

Analysis of Brownfields  
Cleanup Alternatives at the  
Former Railroad Right of Way  
Newburyport, MA



Prepared for:  
The City of Newburyport  
Newburyport, MA

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Insert revision record

## Sign-off Sheet

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Prepared by   
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## 1.0 INTRODUCTION

This Analysis of Brownfields Cleanup Alternatives is prepared on behalf of the City of Newburyport, and the Massachusetts Department of Transportation (MassDOT) who are jointly undertaking design and construction of a 1.6 mile rail to trail repurposing of the former Boston & Maine railroad right of way located in Newbury and Newburyport, MA. The project is identified as the Clipper City Rail Trail (CCRT) and extends from Parker Street in Newbury to the waterfront area in Newburyport. As a result of pre-construction characterization soil sampling, a portion of the CCRT has been identified as impacted by polychlorinated biphenyls (PCBs) in soil above applicable regulatory standards. The area of impacted soil is a former railroad right of way that is located at the rear of 157 Water Street in Newburyport, MA. The impacted soil area is co-owned by the City of Newburyport and the utility company National Grid. National Grid operates underground electric service transmission lines through and adjacent to this right of way. National Grid has provided a long-term (99 year) lease to the City, for the portion of the right of way that they own in fee. National Grid has an easement on the City-owned portions of the right of way.

Actions are currently being developed to abate, prevent, or mitigate the potential risk of harm to human health, public safety, public welfare, and the environment from the discovered presence of PCBs in soil on a now designated portion of the right of way. This portion of the property was part of the route of the former B&M Railroad which had been decommissioned circa 1972 to remove track rail and ties, ballast rock and signals associated with the railroad. The current condition of the property is soil covered open land which functions as an unimproved walking path. There is no evidence that the soil conditions are different from that of the time when the railroad was present. A site location map is provided as Figure 1.

MassDOT, who is funding construction and provides construction oversight of the CCRT, awarded this phase of construction to ET&L Construction Corporation (ET&L) of Stow, MA. ET&L deployed its partner, Strategic Environmental Services (Strategic) of Sutton, MA to collect test pit soil samples for the purpose of characterization of potential excess soil for beneficial reuse on and off the property or disposal as necessary during construction. The results of those test pit samples identified PCBs along a portion of the CCRT footprint ranging from below 1 parts per million (ppm) to over 100 ppm. These results were brought to the attention of the City. The City of Newburyport immediately retained a Massachusetts Licensed Site Professional (LSP) from Stantec Consulting Services Inc. (Stantec) of Burlington, MA. The LSP notified the Massachusetts Department of Environmental Protection (MassDEP) within 2 hours of knowledge of the Strategic soil confirmation data on January 25, 2017. The City immediately established a plan for isolation of the area from the public and to initiate an assessment Immediate Response Action (IRA) in accordance with the Massachusetts Contingency Plan (MCP). MassDEP was also notified that this IRA would include requirements under the federal Toxic Substance Control Act (TSCA).

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Site RTN: 3-0034101  
Location Aid: Adjacent to Rail Trail – Rear of 157 Water Street  
  
LSP of Record: Robert Nicoloro, LSP #4290  
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## 2.0 DESCRIPTION OF THE RELEASE

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### 2.1 DESCRIPTION OF THE RELEASE

The CCRT is identified as a 1.6-mile former rail road right of way that is being converted to a paved rail trail for recreational use by the public. Figure 2 is provided to show the portion of the rail trail associated with the MCP response actions. The portion of the property that is specifically being addressed, i.e., the Disposal Site is shown in detail on Figure 3 (Figure 3 is a series of three sheets), is approximately 600 linear feet and approximately, 14 feet in width that runs between the rear of the City Wastewater Treatment Plant property boundary and the Merrimack River shoreline. This area is depicted in Figure 3 by the boring locations which have been sampled. The areas of impact are depicted by color graded polygons and notation of sample identification, depth of sample and analytical results for PCBs. This land is relatively flat, runs generally north to south, is soil covered and bordered to the west by a strip of grass and small trees and shrubs, on what used to be the former Boston & Maine (B&M) freight rail right-of-way. The Disposal Site is currently isolated from the public and trespassers by a perimeter fence with warning signs, erected around the impacted area following receipt of soil sampling results.

For the purpose of design and construction of the CCRT, the corridor was measured off in 100 linear foot sections, termed "Stations". Each Station was consecutively numbered and identified on plans by the Station number and the linear footage being measures, for example; 50 feet from Station 65 is designated on plans as 65+50. Soil sampling plans use these Station designations. Each boring location for the collection of soil samples was surveyed with GPS coordinates. The Disposal Site is located within the general centerline of the 14-foot wide path between design Station number 57 through Station 76. Soils are generally characterized as medium brown sands with silt, occasional black fill, slag, and coal ash.

The CCRT is also characterized by the utility-owned corridor and utility easement to National Grid (NG), where NG has direct buried high voltage cables and a concrete duct bank providing electrical service. These cables are buried approximately 3 to 6 feet below grade and are in service. The presence and location of these utilities has influenced where soil borings were advanced and samples collected.

## 2.2 SITE CONDITIONS, SURROUNDING RECEPTORS, AND DETERMINATION OF APPLICABLE MCP STANDARDS

Due diligence assessment activities occurred along this railroad right of way at the time when the City was considering purchase of the property in 2005 (Appendix A). This information provides useful background on the land use, date of the end of railroad operations and environmental conditions prior to the proposed rail trail. The presence of PCBs was not identified above standards at that time.

Analytical data from a 2016 pre-construction characterization soil sampling event prompted additional soil sampling as an effort to understand preliminary boundaries of the impacted soil. Initially, data from soil samples was collected from 0-3 foot composite soil samples collected over a significant distance (at approximately centerline) along the CCRT path. The objective of the follow-up sampling event was to identify the presence of PCBs in the surficial soil, 0-12 inches, and to determine the vertical and lateral extent of the PCB impacted soil using discrete sampling techniques. These data will be discussed later in this document.

Due to the discovery of PCBs in the soil, there was consideration as to the applicability of the Toxic Substance Control Act (TSCA) as well as requirements of compliance with the MCP. The due diligence assessment conducted in 2005, discussed below, helps to clarify that impacted soil is most likely present due to former railroad operations and those railroad operations are documented to have ceased at the location circa 1972, which is prior to applicability of TSCA (1978). The planned response actions will include both MCP preliminary and comprehensive response actions and appropriate waste characterization and disposal in compliance with TSCA 761.61 remediation waste. Additional supporting data collected at the site is discussed below.

## 2.3 PHASE I ENVIRONMENTAL SITE ASSESSMENT 2005

A Phase I Environmental Site Assessment (ESA) of the 1.6 miles of railroad right of way was conducted in 2005 by TRC Solutions of Lowell, MA for the City. The purpose of the Phase I ESA was to identify recognized environmental conditions associated with the property prior to the purchase of the land by the City. The Phase I ESA identified two potential environmental issues: (1) soil and groundwater contamination from former railroad use, and (2) soil and groundwater contamination from reported releases at nearby properties.

TRC conducted a subsequent site investigation to evaluate the potential environmental issues identified in the Phase I ESA. Data from the site investigation was presented in an MCP Response Action Outcome (Class B-1 RAO), dated May 2006, which is provided in Appendix B. The site investigation included 10 soil borings (B-1 through B-10) and the installation of 5 monitoring wells (MW-1, MW-2, MW-4, MW-9, and MW-10).

TRC reported that soil samples were collected and analyzed for extractable petroleum hydrocarbons (EPH), Massachusetts Contingency Plan (MCP) metals, polychlorinated biphenyls (PCBs), and pesticides. One round of groundwater samples was collected from the five monitoring

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wells. Groundwater samples were analyzed for EPH and MCP Metals. Additionally, the groundwater sample collected from MW-10 was sampled for volatile organic compounds (VOCs) and cyanide, based on the presence of a former metals plating facility (i.e. the former Circle Finishing Site, RTNs 3-0392, 3-10321, and 3-24164) to the north of this portion of the right of way.

The site investigation identified concentrations of lead and several polycyclic aromatic hydrocarbon (PAH) compounds, including benzo(a)anthracene, chrysene, benzo(a)pyrene, and dibenzo(a,h)anthracene, above applicable MCP RCS-1 Reportable Concentrations in soil between 0 and 3 feet at boring B-2. In addition, arsenic was detected slightly above the RCS-1 Reportable Concentration of 20 mg/kg in several borings. Exceedances of the RCS-1 reportable criteria triggered a 120-day notification requirement under the MCP.

Because the City did not yet own the Site, results of the Site investigation were transmitted to the former B&M predecessor company. Following purchase of the Site on August 4, 2006, the City prepared and submitted a Release Notification Form to MassDEP on August 31, 2006. As a result, a Release Tracking Number (RTN) 3-26210 was assigned to the Site.

The results reported by TRC also included the detection of Nickel and cyanide in a groundwater sample collected from monitoring well MW-10 at concentrations of 777.1 ug/L and 167 ug/L, respectively. TRC reported that these concentrations exceed applicable MCP RCGW-2 criteria. In accordance with the MCP, 310 CMR 40.0317(16), which states that exceedances of reportable concentrations at disposal sites where a response action is being undertaken do not require additional notification. Monitoring well MW-10 is located within the boundaries of the Circle Finishing disposal site (RTNs 3-0392, 3-10321, and 3-24164), thus, notification to MassDEP of these concentrations was not considered necessary.

The Phase I ESA reported that, given the proximity of the Merrimack River and the Atlantic Ocean, groundwater flow direction is likely tidally influenced in the northern portion of the rail corridor. Based on topography, groundwater flow across northerly portions of the former railroad right of way is expected to be in a northerly direction towards the Merrimack River (TRC, 2005). Between Parker Street and High Street, groundwater is expected to flow southeasterly from the hill where the water tower is located. At the southern portion of this section of rail corridor, groundwater flow measured at the Circle Finishing Site is estimated to flow in a southeasterly direction (LFR, 2003).

### 2.4 PRECHARACTERIZATION SAMPLING 2016

Strategic Environmental Services (SES), working under an agreement with ET&L, who was hired by MassDOT to construct the CCRT, conducted test pit soil sampling on November 10, 2016. The objective of this sampling, according to SES, were to determine the contamination profile of soils, to determine reuse options and to determine suitable disposal facilities prior to excavation by ET&L. The pre-characterization would allow soil to be live-loaded for disposal, which is necessary due to the lack of stockpiling space within the project limits. Soil was initially characterized based on two composite samples: South-1, which was composed of soil sampled from Station 56+00 to Station 77+30, and North-1 which was composed of soil sampled from approximately Station 77+30 to Station 91+15. The sample locations that make up the North 1 composite and the South 1 composite samples are noted in the table below by station number.

Test pit sampling and analysis identified the presence of PCBs in soil in the South1 composite sample at a concentration of 3,500 ug/kg PCBs reported as Aroclor 1260. Additional sampling was for soil delineation data for the presence of PCBs within the area identified by the test pit samples that made up the South 1 composite sample. This area of additional sampling was within designated stations; Station 55 to Station 70. A summary of analytical results for the November 10, 2016 pre-construction characterization soil sampling is provided below. The Laboratory analytical report is provided in Appendix B.

#### 2.4.1 Composite samples collected on November 10, 2016 from the following Stations:

Analytical results from the November 10, 2016 sampling event identify exceedances of the applicable MCP soil category S-1 Method 1 Standards for the following composite soil samples.

South composite sample (South-1): the exceedances noted by Strategic are: Arsenic at 66.3 mg/Kg; Lead at 317 mg/kg; and PCBs (Aroclor 1260) at 3,500 ug/Kg as compared to the S-1 Standard of 20 mg/Kg Arsenic and guidance on historic fill of 20 mg/kg Arsenic; the S-1 Standard for Lead of 200 mg/Kg and the guidance on historic fill of 600 mg/Kg Lead; and the S-1 standard for PCBs of 1,000 ug/Kg.

North composite sample (North-1): the exceedances noted by Strategic are: Arsenic at 25.3 mg/Kg; Lead at 326 mg/kg; and benzo(a)pyrene at 2,200 ug/Kg as compared to the S-1 Standard of 20 mg/Kg Arsenic and guidance on historic fill of 20 mg/Kg; the S-1 Standard for Lead of 200 mg/kg and the guidance on historic fill of 600 mg/Kg Lead; and the S-1 Standard for benzo(a) pyrene of 2,000 ug/kg and guidance on historic fill guidance of 7,000 ug/Kg. An exceedance of PCBs was not reported for the North 1 composite sample.

It was determined that additional analysis was warranted based on the South 1 composite sample results of 3,500 ug/Kg PCBs and 66.3 mg/Kg Arsenic when compared to the MCP Method 1 PCBs in soil standard of S-1/GW-3 of 1 ug/g and Method 1 soil standard of S-3/GW-3 of 4 ug/g; and the Method 1 Arsenic in soil standard of S-1/GW-3 and S-2/GW-3 of 20 ug/g. The results above the Method 1 standard for Arsenic are shown in the table below in Bold.

Under current conditions, the appropriate MCP soil characterization is S-1/GW3, where-as the planned finished improvement of the path with a paved rail-trail will change the soil to a S-2/GW-3 category. As a future condition, these analytical results exceed only for Arsenic and PCBs. The presence of metals, including arsenic, are documented in the 2005 Phase I ESA and the 2006 Class B-1 Response Action Outcome, concluding that no further actions are needed until such time a soil management plan will be necessary for the excavation and disposal of soil conducted as part of the rail trail development. Based on the results above, it was determined that additional analysis was necessary to characterize soil prior to excavation.

Eleven discrete soil samples were collected from the South portion of the work area along the CCRT at the same time the South 1 composite sample was collected. These locations are

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identified as S-1 to S-11. Samples were submitted as a composite of soil depths at these eleven locations collected at a depth between zero and 36 inches. The results of PCB analysis identified Aroclor 1260 at concentrations above the method detection levels at 5 locations. The results of Arsenic analysis identified six of the eleven samples over the applicable standard of 20 ug/g. These locations and results are identified below. The analytical report for these sample locations is provided as Appendix B. Sampling points are shown on the Figure 4 series of drawings.

In the tables that follow, exceedances of the MCP Method 1 standard for PCBs in S-1/GW-3 soil of 1 ug/g soil are shown in **BOLD**; exceedances of the S-2/GW-3 standard for PCBs of 4 ug/g are shown in **BOLD Underline**; and exceedances of 50 mg/Kg requiring TSCA remediation waste disposal are shown in red text, and exceedance of the upper concentration limits (UCL) of the MCP of 100 ug/g is shown as a yellow box.

Table 1 – November 10, 2016 Sampling Results

South Sample ID	Station	Sample composite Depth (Inches)	PCB Detections (Aroclor 1260) ug/Kg	Arsenic Detections (mg/Kg)
S-1	57+00	0-36	ND	22.1
S-2	59+00	0-36	ND	17.2
S-3	61+00	0-36	1,380	16.3
S-4	63+00	0-36	<b><u>39,200</u></b>	16.4
S-5	65+00	0-36	1,430	36.3
S-6	67+00	0-36	371	31.9
S-7	68+30	0-36	ND	21.6
S-8	68+60	0-36	ND	14.7
S-9	69+00	0-36	139	31.7
S-10	72+00	0-36	ND	16.1
S-11	76+00	0-36	ND	24.0

Based on the results above for Arsenic, the concentrations in soil averaged over the 11 samples equals 22.6 mg/Kg which is only 13% above the MCP applicable standard of 20 mg/Kg. The

averaging of soil results is appropriate given the linear distance covered by the sampling, that the concentrations at each sample location is within the same order of magnitude; and that concentrations vary but in a close range to each other. One sample (S-5) is 44.9% higher than the standard, two samples (S-6 and S-9) are an average of 37.1% higher, and 3 samples (S-1, S-7, and S-11) are an average of 12.8 % higher than the standard. Conversely and similarly, there are five samples that are lower than the standard. Sample S-8 is the lowest concentration and 26.5 % lower than the standard. There are 4 samples (S-2, S-3, S-4 and S-10) that are an average of 16.9% lower than the standard. Eliminating the highest and the lowest concentrations, the average concentration is 23.6 mg/Kg which is only 18% above the standard. The results of the analysis of the individual grab samples indicated the presence of arsenic at concentrations ranging from 14.7 to 36.3 mg/kg, which represented a pattern more consistent with the prior data obtained. This suggests that the 66.3 mg/kg concentration obtained from the composite sample is considered an anomaly or outlier and not representative of the overall data set. Both slag material and coal ash have been identified both visually and via laboratory analysis, therefore, it is more likely that a fragment of slag or coal ash is present in the composite sample South 1 resulting in a biased high concentration. Given the low and consistent concentrations of Arsenic, which is determined to be attributable to historic industrial activities associated with the railroad at this site, the detections of metals to include Arsenic will not be carried through to risk characterization nor any planned remedial actions. The focus of the continuation of response actions at this site is on PCBs.

## 2.5 DISCRETE SOIL SAMPLING EVENT JANUARY 19, 2017

As a result of the detections reported by Strategic in December 2016, a follow-up work plan was prepared for sampling discrete soil at designated depth intervals at boring locations for further delineation of PCBs based on the previous detections. The work plan was implemented on January 19, 2017 and involved the Station locations listed below.

The locations of previous sampling, S-3, S-4, and S-5 (Stations 61+00, 63+00, and 65+00 respectively) were re-sampled first to determine the depth at which the PCBs were detected. Borings were advanced, at each of these locations (centerline samples) and then one boring each, approximately 5 feet to the East and West of the center boring at each of the three previous sampling locations (peripheral samples). A total of nine (9) soil borings were advanced at these locations. At each boring location, samples were collected from the following depth intervals: 0-1 foot, 1 to 3 foot, and 3 to 5 foot, for a total of twenty-seven (27) samples.

The results of the January 19, 2017 sampling and analysis event are identified in Table 2. The analytical report is provided in Appendix B. Sampling points are shown on the series of sheets that make up Figure 4.

Table 2 – January 19, 2016 Sampling Results

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Station	Sample Location East (E) Along River side of path, West (W) side of the path adjacent to the WWTP, Middle (M) mid-path of the CCRT; and 0 – Previous Test Pit Location	Sample composite Depth (Inches)	PCB Detections (Aroclor 1260) ug/Kg <sup>1</sup>
60+75 M-0	Middle (M) mid-path of the CCRT	0-12	538
61+00 E-0	Location East (E) Along River side of path	0-12	635
61+00 E-1	Location East (E) Along River side of path	12-24	281
61+00 E-3	Location East (E) Along River side of path	24-36	ND
61+00 M-0	Middle (M) mid-path of the CCRT	0-12	618
61+00 M-1	Middle (M) mid-path of the CCRT	12-24	104
61+00 M-3	Middle (M) mid-path of the CCRT	24-36	ND
61+00 W-0	West (W) side of the path adjacent to the WWTP	0-12	273
61+00 W-1	West (W) side of the path adjacent to the WWTP	12-24	402
61+00 W-3	West (W) side of the path adjacent to the WWTP	24-36	ND
61+00-0	Previous Test Pit Location	0-12	648
61+50 M-0	Middle (M) mid-path of the CCRT	0-12	2,300
62+50 M-0	Middle (M) mid-path of the CCRT	0-12	<u>10,300</u>
63+00-0	Previous Test Pit Location	0-12	<u>51,000</u>
63+00 E-0	Location East (E) Along River side of path	0-12	<u>5,910</u>
63+00 E-1	Location East (E) Along River side of path	12-24	343
63+00 E-3	Location East (E) Along River side of path	24-36	ND
63+00 M-0	Middle (M) mid-path of the CCRT	0-12	<u>115,000</u>
63+00 M-1	Middle (M) mid-path of the CCRT	12-24	3,490



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63+00 M-3	Middle (M) mid-path of the CCRT	24-36	ND
63+00 W-0	West (W) side of the path adjacent to the WWTP	0-12	<u>27,300</u>
63+00 W-1	West (W) side of the path adjacent to the WWTP	12-24	<u>5,240</u>
63+00 W-3	West (W) side of the path adjacent to the WWTP	24-36	ND
63+50 M-0	Middle (M) mid-path of the CCRT	0-12	<u>7,380</u>
64+50 M-0	Middle (M) mid-path of the CCRT	0-12	2,340
65+00 E-0	Location East (E) Along River side of path	0-12	<u>27,800</u>
65+00 E-1	Location East (E) Along River side of path	12-24	ND
65+00 E-3	Location East (E) Along River side of path	24-36	ND
65+00 M-0	Middle (M) mid-path of the CCRT	0-12	1,370
65+00 M-1	Middle (M) mid-path of the CCRT	12-24	1,820
65+00 M-3	Middle (M) mid-path of the CCRT	24-36	ND
65+00 W-0	West (W) side of the path adjacent to the WWTP	0-12	ND
65+00 W-1	West (W) side of the path adjacent to the WWTP	12-24	428
65+00 W-3	West (W) side of the path adjacent to the WWTP	24-36	1,200
65+00-0	Previous Test Pit Location	0-12	1,990
65+25 M-0	Middle (M) mid-path of the CCRT	0-12	3,030

<sup>1</sup> The MCP Method 1 standard for PCBs in S-1/GW-3 soil of 1 ug/g soil are shown in BOLD; exceedances of the S-2/GW-3 standard for PCBs of 4 ug/g are shown in BOLD Underline; and exceedances of 50 mg/Kg requiring TSCA remediation waste disposal are shown in red text, and exceedance of the upper concentration limits (UCL) of the MCP of 100 ug/g is shown as a yellow box.

## 2.6 JANUARY 31, 2017 ARCHIVED SAMPLE SET ANALYSIS

As a result of the detections reported by Strategic on January 25, 2017, MassDEP was notified of the elevated concentrations of PCBs above 10.0 ug/g in surficial soil. A follow-up set of samples collected on January 19, 2017, but archived pending results of the first set of samples shown in the table above, were analyzed for PCBs on January 31, 2017 (Appendix B). Sampling points are



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shown on the series of sheets that make up Figure 4. The objective was to identify PCB soil concentrations stepping away from or below the sample locations where the previous PCB data show elevated results.

Table 3 – January 31, 2017 Archived Sampling Results

Station	Sample Location East (E) Along River side of path, West (W) side of the path adjacent to the WWTP, Middle (M) mid-path of the CCRT; and 0 – Previous Test Pit Location	Sample composite Depth (Inches)	PCB Detections (Aroclor 1260) ug/Kg <sup>1</sup>
61+25 M-0	Middle (M) mid-path of the CCRT	0-12	3,620
61+50 E-0	Location East (E) Along River side of path	0-12	<u>4,070</u>
61+50 M-1	Middle (M) mid-path of the CCRT	12-24	299
61+50 W-0	West (W) side of the path adjacent to the WWTP	0-12	642
62+50 E-0	Location East (E) Along River side of path	0-12	<u>17,300</u>
62+50 M-1	Middle (M) mid-path of the CCRT	12-24	507
62+50 W-0	West (W) side of the path adjacent to the WWTP	0-12	<u>9,170</u>
62+75 M-0	Middle (M) mid-path of the CCRT	0-12	<u>24,200</u>
63+25 M-0	Middle (M) mid-path of the CCRT	0-12	<u>39,300</u>
63+50 E-0	Location East (E) Along River side of path	0-12	<u>9,710</u>
63+50 M-1	Middle (M) mid-path of the CCRT	12-24	3,530
63+50 W-0	West (W) side of the path adjacent to the WWTP	0-12	<u>23,300</u>
64+50 E-0	Location East (E) Along River side of path	0-12	960
64+50 M-1	Middle (M) mid-path of the CCRT	12-24	2,160
65+50 W-0	West (W) side of the path adjacent to the WWTP	0-12	901
65+25 E-0	Location East (E) Along River side of path	0-12	2,300

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65+25 W-0	West (W) side of the path adjacent to the WWTP	0-12	227
65+50 M-0	Middle (M) mid-path of the CCRT	0-12	866

<sup>1</sup> Units of ug/kg are used in this table to be consistent with laboratory reporting results. The MCP Method 1 standard for PCBs in S-1/GW-3 soil of 1 ug/g soil are shown in BOLD; exceedances of the S-2/GW-3 standard for PCBs of 4 ug/g are shown in **BOLD Underline**; and exceedances of 50 mg/Kg requiring TSCA remediation waste disposal are shown in red text, and exceedance of the upper concentration limits (UCL) of the MCP of 100 ug/g is shown as a yellow box.

## 2.7 ADDITIONAL ANALYSIS MARCH 8, 2017

Following review of the January 31, 2017 sample results, an additional evaluation was conducted to determine whether or not to have the final batch of samples archived at the laboratory since the January 19 and 20, 2017 sampling event, analyzed for PCBs. Based on the need to develop a better defined remediation area, the remaining samples in the laboratory were extracted on March 7, 2017 and analyzed on March 8, 2017 (Appendix B). Sampling points are shown on the series of sheets that make up Figure 4. This analysis was conducted 45 days from the date of sampling. Holding times for PCBs is estimated to be 1 year from the date of sampling.

Table 4 – March 8, 2017 Archived Sampling Results

Station	Sample Location East (E) Along River side of path, West (W) side of the path adjacent to the WWTP, Middle (M) mid-path of the CCRT; and 0 – Previous Test Pit Location	Sample composite Depth (Inches)	PCB Detections (Aroclor 1260) ug/Kg <sup>1</sup>
62+50 E-1	Location East (E) Along River side of path	12-24	ND
62+50 E-3	Location East (E) Along River side of path	24-36	ND
62+75 M-1	Middle (M) mid-path of the CCRT	12-24	<b><u>4,310</u></b>
63+75 M-3	Middle (M) mid-path of the CCRT	24-36	ND
63+50 W-1	West (W) side of the path adjacent to the WWTP	12-24	443
63+50 W-3	West (W) side of the path adjacent to the WWTP	24-36	ND
64+75 M-0	Middle (M) mid-path of the CCRT	0-12	375
65+75 M-1	Middle (M) mid-path of the CCRT	12-24	3,920

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65+75 M-3	Middle (M) mid-path of the CCRT	24-36	ND
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<sup>1</sup> Units of ug/kg are used in this table to be consistent with laboratory reporting results. The MCP Method 1 standard exceedances for PCBs in S-1/GW-3 soil of 1 ug/g soil are shown in **BOLD**; exceedances of the S-2/GW-3 standard for PCBs of 4 ug/g are shown in **BOLD Underline**; and exceedances of 50 mg/Kg requiring TSCA remediation waste disposal are shown in red text, and exceedance of the upper concentration limits (UCL) of the MCP of 100 ug/g is shown as a yellow box.

Based on the results of soil sampling and analysis described above in Section 2, soil delineation for PCBs was considered adequate at that point to plan the IRA to mitigate potential risk of harm and to move forward with the planned construction of the CCRT.

## 2.8 ADDITIONAL ANALYSIS MAY 4, 2017

Additional soil sampling was conducted on May 4, 2017 to fill in data gaps between Stations 61+00 and 64+00, to fill in data gaps between Stations 65+00 and 66+00, at two proposed bench locations at approximate Stations 61 and 67, and at two proposed sculpture locations off to the west side of the trail between Stations 60 and 61.

Table 5 – May 4, 2017 Additional Sampling Results

Station	Sample Location West (W) side of the path adjacent to the WWTP	Sample Depth (Inches)	PCB Detections (Aroclor 1260) ug/Kg <sup>1</sup>
SW-1	Sculpture West Location -off trail located near Station 60+50	0-12	325
		12-24	505 As Aroclor 1262
SW-2	Sculpture West Location – off trail located near Station 60+50	0-12	356
		12-24	ND
Seal	Sculpture west location North of SW-2 – off trail Located near Station 60+50	0-12	ND
		12-24	ND
B-1	Bench Cutout off trail located near Station 60+75	0-12	127
		12-24	155

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B-2	Bench Cutout off trail located near Station 61+25	0-12	423
		12-24	230
61+80 W	West (W) side of the path adjacent to the WWTP	0-12	1030
		12-24	923
62+30 W	West (W) side of the path adjacent to the WWTP	0-12	370
		12-24	516
62+80 W	West (W) side of the path adjacent to the WWTP	0-12	<u>23900</u>
63+30 W	West (W) side of the path adjacent to the WWTP	0-12	ND
		12-24	<u>9430</u>
63+90 W	West (W) side of the path adjacent to the WWTP	0-12	2110
		12-24	1140
65+10 W	West (W) side of the path adjacent to the WWTP	0-12	1190
66+05 W	West (W) side of the path adjacent to the WWTP	0-12	548
		12-24	526
B-3	Bench Cutout off trail located near Station 66+50	0-12	64.1
		12-24	59.1
B-4	Bench Cutout off trail located near Station 66+50	0-12	ND
		12-24	19.9

<sup>1</sup> Units of ug/kg are used in this table to be consistent with laboratory reporting results. The MCP Method 1 standard for PCBs in S-1/GW-3 soil of 1 ug/g soil are shown in BOLD; exceedances of the S-2/GW-3 standard for PCBs of 4 ug/g are shown in **BOLD Underline**; and exceedances of 50 mg/Kg requiring TSCA remediation waste disposal are shown in red text, and exceedance of the upper concentration limits (UCL) of the MCP of 100 ug/g is shown as a yellow box.

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### 3.0 DESCRIPTION OF THE REMEDIATION WASTE AREA

For the purpose of evaluating remedial action alternatives, consideration was given to current and future land use conditions and the TSCA rules under 40 CFR 761(a) and (c); 761(a) being the section on *Self-Implementing on-site cleanup and disposal of PCB remediation waste*, and 761(c) being the section on *Risk-based disposal approval*. For the purpose of this Analysis, TSCA 761.61(a) is being applied to this Site at this time subject to re-evaluation when additional data results are available. The requirements of the MCP are also considered in addressing this remediation waste area.

The remediation waste area associated with the PCB impacts is identified as the former railroad right of way and is located behind 157 Water Street Municipal Wastewater Treatment Plant and neighboring structures. To the west, there is land associated with the right of way that varies in width due to a fenceline and other physical boundaries. To the east, there is land associated with the right of way that varies in width due to rip-rap along the shoreline of the Merrimack River. The remediation area, based on sampling, is identified within the approximate 600-linear foot Disposal Site between stations 61+00 and 65+75, or approximately 475 linear feet. This dimension is subject to change based on additional sampling data, other site features, and observation of field conditions.

Two underground electric utilities run adjacent to and along the right of way. One utility is a direct-buried set of cables, located an average 4 to 5 feet below grade, running beyond the length of the remediation area. The second utility is a concrete encased electrical duct bank, also running adjacent to and along the right of way for a distance beyond the limits of the remediation area. The electrical duct bank is known to be buried approximately 3 feet below grade. Each utility has a restriction issued by the utility company, National Grid, notifying to not dig within 3 feet of the direct buried cables and not to uncover the electrical duct bank. This poses a safety restriction on the remedial actions being evaluated for this site.

The extent of PCBs in soil requiring consideration in remedial actions has been generally characterized as soil to a depth of 48 inches from existing grade along the path. The exception is the areas restricted by National Grid. There are soils along this path that are considered undisturbed from the time that the railroad abandoned the line. There are soils that are considered disturbed as the result of the 2003 installation of the electrical duct bank by, at that time, Massachusetts Electric, now National Grid. The area of the direct buried cables is considered undisturbed since the cables have been in place since the 1930's.

Future land use of this area is expected to be a recreational walking and bike path. There will also be two to three benches that will overlook the water. An interactive sculpture is planned for an area just west of the path. With the exception of the interactive sculpture area, other accessible

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areas of the path will be paved. The surfacing for the interactive sculpture area will likely be wood fiber safety surface to reduce the potential for injury as a result of falls.

### 3.1 IDENTIFICATION OF REMEDIAL ACTION ALTERNATIVES

Four remedial action alternatives (RAA) have been identified as feasible for this remedial waste area. The identification of these RAA is based on future land use, access, future liability and obligations, implementation and constructability, and comparison of remedial action costs. A cost outline and supporting spreadsheet is attached as Appendix C

In the initial screening of remedial action alternatives for this site, the remediation technologies of on-site thermal desorption, soil processing for de-chlorination, and in-situ biological and chemical treatment of soil were not carried through the analysis due to the limited area for the work to be conducted, nearby residential properties, costs of the technologies for ex-situ treatment following excavation and the questionable reliability and completeness of in-situ treatment alternatives for PCBs. Therefore, the evaluation criteria of Reduction of Toxicity, Mobility or Volume Through Treatment, will not be evaluated, since treatment options are not considered feasible. The RAAs discussed below include actions that have high probability of approval with the regulatory agencies as well as contrasting, but feasible actions with low probability of agency approval.

#### 3.1.1 RAA#1 Cover and No Excavation

Under this RAA, the soil would be left in place and covered by a minimum of 3 inches of asphalt. The grade would remain essentially the same with minimal soil leveling so there would be no side slope work other than loam and seed along the edges of pavement. The sculpture areas would be surfaced with a wood fiber safety surface.

##### Overall Protection to Human Health and the Environment

This alternative is considered to be effective in protecting the public from direct contact with soil as long as there is no significant deterioration with the pavement. Deterioration such as wash-out areas, cracks, pot holes, and exposure due to pavement repair work are possible over time. This alternative is also protective of the environment as long as soils are not disturbed or washed away into an area that is environmentally sensitive or where the public can be exposed to the washed-out soil.

A deed restriction (Activity and Use Limitation – AUL) pursuant to the MCP would be required to notify the public that a hazard exists in the soils below the cover if those soils were to be exposed to the surface.

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### Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Applicable regulations include the Toxic Substance Control Act 40 CFR 761, and the Massachusetts Contingency Plan (MCP). Compliance with TSCA and the MCP would be determined by the regulatory agencies of USEPA and the Massachusetts Department of Environmental Protection (MassDEP) who would provide a determination of the completeness of compliance to the respective regulations. For this RAA, it is assumed that each agency would have significant comments regarding the adequacy of the rail trail cover design and whether or not a condition of no significant risk can be achieved with this remedy. TSCA compliance would require interaction with USEPA, which is expected to raise questions regarding this remedy in meeting the requirements of TSCA. This RAA, may have a low probability of agency acceptance.

### Long Term Effectiveness and Performance

The long-term effectiveness of this alternative is dependent on inspections and repairs needed, undertaken and the frequency of occurrence. Major storm events, sea level rise and other natural changes could stress the paved area into failure. Failures would, in most scenarios, not be catastrophic but would rather require soil replacement and repaving. A deed restriction (AUL) would be required that obligates the property owner(s) to a schedule of inspections, repairs and long term liability, as the paved cover over soil would be required in perpetuity or as long as the PCBs are present in concentration above 1 mg/kg, whichever comes first.

### Short Term Effectiveness

This remedial action alternative has short-term benefits in that the work would be relatively simple to design and implement and would require minimal leveling and the application of pavement. Once installed, the paved surface would act as a barrier to direct contact hazard and/or to minimize the potential for soil disturbance that could relocate PCBs. This action would not reduce toxicity, concentrations or the presence of PCBs below the pavement along this section of the path.

### Implementability

This remedial action is highly implementable involving limited construction and disturbance of soil. There would likely be only limited potential for fugitive dust during construction as compared to extensive excavation of impacted soil. Paving this area would not be hindered by the presence of PCBs in soil.

### Cost

The cost of this remedial action is lowest of all technically feasible RAA. The material and installation cost of asphalt binder and top courses are currently included in the rail trail project. Installation and material cost may be expanded by 10-20% if the pavement is extended further on either side of the railroad right of way. Paving cannot be conducted between December 1 and March 30 due to seasonal shut-down of the asphalt plants.





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The estimated cost of this RAA is: \$66,400 with estimated costs of \$105,000 for inspections and maintenance for 30 years.

#### State Agency Acceptance

Neither the USEPA or the MassDEP are expected to approve this RAA without some soil excavation, limited to removal of "hot spots" of equal to or greater than 50 mg/kg PCBs in soil, or removal of soil impacted with greater than 1 mg/kg of PCBs. TSCA and MCP compliance is not considered complete with the implementation this RAA – as is.

#### Community Acceptance

The public may raise concerns regarding the remaining presence of PCBs in soil at elevated concentrations beneath a public recreation trail. The City municipal officers that are currently involved must be comfortable with the alternative as being protective of human health and the environment. The public may question why the implementation of this RAA is protective if the RAA does not meet the requirements of TSCA and the MCP. Such questions would require support from the regulatory agencies to answer, however that support may not be given for this particular remedy.

### 3.1.2 RAA#2 Excavate Soil as TSCA Remediation Waste

Under this RAA, the soil would be excavated to the limits of PCB detection regardless of the concentrations of PCBs in place. This approach would comply with TSCA 40 CFR 761.61(a) with the determination by USEPA that, due to disturbance of soil from past operations, the concentrations of soil have been mixed, moved, and diluted due to the past soil disturbance activities. The result is that all soil with PCBs concentrations is now subject to TSCA remediation. The TSCA RAA under this scenario is excavation, therefore all soil with PCB concentrations would be excavated and disposed of off-site to a licensed TSCA disposal facility. Acceptance by that facility for landfilling would be subject to waste profile approval and facility-State approval. The volume and frequency of shipments will be determined by the accepting disposal facility. Soil would be landfilled in an out of State TSCA/RCRA approved landfill cell. The estimated amount of soil to be removed under this RAA is 1200 tons.

#### Overall Protection to Human Health and the Environment

This alternative is considered to be effective in protecting the public from direct contact with soil as the contaminated soil will be removed. Remediation will also include confirmation sampling following excavation to demonstrate that excavation was successful in removing the potential risk to human health and the environment.

#### Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

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Applicable regulations include the Toxic Substance Control Act 40 CFR 761, and the Massachusetts Contingency Plan (MCP). Compliance with TSCA and the MCP would be determined based on USEPA approval of the TSCA remediation Plan and the Massachusetts **Licensed Site Professional's opinion regarding compliance with the MCP**. For this RAA, it is assumed that each agency would have review comments regarding the extent of excavation, conditions for implementation and confirmation sampling for closure. This RAA, may have a high probability of agency acceptance.

#### Long Term Effectiveness and Performance

The long-term effectiveness of this alternative is ensured by the removal of the contaminated soil. No weather effects or new uses of the land will compromise the RAA once completed. Major storm events, sea level rise and other natural changes would not cause an increase exposure risk under this RAA as the source of the potential risk has been removed and not subject to the stress of severe weather conditions. Implementation of this remedy would be scheduled around major weather events and periods such as hurricane and heavy snowfall seasons. There will be no need for institutional controls such as a deed restriction.

#### Short Term Effectiveness

This remedial action alternative has short-term benefits in that the work would involve the complete removal of PCBs in soil to a standard of 1 mg/kg or less. The excavation can be accomplished within a reasonable time and duration. There would be no need to return to the site years later for a more aggressive remediation.

#### Implementability

This remedial action is implementable with restrictions and limitations involving construction and disturbance of soil. There would likely be a potential for fugitive dust during construction which would need to be monitored and potential risks mitigated as necessary. The excavation would be backfilled and compacted for future construction of the rail trail. Since there is limited space in the area, stockpiling of excavated soils pending loading and shipping to the off-site disposal facility would be complicated and not feasible. Live loading, therefore, would be needed which presents logistical issues associated with space to work, decontamination of vehicles, truck or roll-off holding areas, and truck traffic issues. These issues would need to be solved well in advance of the excavation.

As noted above, there are two underground electric services adjacent to and beneath the former railroad right of way; one is a set of direct buried electric cables at an average depth of 5 feet below existing grades; and the other is a concrete encased electrical duct bank buried approximately 3 feet below existing grade. The existence of these utilities pose a public safety concern and have excavation restrictions near them. Soil that is immediately adjacent to these utilities could not be removed. These soils will remain place and therefore cause a conflict with gaining approval of a total removal RAA scenario. The alternative is to remove the utility to access

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the soils in the restricted area. This option is feasible, but disruptive to the utility and would come with a high cost.

It is unclear at this point if the utility company would agree to self-perform the excavation of soil immediately adjacent to these utilities.

The remediation plan would require USEPA approval and MassDEP review. The timing for this agency approval could be significant.

#### Cost

The cost of this remedial action is highest of all reasonable RAAs. Transportation and disposal of PCBs soil at a TSCA permitted landfill is estimated \$308.00 to \$330.00 per ton. The approximate volume of soils to be excavated could exceed 1,200 tons. Experience has shown that there is typically over excavation, and possibly additional excavation needed after the initial excavation due to a discovered impacted area not seen in the pre-excavation sampling data. This raises the cost significantly to remobilize. Excavation is complicated by decontamination protocols required for TSCA work especially given the limited space available. This is another reason for costs to escalate. Fugitive dust monitoring has the potential to slow the excavation due to dust excursions.

Remediation near the underground utilities is a significant cost if those utilities are required to be removed and relocated.

The estimated cost of this RAA is: \$440,000

#### State Agency Acceptance

Neither the USEPA or the MassDEP would object to this RAA. As mentioned above, TSCA and MCP compliance would be complete with this RAA which would prompt agency acceptance of this RAA.

#### Community Acceptance

The public may raise concerns regarding PCB soil dust as well as truck traffic through this very congested part of the City. The City municipal officers that are currently involved must be comfortable with the alternative as not becoming a public safety issue due to dust emissions or traffic and noise concerns. The public should not question that the implementation of this RAA is protective if the RAA meets the requirements of TSCA and the MCP. The public may ask questions regarding the implementation, schedule and confirmation that the work was successful.

### 3.1.3 RAA#3 Targeted Excavation and Capping

Under this RAA, the soil would be left in place and covered by a regulatory compliant cover or "cap". Targeted excavation to a depth of approximately 2 to 2.5 feet below current grade is necessary to remove PCB in soil. This depth of excavation will likely achieve cleanup of generally

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25 mg/kg or less based on current data. Excavation will be conducted based on pre-excavation sampling data within the area of concern. The data will assist in the preparation of the TSCA Remediation Plan. The cap will involve, at a minimum, 2 feet of clean fill compacted for future paving of the rail trail. Variations of the cap could include increasing the thickness of the rail trail pavement, or increasing the thickness of clean fill, a synthetic liner with clean fill and pavement, or other subtle variations of these options as long as the cap is compliant with TSCA. The ground at the sculpture area would be surfaced with a wood fiber safety surface.

#### Overall Protection to Human Health and the Environment

This alternative is considered to be effective in protecting the public from direct contact with soil as long as there is no significant deterioration or damage to the cap. Deterioration such as wash-out, cracking, pot holes, and exposure due to repair work are less likely due to the engineered design of the cap which would protect against such occurrences under reasonable weather scenarios and maintenance. This alternative is protective of the environment around this area as long as the cap is not disturbed or compromised, and that the pavement is maintained.

Targeted excavation of elevated concentration of PCBs above 25 mg/kg will remove the more significant hazards associated with the site leaving behind low concentrations of PCBs in soil that are unlikely to be accessible due to the engineered cap. Dust monitoring during the targeted excavation would be necessary to demonstrate that public safety is not at risk and that exceedances are immediately mitigated.

A deed restriction would be required to notify the public that a hazard exists in the soils below the cap, if those soils were to be excavated to the surface.

#### Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Applicable regulations include the Toxic Substance Control Act 40 CFR 761, and the Massachusetts Contingency Plan (MCP). Compliance with TSCA and the MCP would be determined by the regulatory agencies of USEPA and the Massachusetts Department of Environmental Protection (MassDEP) who would provide a review of the plan of compliance with the respective regulations. TSCA compliance would require interaction with USEPA, which is expected to raise minimal questions regarding this remedy in meeting the requirements of TSCA. This RAA, may have a moderate probability of agency acceptance.

#### Long Term Effectiveness and Performance

The long-term effectiveness of this alternative is dependent on inspections and repairs. Major storm events, sea level rise and other natural changes could stress the capped area, however, that would be addressed in the engineered design. Failures would, in most scenarios, not be catastrophic but would rather require pavement repair of the trail surface. Major storm events, sea level rise and other natural changes could stress the paved area into failure. Capping design would meet the requirements of TSCA and as well as the MCP to withstand weather related

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stresses. This RAA would require periodic and post weather vent inspection to gauge damage or potential deterioration of the cap. A deed restriction would be required that obligates the property owner(s) to a schedule of inspections, repairs and long term liability, as the cap over soil would be required for perpetuity or as long as the PCBs are present in concentration above 1 mg/kg, whichever comes first.

#### Short Term Effectiveness

This remedial action alternative has short-term benefits in that the work would be engineered and implement to specifications. Once in place, the cap and paved surface are an engineered barrier to direct contact hazard and/or minimize the potential for soil disturbance that could relocate PCBs. This action would not reduce toxicity, concentrations or the presence of PCBs below 25 mg/kg below the cap.

#### Implementability

This remedial action is marginally implementable and involve engineering design, specification development, construction, **construction oversight and preparation of "As Built" plans**. There would be the potential for fugitive dust during construction. Capping would cause grade changes which then would involve storm water conveyance controls. Cap construction should not be conducted when soil is frozen.

As noted above there are underground electric services adjacent to and beneath the former railroad right of way; one is a set of direct buried cables at an average depth of 5 feet below existing grades; and the other is a concrete encased electrical duct bank buried approximately 3 feet below existing grade. The existence of these utilities pose public safety issues concerns and therefore, present excavation restrictions. This causes excavation next to and above or below the cables to be not feasible due to safety concerns.

Additionally, these utilities cause an issue if the area is to be capped. Should the utility company need to access these utilities for repair or replacement, the cap would be compromised requiring a new or repair design, specifications, and implementation to restore the cap. It is unclear at this point if the utility company would agree to the excavation, cap and AUL of which they would be a signatory party to.

In planning of utility work, a soils management plan and health & safety plan would be required, the work would need to have the oversight of an LSP and the approval from USEPA and possibly MassDEP.

#### Cost

The cost of this remedial action is moderate to high as compared to the reasonable RAAs. The costs include engineering design plan development and interactions with USEPA until a plan is



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approved. Public involvement may be significant and time consuming. Material import and construction would have a higher cost than just paving as in RAA#1.

Experience has shown that there is typically over excavation and possibly additional excavation needed after the initial excavation due to a discovered impacted area not seen in the pre-excavation sampling data. This raises the cost significantly to remobilize. Excavation is complicated by decontamination protocols required for TSCA work especially given the limited space available. This is another reason that costs could escalate. Fugitive dust monitoring has the potential to slow the excavation due to dust excursions. The volume of soil to be excavated is estimated at approximately 200 tons of soil.

Remediation near the underground utilities is a significant cost if those utilities are required to be removed and relocated. Additionally, the cost would be significant to design repairs to the engineered cap should the cap be compromised for utility access and repair.

The estimated cost of this RAA is: \$264,400

#### State Agency Acceptance

USEPA and the MassDEP are expected to approve this RAA with comments and likely with conditions. TSCA and MCP compliance is complete with this RAA but would require an agency approved notice of activity and use limitation (AUL) for the cap area.

#### Community Acceptance

The public may raise concerns regarding the remaining PCBs in the soil at concentrations above 1 mg/kg beneath a public recreational walking trail. The City municipal officers are currently involved and must be comfortable with the alternative as being protective of human health and the environment and be ready to fulfil the obligations of the AUL. The public may question why the implementation of this RAA is protective if the RAA does not completely remove the PCBs. Such questions would require support from the regulatory agencies to answer.

### 3.1.4 RAA#4 Target Excavation of Soils, Cap Utility Conveyance Areas

This RAA involves the removal of soil to a cleanup goal of PCBs of 1 mg/kg in the accessible areas of the former railroad right of way. Areas within the right of way that are not accessible to the excavation include the area near the direct buried electric cables at a depth of 5 feet with a **recommended safety "do not approach"** zone of 36 inches around these cables; and the concrete encased electrical duct bank along the right of way. Excavation of soil around the duct bank is allowed as long as the duct bank is not destabilized or exhumed. This scenario suggests that excavation of soil could expose the top of the duct bank and as much as 50% of the duct bank side walls utilizing specialized equipment to remove soil.

