanadium	55.5	2.0	mg/Kg wet	56.3		98.6	64.8-135.2	1.46	30	
Zinc	188	2.0	mg/Kg wet	198		94.8	79.7-120.8	5.71	30	

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

QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B173743 - SW-846 3051											
Duplicate (B173743-DUP1)	**Source: 17C1191-06**			Prepared: 04/04/17 Analyzed: 04/05/17							
Antimony	5.07	2.7	mg/Kg dry		ND				NC	35	
Arsenic	21.6	2.7	mg/Kg dry		19.2				12.2	35	
Barium	98.8	2.7	mg/Kg dry		131				28.2	35	
Beryllium	0.500	0.27	mg/Kg dry		0.477				4.88	35	
Cadmium	0.891	0.27	mg/Kg dry		0.805				10.2	35	
Chromium	32.0	0.54	mg/Kg dry		30.8				3.80	35	
Lead	785	0.82	mg/Kg dry		779				0.886	35	
Nickel	19.1	0.54	mg/Kg dry		17.1				11.0	35	
Selenium	ND	5.4	mg/Kg dry		ND				NC	35	
Silver	ND	0.54	mg/Kg dry		ND				NC	35	
Thallium	ND	2.7	mg/Kg dry		ND				NC	35	
Vanadium	27.3	1.1	mg/Kg dry		26.5				2.90	35	
Zinc	109	1.1	mg/Kg dry		101				7.01	35	
MRL Check (B173743-MRL1)				Prepared: 04/04/17 Analyzed: 04/05/17							
Lead	0.838	0.73	mg/Kg wet	0.727		115		80-120			
Matrix Spike (B173743-MS1)	**Source: 17C1191-06**			Prepared: 04/04/17 Analyzed: 04/05/17							
Antimony	28.3	2.6	mg/Kg dry	26.0	ND	109		75-125			
Arsenic	47.6	2.6	mg/Kg dry	26.0	19.2	109		75-125			
Barium	117	2.6	mg/Kg dry	26.0	131	**-55.6**	*	75-125			MS-19
Beryllium	27.5	0.26	mg/Kg dry	26.0	0.477	104		75-125			
Cadmium	25.4	0.26	mg/Kg dry	26.0	0.805	94.3		75-125			
Chromium	54.4	0.52	mg/Kg dry	26.0	30.8	90.5		75-125			
Lead	756	0.78	mg/Kg dry	26.0	779	**-86.6**	*	75-125			MS-19
Nickel	41.3	0.52	mg/Kg dry	26.0	17.1	92.9		75-125			
Selenium	24.6	5.2	mg/Kg dry	26.0	1.38	89.0		75-125			
Silver	23.4	0.52	mg/Kg dry	26.0	ND	89.9		75-125			
Thallium	26.0	2.6	mg/Kg dry	26.0	ND	99.9		75-125			
Vanadium	50.4	1.0	mg/Kg dry	26.0	26.5	91.8		75-125			
Zinc	133	1.0	mg/Kg dry	26.0	101	121		75-125			
Batch B173810 - SW-846 7471											
Blank (B173810-BLK1)				Prepared: 04/06/17 Analyzed: 04/07/17							
Mercury	ND	0.025	mg/Kg wet								
LCS (B173810-BS1)				Prepared: 04/06/17 Analyzed: 04/07/17							
Mercury	8.42	1.9	mg/Kg wet	9.36		90.0		73.7-126.3			
LCS Dup (B173810-BSD1)				Prepared: 04/06/17 Analyzed: 04/07/17							
Mercury	9.13	1.9	mg/Kg wet	9.36		97.5		73.7-126.3	8.09	30	

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

QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD		RPD Limit	Notes
Batch B173810 - SW-846 7471											
Duplicate (B173810-DUP1)	**Source: 17C1191-09**			Prepared: 04/06/17 Analyzed: 04/07/17							
Mercury	0.433	0.029	mg/Kg dry		0.258			**50.8**	*	35	R-02
Matrix Spike (B173810-MS1)	**Source: 17C1191-09**			Prepared: 04/06/17 Analyzed: 04/07/17							
Mercury	0.474	0.029	mg/Kg dry	0.193	0.258	112	75-125				

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B173503 - % Solids										
Duplicate (B173503-DUP9)	**Source: 17C1191-01**		Prepared: 03/31/17 Analyzed: 04/03/17							
% Solids	90.6		% Wt		89.9			0.776	20	