Under this RAA, the soil not accessible to excavation due to the restrictions on and around the immediate area of these utilities, would be left in place and covered by a regulatory compliant

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cover or "cap" over the direct buried cables and concrete encased electrical duct bank. Excavation in the unrestricted portion of the former railroad right of way is feasible to a depth of approximately 48 inches below current grade to remove PCB concentrations in soil above 1 mg/kg. Excavation would be conducted based on pre-excavation sampling data within the area of concern. The data will assist in the preparation of the TSCA Remediation Plan for USEPA approval and MassDEP review. Excavated soil from the top and sides of the duct bank will be disposed of offsite as a TSCA waste regardless of the concentration of PCBs. This is due to the argument that the soils in this specific utility corridor were disturbed by utility actions to install the duct bank. Soil excavated from the unrestricted areas of the former railroad right of way will be disposed of as a non-TSCA waste, provided the sampling data support the concentrations of PCBs is below 50 mg/kg. Soil found to contain PCBs at or above a concentration of 50 mg/kg will be disposed of offsite as TSCA remediation waste. Above the utilities, the cap will involve, at a minimum, 2 feet of clean fill compacted for paving of the rail trail. Variations of the cap could include increasing the thickness of the rail trail pavement along with clean fill, a synthetic liner with clean fill and pavement, or other subtle variations of this as long as the cap is regulatory compliant with TSCA. The ground at the sculpture area would be surfaced with wood fiber safety surface.

#### Overall Protection to Human Health and the Environment

This alternative is considered to be effective in protecting the public from direct contact with soil remaining that has elevated concentrations of PCBs and is inaccessible due to the presence of the utilities as long as there is no significant deterioration or damage to the cap. Since the cap would be constructed at a depth of 36 inches or more above the direct buried cables, the cap is not vulnerable to weather conditions impacting the surface of the rail trail. The cap over the duct bank would be constructed on the top surface of the duct bank following excavation of soil in those locations. The cap surface would have a minimum of 12 inches below the current grade. Therefore, damage to the cap from weather events is unlikely. This alternative is protective of the environment around this area as long as the cap is not disturbed or compromised and impacted soil is not allowed to be dispersed on the surface of the right of way.

Excavation of targeted elevated concentration of PCBs above 1 mg/kg will remove the hazards associated with the unrestricted soil leaving behind low concentrations of PCBs in soil, less than 1 ppm which is below the applicable standards under the MCP. Therefore, no cap or restrictions would be needed. These remaining soils are unlikely to cause a condition of significant risk even if they became accessible. Dust monitoring during the targeted excavation would be necessary to demonstrate that public safety is not at risk and that exceedances are immediately mitigated.

A deed restriction (AUL) would be required to notify the public that a hazard exists in the soils below the cap if those soils were to be excavated to the surface.

#### Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Applicable regulations include the Toxic Substance Control Act 40 CFR 761, and the Massachusetts Contingency Plan (MCP). Compliance with TSCA and the MCP would be



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determined by the regulatory agencies of USEPA and the Massachusetts Department of Environmental Protection (MassDEP) who would provide a review of the plan for compliance to the respective regulations. TSCA compliance would require interactions with USEPA, which is expected to raise minimal questions regarding this remedy in meeting the requirements of TSCA. This RAA, may have a moderate probability of agency acceptance.

#### Long Term Effectiveness and Performance

The long-term effectiveness of this alternative is dependent on inspections and repairs. Major storm events, sea level rise and other natural changes are unlikely to stress the capped area. Failures would, in most scenarios, not be catastrophic but would rather require repair. Major storm events, sea level rise and other natural changes could stress the paved area into failure. Capping design would meet the requirements of TSCA and as well as the MCP to withstand weather related stresses. This RAA would require periodic and post weather vent inspection to gauge damage or potential deterioration of the cap. Those inspections would likely involve both City and the Utility company owning the utility and maintaining lines. A deed restriction would be required that obligates the property owner(s) to a schedule of inspections, repairs and long term liability, as the cap would be required in perpetuity or as long as the PCBs are present in concentration above 1 mg/kg, whichever comes first.

#### Short Term Effectiveness

This remedial action alternative has short-term benefits in that the work would be engineered and implemented to specifications. The cap and paved surface are the installation of an engineered barrier to direct contact hazard and/or minimize the potential for soil disturbance that could relocate PCBs. This action would reduce toxicity of a significant portion of the impacted soil area through excavation of the unrestricted areas.

#### Implementability

This remedial action is highly implementable involving engineering design, specification **development, construction, construction oversight and preparation of "As Built" plans.** Capping in this scenario is unlikely to cause grade changes and storm water conveyance controls are not anticipated. Cap construction should not be conducted when soil is frozen.

This RAA addresses the presence of the electrical duct bank however, utility company review and approval the excavation procedure would be anticipated.

As noted above, there is a set of direct buried electric cables at an average depth of 5 feet below existing grades; these cables pose public safety concerns and have excavation restrictions on them. Excavation near the direct bury electric cables not feasible due to safety concerns.

Additionally, these utilities cause an issue if the area is to be capped. Should the utility company need to access these utilities for repair or replacement, the cap would be compromised requiring a new and repair design, specifications, and implementation to restore the cap. It is unclear at



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this point if the utility company would agree to the excavation, cap and AUL of which they would be a signatory party to. The timing on this approval is at the stage when the RAA are identified and confirmed, but prior to regulatory agency involvement and public comment. In planning of utility work, a soils management plan and health & safety plan would be required, the work would need to have the oversight of an LSP and the approval from USEPA and possibly MassDEP. This work is less intrusive than the restoration work that would be needed if the entire right of way were capped.

#### Cost

The cost of this remedial action is moderate of all reasonable RAAs. The costs include engineering design, plan development and interactions with USEPA until a plan is approved. Public involvement may be significant and time consuming. The cost of additional material import and construction would be limited to materials needed for the cap near the electrical duct bank.

Experience has shown that there is typically over excavation, and possibly additional excavation needed after the initial excavation due to a discovered impacted area not seen in the pre-excavation sampling data. The volume of soil to be excavated is estimated at approximately 520 tons of soil. Since the excavation areas will achieve a reduction in PCB concentrations to 1 mg/kg, with minimal remobilization costs. Excavation is complicated by decontamination protocols required for TSCA work, especially given the limited space available to work. This another reason costs could escalate. Fugitive dust monitoring has the potential to slow the excavation due to dust excursions.

Remediation near the underground utilities is a significant cost if those utilities are required to be removed and relocated. Additionally, the cost would be significant to design repairs to the engineered cap if the cap is compromised by utility access for repairs.

The estimated cost of this RAA is: \$213,900

#### State Agency Acceptance

USEPA or the MassDEP are expected to approve this RAA with comments and likely with conditions. TSCA and MCP compliance is complete with this RAA but would require agency approved notice of activity and use limitation (AUL) for the cap area.

#### Community Acceptance

The public may raise concerns regarding the remaining presence of PCBs in the soil at concentrations above 1 mg/kg beneath or adjacent to the buried utility conveyances but should recognize the safety issues associated with excavating near the electric services. The City municipal officers that are currently involved must be comfortable with the alternative as being protective of human health and the environment and be ready to fulfil the obligations of the AUL. The public may question why the implementation of this RAA is protective if the RAA does not

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completely remove the PCBs. Such questions would require support from the regulatory agencies to answer.

### 3.1.5 RAA#5 No Action Alternative

#### Overall Protection to Human Health and the Environment

This alternative is considered to be less than effective in protecting the public from direct contact and would require continued isolation of the subject area and would require maintaining the condition of Immediate Response Actions (IRA) under the Massachusetts Contingency Plan. There IRA conditions are not allowed by the State to continue indefinitely and therefore require timely action. A no action alternative is contrary to those regulations.

#### Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Applicable regulations include the Toxic Substance Control Act 40 CFR 761, and the Massachusetts Contingency Plan (MCP). Compliance with TSCA and the MCP would be determined by the regulatory agencies of USEPA and the Massachusetts Department of Environmental Protection (MassDEP) who would provide a determination of the completeness of compliance to the respective regulations. For this RAA, it is assumed that each agency would have significant comments regarding the adequacy of no action and possibly determine that such an alternative if implemented could be a violation.

#### Long Term Effectiveness and Performance

The long-term effectiveness of this alternative is dependent on inspections and repairs needed, undertaken and the frequency of occurrence to isolate the area. Major storm events, sea level rise and other natural changes could stress the unpaved area into failure requiring soil disturbance and soil management to repair weather related damage. Failures would, in most scenarios, not be catastrophic but would rather require soil replacement.

#### Short Term Effectiveness

This remedial action alternative has no short-term benefits in that the work would be limited to maintenance of the isolation barrier already in place.

#### Implementability

This remedial action is highly implementable involving limited effort and no disturbance of soil.

Cost

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The cost of this remedial action is lowest of all technically feasible RAAs. The material and maintenance costs would be minimally and at the most require annual maintenance provided there were no vandalism issues.

The estimated cost of this RAA is near zero dollars.

#### State Agency Acceptance

Neither the USEPA or the MassDEP are expected to approve this RAA without some soil excavation, **limited to removal of "hot spots" of equal to or greater than 50 mg/kg PCBs in soil, or removal of soil impacted with greater than 1 mg/kg of PCBs.** TSCA and MCP compliance is not considered complete with the implementation this RAA – as is.

#### Community Acceptance

The public may raise concerns regarding the presence of PCBs in soil at elevated concentrations being left beneath a public recreation trail. The City municipal officers that are currently involved would likely not be comfortable with this alternative as being protective of human health and the environment. The public may question why the implementation of remedial actions is not being undertaken especially when this no action alternative is not meet the requirements of TSCA and the MCP. Such questions would require support from the regulatory agencies to answer, however that support may not be given for this particular remedy.

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## 4.0 SELECTED REMEDIAL ACTION ALTERNATIVE

The above excavation and capping alternatives provide a direct comparison of the engineering accessibility and remedial action costs to remediate PCB contaminated soil. Each RAA has its unique set of challenges and compliance issues all of which affect implementability and costs. Based on the above review of the feasible RAA options, the RAA #4: Target Excavation of Soils, Cap Utility Conveyance Areas is selected for this site. This RAA demonstrates the complexity of installing a protective cap over the utility conveyances can be designed into the plan. The excavation of soil in accessible unrestricted areas will be completed to a cleanup goal of 1 mg/kg of PCBs in soil and is considered to be protective to human health and the environment. The Design of the RAA will meet the intent of the applicable regulations and achieve compliance with those regulations. The RAA plan will require agency approval. An AUL will be required for only the capped areas.

### 4.1 GREEN REMEDIATION

As a general rule, the implementation of remedial action for this site will be consistent with continuing efforts to practice: “green” principals and best management practices of the parties involved in implementing the remedial actions. The specifications for the work will encourage contractors to utilize best management practices and to power their equipment with green fuel to the extent possible and economically feasible. As a side note, the author of most of the plans to-date, (Stantec Environmental Services Inc.) is an ISO certified firm and has a position of verifier with the Greenhouse Gas Registry. Stantec’s architectural practice has many staff working on sustainable design green buildings, and who are who are LEED certified, to include the Stantec project manager for the landscape architectural design of this project who is a LEED Accredited Professional, U.S. Green Building Council.

#### Land Use

Future use and redevelopment of the property as a rail trail has certain physical design and boundaries of the trail layout that helps guide the type of sampling and remediation required; ensure that sampling and remedial actions are the most efficient and sustainable methods available. As an example, the last round of sampling was conducted via hand boring instead of mechanical. Moving forward, there will be additional hand borings where reasonably practical, as well as mechanical. Additionally, the design of the rail trail has eliminated most infrastructure features eventually making the trail easy to maintain. The remediation selected for this site is equally simplified to ease in future maintenance.

#### Reporting and Communication

- All interim and final documents have been and will continue to be submitted in digital rather than hardcopy format, with the exception of a hard copy and electronic comply (CD) as required by EPA. All internal copies have been distributed for comment electronically, using the Microsoft Word feature of red-line, strike out for editing. All modifications and draft will continue to be distributed electronically.



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#### GENERAL ON-SITE OPERATIONS

No on-site structures exist and no construction trailers will be used during the remedial action implementation. Space within the nearby City of Newburyport Wastewater Treatment Plan may be utilized to hold project meetings. To this point, meetings being held in a MassDOT field office in Newburyport.

There will be few opportunities to minimize non-renewable energy consumption. However, vehicle fueling will be accomplished on site from an outside vendor who will be encouraged to:

- Use energy efficient equipment;
- Purchase renewable energy supply through local utility programs;
- Purchase Renewable Energy Credits/Certificates (RECs or Green Tags);
- Research potential for Green Pricing Programs and Power Purchase agreements; and
- new or well-maintained equipment.

#### Use environmentally preferable products

Surfacing design will call for the use of natural or recycled materials for various surfaces of the finished trail. Vegetation will be naturally enhanced with seeding and clearing of dead vegetation to promote new growth.

#### Encourage sustainable and environmentally responsible practices

##### Minimize waste

- Reuse or recycling of solid waste will be conducted to the extent feasible given that the work involves contact with contaminated waste. However, recycling receptacles in the clean zone will allow collection of recyclable materials not in contact with the contaminants;
- Protection of surface water will be accomplished by installing and maintaining erosion control systems prior to and during the implementation of the remedial actions. Water conservation will be encouraged as the Contractor uses minimal water mist for dust suppression;
- The remediation contractor will be encouraged to use alternative fuel vehicles such as ultra-low sulfur diesel;
- The remediation contractor is encouraged to have staff carpool to the site;
- The schedule of activities will be established to efficiently minimize travel to and from the site at the hours of least traffic on the roads, as practical; and
- Ecological revitalization will be incorporated with restoration of the site following remediation. This is accomplished by enhancing indigenous vegetation growth, no introduction of evasive species of plants, and grounds maintenance to keep the locations accessible and attractive for the rail trail uses who enjoy the natural setting.

#### FIELD INVESTIGATIONS/REMEDIATION plans will encourage the following implementation elements

##### Mobilization

- Encourage use of fuel-efficient / alternative fuel vehicles and equipment;
- Minimize mobilizations;
- Use existing roadways where available;
- Provide for erosion and sediment control to minimize runoff into environmentally sensitive areas;
- Avoid environmentally sensitive areas and cutting native trees/vegetation when excavating or constructing the remedy; and



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- The contractors will be encouraged to use of diesel engines that meet the most stringent EPA on-road emissions standards available upon time of project's implementation or utilize EPA or CARB verified emission control technology to reduce particulate matter (PM) emissions by a minimum of 85% when technologically feasible on all on-road diesel engines

#### Field Screening

- Use The implementation of activities for this site will continue to use non-invasive technologies, where feasible, for subsurface characterization to minimize wastes Ground Penetrating Radar, GPS surveys and photoionization Detector (PID) equipment; and
- incorporate systematic planning, dynamic work strategies, and real-time measurements into work plans (TRIAD) to promote efficiency in investigations. As with previous sampling events, samples were collected and archived to be analyzed only if certain samples in a shallower depth interval identified elected concentrations requiring a deeper interval be analyzed. This saves costs and reduced the number of mobilizations and laboratory effort.

#### Drilling/Excavating

Contractors are encouraged to:

- Have idle reduction policy and idle reduction devices installed on machinery;
- Use ultra-low sulfur diesel and/or fuel-grade biodiesel as fuel on machinery;
- Maximize use of machinery equipped with advanced emission controls;
- Use diesel engines that meet the most stringent EPA on-road emissions standards available upon time of project's implementation or utilize EPA or CARB verified emission control technology to reduce PM emissions by a minimum of 85% when technologically feasible on all on-road diesel engines; and
- Regular engine maintenance on machinery to improve efficiency

#### Transport and Disposal of Soils and Backfill

Contractor will be encouraged to maximize efficiency in transport/disposal of soils and backfill, utilizing practices such as backloading and live loading.

## FIGURES

## APPENDICES



## APPENDIX A – Phase I ESA

## APPENDIX B – 2006 RAO

SCANNED

**TRC**  
Customer-Focused Solutions

u/A

B1/1

## CLASS B-1 RESPONSE ACTION OUTCOME STATEMENT

*Between Newburyport and Boston* *Newburyport*

### FORMER BOSTON & MAINE RAILROAD LINE

**RTN 3-26210**

*Prepared for:*

Merrimack Valley Planning Commission  
160 Main Street  
Haverhill, Massachusetts 01830

*and*

City of Newburyport, Office of Planning and Development  
Newburyport City Hall  
60 Pleasant Street  
Newburyport, Massachusetts 01950

*Prepared by:*

TRC Environmental Corporation  
116 John Street  
Boott Mills South  
Lowell, Massachusetts 01852

TRC Project Number: 42039-0010-00009/52037-0010-00090

December 2006

RECEIVED

DEC 4 2006

DEP  
NORTHEAST REGIONAL OFFICE

RECEIVED

DEC 8 2006

DEP

NORTHEAST REGIONAL OFFICE



**Boott Mills South - 116 John Street  
Lowell, MA 01852  
(978) 970-5600  
(978) 453-1995- FAX**

## LETTER OF TRANSMITTAL

**To:** Massachusetts DEP  
Bureau of Waste Site Cleanup  
205B Lowell Street  
Wilmington, MA 01887  
**FAX:**  
**PHONE:** 978-694-3200

**Date:** December 4, 2006 **Project:** 52037

**From:** Frank Calandra  
**FAX:** (978) 453-1995  
**Phone:** (978) 970-5600

**Hand Delivered**

### WE ARE SENDING YOU:

☒ Attached or ☐ Under separate cover via \_\_\_ the following items:

<input type="checkbox"/> Press Release	<input type="checkbox"/> Correspondence	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Posters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Reports	<input type="checkbox"/>	<input type="checkbox"/>	

### ITEMS ATTACHED:

COPIES	DATE	NO.	DESCRIPTION
1	December 2006		Class B-1 Response Action Outcome Statement, Former Boston & Maine Railroad Line, RTN 3-26210

### THESE ARE TRANSMITTED AS CHECKED BELOW:

<input type="checkbox"/> For your Approval	<input type="checkbox"/> Approved as submitted	<input type="checkbox"/> Resubmit ___ copies for approval
<input type="checkbox"/> For your use	<input type="checkbox"/> Approved as noted	<input type="checkbox"/> Submit ___ copies for distribution
<input type="checkbox"/> As requested	<input type="checkbox"/> Returned for corrections	<input type="checkbox"/> Publication
<input type="checkbox"/> For review and comment	<input type="checkbox"/> For your signature	<input type="checkbox"/> Payment
<input type="checkbox"/>		<input type="checkbox"/>

### REMARKS:

**RECEIVED**

DEC - 4 2006

DEP  
NORTHEAST REGIONAL OFFICE

**COPY TO:** Geordie Vining, City of Newburyport

  
**SIGNED:** Frank Calandra

*If enclosures are not as noted, kindly notify us at once.*

# DEP BWSC RAO LEVEL 1 AUDIT FORM

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Lead RTN: 3-26210		
<b>SUBMITTAL TYPE</b> Class: A <u>B</u> C <u>1</u> 2 3 4 Partial Revised AUL Other: Related RTNs:		OHM description: (Source, Type of OHM, Media Affected) <u>EPA, metals, vinyl chloride</u>  Date RAO Rcvd <u>12/4/06</u> Date Screened <u>2/12/07</u>  Site Use: <u>former RR line</u>

Town: <u>Newburyport</u>	Site Name: <u>Former B + M RR line</u>
Address: <u>Between Newburyport Tpk + Walcott St</u>	SP Name/#: <u>Mark Casey 5319</u>
PRP/OP:	Consulting Firm:

Based upon conditions at time of RAO submittal				
<b>I. SITE CONDITIONS</b>				
<b>A. Air</b>	Yes	No	?	Page
1. <input type="checkbox"/> Applicable GW-2 standard exceeded @ residence/school with no soil gas/indoor air sampling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. <input type="checkbox"/> Site contaminants impacting indoor air	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>B. Drinking Water/Groundwater</b>	Yes	No	?	Page
1. <input type="checkbox"/> More than 0.5" NAPL observed in any monitoring well	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. <input type="checkbox"/> Site within potential drinking water source area (PDWSA)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. <input type="checkbox"/> Site located within IWPA/mapped Zone II	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. <input type="checkbox"/> Private/Non-municipal public well(s) (i.e. TNC, NTNC) located within 500 feet of site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5. <input type="checkbox"/> Municipal well(s) located within 1000 feet of site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6. <input type="checkbox"/> Private well contaminated as a result of site, still in use (no filter, no public water, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7. <input type="checkbox"/> Public water supply contaminated as a result of site, no filters or other mitigation.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>C. Contaminated Soil At a School or Residence</b>	Yes	No	?	Page
1. <input type="checkbox"/> EPC in S-1 soil exceeds Method 1 Standard	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. <input type="checkbox"/> Bioaccumulating compounds (i.e. Hg, Pb, PCBs, etc.) detected less than 1 foot deep	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0-3'
3. <input type="checkbox"/> IH compounds (arsenic, cadmium, chrome VI, cyanide) detected less than 1 foot deep	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0-3'
<b>D. Environmental Concerns</b>	Yes	No	?	Page
1. <input checked="" type="checkbox"/> Site within 500 feet of surface water and/or wetlands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. <input type="checkbox"/> Endangered species habitat, ACEC and/or certified vernal pool within 500 feet	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. <input type="checkbox"/> Confirmed contamination of surface water, sediments and/or wetlands with site contaminants	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>E. Site &amp; Area Use – Check All That Apply</b>	Yes	No	?	Page
1. <input checked="" type="checkbox"/> Industrial use or public Right of Way (no children likely to be present)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. <input type="checkbox"/> Commercial (limited presence of children)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. <input type="checkbox"/> School/Institution (pre-K through high school, not college/university)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. <input checked="" type="checkbox"/> Residential	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>F. Released OHM (Primary Contaminant Type[s])</b>	Yes	No	?	Page
1. <input type="checkbox"/> Petroleum fuel oils (e.g. #2, #4, #6, JP-4, JP-8, kerosene, lube oil, MODF, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. <input type="checkbox"/> Gasoline, waste oils, Aviation Fuel (AVGAS, Jet A, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. <input checked="" type="checkbox"/> Metals, coal tar, PCBs, pesticides/herbicides, asbestos, cyanide	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. <input type="checkbox"/> Chlorinated solvents, perchlorate, or other organic compounds	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	vinyl chloride in
<b>G. Site Complexity</b>	Yes	No	?	Page
1. <input checked="" type="checkbox"/> Co-mingled plumes (i.e., from different sources, one or more releases co-mingled)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. <input type="checkbox"/> Bedrock contamination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
If <input type="checkbox"/> conditions currently exist, see supervisor to discuss.				

# DEP BWSC RAO LEVEL 1 AUDIT FORM

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II. TECHNICAL ADEQUACY		Citation(s)	Yes	No	?	NA	Page
<b>A. Remedial Response Actions:</b>							
1.	Documentation (BOL, HWM, etc.) of removal/treatment of contaminated soil was provided	40.0030	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.	Remediation waste properly managed (Air [95%], GW [permit], SW [NPDES])	40.0031-40.0049	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>B. Source/Extent Investigations:</b>							
1.	History of OHM use/storage/disposal at the site included	40.0405(1), 40.0835(4)(c)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.	Potential source(s) identified, characterized, or abated (septic leach field, floor drain, AST, etc.)	40.0923(2), 40.1003(5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.	All migration pathways evaluated (soil, groundwater, surface water, air, sediment, food)	40.0904(2)(c)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.	Extent of contamination defined in all media (including downgradient)	40.0904(2)(a), 40.1003(5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.	Potential or actual OHM analyzed for and/or evaluated (metals, VPH, VOCs, etc.)	40.0904(3)(a), 40.0926(1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.	Proper sample collection technique/preservation/holding times/surrogate recovery, etc.	40.0017(2-3), 40.1056(1)(j)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>C. Risk Characterization:</b>							
1.	Correct risk characterization method used (relative to indoor air, surface water, sediment, etc.)	40.0941, 40.0942	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.	Background identified or characterized	40.0904(2)(b), 40.1020	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.	All receptors accounted for (human, environmental) or AUL applied	40.0920-40.0922	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.	Site activities and uses identified (current, future, any limitations that were assumed)	40.0923	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.	Exposure points identified (GW & soil for all RC Methods, other media for Methods 2 & 3)	40.0924	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.	All exposure pathways identified and evaluated (inhalation, ingestion, dermal, etc.)	40.0925	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Inhalation of dust?
7.	Hot Spot(s) addressed, identified (as Hot Spot) and not added in to other EPCs	40.0924(4), 40.0926(5)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8.	EPC calculation(s)/equations provided (including spatial and/or temporal, Hot Spots, etc.)	40.0926	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
9.	EPC properly calculated (maximum concentration, 75%/10x, upper confidence limit)	40.0926(3)(a),(b),(c)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No calculations
10.	Soil/groundwater categories properly identified	40.0930	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No data
11.	Applicable soil and/or GW standards not exceeded (Method 1 or 2) or AUL applied	40.0973(7), 40.0988(2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12.	Characterization of Risk to Safety is included (all methods)	40.0960	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13.	Method 3 Public Welfare Risk Characterization is included	40.0994	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14.	Method 3 Environmental Risk Characterization – Stage 1 or 2 was completed, if applicable	40.0995	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15.	Method 3 Human Health: Non-Cancer Risks < HI of 1, ELCR < than 1x10 <sup>-5</sup>	40.0993(6),(7)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

# DEP GWSC RAO LEVEL 1 AUDIT FORM

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III. Response Action Outcome Statement (RAO):			Yes	No	?	NA	Page
1.	Correct RAO Class was selected	40.1030 - 40.1050	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	40.1036(4)(a) <i>40.1036(4)(a)</i>
2.	RAO boundaries delineated and referenced to permanent landmarks or surveyed boundaries	40.1003(4), 40.1056(2)(a)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>40.1036(4)(a)</i>
3.	Relationship of this RAO to other RAOs for the property has been defined	40.1056(1)(d)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>40.1036(4)(a)</i>
4.	Data Usability Assessment (scien. valid & defensible, precise, accurate, complete) is included	40.1056(1)(f), 40.1056(2)(k)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>40.1036(4)(a)</i>
5.	Data Representativeness Evaluation (adequate spatial and temporal data) is included	40.1056(2)(k)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>40.1036(4)(a)</i>
<b>A. CLASS A - Permanent Solutions:</b>			Yes	No	?	NA	Page
1.	A background feasibility evaluation is included	40.1020(3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.	A Permanent Solution has been achieved	40.1035(1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.	All sources have been eliminated or controlled	40.1035(2)(b)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.	Phase IV, Phase V, or Post-RAO O&M, where required, were completed	40.1036(6)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>A-1. CLASS A-1:</b>			Yes	No	?	NA	Page
1.	The level of OHM at the site has been reduced to background	40.1036(1)(a)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.	Threats of Release Only: all TORs were eliminated, and a release of OHM has not occurred	40.1036(1)(b)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>A-2. CLASS A-2:</b>			Yes	No	?	NA	Page
1.	An AUL is not required to maintain a condition of No Significant Risk	40.1036(2)(c)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>A-3. CLASS A-3:</b>			Yes	No	?	NA	Page
1.	An AUL has been implemented to maintain a condition of No Significant Risk	40.1036(3)(c)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.	Groundwater or Soil OHM concentrations do not exceed UCLs	40.1036(3)(d)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>A-4. CLASS A-4:</b>			Yes	No	?	NA	Page
1.	An AUL has been implemented to maintain a condition of No Significant Risk	40.1036(4)(c)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.	OHM in soil that exceeds UCLs is beneath engineered barrier or >15 feet below ground surface	40.1036(4)(d)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.	UCL Feasibility Evaluation conducted and shows that achieving UCLs is not feasible	40.1036(4)(e), 40.1056(2)(f)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

# DEP BWSC RAO LEVEL 1 AUDIT FORM

**Disclaimer:** This checklist is for use by DEP in reviewing Response Action Outcome (RAO) Statements, and may not be relied upon for any other purpose. This checklist is not a comprehensive list of RAO requirements, which are fully set forth in MGL c. 21E and 310 CMR 40.0000. Completion of this checklist by DEP does not constitute a final agency decision, and does not create any legal rights or relieve any party of obligations that exist pursuant to applicable laws.

B. CLASS B - Permanent Solutions:			Yes	No	?	NA	Page
1. A condition of No Significant Risk exists		40.1045(1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
2. Remedial actions have not been conducted		40.1045(2), 40.1046(6)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
3. Where GW-1 applies, groundwater does not exceed an applicable or analogous standard		40.1046(5)(b)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Page 4
B-1. CLASS B-1:			Yes	No	?	NA	Page 4
1. One or more AULs are not necessary to maintain a level of no significant risk		40.1046(1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Page 4
B-2. CLASS B-2:			Yes	No	?	NA	Page 4
1. An AUL has been implemented to maintain a condition of No Significant Risk		40.1046(2)(a), 40.1056(2)(g)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
2. OHM in groundwater or soil does not exceed UCLs		40.1046(2)(b)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
B-3. CLASS B-3:			Yes	No	?	NA	Page 4
1. An AUL has been implemented to maintain a condition of No Significant Risk		40.1046(3)(a), 40.1056(2)(g), h	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
2. EPC in soil exceeds UCLs; however:			---	---	---	---	Page 4
a. OHM is located >15 feet below ground surface, AND		40.1046(3)(b)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
b. UCL Feasibility Evaluation shows that achieving UCLs is not feasible		40.1046(3)(c)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
C. CLASS C - Temporary Solutions:			Yes	No	?	NA	Page 4
1. A condition of No Substantial Hazard exists		40.1050(1)(a), 40.1051(1, 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
2. ID, characterization, elimination, and control or mitigation of OHM release has been demonstrated		40.1050(1)(b), 40.1056(2)(d)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
3. Soil and/or groundwater concentrations exceed applicable or analogous standards or UCLs		40.1050(2)(a, b)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
4. Phase II and Phase III reports were submitted, or DPS Opinion was submitted		40.1050(3), 40.1050(4)(a)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
5. A plan with definitive and enterprising steps toward a Permanent Solution has been submitted		40.1051(3)(a), 40.1051(4)(a)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
C-1. CLASS C-1:			Yes	No	?	NA	Page 4
1. Valid feasibility evaluation - Permanent Solution currently cannot be achieved.		40.1051(1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4
C-2. CLASS C-2:			Yes	No	?	NA	Page 4
1. Site has a valid Tier I Permit, Permit Extension, or Tier 2 status		40.1051(4)(b)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Page 4



# **CLASS B-1 RESPONSE ACTION OUTCOME STATEMENT**

## **FORMER BOSTON & MAINE RAILROAD LINE**

**RTN 3-26210**

---

***Prepared for:***

Merrimack Valley Planning Commission  
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Haverhill, Massachusetts 01830

***and***

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TRC Project Number: 42039-0010-00009/52037-0010-00000

**December 2006**

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Figure 2:	Site Plan

### APPENDICES

Appendix A:	Bureau of Waste Site Cleanup Transmittal Forms
Appendix B:	Copies of the Public Notification Letters
Appendix C:	May 2006 Site Investigation Summary Report, Former Boston & Maine Railroad Line

## 1.0 INTRODUCTION

This Class B-1 Response Action Outcome (RAO) Statement Report was prepared by TRC Environmental Corporation (TRC) on behalf of the City of Newburyport, Massachusetts (the "City") for the Former Boston & Maine (B&M) Railroad Line located in Newbury and Newburyport, Massachusetts (the "Site"). This RAO Statement is based on the results of an investigation conducted in May 2006 by TRC along the alignment of the former railroad line.

TRC prepared this RAO Statement in accordance with the Massachusetts Contingency Plan (MCP), 310 CMR 40.1000. The purpose of this RAO Statement is to demonstrate that a level of No Significant Risk has been achieved. This RAO Statement does not rely upon the implementation of an Activity and Use Limitation to achieve a level of No Significant Risk.

A copy of Massachusetts Department of Environmental Protection (MADEP) RAO Form BWSC-104 is included in this report as Appendix A. Copies of the Public Notification letters are included in this report as Appendix B. The May 2006 Site Investigation report entitled, "Site Investigation Summary Report, Former Boston & Maine Railroad Line" is provided in Appendix C.

## 2.0 BACKGROUND

A Site Location Map is presented in Figure 1. The Site is an approximate 1.3-mile inactive rail corridor which extends from approximately Route 1 in Newbury to the waterfront area in Newburyport. The Site was used historically as a railroad corridor until its abandonment in 1972. The steel rail and wooden railroad ties were removed. The City purchased the Site on August 4, 2006 and plans to develop it as a rail trail for recreational use.

Prior to the purchase, TRC conducted a Phase I Environmental Site Assessment (ESA) to identify recognized environmental conditions associated with the Site. The Phase I ESA identified two potential environmental issues: (1) soil and groundwater contamination from former railroad use, and (2) soil and groundwater contamination from reported releases at nearby properties. TRC subsequently conducted a Site investigation to evaluate the potential environmental issues identified in the Phase I ESA. The Site investigation report, dated May 2006, is provided in Appendix C. The Site investigation consisted of a visual Site inspection and the installation of 10 soil borings (B-1 through B-10) and 5 monitoring wells (MW-1, MW-2, MW-4, MW-9, and MW-10).

Soil samples were collected and analyzed for extractable petroleum hydrocarbons (EPH), MCP metals, polychlorinated biphenyls (PCBs), and pesticides. One round of groundwater samples were collected from the five monitoring wells. Groundwater samples were analyzed for EPH and MCP Metals. Additionally, the groundwater sample collected from MW-10 was sampled for volatile organic compounds (VOCs) and cyanide based on the presence of a former metals plating facility (i.e. the former Circle Finishing Site, RTNs 3-0392, 3-10321, and 3-24164) to the north of this portion of the Site.

The Site investigation identified concentrations of lead and several polycyclic aromatic hydrocarbon (PAH) compounds, including benzo(a)anthracene, chrysene, benzo(a)pyrene, and dibenzo(a,h)anthracene, above applicable MCP RCS-1 Reportable Concentrations in soil between 0 and 3 feet at boring B-2. In addition, arsenic was detected slightly above the RCS-1 Reportable Concentration of 20 mg/kg in select borings. Exceedances of the RCS-1 reportable criteria triggered a 120-day notification requirement to DEP.

Because the City did not own the Site, results of the Site investigation were transmitted to B&M. Following purchase of the Site, the City prepared and submitted a Release Notification Form to MADEP on August 31, 2006. Release Tracking Number (RTN) 3-26210 was assigned to the Site.

Nickel and cyanide were detected in a groundwater sample collected from monitoring well MW-10 at concentrations of 777.1 ug/L and 167 ug/L, respectively. Although these concentrations exceed applicable MCP RCGW-2 criteria, the City did not include these data in the 120-day notification per the MCP, 310 CMR 40.0317(16), which states that exceedances of reportable concentrations at disposal sites where a response action is being undertaken do not require notification. Monitoring well MW-10 is located within the boundaries of the Circle Finishing disposal site (RTNs 3-0392, 3-10321, and 3-24164), thus, notification to DEP of these concentrations was not considered necessary.

### **3.0 SITE TOPOGRAPHY AND HYDROGEOLOGY**

In general, surface and shallow subsurface soils consist of medium to coarse sand throughout the Site. In residential areas where portions of the Site have been seeded with grass and maintained by adjacent residents, a layer of topsoil is present. Silts and clays were identified in several borings at and below 5 feet.

Given the proximity of the Merrimack River and the Atlantic Ocean, groundwater flow direction is likely tidally influenced in the northern portion of the rail corridor. Based on topography, groundwater flow across northerly portions of the former rail line is expected to be in a northerly direction towards the Merrimack River (TRC, 2005). Between Parker Street and High Street, groundwater is expected to flow southeasterly from the hill where the water tower is located. At the southern portion of this section of rail corridor, groundwater flow measured at the Circle Finishing Site is estimated to flow in a southeasterly direction (LFR, 2003).

## 4.0 NATURE AND EXTENT OF CONTAMINATION

Summaries of soil and groundwater analytical data are presented in Tables 1 and 2, respectively. To help convey the extent of contamination at the Site, soil sample results are compared to MCP Method 1 S-1 standards, and groundwater sample results are compared to MCP Method 1 GW-3 standards. An evaluation of Site risks is presented in Section 5.0.

### 4.1 EPH/PAHs in Soil

EPH and associated PAHs were detected at three of the ten soil boring locations advanced by TRC. At two locations, B-2 and B-10, PAH concentrations exceeded MCP Method 1 S-1 standards. Benzo(a)anthracene, chrysene, benzo(a)pyrene, and dibenzo(a,h)anthracene were detected above MCP Method 1 standards at B-2(0-3'), and C11-C22 Aromatics, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, and dibenzo(a,h)anthracene were detected above MCP Method 1 standards at location B-10(0-3').

Likely sources of the elevated EPH fractions and PAHs in the vicinity of B-10 include runoff from Route 1 asphalt pavement. Also, B-10 is located within the boundaries of the Circle Finishing disposal site (RTNs 3-0392, 3-10321, and 3-24164).

### 4.2 Metals in Soil

Arsenic was detected consistently throughout the former rail line in concentrations ranging from 9.1 to 27 mg/kg. Concentrations of arsenic at B-3 (23 mg/kg), B-5 (21 mg/kg), and B-9 (27 mg/kg) were slightly above the MCP Method 1 S-1 standard of 20 mg/kg. Given the consistent concentrations of arsenic detected along the former rail corridor (e.g. standard deviation of approximately 6 mg/kg among arsenic samples), these concentrations likely represent background conditions.

Lead was detected at all soil boring locations advanced by TRC. At location B-2(0-3'), which is located at the northern-most portion of the Site, lead was detected at a concentration of 430 mg/kg (320 mg/kg in a field duplicate sample), which is above the MCP Method 1 S-1 standard of 300 mg/kg. Concentrations of lead at the other nine locations were below MCP Method 1 S-1 standards. Although there is no apparent source of the elevated lead detected in B-2, the source is likely related to historical Site use or imported fill which may have been used to grade the walkway.

Nickel and chromium were detected at all soil boring locations advanced by TRC. The highest concentrations of chromium and nickel were detected at location B-10(0-3'), which is located within the Circle Finishing disposal site. Chromium and nickel were detected in B-10(0-3') at concentrations of 54 mg/kg and 71 mg/kg, respectively. These concentrations exceed the MCP Method 1 S-1 standards. Concentrations of chromium and nickel at the other nine locations were below MCP Method 1 S-1 standards. The likely source of the elevated chromium and nickel at location B-10 is the Circle Finishing disposal site, as both compounds are commonly used in metal finishing processes.

### **4.3 Pesticides in Soil**

The pesticides 4,4'-DDE and 4,4'-DDT were detected at concentrations slightly above laboratory method detection limits at location B-3(0-3'). These detected concentrations are well below MCP Method 1 S-1 standards for these compounds.

### **4.4 PCBs in Soil**

PCBs were analyzed in soil samples collected from boring B-5 because of its location in the vicinity of a former electric substation structure. PCBs were not detected.

### **4.5 Groundwater**

No chemicals were detected in groundwater at the Site at concentrations above MCP Method 1 GW-3 groundwater standards. The groundwater sample from monitoring well MW-10, which is located within the boundaries of the Circle Finishing disposal site, exceeded applicable MCP Method 1 GW-3 standards for nickel and total cyanide. Nickel was detected at a concentration of 777.1 ug/L, which exceeds the MCP Method 1 GW-3 standard of 200 ug/L, and total cyanide was detected at a concentration of 167 ug/L, which exceeds the MCP Method 1 GW-3 standard of 30 ug/L.

Nickel and cyanide are consistent with the chemicals released at the Circle Finishing site and are not considered to be associated with former railroad line use. Monitoring wells located to the north of MW-10 on the Circle Finishing property contained similar or higher concentrations of nickel in groundwater. In monitoring well B-16A, which is located along the southeast edge of the Circle Finishing property, nickel was detected at a concentration of 760 ug/L. Similarly, in monitoring well 17A, located within the former railroad line to the northeast of MW-10, nickel was detected at a concentration of 1,930 ug/L [LFR, 2004]. Cyanide is a common chemical used in the metal finishing industry and the DEP files for the Circle Finishing Site document that a release of cyanide to the environment occurred as a result of the 1993 fire at this facility. No other potential source of cyanide contamination in groundwater was identified within the rail corridor. Based on this information, well MW-10 is considered part of the Circle Finishing Site and is not included as part of the former rail corridor Site.

## **5.0 METHOD 1 RISK CHARACTERIZATION AND EXPOSURE ASSESSMENT**

TRC completed a Method 1 risk characterization for the subject Site to evaluate whether the concentrations of oil and hazardous materials in soil and groundwater pose a significant risk to health, safety, public welfare or the environment.

### **5.1 Current and Reasonably Foreseeable Site Activity and Use**

The Site is a former rail line corridor. The northern portion of the Site between Water Street and the Merrimack River waterfront in Newburyport, Massachusetts is currently used by the general public as a pedestrian and vehicle pathway to access the waterfront area. Some portions of the Site are overgrown with vegetation and are not accessible. The Site is mostly unpaved except in locations where it crosses roadways.

The City plans to develop the Site as a rail trail for recreational use. The entire length of the former rail line, from Route 1 to the Merrimack River, is expected to be paved. No buildings or structures are planned. Foreseeable recreational activities at the Site which are typical for rail trails include walking, jogging, and bicycling.

### **5.2 Applicable MCP Groundwater and Soil Categories**

This section presents a discussion of the MCP groundwater and soil categories that are applicable to the Site

#### **5.2.1 Applicable Groundwater Categories**

Groundwater is categorized based upon its current and/or potential future use as a drinking water (GW-1), its potential to act as a source of volatile material to indoor air (GW-2), and the potential to discharge material to surface water (GW-3). The MCP describes six criteria used for determining if Site groundwater is categorized as GW-1. These criteria include the following.

- The groundwater is within a Zone II.
- The groundwater is within an Interim Wellhead Protection Area.
- The groundwater is within a Potentially Productive Aquifer.
- The groundwater is within Zone A of a Class A Surface Water Body.
- The groundwater is located 500 feet or more from a public water system distribution pipeline.
- The groundwater is located within 500 feet of a private water supply well that was in use at the time of notification pursuant to 310 CMR 40.0300 and was installed in conformance with an applicable laws, by-laws, or regulations.

No Current Drinking Water Sources were identified within the former rail line. However, the Massachusetts Geographical Information System (GIS) identifies a medium yield aquifer located



beneath the middle portion of the former rail line between High Street and Parker Street. The medium yield aquifer is considered a Potentially Productive Aquifer per the MCP, thereby, categorizing the groundwater beneath the Site as GW-1 in this location. No monitoring wells were installed within the aquifer footprint during this investigation because the Phase I ESA did not identify any potential sources of impacts to groundwater in this area.

The MCP indicates that groundwater is categorized as GW-2 when it is located within thirty feet of an occupied building or structure and the average annual depth to groundwater in the area is fifteen feet or less. There are no occupied structures currently present on the Site. The City plans to redevelop the Site for future use as a recreational rail trail, and no onsite building are planned as part of this future redevelopment. Based on this information, groundwater at the Site is also not categorized as GW-2.

The MCP indicates that all groundwater in Massachusetts is classified as GW-3. Therefore, groundwater at the Site is classified as GW-3.

#### **5.2.2 *Applicable Soil Categories***

The entire section of rail corridor under investigation is currently unpaved and access to the rail corridor is un-restricted (however, some sections are overgrown and access to these sections is limited). The northern portion of the Site between Water Street and the Merrimack River in Newburyport is used by the general public as a pedestrian and vehicle pathway to access the waterfront area. Pursuant to 310 CMR 40.0933, this corresponds to high frequency/low intensity use for children and adults. Accordingly, the applicable MCP soil categories for the current activities and uses in this portion of the Site are S-1/GW-3 for surface soil (i.e., 0-3 feet below ground surface), and S-2/GW-3 for subsurface soil (i.e., soil greater than 3 feet but less than 15 feet below ground surface).

Based on the presence of the potentially productive aquifer between High and Parker Streets, the applicable MCP soil categories for current activities and uses in this portion of the Site are S-1/GW-1 for surface soil and S-2/GW-1 for subsurface soil.

Assuming future use of the property as a paved recreational pathway, the future activities and uses for both children and adults are assumed to remain as high frequency/low intensity. Based on this information, the applicable MCP soil category for the anticipated future site activities and uses is S-2/GW-3 for both surface and subsurface soil for areas outside the potentially productive aquifer located between High and Parker Streets. The applicable MCP soil category for future Site activities and uses in the portion of the Site between High and Parker Streets is S-2/GW-1 for both surface soil and subsurface soil.

### **5.3 Exposure Point Concentrations and Comparison to MCP Method 1 Standards**

This section describes the calculation of Exposure Point Concentrations (EPCs) and compares the EPCs to applicable Method 1 Soil and Groundwater Standards.

### 5.3.1 Soil Exposure

Based on the relative uniformity of contaminant concentrations detected in soil across the Site, site-wide EPCs were developed for the detected concentrations of compounds in soil. Separate EPCs were developed for surface soil (i.e., 0-3 feet below ground surface), and subsurface soil (i.e., soil > 3 feet below ground surface) for each exposure area. Soil EPCs are calculated using data from locations B-1 through B-9. Data from B-10 are not included because B-10 is located within the boundaries of the Circle Finishing disposal site and is not considered part of the subject disposal site.

The EPCs were calculated as the arithmetic mean concentrations of detected constituents. The EPC calculations for soil are provided in Table 1. As shown in Table 1, all of the detected concentrations for each compound of interest were less than 10 times their respective MCP Method 1 S-1/GW-1 and/or S-1/GW-3 soil standards. In addition, at least 75% of samples had detected concentrations below the MCP Method 1 S-1 soil standards for all compounds of interest except arsenic, in which 67% of the samples (6 out of 9 samples) had concentrations below the MCP Method 1 S-1 standards. Thus, use of an arithmetic mean as the EPC was considered appropriate and not likely to underestimate the true EPC for all compounds of interest except for arsenic. For arsenic, the rationale for using the arithmetic mean is as follows.

The detected concentrations of arsenic in soil across the Site were relatively uniform and ranged from 9.1 mg/kg to 27 mg/kg. The arithmetic mean arsenic concentration in soil at the Site is 18.7 mg/kg, with a standard deviation of 5.8 mg/kg. Given the historic use of the Site as a railroad corridor, the presence of arsenic in soil at these concentrations is likely associated with background conditions. Note that the detected concentrations of arsenic in the majority of the samples are below the DEP-published background concentration of 20 mg/kg for arsenic in soil, and three of the samples from the investigation area had arsenic concentrations that only slightly exceed this DEP-published background concentration. All of the detected arsenic concentrations are within the range of arsenic background concentrations observed during the DEP 1995 background study and the Central Artery/Third Harbor Tunnel project (DEP, 2002).

The only potential source of arsenic release to soil based on the historic use of the property is from possible application of pesticides along the rail corridor, which was common practice for historic railroad lines. Given this potential source of release, higher concentrations of arsenic would be expected in the surface soil. As shown in Table 1, TRC's soil samples for arsenic were obtained from the 0-3' depth interval, therefore, the concentrations used in the EPC calculation for arsenic likely represent reasonably worst case arsenic levels. In addition, based on the Site's current and foreseeable future use as a recreational rail trail, exposure is not likely to be greater in any individual portion of the rail trail. Based on this rationale, use of the arithmetic mean concentration for arsenic in soil as the EPC is appropriate and is not likely to underestimate the true EPC at this Site.

Tables 1 compares site-wide EPCs to their applicable MCP Method 1 soil standards for current and future use of the Site. As shown in Table 1, the EPCs for all compounds in soil are below their respective MCP Method 1 soil standards which are applicable to current and future Site uses.

### ***5.3.2 Groundwater Exposure***

Per the MCP at 310 CMR 40.0924 (2), the groundwater exposure areas at the Site are considered the groundwater resource itself and the groundwater exposure point concentrations are the concentrations detected at each individual monitoring well at the Site. These data are provided in Table 2. All on-site monitoring wells were constructed in the GW-3 portion of the Site. Therefore, groundwater data is compared to MCP Method 1 GW-3 standards. No groundwater concentrations exceed MCP Method 1 GW-3 standards.

As shown in Table 2, nickel and total cyanide were detected in monitoring well MW-10 exceeding their applicable MCP Method 1 GW-3 standards of 200 ug/L and 30 ug/L, respectively. However, because MW-10 is located within the boundaries of the Circle Finishing disposal site, it is not considered part of the subject disposal site. The presence of nickel and cyanide in groundwater are consistent with the documented release at the Former Circle Finishing Site.

### ***5.3.3 Characterization of Risk to Safety***

Characterization of the risk of harm to safety was performed by evaluating Site conditions relative to conditions that could pose a threat of physical harm or bodily injury. Conditions that could pose a risk to harm to safety include the following:

- Presence of rusted or corroded drums, containers, open pits, or lagoons;
- Threat of fire or explosion or presence of explosive vapors; and,
- Uncontained materials exhibiting characteristics of corrosivity, reactivity, or flammability.

Based on information presented in reports upon which this risk characterization is based, none of these conditions was reported or is anticipated to exist at the Site in relation to the release, now or in the future. Therefore, the Site is judged to pose no significant risk of harm to safety.

## **6.0 DATA USABILITY ASSESSMENT AND REPRESENTATIVENESS EVALUATION**

### **6.1 Data Usability Assessment**

A data usability assessment was performed on laboratory data associated with the soil and groundwater data collected for the Site. The assessment concluded that the data are usable for MCP decisions based on the Compendium of Analytical Methods (CAM) requirements for acceptable accuracy, precision, and sensitivity. The detailed data assessment evaluation is provided in Appendix C of the Site Investigation Report (found in Appendix C of this report).

### **6.2 Representativeness Evaluation**

To perform a representativeness evaluation, The Conceptual Site Model (CSM) for the Site must be understood. The CSM for the Site is described as follows:

The Site is former railroad line which was constructed in 1846. The Site was used as an active railroad line until its abandonment in January 1972. Historic railroad operations typically involved the use of chemicals that may have resulted in presence contamination. The most commonly reported contamination along rail lines includes metals, pesticides, and constituents of oil or fuel (petroleum products). These chemicals have been associated with normal railroad operations and are likely to be found in surface soil anywhere along the line. Lubricating oil and diesel that dripped from the trains are likely sources of the petroleum product found along the lines. Other sources of contaminants associated with historic railroad operation may include coal ash from engines, creosote from ties, and PAHs from the diesel exhaust.

A review of federal, state, and municipal records identified two DEP disposal sites located adjacent to the subject Site.

- 1) **Circle Finishing Site.** The Circle Finishing site, which is located to the north of the westernmost portion of the Site, is a former metal plating facility (i.e. the former Circle Finishing site, RTNs 3-0392, 3-10321, and 3-24164 ). On December 20, 1993, a fire occurred at the Circle Finishing site that resulted in the release of various metal plating solutions containing oil and hazardous materials. Immediate Response Action (IRA) activities were conducted at the time to address the release. The site was classified as Tier 1B in December 1995. Although several Tier 1 permit extensions were granted, based on DEP records, no substantial remedial actions to address soil and groundwater contamination have been conducted.
- 2) **Wastewater Treatment Plant.** The City of Newburyport Wastewater Treatment Plant (WWTP), located at 157 Water Street, borders the Site at its easternmost portion. Two separate releases at this site were identified during a review of DEP files. The first release occurred in February 1999 when approximately 500 gallons of ferric chloride was released for an aboveground storage tank. The release was completely contained within a containment basin, and a Class A-1 RAO was submitted for the release. The second release occurred in May 2004 when oily soil was identified during excavation for a new

underground storage tank. Lead, total petroleum hydrocarbons, and PAHs were identified in soil above MCP Reportable Concentrations. Approximately 40 tons of contaminated soil was excavated and disposed off site. Consequently, a Class A-2 RAO was submitted for the release. Both WWTP releases appear to have been limited to areas within the treatment plant property and are unlikely to impact the former railroad line.

Following the records review, TRC conducted a Site investigation to assess potential impacts from known releases at the adjacent Circle Finishing and wastewater treatment plant sites described above and other releases that were identified at nearby properties. TRC installed soil borings and monitoring wells in locations where impacts from the identified release sites were deemed likely. Additionally, locations of soil borings and wells were selected to achieve adequate spatial coverage over the entire Site to evaluate impacts from former railroad operations. The Site investigation report is provided in Appendix C.

Soil samples were analyzed for EPH, metals, pesticides, and PCBs. Given that the most likely releases at the Site occurred to surface soil, TRC collected the majority of soil samples from the 0-3 feet depth interval. TRC conducted one round of groundwater sampling from the five newly-installed monitoring wells. Groundwater samples were analyzed for EPH and metals. Additionally, the groundwater sample collected from MW-10 was sampled for VOCs and cyanide based on the adjacent location of the Circle Finishing Site.

Soil sample results indicate detected concentrations of PAHs and metals in soil generally at relatively uniform concentrations across Site consistent with former use as RR line. Boring B-10 contained slightly higher concentration of petroleum hydrocarbons. However, the likely cause is auto traffic on Route 1. Slightly elevated concentrations of lead were detected at location B-2 located next to WWTP. These elevated lead concentrations could be associated with incidental releases at the WWTP.

Groundwater concentrations detected in Site monitoring wells were below MCP Method 1 GW-3 standards. Concentrations of nickel and cyanide in monitoring well MW-10 were detected above GW-3. However, MW-10 is considered part of Circle Finishing site. As discussed in Section 4.5, concentrations of nickel and cyanide are consistent with those detected in Circle Finishing site monitoring wells.

Based on the CSM described above, the adequacy of spatial and temporal data sets was evaluated, and the data was deemed suitable by TRC to support this RAO Statement. Although soil sample locations were spaced relatively far apart, sample locations were selected in areas where highest contamination levels were anticipated based on Site history and locations of known releases at nearby sites. Thus, concentrations of detected Site contaminants are likely biased high. Visual inspection did not reveal areas that appeared worse than others. Also, exposure is not likely to be greater in any individual portion of the recreational rail trail. Temporally, the data collected is sufficient to address the nature and extent of contamination identified at the Site. The release was identified due to exceedances of applicable Reportable Concentrations under the MCP. No specific release that would migrate or worsen over time was identified.

## **7.0 RESPONSE ACTION OUTCOME STATEMENT**

It is TRC's opinion that a condition of No Significant Risk exists under current Site condition at the Former B&M Rail Line Site (RTN 3-26210) in Newbury and Newburyport, Massachusetts and that the criteria presented in 310 CMR 40.1046(1) have been met. Therefore, this Class B-1 RAO Statement is being submitted. This Class B-1 RAO is supported by a Method 1 Risk Characterization, which demonstrates that the Site poses No Significant Risk of harm to health, safety, public welfare, or the environment. This RAO Statement does not rely upon the implementation of an Activity and Use Limitation to achieve a level of No Significant Risk. A copy of the Response Action Outcome Statement (BWSC-104) is provided in Appendix A.

In addition, in accordance with the public involvement requirements of the MCP (310 CMR 40.1403) notification of the availability of this RAO Statement have been sent to the Mayor and Board of Health for the City of Newburyport. Copies of these notification letters are provided in Appendix B.

TRC recommends using the best management practice guidance when planning the future rail trail and designing the trail to discourage potential off-path activities on the portion of trail adjacent to Circle Finishing Site to minimize exposure to detected Site contaminants. TRC also recommends that the City evaluate the status of current and planned MCP Response Actions at the Circle Finishing site for the purpose of coordinating design and construction of the future rail trail with any remediation that may be performed.

## 8.0 REFERENCES

LFR, 2003. *Phase II Addendum – Response to Phase II Comments by DEP, Circle Finishing, Inc., US Route 1/Traffic Circle, Newburyport, Massachusetts*, Levine-Fricke, November 18, 2003.

LFR, 2004. *Phase IV Remedy Implementation Plan, Circle Finishing, Inc., US Route 1/Traffic Circle, Newburyport, Massachusetts, RTN 3-0392 and 3-10321*, Levine-Fricke, November 1, 2004.

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TRC, 2005. *Phase I Environmental Site Assessment, Former Boston & Maine Railroad Line, Newbury and Newburyport, Massachusetts*, December 2005.

TRC, 2006. *Site Investigation Summary Report, Former Boston & Maine Railroad Line, Newbury and Newburyport, Massachusetts*, May 2006.

DEP, 2002. *Technical Update - Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil*, May 2002

## TABLES



**Table 1**  
Comparison of Soil Results to MCP Method 1 Standards  
Former B & M Railroad  
Newburyport, Massachusetts

Analysis	Analyte	Sample Location:		Depth:		Date sampled:		B-1		B-2		B-3		B-4		B-5		B-6		B-7		B-8		B-9		B-10		EPC		
		S-1/GW-1	S-1/GW-3	0-3'	3-10'	0-3'	3-10'	0-3'	3-10'	0-3'	3-10'	0-3'	3-10'	0-3'	3-10'	0-3'	3-10'	0-3'	3-10'	0-3'	3-10'	0-3'	3-10'	0-3'	3-10'	0-3'	3-10'	0-3'	3-10'	
EPH (mg/kg)	C9 - C18 Aliphatics	1000	1000	7.25 U	7.75 U	15.0 U	7.58 U	8.38 U	7.41 U	7.33 U	7.17 U	7.02 U	7.02 U	7.02 U	7.02 U	6.94 U	7.02 U	7.02 U	7.02 U	7.02 U	7.17 U	7.17 U	7.25 U	7.02 U	7.02 U	7.94 U	ND	19.648		
	C19 - C26 Aliphatics	3000	3000	68.5	7.75 U	15.0 U	10.5	25.6	9.28	7.33 U	7.17 U	7.02 U	7.02 U	7.02 U	7.02 U	6.94 U	7.02 U	7.02 U	7.02 U	7.02 U	7.17 U	7.17 U	7.25 U	7.02 U	7.02 U	26.0	12.021	8.008		
	C11 - C22 Aromatics	200	200	102	7.75 U	139	80.0	55.8	24.9	7.33 U	7.17 U	7.02 U	7.02 U	7.02 U	7.02 U	6.94 U	7.02 U	7.02 U	7.02 U	7.02 U	7.17 U	7.17 U	7.25 U	7.02 U	7.02 U	202	28.645	14.048		
	Naphthalene	4	4	0.362 U	0.388 U	2.18 U	0.379 U	0.383 U	0.370 U	0.366 U	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250		
	2-Methylanthracene	100	100	0.362 U	0.388 U	0.769 U	0.379 U	0.383 U	0.370 U	0.366 U	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250		
	Acenaphthylene	200	200	0.362 U	0.388 U	0.769 U	0.379 U	0.383 U	0.370 U	0.366 U	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250		
	Acenaphthylene	200	200	0.362 U	0.388 U	0.769 U	0.379 U	0.383 U	0.370 U	0.366 U	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250		
	Fluorene	400	400	0.362 U	0.388 U	0.908 U	0.594 U	0.383 U	0.370 U	0.366 U	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250		
	Phenanthrene	700	700	0.362 U	0.388 U	10.9	6.98	1.51	0.456	0.456	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250		
	Anthracene	1000	1000	0.362 U	0.388 U	2.80	1.61	0.983 U	0.370 U	0.366 U	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250		
	Fluoranthene	1000	1000	0.416 U	0.388 U	16.0	9.68	2.10	0.914	0.914	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250		
	Pyrene	1000	1000	0.644 U	0.388 U	12.8	7.73	1.66	0.875	0.875	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250		
	Benzo(a)anthracene	7	7	0.398 U	0.388 U	7.56	4.35	0.933 U	0.392	0.392	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250		
	Chrysene	7	7	0.474 U	0.388 U	7.37	4.23	0.871 U	0.513	0.513	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250		
	Benzo(b)fluoranthene	70	70	0.400 U	0.388 U	6.02	3.43	0.785 U	0.503	0.503	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250		
PCBs (mg/kg)	Benzo(a)pyrene	2	2	0.459 U	0.388 U	7.50	4.16	0.889 U	0.584	0.584	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250			
	Indeno(1,2,3-cd)Pyrene	7	7	0.362 U	0.388 U	5.00	2.57	0.575 U	0.473	0.473	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250			
	Dibenz(a,h)anthracene	0.7	0.7	0.362 U	0.388 U	1.02	0.569 U	0.383 U	0.370 U	0.370 U	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250			
	Benzo(g,h,i)perylene	1000	1000	0.362 U	0.388 U	4.44	2.07	0.500 U	0.370 U	0.370 U	0.366 U	0.358 U	0.351 U	0.351 U	0.351 U	0.347 U	0.351 U	0.351 U	0.351 U	0.358 U	0.358 U	0.362 U	0.351 U	0.397 U	0.397 U	0.342	0.250			
	Aroclor 1016	2	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0347 U	0.0347 U	0.0347 U	0.0347 U	NA	NA	NA	NA	NA	NA	NA	NA	NA		
	Aroclor 1221	2	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0347 U	0.0347 U	0.0347 U	0.0347 U	NA	NA	NA	NA	NA	NA	NA	NA	NA		
	Aroclor 1232	2	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0347 U	0.0347 U	0.0347 U	0.0347 U	NA	NA	NA	NA	NA	NA	NA	NA	NA		
	Aroclor 1242	2	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0347 U	0.0347 U	0.0347 U	0.0347 U	NA	NA	NA	NA	NA	NA	NA	NA	NA		
	Aroclor 1248	2	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0347 U	0.0347 U	0.0347 U	0.0347 U	NA	NA	NA	NA	NA	NA	NA	NA	NA		
	Aroclor 1254	2	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0347 U	0.0347 U	0.0347 U	0.0347 U	NA	NA	NA	NA	NA	NA	NA	NA	NA		
	Aroclor 1260	2	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0347 U	0.0347 U	0.0347 U	0.0347 U	NA	NA	NA	NA	NA	NA	NA	NA	NA		
	Pesticides (mg/kg)	Delta-BHC	NS	NS	0.0362 U	0.0362 U	0.0187 U	0.0189 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0351 U	0.0351 U	0.0351 U	0.0351 U	0.00351 U	0.00351 U	0.00358 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U
		Lindane	0.003	0.003	0.0290 U	0.0362 U	0.0187 U	0.0189 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0351 U	0.0351 U	0.0351 U	0.0351 U	0.00351 U	0.00351 U	0.00358 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U
		Alphas-BHC	NS	NS	0.0362 U	0.0362 U	0.0187 U	0.0189 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0351 U	0.0351 U	0.0351 U	0.0351 U	0.00351 U	0.00351 U	0.00358 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U
		Beta-BHC	NS	NS	0.0362 U	0.0362 U	0.0187 U	0.0189 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0351 U	0.0351 U	0.0351 U	0.0351 U	0.00351 U	0.00351 U	0.00358 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U
Heptachlor		0.2	0.2	0.0362 U	0.0362 U	0.0187 U	0.0189 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0351 U	0.0351 U	0.0351 U	0.0351 U	0.00351 U	0.00351 U	0.00358 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	
Aldrin		0.04	0.04	0.0362 U	0.0362 U	0.0187 U	0.0189 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0351 U	0.0351 U	0.0351 U	0.0351 U	0.00351 U	0.00351 U	0.00358 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	
Heptachlor epoxide		0.09	0.09	0.0362 U	0.0362 U	0.0187 U	0.0189 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0351 U	0.0351 U	0.0351 U	0.0351 U	0.00351 U	0.00351 U	0.00358 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	0.00362 U	
Endrin		8	8	0.0362 U	0.0362 U	0.0187 U	0.0189 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0185 U	0.0351 U	0.0351 U	0.0351 U	0.0351 U	0.00351 U	0.00351 U	0.00358 U	0.00362 U	0.00362 U	0.0036						

**Table 2**  
**Comparison of Groundwater Results to MCP Method 1 Standards**  
**Former B & M Railroad**  
**Newburyport, Massachusetts**

Analysis	Analyte	Method 1 GW-3	Sample Location: Date sampled:	MW-1 4/12/2006	MW-2 4/12/2006	MW-4 4/12/2006	MW-9 4/12/2006	MW-10 4/12/2006
VOCs (ug/L)	Methylene chloride	50000		NA	NA	NA	NA	5.0 U
	1,1-Dichloroethane	20000		NA	NA	NA	NA	4.6
	Chloroform	10000		NA	NA	NA	NA	0.88
	Carbon tetrachloride	5000		NA	NA	NA	NA	0.50 U
	1,2-Dichloropropane	50000		NA	NA	NA	NA	1.8 U
	Dibromochloromethane	50000		NA	NA	NA	NA	0.50 U
	1,1,2-Trichloroethane	50000		NA	NA	NA	NA	0.75 U
	Tetrachloroethene	30000		NA	NA	NA	NA	0.73
	Chlorobenzene	1000		NA	NA	NA	NA	0.50 U
	Trichlorofluoromethane	NS		NA	NA	NA	NA	2.5 U
	1,2-Dichloroethane	20000		NA	NA	NA	NA	0.50 U
	1,1,1-Trichloroethane	20000		NA	NA	NA	NA	3.8
	Bromodichloromethane	50000		NA	NA	NA	NA	0.50 U
	trans-1,3-Dichloropropene	2000 <sup>nd</sup>		NA	NA	NA	NA	0.50 U
	cis-1,3-Dichloropropene	2000 <sup>nd</sup>		NA	NA	NA	NA	0.50 U
	1,1-Dichloropropene	NS		NA	NA	NA	NA	2.5 U
	Bromoform	50000		NA	NA	NA	NA	2.0 U
	1,1,2,2-Tetrachloroethane	50000		NA	NA	NA	NA	0.50 U
	Benzene	10000		NA	NA	NA	NA	13
	Toluene	4000		NA	NA	NA	NA	1.6
	Ethylbenzene	4000		NA	NA	NA	NA	9.6
	Chloromethane	NS		NA	NA	NA	NA	2.5 U
	Bromomethane	50000		NA	NA	NA	NA	1.0 U
	Vinyl chloride	50000		NA	NA	NA	NA	7.8
	Chloroethane	NS		NA	NA	NA	NA	1.0 U
	1,1-Dichloroethene	30000		NA	NA	NA	NA	0.50 U
	trans-1,2-Dichloroethene	50000		NA	NA	NA	NA	0.75 U
	Trichloroethene	5000		NA	NA	NA	NA	17
	1,2-Dichlorobenzene	2000		NA	NA	NA	NA	2.5 U
	1,3-Dichlorobenzene	50000		NA	NA	NA	NA	2.5 U
	1,4-Dichlorobenzene	8000		NA	NA	NA	NA	2.5 U
	Methyl tert butyl ether	50000		NA	NA	NA	NA	1.0 U
	p/m-Xylene	500		NA	NA	NA	NA	4.8
	o-Xylene	500		NA	NA	NA	NA	1.2
	cis-1,2-Dichloroethene	50000		NA	NA	NA	NA	14
	Dibromomethane	NS		NA	NA	NA	NA	5.0 U
	1,2,3-Trichloropropane	NS		NA	NA	NA	NA	5.0 U
	Styrene	6000		NA	NA	NA	NA	1.0 U
	Dichlorodifluoromethane	NS		NA	NA	NA	NA	5.0 U
	Acetone	50000		NA	NA	NA	NA	5.0 U
	Carbon disulfide	NS		NA	NA	NA	NA	5.0 U
	2-Butanone	50000		NA	NA	NA	NA	5.0 U
	4-Methyl-2-pentanone	50000		NA	NA	NA	NA	5.0 U
	2-Hexanone	NS		NA	NA	NA	NA	5.0 U
	Bromochloromethane	NS		NA	NA	NA	NA	2.5 U
	Tetrahydrofuran	NS		NA	NA	NA	NA	10 U
	2,2-Dichloropropane	NS		NA	NA	NA	NA	2.5 U
	1,2-Dibromoethane	50000		NA	NA	NA	NA	2.0 U
	1,3-Dichloropropane	NS		NA	NA	NA	NA	2.5 U
	1,1,1,2-Tetrachloroethane	50000		NA	NA	NA	NA	0.50 U
	Bromobenzene	NS		NA	NA	NA	NA	2.5 U
	n-Butylbenzene	4000 <sup>th</sup>		NA	NA	NA	NA	5.5
	sec-Butylbenzene	4000 <sup>th</sup>		NA	NA	NA	NA	1.8
	tert-Butylbenzene	4000 <sup>th</sup>		NA	NA	NA	NA	2.5 U
	o-Chlorotoluene	NS		NA	NA	NA	NA	2.5 U
	p-Chlorotoluene	NS		NA	NA	NA	NA	2.5 U
	1,2-Dibromo-3-chloropropane	NS		NA	NA	NA	NA	2.5 U
	Hexachlorobutadiene	3000		NA	NA	NA	NA	0.60 U
	Isopropylbenzene	4000 <sup>th</sup>		NA	NA	NA	NA	3.2
	p-Isopropyltoluene	4000 <sup>th</sup>		NA	NA	NA	NA	1.8
	Naphthalene	20000		NA	NA	NA	NA	9.3
	n-Propylbenzene	4000 <sup>th</sup>		NA	NA	NA	NA	8.8
	1,2,3-Trichlorobenzene	NS		NA	NA	NA	NA	2.5 U
	1,2,4-Trichlorobenzene	50000		NA	NA	NA	NA	2.5 U
	1,3,5-Trimethylbenzene	4000 <sup>th</sup>		NA	NA	NA	NA	4.0
	1,2,4-Trimethylbenzene	4000 <sup>th</sup>		NA	NA	NA	NA	23
	Ethyl ether	NS		NA	NA	NA	NA	2.5 U
	Isopropyl Ether	NS		NA	NA	NA	NA	2.0 U
	Ethyl-Tert-Butyl-Ether	NS		NA	NA	NA	NA	2.0 U
	Tertiary-Amyl Methyl Ether	NS		NA	NA	NA	NA	2.0 U
	1,4-Dioxane	NS		NA	NA	NA	NA	250 U

**Table 2**  
**Comparison of Groundwater Results to MCP Method 1 Standards**  
**Former B & M Railroad**  
**Newburyport, Massachusetts**

Analysis	Analyte	Method 1 GW-3	Sample Location: Date sampled:	MW-1 4/12/2006	MW-2 4/12/2006	MW-4 4/12/2006	MW-9 4/12/2006	MW-10 4/12/2006
<b>EPH</b> (ug/L)	C9 - C18 Aliphatics	20000		100 U	100 U	100 U	100 U	100 U
	C19 - C36 Aliphatics	50000		100 U	100 U	100 U	100 U	100 U
	C11 - C22 Aromatics	30000		100 U	100 U	100 U	100 U	100 U
	Naphthalene	20000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	2-Methylnaphthalene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Acenaphthylene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Acenaphthene	5000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Fluorene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Phenanthrene	50		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Anthracene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Fluoranthene	200		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Pyrene	20		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(a)anthracene	1000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Chrysene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(b)fluoranthene	400		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(k)fluoranthene	100		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(a)pyrene	500		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Indeno(1,2,3-cd)Pyrene	100		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
<b>Metals</b> (ug/L)	Dibenzo(a,h)anthracene	40		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(ghi)perylene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Antimony, Total	8000		0.8	0.5 U	0.5 U	0.5 U	0.5 U
	Arsenic, Total	900		3.7	29.4	1.5	16.3	6.8
	Barium, Total	50000		77.3	56.8	18.2	39.5	840
	Beryllium, Total	50		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	Cadmium, Total	4		0.5 U	0.5 U	0.5 U	0.5 U	0.7
	Chromium, Total	300		1.9	0.5	0.9	14.2	3.4
	Lead, Total	10		1.2	0.5 U	0.5 U	6.1	2.0
	Nickel, Total	200		6.3	7.4	9.5	21.2	777.1
	Selenium, Total	100		6.0	1.0 U	2.0	1.0 U	1.0 U
	Silver, Total	7		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
<b>Cyanide (Total)</b> (ug/L)	Thallium, Total	3000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	Vanadium, Total	4000		1.2	0.5 U	0.5 U	10.2	0.5 U
	Zinc, Total	900		138.6	52.4	5.0 U	20.9	35.5
<b>Cyanide (Total) (ug/L)</b>		30		NA	NA	NA	NA	167

**Notes:**

All units in ug/L unless otherwise specified.

ug/L - micrograms per liter.

NS - No standard available for this compound.

(1) - Per the MCP VOC Analytical Method requirements, the results for these compounds are compared to the MCP Method 1 GW-3 standard for C9-C10 aromatic hydrocarbons.

(2) - MCP Method 1 GW-3 standard for 1,3-Dichloropropene used.

U - Compound was not detected at specified quantitation limit.

NA - Sample not analyzed for the listed analyte.

Values in Bold indicate the compound was detected.

Values shown in Bold and shaded type equal or exceed MCP Method 1 GW-3 standard.

VOCs - Volatile Organic Compounds.

EPH - Extractable Petroleum Hydrocarbons.

MCP - Massachusetts Contingency Plan.

## FIGURES





**APPENDIX A**

**BUREAU OF WASTE SITE CLEANUP**  
**TRANSMITTAL FORMS**



Massachusetts Department of Environmental Protection  
Bureau of Waste Site Cleanup

BWSC104

RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.1000 (Subpart J)

Release Tracking Number

3 - 26210

For sites with multiple RTNs, enter the Primary RTN above.

A. SITE LOCATION:

1. Site Name/Location Aid: Former Boston & Maine Railroad Line
2. Street Address: 1.3 Miles of Inactive Railroad Corridor between Newburyport Turnpike & Water St.
3. City/Town: Newburyport 4. ZIP Code: 01950-0000

☐ 5. Check here if a Tier Classification Submittal has been provided to DEP for this disposal site.

- ☐ a. Tier IA ☐ b. Tier IB ☐ c. Tier IC ☐ d. Tier II

6. If a Tier I Permit has been issued, provide Permit Number: \_\_\_\_\_

B. THIS FORM IS BEING USED TO: (check all that apply)

1. List Submittal Date of RAO Statement (if previously submitted): \_\_\_\_\_ mm/dd/yyyy

☒ 2. Submit a Response Action Outcome (RAO) Statement

☐ a. Check here if this RAO Statement covers additional Release Tracking Numbers (RTNs). RTNs that have been previously linked to a Tier Classified Primary RTN do not need to be listed here.

b. Provide additional Release Tracking Number(s) covered by this RAO Statement.

☐ -  ☐ -

☐ 3. Submit a Revised Response Action Outcome Statement

☐ a. Check here if this Revised RAO Statement covers additional Release Tracking Numbers (RTNs), not listed on the RAO Statement or previously submitted Revised RAO Statements. RTNs that have been previously linked to a Tier Classified Primary RTN do not need to be listed here.

b. Provide additional Release Tracking Number(s) covered by this RAO Statement.

☐ -  ☐ -

☐ 4. Submit a Response Action Outcome Partial (RAO-P) Statement

Check above box, if any Response Actions remain to be taken to address conditions associated with this disposal site having the Primary RTN listed in the header section of this transmittal form. This RAO Statement will record only an RAO-Partial Statement for that RTN. A final RAO Statement will need to be submitted that references all RAO-Partial Statements and, if applicable, covers any remaining conditions not covered by the RAO-Partial Statements.

Also, specify if you are an Eligible Person or Tenant pursuant to M.G.L. c. 21E s.2, and have no further obligation to conduct response actions on the remaining portion(s) of the disposal site:

- ☐ a. Eligible Person ☐ b. Eligible Tenant

☐ 5. Submit an optional Phase I Completion Statement supporting an RAO Statement

☐ 6. Submit a Periodic Review Opinion evaluating the status of a Temporary Solution for a Class C-1 RAO Statement, as specified in 310 CMR 40.1051 (Section F is optional)

☐ 7. Submit a Retraction of a previously submitted Response Action Outcome Statement (Sections E & F are not required)

(All sections of this transmittal form must be filled out unless otherwise noted above)

RECEIVED  
DEC - 4 2006  
DEP  
NORTHEAST REGIONAL OFFICE

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DEC 04 2006

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NORTHEAST REGIONAL OFFICE





RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.1000 (Subpart J)

Release Tracking Number

3

26210

C. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply; for volumes, list cumulative amounts)

- |                                                                              |                                                         |
|------------------------------------------------------------------------------|---------------------------------------------------------|
| <input checked="" type="checkbox"/> 1. Assessment and/or Monitoring Only     | <input type="checkbox"/> 2. Temporary Covers or Caps    |
| <input type="checkbox"/> 3. Deployment of Absorbent or Containment Materials | <input type="checkbox"/> 4. Treatment of Water Supplies |
| <input type="checkbox"/> 5. Structure Venting System                         | <input type="checkbox"/> 6. Engineered Barrier          |
| <input type="checkbox"/> 7. Product or NAPL Recovery                         | <input type="checkbox"/> 8. Fencing and Sign Posting    |
| <input type="checkbox"/> 9. Groundwater Treatment Systems                    | <input type="checkbox"/> 10. Soil Vapor Extraction      |
| <input type="checkbox"/> 11. Bioremediation                                  | <input type="checkbox"/> 12. Air Sparging               |
| <input type="checkbox"/> 13. Monitored Natural Attenuation                   | <input type="checkbox"/> 14. In-situ Chemical Oxidation |

☐ 15. Removal of Contaminated Soils

☐ a. Re-use, Recycling or Treatment ☐ i. On Site Estimated volume in cubic yards \_\_\_\_\_

☐ ii. Off Site Estimated volume in cubic yards \_\_\_\_\_

ia. Facility Name: \_\_\_\_\_ Town: \_\_\_\_\_ State: \_\_\_\_\_

iib. Facility Name: \_\_\_\_\_ Town: \_\_\_\_\_ State: \_\_\_\_\_

iii. Describe: \_\_\_\_\_

☐ b. Landfill

☐ i. Cover Estimated volume in cubic yards \_\_\_\_\_

Facility Name: \_\_\_\_\_ Town: \_\_\_\_\_ State: \_\_\_\_\_

☐ ii. Disposal Estimated volume in cubic yards \_\_\_\_\_

Facility Name: \_\_\_\_\_ Town: \_\_\_\_\_ State: \_\_\_\_\_

☐ 16. Removal of Drums, Tanks or Containers:

a. Describe Quantity and Amount: \_\_\_\_\_

b. Facility Name: \_\_\_\_\_ Town: \_\_\_\_\_ State: \_\_\_\_\_

c. Facility Name: \_\_\_\_\_ Town: \_\_\_\_\_ State: \_\_\_\_\_

☐ 17. Removal of Other Contaminated Media:

a. Specify Type and Volume: \_\_\_\_\_

b. Facility Name: \_\_\_\_\_ Town: \_\_\_\_\_ State: \_\_\_\_\_

c. Facility Name: \_\_\_\_\_ Town: \_\_\_\_\_ State: \_\_\_\_\_



**RESPONSE ACTION OUTCOME (RAO) STATEMENT**

Pursuant to 310 CMR 40.1000 (Subpart J)

Release Tracking Number

3

26210

**C. DESCRIPTION OF RESPONSE ACTIONS (cont.):** (check all that apply; for volumes, list cumulative amounts)

☐ 18. Other Response Actions:

Describe: \_\_\_\_\_

☐ 19. Use of Innovative Technologies:

Describe: \_\_\_\_\_

**D. SITE USE:**

1. Are the response actions that are the subject of this submittal associated with the *redevelopment, reuse* or the *major expansion of the current use* of property(ies) impacted by the presence of oil and/or hazardous materials?

☐ a. Yes ☒ b. No ☐ c. Don't know

2. Is the property a *vacant or under-utilized commercial or industrial property* ("a brownfield property")?

☒ a. Yes ☐ b. No ☐ c. Don't know

3. Will funds from a state or federal brownfield incentive program be used on one or more of the property(ies) within the disposal site?

☒ a. Yes ☐ b. No ☐ c. Don't know If Yes, identify program(s): \_\_\_\_\_

4. Has a Covenant Not to Sue been obtained or sought?

☐ a. Yes ☐ b. No ☒ c. Don't know

5. Check all applicable categories that apply to the person making this submittal: ☐ a. Redevelopment Agency or Authority

☐ b. Community Development Corporation ☐ c. Economic Development and Industrial Corporation

☐ d. Private Developer ☐ e. Fiduciary ☐ f. Secured Lender ☒ g. Municipality

☐ h. Potential Buyer (non-owner) ☐ i. Other, describe: \_\_\_\_\_

**This data will be used by MassDEP for information purposes only, and does not represent or create any legal commitment, obligation or liability on the part of the party or person providing this data to MassDEP.**

**E. RESPONSE ACTION OUTCOME CLASS:**

Specify the Class of Response Action Outcome that applies to the disposal site, or site of the Threat of Release.  
Select **ONLY** one Class.

☐ 1. Class A-1 RAO: Specify one of the following:

☐ a. Contamination has been reduced to background levels. ☐ b. A Threat of Release has been eliminated.

☐ 2. Class A-2 RAO: You **MUST** provide justification that reducing contamination to or approaching background levels is infeasible.

☐ 3. Class A-3 RAO: You **MUST** provide an implemented Activity and Use Limitation (AUL) and justification that reducing contamination to or approaching background levels is infeasible.

☐ 4. Class A-4 RAO: You **MUST** provide an implemented AUL, justification that reducing contamination to or approaching background levels is infeasible, and justification that reducing contamination to less than Upper Concentration Limits (UCLs) 15 feet below ground surface or below an Engineered Barrier is infeasible. If the Permanent Solution relies upon an Engineered Barrier, you must provide or have previously provided a Phase III Remedial Action Plan that justifies the selection of the Engineered Barrier.



RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.1000 (Subpart J)

Release Tracking Number

3

26210

E. RESPONSE ACTION OUTCOME CLASS (cont.):

☒ 5. Class B-1 RAO: Specify one of the following:

- ☐ a. Contamination is consistent with background levels ☒ b. Contamination is **NOT** consistent with background levels.

☐ 6. Class B-2 RAO: You **MUST** provide an implemented AUL.

☐ 7. Class B-3 RAO: You **MUST** provide an implemented AUL and justification that reducing contamination to less than Upper Concentration Limits (UCLs) 15 feet below ground surface is infeasible.

☐ 8. Class C-1 RAO: You must submit a plan as specified at 310 CMR 40.0861(2)(h). Indicate type of ongoing response actions.

- ☐ a. Active Remedial System ☐ b. Active Remedial Monitoring Program ☐ c. None

☐ d. Other Specify: \_\_\_\_\_

☐ 9. Class C-2 RAO: You must hold a valid Tier I Permit or Tier II Classification to continue response actions toward a Permanent Solution.

F. RESPONSE ACTION OUTCOME INFORMATION:

1. Specify the Risk Characterization Method(s) used to achieve the RAO described above:

- ☒ a. Method 1 ☐ b. Method 2 ☐ c. Method 3  
☐ d. Method Not Applicable-Contamination reduced to or consistent with background, or Threat of Release abated

2. Specify all Soil Category(ies) applicable. More than one Soil Category may apply at a Site. Be sure to check off all **APPLICABLE** categories:

- ☐ a. S-1/GW-1 ☒ d. S-2/GW-1 ☐ g. S-3/GW-1  
☐ b. S-1/GW-2 ☐ e. S-2/GW-2 ☐ h. S-3/GW-2  
☐ c. S-1/GW-3 ☒ f. S-2/GW-3 ☐ i. S-3/GW-3

3. Specify all Groundwater Category(ies) impacted. A site may impact more than one Groundwater Category. Be sure to check off all **IMPACTED** categories:

- ☐ a. GW-1 ☐ b. GW-2 ☐ c. GW-3 ☒ d. No Groundwater Impacted

4. Specify remediation conducted:

- ☐ a. Check here if soil remediation was conducted.  
☐ b. Check here if groundwater remediation was conducted.

5. Specify whether the analytical data used to support the Response Action Outcome was generated pursuant to the Department's Compendium of Analytical Methods (CAM) and 310 CMR 40.1056:

- ☒ a. CAM used to support all analytical data. ☐ b. CAM used to support some of the analytical data.  
☐ c. CAM not used.

☒ 6. Check here to certify that the Class A, B or C Response Action Outcome includes a Data Usability Assessment and Data Representativeness Evaluation pursuant to 310 CMR 40.1056.

7. Estimate the number of acres this RAO Statement applies to: 17.5



Massachusetts Department of Environmental Protection  
Bureau of Waste Site Cleanup

BWSC104

RESPONSE ACTION OUTCOME (RAO) STATEMENT

Release Tracking Number

3 - 26210

Pursuant to 310 CMR 40.1000 (Subpart J)

G. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR 4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

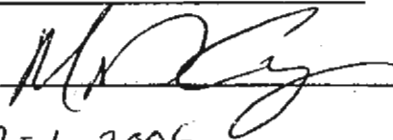
> if Section B indicates that either an RAO Statement, Phase I Completion Statement and/or Periodic Review Opinion is being provided, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal.

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP #: 5319

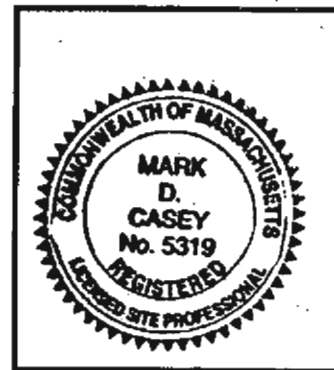
2. First Name: Mark 3. Last Name: Casey

4. Telephone: 978-656-3609 5. Ext.: 6. FAX: 978-453-1995

7. Signature: 

8. Date: 12-1-2006  
mm/dd/yyyy

9. LSP Stamp:



H. PERSON MAKING SUBMITTAL:

1. Check all that apply: ☐ a. change in contact name ☐ b. change of address ☐ c. change in the person undertaking response actions

2. Name of Organization: City of Newburyport

3. Contact First Name: Geordie 4. Last Name: Vining

5. Street: 60 Pleasant Street 6. Title: Senior Project Manager

7. City/Town: Newburyport 8. State: MA 9. ZIP Code: 01950-0000

10. Telephone: 978-465-4400 11. Ext.: 12. FAX: 978-465-4452



Massachusetts Department of Environmental Protection  
Bureau of Waste Site Cleanup

BWSC104

RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.1000 (Subpart J)

Release Tracking Number

3

26210

I. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON MAKING SUBMITTAL:

- ☒ 1. RP or PRP ☒ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter  
☐ e. Other RP or PRP Specify: \_\_\_\_\_
- ☐ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)
- ☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))
- ☐ 4. Any Other Person Making Submittal Specify Relationship: \_\_\_\_\_

J. REQUIRED ATTACHMENT AND SUBMITTALS:

- ☐ 1. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.
- ☐ 2. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the submittal of an RAO Statement that relies on the public way/rail right-of-way exemption from the requirements of an AUL.
- ☒ 3. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the submittal of a RAO Statement with instructions on how to obtain a full copy of the report.
- ☒ 4. Check here to certify that documentation is attached specifying the location of the Site, or the location and boundaries of the Disposal Site subject to this RAO Statement. If submitting an RAO Statement for a PORTION of a Disposal Site, you must document the location and boundaries for both the portion subject to this submittal and, to the extent defined, the entire Disposal Site.
- ☒ 5. Check here to certify that, pursuant to 310 CMR 40.1406, notice was provided to the owner(s) of each property within the disposal site boundaries, or notice was not required because the disposal site boundaries are limited to property owned by the party conducting response actions. (check all that apply)
- ☐ a. Notice was provided prior to, or concurrent with the submittal of a Phase II Completion Statement to the Department.
- ☐ b. Notice was provided prior to, or concurrent with the submittal of this RAO Statement to the Department.
- ☒ c. Notice not required. d. Total number of property owners notified, if applicable: \_\_\_\_\_
- ☐ 6. Check here if required to submit one or more AULs. You must submit an AUL Transmittal Form (BWSC113) and a copy of each implemented AUL related to this RAO Statement. Specify the type of AUL(s) below: (required for Class A-3, A-4, B-2, B-3 RAO Statements)
- ☐ a. Notice of Activity and Use Limitation b. Number of Notices submitted: \_\_\_\_\_
- ☐ c. Grant of Environmental Restriction d. Number of Grants submitted: \_\_\_\_\_
- ☐ 7. If an RAO Compliance Fee is required for any of the RTNs listed on this transmittal form, check here to certify that an RAO Compliance Fee was submitted to DEP, P. O. Box 4062, Boston, MA 02211.
- ☐ 8. Check here if any non-updatable information provided on this form is incorrect, e.g. Site Address/Location Aid. Send corrections to the DEP Regional Office.
- ☒ 9. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.



Massachusetts Department of Environmental Protection  
Bureau of Waste Site Cleanup

BWSC104

RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.1000 (Subpart J)

Release Tracking Number

3

-

26210

K. CERTIFICATION OF PERSON MAKING SUBMITTAL:

1. I, Geordie Vining, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By:

Signature

3. Title: Senior Project Manager

4. For:

City of Newburyport

(Name of person or entity recorded in Section H)

5. Date:

11/28/2006  
mm/dd/yyyy



6. Check here if the address of the person providing certification is different from address recorded in Section H.

7. Street:

8. City/Town:

9. State:

10. ZIP Code:

11. Telephone:

12. Ext.:

13. FAX:

YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO \$10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

Date Stamp (DEP USE ONLY:)

RECEIVED

DEC - 4 2006

DEP  
NORTHEAST REGIONAL OFFICE

**APPENDIX B**

**COPIES OF PUBLIC NOTIFICATION LETTERS**



December 4, 2006

Mr. John Morris  
Director of Public Health  
60 Pleasant Street  
Newburyport, Massachusetts 01950

Re: Response Action Outcome Statement (RAO) Submittal  
Former B&M Rail Line  
Newburyport, Massachusetts  
RTN 3-26210

Dear Mr. Morris:

TRC Environmental Corporation (TRC), on behalf of the City of Newburyport (the "City"), is notifying your office of a submittal of a Class B-1 Response Action Outcome (RAO) Statement prepared for the Former B&M Rail Line in Newbury and Newburyport, Massachusetts (the "Site"). A figure showing the location of the Site is enclosed. This notification is being made in fulfillment of the public notice requirements of the Massachusetts Contingency Plan ("MCP"), 310 CMR 40.1403(3)(f). A Class B-1 RAO Statement indicates that no remedial actions have been conducted because a level of No Significant Risk exists.

A copy of the RAO has been submitted to Mr. Geordie Vining of the City's Office of Planning and Development. The original report was submitted and can be viewed by the public at the Massachusetts Department of Environmental Protection (MADEP) Northeast Regional Office file review office located at 205B Lowell Street in Wilmington, Massachusetts. The public may review the MADEP Northeast Region's files Tuesday through Thursday from 9:00am to 12:00pm (except state holidays). To set up an appointment for a file review, call 978-694-3320.

If you have any questions, please contact Mr. Geordie Vining of the City of Newburyport Office of Planning and Development, at (978) 465-4400.

Sincerely,

TRC ENVIRONMENTAL CORPORATION

A handwritten signature in black ink, appearing to read "Frank Calandra".

Frank Calandra  
Project Manager

Enclosure

cc: Bureau of Waste Site Cleanup, DEP Northeast Regional Office





Aerial Photography Source : MASSGIS 2001 - 1:5000

- SOIL BORING
- ⊕ SOIL BORING/MONITORING WELL

- Aquifer
- Non Potential Drinking Water Source Area
- Medium Yield
- Aquifer
- Medium Yield
- CITY / TOWN LINE
- APPROXIMATE SITE BOUNDARY

ID	EASTING	NORTHING
B-1/MW-1	252220.76611	951220.21059
B-2/MW-2	252287.69915	951138.39869
B-3	252332.94282	950783.22459
B-4/MW-4	252257.22098	950596.00039
B-5	251947.34365	950134.62774
B-6	251751.22033	950174.14058
B-7	251693.69393	950157.92443
B-8	251652.84756	950120.01414
B-9/MW-9	251357.55375	949932.14262
B-10/MW-10	251095.30487	949828.42069

PROJECTION : MASS STATE PLANE NAD83 METERS

FORMER BOSTON AND MAINE RAILROAD SITE  
NEWBURYPORT AND NEWBURY, MASSACHUSETTS

#### SITE PLAN

**TRC**

Soil Vials Exam  
1/10 John Basso  
Lynch, Massachusetts 01860  
215-075-0000

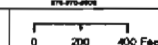


FIGURE  
2



December 4, 2006

Mr. John F. Moak, Mayor  
Newburyport City Hall  
60 Pleasant Street  
Newburyport, Massachusetts 01950

Re: Response Action Outcome Statement (RAO) Submittal  
Former B&M Rail Line  
Newburyport, Massachusetts  
RTN 3-26210

Dear Mayor Moak:

TRC Environmental Corporation (TRC), on behalf of the City of Newburyport (the "City"), is notifying your office of a submittal of a Class B-1 Response Action Outcome (RAO) Statement prepared for the Former B&M Rail Line in Newbury and Newburyport, Massachusetts (the "Site"). A figure showing the location of the Site is enclosed. This notification is being made in fulfillment of the public notice requirements of the Massachusetts Contingency Plan ("MCP"), 310 CMR 40.1403(3)(f). A Class B-1 RAO Statement indicates that no remedial actions have been conducted because a level of No Significant Risk exists.

A copy of the RAO has been submitted to Mr. Geordie Vining of the City's Office of Planning and Development. The original report was submitted and can be viewed by the public at the Massachusetts Department of Environmental Protection (MADEP) Northeast Regional Office file review office located at 205B Lowell Street in Wilmington, Massachusetts. The public may review the MADEP Northeast Region's files Tuesday through Thursday from 9:00am to 12:00pm (except state holidays). To set up an appointment for a file review, call 978-694-3320.

If you have any questions, please contact Mr. Geordie Vining of the City of Newburyport Office of Planning and Development, at (978) 465-4400.

Sincerely,

TRC ENVIRONMENTAL CORPORATION

A handwritten signature in black ink, appearing to read "Frank Calandra".