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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
ND	Not Detected
RL	Reporting Limit
DL	Method Detection Limit
MCL	Maximum Contaminant 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.
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
L-14	Compound classified by MA CAM as difficult with acceptable recoveries of 40-160%. Recovery does not meet 70-130% criteria but does meet difficult compound criteria.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
O-01	Soil/methanol ratio does not meet method specifications. Excess amount of soil. Sample was completely covered with methanol, but with less than the method-specified amount.
R-02	Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.
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.
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.
V-20	Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
MADEP-EPH-04-1.1 in Soil	
C9-C18 Aliphatics	CT,NC,ME,NH-P
C19-C36 Aliphatics	CT,NC,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,ME,NH-P
C11-C22 Aromatics	CT,NC,ME,NH-P
Acenaphthene	CT,NC,ME,NH-P
Acenaphthylene	CT,NC,ME,NH-P
Anthracene	CT,NC,ME,NH-P
Benzo(a)anthracene	CT,NC,ME,NH-P
Benzo(a)pyrene	CT,NC,ME,NH-P
Benzo(b)fluoranthene	CT,NC,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,ME,NH-P
Benzo(k)fluoranthene	CT,NC,ME,NH-P
Chrysene	CT,NC,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,ME,NH-P
Fluoranthene	CT,NC,ME,NH-P
Fluorene	CT,NC,ME
Indeno(1,2,3-cd)pyrene	CT,NC,ME,NH-P
2-Methylnaphthalene	CT,NC,ME
Naphthalene	CT,NC,ME,NH-P
Phenanthrene	CT,NC,ME,NH-P
Pyrene	CT,NC,ME,NH-P
MADEP-VPH-04-1.1 in Soil	
Unadjusted C5-C8 Aliphatics	CT,NC,ME,NH-P
C5-C8 Aliphatics	CT,NC,ME,NH-P
Unadjusted C9-C12 Aliphatics	CT,NC,ME,NH-P
C9-C12 Aliphatics	CT,NC,ME,NH-P
C9-C10 Aromatics	CT,NC,ME,NH-P
Benzene	CT,NC,ME,NH-P
Ethylbenzene	CT,NC,ME,NH-P
Methyl tert-Butyl Ether (MTBE)	CT,NC,ME,NH-P
Naphthalene	CT,NC,ME,NH-P
Toluene	CT,NC,ME,NH-P
m+p Xylene	CT,NC,ME,NH-P
o-Xylene	CT,NC,ME,NH-P
SW-846 6010C-D in Soil	
Antimony	CT,NH,NY,ME,VA,NC
Arsenic	CT,NH,NY,ME,VA,NC
Barium	CT,NH,NY,ME,VA,NC
Beryllium	CT,NH,NY,ME,VA,NC
Cadmium	CT,NH,NY,ME,VA,NC
Chromium	CT,NH,NY,ME,VA,NC
Lead	CT,NH,NY,AIHA,ME,VA,NC
Nickel	CT,NH,NY,ME,VA,NC
Selenium	CT,NH,NY,ME,VA,NC
Silver	CT,NH,NY,ME,VA,NC
Thallium	CT,NH,NY,ME,VA,NC

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C-D in Soil	
Vanadium	CT,NH,NY,ME,VA,NC
Zinc	CT,NH,NY,ME,VA,NC
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA
SW-846 8260C in Soil	
Acetone	CT,NH,NY,ME
Acetone	CT,NH,NY,ME
Benzene	CT,NH,NY,ME
Benzene	CT,NH,NY,ME
Bromobenzene	NH,NY,ME
Bromobenzene	NH,NY,ME
Bromochloromethane	NH,NY,ME
Bromochloromethane	NH,NY,ME
Bromodichloromethane	CT,NH,NY,ME
Bromodichloromethane	CT,NH,NY,ME
Bromoform	CT,NH,NY,ME
Bromoform	CT,NH,NY,ME
Bromomethane	CT,NH,NY,ME
Bromomethane	CT,NH,NY,ME
2-Butanone (MEK)	CT,NH,NY,ME
2-Butanone (MEK)	CT,NH,NY,ME
n-Butylbenzene	CT,NH,NY,ME
n-Butylbenzene	CT,NH,NY,ME
sec-Butylbenzene	CT,NH,NY,ME
sec-Butylbenzene	CT,NH,NY,ME
tert-Butylbenzene	CT,NH,NY,ME
tert-Butylbenzene	CT,NH,NY,ME
Carbon Disulfide	CT,NH,NY,ME
Carbon Disulfide	CT,NH,NY,ME
Carbon Tetrachloride	CT,NH,NY,ME
Carbon Tetrachloride	CT,NH,NY,ME
Chlorobenzene	CT,NH,NY,ME
Chlorobenzene	CT,NH,NY,ME
Chlorodibromomethane	CT,NH,NY,ME
Chlorodibromomethane	CT,NH,NY,ME
Chloroethane	CT,NH,NY,ME
Chloroethane	CT,NH,NY,ME
Chloroform	CT,NH,NY,ME
Chloroform	CT,NH,NY,ME
Chloromethane	CT,NH,NY,ME
Chloromethane	CT,NH,NY,ME
2-Chlorotoluene	CT,NH,NY,ME
2-Chlorotoluene	CT,NH,NY,ME
4-Chlorotoluene	CT,NH,NY,ME
4-Chlorotoluene	CT,NH,NY,ME
Dibromomethane	NH,NY,ME