Frank Calandra  
Project Manager

Enclosure

cc: Bureau of Waste Site Cleanup, DEP Northeast Regional Office



Aerial Photography Source : MASSGIS 2001 - 1:5000

- SOIL BORING
- ⊕ SOIL BORING MONITORING WELL

#### Aquifer

Non Potential Drinking Water Source Area

Medium Yield

#### Aquifer

Medium Yield

CITY / TOWN LINE

APPROXIMATE SITE BOUNDARY

ID	EASTING	NORTHING
B-1/MW-1	252220.75611	951220.21059
B-2/MW-2	252267.69915	951178.39869
B-3	252332.94282	950783.22459
B-4/MW-4	252257.22098	950596.00039
B-5	251947.34365	950334.62774
B-6	251751.22033	950174.14058
B-7	251693.69393	950157.92443
B-8	251652.84756	950120.01414
B-9/MW-9	251357.55375	949932.14262
B-10/MW-10	251095.30487	949828.42069

PROJECTION : MASS STATE PLANE NAD83 METERS

FORMER BOSTON AND MAINE RAILROAD SITE  
NEWBURYPORT AND NEWBURY, MASSACHUSETTS

#### SITE PLAN

TRC  
170 Main Street  
Lowell, MA 01850  
603.452.7000

FIGURE 2

0 200 400 Feet

**APPENDIX C**

**MAY 2006 SITE INVESTIGATION SUMMARY REPORT,  
FORMER BOSTON & MAINE RAILROAD LINE**

# **SITE INVESTIGATION SUMMARY REPORT**

## **FORMER BOSTON & MAINE RAILROAD LINE**

---

***Prepared for:***

Merrimack Valley Planning Commission  
160 Main Street  
Haverhill, Massachusetts 01830

***and***

City of Newburyport, Office of Planning and Development  
Newburyport City Hall  
60 Pleasant Street  
Newburyport, Massachusetts 01950

***Prepared by:***

TRC Environmental Corporation  
116 John Street  
Boott Mills South  
Lowell, Massachusetts 01852

TRC Project Number: 42039-0010-00009/52037-0010-00000

**May 2006**

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Appendix A:	Site Photos
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Appendix C:	Soil and Groundwater Analytical Laboratory Reports

## 1.0 INTRODUCTION

TRC Environmental Corporation (TRC) prepared this Site Investigation Summary Report for the former Boston & Maine (B&M) Railroad Line in Newbury and Newburyport, Massachusetts (the "Site"). A Site location map is shown in Figure 1. This Site investigation was performed on behalf of the City of Newburyport and the Merrimack Valley Planning Commission (MVPC), as part of the MVPC's Brownfields Program funded by a grant from the United States Environmental Protection Agency (EPA).

This Site investigation was conducted in accordance with the scope of work set forth in the EPA-approved Quality Assurance Project Plan (QAPP) Addendum C dated March 2006 (TRC, 2006).

### 1.1 Objective

The purpose of this Site investigation was to conduct field investigations to evaluate Recognized Environmental Conditions (RECs) identified in the Phase I Environmental Site Assessment (ESA) (TRC, 2005) for the Site. The Phase I Environmental Site Assessment identified the following two RECs:

1. Potential soil and groundwater contamination from former railroad use, and
2. Potential soil and groundwater contamination from reported releases at nearby properties.

A summary of the Site investigation objectives and actions performed to address the above RECs is presented in Table 1.

### 1.2 Background

The Site is an approximate 1.3-mile inactive rail corridor which extends from Route 1 in Newbury to the waterfront area in Newburyport. The Site was used historically as a railroad corridor until its abandonment in 1972. It is our understanding that the City of Newburyport plans to purchase this land and develop it as a rail trail for recreational use.

#### 1.2.1 *Potential Soil and Groundwater Contamination from Former Railroad Use*

Environmental impacts typically associated with historic railroad operations include soil and groundwater contamination from releases stemming from the presence of coal, creosote, heavy metals, pesticides, and petroleum. The DEP's *Best Management Practices for Controlling Exposure to Soil during the Development of Rail Trails* guidance document states:

*"Some historic railroad operations involved the use of chemicals that may have resulted in presence today of contamination. The most commonly reported contamination along rail lines includes metals, pesticides, (such as lead arsenate), and constituents of oil or fuel (petroleum products). These chemicals have been associated with normal railroad operations and are likely to be found anywhere along the line. For example, it would not be uncommon to find arsenic (up to ten times natural background levels) present in the soil along a right-of-way from old railroad ties*

*dipped in an arsenic solution, arsenic weed-control sprays, and arsenic-laced slag used as railroad bed fill. Lubricating oil and diesel that dripped from the trains are likely sources of the petroleum product found along the lines. Other sources of contaminants associated with historic railroad operation may include coal ash from engines, creosote from ties, and polynuclear aromatic hydrocarbons ("PAHs") from the diesel exhaust."*

#### **1.2.2 Potential Soil and Groundwater Contamination from Reported Releases at Nearby Properties**

The Phase I ESA identified four nearby releases that could potentially impact the Site.

- 157 Water Street, Newburyport - Potential lead and petroleum contamination in soil and groundwater from oil and hazardous material releases.
- 115 Water Street, Newburyport - Potential soil and groundwater contamination from releases of oil, waste oil and gasoline.
- 12 Parker Street, Newburyport – Potential soil and groundwater contamination from petroleum releases.
- 44 High Street, Newburyport – Potential soil and groundwater contamination from releases of diesel fuel and oil.

In addition to the above sites, TRC evaluated potential impacts to soil and groundwater from the Circle Finishing site located adjacent to the southern terminus of the former rail line at Route 1.



## **2.0 SITE INVESTIGATION**

### **2.1 Visual Site Inspection**

On April 19, 2006, TRC conducted a visual inspection of former railroad line from the northernmost point near the American Yacht Club to the southern terminus at Route 1. The visual inspection is documented by photographs which are included in Appendix A. Narrow portions of the former rail line between Harrison Street and Water Street were obstructed by trees and brush that prevented access (Photo 3).

The northern portion of the former rail line along the abutting 157 Water Street property was inspected, and no apparent impacts from historic releases at 157 Water Street were identified (Photos 1 and 2). TRC also conducted visual inspection of southern terminus of the Site abutting Circle Finishing site (Photos 10, 11, and 12). TRC observed several piles of soil and debris present on the Circle Finishing site. In addition, an existing monitoring well, likely installed to assess groundwater impacts from the Circle Finishing site, was identified.

### **2.2 Soil Boring and Monitoring Well Installation**

Under the supervision of TRC, Geosearch, Inc. of Fitchburg, Massachusetts advanced ten soil borings (B-1 through B-10) along the length of the Site using a direct push GeoProbe™ drill rig. Five of the soil borings (B-1, B-2, B-4, B-9, and B-10) were converted to groundwater monitoring wells. Soil boring and monitoring well locations are shown in Figure 2.

The monitoring wells are constructed of 2-inch diameter flush threaded 0.010-inch slot Schedule 40 PVC well screen, solid PVC riser, and a well cap. Graded washed sand was used to fill the annulus around the well screen to one foot above the top of the well screen. A minimum of a 1-foot bentonite seal was placed above the sand. Monitoring wells are finished with protective flush-mounted road-boxes. Boring logs and monitoring well construction diagrams are included in Appendix B.

Locations of soil borings and monitoring wells were recorded with a Trimble GeoExplorer CE Series (GeoXT) global positioning system (GPS) device. Accuracy of the GPS device is within one meter. Northing and Easting coordinates, referenced in NAD83 State Plane coordinates, are presented in Figure 2.

### **2.3 Soil Sampling**

Prior to sample collection, soil samples were screened in the field with a photoionization detector during boring installation for the presence of volatile compounds using a jar headspace technique. Screening results are indicated on the boring logs in Appendix B.

At each boring location (B-1 through B-10), soil samples were collected from approximately 0 to 3 feet and analyzed for extractable petroleum hydrocarbons (EPH), Massachusetts Contingency Plan (MCP) metals, and pesticides. Soil samples were also collected from approximately 3 to 10 feet at locations B-1, B-2, B-4, B-5, and B-9 and analyzed for EPH. Soil samples collected at

boring B-5 were also analyzed for polychlorinated biphenyls (PCBs) based on the proximate location of a former electric substation structure.

## **2.4 Groundwater Sampling**

TRC conducted one round of groundwater sampling from the five newly-installed monitoring wells MW-1, MW-2, MW-4, MW-9, and MW-10 to evaluate RECs related to groundwater quality. Groundwater samples were analyzed for EPH and MCP Metals. Additionally, the groundwater sample collected from MW-10 was sampled for volatile organic compounds (VOCs) and cyanide based on the presence of a former metals plating facility to the north of the Site.

### **3.0 RESULTS OF INVESTIGATION**

#### **3.1 Hydrogeological Characteristics**

In general, surface and shallow subsurface soils consist of medium to coarse sand throughout the Site. In residential areas where portions of the Site have been seeded with grass and maintained, a layer of topsoil is present. Silts and clays were identified in several borings at and below 5 feet.

Given the proximity of Merrimack River and the Atlantic Ocean, groundwater flow direction is likely tidally influenced. Based on topography, groundwater flow across northerly portions of the former rail line is expected to be in a northerly direction towards the Merrimack River (TRC, 2005). Between Parker Street and High Street, Site groundwater is expected to flow southeasterly from the hill where the water tower is located. At the southern portion of the Site, groundwater flow was measured at the abutting Circle Finishing site and is estimated to flow in a southeasterly direction (LFR, 2003).

No Current Drinking Water Sources were identified within the former rail line. However, the Massachusetts Geographical Information System (GIS) identifies a medium yield aquifer located beneath the portion of the former rail line between High Street and Parker Street. In a separate effort unrelated to this assessment, the City of Newburyport is investigating the feasibility of installing public drinking water supply wells within this aquifer. No monitoring wells were installed within the aquifer footprint during this investigation because the Phase I ESA did not identify any potential impacts to groundwater in this area.

#### **3.2 Results of Soil and Groundwater Testing**

For the purpose of this evaluation, the Site is divided into four representative portions based on geographical and functional features. Soil and groundwater analytical results for each portion of the Site are discussed separately in the following subsections. Copies of the analytical laboratory reports and a data usability assessment prepared by TRC are included in Appendix C.

A summary of soil analytical results is presented in Table 2. The Massachusetts Contingency Plan (MCP) requires that reporting category RCS-1 be applied to soil samples obtained at or within 500 feet of a residential dwelling, residentially-zoned property, school, playground, recreational area or park. All soil boring locations except B-10 are located within 500 feet of residentially-zoned properties. Accordingly, soil analytical results for soil borings B-1 through B-9 are compared to MCP RCS-1 criteria, and soil analytical results for soil borings B-10 are compared to MCP RCS-2 criteria.

A summary of groundwater analytical results is presented in Table 3. Groundwater analytical results are compared to MCP reporting category RCGW-2 as the monitoring wells are not located within in a Current Drinking Water Source Area or within a Potential Drinking Water Source Area. No monitoring wells were installed within the aquifer footprint during this investigation because the Phase I ESA did not identify any potential impacts to groundwater in this area.

### 3.2.1 *North of Water Street*

Two soil borings/monitoring wells, B-1/MW-1 and B-2/MW-2, were advanced in the area north of Water Street.

- **EPH in Soil:** Aliphatic and aromatic fractions and several target polycyclic aromatic hydrocarbons (PAHs) were detected in soil samples. Several PAHs, benzo(a)anthracene, chrysene, benzo(a)pyrene, and dibenzo(a,h)anthracene, were detected in B-2 (0-3') at concentrations exceeding applicable RCS-1 reporting criteria.
- **Pesticides in Soil:** Pesticides were not detected at either B-1 or B-2.
- **Metals in Soil:** Several metals were detected in soil samples from locations B-1 and B-2. Lead was detected in sample B-2 (0-3') at a concentration of 430 milligrams per kilogram (mg/kg) (and 320 mg/kg in a duplicate sample) which exceeds the MCP RCS-1 criterion of 300 mg/kg.
- **Groundwater:** Several metals were detected in groundwater samples from monitoring wells MW-1 and MW-2, but concentrations were below applicable MCP RCGW-2 criteria. EPH was not detected in either MW-1 or MW-2.

### 3.2.2 *Residential Area between Water Street and High Street*

Two soil borings, B-3 and B-4, were advanced in the vicinity of the residential developments between Water Street and High Street.

- **EPH in Soil:** Aliphatic and aromatic fractions and several target PAHs were detected in soil sample B-3 (0-3'). None were detected above applicable MCP RCS-1 reporting criteria.
- **Pesticides in Soil:** The pesticides 4,4'-DDE and 4,4'-DDT were detected in soil sample B-3 (0-3') at concentrations well below their applicable MCP RCS-1 reporting criteria.
- **Metals in Soil:** Several metals were detected in soil samples from locations B-3 and B-4. Arsenic was detected in sample B-3 (0-3') at a concentration of 23 mg/kg which slightly exceeds the MCP RCS-1 reporting criterion of 20 mg/kg.
- **Groundwater:** Several metals were detected in the groundwater sample from monitoring well MW-4, but concentrations were below applicable MCP RCGW-2 criteria. EPH was not detected in MW-4.

### 3.2.3 *Area between High Street and Parker Street*

Four soil borings, B-5 through B-8, were advanced in the area between High Street and Parker Street.

- **EPH in Soil:** EPH was not detected in any of the samples from locations B-5 through B-8.
- **Pesticides in Soil:** Pesticides were not detected in any of the samples from locations B-5 through B-8.

- **Metals in Soil:** Several metals were detected in each of the soil samples. Arsenic was detected in sample B-5 (0-3') at a concentration of 21 mg/kg which slightly exceeds the MCP RCS-1 reporting criterion of 20 mg/kg.
- **PCBs in Soil:** PCBs were not detected in soil sample B-5 (0-3') which was collected in the area of the former electric substation.
- **Groundwater:** No groundwater testing was conducted in this area because the Phase I Environmental Site Assessment (TRC, 2005) did not identify any potential sources of groundwater contamination in this area.

#### 3.2.4 *Area between Parker Street and Route 1*

Two soil borings/monitoring wells, B-9/MW-9 and B-10/MW-10, were advanced in the area between Parker Street and Route 1.

- **EPH in Soil:** Aliphatic and aromatic fractions and several target PAHs were detected in soil sample B-10 (0-3'). Chrysene and benzo(a)pyrene were detected in B-10 (0-3') at concentrations exceeding applicable MCP RCS-2 reporting criteria. EPH was not detected in samples from boring B-9.
- **Pesticides in Soil:** Pesticides were not detected at either B-9 or B-10.
- **Metals in Soil:** Several metals were detected in soil samples from locations B-9 and B-10. Arsenic was detected in sample B-9 (0-3') at a concentration of 27 mg/kg which exceeds the MCP RCS-1 criterion of 20 mg/kg.
- **Groundwater:** Several metals were detected in groundwater samples from monitoring wells MW-9 and MW-10. Nickel was detected in monitoring well MW-10 at a concentration of 777.1 micrograms per liter ( $\mu\text{g/L}$ ), which exceeds the MCP RCGW-2 criterion of 200  $\mu\text{g/L}$ . Several VOCs including trichloroethene (TCE), tetrachloroethene (PCE), vinyl chloride, and benzene were detected in monitoring well MW-10. Vinyl chloride was detected in monitoring well MW-10 at a concentration of 7.8  $\mu\text{g/L}$ , which exceeds the MCP RCGW-2 criterion of 2  $\mu\text{g/L}$ . In addition, cyanide was detected in monitoring well MW-10 at a concentration of 167  $\mu\text{g/L}$ , which exceeds the MCP RCGW-2 criterion of 30  $\mu\text{g/L}$ . EPH was not detected in either MW-9 or MW-10.

## **4.0 DISCUSSION OF FINDINGS**

Considering the results described in Section 3, TRC has identified two potential issues which are discussed below.

### **4.1 Lead, PAHs, and Arsenic above Reportable Concentrations**

Concentrations of lead and several PAH compounds, including benzo(a)anthracene, chrysene, benzo(a)pyrene, and dibenzo(a,h)anthracene, were detected above applicable RCS-1 reportable concentrations in soil between 0 and 3 feet at boring B-2. In addition, arsenic was detected consistently throughout the former rail line in concentrations ranging from 9.1 to 27 mg/kg. Concentrations of arsenic at B-3 (23 mg/kg), B-5 (21 mg/kg), and B-9 (27 mg/kg) were slightly above the RCS-1 reportable concentration of 20 mg/kg. These detected concentrations are likely attributed to either (i) background soil conditions, or (ii) residuals from historic railroad operations such as railroad ties dipped in arsenic solution or arsenic weed control sprays.

These exceedances of MCP RCS-1 reporting criteria represent a release that requires notification by the Site owner to DEP within 120 days of obtaining knowledge per the MCP 310 CMR 40.0315(1). If the City purchases the Site, the City, as the new Site owner, would be required to fulfill the notification obligation within 120 days after the purchase.

Potential costs associated with reporting the release to DEP and conducting response actions is estimated to be on the order of \$5,000 to \$10,000. The likely outcome would be a Class B Response Action Outcome supported by a Method 1 risk assessment. TRC expects that the detected soil and groundwater contaminant concentrations do not pose a Significant Risk as potential exposure point concentrations are less than MCP Method 1 soil cleanup standards. TRC calculated average soil concentrations for the purpose of estimating potential exposure point concentrations that would be used in an MCP Method 1 risk assessment. As shown in Table 4, average soil concentrations, which conservatively include data from boring B-10, meet MCP Method 1 S-1/GW-3 soil standards. Also, groundwater samples from MW-1, MW-2, MW-4, and MW-9 are below applicable MCP Method 1 GW-3 standards. Groundwater analytical data are compared to MCP Method 1 GW-3 standards in Table 5.

### **4.2 Impacts from Circle Finishing Site**

The location of soil boring/monitoring well B-10/MW-10 was selected primarily to evaluate potential impacts to soil and groundwater from the adjacent Circle Finishing site. The Circle Finishing property, located on the edge of the Route 1 traffic circle, was previously home to many businesses including a gas station and an automobile repair shop. In December 1993, a fire destroyed the Circle Finishing building and various metal plating solutions containing chromium, nickel, copper, zinc, and cyanide were released.

In a soil sample from boring B-10, concentrations of two PAHs, chrysene and benzo(a)pyrene, were detected above applicable RCS-2 reportable concentrations in soil sample B-10 (0-3'). Likely sources of these elevated PAHs include runoff from Route 1 asphalt pavement and ash deposition from the fire that destroyed the adjacent Circle Finishing site. In groundwater, vinyl

chloride, nickel, and cyanide were detected at concentrations exceeding applicable MCP RCGW-2 reporting criteria. These compounds are consistent with the chemicals released at the Circle Finishing site.

TRC reviewed the Circle Finishing site Phase II Addendum dated November 18, 2003 (LFR, 2003) to evaluate whether the southern portion of the site is part of the Circle Finishing disposal site. Although a disposal site boundary was not defined in the site plan, monitoring wells were installed on the former rail line, indicating that it is part of the disposal site. Because the portion of the former rail line adjacent to the Circle Finishing site appears to be included in the disposal site boundary, exceedances of reportable concentrations do not require notification to DEP under MCP 310 CMR 40.0317(16)(a), which states notification is not required for releases at a disposal site where a response action is being undertaken in compliance with the provisions of the MCP.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on Site observations and data collected for the Site during this investigation, TRC's conclusions and recommendations are as follows:

- Detections of lead, arsenic, and PAHs in soil above applicable MCP RCS-1 reportable concentrations require notification to the DEP by the current Site owner within 120 day of obtaining knowledge of the release. If the City purchases the Site, they would be required to notify the DEP of the release within 120 days of the date of purchase. Pursuant to 310 CMR 40.0017(6) and 310 CMR 40.1403(10), the City should notify the current property owner of the results of this investigation. Such notification should be made by Friday, April 28, 2006.
- Detections of vinyl chloride, nickel, and cyanide exceeding applicable RCGW-2 reportable concentrations in groundwater in MW-10 do not appear to require notification to DEP because detected contamination is related to the Circle Finishing disposal site where MCP response actions are presently being undertaken. TRC recommends using the best management practice guidance when planning the future rail trail and designing the trail to discourage potential off-path activities on the portion of trail adjacent to Circle Finishing Site to minimize exposure to detected Site contaminants. TRC also recommends that the City evaluate the status of current and planned MCP Response Actions at the Circle Finishing site for the purpose of coordinating design and construction of the future rail trail with any remediation being performed.
- Although limited groundwater testing was performed to evaluate potential impacts from nearby releases, TRC did not evaluate groundwater for potential as a drinking water supply. It is important to note, however, that several VOCs, including TCE, PCE, vinyl chloride, and benzene, were detected in shallow groundwater in monitoring well MW-10 located within one half mile of the aquifer identified by MassGIS.



## 6.0 REFERENCES

LFR, 2003. *Phase II Addendum – Response to Phase II Comments by DEP, Circle Finishing, Inc., US Route 1/Traffic Circle, Newburyport, Massachusetts*, Levine-Fricke, November 18, 2003.

Massachusetts DEP. *Best Management Practices for Controlling Exposure to Soil During the Development of Rail Trails*, Massachusetts Department of Environmental Protection (DEP), undated.

Massachusetts DEP, 2006. *The Massachusetts Contingency Plan, 310 CMR 40.000*, Massachusetts DEP, Effective 4/3/2006.

TRC, 2006. *Quality Assurance Project Plan, Addendum C, Former Boston & Maine Railroad Line, Newbury and Newburyport, Massachusetts*, March 2006.

TRC, 2005. *Phase I Environmental Site Assessment, Former Boston & Maine Railroad Line, Newbury and Newburyport, Massachusetts*, December 2005.

## TABLES

**Table 1**  
**Site Investigation Objectives**  
**Former B&M Railroad Line**  
**Newbury and Newburyport, Massachusetts**

Area of Concern	Issue	Action
<i>REC No. 1</i>		
Entire 1.3-Mile Corridor	Soil contamination from historical use as railroad	Conducted visual inspection of entire railroad line and sampled soil and groundwater at 10 locations along length of line.
Electric Substation	PCB and oil contamination near former electric substation	Sampled soil at boring B-5 for PCBs and petroleum in vicinity of substation.
<i>REC No. 2</i>		
Newburyport Wastewater Treatment Plant, 157 Water Street (RTN 3-24483)	Potential lead and petroleum contamination in soil and groundwater from recent release.	Conducted visual inspection of Site abutting 157 Water Street, sampled surface soil, subsurface soil, and groundwater at locations B-1/MW-1 and B-2/MW-2.
Former C&D Oil Company, 115 Water Street (RTN 3-2947)	Potential groundwater contamination from historic releases of oil.	Conducted groundwater testing in monitoring wells MW-1 and MW-2.
Amcare, 12 Parker Street (RTN 3-2417)	Potential groundwater contamination from historic releases of diesel fuel and waste oil. Site ranking is Tier ID.	Conducted groundwater testing in monitoring wells MW-9 and MW-10.
Auto Parts Site, 44 High Street	Potential petroleum contamination in groundwater from buried car parts.	Conducted groundwater testing in monitoring well MW-4.
Circle Finishing*	Potential soil and groundwater contamination from recent releases.	Conducted visual inspection of Site abutting Circle Finishing and sampled surface soil, subsurface soil, and groundwater.
<b>Notes:</b> <i>* Not included in Phase I Site Assessment Report</i> PCBs = Polychlorinated biphenyls		

**Table 2**  
**Summary of Analytical Results for Soil Samples**  
**Former B & M Railroad**  
**Newburyport, Massachusetts**

Analysis	Analyte	MCP Reportable Concentrations		Sample Location: Depth: Date sampled:	B-1		B-2			B-3
					0-3'	3-10'	0-3'	0-3'	3-10'	0-3'
		RC S-1	RC S-2		4/3/2006	4/3/2006	4/3/2006	4/3/2006	4/3/2006	4/3/2006
EPH (mg/kg)	C9 - C18 Aliphatics	1000	2500		7.25 U	7.75 U	15.0 U	7.58 U	83.8	7.41 U
	C19 - C36 Aliphatics	3000	5000		68.5	7.75 U	15.0 U	10.5	25.6	9.28
	C11 - C22 Aromatics	200	2000		102	7.75 U	139	80.0	55.8	24.9
	Naphthalene	4	40		0.362 U	0.388 U	2.18	1.10	0.527	0.370 U
	2-Methylnaphthalene	4	1000		0.362 U	0.388 U	0.749 U	0.379 U	0.383 U	0.370 U
	Acenaphthylene	100	1000		0.362 U	0.388 U	0.769	0.379 U	0.383 U	0.370 U
	Acenaphthene	20	2500		0.362 U	0.388 U	0.749 U	0.503	0.383 U	0.370 U
	Fluorene	400	2000		0.362 U	0.388 U	0.908	0.594	0.383 U	0.370 U
	Phenanthrene	100	100		0.362 U	0.388 U	10.9	6.98	1.51	0.456
	Anthracene	1000	2500		0.362 U	0.388 U	2.80	1.61	0.383 U	0.370 U
	Fluoranthene	1000	3000		0.616	0.388 U	16.0	9.68	2.10	0.914
	Pyrene	1000	3000		0.644	0.388 U	12.8	7.73	1.66	0.875
	Benzo(a)anthracene	7	40		0.398	0.388 U	7.56	4.35	0.933	0.392
	Chrysene	7	10		0.474	0.388 U	7.37	4.23	0.871	0.513
	Benzo(b)fluoranthene	7	40		0.415	0.388 U	6.57	3.91	0.718	0.626
	Benzo(k)fluoranthene	70	400		0.400	0.388 U	6.02	3.43	0.785	0.503
	Benzo(a)pyrene	2	4		0.459	0.388 U	7.59	4.16	0.889	0.584
	Indeno(1,2,3-cd)Pyrene	7	40		0.362 U	0.388 U	5.00	2.57	0.575	0.473
	Dibenzo(a,h)anthracene	0.7	4		0.362 U	0.388 U	1.02	0.569	0.383 U	0.370 U
	Benzo(ghi)perylene	1000	2500		0.362 U	0.388 U	4.44	2.07	0.500	0.370 U
PCBs (mg/kg)	Aroclor 1016	2	2		NA	NA	NA	NA	NA	NA
	Aroclor 1221	2	2		NA	NA	NA	NA	NA	NA
	Aroclor 1232	2	2		NA	NA	NA	NA	NA	NA
	Aroclor 1242	2	2		NA	NA	NA	NA	NA	NA
	Aroclor 1248	2	2		NA	NA	NA	NA	NA	NA
	Aroclor 1254	2	2		NA	NA	NA	NA	NA	NA
	Aroclor 1260	2	2		NA	NA	NA	NA	NA	NA
Pesticides (mg/kg)	Delta-BHC	10	100		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Lindane	0.003	0.5		0.0290 U	NA	0.0150 U	0.0152 U	NA	0.0148 U
	Alpha-BHC	50	500		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Beta-BHC	10	100		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Heptachlor	0.2	2		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Aldrin	0.04	0.4		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Heptachlor epoxide	0.09	0.7		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Endrin	8	10		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Endrin ketone	NS	NS		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Dieldrin	0.05	0.4		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	4,4'-DDE	3	20		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0228
	4,4'-DDD	4	30		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	4,4'-DDT	3	20		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0463
	Endosulfan I	0.05	0.05		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Endosulfan II	0.05	0.05		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Endosulfan sulfate	0.05	0.05		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Methoxychlor	30	30		0.145 U	NA	0.0749 U	0.0758 U	NA	0.0741 U
	Technical Chlordane	0.7	30		0.145 U	NA	0.0749 U	0.0758 U	NA	0.0741 U
	Toxaphene	10	100		0.145 U	NA	0.0749 U	0.0758 U	NA	0.0741 U
	Hexachlorobenzene	0.7	5		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
Metals (mg/kg)	Antimony, Total	20	30		2.2 U	NA	2.2 U	4.3	NA	2.2 U
	Arsenic, Total	20	20		12	NA	12	13	NA	23
	Barium, Total	1000	3000		43	NA	100	83	NA	40
	Beryllium, Total	0.7	0.8		0.22 U	NA	0.22 U	0.23 U	NA	0.22 U
	Cadmium, Total	2	30		0.43 U	NA	0.44 U	0.45 U	NA	0.44 U
	Chromium, Total	30	200		15	NA	15	13	NA	21
	Lead, Total	300	300		80	NA	430	320	NA	280
	Nickel, Total	20	700		12	NA	12	12	NA	17
	Selenium, Total	400	800		2.2 U	NA	2.2 U	2.3 U	NA	2.2 U
	Silver, Total	100	200		0.43 U	NA	0.44 U	0.45 U	NA	0.44 U
	Thallium, Total	8	60		2.2 U	NA	2.2 U	2.3 U	NA	2.2 U
	Vanadium, Total	600	1000		16	NA	16	13	NA	16
	Zinc, Total	2500	3000		120	NA	130	130	NA	57
Solids (Total) (%)		NS	NS		92	86	89	88	87	90

**Notes:**

All units in mg/kg unless otherwise specified.

mg/kg - milligrams per kilogram (dry weight) or parts per million (ppm).

\* - MCP RC S-2 criteria were used to compare with the results at this location only.

NS - No criterion available for this compound.

U - Compound was not detected at specified quantization limit.

NA - Sample not analyzed for the listed analyte.

Values in Bold indicate the compound was detected.

Values shown in Bold and shaded type equal or exceed the computed MCP RC criterion.

EPH - Extractable Petroleum Hydrocarbons.

PCBs - Polychlorinated Biphenyls

MCP - Massachusetts Contingency Plan.

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**Table 2**  
**Summary of Analytical Results for Soil Samples**  
**Former B & M Railroad**  
**Newburyport, Massachusetts**

Analysis	Analyte	MCP Reportable Concentrations		Sample Location: Depth: Date sampled:	B-4		B-5			B-6	
		RC S-1	RC S-2		0-3'	3-10'	0-3'	0-3'	3-10'	0-3'	
					4/3/2006	4/3/2006	4/3/2006	4/3/2006 Field Dup	4/3/2006	4/3/2006	
EPH (mg/kg)	C9 - C18 Aliphatics	1000	2500		7.33 U	7.17 U	7.02 U	NA	6.94 U	7.02 U	
	C19 - C36 Aliphatics	3000	5000		7.33 U	7.17 U	7.02 U	NA	6.94 U	7.02 U	
	C11 - C22 Aromatics	200	2000		7.33 U	7.17 U	7.02 U	NA	6.94 U	7.02 U	
	Naphthalene	4	40		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	2-Methylnaphthalene	4	1000		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Acenaphthylene	100	1000		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Acenaphthene	20	2500		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Fluorene	400	2000		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Phenanthrene	100	100		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Anthracene	1000	2500		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Fluoranthene	1000	3000		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Pyrene	1000	3000		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Benzo(a)anthracene	7	40		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Chrysene	7	10		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Benzo(b)fluoranthene	7	40		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Benzo(k)fluoranthene	70	400		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Benzo(a)pyrene	2	4		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
PCBs (mg/kg)	Indeno(1,2,3-cd)Pyrene	7	40		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Dibenzo(a,h)anthracene	0.7	4		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Benzo(ghi)perylene	1000	2500		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U	
	Aroclor 1016	2	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA	
	Aroclor 1221	2	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA	
	Aroclor 1232	2	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA	
	Aroclor 1242	2	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA	
	Aroclor 1248	2	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA	
	Aroclor 1254	2	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA	
	Aroclor 1260	2	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA	
	Pesticides (mg/kg)	Delta-BHC	10	100		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
		Lindane	0.003	0.5		0.0146 U	NA	0.0140 U	NA	NA	0.00281 U
		Alpha-BHC	50	500		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
		Beta-BHC	10	100		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
		Heptachlor	0.2	2		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
		Aldrin	0.04	0.4		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
		Heptachlor epoxide	0.09	0.7		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
Endrin		8	10		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U	
Endrin ketone		NS	NS		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U	
Dieldrin		0.05	0.4		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U	
4,4'-DDE		3	20		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U	
4,4'-DDD		4	30		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U	
4,4'-DDT		3	20		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U	
Endosulfan I		0.05	0.05		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U	
Endosulfan II		0.05	0.05		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U	
Endosulfan sulfate		0.05	0.05		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U	
Metboxychlor		30	30		0.0733 U	NA	0.0702 U	NA	NA	0.0140 U	
Technical Chlordane	0.7	30		0.0733 U	NA	0.0702 U	NA	NA	0.0140 U		
Toxaphene	10	100		0.0733 U	NA	0.0702 U	NA	NA	0.0140 U		
Hexachlorobenzene	0.7	5		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U		
Metals (mg/kg)	Antimony, Total	20	30		2.2 U	NA	2.1 U	NA	NA	2.1 U	
	Arsenic, Total	20	20		9.1	NA	21	NA	NA	19	
	Barium, Total	1000	3000		37	NA	15	NA	NA	16	
	Beryllium, Total	0.7	0.8		0.22 U	NA	0.21 U	NA	NA	0.21 U	
	Cadmium, Total	2	30		0.44 U	NA	0.42 U	NA	NA	0.42 U	
	Chromium, Total	30	200		19	NA	14	NA	NA	16	
	Lead, Total	300	300		20	NA	18	NA	NA	5.6	
	Nickel, Total	20	700		18	NA	13	NA	NA	14	
	Selenium, Total	400	800		2.2 U	NA	2.1 U	NA	NA	2.1 U	
	Silver, Total	100	200		0.44 U	NA	0.42 U	NA	NA	0.42 U	
	Thallium, Total	8	60		2.2 U	NA	2.1 U	NA	NA	2.1 U	
	Vanadium, Total	600	1000		14	NA	9.8	NA	NA	11	
	Zinc, Total	2500	3000		28	NA	130	NA	NA	17	
Solids (Total) (%)		NS	NS		91	93	95	94	96	95	

**Notes:**

All units in mg/kg unless otherwise specified.

mg/kg - milligram per kilogram (dry weight) or parts per million (ppm).

\* - MCP RC S-2 criteria were used to compare with the results at this location only.

NS - No criterion available for this compound.

U - Compound was not detected at specified quantitation limit.

NA - Sample not analyzed for the listed analyte.

Values in Bold indicate the compound was detected.

Values shown in Bold and shaded type equal or exceed the compared MCP RC criterion.

EPH - Extractable Petroleum Hydrocarbons.

PCBs - Polychlorinated Biphenyls.

MCP - Massachusetts Contingency Plan.

**Table 2**  
**Summary of Analytical Results for Soil Samples**  
**Former B & M Railroad**  
**Newburyport, Massachusetts**

Analysis	Analyte	MCP Reportable Concentrations		Sample Location: Depth: Date sampled:	B-7 0-3' 4/3/2006	B-8 0-3' 4/3/2006	B-9		B-10 0-3' 4/4/2006
		RC S-1	RC S-2		0-3' 4/7/2006	3-10' 4/7/2006	0-3' 4/4/2006		
EPH (mg/kg)	C9 - C18 Aliphatics	1000	2500		7.02 U	7.17 U	7.25 U	7.02 U	7.94 U
	C19 - C36 Aliphatics	3000	5000		7.02 U	7.17 U	7.25 U	7.02 U	26.0
	C11 - C22 Aromatics	200	2000		7.02 U	7.17 U	7.25 U	7.02 U	202
	Naphthalene	4	40		0.351 U	0.358 U	0.362 U	0.351 U	0.397 U
	2-Methylnaphthalene	4	1000		0.351 U	0.358 U	0.362 U	0.351 U	0.397 U
	Acenaphthylene	100	1000		0.351 U	0.358 U	0.362 U	0.351 U	0.397 U
	Acenaphthene	20	2500		0.351 U	0.358 U	0.362 U	0.351 U	0.682
	Fluorene	400	2000		0.351 U	0.358 U	0.362 U	0.351 U	0.570
	Phenanthrene	100	100		0.351 U	0.358 U	0.362 U	0.351 U	9.63
	Anthracene	1000	2500		0.351 U	0.358 U	0.362 U	0.351 U	2.92
	Fluoranthene	1000	3000		0.351 U	0.358 U	0.362 U	0.351 U	19.6
	Pyrene	1000	3000		0.351 U	0.358 U	0.362 U	0.351 U	16.3
	Benzo(a)anthracene	7	40		0.351 U	0.358 U	0.362 U	0.351 U	11.8
	Chrysene	7	10		0.351 U	0.358 U	0.362 U	0.351 U	14.4
	Benzo(b)fluoranthene	7	40		0.351 U	0.358 U	0.362 U	0.351 U	10.1
	Benzo(k)fluoranthene	70	400		0.351 U	0.358 U	0.362 U	0.351 U	6.47
	Benzo(a)pyrene	2	4		0.351 U	0.358 U	0.362 U	0.351 U	9.26
	Indeno(1,2,3-cd)Pyrene	7	40		0.351 U	0.358 U	0.362 U	0.351 U	4.72
	Dibenzo(a,h)anthracene	0.7	4		0.351 U	0.358 U	0.362 U	0.351 U	1.19
	Benzo(ghi)perylene	1000	2500		0.351 U	0.358 U	0.362 U	0.351 U	4.24
PCBs (mg/kg)	Aroclor 1016	2	2		NA	NA	NA	NA	NA
	Aroclor 1221	2	2		NA	NA	NA	NA	NA
	Aroclor 1232	2	2		NA	NA	NA	NA	NA
	Aroclor 1242	2	2		NA	NA	NA	NA	NA
	Aroclor 1248	2	2		NA	NA	NA	NA	NA
	Aroclor 1254	2	2		NA	NA	NA	NA	NA
	Aroclor 1260	2	2		NA	NA	NA	NA	NA
Pesticides (mg/kg)	Delta-BHC	10	100		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	Lindane	0.003	0.5		0.00281 U	0.00287 U	0.00290 U	NA	0.0317 U
	Alpha-BHC	50	500		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	Beta-BHC	10	100		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	Heptachlor	0.2	2		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	Aldrin	0.04	0.4		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	Heptachlor epoxide	0.09	0.7		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	Endrin	8	10		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	Endrin ketone	NS	NS		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	Dieldrin	0.05	0.4		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	4,4'-DDE	3	20		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	4,4'-DDD	4	30		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	4,4'-DDT	3	20		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	Endosulfan I	0.05	0.05		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	Endosulfan II	0.05	0.05		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	Endosulfan sulfate	0.05	0.05		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
	Methoxychlor	30	30		0.0140 U	0.0143 U	0.0145 U	NA	0.159 U
	Technical Chlordane	0.7	30		0.0140 U	0.0143 U	0.0145 U	NA	0.159 U
	Toxaphene	10	100		0.0140 U	0.0143 U	0.0145 U	NA	0.159 U
	Hexachlorobenzene	0.7	5		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U
Metals (mg/kg)	Antimony, Total	20	30		2.1 U	2.1 U	2.2 U	NA	2.4 U
	Arsenic, Total	20	20		17	15	27	NA	14
	Barium, Total	1000	3000		13	13	17	NA	40
	Beryllium, Total	0.7	0.8		0.21 U	0.21 U	0.22 U	NA	0.24 U
	Cadmium, Total	2	30		0.42 U	0.42 U	0.43 U	NA	0.47 U
	Chromium, Total	30	200		12	12	16	NA	54
	Lead, Total	300	300		6.0	5.4	9.9	NA	28
	Nickel, Total	20	700		11	12	15	NA	71
	Selenium, Total	400	800		2.1 U	2.1 U	2.2 U	NA	2.4 U
	Silver, Total	100	200		0.42 U	0.42 U	0.43 U	NA	0.54
	Thallium, Total	8	60		2.1 U	2.1 U	2.2 U	NA	2.4 U
	Vanadium, Total	600	1000		9.2	9.5	13	NA	20
	Zinc, Total	2500	3000		15	15	25	NA	61
	Solids (Total) (%)		NS	NS		95	93	92	95

**Notes:**

All units in mg/kg unless otherwise specified.

mg/kg - milligrams per kilogram (dry weight) or parts per million (ppm).

\* - MCP RCS-2 criteria were used to compare with the results at this location only.

NS - No criterion available for this compound.

U - Compound was not detected at specified quantitation limit.

NA - Sample not analyzed for the listed analyte.

Values in Bold indicate the compound was detected.

Values shown in Bold and shaded type equal or exceed the compared MCP RC criterion

EPH - Extractable Petroleum Hydrocarbons.

PCBs - Polychlorinated Biphenyls.

MCP - Massachusetts Contingency Plan.

**Table 3**  
**Summary of Analytical Results for Groundwater Samples**  
**Former B & M Railroad**  
**Newburyport, Massachusetts**

Analysis	Analyte	MCP RC GW-2	Sample Location: Date sampled:	MW-1 4/12/2006	MW-2 4/12/2006	MW-4 4/12/2006	MW-9 4/12/2006	MW-10 4/12/2006
VOCs (ug/L)	Methylene chloride	10000		NA	NA	NA	NA	5.0 U
	1,1-Dichloroethane	1000		NA	NA	NA	NA	4.6
	Chloroform	400		NA	NA	NA	NA	0.88
	Carbon tetrachloride	2		NA	NA	NA	NA	0.50 U
	1,2-Dichloropropane	3		NA	NA	NA	NA	1.8 U
	Dibromochloromethane	20		NA	NA	NA	NA	0.50 U
	1,1,2-Trichloroethane	900		NA	NA	NA	NA	0.75 U
	Tetrachloroethene	50		NA	NA	NA	NA	0.73
	Chlorobenzene	200		NA	NA	NA	NA	0.50 U
	Trichlorofluoromethane	100000		NA	NA	NA	NA	2.5 U
	1,2-Dichloroethane	5		NA	NA	NA	NA	0.50 U
	1,1,1-Trichloroethane	4000		NA	NA	NA	NA	3.8
	Bromodichloromethane	6		NA	NA	NA	NA	0.50 U
	trans-1,3-Dichloropropene	5 <sup>19</sup>		NA	NA	NA	NA	0.50 U
	cis-1,3-Dichloropropene	5 <sup>19</sup>		NA	NA	NA	NA	0.50 U
	1,1-Dichloropropene	5 <sup>19</sup>		NA	NA	NA	NA	2.5 U
	Bromoform	700		NA	NA	NA	NA	2.0 U
	1,1,2,2-Tetrachloroethane	9		NA	NA	NA	NA	0.50 U
	Benzene	2000		NA	NA	NA	NA	13
	Toluene	4000		NA	NA	NA	NA	1.6
	Ethylbenzene	4000		NA	NA	NA	NA	9.6
	Chloromethane	10000		NA	NA	NA	NA	2.5 U
	Bromomethane	2		NA	NA	NA	NA	1.0 U
	Vinyl chloride	2		NA	NA	NA	NA	7.8
	Chloroethane	10000		NA	NA	NA	NA	1.0 U
	1,1-Dichloroethene	80		NA	NA	NA	NA	0.50 U
	trans-1,2-Dichloroethene	90		NA	NA	NA	NA	0.75 U
	Trichloroethene	30		NA	NA	NA	NA	17
	1,2-Dichlorobenzene	2000		NA	NA	NA	NA	2.5 U
	1,3-Dichlorobenzene	2000		NA	NA	NA	NA	2.5 U
	1,4-Dichlorobenzene	200		NA	NA	NA	NA	2.5 U
	Methyl tert butyl ether	50000		NA	NA	NA	NA	1.0 U
	p/m-Xylene	500		NA	NA	NA	NA	4.8
	o-Xylene	500		NA	NA	NA	NA	1.2
	cis-1,2-Dichloroethene	100		NA	NA	NA	NA	14
	Dibromomethane	50000		NA	NA	NA	NA	5.0 U
	1,2,3-Trichloropropane	10000		NA	NA	NA	NA	5.0 U
	Styrene	100		NA	NA	NA	NA	1.0 U
	Dichlorodifluoromethane	100000		NA	NA	NA	NA	5.0 U
	Acetone	50000		NA	NA	NA	NA	5.0 U
	Carbon disulfide	10000		NA	NA	NA	NA	5.0 U
	2-Butanone	50000		NA	NA	NA	NA	5.0 U
	4-Methyl-2-pentanone	50000		NA	NA	NA	NA	5.0 U
	2-Hexanone	10000		NA	NA	NA	NA	5.0 U
	Bromochloromethane	NS		NA	NA	NA	NA	2.5 U
	Tetrahydrofuran	50000		NA	NA	NA	NA	10 U
	2,2-Dichloropropane	9 <sup>20</sup>		NA	NA	NA	NA	2.5 U
	1,2-Dibromoethane	2		NA	NA	NA	NA	2.0 U
	1,3-Dichloropropane	50000		NA	NA	NA	NA	2.5 U
	1,1,1,2-Tetrachloroethane	10		NA	NA	NA	NA	0.50 U
	Bromobenzene	10000		NA	NA	NA	NA	2.5 U
	n-Butylbenzene	4000 <sup>21</sup>		NA	NA	NA	NA	5.5
	sec-Butylbenzene	4000 <sup>21</sup>		NA	NA	NA	NA	1.8
	tert-Butylbenzene	4000 <sup>21</sup>		NA	NA	NA	NA	2.5 U
	o-Chlorotoluene	10000		NA	NA	NA	NA	2.5 U
	p-Chlorotoluene	NS		NA	NA	NA	NA	2.5 U
	1,2-Dibromo-3-chloropropane	1000		NA	NA	NA	NA	2.5 U
	Hexachlorobutadiene	1		NA	NA	NA	NA	0.60 U
	Isopropylbenzene	4000 <sup>22</sup>		NA	NA	NA	NA	3.2
	p-Isopropyltoluene	4000 <sup>22</sup>		NA	NA	NA	NA	1.8
	Naphthalene	1000		NA	NA	NA	NA	9.3
	n-Propylbenzene	4000 <sup>23</sup>		NA	NA	NA	NA	8.8
	1,2,3-Trichlorobenzene	NS		NA	NA	NA	NA	2.5 U
	1,2,4-Trichlorobenzene	2000		NA	NA	NA	NA	2.5 U
	1,3,5-Trimethylbenzene	4000 <sup>24</sup>		NA	NA	NA	NA	4.0
	1,2,4-Trimethylbenzene	4000 <sup>24</sup>		NA	NA	NA	NA	23
	Ethyl ether	10000		NA	NA	NA	NA	2.5 U
	Isopropyl Ether	10000		NA	NA	NA	NA	2.0 U
	Ethyl-Tert-Butyl-Ether	NS		NA	NA	NA	NA	2.0 U
	Tertiary-Amyl Methyl Ether	NS		NA	NA	NA	NA	2.0 U
	1,4-Dioxane	NS		NA	NA	NA	NA	250 U

**Table 3**  
**Summary of Analytical Results for Groundwater Samples**  
**Former B & M Railroad**  
**Newburyport, Massachusetts**

Analysis	Analyte	MCP RC GW-2	Sample Location: Date sampled:	MW-1 4/12/2006	MW-2 4/12/2006	MW-4 4/12/2006	MW-9 4/12/2006	MW-10 4/12/2006
<b>EPH</b> (ug/L)	C9 - C18 Aliphatics	1000		100 U	100 U	100 U	100 U	100 U
	C19 - C36 Aliphatics	50000		100 U	100 U	100 U	100 U	100 U
	C11 - C22 Aromatics	30000		100 U	100 U	100 U	100 U	100 U
	Naphthalene	1000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	2-Methylnaphthalene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Acenaphthylene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Acenaphthene	5000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Fluorene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Phenanthrene	50		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Anthracene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Fluoranthene	200		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Pyrene	20		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(a)anthracene	1000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Chrysene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(b)fluoranthene	400		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(k)fluoranthene	100		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(a)pyrene	500		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Indeno(1,2,3-cd)Pyrene	100		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Dibenzo(a,h)anthracene	40		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(ghi)perylene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
<b>Metals</b> (ug/L)	Antimony, Total	8000		0.8	0.5 U	0.5 U	0.5 U	0.5 U
	Arsenic, Total	900		3.7	29.4	1.5	16.3	6.8
	Barium, Total	50000		77.3	56.8	18.2	39.5	840
	Beryllium, Total	50		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	Cadmium, Total	4		0.5 U	0.5 U	0.5 U	0.5 U	0.7
	Chromium, Total	300		1.9	0.5	0.9	14.2	3.4
	Lead, Total	10		1.2	0.5 U	0.5 U	6.1	2.0
	Nickel, Total	200		6.3	7.4	9.5	21.2	777.1
	Selenium, Total	100		6.0	1.0 U	2.0	1.0 U	1.0 U
	Silver, Total	7		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	Thallium, Total	3000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	Vanadium, Total	4000		1.2	0.5 U	0.5 U	10.2	0.5 U
	Zinc, Total	900		138.6	52.4	5.0 U	20.9	35.5
<b>Cyanide (Total) (ug/L)</b>		30		NA	NA	NA	NA	167

**Notes:**

All units in ug/L unless otherwise specified.

ug/L - micrograms per liter.

NS - No criterion available for this compound.

(1) - Per the MCP VOC Analytical Method requirements, the results for these compounds are compared to the RC GW-2 criterion for C9-C10 aromatic hydrocarbons.

(2) - RC GW-2 criterion for Dichloropropane used.

(3) - RC GW-2 criterion for Dichloropropane used.

(4) - RC GW-2 criterion for 1,3-Dichloropropane used.

U - Compound was not detected at specified quantitation limit.

NA - Sample not analyzed for the listed analyte.

Values in Bold indicate the compound was detected.

Values shown in Bold and shaded type equal or exceed the MCP RC GW-2 criteria.

VOCs - Volatile Organic Compounds.

EPH - Extractable Petroleum Hydrocarbons.

MCP RC - Massachusetts Contingency Plan Reportable Concentrations.



**Table 4**  
**Comparison of Soil Results to MCP Method 1 Standards**  
**Former B & M Railroad**  
**Newburyport, Massachusetts**

Analysis	Analyte	Method 1	Sample Location: Depth: Date sampled:	B-1		B-2			B-3
				0-3'	3-10'	0-3'	0-3'	3-10'	
		S-1/GW-3		4/3/2006	4/3/2006	4/3/2006	4/3/2006	4/3/2006	4/3/2006
EPH (mg/kg)	C9 - C18 Aliphatics	1000		7.25 U	7.75 U	15.0 U	7.58 U	83.8	7.41 U
	C19 - C36 Aliphatics	3000		68.5	7.75 U	15.0 U	10.5	25.6	9.28
	C11 - C22 Aromatics	800		102	7.75 U	139	80.0	55.8	24.9
	Naphthalene	500		0.362 U	0.388 U	2.18	1.10	0.527	0.370 U
	2-Methylnaphthalene	500		0.362 U	0.388 U	0.749 U	0.379 U	0.383 U	0.370 U
	Acenaphthylene	100		0.362 U	0.388 U	0.769	0.379 U	0.383 U	0.370 U
	Acenaphthene	1000		0.362 U	0.388 U	0.749 U	0.503	0.383 U	0.370 U
	Fluorene	1000		0.362 U	0.388 U	0.908	0.594	0.383 U	0.370 U
	Phenanthrene	100		0.362 U	0.388 U	10.9	6.98	1.51	0.456
	Anthracene	1000		0.362 U	0.388 U	2.80	1.61	0.383 U	0.370 U
	Fluoranthene	1000		0.616	0.388 U	16.0	9.68	2.10	0.914
	Pyrene	1000		0.644	0.388 U	12.8	7.73	1.66	0.875
	Benzo(a)anthracene	7		0.398	0.388 U	7.56	4.35	0.933	0.392
	Chrysene	7		0.474	0.388 U	7.37	4.23	0.871	0.513
	Benzo(b)fluoranthene	7		0.415	0.388 U	6.57	3.91	0.718	0.626
	Benzo(k)fluoranthene	70		0.400	0.388 U	6.02	3.43	0.785	0.503
	Benzo(a)pyrene	2		0.459	0.388 U	7.59	4.16	0.889	0.584
	Indeno(1,2,3-cd)Pyrene	7		0.362 U	0.388 U	5.00	2.57	0.575	0.473
	Dibenzo(a,h)anthracene	0.7		0.362 U	0.388 U	1.02	0.569	0.383 U	0.370 U
	Benzo(ghi)perylene	1000		0.362 U	0.388 U	4.44	2.07	0.500	0.370 U
PCBs (mg/kg)	Aroclor 1016	2		NA	NA	NA	NA	NA	NA
	Aroclor 1221	2		NA	NA	NA	NA	NA	NA
	Aroclor 1232	2		NA	NA	NA	NA	NA	NA
	Aroclor 1242	2		NA	NA	NA	NA	NA	NA
	Aroclor 1248	2		NA	NA	NA	NA	NA	NA
	Aroclor 1254	2		NA	NA	NA	NA	NA	NA
	Aroclor 1260	2		NA	NA	NA	NA	NA	NA
Pesticides (mg/kg)	Delta-BHC	NS		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Lindane	0.5		0.0290 U	NA	0.0150 U	0.0152 U	NA	0.0148 U
	Alpha-BHC	NS		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Beta-BHC	NS		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Heptachlor	0.2		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Aldrin	0.04		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Heptachlor epoxide	0.09		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Endrin	8		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Endrin ketone	NS		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Dieldrin	0.05		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	4,4'-DDE	3		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0228
	4,4'-DDD	4		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	4,4'-DDT	3		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0463
	Endosulfan I	1 <sup>(1)</sup>		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Endosulfan II	1 <sup>(1)</sup>		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Endosulfan sulfate	NS		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
	Methoxychlor	30		0.145 U	NA	0.0749 U	0.0758 U	NA	0.0741 U
	Technical Chlordane	0.7		0.145 U	NA	0.0749 U	0.0758 U	NA	0.0741 U
	Toxaphene	NS		0.145 U	NA	0.0749 U	0.0758 U	NA	0.0741 U
	Hexachlorobenzene	0.7		0.0362 U	NA	0.0187 U	0.0189 U	NA	0.0185 U
Metals (mg/kg)	Antimony, Total	20		2.2 U	NA	2.2 U	4.3	NA	2.2 U
	Arsenic, Total	20		12	NA	12	13	NA	23
	Barium, Total	1000		43	NA	100	83	NA	40
	Beryllium, Total	0.7		0.22 U	NA	0.22 U	0.23 U	NA	0.22 U
	Cadmium, Total	2		0.43 U	NA	0.44 U	0.45 U	NA	0.44 U
	Chromium, Total	30		15	NA	15	13	NA	21
	Lead, Total	300		80	NA	430	320	NA	280
	Nickel, Total	20		12	NA	12	12	NA	17
	Selenium, Total	400		2.2 U	NA	2.2 U	2.3 U	NA	2.2 U
	Silver, Total	100		0.43 U	NA	0.44 U	0.45 U	NA	0.44 U
	Thallium, Total	8		2.2 U	NA	2.2 U	2.3 U	NA	2.2 U
	Vanadium, Total	600		16	NA	16	13	NA	16
	Zinc, Total	2500		120	NA	130	130	NA	57
Solids (Total) (%)		NS		92	86	89	88	87	90

**Notes:**

All units in mg/kg unless otherwise specified.

mg/kg - milligrams per kilogram (dry weight) or parts per million (ppm).

(1) - MCP Method 1 S-1/GW-3 standard for endosulfan used.

NS - No standard available for this compound.

U - Compound was not detected at specified quantitation limit.

NA - Sample not analyzed for the listed analyte.

Values in Bold indicate the compound was detected.

Values shown in bold and shaded represent increased MCP S-1/GW-3 standards.

EPH - Extractable Petroleum Hydrocarbons.

PCBs - Polychlorinated Biphenyls.

MCP - Massachusetts Contingency Plan.

Average value - Computed by the sum of the detected values and half of the quantitation limits for the non-detects divided by the number of samples analyzed for the analyte; the higher value of the field duplicate pairs was used in the computation.

← see photo

**Table 4**  
**Comparison of Soil Results to MCP Method 1 Standards**  
**Former B & M Railroad**  
**Newburyport, Massachusetts**

Analysis	Analyte	Method 1	Sample Location: Depth: Date sampled:	B-4		B-5			B-6
				0-3'	3-10'	0-3'	0-3'	3-10'	
		S-1/GW-3		4/3/2006	4/3/2006	4/3/2006	Field Dup	4/3/2006	4/3/2006
EPH (mg/kg)	C9 - C18 Aliphatics	1000		7.33 U	7.17 U	7.02 U	NA	6.94 U	7.02 U
	C19 - C36 Aliphatics	3000		7.33 U	7.17 U	7.02 U	NA	6.94 U	7.02 U
	C11 - C22 Aromatics	800		7.33 U	7.17 U	7.02 U	NA	6.94 U	7.02 U
	Naphthalene	500		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	2-Methylnaphthalene	500		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Acenaphthylene	100		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Acenaphthene	1000		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Fluorene	1000		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Phenanthrene	100		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Anthracene	1000		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Fluoranthene	1000		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Pyrene	1000		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Benzo(a)anthracene	7		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Chrysene	7		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Benzo(b)fluoranthene	7		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Benzo(k)fluoranthene	70		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Benzo(a)pyrene	2		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Indeno(1,2,3-cd)Pyrene	7		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Dibenzo(a,h)anthracene	0.7		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
	Benzo(ghi)perylene	1000		0.366 U	0.358 U	0.351 U	NA	0.347 U	0.351 U
PCBs (mg/kg)	Aroclor 1016	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA
	Aroclor 1221	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA
	Aroclor 1232	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA
	Aroclor 1242	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA
	Aroclor 1248	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA
	Aroclor 1254	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA
	Aroclor 1260	2		NA	NA	0.0351 U	0.0355 U	0.0347 U	NA
Pesticides (mg/kg)	Delta-BHC	NS		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	Lindane	0.5		0.0146 U	NA	0.0140 U	NA	NA	0.00281 U
	Alpha-BHC	NS		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	Beta-BHC	NS		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	Heptachlor	0.2		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	Aldrin	0.04		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	Heptachlor epoxide	0.09		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	Endrin	8		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	Endrin ketone	NS		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	Dieldrin	0.05		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	4,4'-DDE	3		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	4,4'-DDD	4		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	4,4'-DDT	3		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	Endosulfan I	1 <sup>(1)</sup>		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	Endosulfan II	1 <sup>(1)</sup>		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	Endosulfan sulfate	NS		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
	Methoxychlor	30		0.0733 U	NA	0.0702 U	NA	NA	0.0140 U
	Technical Chlordane	0.7		0.0733 U	NA	0.0702 U	NA	NA	0.0140 U
	Toxaphene	NS		0.0733 U	NA	0.0702 U	NA	NA	0.0140 U
	Hexachlorobenzene	0.7		0.0183 U	NA	0.0175 U	NA	NA	0.00351 U
Metals (mg/kg)	Antimony, Total	20		2.2 U	NA	2.1 U	NA	NA	2.1 U
	Arsenic, Total	20		9.1	NA	21	NA	NA	19
	Barium, Total	1000		37	NA	15	NA	NA	16
	Beryllium, Total	0.7		0.22 U	NA	0.21 U	NA	NA	0.21 U
	Cadmium, Total	2		0.44 U	NA	0.42 U	NA	NA	0.42 U
	Chromium, Total	30		19	NA	14	NA	NA	16
	Lead, Total	300		20	NA	18	NA	NA	5.6
	Nickel, Total	20		18	NA	13	NA	NA	14
	Selenium, Total	400		2.2 U	NA	2.1 U	NA	NA	2.1 U
	Silver, Total	100		0.44 U	NA	0.42 U	NA	NA	0.42 U
	Thallium, Total	8		2.2 U	NA	2.1 U	NA	NA	2.1 U
	Vanadium, Total	600		14	NA	9.8	NA	NA	11
	Zinc, Total	2500		28	NA	130	NA	NA	17
Solids (Total) (%)			NS	91	93	95	94	96	95

**Notes:**

All units in mg/kg unless otherwise specified.

mg/kg - milligrams per kilogram (dry weight) or parts per million (ppm).

(1) - MCP Method 1 S-1/GW-3 standard for endosulfan used.

NS - No standard available for this compound.

U - Compound was not detected at specified quantitation limit.

NA - Sample not analyzed for the listed analyte.

Values in Bold indicate the compound was detected.

Values shown in field and shaded represent or exceed MCP S-1/GW-3 standards

EPH - Extractable Petroleum Hydrocarbons.

PCBs - Polychlorinated Biphenyls.

MCP - Massachusetts Contingency Plan.

Average value - Computed by the sum of the detected values and half of the quantitation

limits for the non-detects divided by the number of samples analyzed for the analyte.

the higher value of the field duplicate pairs was used in the computation.

**Table 4**  
**Comparison of Soil Results to MCP Method 1 Standards**  
**Former B & M Railroad**  
**Newburyport, Massachusetts**

Analysis	Analyte	Method 1	Sample Location: Depth: Date sampled:	B-7	B-8	B-9		B-10	Average Value
				0-3' 4/3/2006	0-3' 4/3/2006	0-3' 4/7/2006	3-10' 4/7/2006	0-3' 4/4/2006	
EPH (mg/kg)	C9 - C18 Aliphatics	1000		7.02 U	7.17 U	7.25 U	7.02 U	7.94 U	9.230
	C19 - C36 Aliphatics	3000		7.02 U	7.17 U	7.25 U	7.02 U	26.0	11.51
	C11 - C22 Aromatics	800		7.02 U	7.17 U	7.25 U	7.02 U	202	37.303
	Naphthalene	500		0.351 U	0.358 U	0.362 U	0.351 U	0.397 U	0.338
	2-Methylnaphthalene	500		0.351 U	0.358 U	0.362 U	0.351 U	0.397 U	0.195
	Acenaphthylene	100		0.351 U	0.358 U	0.362 U	0.351 U	0.397 U	0.221
	Acenaphthene	1000		0.351 U	0.358 U	0.362 U	0.351 U	0.682	0.227
	Fluorene	1000		0.351 U	0.358 U	0.362 U	0.351 U	0.570	0.255
	Phenanthrene	100		0.351 U	0.358 U	0.362 U	0.351 U	9.63	1.631
	Anthracene	1000		0.351 U	0.358 U	0.362 U	0.351 U	2.92	0.538
	Fluoranthene	1000		0.351 U	0.358 U	0.362 U	0.351 U	19.6	2.735
	Pyrene	1000		0.351 U	0.358 U	0.362 U	0.351 U	16.3	2.271
	Benzo(a)anthracene	7		0.351 U	0.358 U	0.362 U	0.351 U	11.8	1.52
	Chrysene	7		0.351 U	0.358 U	0.362 U	0.351 U	14.4	1.695
	Benzo(b)fluoranthene	7		0.351 U	0.358 U	0.362 U	0.351 U	10.1	1.348
	Benzo(k)fluoranthene	70		0.351 U	0.358 U	0.362 U	0.351 U	6.47	1.065
	Benzo(a)pyrene	2		0.351 U	0.358 U	0.362 U	0.351 U	9.26	1.372
	Indeno(1,2,3-cd)Pyrene	7		0.351 U	0.358 U	0.362 U	0.351 U	4.72	0.849
	Dibenzo(a,h)anthracene	0.7		0.351 U	0.358 U	0.362 U	0.351 U	1.19	0.30
	Benzo(ghi)perylene	1000		0.351 U	0.358 U	0.362 U	0.351 U	4.24	0.76
PCBs (mg/kg)	Aroclor 1016	2		NA	NA	NA	NA	NA	0.0176
	Aroclor 1221	2		NA	NA	NA	NA	NA	0.0176
	Aroclor 1232	2		NA	NA	NA	NA	NA	0.0176
	Aroclor 1242	2		NA	NA	NA	NA	NA	0.0176
	Aroclor 1248	2		NA	NA	NA	NA	NA	0.0176
	Aroclor 1254	2		NA	NA	NA	NA	NA	0.0176
	Aroclor 1260	2		NA	NA	NA	NA	NA	0.0176
Pesticides (mg/kg)	Delta-BHC	NS		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	Lindane	0.5		0.00281 U	0.00287 U	0.00290 U	NA	0.0317 U	0.0065
	Alpha-BHC	NS		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	Beta-BHC	NS		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	Heptachlor	0.2		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	Aldrin	0.04		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	Heptachlor epoxide	0.09		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	Endrin	8		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	Endrin ketone	NS		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	Dieldrin	0.05		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	4,4'-DDE	3		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0095
	4,4'-DDD	4		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	4,4'-DDT	3		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0119
	Endosulfan I	1 <sup>(1)</sup>		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	Endosulfan II	1 <sup>(1)</sup>		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	Endosulfan sulfate	NS		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
	Methoxychlor	30		0.0140 U	0.0143 U	0.0145 U	NA	0.159 U	0.0327
	Technical Chlordane	0.7		0.0140 U	0.0143 U	0.0145 U	NA	0.159 U	0.0327
	Toxaphene	NS		0.0140 U	0.0143 U	0.0145 U	NA	0.159 U	0.0327
	Hexachlorobenzene	0.7		0.00351 U	0.00358 U	0.00362 U	NA	0.0397 U	0.0082
Metals (mg/kg)	Antimony, Total	20		2.1 U	2.1 U	2.2 U	NA	2.4 U	1.41
	Arsenic, Total	20		17	15	27	NA	14	17.01
	Barium, Total	1000		13	13	17	NA	40	33.40
	Beryllium, Total	0.7		0.21 U	0.21 U	0.22 U	NA	0.24 U	0.11
	Cadmium, Total	2		0.42 U	0.42 U	0.43 U	NA	0.47 U	0.22
	Chromium, Total	30		12	12	16	NA	54	19.40
	Lead, Total	300		6.0	5.4	9.9	NA	28	88.29
	Nickel, Total	20		11	12	15	NA	71	19.50
	Selenium, Total	400		2.1 U	2.1 U	2.2 U	NA	2.4 U	1.10
	Silver, Total	100		0.42 U	0.42 U	0.43 U	NA	0.54	0.25
	Thallium, Total	8		2.1 U	2.1 U	2.2 U	NA	2.4 U	1.10
	Vanadium, Total	600		9.2	9.5	13	NA	20	13.45
	Zinc, Total	2500		15	15	25	NA	61	59.80
Solids (Total) (%)			NS	95	93	92	95	84	91.69

**Notes:**

All units in mg/kg unless otherwise specified.

mg/kg - milligrams per kilogram (dry weight) or parts per million (ppm).

(1) - MCP Method 1 S-1/GW-3 standard for endosulfan used.

NS - No standard available for this compound.

U - Compound was not detected at specified quantitation limit.

NA - Sample not analyzed for the listed analyte.

Values in Bold indicate the compound was detected.

Values shown in (1) and (2) are equal or exceed MCP S-1/GW-3 standards.

EPH - Extractable Petroleum Hydrocarbons.

PCBs - Polychlorinated Biphenyls.

MCP - Massachusetts Contingency Plan.

Average value - Computed by the sum of the detected values and half of the quantitation

limits for the non-detects divided by the number of samples analyzed for the analyte;

the higher value of the field duplicate pairs was used in the computation.

**Table 5**  
**Comparison of Groundwater Results to MCP Method 1 Standards**  
**Former B & M Railroad**  
**Newburyport, Massachusetts**

Analysis	Analyte	Method 1 GW-3	Sample Location: Date sampled:	MW-1 4/12/2006	MW-2 4/12/2006	MW-4 4/12/2006	MW-9 4/12/2006	MW-10 4/12/2006
VOCs (ug/L)	Methylene chloride	50000		NA	NA	NA	NA	5.0 U
	1,1-Dichloroethane	20000		NA	NA	NA	NA	4.6
	Chloroform	10000		NA	NA	NA	NA	0.88
	Carbon tetrachloride	5000		NA	NA	NA	NA	0.50 U
	1,2-Dichloropropane	50000		NA	NA	NA	NA	1.8 U
	Dibromochloromethane	50000		NA	NA	NA	NA	0.50 U
	1,1,2-Trichloroethane	50000		NA	NA	NA	NA	0.75 U
	Tetrachloroethene	30000		NA	NA	NA	NA	0.73
	Chlorobenzene	1000		NA	NA	NA	NA	0.50 U
	Trichlorofluoromethane	NS		NA	NA	NA	NA	2.5 U
	1,2-Dichloroethane	20000		NA	NA	NA	NA	0.50 U
	1,1,1-Trichloroethane	20000		NA	NA	NA	NA	3.8
	Bromodichloromethane	50000		NA	NA	NA	NA	0.50 U
	trans-1,3-Dichloropropene	2000 <sup>(2)</sup>		NA	NA	NA	NA	0.50 U
	cis-1,3-Dichloropropene	2000 <sup>(2)</sup>		NA	NA	NA	NA	0.50 U
	1,1-Dichloropropene	NS		NA	NA	NA	NA	2.5 U
	Bromoform	50000		NA	NA	NA	NA	2.0 U
	1,1,2,2-Tetrachloroethane	50000		NA	NA	NA	NA	0.50 U
	Benzene	10000		NA	NA	NA	NA	13
	Toluene	4000		NA	NA	NA	NA	1.6
	Ethylbenzene	4000		NA	NA	NA	NA	9.6
	Chloromethane	NS		NA	NA	NA	NA	2.5 U
	Bromomethane	50000		NA	NA	NA	NA	1.0 U
	Vinyl chloride	50000		NA	NA	NA	NA	7.8
	Chloroethane	NS		NA	NA	NA	NA	1.0 U
	1,1-Dichloroethene	30000		NA	NA	NA	NA	0.50 U
	trans-1,2-Dichloroethene	50000		NA	NA	NA	NA	0.75 U
	Trichloroethene	5000		NA	NA	NA	NA	17
	1,2-Dichlorobenzene	2000		NA	NA	NA	NA	2.5 U
	1,3-Dichlorobenzene	50000		NA	NA	NA	NA	2.5 U
	1,4-Dichlorobenzene	8000		NA	NA	NA	NA	2.5 U
	Methyl tert butyl ether	50000		NA	NA	NA	NA	1.0 U
	p/m-Xylene	500		NA	NA	NA	NA	4.8
	o-Xylene	500		NA	NA	NA	NA	1.2
	cis-1,2-Dichloroethene	50000		NA	NA	NA	NA	14
	Dibromomethane	NS		NA	NA	NA	NA	5.0 U
	1,2,3-Trichloropropane	NS		NA	NA	NA	NA	5.0 U
	Styrene	6000		NA	NA	NA	NA	1.0 U
	Dichlorodifluoromethane	NS		NA	NA	NA	NA	5.0 U
	Acetone	50000		NA	NA	NA	NA	5.0 U
	Carbon disulfide	NS		NA	NA	NA	NA	5.0 U
	2-Butanone	50000		NA	NA	NA	NA	5.0 U
	4-Methyl-2-pentanone	50000		NA	NA	NA	NA	5.0 U
	2-Hexanone	NS		NA	NA	NA	NA	5.0 U
	Bromochloromethane	NS		NA	NA	NA	NA	2.5 U
	Tetrahydrofuran	NS		NA	NA	NA	NA	10 U
	2,2-Dichloropropane	NS		NA	NA	NA	NA	2.5 U
	1,2-Dibromoethane	50000		NA	NA	NA	NA	2.0 U
	1,3-Dichloropropane	NS		NA	NA	NA	NA	2.5 U
	1,1,1,2-Tetrachloroethane	50000		NA	NA	NA	NA	0.50 U
	Bromobenzene	NS		NA	NA	NA	NA	2.5 U
	n-Butylbenzene	4000 <sup>(3)</sup>		NA	NA	NA	NA	5.5
	sec-Butylbenzene	4000 <sup>(3)</sup>		NA	NA	NA	NA	1.8
	tert-Butylbenzene	4000 <sup>(3)</sup>		NA	NA	NA	NA	2.5 U
	o-Chlorotoluene	NS		NA	NA	NA	NA	2.5 U
	p-Chlorotoluene	NS		NA	NA	NA	NA	2.5 U
	1,2-Dibromo-3-chloropropane	NS		NA	NA	NA	NA	2.5 U
	Hexachlorobutadiene	3000		NA	NA	NA	NA	0.60 U
	Isopropylbenzene	4000 <sup>(3)</sup>		NA	NA	NA	NA	3.2
	p-Isopropyltoluene	4000 <sup>(3)</sup>		NA	NA	NA	NA	1.8
	Naphthalene	20000		NA	NA	NA	NA	9.3
	n-Propylbenzene	4000 <sup>(3)</sup>		NA	NA	NA	NA	8.8
	1,2,3-Trichlorobenzene	NS		NA	NA	NA	NA	2.5 U
	1,2,4-Trichlorobenzene	50000		NA	NA	NA	NA	2.5 U
	1,3,5-Trimethylbenzene	4000 <sup>(3)</sup>		NA	NA	NA	NA	4.0
	1,2,4-Trimethylbenzene	4000 <sup>(3)</sup>		NA	NA	NA	NA	23
	Ethyl ether	NS		NA	NA	NA	NA	2.5 U
	Isopropyl Ether	NS		NA	NA	NA	NA	2.0 U
	Ethyl-Tert-Butyl-Ether	NS		NA	NA	NA	NA	2.0 U
	Tertiary-Amyl Methyl Ether	NS		NA	NA	NA	NA	2.0 U
	1,4-Dioxane	NS		NA	NA	NA	NA	250 U

**Table 5**  
**Comparison of Groundwater Results to MCP Method 1 Standards**  
**Former B & M Railroad**  
**Newburyport, Massachusetts**

Analysis	Analyte	Method 1 GW-3	Sample Location: Date sampled:	MW-1 4/12/2006	MW-2 4/12/2006	MW-4 4/12/2006	MW-9 4/12/2006	MW-10 4/12/2006
<b>EPH</b> (ug/L)	C9 - C18 Aliphatics	20000		100 U	100 U	100 U	100 U	100 U
	C19 - C36 Aliphatics	50000		100 U	100 U	100 U	100 U	100 U
	C11 - C22 Aromatics	30000		100 U	100 U	100 U	100 U	100 U
	Naphthalene	20000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	2-Methylnaphthalene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Acenaphthylene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Acenaphthene	5000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Fluorene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Phenanthrene	50		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Anthracene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Fluoranthene	200		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Pyrene	20		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(a)anthracene	1000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Chrysene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(b)fluoranthene	400		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(k)fluoranthene	100		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(a)pyrene	500		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Indeno(1,2,3-cd)Pyrene	100		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Dibenzo(a,h)anthracene	40		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
	Benzo(ghi)perylene	3000		10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
<b>Metals</b> (ug/L)	Antimony, Total	8000		0.8	0.5 U	0.5 U	0.5 U	0.5 U
	Arsenic, Total	900		3.7	29.4	1.5	16.3	6.8
	Barium, Total	50000		77.3	56.8	18.2	39.5	840
	Beryllium, Total	50		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	Cadmium, Total	4		0.5 U	0.5 U	0.5 U	0.5 U	0.7
	Chromium, Total	300		1.9	0.5	0.9	14.2	3.4
	Lead, Total	10		1.2	0.5 U	0.5 U	6.1	2.0
	Nickel, Total	200		6.3	7.4	9.5	21.2	777.1
	Selenium, Total	100		6.0	1.0 U	2.0	1.0 U	1.0 U
	Silver, Total	7		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	Thallium, Total	3000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	Vanadium, Total	4000		1.2	0.5 U	0.5 U	10.2	0.5 U
	Zinc, Total	900		138.6	52.4	5.0 U	20.9	35.5
<b>Cyanide (Total) (ug/L)</b>		30		NA	NA	NA	NA	167

**Notes:**

All units in ug/L unless otherwise specified.

ug/L - micrograms per liter.

NS - No standard available for this compound.

(1) - Per the MCP VOC Analytical Method requirements, the results for these compounds are compared to the MCP Method 1 GW-3 standard for C9-C10 aromatic hydrocarbons.

(2) - MCP Method 1 GW-3 standard for 1,3-Dichloropropene used.

U - Compound was not detected at specified quantitation limit.

NA - Sample not analyzed for the listed analyte.

Values in Bold indicate the compound was detected.

Values shown in Bold and shaded type equal or exceed MCP Method 1 GW-3 standard.

VOCs - Volatile Organic Compounds.

EPH - Extractable Petroleum Hydrocarbons.

MCP - Massachusetts Contingency Plan.

## FIGURES







**APPENDIX A**  
**SITE PHOTOS**

## PHOTOGRAPHIC REPORTING DATA SHEET

<b>Client:</b> Merrimack Valley Planning Commission/ City of Newburyport	<b>Date Taken:</b> April 19, 2006
<b>Project:</b> Phase II Site Assessment	<b>Photographer(s):</b> F. Calandra
<b>Type of Site:</b> Former Rail Line	<b>Name of Site:</b> Former Boston & Maine Railroad Line
<b>Location:</b> Between Yacht Club and Water Street Adjacent to Treatment Plant	<b>Direction Facing:</b> Southeast



**Photograph 1:** Northern portion of former rail line between American Yacht Club and Water Street (near monitoring well MW-1).

## PHOTOGRAPHIC REPORTING DATA SHEET

Client: Merrimack Valley Planning Commission/ City of Newburyport	Date Taken: April 19, 2006
Project: Phase II Site Assessment	Photographer(s): F. Calandra
Type of Site: Former Rail Line	Name of Site: Former Boston & Maine Railroad Line
Location: Between Yacht Club and Water Street Adjacent to Treatment Plant	Direction facing: Southeast



**Photograph 2:** Northern portion of former rail line between American Yacht Club and Water Street (near monitoring well MW-2).

## PHOTOGRAPHIC REPORTING DATA SHEET

Client: Merrimack Valley Planning Commission/ City of Newburyport	Date Taken: April 19, 2006
Project: Phase II Site Assessment	Photographer(s): F. Calandra
Type of Site: Former Rail Line	Name of Site: Former Boston & Maine Railroad Line
Location: Between Water Street and Harrison Street	Direction facing: North



Photograph 3: Northern side of Harrison Street crossing (in vicinity of soil boring B-3).

## PHOTOGRAPHIC REPORTING DATA SHEET

<b>Client:</b> Merrimack Valley Planning Commission/ City of Newburyport	<b>Date Taken:</b> April 19, 2006
<b>Project:</b> Phase II Site Assessment	<b>Photographer(s):</b> V. Calandra
<b>Type of Site:</b> Former Rail Line	<b>Name of Site:</b> Former Boston & Maine Railroad Line
<b>Location:</b> Purchase Street Crossing	<b>Direction facing:</b> South



**Photograph 4:** Former rail line at southern side of Purchase Street.

## PHOTOGRAPHIC REPORTING DATA SHEET

<b>Client:</b> Merrimack Valley Planning Commission/ City of Newburyport	<b>Date Taken:</b> April 19, 2006
<b>Project:</b> Phase II Site Assessment	<b>Photographer(s):</b> F. Calandra
<b>Type of Site:</b> Former Rail Line	<b>Name of Site:</b> Former Boston & Maine Railroad Line
<b>Location:</b> Between Hancock Street and Chestnut Street	<b>Direction facing:</b> North



Photograph 5: Former rail line between Hancock Street and Chestnut Street.  
Monitoring Well MW-4 shown.

## PHOTOGRAPHIC REPORTING DATA SHEET

Client: Merrimack Valley Planning Commission/ City of Newburyport	Date Taken: April 19, 2006
Project: Phase II Site Assessment	Photographer(s): F. Calandra
Type of Site: Former Rail Line	Name of Site: Former Boston & Maine Railroad Line
Location: Between High Street and Chestnut Street	Direction facing: South



**Photograph 6:** Former rail line between High Street and Chestnut Street looking south from Chestnut Street.

## PHOTOGRAPHIC REPORTING DATA SHEET

Client: Merrimack Valley Planning Commission/ City of Newburyport	Date Taken: April 19, 2006
Project: Phase II Site Assessment	Photographer(s): F. Calandra
Type of Site: Former Rail Line	Name of Site: Former Boston & Maine Railroad Line
Location: Between High Street and Parker Street	Direction facing: Northeast



Photograph 7: Former rail line between High Street and Parker Street near High Street crossing.



## PHOTOGRAPHIC REPORTING DATA SHEET

Client: Merrimack Valley Planning Commission/ City of Newburyport	Date Taken: April 19, 2006
Project: Phase II Site Assessment	Photographer(s): F. Calandra
Type of Site: Former Rail Line	Name of Site: Former Boston & Maine Railroad Line
Location: Parker Street	Direction Facing: Northeast



Photograph 8: Gate at northern side of Parker Street crossing.

## PHOTOGRAPHIC REPORTING DATA SHEET

Client: Merrimack Valley Planning Commission/ City of Newburyport	Date Taken: April 19, 2006
Project: Phase II Site Assessment	Photographer(s): F. Calandra
Type of Site: Former Rail Line	Name of Site: Former Boston & Maine Railroad Line
Location: Parker Street	Direction facing: Southwest



Photograph 9: Gate at southern side of Parker Street crossing.

## PHOTOGRAPHIC REPORTING DATA SHEET

Client: Merrimack Valley Planning Commission/ City of Newburyport	Date Taken: April 19, 2006
Project: Phase II Site Assessment	Photographer(s): F. Calandra
Type of Site: Former Rail Line	Name of Site: Former Boston & Maine Railroad Line
Location: Newbury Turnpike (Route 1)	Direction facing: Southwest



Photograph 10: Southern portion of former rail line at Newbury Turnpike (Route 1).

## PHOTOGRAPHIC REPORTING DATA SHEET

Client: Merrimack Valley Planning Commission/ City of Newburyport	Date Taken: April 19, 2006
Project: Phase II Site Assessment	Photographer(s): F. Calandra
Type of Site: Former Rail Line	Name of Site: Former Boston & Maine Railroad Line
Location: Newbury Turnpike (Route 1)	Direction facing: West



Photograph 11: Photograph of southern terminus of former rail line at Newbury Turnpike (Route 1). Monitoring well MW-10 shown.

## PHOTOGRAPHIC REPORTING DATA SHEET

Client: Merrimack Valley Planning Commission/ City of Newburyport	Date Taken: April 19, 2006
Project: Phase II Site Assessment	Photographer(s): P. Calandra
Type of Site: Former Rail Line	Name of Site: Former Boston & Maine Railroad Line
Location: Southern Terminus	Direction facing: North



Photograph 12: Southern portion of former rail line looking towards Circle Finishing site.

**APPENDIX B**

**SOIL BORING LOGS AND  
MONITORING WELL CONSTRUCTION DIAGRAMS**

<b>TRC</b>	Project/Client	Project No.	Boring No. <b>B-1</b>	Sheet		
	Former B&M Railroad / MVPC	52037-0010-00000	Well No. <b>MW-1</b>	1 of 1		
	Location: <b>Newbury/Newburyport, MA</b>		TRC Geologist <b>M. Oliveira</b>			
<b>Geoprobe Soil Log</b>						
Geoprobe Contractor/Foreman <b>Geosearch / Steve Law</b>		Geoprobe Make/Model <b>Geoprobe 6600</b>		Sampling Description Continuous		
Sampler Description: <b>5' Macro core</b>		Sampling Method Direct Push		Coordinates X=      Y=		
Temporary piezometer or well installed? (list details below) <b>Y</b>		Drill bit/auger Diameter (if used): <b>NA</b>		Ref. El.:		
Depth <b>14'</b>		Sampler Diameter: <b>2.5"</b>		Riser Sirck-up: <b>NA</b>		
Screen Length/Type: <b>10' / 0010 slot PVC</b>		Water Table Depth: <b>2.5'</b>		Surface Elevation:		
Riser Length/Type: <b>4' / 2" PVC</b>		Total Depth: <b>14'</b>		Date Start: <b>4/3/06</b> Date Finish: <b>4/3/06</b>		
Depth	Sample Number	PEN/REC	Sample Description	Stratigraphic Description	Field Testing	Lab Sample Number
1	S-1	5' / 3.6'	0-6" brown coarse sand w/ c. gravel			
2			6"-20" gray to brown sand + silt w/ little c. gravel			
3						
4						
5	S-2	5' / 3'	20"-3' gray to brown silty clay w/ coarse sand			
6			3'-3.6' gray to black silt w/ some sand			
7			moist @ bottom			
8						
9			3'-3.5' black to brown coarse sand			
10	S-3		3.5'-6.5' coarse brown sand saturated @ 4.5'			
11						
12						
13						

<b>Granular Soils</b> Blows/ft      Density 0-4      v. loose 4-10      loose 10-30      m. dense 30-50      dense >50      v. dense Proportions trace 0-10%      some 20-35% little 10-20%      and 35-50%	<b>Cohesive Soils</b> Blows/ft      Density >2      v. soft 2-4      soft 4-8      m. stiff 8-15      stiff 15-30      v. stiff >30      hard	<b>Grain Size (USCS)</b> silt/clay <0.08 mm f. sand 0.43-0.08 mm m. sand 2.0-0.43 mm c. sand 4.8-2.0 mm f. gravel 19-4.8 mm c. gravel 75-19 mm cobble 300-75 mm boulder >300 mm	<b>Notes</b> 1) <b>0915 B-1 (0-3): EPH Metals Pesticides</b> 2) 3) 4) <b>0920: B-1 (3-10') EPH</b>
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**TRC**

## Monitoring Well Construction Summary

Well No.

MW - 1

Project: Former B&M Railroad No.: 52037-0010-00000Client: MVPC Date Completed: \_\_\_\_\_Location: Newbury & Newburyport, MABoring Contractor: Geosearch Method: Direct PushTRC Geologist: M. OliveiraReference Elevation: top of riser

Elev. Ground Surface: \_\_\_\_\_

Depth to Ground Water: \_\_\_\_\_

Development Date: 4/3/06Development Method: Surge/whale pumpGround  
Elevation

Generalized Stratigraphy and Water Level



Elevation top of protective casing: \_\_\_\_\_

Elevation of top riser pipe: \_\_\_\_\_

Stick-up of protective casing: NAStick-up of riser pipe: NAType of surface seal: concrete

I.D. of protective casing: \_\_\_\_\_

Type of protective casing: 2" PVC

Depth bottom of protective casing \_\_\_\_\_

Riser pipe I.D. \_\_\_\_\_

Type of riser pipe: \_\_\_\_\_

Borehole diameter: 3 1/2"

Type of backfill: \_\_\_\_\_

Elevation/depth top of seal: 1'-2'Type and thickness of seal:  Bentonite - 1'Depth top of filter pack: 2'Elevation/Depth top of screen: 4'Type of screen: 0.010 slot PVC (2")

Slot size: \_\_\_\_\_

I.D. of screen \_\_\_\_\_

Type of filter/sand pack: #2 sandElevation/depth bottom of screen: 14Elevation/depth bottom of well: 14Elevation/depth bottom of filter pack: 14

Type of backfill below observation well: \_\_\_\_\_

Elevation/depth of borehole: 14



<b>TRC</b>	Project/Client	Project No.	Boring No. <b>B-2</b>	Sheet
	Former B&M Railroad / MVPC	52037-0010-00000	Well No. <b>MW-2</b>	1 of 1
<b>Geoprobe Soil Log</b>	Location:		TRC Geologist	
	<b>Newbury/Newburyport, MA</b>		<b>M. Oliveira</b>	
Geoprobe Contractor/Foreman <b>Geosearch/Steve Law</b>		Geoprobe Make/Model <b>Geoprobe 6600</b>	Sampling Description Continuous	
Sampler Description: <b>5' Macro core</b>		Sampling Method Direct Push	Coordinates X=      Y=	
Temporary piezometer or well installed? (list details below) <b>Yes</b>		Drill bit/auger Diameter (if used): <b>NA</b>	Ref. El.:	
Depth <b>14'</b>		Sampler Diameter: <b>2.5"</b>	Riser Size/up: <b>NA</b>	
Screen Length/Type: <b>10'/0.010 slot PVC</b>		Water Table Depth: <b>~6'</b>	Surface Elevation:	
Riser Length/Type: <b>4'/2" PVC</b>		Total Depth: <b>14'</b>	Date Start: <b>4/3/06</b>	Date Finish: <b>4/3/06</b>

Depth	Sample Number	PEN/REC	Sample Description	Stratigraphic Description	Field Testing	Lab Sample Number
1	S-1	5'/3'	0-1.5' brown to dark brown m. sand w/ some silt, little clay			
2			1.5-2.5' brown to black sand + silt w/ little clay + little red brick fragments			
3			2.5-3' brown to dark brown silt + clay w/ some sand			
4			5-6.5' brown f-m sand			
5	S-2	5'/2.5'	6.5-8.5' saturated brown m-c. sand w/ black c. sand - saturated @ 6'			
6						
7						
8						
9						
10	S-3					
11						
12						
13						

<b>Grain Size (USCS)</b> Blows/ft    Density 0-4        v. loose 4-10       loose 10-30      m. dense 30-50      dense >50        v. dense Proportions trace 0-10% some 20-35% little 10-20% and 35-50%	<b>Cohesive Soils</b> Blows/ft    Density >2        v. soft 2-4        soft 4-8        m. stiff 8-15      stiff 15-30    v. stiff >30      hard	<b>Grain Size (USCS)</b> silt/clay <0.08 mm f. sand 0.43-0.08 mm m. sand 2.0-0.43 mm c. sand 4.8-2.0 mm f. gravel 19-4.8 mm c. gravel 75-19 mm cobble 300-75 mm boulder >300 mm	<b>Notes</b> 1) 10:05: B-2(0-3') EPH Metals Pesticides 2) _____ 3) 10:10: B-2(3-10') EPH 4) FD: B-X(0-3') EPH, Metals, Pesticides @ false time 09:40
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# Monitoring Well Construction Summary

Well No.

MW - 2

Project: Former B&M Railroad No.: 52037-0010-00000Client: MVPC Date Completed: \_\_\_\_\_Location: Newbury & Newburyport, MABoring Contractor: Geosearch Method: Direct PushTRC Geologist: M. OliveiraReference Elevation: top of riser

Elev. Ground Surface: \_\_\_\_\_

Depth to Ground Water: ≈ 6'Development Date: 4/3/06Development Method: Surge/Whale PumpGround  
Elevation

Generalized Stratigraphy and Water Level



Elevation top of protective casing: \_\_\_\_\_

Elevation of top riser pipe: \_\_\_\_\_

Stick-up of protective casing: NAStick-up of riser pipe: NAType of surface seal: concrete

I.D. of protective casing: \_\_\_\_\_

Type of protective casing: 2" PVC

Depth bottom of protective casing \_\_\_\_\_

Riser pipe I.D. \_\_\_\_\_

Type of riser pipe: \_\_\_\_\_

Borehole diameter: 3 1/2"

Type of backfill: \_\_\_\_\_

Elevation/depth top of seal: 1'-2'Type and thickness of seal: ben-tonite-1'Depth top of filter pack: 2'Elevation/Depth top of screen: 4'Type of screen: 0.010 slot PVC (2")

Slot size: \_\_\_\_\_

I.D. of screen \_\_\_\_\_

Type of filter/sand pack: #2 SandElevation/depth bottom of screen: 14Elevation/depth bottom of well: 14Elevation/depth bottom of filter pack: 14

Type of backfill below observation well: \_\_\_\_\_

Elevation/depth of borehole: 14

<b>TRC</b>  Geoprobe Soil Log	Project/Client		Project No.		Boring No. <b>B-4</b>		Sheet	
	Former B&M Railroad / MVPC		52037-0010-00000		Well No. <b>MW-4</b>		1 of 1	
	Location: <b>Newbury / Newburyport, MA</b>				TRC Geologist <b>M. Oliveira</b>			
Geoprobe Contractor/Foreman <b>Geosearch / Steve Law</b>			Geoprobe Make/Model <b>Geoprobe 6600</b>		Sampling Description Continuous			
Sampler Description: <b>5' Macro core</b>			Sampling Method Direct Push		Coordinates X=                      Y=			
Temporary piezometer or well installed ? (list details below) <b>Yes</b>			Drill bit/auger Diameter (if used): <b>NA</b>		Ref. El.:			
Depth <b>20'</b>			Sampler Diameter: <b>2.5"</b>		Riser Sock-up: <b>NA</b>			
Screen Length/Type: <b>10' / 0.010 slot PVC</b>			Water Table Depth: <b>~15'</b>		Surface Elevation:			
Riser Length/Type: <b>10' / 2" PVC</b>			Total Depth: <b>20'</b>		Date Start: <b>4/3/06</b>		Date Finish: <b>4/3/06</b>	
Depth	Sample Number	PEN/REC	Sample Description		Stratigraphic Description	Field Testing	Lab Sample Number	
1	S-1	5'/3.5'	0-6": brown topsoil made up of silt w/ trace roots from		0-3'	1.5 ppm		
2			6"-3': light brown to orange f-m sand w/ some clay, trace silt + gravel					
3			3'-3.5': dark brown to brown m. sand and silt w/ little clay, trace gravel					
4								
5								
6	S-2	5'/3.75'	5-5.5' same as 3-3.5'		3-10'	2.1 ppm		
7			5.5-8.75' light brown to brown f-m sand w/ trace clay, little gravel					
8								
9								
10								
11	S-3	5'/5'	10-12': same as above		10-15'	0.7 ppm		
12			12-13': gray to brown m-c sand w/ some c. gravel					
13			13-15': light brown to brown f-m sand w/ little silt + clay, moist @ 14'					
<b>GS/GS+Soils</b>			<b>Cohesive Soils</b>		<b>Grain Size (USCS)</b>		<b>Notes</b>	
Blows/ft	Density	Blows/ft	Density				1) 12:20: B-4(0-3') MS/ <sup>DUP</sup> MSD or EPH Pesticides Metals 2) 3) 12:25: B-4(3-16') EPH 4)	
0-4	v. loose	>2	v. soft	silt/clay	<0.08 mm			
4-10	loose	2-4	soft	f. sand	0.43-0.08 mm			
10-30	m. dense	4-8	m. stiff	m. sand	2.0-0.43 mm			
30-50	dense	8-15	stiff	c. sand	4.8-2.0 mm			
>50	v. dense	15-30	v. stiff	f. gravel	19-4.8 mm			
<b>Proportions</b>		>30	hard	c. gravel	75-19 mm			
trace	0-10%	some	20-35%	cobble	300-75 mm			
little	10-20%	and	35-50%	boulder	>300 mm			



# Monitoring Well Construction Summary

Well No.