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Soil	
Dibromomethane	NH,NY,ME
1,2-Dichlorobenzene	CT,NH,NY,ME
1,2-Dichlorobenzene	CT,NH,NY,ME
1,3-Dichlorobenzene	CT,NH,NY,ME
1,3-Dichlorobenzene	CT,NH,NY,ME
1,4-Dichlorobenzene	CT,NH,NY,ME
1,4-Dichlorobenzene	CT,NH,NY,ME
Dichlorodifluoromethane (Freon 12)	NY,ME
Dichlorodifluoromethane (Freon 12)	NY,ME
1,1-Dichloroethane	CT,NH,NY,ME
1,1-Dichloroethane	CT,NH,NY,ME
1,2-Dichloroethane	CT,NH,NY,ME
1,2-Dichloroethane	CT,NH,NY,ME
1,1-Dichloroethylene	CT,NH,NY,ME
1,1-Dichloroethylene	CT,NH,NY,ME
cis-1,2-Dichloroethylene	CT,NH,NY,ME
cis-1,2-Dichloroethylene	CT,NH,NY,ME
trans-1,2-Dichloroethylene	CT,NH,NY,ME
trans-1,2-Dichloroethylene	CT,NH,NY,ME
1,2-Dichloropropane	CT,NH,NY,ME
1,2-Dichloropropane	CT,NH,NY,ME
1,3-Dichloropropane	NH,NY,ME
1,3-Dichloropropane	NH,NY,ME
2,2-Dichloropropane	NH,NY,ME
2,2-Dichloropropane	NH,NY,ME
1,1-Dichloropropene	NH,NY,ME
1,1-Dichloropropene	NH,NY,ME
cis-1,3-Dichloropropene	CT,NH,NY,ME
cis-1,3-Dichloropropene	CT,NH,NY,ME
trans-1,3-Dichloropropene	CT,NH,NY,ME
trans-1,3-Dichloropropene	CT,NH,NY,ME
1,4-Dioxane	NY
Ethylbenzene	CT,NH,NY,ME
Ethylbenzene	CT,NH,NY,ME
Hexachlorobutadiene	NH,NY,ME
Hexachlorobutadiene	NH,NY,ME
2-Hexanone (MBK)	CT,NH,NY,ME
2-Hexanone (MBK)	CT,NH,NY,ME
Isopropylbenzene (Cumene)	CT,NH,NY,ME
Isopropylbenzene (Cumene)	CT,NH,NY,ME
p-Isopropyltoluene (p-Cymene)	NH,NY
p-Isopropyltoluene (p-Cymene)	NH,NY
Methyl tert-Butyl Ether (MTBE)	NH,NY
Methyl tert-Butyl Ether (MTBE)	NY
Methylene Chloride	CT,NH,NY,ME
Methylene Chloride	CT,NH,NY,ME
4-Methyl-2-pentanone (MIBK)	CT,NH,NY

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Soil	
4-Methyl-2-pentanone (MIBK)	CT,NH,NY
Naphthalene	NH,NY,ME
Naphthalene	NH,NY,ME
n-Propylbenzene	NH,NY
n-Propylbenzene	NH,NY
Styrene	CT,NH,NY,ME
Styrene	CT,NH,NY,ME
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME
Tetrachloroethylene	CT,NH,NY,ME
Tetrachloroethylene	CT,NH,NY,ME
Toluene	CT,NH,NY,ME
Toluene	CT,NH,NY,ME
1,2,3-Trichlorobenzene	ME
1,2,3-Trichlorobenzene	NY
1,2,4-Trichlorobenzene	NH,NY,ME
1,2,4-Trichlorobenzene	NH,NY,ME
1,1,1-Trichloroethane	CT,NH,NY,ME
1,1,1-Trichloroethane	CT,NH,NY,ME
1,1,2-Trichloroethane	CT,NH,NY,ME
1,1,2-Trichloroethane	CT,NH,NY,ME
Trichloroethylene	CT,NH,NY,ME
Trichloroethylene	CT,NH,NY,ME
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME
1,2,3-Trichloropropane	NH,NY,ME
1,2,3-Trichloropropane	NH,NY,ME
1,2,4-Trimethylbenzene	CT,NH,NY,ME
1,2,4-Trimethylbenzene	CT,NH,NY,ME
1,3,5-Trimethylbenzene	CT,NH,NY,ME
1,3,5-Trimethylbenzene	CT,NH,NY,ME
Vinyl Chloride	CT,NH,NY,ME
Vinyl Chloride	CT,NH,NY,ME
m+p Xylene	CT,NH,NY,ME
m+p Xylene	CT,NH,NY,ME
o-Xylene	CT,NH,NY,ME
o-Xylene	CT,NH,NY,ME

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

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	02/1/2018
MA	Massachusetts DEP	M-MA100	06/30/2017
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2017
NY	New York State Department of Health	10899 NELAP	04/1/2018
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2018
RI	Rhode Island Department of Health	LAO00112	12/30/2017
NC	North Carolina Div. of Water Quality	652	12/31/2017
NJ	New Jersey DEP	MA007 NELAP	06/30/2017
FL	Florida Department of Health	E871027 NELAP	06/30/2017
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2017
ME	State of Maine	2011028	06/9/2017
VA	Commonwealth of Virginia	460217	12/14/2017
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2017

CHAIN OF CUSTODY RECORD

con-test® ANALYTICAL LABORATORY
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39 Spruce Street
East longmeadow, MA 01028