MW - 4

Project: Former B&M Railroad No.: 52037-0010-00000Client: MVPC Date Completed: \_\_\_\_\_Location: Newbury & Newburyport, MABoring Contractor: Geosearch Method: Direct PushTRC Geologist: M. OliveiraReference Elevation: Top of riser

Elev. Ground Surface: \_\_\_\_\_

Depth to Ground Water: ≈ 15'Development Date: 4/3/06Development Method: Surge/Whale PumpGround  
Elevation

Generalized Stratigraphy and Water Level



Elevation top of protective casing: \_\_\_\_\_

Elevation of top riser pipe: \_\_\_\_\_

Stick-up of protective casing: NAStick-up of riser pipe: NAType of surface seal: grout concrete  
MA 04/15/06

I.D. of protective casing: \_\_\_\_\_

Type of protective casing: 2" PVCDepth bottom of protective casing 10'

Riser pipe I.D. \_\_\_\_\_

Type of riser pipe: 2" PVCBorehole diameter: 3 1/2"

Type of backfill: \_\_\_\_\_

Elevation/depth top of seal: 6'Type and thickness of seal: heptamite-2'Depth top of filter pack: 8'Elevation/Depth top of screen: 10'Type of screen: 0.010 slot PVC (2")

Slot size: \_\_\_\_\_

I.D. of screen \_\_\_\_\_

Type of filter/sand pack: \_\_\_\_\_

Elevation/depth bottom of screen: 20'Elevation/depth bottom of well: 20'Elevation/depth bottom of filter pack: 20'

Type of backfill below observation well: \_\_\_\_\_

Elevation/depth of borehole: 20'

<h1>TRC</h1>	Project/Client	Project No.	Boring No. <b>B-5</b>	Sheet
	Former B&M Railroad / MVPC	52037-0010-00000	Well No. <b>---</b>	1 of 1
	Geoprobe Soil Log		Location: <b>Newbury / Newburyport, MA</b> TRC Geologist: <b>M. Oliveira</b>	
Geoprobe Contractor/Foreman <b>Geosearch / Steve Law</b>		Geoprobe Make/Model <b>Geoprobe 6600</b>		Sampling Description Continuous
Sampler Description: <b>5' Macro core</b>		Sampling Method Direct Push		Coordinates X=      Y=
Temporary piezometer or well installed ? ( list details below) <b>No</b>		Drill bit/auger Diameter (if used): <b>NA</b>		Ref. El.:
Depth		Sampler Diameter: <b>2.5"</b>		Riser Suck-up: <b>NA</b>
Screen Length/Type:		Water Table Depth:		Surface Elevation:
Riser Length/Type:		Total Depth: <b>10'</b>		Date Start: <b>4/3/06</b> Date Finish: <b>4/3/06</b>

Depth	Sample Number	PEN/REC	Sample Description	Strati-graphic Description	Field Testing	Lab Sample Number
1	S-1	5'/3'	0-1': brown - light brown m. sand and silt, black coal ash like material present from 8-9" 1'-3': brown to light brown f-m sand w/ trace c. sand		0-3' = 5.8 ppm	
2						
3						
4						
5	S-2	5'/3.5'	same as 1-3' above dry to bottom		3-10' = 3.4 ppm	
6						
7						
8						
9						
10						
11						
12						
13	S-3					

<b>Granular Soils</b> Blows/ft      Density 0-4      v. loose 4-10      loose 10-30      m. dense 30-50      dense >50      v. dense Proportions trace 0-10%      some 20-35% little 10-20%      and 35-50%	<b>Cohesive Soils</b> Blows/ft      Density >2      v. soft 2-4      soft 4-8      m. stiff 8-15      stiff 15-30      v. stiff >30      hard	<b>Grain Size (USCS)</b> silt/clay <0.08 mm f. sand 0.43-0.08 mm m. sand 2.0-0.43 mm c. sand 4.8-2.0 mm f. gravel 19-4.8 mm c. gravel 75-19 mm cobble 300-75 mm boulder >300 mm	<b>Notes</b> 1) 13:50: B-5(0-3') EPH Metals Pesticides 2) 3) 13:55: B-5(3-10') PCBs EPH, PCBs (PCB MS/MSD) 4) FD: B-Y(0-3'): PCBs @ false time 13:26
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<h1 style="margin:0;">TRC</h1> <h2 style="margin:5px 0 0 0;">Geoprobe Soil Log</h2>	Project/Client	Project No.	Boring No. <b>B-6</b>	Sheet				
	Former B&M Railroad / MVPC	52037-0010-00000	Well No. <b>—</b>	1 of 1				
	Location: <b>Newbury / Newburyport, MA</b>		TRC Geologist <b>M. Oliveira</b>					
Geoprobe Contractor/Foreman <b>Geosearch / Steve Law</b>		Geoprobe Make/Model <b>Geoprobe 6600</b>	Sampling Description Continuous					
Sampler Description: <b>5' Macro core</b>		Sampling Method Direct Push	Coordinates X=      Y=					
Temporary piezometer or well installed ? ( list details below) <b>No</b>		Drill bit/auger Diameter (if used): <b>NA</b>	Ref. El.:					
Depth		Sampler Diameter: <b>2.5"</b>	Riser Size/up: <b>NA</b>					
Screen Length/Type:		Water Table Depth:	Surface Elevation:					
Riser Length/Type:		Total Depth: <b>3'</b>	Date Start: <b>4/3/06</b>	Date Finish: <b>4/3/06</b>				
Depth	Sample Number	PEN/REC	Sample Description	Stratigraphic Description	Field Testing	Lab Sample Number		
1	S-1	3'/2.25'	<b>0-6": brown topsoil consisting of m-c sand and silt, roots present, little fine gravel</b> <b>6"-2.25': light brown to brown m-c sand, trace silt, sand more coarse toward bottom</b> <b>DRY</b>		<b>0-3' = 8.1 ppm</b>			
2								
3								
4								
5								
6	S-2							
7								
8								
9								
10								
11	S-3							
12								
13								
<b>Grain Size (USCS)</b> Blows/ft    Density 0-4          v. loose 4-10        loose 10-30       m. dense 30-50       dense >50        v. dense Proportions trace 0-10%    some 20-35% little 10-20%    and    35-50%		<b>Cohesive Soils</b> Blows/ft    Density >2          v. soft 2-4          soft 4-8          m. stiff 8-15        stiff 15-30       v. stiff >30        hard		<b>Notes</b> 1) <b>14:40: B-6(0-3') EPH</b> <b>Metals</b> <b>Pesticides</b> 2) 3) 4)				

<h1 style="margin:0;">TRC</h1> <h2 style="margin:5px 0 0 0;">Geoprobe Soil Log</h2>	Project/Client	Project No.	Boring No. <b>B-7</b>	Sheet		
	Former B&M Railroad / MVPC	52037-0010-00000	Well No. <b>---</b>	1 of 1		
	Location: <b>Newbury/Newburyport, MA</b>		TRC Geologist <b>M. Oliveira</b>			
Geoprobe Contractor/Foreman <b>Geosearch / Steve Law</b>		Geoprobe Make/Model		Sampling Description Continuous		
Sampler Description: <b>5' Macro core</b>		Sampling Method Direct Push		Coordinates X=      Y=		
Temporary piezometer or well installed? (list details below) <b>No</b>		Drill bit/auger Diameter (if used): <b>NA</b>		Ref. El.:		
Depth		Sampler Diameter: <b>2.5"</b>		Riser Stick-up: <b>NA</b>		
Screen Length/Type:		Water Table Depth:		Surface Elevation:		
Riser Length/Type:		Total Depth: <b>3'</b>		Date Start: <b>4/1/06</b> Date Finish: <b>4/1/06</b>		
Depth	Sample Number	PEN/REC	Sample Description	Stratigraphic Description	Field Testing	Lab Sample Number
1	S-1	3'/2.75'	<b>0-6": black to brown top soil + OM. top soil is silt and f-m sand. roots present.</b> <b>6"-2.75': brown to light brown M-C sand. DRY</b> <b>0-3" = 2.4 ppm</b>			
2						
3						
4						
5						
6	S-2					
7						
8						
9						
10	S-3					
11						
12						
13						

<b>Granular Soils</b> Blows/ft      Density 0-4            v. loose 4-10          loose 10-30        m. dense 30-50        dense >50          v. dense Proportions trace 0-10%    some 20-35% little 10-20%   and 35-50%	<b>Cohesive Soils</b> Blows/ft      Density >2            v. soft 2-4            soft 4-8            m. stiff 8-15          stiff 15-30        v. stiff >30          hard	<b>Grain Size (USCS)</b> silt/clay      <0.08 mm f. sand        0.43-0.08 mm m. sand       2.0-0.43 mm c. sand        4.8-2.0 mm f. gravel       19-4.8 mm c. gravel       75-19 mm cobble        300-75 mm boulder       >300 mm	<b>Notes</b> 1) <b>1530: B-7(0-3'): EPH</b> <b>Metals</b> <b>Pesticides</b> 2) 3) 4)
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<h1 style="margin:0;">TRC</h1> <h2 style="margin:0;">Geoprobe Soil Log</h2>	Project/Client	Project No.	Boring No. <b>B-8</b>	Sheet		
	Former B&M Railroad / MVPC	52037-0010-00000	Well No. <b>---</b>	1 of 1		
	Location: <b>Newbury/Newburyport, MA</b>		TRC Geologist <b>M. Oliveira</b>			
Geoprobe Contractor/Foreman <b>Geo search / Steve Law</b>		Geoprobe Make/Model		Sampling Description Continuous		
Sampler Description: <b>5' Macrolog</b>		Sampling Method Direct Push		Coordinates X=      Y=		
Temporary piezometer or well installed? (list details below) <b>NO</b>		Drill bit/auger Diameter (if used): <b>NA</b>		Ref. El.:		
Depth		Sampler Diameter: <b>2.5"</b>		Riser Stick-up: <b>NA</b>		
Screen Length/Type:		Water Table Depth:		Surface Elevation:		
Riser Length/Type:		Total Depth: <b>3'</b>		Date Start: <b>4/3/06</b> Date Finish: <b>4/3/06</b>		
Depth	Sample Number	PEN/REC	Sample Description	Strati-graphic Description	Field Testing	Lab Sample Number
1	S-1	3'/3'	<b>0-1': dark brown to brown topsoil comprised of F-C sand and silt w/ trace c. gravel</b> <b>1-3': light brown f-c sand</b> <b>DRY</b>			
2						
3						
4						
5						
6	S-2					
7						
8						
9						
10	S-3					
11						
12						
13						
<b>Grain Size (USCS)</b> silt/clay <0.08 mm f. sand 0.43-0.08 mm m. sand 2.0-0.43 mm c. sand 4.8-2.0 mm f. gravel 19-4.8 mm c. gravel 75-19 mm cobble 300-75 mm boulder >300 mm		<b>Notes</b> 1) <b>16:10: B-8(0-3'): EPH Metals Pesticides</b> 2) 3) 4)				



<b>TRC</b>	Project/Client: Former B&M Railroad/ MVPC	Project No. 52037-0010-00000	Boring No. <b>8-9</b>	Sheet 1 of 1		
	Location: <b>Newbury / Newburyport, MA</b>		Well No. <b>MW-9</b>			
	Geoprobe Soil Log		TRC Geologist <b>N Salim</b>			
Geoprobe Contractor/Foreman <b>Geosearch / Brian Law</b>		Geoprobe Make/Model		Sampling Description <b>Continuous</b>		
Sampler Description: 60" Macrocore		Drilling Method Direct Push		Coordinates X=      Y=		
Well Installation Details		Drill Bit/Auger Diameter: <b>NA</b>		Ref. El.:		
Depth <b>18'</b>		Hammer weight/fall:		Riser Stick-up:		
Screen Length/Type: <b>10'</b>		Water Table Depth: <b>~ 8'</b>		Surface Elevation:		
Riser Length/Type: <b>8'</b>		Total Depth:		Date Start: <b>02/07/06</b> Date Finish: <b>09/07/06</b>		
Depth	Sample Number	PEN/REC	Sample Description	Stratigraphic Description	Field Testing	Lab Sample Number
1	S-1	3'/3'	0-6" brown topsoil, silt and roots		1.3 ppm	
2			6"-3' tan fine-medium sand, trace gravel			
3					1.3 ppm	
4		5'/5'	3'-8' tan fine to medium sand, trace gravel		1.3 ppm	
5						
6	S-2				0.4 ppm	
7						
8						
9		5'/5'	8-11 tan fine to medium sand trace gravel (moist)		1.3 ppm	
10			11'-12' tan fine to medium sand, trace gravel (saturated)		0.4 ppm	
11	S-3					
12						
13			12'-13' greenish-gray clay (moist)			

Granular Soils		Cohesive Soils		Grain Size (USCS)		Notes 1) Sample Time = <b>9.00</b> <b>930</b> 2) Interval = <b>0-3 ft</b> <b>3-10 ft</b> 3) Sampled for <b>EPH Metals</b> <b>EPH</b> 4) <b>Pesticides</b>
Blows/ft	Density	Blows/ft	Density			
0-4	v. loose	>2	v. soft	silt/clay	<0.08 mm	
4-10	loose	2-4	soft	f. sand	0.43-0.08 mm	
10-30	m. dense	4-8	m. stiff	m. sand	2.0-0.43 mm	
30-50	dense	8-15	stiff	c. sand	4.8-2.0 mm	
>50	v. dense	15-30	v. stiff	f. gravel	19-4.8 mm	
Proportions		>30	hard	c. gravel	75-19 mm	
trace	0-10%	some	20-35%	cobble	300-75 mm	
little	10-20%	and	35-50%	boulder	>300 mm	

Well Installation - **1.5 ft Bentonite**  
**#2 grade Sand**

<h1 style="margin: 0;">TRC</h1>			Project/Client Former B&M Railroad/ MVPCC		Project No. 52037-0010-00000		Boring No. <b>B-9</b>		Sheet	
							Well No. <b>MW-9</b>		2 of 2	
Geoprobe Soil Log			Location Description <b>Newbury / Newburyport</b>					TRC Geologist <b>M. Saten</b>		
Depth	Sample Number	PEN/REC	Sample Description			Stratigraphic Description	Field Testing	Lab Sample Number		
15	S-3 cont.		<b>13' - 18' greenish-gray clay (moist)</b>							
16	S-4									
17			<b>18' - 23' greenish gray clay moist</b>							
18										
19										
20	S-5									
21			<div style="text-align: center;"> <b>EOB - 23 ft</b> </div>							
22										
23										
24										
25	S-6									
26										
27										
28										
29										
30										
31										

Granular Soils		Cohesive Soils		Grain Size (USCS)		Notes
Blows/ft	Density	Blows/ft	Density			
0-4	v. loose	>2	v. soft	silt/clay	<0.08 mm	1)
4-10	loose	2-4	soft	f. sand	0.43-0.08 mm	2)
10-30	m. dense	4-8	m. stiff	m. sand	2.0-0.43 mm	3)
30-50	dense	8-15	stiff	c. sand	4.8-2.0 mm	4)
>50	v. dense	15-30	v. stiff	f. gravel	19-4.8 mm	
Proportions		>30	hard	c. gravel	75-19 mm	
trace	0-10%			cobble	300-75 mm	
little	10-20%			boulder	>300 mm	
	some 20-35%					
	and 35-50%					



# Monitoring Well Construction Summary

Well No.

MW - 9

Project: Former B&M Railroad No.: 52037-0010-00000Client: MVPC Date Completed: \_\_\_\_\_Location: Newbury & Newburyport, MABoring Contractor: Geosearch Method: Direct Push

TRC Geologist: \_\_\_\_\_

Reference Elevation: \_\_\_\_\_

Elev. Ground Surface: \_\_\_\_\_

Depth to Ground Water: ~ 8 ftDevelopment Date: 04/07/06Development Method: Surge / Whale PumpGround  
Elevation

Generalized Stratigraphy and Water Level



Elevation top of protective casing: \_\_\_\_\_

Elevation of top riser pipe: \_\_\_\_\_

Stick-up of protective casing: FlushStick-up of riser pipe: < FlushType of surface seal: Concrete  
Collar

I.D. of protective casing: \_\_\_\_\_

Type of protective casing: Road Box

Depth bottom of protective casing \_\_\_\_\_

Riser pipe I.D. \_\_\_\_\_

Type of riser pipe: Schedule 40 PVC

Borehole diameter: \_\_\_\_\_

Type of backfill: #2 Fillin Sand

Elevation/depth top of seal: \_\_\_\_\_

Type and thickness of seal: Bentonite  
Chip ~ 1.5 ft

Depth top of filter pack: \_\_\_\_\_

Elevation/Depth top of screen: \_\_\_\_\_

Type of screen: 0.010 Slot PVC (2")Slot size: Schedule 40 PVC

I.D. of screen \_\_\_\_\_

Type of filter/sand pack: #2 Fillin  
Sand

Elevation/depth bottom of screen: \_\_\_\_\_

Elevation/depth bottom of well: \_\_\_\_\_

Elevation/depth bottom of filter pack: \_\_\_\_\_

Type of backfill below observation well: \_\_\_\_\_

#2 Fillin Sand

Elevation/depth of borehole: \_\_\_\_\_

4"

2"

3.5

4.5

6'

8'

2"

18'

18'

18'

23

<h1 style="margin:0;">TRC</h1> <h2 style="margin:5px 0 0 0;">Geoprobe Soil Log</h2>	Project/Client	Project No.	Boring No. <b>B-10</b>	Sheet
	Former B&M Railroad / MVP	52037-0010-00000	Well No. <b>NW-10</b>	1 of 1
	Location: <b>Newbury/Newburyport, MA</b>		TRC Geologist <b>M. Oliwira</b>	

Geoprobe Contractor/Foreman <b>Geosearch</b>	Geoprobe Make/Model	Sampling Description Continuous
-------------------------------------------------	---------------------	------------------------------------

Sampler Description: <b>5' Macro core</b>	Sampling Method Direct Push	Coordinates X=      Y=
Temporary piezometer or well installed? (list details below) <b>Yes</b>	Drill bit/auger Diameter (if used): <b>NA</b>	Ref. El.:
Depth <b>14'</b>	Sampler Diameter: <b>2.5"</b>	Riser Suck-up: <b>NA</b>
Screen Length/Type: <b>10'/0.010 Slot PVC</b>	Water Table Depth: <b>~2'</b>	Surface Elevation: -
Riser Length/Type: <b>4'/2" PVC</b>	Total Depth: <b>14'</b>	Date Start: <b>4/4/06</b> Date Finish: <b>4/4/06</b>

Depth	Sample Number	PEN/REC	Sample Description	Stratigraphic Description	Field Testing	Lab Sample Number
1	S-1	3'/225'	0-6": black to brown c. sand + silt w/ some c. gravel + trace OM, trace cobble	Fill ? ↓	NM	
2			6"-12": light brown m-c. sand w/ little f. gravel			
3			12"-15": <del>light</del> cobble + c. gravel			
4			15"-18": brown c. sand + f. gravel			
5	S-2		18"-22": light brown to gray m-c. sand and little f. gravel			
6			22"-26": light brown coarse sand w/ little f. gravel			
7			Water table ~ 2'			
8						
9						
10	S-3					
11						
12						
13						

<b>Granular Soils</b> Blows/ft      Density 0-4      v. loose 4-10      loose 10-30      m. dense 30-50      dense >50      v. dense Proportions trace 0-10%      some 20-35% little 10-20%      and 35-50%	<b>Cohesive Soils</b> Blows/ft      Density >2      v. soft 2-4      soft 4-8      m. stiff 8-15      stiff 15-30      v. stiff >30      hard	<b>Grain Size (USCS)</b> silt/clay      <0.08 mm f. sand      0.08-0.43 mm m. sand      0.43-0.60 mm c. sand      0.60-2.0 mm f. gravel      2.0-4.75 mm c. gravel      4.75-20 mm cobble      20-75 mm boulder      >75 mm	<b>Notes</b> 1) <b>09:05: B-10(0-3'): EPH</b> <b>Metals</b> 2) <b>NM - could not measure</b> <b>Pesticides</b> 3) <b>headspace due to insufficient soil volume after filling sample containers</b> 4)
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



## Monitoring Well Construction Summary

Well No.

MW - 10

Project: Former B&M Railroad No.: 52037-0010-00000Client: MVPC Date Completed: \_\_\_\_\_Location: Newbury & Newburyport, MABoring Contractor: Geosearch Method: Direct PushTRC Geologist: M. OliveiraReference Elevation: top of riser

Elev. Ground Surface: \_\_\_\_\_

Depth to Ground Water: ~2'Development Date: 4/4/06Development Method: Surge/Whale PumpGround  
Elevation

Generalized Stratigraphy and Water Level



Elevation top of protective casing: \_\_\_\_\_

Elevation of top riser pipe: \_\_\_\_\_

Stick-up of protective casing: NAStick-up of riser pipe: NAType of surface seal: concrete

I.D. of protective casing: \_\_\_\_\_

Type of protective casing: 2" PVC

Depth bottom of protective casing \_\_\_\_\_

Riser pipe I.D. \_\_\_\_\_

Type of riser pipe: \_\_\_\_\_

Borehole diameter: 3 1/2"

Type of backfill: \_\_\_\_\_

Elevation/depth top of seal: 1'-2'Type and thickness of seal: bentonite-1'Depth top of filter pack: 2'Elevation/Depth top of screen: 4'Type of screen: 0.060 slot PVC (2')

Slot size: \_\_\_\_\_

I.D. of screen \_\_\_\_\_

Type of filter/sand pack: #2 SandElevation/depth bottom of screen: 14Elevation/depth bottom of well: 14Elevation/depth bottom of filter pack: 14

Type of backfill below observation well: \_\_\_\_\_

Elevation/depth of borehole: 14

**APPENDIX C**

**SOIL AND GROUNDWATER ANALYTICAL  
LABORATORY REPORTS**

**Former Boston & Maine Railroad, Newbury & Newburyport, MA**  
**Data Usability Assessment**

The data associated with soil samples collected 4/3/06, 4/4/06, and 4/7/06 and groundwater samples collected 4/12/06 were reviewed. In general, the data are usable for MCP decisions based on the Compendium of Analytical Methods (CAM) requirements for acceptable accuracy, precision, and sensitivity. Although there were select quality control (QC) nonconformances, the data are valid as reported and may be used for decision-making purposes with the following caution.

- Potential uncertainty exists for the majority of EPH constituents in soil sample B-2 (0-3') due to field duplicate variability. Select results in the original sample exceed the S-1 RC and should be used for decision-making purposes in order to remain conservative.

Details on the data usability assessment are provided below.

### **I. Soil Samples**

There were no biases or uncertainty associated with the PCB analyses of soil samples. Sensitivity was not acceptable for gamma-BHC (lindane) in select samples (i.e., nondetect results exhibited quantitation limits above the applicable S-1 RC). The following table summarizes the affected samples.

Analyte Affected	Affected Samples	S-1 RC (mg/kg)	Quantitation Limits (mg/kg)
Gamma-BHC (Lindane)	B-1 (0-3'), B-2 (0-3'), B-3 (0-3'), B-4 (0-3'), B-5 (0-3')	0.003	0.0290, 0.0150, 0.0148, 0.0146, 0.0140

#### **A. Low-Biased Results**

Potential low bias exists for the barium results in all soil samples due to slightly low recovery in the matrix spike analysis. The overall data usability and decision-making process was not affected by the QC nonconformance as all results for barium were over an order of magnitude below the applicable RC.

#### **B. High-Biased Results**

Potential false positives (or high bias) exist for zinc results in all soil samples with the exception of B-9 (0-3') and B-9 (3-10') due to method blank contamination. The overall data usability and decision-making process was not affected by the blank contamination since the detected results for zinc were below the applicable RC in all associated samples.

#### **C. Potential Uncertainty**

Potential uncertainty exists for select results due to various QC nonconformances. The majority of EPH constituents showed high variability in the field duplicate performed on sample B-2 (0-3'). The end user of the data should use the results of the original sample which exhibited higher concentrations of all constituents, some of which exceeded S-1 RCs in the original sample only. In general, the overall data usability and decision-making process was not affected by the other QC nonconformances, as shown in the table below.

Samples Affected	Analytes Affected	Reason for Uncertainty	Reason Data Usability or Decision-making Process Not Affected
B-4 (0-3')	Hexachlorobenzene	MS/MSD RPD nonconformance	Result significantly below the S-1 RC
B-10 (0-3')	Fluorene	LCS/LCS Duplicate RPD nonconformance	Result significantly below the S-2 RC

### **III. Groundwater Samples**

There were no biases or uncertainty associated with the metals and cyanide analyses of groundwater samples. Sensitivity was acceptable for all analyses (i.e., quantitation limits were below the MCP GW-2 RCs for all nondetect results).

#### **A. Low-Biased Results**

Potential low bias exists for select results due to various QC nonconformances. In general, the overall data usability and decision-making process was not affected by the QC nonconformances, as shown in the table below.

Samples Affected	Analytes Affected	Reason for Low Bias	Reason Data Usability or Decision-making Process Not Affected
MW-10	C <sub>9</sub> -C <sub>18</sub> Aliphatics and C <sub>19</sub> -C <sub>36</sub> Aliphatics	Low surrogate recovery	Nondetect results for these hydrocarbon ranges significantly below the GW-2 RC
MW-10	Dichlorodifluoromethane	Low recovery in LCS and LCS Duplicate	Nondetect result for this compound significantly below the GW-2 RC



ALPHA ANALYTICAL LABORATORIES

Eight Walkup Drive  
Westborough, Massachusetts 01581-1019  
(508) 898-9220 www.alphalab.com

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

CERTIFICATE OF ANALYSIS

Client:	TRC Environmental Corporation	Laboratory Job Number:	L0604684
Address:	Boott Mills South 116 John Street Lowell, MA 01852	Date Received:	05-APR-2006
Attn:	Mr. Frank Calandra	Date Reported:	08-MAY-2006
Project Number:	52037-0010-00000	Delivery Method:	Alpha
Site:	FORMER B&M RAILROAD		

The following questions pertain only to MCP Analytical Methods

An affirmative response to questions A,B,C & D is required for "Presumptive Certainty" status

- A. Were all samples received by the laboratory in a condition consistent with those described on their Chain-of-Custody documentation for the data set? YES
- B. Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines? YES
- C. Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in section 2.0 of the MADEP document CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? YES
- D. VPH and EPH methods only: Was the VPH or EPH method run without significant modifications, as specified in Section 11.3? YES

A response to questions E and F is required for "Presumptive Certainty" status

- E. Were all QC performance standards and recommendations for the specified method(s) achieved? NO
- F. Were results for all analyte-list compounds/elements for the specified method(s) reported? YES

Any answers of NO to the above questions are addressed in the 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 report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized by:   
Technical Director

## ALPHA ANALYTICAL LABORATORIES

Laboratory Job Number: L0604684

Date Reported: 08-MAY-2006

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ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L0604684-01	B-1 (0-3')	NEWBURYPORT, MA
L0604684-02	B-1 (3-10')	NEWBURYPORT, MA
L0604684-03	B-X (0-3')	NEWBURYPORT, MA
L0604684-04	B-2 (0-3')	NEWBURYPORT, MA
L0604684-05	B-2 (3-10')	NEWBURYPORT, MA
L0604684-06	B-3 (0-3')	NEWBURYPORT, MA
L0604684-07	B-4 (0-3')	NEWBURYPORT, MA
L0604684-08	B-4 (3-10')	NEWBURYPORT, MA
L0604684-09	B-Y (0-3')	NEWBURYPORT, MA
L0604684-10	B-5 (0-3')	NEWBURYPORT, MA
L0604684-11	B-5 (3-10')	NEWBURYPORT, MA
L0604684-12	B-6 (0-3')	NEWBURYPORT, MA
L0604684-13	B-7 (0-3')	NEWBURYPORT, MA
L0604684-14	B-8 (0-3')	NEWBURYPORT, MA
L0604684-15	B-10 (0-3')	NEWBURYPORT, MA

ALPHA ANALYTICAL LABORATORIES  
NARRATIVE REPORT

Laboratory Job Number: L0604684

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Report Submission

This report replaces the report issued April 13, 2006. The EPH narrative section has been amended and the non-diluted EPH run of L0604684-15 has been added to the report.

MCP Related Narratives

Metals

The WG235174-4,5 solid LCS/LCSD % recoveries for Cd are acceptable since they fall within the vendor specified control limits.

In reference to question E:

The WG235175-2 MS % recovery for Ba is outside the acceptance criteria for the method. A post analytical spike was performed with an acceptable recovery of 99%.

PCB

WG235183

Extraction method 3545

Cleanup method 3665A

Pesticides

WG235185

Extraction method: 3545

Cleanup method: 3620B

In reference to question E:

The MS/MSD RPD for Hexachlorobenzene is above method acceptance criteria.

The following samples have elevated limits of detection due to analytical dilutions required by the matrix of the samples. Failure of instrument QC required reanalysis on dilution. The Reporting limits were not achieved for Lindane:

L0604684-03, -04, -07, -10 (5x)

L0604684-01 and -15 (10x)

L0604684-06 has elevated limits of detection due to the 5x dilutions required by the elevated concentrations of target compounds in the sample. The Reporting Limits were not achieved for Lindane.

In reference to question E:

The surrogates could not be recovered on -01 and -15 due to the dilutions required to quantitate the samples.

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ALPHA ANALYTICAL LABORATORIES  
NARRATIVE REPORT

Laboratory Job Number: L0604684

Continued

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EPH

WG235816:

Extraction method 3545

L0604684-04 has elevated limits of detection due to the 2x dilution required by the elevated concentrations of target compounds in the sample. The dilution was based on the physical appearance of the final extract.

The results for L0604684-15 were re-evaluated at the client's request. It was determined that an analytical oversight occurred with the first analysis and the initial results were not reported.

L0604684-15 required re-analysis on a 2x dilution in order to quantitate the sample within the range of the calibration. The result is reported as a greater than value for the compound that exceeded the calibration on the initial analysis. The re-analysis was performed only for the compound which exceeded the range of the calibration.

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-01

Date Collected: 03-APR-2006 09:15

B-1 (0-3')

Date Received : 05-APR-2006

Sample Matrix:

SOIL

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 3-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP ANAL	ID
Solids, Total	92	%	0.10	30 2540G	0410 12:37 PD	
<u>Total Metals by MCP 6000/7000 series</u>						
Antimony, Total	ND	mg/kg	2.2	60 6010B	0406 17:45 0407 12:17 RW	
Arsenic, Total	12	mg/kg	0.43	60 6010B	0406 17:45 0407 12:17 RW	
Barium, Total	43	mg/kg	0.43	60 6010B	0406 17:45 0407 12:17 RW	
Beryllium, Total	ND	mg/kg	0.22	60 6010B	0406 17:45 0407 12:17 RW	
Cadmium, Total	ND	mg/kg	0.43	60 6010B	0406 17:45 0407 12:17 RW	
Chromium, Total	15	mg/kg	0.43	60 6010B	0406 17:45 0407 12:17 RW	
Lead, Total	80	mg/kg	2.2	60 6010B	0406 17:45 0407 12:17 RW	
Nickel, Total	12	mg/kg	1.1	60 6010B	0406 17:45 0407 12:17 RW	
Selenium, Total	ND	mg/kg	2.2	60 6010B	0406 17:45 0407 12:17 RW	
Silver, Total	ND	mg/kg	0.43	60 6010B	0406 17:45 0407 12:17 RW	
Thallium, Total	ND	mg/kg	2.2	60 6010B	0406 17:45 0407 12:17 RW	
Vanadium, Total	16	mg/kg	0.43	60 6010B	0406 17:45 0407 12:17 RW	
Zinc, Total	120	mg/kg	2.2	60 6010B	0406 17:45 0407 12:17 RW	
<u>Organochlorine Pesticides by MCP 8081A</u>						
Surrogate(s)	Recovery		QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	ND	%	30-150			
Decachlorobiphenyl	ND	%	30-150			
<u>Organochlorine Pesticides by MCP 8081A</u>						
Delta-BHC	ND	ug/kg	36.2			
Lindane	ND	ug/kg	29.0			
Alpha-BHC	ND	ug/kg	36.2			
Beta-BHC	ND	ug/kg	36.2			
Heptachlor	ND	ug/kg	36.2			
Aldrin	ND	ug/kg	36.2			
Heptachlor epoxide	ND	ug/kg	36.2			
Endrin	ND	ug/kg	36.2			
Endrin ketone	ND	ug/kg	36.2			
Dieldrin	ND	ug/kg	36.2			
4,4'-DDE	ND	ug/kg	36.2			
4,4'-DDD	ND	ug/kg	36.2			
4,4'-DDT	ND	ug/kg	36.2			
Endosulfan I	ND	ug/kg	36.2			

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604684-01  
B-1 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
<hr/>							
Organochlorine Pesticides by MCP-8081A cont'd							
Endosulfan II	ND	ug/kg	36.2	64-8081A	0406	23:50	0411
Endosulfan sulfate	ND	ug/kg	36.2				23:24 JB
Methoxychlor	ND	ug/kg	145.				
Chlordane	ND	ug/kg	145.				
Toxaphene	ND	ug/kg	145.				
Hexachlorobenzene	ND	ug/kg	36.2				
<hr/>							
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	ND	%	30-150				
Decachlorobiphenyl	ND	%	30-150				

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604684-01  
B-1 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP    ANAL	ID
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Extractable Petroleum Hydrocarbons 61 EPH-04-1 041119:30 0413 00:57 BN

**Quality Control Information**

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? YES  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	mg/kg	7.25
C19-C36 Aliphatics	68.5	mg/kg	7.25
C11-C22 Aromatics	105	mg/kg	7.25
C11-C22 Aromatics, Adjusted	102	mg/kg	7.25
Naphthalene	ND	mg/kg	0.362
2-Methylnaphthalene	ND	mg/kg	0.362
Acenaphthylene	ND	mg/kg	0.362
Acenaphthene	ND	mg/kg	0.362
Fluorene	ND	mg/kg	0.362
Phenanthrene	ND	mg/kg	0.362
Anthracene	ND	mg/kg	0.362
Fluoranthene	0.616	mg/kg	0.362
Pyrene	0.644	mg/kg	0.362
Benzo(a)anthracene	0.398	mg/kg	0.362
Chrysene	0.474	mg/kg	0.362
Benzo(b)fluoranthene	0.415	mg/kg	0.362
Benzo(k)fluoranthene	0.400	mg/kg	0.362
Benzo(a)pyrene	0.459	mg/kg	0.362
Indeno(1,2,3-cd)Pyrene	ND	mg/kg	0.362
Dibenzo(a,h)anthracene	ND	mg/kg	0.362
Benzo(ghi)perylene	ND	mg/kg	0.362
Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	70.0	%	40-140
o-Terphenyl	89.0	%	40-140
2-Fluorobiphenyl	84.0	%	40-140
2-Bromonaphthalene	88.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-02

Date Collected: 03-APR-2006 09:20

B-1 (3-10')

Date Received : 05-APR-2006

Sample Matrix:

SOIL

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total	86	%	0.10	30 2540G			0410 12:37 PD

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604684-02  
B-1 (3-10')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP      ANAL	ID
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Extractable Petroleum Hydrocarbons	61 EPH-04-1	0411 19:30-0412 21:42 BN
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Quality Control Information
-----------------------------

Condition of sample received:	Satisfactory
Sample temperature upon receipt:	Received on Ice
Sample extraction method:	Extracted Per the Method
Were all QA/QC procedures REQUIRED by the method followed?	YES
Were all performance/acceptance standards for the required procedures achieved?	YES
Were significant modifications made to the method as specified in Sect 11.3?	NO
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.	
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.	

C9-C18 Aliphatics	ND	mg/kg	7.75
C19-C36 Aliphatics	ND	mg/kg	7.75
C11-C22 Aromatics	ND	mg/kg	7.75
C11-C22 Aromatics, Adjusted	ND	mg/kg	7.75
Naphthalene	ND	mg/kg	0.388
2-Methylnaphthalene	ND	mg/kg	0.388
Acenaphthylene	ND	mg/kg	0.388
Acenaphthene	ND	mg/kg	0.388
Fluorene	ND	mg/kg	0.388
Phenanthrene	ND	mg/kg	0.388
Anthracene	ND	mg/kg	0.388
Fluoranthene	ND	mg/kg	0.388
Pyrene	ND	mg/kg	0.388
Benzo(a)anthracene	ND	mg/kg	0.388
Chrysene	ND	mg/kg	0.388
Benzo(b)fluoranthene	ND	mg/kg	0.388
Benzo(k)fluoranthene	ND	mg/kg	0.388
Benzo(a)pyrene	ND	mg/kg	0.388
Indeno(1,2,3-cd)Pyrene	ND	mg/kg	0.388
Dibenzo(a,h)anthracene	ND	mg/kg	0.388
Benzo(ghi)perylene	ND	mg/kg	0.388

Surrogate(s)	Recovery	QC Criteria
Chloro-Octadecane	59.0 %	40-140
o-Terphenyl	76.0 %	40-140
2-Fluorobiphenyl	77.0 %	40-140
2-Bromonaphthalene	74.0 %	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE.

Laboratory Sample Number: L0604684-03

Date Collected: 03-APR-2006 09:40

B-X (0-3')

Date Received : 05-APR-2006

Sample Matrix: SOIL

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 3-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total	88	%	0.10	30 2540G		0410 12:37 PD	
<u>Total Metals by MCP 6000/7000 series</u>							
Antimony, Total	4.3	mg/kg	2.3	60 6010B	0406 17:45	0407 12:19 RW	
Arsenic, Total	13	mg/kg	0.45	60 6010B	0406 17:45	0407 12:19 RW	
Barium, Total	83	mg/kg	0.45	60 6010B	0406 17:45	0407 12:19 RW	
Beryllium, Total	ND	mg/kg	0.23	60 6010B	0406 17:45	0407 12:19 RW	
Cadmium, Total	ND	mg/kg	0.45	60 6010B	0406 17:45	0407 12:19 RW	
Chromium, Total	13	mg/kg	0.45	60 6010B	0406 17:45	0407 12:19 RW	
Lead, Total	320	mg/kg	2.3	60 6010B	0406 17:45	0407 12:19 RW	
Nickel, Total	12	mg/kg	1.1	60 6010B	0406 17:45	0407 12:19 RW	
Selenium, Total	ND	mg/kg	2.3	60 6010B	0406 17:45	0407 12:19 RW	
Silver, Total	ND	mg/kg	0.45	60 6010B	0406 17:45	0407 12:19 RW	
Thallium, Total	ND	mg/kg	2.3	60 6010B	0406 17:45	0407 12:19 RW	
Vanadium, Total	13	mg/kg	0.45	60 6010B	0406 17:45	0407 12:19 RW	
Zinc, Total	130	mg/kg	2.3	60 6010B	0406 17:45	0407 12:19 RW	
<u>Organochlorine Pesticides by MCP 8081A</u>							
Delta-BHC	ND	ug/kg	18.9	64 8081A	0406 23:50	0412 01:19 JB	
Lindane	ND	ug/kg	15.2				
Alpha-BHC	ND	ug/kg	18.9				
Beta-BHC	ND	ug/kg	18.9				
Heptachlor	ND	ug/kg	18.9				
Aldrin	ND	ug/kg	18.9				
Heptachlor epoxide	ND	ug/kg	18.9				
Endrin	ND	ug/kg	18.9				
Endrin ketone	ND	ug/kg	18.9				
Dieldrin	ND	ug/kg	18.9				
4,4'-DDE	ND	ug/kg	18.9				
4,4'-DDD	ND	ug/kg	18.9				
4,4'-DDT	ND	ug/kg	18.9				
Endosulfan I	ND	ug/kg	18.9				
Endosulfan II	ND	ug/kg	18.9				
Endosulfan sulfate	ND	ug/kg	18.9				
Methoxychlor	ND	ug/kg	75.8				
Chlordane	ND	ug/kg	75.8				
Toxaphene	ND	ug/kg	75.8				
Hexachlorobenzene	ND	ug/kg	18.9				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604684-03  
B-X (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
<hr/>							
Organochlorine Pesticides by MCP 8081A cont'd							
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	75.0	%		30-150			
Decachlorobiphenyl	76.0	%		30-150			
<hr/>							
Organochlorine Pesticides by MCP 8081A							
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	77.0	%		30-150			
Decachlorobiphenyl	77.0	%		30-150			

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604684-03  
B-X (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Extractable Petroleum Hydrocarbons 61:EPH-04-1 0411 19:30 0412 22:14 BN

Quality Control Information

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? YES  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	mg/kg	7.58
C19-C36 Aliphatics	10.5	mg/kg	7.58
C11-C22 Aromatics	134	mg/kg	7.58
C11-C22 Aromatics, Adjusted	80.0	mg/kg	7.58
Naphthalene	1.10	mg/kg	0.379
2-Methylnaphthalene	ND	mg/kg	0.379
Acenaphthylene	ND	mg/kg	0.379
Acenaphthene	0.503	mg/kg	0.379
Fluorene	0.594	mg/kg	0.379
Phenanthrene	6.98	mg/kg	0.379
Anthracene	1.61	mg/kg	0.379
Fluoranthene	9.68	mg/kg	0.379
Pyrene	7.73	mg/kg	0.379
Benzo(a)anthracene	4.35	mg/kg	0.379
Chrysene	4.23	mg/kg	0.379
Benzo(b)fluoranthene	3.91	mg/kg	0.379
Benzo(k)fluoranthene	3.43	mg/kg	0.379
Benzo(a)pyrene	4.16	mg/kg	0.379
Indeno(1,2,3-cd)Pyrene	2.57	mg/kg	0.379
Dibenzo(a,h)anthracene	0.569	mg/kg	0.379
Benzo(ghi)perylene	2.07	mg/kg	0.379

Surrogate(s)	Recovery	QC Criteria
Chloro-Octadecane	60.0 %	40-140
o-Terphenyl	105 %	40-140
2-Fluorobiphenyl	72.0 %	40-140
2-Bromonaphthalene	73.0 %	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-04

B-2 (0-3')

Sample Matrix:

SOIL

Date Collected: 03-APR-2006 10:05

Date Received : 05-APR-2006

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 3-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total	89	%	0.10	30 2540G			0410 12:37 PD
<u>Total Metals by MCP 6000/7000 series</u>							
Antimony, Total	ND	mg/kg	2.2	60 6010B	0406 17:45	0407 12:22	RW
Arsenic, Total	12	mg/kg	0.44	60 6010B	0406 17:45	0407 12:22	RW
Barium, Total	100	mg/kg	0.44	60 6010B	0406 17:45	0407 12:22	RW
Beryllium, Total	ND	mg/kg	0.22	60 6010B	0406 17:45	0407 12:22	RW
Cadmium, Total	ND	mg/kg	0.44	60 6010B	0406 17:45	0407 12:22	RW
Chromium, Total	15	mg/kg	0.44	60 6010B	0406 17:45	0407 12:22	RW
Lead, Total	430	mg/kg	2.2	60 6010B	0406 17:45	0407 12:22	RW
Nickel, Total	12	mg/kg	1.1	60 6010B	0406 17:45	0407 12:22	RW
Selenium, Total	ND	mg/kg	2.2	60 6010B	0406 17:45	0407 12:22	RW
Silver, Total	ND	mg/kg	0.44	60 6010B	0406 17:45	0407 12:22	RW
Thallium, Total	ND	mg/kg	2.2	60 6010B	0406 17:45	0407 12:22	RW
Vanadium, Total	16	mg/kg	0.44	60 6010B	0406 17:45	0407 12:22	RW
Zinc, Total	130	mg/kg	2.2	60 6010B	0406 17:45	0407 12:22	RW
<u>Organochlorine Pesticides by MCP 8081A</u>							
Delta-BHC	ND	ug/kg	18.7	64 8081A	0406 23:50	0411 23:53	JB
Lindane	ND	ug/kg	15.0				
Alpha-BHC	ND	ug/kg	18.7				
Beta-BHC	ND	ug/kg	18.7				
Heptachlor	ND	ug/kg	18.7				
Aldrin	ND	ug/kg	18.7				
Heptachlor epoxide	ND	ug/kg	18.7				
Endrin	ND	ug/kg	18.7				
Endrin ketone	ND	ug/kg	18.7				
Dieldrin	ND	ug/kg	18.7				
4,4'-DDE	ND	ug/kg	18.7				
4,4'-DDD	ND	ug/kg	18.7				
4,4'-DDT	ND	ug/kg	18.7				
Endosulfan I	ND	ug/kg	18.7				
Endosulfan II	ND	ug/kg	18.7				
Endosulfan sulfate	ND	ug/kg	18.7				
Methoxychlor	ND	ug/kg	74.9				
Chlordane	ND	ug/kg	74.9				
Toxaphene	ND	ug/kg	74.9				
Hexachlorobenzene	ND	ug/kg	18.7				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604684-04  
B-2 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Organochlorine Pesticides by MCP 8081A cont'd							
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	58.0	%		30-150			
Decachlorobiphenyl	56.0	%		30-150			
Organochlorine Pesticides by MCP 8081A							
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	59.0	%		30-150			
Decachlorobiphenyl	55.0	%		30-150			

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604684-04  
B-2 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP    ANAL	ID
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Extractable Petroleum Hydrocarbons 61 EPH-04-1 041119:30 0412 23:52 BN

**Quality Control Information**

Condition of sample received:	Satisfactory
Sample temperature upon receipt:	Received on Ice
Sample extraction method:	Extracted Per the Method
Were all QA/QC procedures REQUIRED by the method followed?	YES
Were all performance/acceptance standards for the required procedures achieved?	YES
Were significant modifications made to the method as specified in Sect 11.3?	NO
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.	
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.	

C9-C18 Aliphatics	ND	mg/kg	15.0
C19-C36 Aliphatics	ND	mg/kg	15.0
C11-C22 Aromatics	231	mg/kg	15.0
C11-C22 Aromatics, Adjusted	139	mg/kg	15.0
Naphthalene	2.18	mg/kg	0.749
2-Methylnaphthalene	ND	mg/kg	0.749
Acenaphthylene	0.769	mg/kg	0.749
Acenaphthene	ND	mg/kg	0.749
Fluorene	0.908	mg/kg	0.749
Phenanthrene	10.9	mg/kg	0.749
Anthracene	2.80	mg/kg	0.749
Fluoranthene	16.0	mg/kg	0.749
Pyrene	12.8	mg/kg	0.749
Benzo(a)anthracene	7.56	mg/kg	0.749
Chrysene	7.37	mg/kg	0.749
Benzo(b)fluoranthene	6.57	mg/kg	0.749
Benzo(k)fluoranthene	6.02	mg/kg	0.749
Benzo(a)pyrene	7.59	mg/kg	0.749
Indeno(1,2,3-cd)Pyrene	5.00	mg/kg	0.749
Dibenzo(a,h)anthracene	1.02	mg/kg	0.749
Benzo(ghi)perylene	4.44	mg/kg	0.749
Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	53.0	%	40-140
o-Terphenyl	119	%	40-140
2-Fluorobiphenyl	72.0	%	40-140
2-Bromonaphthalene	76.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-05

B-2 (3-10')

Sample Matrix:

SOIL

Date Collected: 03-APR-2006 10:10

Date Received : 05-APR-2006

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total	87	%	0.10	30 2540G		0410 12:37 PD	

Comments: Complete list of References and Glossary of Terms found in Addendum I



**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604684-05  
B-2 (3-10')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Extractable Petroleum Hydrocarbons 61 EPH-04-1 0411 19:30 0412 22:47 BN

**Quality Control Information**

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? YES  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	83.8	mg/kg	7.66
C19-C36 Aliphatics	25.6	mg/kg	7.66
C11-C22 Aromatics	66.9	mg/kg	7.66
C11-C22 Aromatics, Adjusted	55.8	mg/kg	7.66
Naphthalene	0.527	mg/kg	0.383
2-Methylnaphthalene	ND	mg/kg	0.383
Acenaphthylene	ND	mg/kg	0.383
Acenaphthene	ND	mg/kg	0.383
Fluorene	ND	mg/kg	0.383
Phenanthrene	1.51	mg/kg	0.383
Anthracene	ND	mg/kg	0.383
Fluoranthene	2.10	mg/kg	0.383
Pyrene	1.66	mg/kg	0.383
Benzo(a)anthracene	0.933	mg/kg	0.383
Chrysene	0.871	mg/kg	0.383
Benzo(b)fluoranthene	0.718	mg/kg	0.383
Benzo(k)fluoranthene	0.785	mg/kg	0.383
Benzo(a)pyrene	0.889	mg/kg	0.383
Indeno(1,2,3-cd)Pyrene	0.575	mg/kg	0.383
Dibenzo(a,h)anthracene	ND	mg/kg	0.383
Benzo(ghi)perylene	0.500	mg/kg	0.383

Surrogate(s)	Recovery	QC Criteria
Chloro-Octadecane	58.0 %	40-140
o-Terphenyl	90.0 %	40-140
2-Fluorobiphenyl	80.0 %	40-140
2-Bromonaphthalene	78.0 %	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-06

B-3 (0-3')

Sample Matrix:

SOIL

Date Collected: 03-APR-2006 11:05

Date Received : 05-APR-2006

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 3-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total	90	%	0.10	30 2540G			0410 12:37 PD
Total Metals by MCP 6000/7000 series 60 6010B							
Antimony, Total	ND	mg/kg	2.2	60 6010B	0406 17:45	0407 12:25	RW
Arsenic, Total	23	mg/kg	0.44	60 6010B	0406 17:45	0407 12:25	RW
Barium, Total	40	mg/kg	0.44	60 6010B	0406 17:45	0407 12:25	RW
Beryllium, Total	ND	mg/kg	0.22	60 6010B	0406 17:45	0407 12:25	RW
Cadmium, Total	ND	mg/kg	0.44	60 6010B	0406 17:45	0407 12:25	RW
Chromium, Total	21	mg/kg	0.44	60 6010B	0406 17:45	0407 12:25	RW
Lead, Total	280	mg/kg	2.2	60 6010B	0406 17:45	0407 12:25	RW
Nickel, Total	17	mg/kg	1.1	60 6010B	0406 17:45	0407 12:25	RW
Selenium, Total	ND	mg/kg	2.2	60 6010B	0406 17:45	0407 12:25	RW
Silver, Total	ND	mg/kg	0.44	60 6010B	0406 17:45	0407 12:25	RW
Thallium, Total	ND	mg/kg	2.2	60 6010B	0406 17:45	0407 12:25	RW
Vanadium, Total	16	mg/kg	0.44	60 6010B	0406 17:45	0407 12:25	RW
Zinc, Total	57	mg/kg	2.2	60 6010B	0406 17:45	0407 12:25	RW
Organochlorine Pesticides by MCP 8081A 64 8081A 0406 23:50 0412 00:21 JB							
Delta-BHC	ND	ug/kg	18.5				
Lindane	ND	ug/kg	14.8				
Alpha-BHC	ND	ug/kg	18.5				
Beta-BHC	ND	ug/kg	18.5				
Heptachlor	ND	ug/kg	18.5				
Aldrin	ND	ug/kg	18.5				
Heptachlor epoxide	ND	ug/kg	18.5				
Endrin	ND	ug/kg	18.5				
Endrin ketone	ND	ug/kg	18.5				
Dieldrin	ND	ug/kg	18.5				
4,4'-DDE	22.8	ug/kg	18.5				
4,4'-DDD	ND	ug/kg	18.5				
Endosulfan I	ND	ug/kg	18.5				
Endosulfan II	ND	ug/kg	18.5				
Endosulfan sulfate	ND	ug/kg	18.5				
Methoxychlor	ND	ug/kg	74.1				
Chlordane	ND	ug/kg	74.1				
Toxaphene	ND	ug/kg	74.1				
Hexachlorobenzene	ND	ug/kg	18.5				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604684-06  
B-3 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Organochlorine Pesticides by MCP-8081A-cont'd							
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	83.0	%		30-150			
Decachlorobiphenyl	75.0	%		30-150			
Organochlorine Pesticides by MCP-8081A							
4,4'-DDT	46.3	ug/kg		18.5			
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	81.0	%		30-150			
Decachlorobiphenyl	78.0	%		30-150			

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604684-06  
B-3 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP      ANAL	ID
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Extractable Petroleum Hydrocarbons 61 EPH-04-1 0411 19:30 0412 23:19 BN

**Quality Control Information**

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? YES  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	mg/kg	7.41
C19-C36 Aliphatics	9.28	mg/kg	7.41
C11-C22 Aromatics	30.3	mg/kg	7.41
C11-C22 Aromatics, Adjusted	24.9	mg/kg	7.41
Naphthalene	ND	mg/kg	0.370
2-Methylnaphthalene	ND	mg/kg	0.370
Acenaphthylene	ND	mg/kg	0.370
Acenaphthene	ND	mg/kg	0.370
Fluorene	ND	mg/kg	0.370
Phenanthrene	0.456	mg/kg	0.370
Anthracene	ND	mg/kg	0.370
Fluoranthene	0.914	mg/kg	0.370
Pyrene	0.875	mg/kg	0.370
Benzo(a)anthracene	0.392	mg/kg	0.370
Chrysene	0.513	mg/kg	0.370
Benzo(b)fluoranthene	0.626	mg/kg	0.370
Benzo(k)fluoranthene	0.503	mg/kg	0.370
Benzo(a)pyrene	0.584	mg/kg	0.370
Indeno(1,2,3-cd)Pyrene	0.473	mg/kg	0.370
Dibenzo(a,h)anthracene	ND	mg/kg	0.370
Benzo(ghi)perylene	ND	mg/kg	0.370

Surrogate(s)	Recovery	QC Criteria
Chloro-Octadecane	58.0 %	40-140
o-Terphenyl	79.0 %	40-140
2-Fluorobiphenyl	80.0 %	40-140
2-Bromonaphthalene	78.0 %	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-07

Date Collected: 03-APR-2006 12:20

B-4 (0-3')

Date Received : 05-APR-2006

Sample Matrix: SOIL

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 6-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP ANAL	ID
Solids, Total	91	%	0.10	30 2540G	0410 12:37 PD	
<u>Total Metals by MCP 6000/7000 series</u>						
Antimony, Total	ND	mg/kg	2.2	60 6010B	0406 17:45 0407 12:31 RW	
Arsenic, Total	9.1	mg/kg	0.44	60 6010B	0406 17:45 0407 12:31 RW	
Barium, Total	37	mg/kg	0.44	60 6010B	0406 17:45 0407 12:31 RW	
Beryllium, Total	ND	mg/kg	0.22	60 6010B	0406 17:45 0407 12:31 RW	
Cadmium, Total	ND	mg/kg	0.44	60 6010B	0406 17:45 0407 12:31 RW	
Chromium, Total	19	mg/kg	0.44	60 6010B	0406 17:45 0407 12:31 RW	
Lead, Total	20	mg/kg	2.2	60 6010B	0406 17:45 0407 12:31 RW	
Nickel, Total	18	mg/kg	1.1	60 6010B	0406 17:45 0407 12:31 RW	
Selenium, Total	ND	mg/kg	2.2	60 6010B	0406 17:45 0407 12:31 RW	
Silver, Total	ND	mg/kg	0.44	60 6010B	0406 17:45 0407 12:31 RW	
Thallium, Total	ND	mg/kg	2.2	60 6010B	0406 17:45 0407 12:31 RW	
Vanadium, Total	14	mg/kg	0.44	60 6010B	0406 17:45 0407 12:31 RW	
Zinc, Total	28	mg/kg	2.2	60 6010B	0406 17:45 0407 12:31 RW	
<u>Organochlorine Pesticides by MCP 8081A</u>						
Surrogate(s)	Recovery		QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	66.0	%	30-150			
Decachlorobiphenyl	63.0	%	30-150			
<u>Organochlorine Pesticides by MCP 8081A</u>						
Delta-BHC	ND	ug/kg	18.3			
Lindane	ND	ug/kg	14.6			
Alpha-BHC	ND	ug/kg	18.3			
Beta-BHC	ND	ug/kg	18.3			
Heptachlor	ND	ug/kg	18.3			
Aldrin	ND	ug/kg	18.3			
Heptachlor epoxide	ND	ug/kg	18.3			
Endrin	ND	ug/kg	18.3			
Endrin ketone	ND	ug/kg	18.3			
Dieldrin	ND	ug/kg	18.3			
4,4'-DDE	ND	ug/kg	18.3			
4,4'-DDD	ND	ug/kg	18.3			
4,4'-DDT	ND	ug/kg	18.3			
Endosulfan I	ND	ug/kg	18.3			

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604684-07  
B-4 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Organochlorine Pesticides by MCP-8081A cont'd							
Endosulfan II	ND	ug/kg	18.3				
Endosulfan sulfate	ND	ug/kg	18.3				
Methoxychlor	ND	ug/kg	73.3				
Chlordane	ND	ug/kg	73.3				
Toxaphene	ND	ug/kg	73.3				
Hexachlorobenzene	ND	ug/kg	18.3				
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	68.0	%		30-150			
Decachlorobiphenyl	58.0	%		30-150			

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604684-07  
B-4 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Extractable Petroleum Hydrocarbons 61 EPH-04-1 0411 19:30 0412-21:43 BN

**Quality Control Information**

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? YES  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	mg/kg	7.33
C19-C36 Aliphatics	ND	mg/kg	7.33
C11-C22 Aromatics	ND	mg/kg	7.33
C11-C22 Aromatics, Adjusted	ND	mg/kg	7.33
Naphthalene	ND	mg/kg	0.366
2-Methylnaphthalene	ND	mg/kg	0.366
Acenaphthylene	ND	mg/kg	0.366
Acenaphthene	ND	mg/kg	0.366
Fluorene	ND	mg/kg	0.366
Phenanthrene	ND	mg/kg	0.366
Anthracene	ND	mg/kg	0.366
Fluoranthene	ND	mg/kg	0.366
Pyrene	ND	mg/kg	0.366
Benzo(a)anthracene	ND	mg/kg	0.366
Chrysene	ND	mg/kg	0.366
Benzo(b)fluoranthene	ND	mg/kg	0.366
Benzo(k)fluoranthene	ND	mg/kg	0.366
Benzo(a)pyrene	ND	mg/kg	0.366
Indeno(1,2,3-cd)Pyrene	ND	mg/kg	0.366
Dibenzo(a,h)anthracene	ND	mg/kg	0.366
Benzo(ghi)perylene	ND	mg/kg	0.366

Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	65.0	%	40-140
o-Terphenyl	85.0	%	40-140
2-Fluorobiphenyl	87.0	%	40-140
2-Bromonaphthalene	89.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-08

B-4 (3-10')

Sample Matrix:

SOIL

Date Collected: 03-APR-2006 12:25

Date Received : 05-APR-2006

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP ANAL	ID
Solids, Total	93	%	0.10	30 2540G		0410 12:37 PD

Comments: Complete list of References and Glossary of Terms found in Addendum I



**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604684-08  
B-4 (3-10')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Extractable Petroleum Hydrocarbons 61 EPH-04-1 0411 19:30 0412 22:16 BN

**Quality Control Information**

Condition of sample received:	Satisfactory	
Sample temperature upon receipt:	Received on Ice	
Sample extraction method:	Extracted Per the Method	
Were all QA/QC procedures REQUIRED by the method followed?		YES
Were all performance/acceptance standards for the required procedures achieved?		YES
Were significant modifications made to the method as specified in Sect 11.3?		NO
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.		
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.		

C9-C18 Aliphatics	ND	mg/kg	7.17
C19-C36 Aliphatics	ND	mg/kg	7.17
C11-C22 Aromatics	ND	mg/kg	7.17
C11-C22 Aromatics, Adjusted	ND	mg/kg	7.17
Naphthalene	ND	mg/kg	0.358
2-Methylnaphthalene	ND	mg/kg	0.358
Acenaphthylene	ND	mg/kg	0.358
Acenaphthene	ND	mg/kg	0.358
Fluorene	ND	mg/kg	0.358
Phenanthrene	ND	mg/kg	0.358
Anthracene	ND	mg/kg	0.358
Fluoranthene	ND	mg/kg	0.358
Pyrene	ND	mg/kg	0.358
Benzo(a)anthracene	ND	mg/kg	0.358
Chrysene	ND	mg/kg	0.358
Benzo(b)fluoranthene	ND	mg/kg	0.358
Benzo(k)fluoranthene	ND	mg/kg	0.358
Benzo(a)pyrene	ND	mg/kg	0.358
Indeno(1,2,3-cd)Pyrene	ND	mg/kg	0.358
Dibenzo(a,h)anthracene	ND	mg/kg	0.358
Benzo(ghi)perylene	ND	mg/kg	0.358

Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	48.0	%	40-140
o-Terphenyl	71.0	%	40-140
2-Fluorobiphenyl	89.0	%	40-140
2-Bromonaphthalene	90.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-09

Date Collected: 03-APR-2006 13:20

B-Y (0-3')

Date Received : 05-APR-2006

Sample Matrix: SOIL

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total	94	%	0.10	30 2540G		0410 12:37 PD	
<u>Polychlorinated Biphenyls by MCP 8082</u>							
Aroclor 1016	ND	ug/kg	35.5				
Aroclor 1221	ND	ug/kg	35.5				
Aroclor 1232	ND	ug/kg	35.5				
Aroclor 1242	ND	ug/kg	35.5				
Aroclor 1248	ND	ug/kg	35.5				
Aroclor 1254	ND	ug/kg	35.5				
Aroclor 1260	ND	ug/kg	35.5				
Surrogate(s)	Recovery		QC Criteria				
2,4,5,6-Tetrachloro-m-xylene	82.0	%	30-150				
Decachlorobiphenyl	74.0	%	30-150				
<u>Polychlorinated Biphenyls by MCP 8082</u>							
Surrogate(s)	Recovery		QC Criteria				
2,4,5,6-Tetrachloro-m-xylene	84.0	%	30-150				
Decachlorobiphenyl	65.0	%	30-150				

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-10

Date Collected: 03-APR-2006 13:50

B-5 (0-3')

Date Received : 05-APR-2006

Sample Matrix: SOIL

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 4-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total	95	%	0.10	30 2540G		0410 12:37 PD	
<u>Total Metals by MCP 6000/7000 series</u>							
Antimony, Total	ND	mg/kg	2.1	60 6010B	0406 17:45	0407 12:57 RW	
Arsenic, Total	21	mg/kg	0.42	60 6010B	0406 17:45	0407 12:57 RW	
Barium, Total	15	mg/kg	0.42	60 6010B	0406 17:45	0407 12:57 RW	
Beryllium, Total	ND	mg/kg	0.21	60 6010B	0406 17:45	0407 12:57 RW	
Cadmium, Total	ND	mg/kg	0.42	60 6010B	0406 17:45	0407 12:57 RW	
Chromium, Total	14	mg/kg	0.42	60 6010B	0406 17:45	0407 12:57 RW	
Lead, Total	18	mg/kg	2.1	60 6010B	0406 17:45	0407 12:57 RW	
Nickel, Total	13	mg/kg	1.0	60 6010B	0406 17:45	0407 12:57 RW	
Selenium, Total	ND	mg/kg	2.1	60 6010B	0406 17:45	0407 12:57 RW	
Silver, Total	ND	mg/kg	0.42	60 6010B	0406 17:45	0407 12:57 RW	
Thallium, Total	ND	mg/kg	2.1	60 6010B	0406 17:45	0407 12:57 RW	
Vanadium, Total	9.8	mg/kg	0.42	60 6010B	0406 17:45	0407 12:57 RW	
Zinc, Total	130	mg/kg	2.1	60 6010B	0406 17:45	0407 12:57 RW	
<u>Polychlorinated Biphenyls by MCP 8082</u>							
Surrogate(s)	Recovery		QC Criteria				
2,4,5,6-Tetrachloro-m-xylene	69.0	%	30-150				
Decachlorobiphenyl	63.0	%	30-150				
<u>Polychlorinated Biphenyls by MCP 8082</u>							
Aroclor 1016	ND	ug/kg	35.1				
Aroclor 1221	ND	ug/kg	35.1				
Aroclor 1232	ND	ug/kg	35.1				
Aroclor 1242	ND	ug/kg	35.1				
Aroclor 1248	ND	ug/kg	35.1				
Aroclor 1254	ND	ug/kg	35.1				
Aroclor 1260	ND	ug/kg	35.1				
Surrogate(s)	Recovery		QC Criteria				
2,4,5,6-Tetrachloro-m-xylene	67.0	%	30-150				
Decachlorobiphenyl	70.0	%	30-150				
<u>Organochlorine Pesticides by MCP 8081A</u>							
Delta-BHC	ND	ug/kg	17.5				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604684-10  
B-5 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Organochlorine Pesticides by MCP 8081A cont'd 64 8081A 0406 23:50 0412 01:14 JB

Lindane	ND	ug/kg	14.0
Alpha-BHC	ND	ug/kg	17.5
Beta-BHC	ND	ug/kg	17.5
Heptachlor	ND	ug/kg	17.5
Aldrin	ND	ug/kg	17.5
Heptachlor epoxide	ND	ug/kg	17.5
Endrin	ND	ug/kg	17.5
Endrin ketone	ND	ug/kg	17.5
Dieldrin	ND	ug/kg	17.5
4,4'-DDE	ND	ug/kg	17.5
4,4'-DDD	ND	ug/kg	17.5
4,4'-DDT	ND	ug/kg	17.5
Endosulfan I	ND	ug/kg	17.5
Endosulfan II	ND	ug/kg	17.5
Endosulfan sulfate	ND	ug/kg	17.5
Methoxychlor	ND	ug/kg	70.2
Chlordane	ND	ug/kg	70.2
Toxaphene	ND	ug/kg	70.2
Hexachlorobenzene	ND	ug/kg	17.5

Surrogate(s)	Recovery		QC Criteria
2,4,5,6-Tetrachloro-m-xylene	65.0	%	30-150
Decachlorobiphenyl	55.0	%	30-150

Organochlorine Pesticides by MCP 8081A 64 8081A 0406 23:50 0412 01:14 JB

Surrogate(s)	Recovery		QC Criteria
2,4,5,6-Tetrachloro-m-xylene	63.0	%	30-150
Decachlorobiphenyl	59.0	%	30-150

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604684-10  
B-5 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP ANAL	ID
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Extractable Petroleum Hydrocarbons 61 EPH-04-1 0411 19:30 0412 22:49 BN

Quality Control Information

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? YES  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	mg/kg	7.02
C19-C36 Aliphatics	ND	mg/kg	7.02
C11-C22 Aromatics	ND	mg/kg	7.02
C11-C22 Aromatics, Adjusted	ND	mg/kg	7.02
Naphthalene	ND	mg/kg	0.351
2-Methylnaphthalene	ND	mg/kg	0.351
Acenaphthylene	ND	mg/kg	0.351
Acenaphthene	ND	mg/kg	0.351
Fluorene	ND	mg/kg	0.351
Phenanthrene	ND	mg/kg	0.351
Anthracene	ND	mg/kg	0.351
Fluoranthene	ND	mg/kg	0.351
Pyrene	ND	mg/kg	0.351
Benzo(a)anthracene	ND	mg/kg	0.351
Chrysene	ND	mg/kg	0.351
Benzo(b)fluoranthene	ND	mg/kg	0.351
Benzo(k)fluoranthene	ND	mg/kg	0.351
Benzo(a)pyrene	ND	mg/kg	0.351
Indeno(1,2,3-cd)Pyrene	ND	mg/kg	0.351
Dibenzo(a,h)anthracene	ND	mg/kg	0.351
Benzo(ghi)perylene	ND	mg/kg	0.351

Surrogate(s)	Recovery	QC Criteria
Chloro-Octadecane	57.0 %	40-140
o-Terphenyl	79.0 %	40-140
2-Fluorobiphenyl	99.0 %	40-140
2-Bromonaphthalene	101 %	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-11

Date Collected: 03-APR-2006 13:55

B-5 (3-10')

Date Received : 05-APR-2006

Sample Matrix: SOIL

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 3-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total	96	%	0.10	30 2540G		0410 12:37 PD	
Polychlorinated Biphenyls by MCP 8082							
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	69.0	%		30-150			
Decachlorobiphenyl	58.0	%		30-150			
Polychlorinated Biphenyls by MCP 8082							
Aroclor 1016	ND	ug/kg	34.7				
Aroclor 1221	ND	ug/kg	34.7				
Aroclor 1232	ND	ug/kg	34.7				
Aroclor 1242	ND	ug/kg	34.7				
Aroclor 1248	ND	ug/kg	34.7				
Aroclor 1254	ND	ug/kg	34.7				
Aroclor 1260	ND	ug/kg	34.7				
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	69.0	%		30-150			
Decachlorobiphenyl	64.0	%		30-150			

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604684-11  
B-5 (3-10')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP      ANAL	ID
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Extractable Petroleum Hydrocarbons 61 EPH-04-1 0411 19:30 0412 17:54 BN

**Quality Control Information**

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? YES  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	mg/kg	6.94
C19-C36 Aliphatics	ND	mg/kg	6.94
C11-C22 Aromatics	ND	mg/kg	6.94
C11-C22 Aromatics, Adjusted	ND	mg/kg	6.94
Naphthalene	ND	mg/kg	0.347
2-Methylnaphthalene	ND	mg/kg	0.347
Acenaphthylene	ND	mg/kg	0.347
Acenaphthene	ND	mg/kg	0.347
Fluorene	ND	mg/kg	0.347
Phenanthrene	ND	mg/kg	0.347
Anthracene	ND	mg/kg	0.347
Fluoranthene	ND	mg/kg	0.347
Pyrene	ND	mg/kg	0.347
Benzo(a)anthracene	ND	mg/kg	0.347
Chrysene	ND	mg/kg	0.347
Benzo(b)fluoranthene	ND	mg/kg	0.347
Benzo(k)fluoranthene	ND	mg/kg	0.347
Benzo(a)pyrene	ND	mg/kg	0.347
Indeno(1,2,3-cd)Pyrene	ND	mg/kg	0.347
Dibenzo(a,h)anthracene	ND	mg/kg	0.347
Benzo(ghi)perylene	ND	mg/kg	0.347
Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	55.0	%	40-140
o-Terphenyl	82.0	%	40-140
2-Fluorobiphenyl	91.0	%	40-140
2-Bromonaphthalene	92.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-12

Date Collected: 03-APR-2006 14:40

B-6 (0-3')

Date Received : 05-APR-2006

Sample Matrix: SOIL

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 3-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP ANAL	ID
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Solids, Total	95	%	0.10	30 2540G	0410 12:37 PD	
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Total Metals by MCP 6000/7000 series 60 6010B

Antimony, Total	ND	mg/kg	2.1	60 6010B	0406 17:45 0407 13:00 RW	
Arsenic, Total	19	mg/kg	0.42	60 6010B	0406 17:45 0407 13:00 RW	
Barium, Total	16	mg/kg	0.42	60 6010B	0406 17:45 0407 13:00 RW	
Beryllium, Total	ND	mg/kg	0.21	60 6010B	0406 17:45 0407 13:00 RW	
Cadmium, Total	ND	mg/kg	0.42	60 6010B	0406 17:45 0407 13:00 RW	
Chromium, Total	16	mg/kg	0.42	60 6010B	0406 17:45 0407 13:00 RW	
Lead, Total	5.6	mg/kg	2.1	60 6010B	0406 17:45 0407 13:00 RW	
Nickel, Total	14	mg/kg	1.0	60 6010B	0406 17:45 0407 13:00 RW	
Selenium, Total	ND	mg/kg	2.1	60 6010B	0406 17:45 0407 13:00 RW	
Silver, Total	ND	mg/kg	0.42	60 6010B	0406 17:45 0407 13:00 RW	
Thallium, Total	ND	mg/kg	2.1	60 6010B	0406 17:45 0407 13:00 RW	
Vanadium, Total	11	mg/kg	0.42	60 6010B	0406 17:45 0407 13:00 RW	
Zinc, Total	17	mg/kg	2.1	60 6010B	0406 17:45 0407 13:00 RW	

Organochlorine Pesticides by MCP 8081A 64 8081A 0406 23:50 0412 03:35 JB

Surrogate(s)	Recovery	QC Criteria
2,4,5,6-Tetrachloro-m-xylene	64.0 %	30-150
Decachlorobiphenyl	64.0 %	30-150

Organochlorine Pesticides by MCP 8081A 64 8081A 0406 23:50 0412 03:35 JB

Delta-BHC	ND	ug/kg	3.51
Lindane	ND	ug/kg	2.81
Alpha-BHC	ND	ug/kg	3.51
Beta-BHC	ND	ug/kg	3.51
Heptachlor	ND	ug/kg	3.51
Aldrin	ND	ug/kg	3.51
Heptachlor epoxide	ND	ug/kg	3.51
Endrin	ND	ug/kg	3.51
Endrin ketone	ND	ug/kg	3.51
Dieldrin	ND	ug/kg	3.51
4,4'-DDE	ND	ug/kg	3.51
4,4'-DDD	ND	ug/kg	3.51
4,4'-DDT	ND	ug/kg	3.51
Endosulfan I	ND	ug/kg	3.51

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604684-12  
B-6 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Organochlorine Pesticides by MCP 8081A cont'd 64-8081A 0406-23:50 0412-03:35 JB							
Endosulfan II	ND	ug/kg	3.51				
Endosulfan sulfate	ND	ug/kg	3.51				
Methoxychlor	ND	ug/kg	14.0				
Chlordane	ND	ug/kg	14.0				
Toxaphene	ND	ug/kg	14.0				
Hexachlorobenzene	ND	ug/kg	3.51				
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	68.0	%		30-150			
Decachlorobiphenyl	62.0	%		30-150			

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: 10604684-12  
B-6 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Extractable Petroleum Hydrocarbons 61 EPH-04-1 0411 19:30 0412 18:27 BN

**Quality Control Information**

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? YES  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	mg/kg	7.02
C19-C36 Aliphatics	ND	mg/kg	7.02
C11-C22 Aromatics	ND	mg/kg	7.02
C11-C22 Aromatics, Adjusted	ND	mg/kg	7.02
Naphthalene	ND	mg/kg	0.351
2-Methylnaphthalene	ND	mg/kg	0.351
Acenaphthylene	ND	mg/kg	0.351
Acenaphthene	ND	mg/kg	0.351
Fluorene	ND	mg/kg	0.351
Phenanthrene	ND	mg/kg	0.351
Anthracene	ND	mg/kg	0.351
Fluoranthene	ND	mg/kg	0.351
Pyrene	ND	mg/kg	0.351
Benzo(a)anthracene	ND	mg/kg	0.351
Chrysene	ND	mg/kg	0.351
Benzo(b)fluoranthene	ND	mg/kg	0.351
Benzo(k)fluoranthene	ND	mg/kg	0.351
Benzo(a)pyrene	ND	mg/kg	0.351
Indeno(1,2,3-cd)Pyrene	ND	mg/kg	0.351
Dibenzo(a,h)anthracene	ND	mg/kg	0.351
Benzo(ghi)perylene	ND	mg/kg	0.351

Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	50.0	%	40-140
o-Terphenyl	76.0	%	40-140
2-Fluorobiphenyl	96.0	%	40-140
2-Bromonaphthalene	97.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-13

Date Collected: 03-APR-2006 15:30

B-7 (0-3')

Date Received : 05-APR-2006

Sample Matrix:

SOIL

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 3-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total	95	%	0.10	30 2540G			0410 12:37 PD
<u>Total Metals by MCP 6000/7000 series</u>							
Antimony, Total	ND	mg/kg	2.1	60 6010B	0406 17:45	0407 13:03	RW
Arsenic, Total	17	mg/kg	0.42	60 6010B	0406 17:45	0407 13:03	RW
Barium, Total	13	mg/kg	0.42	60 6010B	0406 17:45	0407 13:03	RW
Beryllium, Total	ND	mg/kg	0.21	60 6010B	0406 17:45	0407 13:03	RW
Cadmium, Total	ND	mg/kg	0.42	60 6010B	0406 17:45	0407 13:03	RW
Chromium, Total	12	mg/kg	0.42	60 6010B	0406 17:45	0407 13:03	RW
Lead, Total	6.0	mg/kg	2.1	60 6010B	0406 17:45	0407 13:03	RW
Nickel, Total	11	mg/kg	1.0	60 6010B	0406 17:45	0407 13:03	RW
Selenium, Total	ND	mg/kg	2.1	60 6010B	0406 17:45	0407 13:03	RW
Silver, Total	ND	mg/kg	0.42	60 6010B	0406 17:45	0407 13:03	RW
Thallium, Total	ND	mg/kg	2.1	60 6010B	0406 17:45	0407 13:03	RW
Vanadium, Total	9.2	mg/kg	0.42	60 6010B	0406 17:45	0407 13:03	RW
Zinc, Total	15	mg/kg	2.1	60 6010B	0406 17:45	0407 13:03	RW
<u>Organochlorine Pesticides by MCP 8081A</u>							
Surrogate(s)	Recovery		QC Criteria				
2,4,5,6-Tetrachloro-m-xylene	67.0	%	30-150				
Decachlorobiphenyl	69.0	%	30-150				
<u>Organochlorine Pesticides by MCP 8081A</u>							
Delta-BHC	ND	ug/kg	3.51				
Lindane	ND	ug/kg	2.81				
Alpha-BHC	ND	ug/kg	3.51				
Beta-BHC	ND	ug/kg	3.51				
Heptachlor	ND	ug/kg	3.51				
Aldrin	ND	ug/kg	3.51				
Heptachlor epoxide	ND	ug/kg	3.51				
Endrin	ND	ug/kg	3.51				
Endrin ketone	ND	ug/kg	3.51				
Dieldrin	ND	ug/kg	3.51				
4,4'-DDE	ND	ug/kg	3.51				
4,4'-DDD	ND	ug/kg	3.51				
4,4'-DDT	ND	ug/kg	3.51				
Endosulfan I	ND	ug/kg	3.51				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604684-13  
B-7 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Organochlorine Pesticides by MCP 8081A cont'd							
Endosulfan II	ND	ug/kg	3.51				
Endosulfan sulfate	ND	ug/kg	3.51				
Methoxychlor	ND	ug/kg	14.0				
Chlordane	ND	ug/kg	14.0				
Toxaphene	ND	ug/kg	14.0				
Hexachlorobenzene	ND	ug/kg	3.51				
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	71.0	%		30-150			
Decachlorobiphenyl	64.0	%		30-150			

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604684-13  
B-7 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Extractable Petroleum Hydrocarbons 612EPH-04-1 0411 19:30 0412 19:00 BM

**Quality Control Information**

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? YES  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	mg/kg	7.02
C19-C36 Aliphatics	ND	mg/kg	7.02
C11-C22 Aromatics	ND	mg/kg	7.02
C11-C22 Aromatics, Adjusted	ND	mg/kg	7.02
Naphthalene	ND	mg/kg	0.351
2-Methylnaphthalene	ND	mg/kg	0.351
Acenaphthylene	ND	mg/kg	0.351
Acenaphthene	ND	mg/kg	0.351
Fluorene	ND	mg/kg	0.351
Phenanthrene	ND	mg/kg	0.351
Anthracene	ND	mg/kg	0.351
Fluoranthene	ND	mg/kg	0.351
Pyrene	ND	mg/kg	0.351
Benzo(a)anthracene	ND	mg/kg	0.351
Chrysene	ND	mg/kg	0.351
Benzo(b)fluoranthene	ND	mg/kg	0.351
Benzo(k)fluoranthene	ND	mg/kg	0.351
Benzo(a)pyrene	ND	mg/kg	0.351
Indeno(1,2,3-cd)Pyrene	ND	mg/kg	0.351
Dibenzo(a,h)anthracene	ND	mg/kg	0.351
Benzo(ghi)perylene	ND	mg/kg	0.351

Surrogate(s)	Recovery	QC Criteria
Chloro-Octadecane	54.0 %	40-140
o-Terphenyl	83.0 %	40-140
2-Fluorobiphenyl	100 %	40-140
2-Bromonaphthalene	102 %	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-14

Date Collected: 03-APR-2006 16:10

B-8 (0-3')

Date Received : 05-APR-2006

Sample Matrix:

SOIL

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 3-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total	93	%	0.10	30 2540G		0410 12:37 PD	
<u>Total Metals by MCP 6000/7000 series</u>							
Antimony, Total	ND	mg/kg	2.1	60 6010B	0406 17:45	0407 13:05	RW
Arsenic, Total	15	mg/kg	0.42	60 6010B	0406 17:45	0407 13:05	RW
Barium, Total	13	mg/kg	0.42	60 6010B	0406 17:45	0407 13:05	RW
Beryllium, Total	ND	mg/kg	0.21	60 6010B	0406 17:45	0407 13:05	RW
Cadmium, Total	ND	mg/kg	0.42	60 6010B	0406 17:45	0407 13:05	RW
Chromium, Total	12	mg/kg	0.42	60 6010B	0406 17:45	0407 13:05	RW
Lead, Total	5.4	mg/kg	2.1	60 6010B	0406 17:45	0407 13:05	RW
Nickel, Total	12	mg/kg	1.0	60 6010B	0406 17:45	0407 13:05	RW
Selenium, Total	ND	mg/kg	2.1	60 6010B	0406 17:45	0407 13:05	RW
Silver, Total	ND	mg/kg	0.42	60 6010B	0406 17:45	0407 13:05	RW
Thallium, Total	ND	mg/kg	2.1	60 6010B	0406 17:45	0407 13:05	RW
Vanadium, Total	9.5	mg/kg	0.42	60 6010B	0406 17:45	0407 13:05	RW
Zinc, Total	15	mg/kg	2.1	60 6010B	0406 17:45	0407 13:05	RW
<u>Organochlorine Pesticides by MCP 8081A</u>							
Delta-BHC	ND	ug/kg	3.58	64 8081A	0406 23:50	0412 04:32	JB
Lindane	ND	ug/kg	2.87				
Alpha-BHC	ND	ug/kg	3.58				
Beta-BHC	ND	ug/kg	3.58				
Heptachlor	ND	ug/kg	3.58				
Aldrin	ND	ug/kg	3.58				
Heptachlor epoxide	ND	ug/kg	3.58				
Endrin	ND	ug/kg	3.58				
Endrin ketone	ND	ug/kg	3.58				
Dieldrin	ND	ug/kg	3.58				
4,4'-DDE	ND	ug/kg	3.58				
4,4'-DDD	ND	ug/kg	3.58				
4,4'-DDT	ND	ug/kg	3.58				
Endosulfan I	ND	ug/kg	3.58				
Endosulfan II	ND	ug/kg	3.58				
Endosulfan sulfate	ND	ug/kg	3.58				
Methoxychlor	ND	ug/kg	14.3				
Chlordane	ND	ug/kg	14.3				
Toxaphene	ND	ug/kg	14.3				
Hexachlorobenzene	ND	ug/kg	3.58				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604684-14  
B-8 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Organochlorine Pesticides by MCP 8081A cont'd 64 8081A 0406 23:50 0412 04:32 JB

Surrogate(s)	Recovery			QC Criteria
2,4,5,6-Tetrachloro-m-xylene	49.0	%		30-150
Decachlorobiphenyl	47.0	%		30-150

Organochlorine Pesticides by MCP 8081A 64 8081A 0406 23:50 0412 04:32 JB

Surrogate(s)	Recovery			QC Criteria
2,4,5,6-Tetrachloro-m-xylene	47.0	%		30-150
Decachlorobiphenyl	52.0	%		30-150

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604684-14  
B-8 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP      ANAL	ID
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Extractable Petroleum Hydrocarbons 61 EPH-04-1 0411 19 30 0412 19 32 BN

**Quality Control Information**

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? YES  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	mg/kg	7.17
C19-C36 Aliphatics	ND	mg/kg	7.17
C11-C22 Aromatics	ND	mg/kg	7.17
C11-C22 Aromatics, Adjusted	ND	mg/kg	7.17
Naphthalene	ND	mg/kg	0.358
2-Methylnaphthalene	ND	mg/kg	0.358
Acenaphthylene	ND	mg/kg	0.358
Acenaphthene	ND	mg/kg	0.358
Fluorene	ND	mg/kg	0.358
Phenanthrene	ND	mg/kg	0.358
Anthracene	ND	mg/kg	0.358
Fluoranthene	ND	mg/kg	0.358
Pyrene	ND	mg/kg	0.358
Benzo(a)anthracene	ND	mg/kg	0.358
Chrysene	ND	mg/kg	0.358
Benzo(b)fluoranthene	ND	mg/kg	0.358
Benzo(k)fluoranthene	ND	mg/kg	0.358
Benzo(a)pyrene	ND	mg/kg	0.358
Indeno(1,2,3-cd)Pyrene	ND	mg/kg	0.358
Dibenzo(a,h)anthracene	ND	mg/kg	0.358
Benzo(ghi)perylene	ND	mg/kg	0.358
Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	56.0	%	40-140
o-Terphenyl	87.0	%	40-140
2-Fluorobiphenyl	100	%	40-140
2-Bromonaphthalene	102	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604684-15

B-10 (0-3')

Sample Matrix:

SOIL

Date Collected: 04-APR-2006 09:05

Date Received : 05-APR-2006

Date Reported : 08-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 3-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total	84	%	0.10	30 2540G		0410 12:37 PD	
<u>Total Metals by MCP 6000/7000 series</u>							
Antimony, Total	ND	mg/kg	2.4	60 6010B	0406 17:45	0407 13:08	RW
Arsenic, Total	14	mg/kg	0.47	60 6010B	0406 17:45	0407 13:08	RW
Barium, Total	40	mg/kg	0.47	60 6010B	0406 17:45	0407 13:08	RW
Beryllium, Total	ND	mg/kg	0.24	60 6010B	0406 17:45	0407 13:08	RW
Cadmium, Total	ND	mg/kg	0.47	60 6010B	0406 17:45	0407 13:08	RW
Chromium, Total	54	mg/kg	0.47	60 6010B	0406 17:45	0407 13:08	RW
Lead, Total	28	mg/kg	2.4	60 6010B	0406 17:45	0407 13:08	RW
Nickel, Total	71	mg/kg	1.2	60 6010B	0406 17:45	0407 13:08	RW
Selenium, Total	ND	mg/kg	2.4	60 6010B	0406 17:45	0407 13:08	RW
Silver, Total	0.54	mg/kg	0.47	60 6010B	0406 17:45	0407 13:08	RW
Thallium, Total	ND	mg/kg	2.4	60 6010B	0406 17:45	0407 13:08	RW
Vanadium, Total	20	mg/kg	0.47	60 6010B	0406 17:45	0407 13:08	RW
Zinc, Total	61	mg/kg	2.4	60 6010B	0406 17:45	0407 13:08	RW
<u>Organochlorine Pesticides by MCP 8081A</u>							
Delta-BHC	ND	ug/kg	39.7	64 8081A	0406 23:50	0412 00:50	JB
Lindane	ND	ug/kg	31.7				
Alpha-BHC	ND	ug/kg	39.7				
Beta-BHC	ND	ug/kg	39.7				
Heptachlor	ND	ug/kg	39.7				
Aldrin	ND	ug/kg	39.7				
Heptachlor epoxide	ND	ug/kg	39.7				
Endrin	ND	ug/kg	39.7				
Endrin ketone	ND	ug/kg	39.7				
Dieldrin	ND	ug/kg	39.7				
4,4'-DDE	ND	ug/kg	39.7				
4,4'-DDD	ND	ug/kg	39.7				
4,4'-DDT	ND	ug/kg	39.7				
Endosulfan I	ND	ug/kg	39.7				
Endosulfan II	ND	ug/kg	39.7				
Endosulfan sulfate	ND	ug/kg	39.7				
Methoxychlor	ND	ug/kg	159.				
Chlordane	ND	ug/kg	159.				
Toxaphene	ND	ug/kg	159.				
Hexachlorobenzene	ND	ug/kg	39.7				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604684-15  
B-10 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Organochlorine Pesticides by MCP 8081A cont'd 64 8081A 0406 23:50 0412 00:50 JB

Surrogate(s)	Recovery			QC Criteria
2,4,5,6-Tetrachloro-m-xylene	ND	%		30-150
Decachlorobiphenyl	ND	%		30-150

Organochlorine Pesticides by MCP 8081A 64 8081A 0406 23:50 0412 00:50 JB

Surrogate(s)	Recovery			QC Criteria
2,4,5,6-Tetrachloro-m-xylene	ND	%		30-150
Decachlorobiphenyl	ND	%		30-150

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604684-15  
B-10 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Extractable Petroleum Hydrocarbons 61 EPH-04-1 0411-19-30 0413 00:24 BN

**Quality Control Information**

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? YES  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	mg/kg	7.94
C19-C36 Aliphatics	26.0	mg/kg	7.94
C11-C22 Aromatics	314	mg/kg	7.94
C11-C22 Aromatics, Adjusted	202	mg/kg	7.94
Naphthalene	ND	mg/kg	0.397
2-Methylnaphthalene	ND	mg/kg	0.397
Acenaphthylene	ND	mg/kg	0.397
Acenaphthene	0.682	mg/kg	0.397
Fluorene	0.570	mg/kg	0.397
Phenanthrene	9.63	mg/kg	0.397
Anthracene	2.92	mg/kg	0.397
Fluoranthene	>13.3	mg/kg	.397
Pyrene	>13.3	mg/kg	.397
Benzo(a)anthracene	11.8	mg/kg	0.397
Chrysene	14.4	mg/kg	0.397
Benzo(b)fluoranthene	10.1	mg/kg	0.397
Benzo(k)fluoranthene	6.47	mg/kg	0.397
Benzo(a)pyrene	9.26	mg/kg	0.397
Indeno(1,2,3-cd)Pyrene	4.72	mg/kg	0.397
Dibenzo(a,h)anthracene	1.19	mg/kg	0.397
Benzo(ghi)perylene	4.24	mg/kg	0.397
Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	59.0	%	40-140
o-Terphenyl	118	%	40-140
2-Fluorobiphenyl	77.0	%	40-140
2-Bromonaphthalene	81.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604684-15  
B-10 (0-3')

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP      ANAL	ID
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Extractable Petroleum Hydrocarbons	61 EPH-04-1	0411-19:30	0413	09:26	BN
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Quality Control Information
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Condition of sample received:	Satisfactory	
Sample temperature upon receipt:	Received on Ice	
Sample extraction method:	Extracted Per the Method	
Were all QA/QC procedures REQUIRED by the method followed?		YES
Were all performance/acceptance standards for the required procedures achieved?		YES
Were significant modifications made to the method as specified in Sect 11.3?		NO
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.		
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.		