17C1191

Rev 04.06.12

Company Name: NOBIS ENGINEERING
Telephone: 978-683-0891
Address: 585 MIDDLESEX ST.
LOWELL, MA 01851
Project # 91830.01
Client PO#
Attention: E. JOHNSON / S. VETERE
Project Location: LOWELL, MA
Sampled By: E. JOHNSON

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email: ejohnson@nobiseng.com
Format: ☒ PDF ☒ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	VOCs	VPH	EPH	METALS	# of Containers	** Preservation	***Container Code
												3	I	V
												M/B	M	V
												V	V	A
1	NOB-101 0-2	3/29/17	1215		X	SO	U	X	X	X	X			
2	NOB-101 6-8	↓	1200		X	↓	↓							
3	NOB-102 0-2		1035		X									
4	NOB-102 7-8		1055		X									
5	NOB-104 0-2		945		X									
6	NOB-104 5-5.5'		955		X									
7	NOB-105 0-2		840		X									
8	NOB-105 11-12		830		X									
9	NOB-106 0-2		910		X									
10	NOB-106 4-5	↓	920		X	↓	↓	↓	↓	↓	↓			

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other _____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL= sludge
O = other _____

Comments:
MCP metals & VPH ranges only per client - MEK 3/31/2017

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Turnaround ††
☒ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts: S-2
Connecticut:
Other:

Is your project MCP or RCP ?
☒ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certifie

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Table of Contents

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
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Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

17C1191

Rev 04.05.12

Company Name: NOBIS ENGINEERING
Address: 585 MIDDLESEX ST.
LOWELL, MA 01851
Attention: E. JOHNSON / S. VETERE
Project Location: LOWELL, MA
Sampled By: E. JOHNSON

Telephone: 978-683-0891
Project #: 91830.01
Client PO#:

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #:
Email: ejohnson@nobiseng.com
Format: ☒ PDF ☒ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	VOCs	VPH	EPH	METALS	# of Containers	** Preservation	***Container Code
								3	1	1	"			
								M/B	M	1	"			
								V	V	A	"			
11	FD-01	3/29/17	1500		X	SO	U	X	X	X	X			
12	TB-01	3/29/17	0700		X	BLANK	U	X						

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL= sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature) Eric Johnson (NOBIS)	Date/Time: 1007	
Received by: (signature)	Date/Time: 1007	
Relinquished by: (signature)	Date/Time: 4:15	
Received by: (signature)	Date/Time: 1615	

Turnaround ††
☒ 7-Day
☐ 10-Day
☐ Other
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts: S-2
Connecticut:
Other:

Is your project MCP or RCP ?
☒ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Table of Contents

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

con-test® ANALYTICAL LABORATORY

Sample Receipt Checklist

CLIENT NAME: Nobis Eng. **RECEIVED BY:** JM **DATE:** 3/30/17

1) **Was the chain(s) of custody relinquished and signed?** **Yes** ✓ **No** ____ **No COC Incl.**

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 2.4 # 2

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:** Login

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** ____ **N/A** ✓

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		16 oz amber	
500 mL Amber		8 oz amber/clear jar	11
250 mL Amber (8oz amber)		4 oz amber/clear jar	
1 Liter Plastic		2 oz amber/clear jar	
500 mL Plastic		Plastic Bag / Ziploc	
250 mL plastic		SOC Kit	
40 mL Vial - type listed below	47	Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

(JM)

40 mL vials: # HCl ____ # Methanol ~~18~~ 23 **Time and Date Frozen:**
Bisulfate 24 # DI Water ____
Thiosulfate ____ Unpreserved ____

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	N/A	
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.	N/A	
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.	N/A	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	T	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	N/A	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** JM **Date/Time:** 3/30/17 1615

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory	Project #: 17C1191
Project Location: Lowell, MA	RTN:

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

17C1191-01 thru 17C1191-12

Matrices: Soil

CAM Protocol (check all that below)

8260 VOC CAM II A (X)	7470/7471 Hg CAM IIIB (X)	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 (X)	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 throughF is required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☑ Yes	☐ No[1]
B	Were the analytical method(s) and all associated QC requirements specificed in the selected CAM protocol(s) followed?	☑ Yes	☐ No[1]
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☑ Yes	☐ No[1]
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, Quality Assurance and Quality Control Guidlines for the Acquisition and Reporting of Analytical Data?	☑ Yes	☐ No[1]
E a	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).	☑ Yes	☐ No[1]
E b	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes	☐ No[1]
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all No responses to Qestions A through E)?	☑ Yes	☐ No[1]

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

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☐ Yes	☑ No[1]

<u>Data User Note:</u> Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were all QC perfomance standards specified in the CAM protocol(s) achieved?	☐ Yes	☑ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☐ Yes	☑ No[1]

[1] *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: Project Manager

Printed Name: Lisa A. Worthington Date: 04/10/17

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

April 12, 2017

Eric Johnson
Nobis Engineering
585 Middlesex Street
Lowell, MA 01851

Project Location: Lowell, MA
Client Job Number:
Project Number: 91830.01
Laboratory Work Order Number: 17D0402

Enclosed are results of analyses for samples received by the laboratory on April 11, 2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Meghan E. Kelley
Project Manager

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con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Nobis Engineering
585 Middlesex Street
Lowell, MA 01851
ATTN: Eric Johnson

REPORT DATE: 4/12/2017

PURCHASE ORDER NUMBER: MO 16-008

PROJECT NUMBER: 91830.01

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 17D0402

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

PROJECT LOCATION: Lowell, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
NOB-106N 0-1	17D0402-01	Soil		SM 2540G SW-846 6010C-D	
NOB-106S 0-1	17D0402-02	Soil		SM 2540G SW-846 6010C-D	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

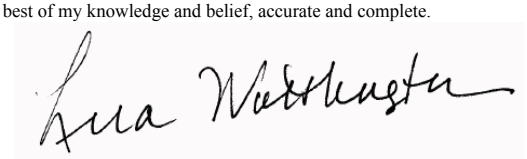
All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

For method 6010, only As was requested and reported.

SW-846 6010C/D SW-846 6020A/B

For NC, Metals methods SW-846 6010D and SW-846 6020B are followed, and for all other states methods SW-846 6010C and SW-846 6020A are followed.

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.



Lisa A. Worthington
Project Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Lowell, MA | Sample Description: | Work Order: 17D0402

Date Received: 4/11/2017

Field Sample #: NOB-106N 0-1 | Sampled: 4/11/2017 10:20

Sample ID: 17D0402-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	180	2.7	mg/Kg dry	1		SW-846 6010C-D	4/12/17	4/12/17 12:25	SHN

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Lowell, MA | Sample Description: | Work Order: 17D0402

Date Received: 4/11/2017

Field Sample #: NOB-106N 0-1 | Sampled: 4/11/2017 10:20

Sample ID: 17D0402-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.7		% Wt	1		SM 2540G	4/11/17	4/12/17 7:47	MRL

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Lowell, MA | Sample Description: | Work Order: 17D0402

Date Received: 4/11/2017

Field Sample #: NOB-106S 0-1 | Sampled: 4/11/2017 10:30

Sample ID: 17D0402-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	140	2.8	mg/Kg dry	1		SW-846 6010C-D	4/12/17	4/12/17 12:29	SHN

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Lowell, MA | Sample Description: | Work Order: 17D0402

Date Received: 4/11/2017

Field Sample #: NOB-106S 0-1 | Sampled: 4/11/2017 10:30

Sample ID: 17D0402-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.3		% Wt	1		SM 2540G	4/11/17	4/12/17 7:47	MRL

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

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
17D0402-01 [NOB-106N 0-1]	B174298	04/11/17
17D0402-02 [NOB-106S 0-1]	B174298	04/11/17

Prep Method: SW-846 3050B-SW-846 6010C-D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17D0402-01 [NOB-106N 0-1]	B174280	1.04	50.0	04/12/17
17D0402-02 [NOB-106S 0-1]	B174280	1.01	50.0	04/12/17

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

QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B174280 - SW-846 3050B										
Blank (B174280-BLK1)				Prepared & Analyzed: 04/12/17						
Arsenic	ND	2.5	mg/Kg wet							
LCS (B174280-BS1)				Prepared & Analyzed: 04/12/17						
Arsenic	54.3	4.9	mg/Kg wet	57.0		95.2	77.8-122.1			
LCS Dup (B174280-BSD1)				Prepared & Analyzed: 04/12/17						
Arsenic	55.7	5.0	mg/Kg wet	57.0		97.8	77.8-122.1	2.65	30	

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

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
ND	Not Detected
RL	Reporting Limit
DL	Method Detection Limit
MCL	Maximum Contaminant 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.

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

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C-D in Soil	
Arsenic	CT,NH,NY,ME,VA,NC

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

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	02/1/2018
MA	Massachusetts DEP	M-MA100	06/30/2017
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2017
NY	New York State Department of Health	10899 NELAP	04/1/2018
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2018
RI	Rhode Island Department of Health	LAO00112	12/30/2017
NC	North Carolina Div. of Water Quality	652	12/31/2017
NJ	New Jersey DEP	MA007 NELAP	06/30/2017
FL	Florida Department of Health	E871027 NELAP	06/30/2017
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2017
ME	State of Maine	2011028	06/9/2017
VA	Commonwealth of Virginia	460217	12/14/2017
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2017

CHAIN OF CUSTODY RECORD

17D0402

Rev. 04.05.12

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Company Name: NOBIS ENGINEERING
Address: 585 MIDDLESEX ST.
LOWELL, MA 01851
Attention: E. JOHNSON / S. VETERE
Project Location: LOWELL, MA
Sampled By: E. JOHNSON

Telephone: 978-683-0891
Project #: 91830.01
Client PO#:

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #:
Email: ejohnson@nobiseng.com
Format: ☒ PDF ☒ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	ANALYSIS REQUESTED: ARSENIC
1	NOB-106N 0-1	4/11/17	1020		X	SO	J	1	1	A	X
2	NOB-106S 0-1	4/11/17	1030		X	SO	J	1	1	A	X

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
	4/11/17 1430
Received by: (signature)	Date/Time:
	4/11/17 1930
Relinquished by: (signature)	Date/Time:
	4/11/17 1940
Received by: (signature)	Date/Time:
	4/11/17 1940

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other
RUSH †
☒ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts: RCS1, RCS-2
Connecticut:
Other:

Is your project MCP or RCP ?
☒ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certifie

TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Table of Contents

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

CON-TEST ANALYTICAL LABORATORY

Sample Receipt Checklist

CLIENT NAME: Nobis Engineering **RECEIVED BY:** JM **DATE:** 4/11/12

1) **Was the chain(s) of custody relinquished and signed?** Yes ✓ No ____ No COC Incl.

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 3.2 # 2

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 N/A Date 4/11/12 Time 1940

7) **Location where samples are stored:** Cog. 7

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 ____ N/A ✓

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		16 oz amber	
500 mL Amber		8 oz amber/clear jar	
250 mL Amber (8oz amber)		4 oz amber/clear jar	2
1 Liter Plastic		2 oz amber/clear jar	
500 mL Plastic		Plastic Bag / Ziploc	
250 mL plastic		SOC Kit	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

40 mL vials: # HCl ____ # Methanol ____ Time and Date Frozen:
Bisulfate ____ # DI Water ____
Thiosulfate ____ Unpreserved ____

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	N/A	
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.	N/A	
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.	N/A	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	N/A	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	N/A	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** JM **Date/Time:** 4/11/17 1940

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory	Project #: 17D0402
Project Location: Lowell, MA	RTN:

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

17D0402-01 thru 17D0402-02

Matrices: Soil

CAM Protocol (check all that below)

8260 VOC CAM II A ( )	7470/7471 Hg CAM IIIB ( )	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 A ( )	8151 Herbicides CAM V C ( )	8330 Explosives CAM VIII A ( )	TO-15 VOC CAM IX B ( )
6010 Metals CAM III A (X)	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 throughF is required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☑ Yes	☐ No[1]
B	Were the analytical method(s) and all associated QC requirements specificed in the selected CAM protocol(s) followed?	☑ Yes	☐ No[1]
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☑ Yes	☐ No[1]
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, Quality Assurance and Quality Control Guidlines for the Acquisition and Reporting of Analytical Data?	☑ Yes	☐ No[1]
E a	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).	☐ Yes	☐ No[1]
E b	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes	☐ No[1]
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all No responses to Qestions A through E)?	☑ Yes	☐ No[1]

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

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☑ Yes	☐ No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**

H	Were all QC perfomance standards specified in the CAM protocol(s) achieved?	☑ Yes	☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☐ Yes	☑ No[1]

[1] *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: Project Manager

Printed Name: Lisa A. Worthington Date: 04/12/17

APPENDIX D

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

RELEASE LOG FORM

BWSC 101

Release Tracking Number
3 - 34180

A. THIS FORM IS BEING USED TO: (check one)

1. Log Date: 4/12/2017 (mm/dd/yyyy) Log Time: 02:21 (hh:mm) ☐ AM ☑ PM

☑ 2. Assign a Release Tracking Number (RTN) to a Release or TOR Report.
☑ a. **Reportable Release or TOR.** ☐ b. **Release that is Less Than the Reporting Thresholds.**

☐ 3. Amend a Previously Recorded Release or TOR Report (RTN Assigned) .
☐ a. The Release is a **Reportable Release or TOR.** ☐ b. The Release is a **Release that is Less Than the Reporting Thresholds.**
☐ c. The Release or TOR is **Retracted.** (BWSC103 must be submitted, as well) ☐ d. The Release or TOR is **not a Release under M.G.L. c. 21E.**

B. REPORTING PERSON:

1. Name of Organization: NOBIS ENGINEERING
2. First Name: STEPHEN 3. Last Name: VETERE
4. Telephone: 9787036029 5. Ext.:
6. Relationship of Person to Release: ☐ PRP ☑ Other c. Type, if known (e.g. Current Owner): Licensed Site Professional

C. RELEASE OR THREAT OF RELEASE (TOR) /SITE LOCATION:

1. Location Aid/Site Name: LOWELL HIGH SCHOOL
2. Street Address: 50 FATHER MORISSETTE BLVD. 3. 2nd Address Line:
4. City/Town: LOWELL, LOWELL 5. Zip Code (if known): 018520000
6. Type of Location: (check all that apply) ☑ a. School ☐ b. Water Body ☐ c. Right of Way ☐ d. Utility Easement
☐ e. Roadway ☐ f. Municipal ☐ g. State ☐ h. Residential ☐ i. Open Space ☐ j. Private Property
☐ k. Industrial ☐ l. Commercial ☐ m. Federal ☑ n. Other Describe: LOWELL HIGH SCHOOL

D. RELEASE OR TOR INFORMATION:

1. Date and Time of **Notification**: 4/12/2017 (mm/dd/yyyy) Time: 02:21 (hh:mm) ☐ AM ☑ PM
2. Date and Time Reporting Person obtained **Knowledge of Release or TOR**: 4/12/2017 (mm/dd/yyyy) Time: 01:30 (hh:mm) ☐ AM ☑ PM
3. Date and Time **Release or TOR occurred**, if known: (mm/dd/yyyy) Time: (hh:mm) ☐ AM ☐ PM
4. **Sources of the Release or TOR**: (check all that apply) ☐ a. Transformer ☐ b. Fuel Tank ☐ c. Pipe
☐ d. OHM Delivery ☐ e. AST ☐ f. Drums ☐ g. Tanker Truck ☐ h. Hose ☐ i. Line
☐ j. UST Describe ☐ k. Vehicle ☐ l. Boat/Vessel
☐ m. Unknown ☑ n. Other: HISTORICAL FILL MATERIAL
5. **Federal LUST Eligible**: ☐ Yes ☑ No ☐ Unknown

Check all Notification Thresholds that apply to the Release or TOR:

6. 2 Hour Reporting Conditions:

- ☐ a. Sudden Release
- ☐ b. Threat of Sudden Release
- ☐ c. Oil Sheen on Surface Water
- ☐ d. Poses Imminent Hazard
- ☑ e. Could Pose Imminent Hazard
- ☐ f. Release Detected in Private Well
- ☐ g. Release to Storm Drain
- ☐ h. Sanitary Sewer Release (Imminent Hazard Only)

7. 72 Hour Reporting Conditions:

- ☐ a. Subsurface Non-Aqueous Phase Liquid (NAPL) Equal to or Greater than 1/2 Inch
- ☐ b. Underground Storage Tank (UST) Release
- ☐ c. Threat of UST Release
- ☐ d. Release to Groundwater near Water Supply
- ☐ e. Release to Groundwater near School or Residence
- ☐ f. Substantial Release Migration

8. 120 Day Reporting Conditions:

- ☐ a. Release of Hazardous Material(s) to Soil or Groundwater Exceeding Reportable Concentration(s)
- ☐ b. Release of Oil to Soil Exceeding Reportable Concentration(s) and Affecting More than 2 Cubic Yards
- ☐ c. Release of Oil to Groundwater Exceeding Reportable Concentration(s)
- ☐ d. Subsurface Non-Aqueous Phase Liquid(NAPL) Equal to or Greater than 1/8 Inch and Less than 1/2 Inch

9. Type of Release or TOR: (check all that apply) ☐ a. Dumping ☐ b. Fire ☐ c. AST Removal ☐ d. Overfill ☐ e. rupture ☐ f. Vehicle Accident ☐ g. Leak ☐ h. Spill ☐ i. Test Failure ☐ j. TOR Only ☐ k. UST Removal Describe ☐ l. Unknown ☑ m. Other: HISTORICAL

10. Media Impacted and Receptors Affected: (check all that apply) ☐ a. Paved Surface ☐ b. Basement ☐ c. School ☐ d. Public Water Supply ☐ e. Surface Water ☐ f. Zone 2 ☐ g. Private Well ☐ h. Residence ☑ i. Soil ☐ j. Ground Water ☐ k. Sediments ☐ l. Wetland ☐ m. Storm Drain ☐ n. Indoor Air ☐ o. Air ☐ p. Soil Gas ☐ q. Sub-Slab Soil Gas ☐ r. Critical Exposure Pathway ☐ s. NAPL ☐ t. Unknown ☐ u. Others Specify:

11. List below the Oils (O) or Hazardous Materials (HM) that exceed their Reportable Concentration (RC) or Reportable Quantity (RQ) by the greatest amount.

☐ Check here if an amount or concentration is unknown or less than detectable.

O or HM Released	CAS Number, if known	O or HM	Amount or Concentration	Units	RCs Exceeded, if Applicable
ARSENIC		HM	180	MG/KG	N/A
					N/A
					N/A

12. Description of Release or Threat of Release (if additional space is needed, attach additional information in H17)

LSP STEPHEN VETERE (THE CALLER) REPORTS A SOIL CONDITION THAT "COULD POSE AN IMMINENT HAZARD" (CPIH) AS EVIDENCED BY THE MEASUREMENT OF 180 MG/KG OF ARSENIC IN ONE SOIL SAMPLE COLLECTED FROM THE 0"-12" SOIL HORIZON DURING SITE CHARACTERIZATION WORK IN PREPARATION FOR POTENTIAL FUTURE SITE CONSTRUCTION ACTIVITIES. THE CALLER REPORTS A SIX-FOOT HIGH CHAIN LINK FENCE WILL BE INSTALLED TO RESTRICT ACCESS TO THE CPIH LOCATION INCLUDING SIGNAGE. THE CALLER REPORTS ADDITIONAL SITE ASSESSMENT WILL BE CONDUCTED TO FURTHER DEFINE THE ARSENIC IN SOIL CONTAMINATION PROFILE. THE CALLER INFORMED THE WRITER A TOTAL OF TWO SURFICIAL SOIL SAMPLES WERE COLLECTED ALONG THE VEGETATED LANSCAPED AREA BETWEEN THE HIGH SCHOOL AND THE ACTIVE RAILROAD TRACKS (USED FOR TROLLEY USE FOR HISTORICAL TOURS AT THAT LOCATION). THE CALLER REPORTS THE FENCE WILL BE INSTALLED BY FRIDAY APRIL 21, 2017 AND INFORMED THE WRITER THAT THE SAMPLE LOCATION EXHIBITING THE CPIH WILL BE IMMEDIATELY TREATED WITH SNOW-FENCE UNTIL THE CHAIN-LINK FENCE IS INSTALLED. THE CALLER STATED THAT THE CHAIN LINK FENCE WILL BE INSTALLED ALONG THE ENTIRE LINEAR DISTANCE OF THE VEGETATED LANSCAPED AREA SO AS TO RESTRICT AND PREVENT DIRECT ACCESS TO ALL THE VEGETATED LANSCAPED AREAS.

E. INVOLVED PARTIES SUMMARY :

1. PRP Status (check one): ☐ a. PRP Unknown ☐ b. PRP unwilling, unable or has not committed to Perform Response Actions
☑ c. PRP Performing Response Actions ☐ d. Release is Adequated Regulated by the US Coast Guard

2. If PRP is not Performing Response Actions, who is?

☐ a. MassDEP State Contractor ☐ b. Other Person

3. Contractor:	a. Name of Organization:		b. Telephone:	
	c. Contact First Name:		d. Last Name:	
4. LSP:	a. Name:	VETERE STEPHEN A	b. LSP #:	3507
	c. Telephone:	9787036029		

F. PRP OR PERSON PERFORMING RESPONSE ACTIONS:

1. Name of Organization: CITY OF LOWELL
2. Contact First Name: MICHAEL 3. Last Name: MCGOVERN
4. Street: 375 MERRIMACK STREET - #43 5. Title: CITY MANAGER
6. City/Town: LOWELL 7. State: MA 8. ZIP Code: 018520000
9. Telephone: 9789704000 10. Ext: 11. Email:
12. Relationship of Person to Release: ☑ PRP ☐ Other c. Type (e.g. Current Owner): Non-specified PRP

☐ 13. Check here if this PRP received a field NOR ☑ 14. Check here if an RNF was requested from this PRP

☑ 15. Check here if Provisions of 21E were explained to this PRP.

G. RECORD ORAL RESPONSE ACTIVITIES:

☐ 1. IRA Completed Pre-notification
☐ 2. No IRA Approved at Notification
☐ 3. IRA Assessment Only.
☑ 4. IRA Oral Plan Approved
☐ 5. IRA Oral Modified Plan Approved
☐ 6. IRA Oral Plan Denied and/or Request for Written Plan
☐ 7. Notice of Intent to Conduct a URAM
☐ 8 IRA-D Oral Plan Approved
☐ 9. IRA-D Oversight Work Started

10. Date of Action:

11. Soil Previously Excavated: ☐ a. Excavated prior to notification. ☐ b. Excavated as part of an UST closure.

c. Quantity of contaminated soil previously excavated and destination, if applicable:

12. Specify any Regional Specific Code (Regional Use):

H. ORAL RESPONSE ACTION PLAN: (check all that apply)

☐ 1. Assessment and/or Monitoring Only
☐ 2. Temporary Covers or Caps
☐ 3. Deployment of Absorbent or Containment Materials
☐ 4. Temporary Water Supplies
☐ 5. Structure Venting System
☐ 6. Temporary Evacuation or Relocation of Residents
☐ 7. Product or NAPL Recovery
☑ 8. Fencing and Sign Posting
☐ 9. Groundwater Treatment Systems
☐ 10. Soil Vapor Extraction
☐ 11. Bioremediation
☐ 12. Air Sparging
☐ 13. Excavation of Contaminated Soils
- ☐ a. Re-use, Recycling or Treatment ☐ i. On Site ☐ ii. Off Site Authorized volume in cubic yards:
- ☐ b. Store ☐ i. On Site ☐ ii. Off Site Authorized volume in cubic yards:
- ☐ c. Landfill ☐ i. Cover ☐ ii. Disposal Authorized volume in cubic yards:

☐ 14. Removal of Drums, Tanks or Containers:

Describe Quantity and Amount: _____

☐ 15. Removal of Other Contaminated Media:

Specify Type and Volume: _____

☑ 16 Other Response Actions and Additional Comments (describe):

THE WRITER PROVIDED A BRIEF EXPLANATION OF THE PROVISIONS OF M.G.L. C. 21E AND THE MCP TO LSP STEPHEN VETERE DURING THE ABOVE REFERENCED CPIH NOTIFICATION, AND HE STATED THAT HE UNDERSTOOD THE IMMEDIATE NEED TO RESTRICT ACCESS TO THE SUBJECT SURFICIAL SOILS BY INSTALLING A CHAIN-LINK FENCE WITH SIGNAGE. LSP VETERE STATED THAT SOIL REMOVAL IS NOT BEING PROPOSED AT THIS TIME.

☐ 17. Check here if Additional Information is Provided in an Attachment

I. DEP STAFF AND FORM PREPARER:

1. DEP Staff: a. Name: FONKEM VICTOR ☐ b. Check here, if Unassigned (or staff name not applicable).

2 . Preparer : a. Name: ROSS STEVEN

b. Signature: STEVEN ROSS c. Date: 4/14/2017