Fluoranthene	19.6	mg/kg	0.794
Pyrene	16.3	mg/kg	0.794

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L0604684

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
<b>Solids, Total for sample(s) 01-15 (L0604684-11, WG235431-1)</b>					
Solids, Total	96	96	%	0	20
<b>Total Metals by MCP 6000/7000 series for sample(s) 01, 03-04, 06-07, 10, 12-15 (L0604684-07, WG2351)</b>					
Antimony, Total	ND	ND	mg/kg	NC	35
Arsenic, Total	9.1	9.6	mg/kg	5	35
Barium, Total	37	26	mg/kg	35	35
Beryllium, Total	ND	ND	mg/kg	NC	35
Cadmium, Total	ND	ND	mg/kg	NC	35
Chromium, Total	19	15	mg/kg	24	35
Lead, Total	20	19	mg/kg	5	35
Nickel, Total	18	16	mg/kg	12	35
Selenium, Total	ND	ND	mg/kg	NC	35
Silver, Total	ND	ND	mg/kg	NC	35
Thallium, Total	ND	ND	mg/kg	NC	35
Vanadium, Total	14	12	mg/kg	15	35
Zinc, Total	28	26	mg/kg	7	35
<b>Extractable Petroleum Hydrocarbons for sample(s) 01-08, 10-15 (L0604684-07, WG235816-5)</b>					
C9-C18 Aliphatics	ND	ND	mg/kg	NC	50
C19-C36 Aliphatics	ND	ND	mg/kg	NC	50
C11-C22 Aromatics	ND	ND	mg/kg	NC	50
C11-C22 Aromatics, Adjusted	ND	ND	mg/kg	NC	50
Naphthalene	ND	ND	mg/kg	NC	50
2-Methylnaphthalene	ND	ND	mg/kg	NC	50
Acenaphthylene	ND	ND	mg/kg	NC	50
Acenaphthene	ND	ND	mg/kg	NC	50
Fluorene	ND	ND	mg/kg	NC	50
Phenanthrene	ND	ND	mg/kg	NC	50
Anthracene	ND	ND	mg/kg	NC	50
Fluoranthene	ND	ND	mg/kg	NC	50
Pyrene	ND	ND	mg/kg	NC	50
Benzo(a)anthracene	ND	ND	mg/kg	NC	50
Chrysene	ND	ND	mg/kg	NC	50
Benzo(b)fluoranthene	ND	ND	mg/kg	NC	50
Benzo(k)fluoranthene	ND	ND	mg/kg	NC	50
Benzo(a)pyrene	ND	ND	mg/kg	NC	50
Indeno(1,2,3-cd)Pyrene	ND	ND	mg/kg	NC	50
Dibenzo(a,h)anthracene	ND	ND	mg/kg	NC	50
Benzo(ghi)perylene	ND	ND	mg/kg	NC	50
Surrogate(s)	Recovery			QC Criteria	
Chloro-Octadecane	65.0	52.0	%	40-140	
o-Terphenyl	85.0	87.0	%	40-140	
2-Fluorobiphenyl	87.0	84.0	%	40-140	
2-Bromonaphthalene	89.0	86.0	%	40-140	

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0604684

Parameter	% Recovery	QC Criteria
<u>Total Metals by MCP 6000/7000 series SPIKE for sample(s) 01, 03-04, 06-07, 10, 12-15 (L0604684-07, 1</u>		
Antimony, Total	87	75-125
Arsenic, Total	93	75-125
Barium, Total	72	75-125
Beryllium, Total	78	75-125
Cadmium, Total	94	75-125
Chromium, Total	80	75-125
Lead, Total	90	75-125
Nickel, Total	82	75-125
Selenium, Total	92	75-125
Silver, Total	84	75-125
Thallium, Total	86	75-125
Vanadium, Total	87	75-125
Zinc, Total	78	75-125
<u>Extractable Petroleum Hydrocarbons SPIKE for sample(s) 01-08, 10-15 (L0604684-07, WG235816, 4)</u>		
C9-C18 Aliphatics	66	40-140
C19-C36 Aliphatics	80	40-140
C11-C22 Aromatics	89	40-140
Naphthalene	81	40-140
2-Methylnaphthalene	81	40-140
Acenaphthylene	86	40-140
Acenaphthene	87	40-140
Fluorene	90	40-140
Phenanthrene	96	40-140
Anthracene	103	40-140
Fluoranthene	94	40-140
Pyrene	93	40-140
Benzo(a)anthracene	87	40-140
Chrysene	103	40-140
Benzo(b)fluoranthene	81	40-140
Benzo(k)fluoranthene	82	40-140
Benzo(a)pyrene	80	40-140
Indeno(1,2,3-cd)Pyrene	77	40-140
Dibenzo(a,h)anthracene	80	40-140
Benzo(ghi)perylene	80	40-140
Nonane (C9)	53	30-140
Decane (C10)	62	40-140
Dodecane (C12)	68	40-140
Tetradecane (C14)	70	40-140
Hexadecane (C16)	72	40-140
Octadecane (C18)	73	40-140
Nonadecane (C19)	76	40-140
Eicosane (C20)	78	40-140
Docosane (C22)	81	40-140
Tetracosane (C24)	80	40-140
Hexacosane (C26)	80	40-140
Octacosane (C28)	79	40-140
triacontane (C30)	78	40-140

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0604684

Continued

Parameter	% Recovery	QC Criteria
<del>Extractable Petroleum Hydrocarbons SPIKE for sample(s) 01-08, 10-15 (L0604684-07, WG235816-4)</del>		
Hexatriacontane (C36)	80	40-140
Surrogate(s)		
Chloro-Octadecane	65	40-140
o-Terphenyl	107	40-140
2-Fluorobiphenyl	90	40-140
2-Bromonaphthalene	93	40-140

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH LCS/LCSD ANALYSIS

Laboratory Job Number: L0604684

Parameter	LCS %	LCSD %	RPD	RPD Limit	QC Limits
<u>Total Metals by MCP 6000/7000 series for sample(s) 01, 03-04, 06-07, 10, 12-15 (WG235175-4, WG235171)</u>					
Antimony, Total	81	81	0	30	75-125
Arsenic, Total	86	86	0	30	75-125
Barium, Total	94	93	1	30	75-125
Beryllium, Total	83	86	4	30	75-125
Cadmium, Total	74	74	0	30	75-125
Chromium, Total	85	90	6	30	75-125
Lead, Total	76	81	6	30	75-125
Nickel, Total	78	81	4	30	75-125
Selenium, Total	91	91	0	30	75-125
Silver, Total	84	84	0	30	75-125
Thallium, Total	80	85	6	30	75-125
Vanadium, Total	76	81	6	30	75-125
Zinc, Total	77	81	5	30	75-125
<u>Polychlorinated Biphenyls by MCP 8082 for sample(s) 09-11 (WG235183-2, WG235183-3)</u>					
Aroclor 1016	76	77	1	30	40-140
Aroclor 1260	76	77	1	30	40-140
Surrogate(s)					
2,4,5,6-Tetrachloro-m-xylene	87	86	1		30-150
2,4,5,6-Tetrachloro-m-xylene	87	88	1		30-150
Decachlorobiphenyl	77	75	3		30-150
Decachlorobiphenyl	63	68	8		30-150
<u>Organochlorine Pesticides by MCP 8081A for sample(s) 01, 03-04, 06-07, 10, 12-15 (WG235185-2, WG235185-3)</u>					
Delta-BHC	71	71	0	30	40-140
Lindane	67	66	1	30	40-140
Alpha-BHC	67	65	3	30	40-140
Beta-BHC	68	68	0	30	40-140
Heptachlor	70	70	1	30	40-140
Aldrin	69	68	2	30	40-140
Heptachlor epoxide	68	67	0	30	40-140
Endrin	76	75	1	30	40-140
Endrin ketone	66	65	2	30	40-140
Dieldrin	65	65	0	30	40-140
4,4'-DDE	70	69	2	30	40-140
4,4'-DDD	66	66	1	30	40-140
4,4'-DDT	72	71	1	30	40-140
Endosulfan I	65	65	1	30	40-140
Endosulfan II	69	68	1	30	40-140
Endosulfan sulfate	73	72	2	30	40-140
Methoxychlor	78	77	1	30	40-140
Hexachlorobenzene	76	74	3	30	40-140
Surrogate(s)					
2,4,5,6-Tetrachloro-m-xylene	69	64	8		30-150
2,4,5,6-Tetrachloro-m-xylene	73	68	7		30-150
Decachlorobiphenyl	66	61	8		30-150



ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH LCS/LCSD ANALYSIS

Laboratory Job Number: L0604684

Continued

Parameter	LCS %	LCSD %	RPD	RPD Limit	QC Limits
<u>Organochlorine Pesticides by MCP 8081A for sample(s) 01, 03-04, 06-07, 10, 12-15 (WG235185-2, WG235185-3)</u>					
Decachlorobiphenyl	64	61	5		30-150
<u>Extractable Petroleum Hydrocarbons for sample(s) 01-08, 10-15 (WG235816-2, WG235816-3)</u>					
C9-C18 Aliphatics	60	62	3	25	40-140
C19-C36 Aliphatics	73	77	5	25	40-140
C11-C22 Aromatics	75	82	9	25	40-140
Naphthalene	68	72	6	25	40-140
2-Methylnaphthalene	69	73	6	25	40-140
Acenaphthylene	74	76	3	25	40-140
Acenaphthene	75	78	4	25	40-140
Fluorene	77	80	4	25	40-140
Phenanthrene	81	85	5	25	40-140
Anthracene	86	91	6	25	40-140
Fluoranthene	79	85	7	25	40-140
Pyrene	79	84	6	25	40-140
Benzo(a)anthracene	72	79	9	25	40-140
Chrysene	85	94	10	25	40-140
Benzo(b)fluoranthene	67	74	10	25	40-140
Benzo(k)fluoranthene	68	76	11	25	40-140
Benzo(a)pyrene	66	73	10	25	40-140
Indeno(1,2,3-cd)Pyrene	64	71	10	25	40-140
Dibenzo(a,h)anthracene	65	73	12	25	40-140
Benzo(ghi)perylene	66	74	11	25	40-140
Nonane (C9)	47	49	4	25	30-140
Decane (C10)	55	57	4	25	40-140
Dodecane (C12)	61	63	3	25	40-140
Tetradecane (C14)	64	66	3	25	40-140
Hexadecane (C16)	68	70	3	25	40-140
Octadecane (C18)	69	72	4	25	40-140
Nonadecane (C19)	71	74	4	25	40-140
Eicosane (C20)	73	76	4	25	40-140
Docosane (C22)	74	78	5	25	40-140
Tetracosane (C24)	73	78	7	25	40-140
Hexacosane (C26)	73	78	7	25	40-140
Octacosane (C28)	73	77	5	25	40-140
triacontane (C30)	73	77	5	25	40-140
Hexatriacontane (C36)	75	79	5	25	40-140
Surrogate(s)					
Chloro-Octadecane	62	62	0		40-140
o-Terphenyl	93	104	11		40-140
2-Fluorobiphenyl	82	84	2		40-140
2-Bromonaphthalene	85	87	2		40-140
% Naphthalene Breakthrough	0	0	NC		
% 2-Methylnaphthalene Breakthrough	0	0	NC		

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE FRACTIONATION CHECK

Laboratory Job Number: L0604684

Parameter	% Recovery	QC Criteria
Fractionation Check Standard Recoveries for Lot FISH52618		
C9-C18 Aliphatics	62	40-140
C19-C36 Aliphatics	71	40-140
C11-C22 Aromatics	80	40-140
Naphthalene	74	40-140
2-Methylnaphthalene	70	40-140
Acenaphthylene	69	40-140
Acenaphthene	72	40-140
Fluorene	72	40-140
Phenanthrene	72	40-140
Anthracene	77	40-140
Fluoranthene	75	40-140
Pyrene	75	40-140
Benzo(a)anthracene	74	40-140
Chrysene	88	40-140
Benzo(b)fluoranthene	72	40-140
Benzo(k)fluoranthene	74	40-140
Benzo(a)pyrene	73	40-140
Indeno(1,2,3-cd)Pyrene	72	40-140
Dibenzo(a,h)anthracene	73	40-140
Benzo(ghi)perylene	73	40-140
Nonane (C9)	57	30-140
Decane (C10)	62	40-140
Dodecane (C12)	65	40-140
Tetradecane (C14)	63	40-140
Hexadecane (C16)	64	40-140
Octadecane (C18)	64	40-140
Nonadecane (C19)	64	40-140
Eicosane (C20)	67	40-140
Docosane (C22)	71	40-140
Tetracosane (C24)	72	40-140
Hexacosane (C26)	72	40-140
Octacosane (C28)	73	40-140
triacontane (C30)	73	40-140
Hexatriacontane (C36)	76	40-140
Surrogate(s)		
Chloro-Octadecane	57	40-140
o-Terphenyl	78	40-140
2-Fluorobiphenyl	72	40-140
2-Bromonaphthalene	72	40-140

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH MS/MSD ANALYSIS

Laboratory Job Number: L0604684

Parameter	MS %	MSD %	RPD	RPD Limit	MS/MSD Limits
<u>Polychlorinated Biphenyls by MCP-8082 for sample(s) 09-11 (L0604684-11, WG235183-5)</u>					
Aroclor 1016	77	71	9	50	40-140
Aroclor 1260	85	77	10	50	40-140
Surrogate(s)					
2,4,5,6-Tetrachloro-m-xylene	72	68	6		30-150
2,4,5,6-Tetrachloro-m-xylene	74	70	6		30-150
Decachlorobiphenyl	83	72	14		30-150
Decachlorobiphenyl	78	65	18		30-150
<u>Organochlorine Pesticides by MCP-8081A for sample(s) 01, 03-04, 06-07, 10, 12-15 (L0604684-07, WG235183-5)</u>					
Delta-BHC	60	51	17	30	30-150
Lindane	58	55	5	30	30-150
Alpha-BHC	57	54	5	30	30-150
Beta-BHC	63	52	19	30	30-150
Heptachlor	61	60	1	30	30-150
Aldrin	61	60	1	30	30-150
Heptachlor epoxide	60	59	1	30	30-150
Endrin	66	65	1	30	30-150
Endrin ketone	58	52	12	30	30-150
Dieldrin	58	56	2	30	30-150
4,4'-DDE	83	86	4	30	30-150
4,4'-DDD	63	61	4	30	30-150
4,4'-DDT	115	110	4	30	30-150
Endosulfan I	57	57	1	30	30-150
Endosulfan II	61	57	7	30	30-150
Endosulfan sulfate	63	55	13	30	30-150
Methoxychlor	73	70	4	30	30-150
Hexachlorobenzene	117	69	52	30	30-150
Surrogate(s)					
2,4,5,6-Tetrachloro-m-xylene	60	56	7		30-150
2,4,5,6-Tetrachloro-m-xylene	70	55	24		30-150
Decachlorobiphenyl	56	57	2		30-150
Decachlorobiphenyl	58	60	3		30-150

**ALPHA ANALYTICAL LABORATORIES**  
**QUALITY ASSURANCE BATCH BLANK ANALYSIS**

Laboratory Job Number: L0604684

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE	ID
					PREP	ANAL
Blank Analysis for sample(s) 01,03-04,06-07,10,12-15 (WG235175-3)						
Total Metals by MCP 6000/7000 series				60 6010B		
Antimony, Total	ND	mg/kg	2.0	60 6010B	0406 17:45	0407 11:57 RW
Arsenic, Total	ND	mg/kg	0.40	60 6010B	0406 17:45	0407 11:57 RW
Barium, Total	ND	mg/kg	0.40	60 6010B	0406 17:45	0407 11:57 RW
Beryllium, Total	ND	mg/kg	0.20	60 6010B	0406 17:45	0407 11:57 RW
Cadmium, Total	ND	mg/kg	0.40	60 6010B	0406 17:45	0407 11:57 RW
Chromium, Total	ND	mg/kg	0.40	60 6010B	0406 17:45	0407 11:57 RW
Lead, Total	ND	mg/kg	2.0	60 6010B	0406 17:45	0407 11:57 RW
Nickel, Total	ND	mg/kg	1.0	60 6010B	0406 17:45	0407 11:57 RW
Selenium, Total	ND	mg/kg	2.0	60 6010B	0406 17:45	0407 11:57 RW
Silver, Total	ND	mg/kg	0.40	60 6010B	0406 17:45	0407 11:57 RW
Thallium, Total	ND	mg/kg	2.0	60 6010B	0406 17:45	0407 11:57 RW
Vanadium, Total	ND	mg/kg	0.40	60 6010B	0406 17:45	0407 11:57 RW
Zinc, Total	2.0	mg/kg	2.0	60 6010B	0406 17:45	0407 11:57 RW
Blank Analysis for sample(s) 09-11 (WG235183-1)						
Polychlorinated Biphenyls by MCP 8082				64 8082	0407 00:30	0410 23:05 SS
Surrogate(s)	Recovery		QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	79.0	%	30-150			
Decachlorobiphenyl	61.0	%	30-150			
Blank Analysis for sample(s) 09-11 (WG235183-1)						
Polychlorinated Biphenyls by MCP 8082				64 8082	0407 00:30	0410 23:05 SS
Aroclor 1016	ND	ug/kg	33.3			
Aroclor 1221	ND	ug/kg	33.3			
Aroclor 1232	ND	ug/kg	33.3			
Aroclor 1242	ND	ug/kg	33.3			
Aroclor 1248	ND	ug/kg	33.3			
Aroclor 1254	ND	ug/kg	33.3			
Aroclor 1260	ND	ug/kg	33.3			
Surrogate(s)	Recovery		QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	79.0	%	30-150			
Decachlorobiphenyl	69.0	%	30-150			
Blank Analysis for sample(s) 01,03-04,06-07,10,12-15 (WG235185-1)						
Organochlorine Pesticides by MCP 8081A				64 8081A	0406 23:50	0411 22:24 JB
Surrogate(s)	Recovery		QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	67.0	%	30-150			
Decachlorobiphenyl	68.0	%	30-150			
Blank Analysis for sample(s) 01,03-04,06-07,10,12-15 (WG235185-1)						
Organochlorine Pesticides by MCP 8081A				64 8081A	0406 23:50	0411 22:24 JB
Delta-BHC	ND	ug/kg	3.33			

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0604684

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Blank Analysis for sample(s) 01,03-04,06-07,10,12-15 (WG235185-1)							
Organochlorine Pesticides by MCP-8081A cont'd 64 8081A 0406 23:50 0411 22:24 JB							
Lindane	ND	ug/kg	2.67				
Alpha-BHC	ND	ug/kg	3.33				
Beta-BHC	ND	ug/kg	3.33				
Heptachlor	ND	ug/kg	3.33				
Aldrin	ND	ug/kg	3.33				
Heptachlor epoxide	ND	ug/kg	3.33				
Endrin	ND	ug/kg	3.33				
Endrin ketone	ND	ug/kg	3.33				
Dieldrin	ND	ug/kg	3.33				
4,4'-DDE	ND	ug/kg	3.33				
4,4'-DDD	ND	ug/kg	3.33				
4,4'-DDT	ND	ug/kg	3.33				
Endosulfan I	ND	ug/kg	3.33				
Endosulfan II	ND	ug/kg	3.33				
Endosulfan sulfate	ND	ug/kg	3.33				
Methoxychlor	ND	ug/kg	13.3				
Chlordane	ND	ug/kg	13.3				
Toxaphene	ND	ug/kg	13.3				
Hexachlorobenzene	ND	ug/kg	3.33				
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	71.0	%		30-150			
Decachlorobiphenyl	66.0	%		30-150			
Blank Analysis for sample(s) 01+08,10-15 (WG235816-1)							
Extractable Petroleum Hydrocarbons 61 EPH-04-1 0411 19:30 0412 13:21 BN							
C9-C18 Aliphatics	ND	mg/kg	6.67				
C19-C36 Aliphatics	ND	mg/kg	6.67				
C11-C22 Aromatics	ND	mg/kg	6.67				
C11-C22 Aromatics, Adjusted	ND	mg/kg	6.67				
Naphthalene	ND	mg/kg	0.333				
2-Methylnaphthalene	ND	mg/kg	0.333				
Acenaphthylene	ND	mg/kg	0.333				
Acenaphthene	ND	mg/kg	0.333				
Fluorene	ND	mg/kg	0.333				
Phenanthrene	ND	mg/kg	0.333				
Anthracene	ND	mg/kg	0.333				
Fluoranthene	ND	mg/kg	0.333				
Pyrene	ND	mg/kg	0.333				
Benzo(a)anthracene	ND	mg/kg	0.333				
Chrysene	ND	mg/kg	0.333				
Benzo(b)fluoranthene	ND	mg/kg	0.333				
Benzo(k)fluoranthene	ND	mg/kg	0.333				
Benzo(a)pyrene	ND	mg/kg	0.333				
Indeno(1,2,3-cd)Pyrene	ND	mg/kg	0.333				
Dibenzo(a,h)anthracene	ND	mg/kg	0.333				

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0604684

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Blank Analysis for sample(s) 01-08, 10-15 (WG235816-1)							
Extractable Petroleum Hydrocarbons cont'd				61 EPH-04-1	0411 19:30	0412 13:21	BN
Benzo(ghi)perylene	ND	mg/kg	0.333				
Surrogate(s)	Recovery			QC Criteria			
Chloro-Octadecane	68.0	%		40-140			
o-Terphenyl	82.0	%		40-140			
2-Fluorobiphenyl	91.0	%		40-140			
2-Bromonaphthalene	92.0	%		40-140			

**ALPHA ANALYTICAL LABORATORIES**  
**ADDENDUM I**

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**REFERENCES**

30. Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.
60. Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). May 2004.
61. Method for the Determination of Extractable Petroleum Hydrocarbons (EPH). Massachusetts Department of Environmental Protection, DEA/ORS/BWSC. May 2004, Revision 1.1.
64. Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). August 2004.

**GLOSSARY OF TERMS AND SYMBOLS**

REF      Reference number in which test method may be found.  
METHOD   Method number by which analysis was performed.  
ID        Initials of the analyst.  
ND        Not detected in comparison to the reported detection limit.  
NI        Not Ignitable.  
ug/cart   Micrograms per Cartridge.

**LIMITATION OF LIABILITIES**

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**ALPHA ANALYTICAL LABORATORIES  
LOGIN SPECIFIC INFORMATION**

Laboratory Job Number: L0604684

Were project specific reporting limits specified?

YES

**Cooler Information**

Cooler	Custody Seal
A	Absent
B	Absent

**Container Information**

Container ID	Container Type	Cooler	pH	Temp	Pres	Seal	Analysis
L0604684-01A	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	EPH-DELUX-04
L0604684-01B	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	MCP-8081-04
L0604684-01C	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-ZN-6010T, PREPT, TS
L0604684-02A	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	EPH-DELUX-04, TS
L0604684-03A	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	EPH-DELUX-04
L0604684-03B	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	MCP-8081-04
L0604684-03C	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-ZN-6010T, PREPT, TS
L0604684-04A	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	EPH-DELUX-04
L0604684-04B	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	MCP-8081-04
L0604684-04C	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-ZN-6010T, PREPT, TS



**ALPHA ANALYTICAL LABORATORIES**  
**LOGIN SPECIFIC INFORMATION**

Laboratory Job Number: L0604684

Continued

Container ID	Container Type	Cooler	pH	Temp	Pres	Seal	Analysis
L0604684-05A	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	EPH-DELUX-04, TS
L0604684-06A	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	EPH-DELUX-04
L0604684-06B	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	MCP-8081-04
L0604684-06C	Amber 250ml unpreserved	A	N/A	2.4C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-ZN-6010T, PREPT, TS
L0604684-07A	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	EPH-DELUX-04
L0604684-07B	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-8081-04
L0604684-07C	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-ZN-6010T, PREPT, TS
L0604684-07D	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	EPH-DELUX-04
L0604684-07E	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-8081-04
L0604684-07F	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-ZN-6010T, PREPT, TS
L0604684-08A	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	EPH-DELUX-04, TS
L0604684-09A	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-8082-04, TS
L0604684-10A	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	EPH-DELUX-04
L0604684-10B	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-8081-04
L0604684-10C	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-

ALPHA ANALYTICAL LABORATORIES  
LOGIN SPECIFIC INFORMATION

Laboratory Job Number: L0604684

Continued

Container ID	Container Type	Cooler	pH	Temp	Pres	Seal	Analysis
							CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-ZN-6010T, PREPT, TS
L0604684-10D	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-8082-04
L0604684-11A	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	EPH-DELUX-04, TS
L0604684-11B	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-8082-04
L0604684-11C	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-8082-04
L0604684-12A	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	EPH-DELUX-04
L0604684-12B	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-8081-04
L0604684-12C	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-ZN-6010T, PREPT, TS
L0604684-13A	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	EPH-DELUX-04
L0604684-13B	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-8081-04
L0604684-13C	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-ZN-6010T, PREPT, TS
L0604684-14A	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	EPH-DELUX-04
L0604684-14B	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-8081-04
L0604684-14C	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-ZN-6010T, PREPT, TS
L0604684-15A	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	EPH-DELUX-04
L0604684-15B	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-8081-04

ALPHA ANALYTICAL LABORATORIES  
LOGIN SPECIFIC INFORMATION

Laboratory Job Number: L0604684

Continued

Container ID	Container Type	Cooler	pH	Temp	Pres	Seal	Analysis
L0604684-15C	Amber 250ml unpreserved	B	N/A	2.0C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-2N-6010T, PREPT, TS

Container Comments

Container ID    Comments

ALPHA

CHAIN OF CUSTODY

PAGE 1 OF 2

WESTBORO, MA  
TEL: 508-898-9220  
FAX: 508-898-9193

RAVENHAM, MA  
TEL: 508-822-9300  
FAX: 508-822-3288

Client Information

Client: TRC Environmental Corp.

Address: 116 John St.

Lowell, MA 01852

Phone: 978-970-5600

Fax: 978-453-1995

Email: fealanda@trcsolutions.com

Other Project Specific Requirements/Comments/Detection Limits:

For questions regarding analysis or detection limits please contact Frank Calandra or Liz Donly at TRC.

Project Information

Project Name: Farm, B.M. Railroad

Project Location: Newbury/Newburyport, MA

Project #: 52037-0010-00000

Project Manager: Frank Calandra

ALPHA Quote #:

Turn-Around Time

Standard ☒ RUSH (only confirmed pre-2006)

Date Due: 4/12 Time:

Date Rec'd In Lab:

4/15

Report Information - Data Deliverables

☐ FAX ☒ EMAIL

☒ ADEx ☐ Add'l Deliverables

Regulatory Requirements/Report Limits

State/Fed Program

MCP/Brownfields

MAMCP PRESUMPTIVE CERTAINTY - CT REASONABLE CONFIDENCE PROTOCOLS

Criteria

S-1, BW-2, GW-3, to QAPP

Billing Information

Same as Client Info

PO #:

ALPHA Job #: 2060687

ANALYSIS  
EPH Deluxe  
Pesticides  
MCP Metals  
PCBs

☒ Yes ☐ No Are MCP Analytical Methods Required?  
☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

SAMPLE HANDLING

Filtration ☐ Done  
☒ Not needed  
☐ Lab to do  
☐ Preservation  
☐ Lab to do  
(Please specify below)

Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Time	Sample Matrix	Sampler's Initials	Analysis	Sample Handling
09688-01	B-1 (0-3')	4/3/06	0915	soil	MAO	X X X	3
-02	B-1 (3-10')		0920			X	1
-03	B-X (0-3')		0940			X X X	3
-04	B-2 (0-3')		1005			X X X	3
-05	B-2 (3-10')		1010			X	1
-06	B-3 (0-3')		1105			X X X	3
-07	B-4 (0-3')		1220			X X X	6
-08	B-4 (3-10')		1225			X X X	1
-09	B-Y (0-3')		1320			X	1
-10	B-5 (0-3')		1350			X X X X	4

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT

MA MCP or CT RCP?

Retinquished By:

Date/Time

Received By:

Date/Time

Container Type  
Preservative

A A A A A A A A



# CHAIN OF CUSTODY

PAGE 2 OF 2

RAYNHAMMA  
WESTBORO, MA  
TEL: 508-898-9220  
FAX: 508-898-9193

TEL: 508-822-9300  
FAX: 508-822-3288

## Client Information

Client: TRC Environmental Corp.

Address: 116 John St.

Lowell, MA 01852

Phone: 978-970-5600

Fax: 978-453-1995

Email: fcaldreda@trcsolutions.com

☐ These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

For questions regarding analyses or detection limits  
please contact Frank Calandra or Liz Donly at TRC.

## Project Information

Project Name: Former B&M Railroad

Project Location: Northbury/Waterbury, MA

Project #: 52037-0010-00000

Project Manager: Frank Calandra

Alpha Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed by e-mail)

Date Due: 4/1/12 Time:

Date Rec'd in Lab:

4/15

Report Information - Data Deliverables

☐ FAX ☒ EMAIL

☒ ADX ☐ Add'l Deliverables

Regulatory Requirements/Report Limits

State/Fed Program Criteria

MCP/Brownfields 5-1, 6W-2, 6W-3, 6W-4

MAMCP PRESUMPTIVE CERTAINTY - CT REASONABLE CONFIDENCE PROTOCOLS

ALPHA Job #:

20604689

Billing Information

Same as Client Info

PO #:

☒ Yes ☐ No Are MCP Analytical Methods Required?

☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

ANALYSIS  
EPH Deluxe  
Pesticides  
MCP Metals  
PCBs

SAMPLE HANDLING  
Filtration  
☐ Done  
☒ Not needed  
☐ Lab to do  
☐ Preservation  
☐ Lab to do  
(Please specify below)

Sample Specific Comments

TOTAL # OF SAMPLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Samplers Initials							MS/MSD - PCBs only
		Date	Time									
<u>07631-11</u>	<u>B-5 (3-15')</u>	<u>4/3/06</u>	<u>1355</u>	<u>SOIL</u>	<u>MAO</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>3</u>
<u>12</u>	<u>B-6 (0-3')</u>	<u>4/3/06</u>	<u>1440</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>3</u>
<u>13</u>	<u>B-7 (0-3')</u>	<u>4/3/06</u>	<u>1530</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>3</u>
<u>14</u>	<u>B-8 (0-3')</u>	<u>4/4/06</u>	<u>1610</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>3</u>
<u>15</u>	<u>B-10 (0-3')</u>	<u>4/4/06</u>	<u>0905</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>3</u>

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT

MA MCP or CT RCP?

FORM NO: 01-01 (rev. 10-01-05)

Relinquished By:

Date/Time

Received By:

Date/Time

Container Type  
Preservative

AA AA AA AA

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms. See reverse side.

ALPHA ANALYTICAL LABORATORIES

Eight Walkup Drive  
Westborough, Massachusetts 01581-1019  
(508) 898-9220 www.alphalab.com

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

CERTIFICATE OF ANALYSIS

Client: TRC Environmental Corporation Laboratory Job Number: L0604958  
Address: Boott Mills South  
116 John Street  
Lowell, MA 01852 Date Received: 07-APR-2006  
Attn: Mr. Frank Calandra Date Reported: 02-MAY-2006  
Project Number: 52037-0010-00000 Delivery Method: Alpha  
Site: FORMER B&M RAILROAD

The following questions pertain only to MCP Analytical Methods

An affirmative response to questions A,B,C & D is required for "Presumptive Certainty" status

- A. Were all samples received by the laboratory in a condition consistent with those described on their Chain-of-Custody documentation for the data set? YES
- B. Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines? YES
- C. Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in section 2.0 of the MADEP document CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? YES
- D. VPH and EPH methods only: Was the VPH or EPH method run without significant modifications, as specified in Section 11.3? YES

A response to questions E and F is required for "Presumptive Certainty" status

- E. Were all QC performance standards and recommendations for the specified method(s) achieved? NO
- F. Were results for all analyte-list compounds/elements for the specified method(s) reported? YES

Any answers of NO to the above questions are addressed in the 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 report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized by:   
Technical Director

ALPHA ANALYTICAL LABORATORIES

Laboratory Job Number: L0604958

Date Reported: 02-MAY-2006

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ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L0604958-01	B-9 (0-3)	NEWBURYPORT, MA
L0604958-02	B-9 (3-10)	NEWBURYPORT, MA

ALPHA ANALYTICAL LABORATORIES  
NARRATIVE REPORT

Laboratory Job Number: L0604958

---

Report Submission

This report is re-issued to include the extraction Method for the analysis of EPH.

EPH

WG235509:

Extraction method 3545

In reference to question E:

The WG235509 LCS/LCSD RPD for Fluorene is above the acceptance criteria for the method.

Pesticides

WG235514

Extraction method: 3545

Cleanup method: 3620B



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604958-01

Date Collected: 07-APR-2006 09:00

B-9 (0-3)

Date Received : 07-APR-2006

Sample Matrix: SOIL

Date Reported : 02-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 4-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP ANAL	ID
-----------	--------	-------	-----	------------	-------------------	----

Solids, Total	92	%	0.10	30 2540G	0410 13:38	PD
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Total Metals by MCP 6000/7000 series 60 6010B

Antimony, Total	ND	mg/kg	2.2	60 6010B	0410 16:00	0411 08:23 RW
Arsenic, Total	27	mg/kg	0.43	60 6010B	0410 16:00	0411 08:23 RW
Barium, Total	17	mg/kg	0.43	60 6010B	0410 16:00	0411 08:23 RW
Beryllium, Total	ND	mg/kg	0.22	60 6010B	0410 16:00	0411 08:23 RW
Cadmium, Total	ND	mg/kg	0.43	60 6010B	0410 16:00	0411 08:23 RW
Chromium, Total	16	mg/kg	0.43	60 6010B	0410 16:00	0411 08:23 RW
Lead, Total	9.9	mg/kg	2.2	60 6010B	0410 16:00	0411 08:23 RW
Nickel, Total	15	mg/kg	1.1	60 6010B	0410 16:00	0411 08:23 RW
Selenium, Total	ND	mg/kg	2.2	60 6010B	0410 16:00	0411 08:23 RW
Silver, Total	ND	mg/kg	0.43	60 6010B	0410 16:00	0411 08:23 RW
Thallium, Total	ND	mg/kg	2.2	60 6010B	0410 16:00	0411 08:23 RW
Vanadium, Total	13	mg/kg	0.43	60 6010B	0410 16:00	0411 08:23 RW
Zinc, Total	25	mg/kg	2.2	60 6010B	0410 16:00	0411 08:23 RW

Organochlorine Pesticides by MCP 8081A 64 8081A 0410 19:45 0413 00:23 JB

Surrogate(s)	Recovery	QC Criteria
2,4,5,6-Tetrachloro-m-xylene	43.0 %	30-150
Decachlorobiphenyl	53.0 %	30-150

Organochlorine Pesticides by MCP 8081A 64 8081A 0410 19:45 0413 00:23 JB

Delta-BHC	ND	ug/kg	3.62
Lindane	ND	ug/kg	2.90
Alpha-BHC	ND	ug/kg	3.62
Beta-BHC	ND	ug/kg	3.62
Heptachlor	ND	ug/kg	3.62
Aldrin	ND	ug/kg	3.62
Heptachlor epoxide	ND	ug/kg	3.62
Endrin	ND	ug/kg	3.62
Endrin ketone	ND	ug/kg	3.62
Dieldrin	ND	ug/kg	3.62
4,4'-DDE	ND	ug/kg	3.62
4,4'-DDD	ND	ug/kg	3.62
4,4'-DDT	ND	ug/kg	3.62
Endosulfan I	ND	ug/kg	3.62

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0604958-01  
B-9 (0-3)

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
<hr/>							
Organochlorine Pesticides by MCP 8081A cont'd							
Endosulfan II	ND	ug/kg	3.62				
Endosulfan sulfate	ND	ug/kg	3.62				
Methoxychlor	ND	ug/kg	14.5				
Chlordane	ND	ug/kg	14.5				
Toxaphene	ND	ug/kg	14.5				
Hexachlorobenzene	ND	ug/kg	3.62				
<hr/>							
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	44.0	%		30-150			
Decachlorobiphenyl	48.0	%		30-150			

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604958-01  
B-9 (0-3)

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Extractable Petroleum Hydrocarbons 61 EPH-04-1 0410-18:00 0413-17:21 BN

**Quality Control Information**

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? NO  
1. One or more of the RPD values for the LCSD was greater than 25%.  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	mg/kg	7.25
C19-C36 Aliphatics	ND	mg/kg	7.25
C11-C22 Aromatics	ND	mg/kg	7.25
C11-C22 Aromatics, Adjusted	ND	mg/kg	7.25
Naphthalene	ND	mg/kg	0.362
2-Methylnaphthalene	ND	mg/kg	0.362
Acenaphthylene	ND	mg/kg	0.362
Acenaphthene	ND	mg/kg	0.362
Fluorene	ND	mg/kg	0.362
Phenanthrene	ND	mg/kg	0.362
Anthracene	ND	mg/kg	0.362
Fluoranthene	ND	mg/kg	0.362
Pyrene	ND	mg/kg	0.362
Benzo(a)anthracene	ND	mg/kg	0.362
Chrysene	ND	mg/kg	0.362
Benzo(b)fluoranthene	ND	mg/kg	0.362
Benzo(k)fluoranthene	ND	mg/kg	0.362
Benzo(a)pyrene	ND	mg/kg	0.362
Indeno(1,2,3-cd)Pyrene	ND	mg/kg	0.362
Dibenzo(a,h)anthracene	ND	mg/kg	0.362
Benzo(ghi)perylene	ND	mg/kg	0.362

Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	43.0	%	40-140
o-Terphenyl	68.0	%	40-140
2-Fluorobiphenyl	87.0	%	40-140
2-Bromonaphthalene	86.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604958-02

B-9 (3-10)

Sample Matrix:

SOIL

Date Collected: 07-APR-2006 09:30

Date Received : 07-APR-2006

Date Reported : 02-MAY-2006

Condition of Sample: Satisfactory

Field Prep: None

Number & Type of Containers: 1-Amber

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total	95	%	0.10	30 2540G		0410 13:38 PD	

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0604958-02  
B-9 (3-10)

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Extractable Petroleum Hydrocarbons 1-61 EPH-04-1 0410 18:00 0413 17:57 BN

**Quality Control Information**

Condition of sample received: Satisfactory  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? NO  
1. One or more of the RPD values for the LCSD was greater than 25%.  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	mg/kg	7.02
C19-C36 Aliphatics	ND	mg/kg	7.02
C11-C22 Aromatics	ND	mg/kg	7.02
C11-C22 Aromatics, Adjusted	ND	mg/kg	7.02
Naphthalene	ND	mg/kg	0.351
2-Methylnaphthalene	ND	mg/kg	0.351
Acenaphthylene	ND	mg/kg	0.351
Acenaphthene	ND	mg/kg	0.351
Fluorene	ND	mg/kg	0.351
Phenanthrene	ND	mg/kg	0.351
Anthracene	ND	mg/kg	0.351
Fluoranthene	ND	mg/kg	0.351
Pyrene	ND	mg/kg	0.351
Benzo (a) anthracene	ND	mg/kg	0.351
Chrysene	ND	mg/kg	0.351
Benzo (b) fluoranthene	ND	mg/kg	0.351
Benzo (k) fluoranthene	ND	mg/kg	0.351
Benzo (a) pyrene	ND	mg/kg	0.351
Indeno (1,2,3-cd) Pyrene	ND	mg/kg	0.351
Dibenzo (a,h) anthracene	ND	mg/kg	0.351
Benzo (ghi) perylene	ND	mg/kg	0.351

Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	59.0	%	40-140
o-Terphenyl	63.0	%	40-140
2-Fluorobiphenyl	75.0	%	40-140
2-Bromonaphthalene	74.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L0604958

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
<div>Solids, Total for sample(s) 01-02 (L0604958-02, WG235436-1)</div>					
Solids, Total	95	95	%	0	20

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH LCS/LCSD ANALYSIS

Laboratory Job Number: L0604958

Parameter	LCS %	LCSD %	RPD	RPD Limit	QC Limits
<u>Total Metals by MCP 6000/7000 series for sample(s) 01 (WG235521-2, WG235521-3)</u>					
Antimony, Total	81	81	0	30	75-125
Arsenic, Total	89	86	3	30	75-125
Barium, Total	98	94	4	30	75-125
Beryllium, Total	89	87	2	30	75-125
Cadmium, Total	89	81	9	30	75-125
Chromium, Total	97	97	0	30	75-125
Lead, Total	81	81	0	30	75-125
Nickel, Total	84	82	2	30	75-125
Selenium, Total	96	91	5	30	75-125
Silver, Total	91	84	8	30	75-125
Thallium, Total	94	85	10	30	75-125
Vanadium, Total	87	82	6	30	75-125
Zinc, Total	85	85	0	30	75-125
<u>Organochlorine Pesticides by MCP 8081A for sample(s) 01 (WG235514-2, WG235514-3)</u>					
Delta-BHC	69	62	10	30	40-140
Lindane	64	57	12	30	40-140
Alpha-BHC	65	58	12	30	40-140
Beta-BHC	65	59	10	30	40-140
Heptachlor	66	59	12	30	40-140
Aldrin	64	56	13	30	40-140
Heptachlor epoxide	64	58	11	30	40-140
Endrin	73	67	9	30	40-140
Endrin ketone	64	59	8	30	40-140
Dieldrin	67	61	9	30	40-140
4,4'-DDE	64	58	9	30	40-140
4,4'-DDD	65	59	10	30	40-140
4,4'-DDT	72	66	9	30	40-140
Endosulfan I	62	56	11	30	40-140
Endosulfan II	67	62	8	30	40-140
Endosulfan sulfate	70	66	7	30	40-140
Methoxychlor	75	70	7	30	40-140
Hexachlorobenzene	65	58	12	30	40-140
<u>Surrogate(s)</u>					
2,4,5,6-Tetrachloro-m-xylene	65	58	11		30-150
2,4,5,6-Tetrachloro-m-xylene	71	55	25		30-150
Decachlorobiphenyl	55	52	6		30-150
Decachlorobiphenyl	53	49	8		30-150
<u>Extractable Petroleum Hydrocarbons for sample(s) 01-02 (WG235509-2, WG235509-3)</u>					
C9-C18 Aliphatics	56	59	5	25	40-140
C19-C36 Aliphatics	65	72	10	25	40-140
C11-C22 Aromatics	69	88	24	25	40-140
Naphthalene	59	73	21	25	40-140
2-Methylnaphthalene	60	74	21	25	40-140
Acenaphthylene	62	78	23	25	40-140
Acenaphthene	63	80	24	25	40-140

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH LCS/LCSD ANALYSIS

Laboratory Job Number: L0604958

Continued

Parameter	LCS %	LCSD %	RPD	RPD Limit	QC Limits
Extractable Petroleum Hydrocarbons for sample(s) 01-02 (WG235509-2, WG235509-3)					
Fluorene	70	94	29	25	40-140
Phenanthrene	67	84	23	25	40-140
Anthracene	68	85	22	25	40-140
Fluoranthene	68	84	21	25	40-140
Pyrene	66	82	22	25	40-140
Benzo(a)anthracene	66	81	20	25	40-140
Chrysene	67	83	21	25	40-140
Benzo(b)fluoranthene	68	83	20	25	40-140
Benzo(k)fluoranthene	66	82	22	25	40-140
Benzo(a)pyrene	64	78	20	25	40-140
Indeno(1,2,3-cd)Pyrene	63	78	21	25	40-140
Dibenzo(a,h)anthracene	64	78	20	25	40-140
Benzo(ghi)perylene	66	82	22	25	40-140
Nonane (C9)	43	44	2	25	30-140
Decane (C10)	54	56	4	25	40-140
Dodecane (C12)	56	58	4	25	40-140
Tetradecane (C14)	57	62	8	25	40-140
Hexadecane (C16)	58	63	8	25	40-140
Octadecane (C18)	58	64	10	25	40-140
Nonadecane (C19)	60	67	11	25	40-140
Eicosane (C20)	62	68	9	25	40-140
Docosane (C22)	65	71	9	25	40-140
Tetracosane (C24)	64	71	10	25	40-140
Hexacosane (C26)	65	71	9	25	40-140
Octacosane (C28)	65	72	10	25	40-140
triacontane (C30)	65	72	10	25	40-140
Hexatriacontane (C36)	70	77	10	25	40-140
Surrogate(s)					
Chloro-Octadecane	44	45	2		40-140
o-Terphenyl	68	83	20		40-140
2-Fluorobiphenyl	74	86	15		40-140
2-Bromonaphthalene	72	86	18		40-140
% Naphthalene Breakthrough	0	0	NC		
% 2-Methylnaphthalene Breakthrough	0	0	NC		



ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE FRACTIONATION CHECK

Laboratory Job Number: L0604958

Parameter	% Recovery	QC Criteria
Fractionation Check Standard Recoveries for Lot FISH52618		
C9-C18 Aliphatics	62	40-140
C19-C36 Aliphatics	71	40-140
C11-C22 Aromatics	80	40-140
Naphthalene	74	40-140
2-Methylnaphthalene	70	40-140
Acenaphthylene	69	40-140
Acenaphthene	72	40-140
Fluorene	72	40-140
Phenanthrene	72	40-140
Anthracene	77	40-140
Fluoranthene	75	40-140
Pyrene	75	40-140
Benzo(a)anthracene	74	40-140
Chrysene	88	40-140
Benzo(b)fluoranthene	72	40-140
Benzo(k)fluoranthene	74	40-140
Benzo(a)pyrene	73	40-140
Indeno(1,2,3-cd)Pyrene	72	40-140
Dibenzo(a,h)anthracene	73	40-140
Benzo(ghi)perylene	73	40-140
Nonane (C9)	57	30-140
Decane (C10)	62	40-140
Dodecane (C12)	65	40-140
Tetradecane (C14)	63	40-140
Hexadecane (C16)	64	40-140
Octadecane (C18)	64	40-140
Nonadecane (C19)	64	40-140
Eicosane (C20)	67	40-140
Docosane (C22)	71	40-140
Tetracosane (C24)	72	40-140
Hexacosane (C26)	72	40-140
Octacosane (C28)	73	40-140
triacontane (C30)	73	40-140
Hexatriacontane (C36)	76	40-140
Surrogate(s)		
Chloro-Octadecane	57	40-140
o-Terphenyl	78	40-140
2-Fluorobiphenyl	72	40-140
2-Bromonaphthalene	72	40-140

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0604958

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Blank Analysis for sample(s) 01 (WG235521-1)  
Total Metals by MCP 6000/7000 series 60 6010B

Antimony, Total	ND	mg/kg	2.0	60 6010B	0410 16:00	0411 08:11	RW
Arsenic, Total	ND	mg/kg	0.40	60 6010B	0410 16:00	0411 08:11	RW
Barium, Total	ND	mg/kg	0.40	60 6010B	0410 16:00	0411 08:11	RW
Beryllium, Total	ND	mg/kg	0.20	60 6010B	0410 16:00	0411 08:11	RW
Cadmium, Total	ND	mg/kg	0.40	60 6010B	0410 16:00	0411 08:11	RW
Chromium, Total	ND	mg/kg	0.40	60 6010B	0410 16:00	0411 08:11	RW
Lead, Total	ND	mg/kg	2.0	60 6010B	0410 16:00	0411 08:11	RW
Nickel, Total	ND	mg/kg	1.0	60 6010B	0410 16:00	0411 08:11	RW
Selenium, Total	ND	mg/kg	2.0	60 6010B	0410 16:00	0411 08:11	RW
Silver, Total	ND	mg/kg	0.40	60 6010B	0410 16:00	0411 08:11	RW
Thallium, Total	ND	mg/kg	2.0	60 6010B	0410 16:00	0411 08:11	RW
Vanadium, Total	ND	mg/kg	0.40	60 6010B	0410 16:00	0411 08:11	RW
Zinc, Total	ND	mg/kg	2.0	60 6010B	0410 16:00	0411 08:11	RW

Blank Analysis for sample(s) 01 (WG235514-1)  
Organochlorine Pesticides by MCP 8081A 64 8081A 0410 19:19 0412 21:05 JB

Delta-BHC	ND	ug/kg	3.33
Lindane	ND	ug/kg	2.67
Alpha-BHC	ND	ug/kg	3.33
Beta-BHC	ND	ug/kg	3.33
Heptachlor	ND	ug/kg	3.33
Aldrin	ND	ug/kg	3.33
Heptachlor epoxide	ND	ug/kg	3.33
Endrin	ND	ug/kg	3.33
Endrin ketone	ND	ug/kg	3.33
Dieldrin	ND	ug/kg	3.33
4,4'-DDE	ND	ug/kg	3.33
4,4'-DDD	ND	ug/kg	3.33
4,4'-DDT	ND	ug/kg	3.33
Endosulfan I	ND	ug/kg	3.33
Endosulfan II	ND	ug/kg	3.33
Endosulfan sulfate	ND	ug/kg	3.33
Methoxychlor	ND	ug/kg	13.3
Chlordane	ND	ug/kg	13.3
Toxaphene	ND	ug/kg	13.3
Hexachlorobenzene	ND	ug/kg	3.33

Surrogate(s)	Recovery	QC Criteria
2,4,5,6-Tetrachloro-m-xylene	72.0 %	30-150
Decachlorobiphenyl	68.0 %	30-150

Blank Analysis for sample(s) 01 (WG235514-1)  
Organochlorine Pesticides by MCP 8081A 64 8081A 0410 19:15 0412 21:05 JB

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0604958

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Blank Analysis for sample(s): 01 (WG235514-1)							
Organochlorine Pesticides by MCP 8081A cont'd							
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	68.0	%		30-150			
Decachlorobiphenyl	65.0	%		30-150			

Blank Analysis for sample(s): 01-02 (WG235509-1)							
Extractable Petroleum Hydrocarbons							
C9-C18 Aliphatics	ND	mg/kg	6.67				
C19-C36 Aliphatics	ND	mg/kg	6.67				
C11-C22 Aromatics	ND	mg/kg	6.67				
C11-C22 Aromatics, Adjusted	ND	mg/kg	6.67				
Naphthalene	ND	mg/kg	0.333				
2-Methylnaphthalene	ND	mg/kg	0.333				
Acenaphthylene	ND	mg/kg	0.333				
Acenaphthene	ND	mg/kg	0.333				
Fluorene	ND	mg/kg	0.333				
Phenanthrene	ND	mg/kg	0.333				
Anthracene	ND	mg/kg	0.333				
Fluoranthene	ND	mg/kg	0.333				
Pyrene	ND	mg/kg	0.333				
Benzo(a)anthracene	ND	mg/kg	0.333				
Chrysene	ND	mg/kg	0.333				
Benzo(b)fluoranthene	ND	mg/kg	0.333				
Benzo(k)fluoranthene	ND	mg/kg	0.333				
Benzo(a)pyrene	ND	mg/kg	0.333				
Indeno(1,2,3-cd)Pyrene	ND	mg/kg	0.333				
Dibenzo(a,h)anthracene	ND	mg/kg	0.333				
Benzo(ghi)perylene	ND	mg/kg	0.333				
Surrogate(s)	Recovery			QC Criteria			
Chloro-Octadecane	49.0	%		40-140			
o-Terphenyl	70.0	%		40-140			
2-Fluorobiphenyl	86.0	%		40-140			
2-Bromonaphthalene	83.0	%		40-140			

**ALPHA ANALYTICAL LABORATORIES  
ADDENDUM I**

---

**REFERENCES**

30. Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.
60. Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). May 2004.
61. Method for the Determination of Extractable Petroleum Hydrocarbons (EPH). Massachusetts Department of Environmental Protection, DEA/ORS/BWSC. May 2004, Revision 1.1.
64. Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). August 2004.

**GLOSSARY OF TERMS AND SYMBOLS**

REF	Reference number in which test method may be found.
METHOD	Method number by which analysis was performed.
ID	Initials of the analyst.
ND	Not detected in comparison to the reported detection limit.
NI	Not Ignitable.
ug/cart	Micrograms per Cartridge.

**LIMITATION OF LIABILITIES**

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.

ALPHA ANALYTICAL LABORATORIES  
LOGIN SPECIFIC INFORMATION

Laboratory Job Number: L0604958

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp	Pres	Seal	Analysis
L0604958-01A	Amber 250ml unpreserved	A	NA	1.6C	Y	Absent	EPH-DELUX-04
L0604958-01B	Amber 250ml unpreserved	A	NA	1.6C	Y	Absent	MCP-8081-04
L0604958-01C	Amber 250ml unpreserved	A	NA	1.6C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-ZN-6010T, PREPT, TS
L0604958-01D	Amber 250ml unpreserved	A	NA	1.6C	Y	Absent	MCP-AG-6010T, MCP-AS-6010T, MCP-BA-6010T, MCP-BE-6010T, MCP-CD-6010T, MCP-CR-6010T, MCP-NI-6010T, MCP-PB-6010T, MCP-SB-6010T, MCP-SE-6010T, MCP-TL-6010T, MCP-V-6010T, MCP-ZN-6010T, PREPT, TS
L0604958-02A	Amber 250ml unpreserved	A	NA	1.6C	Y	Absent	EPH-DELUX-04, TS

Container Comments

Container ID    Comments

# TRC

## Customer-Focused Solutions

**Boott Mills South, Foot of John Street • Lowell, Massachusetts 01852**  
**Telephone 978-970-5600 • Fax 978-453-1995**

# Chain-of-Custody Record

Page 7 of 7

Project Name	Farmers B & M Railroad Line
Project No.:	52037-0010-00010
Sampling Date(s):	04/06/06
Laboratory Name:	Alpha
Laboratory Location:	
Sampler Name(s):	M. Satam

Shipping Carrier	<input type="checkbox"/> FED EX	<input checked="" type="checkbox"/> COURIER
Date Shipped	_____	
Airbill No.	_____	
MCP Work Only: Have the appropriate number of field samples been collected for this program?		
	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Turnaround Time (Circle One)		
15 Day	10 Day	5 Day    3 Day    Other

Analysis and Preservative

[illegible]

COMMENTS: standard turnaround time.  
Tomographic Blauk included

Send results to: Liz Denby

Cooler temperature:

Please call Liz Devlegh (978-686-3577) with questions

Relinquished By: (Signature)

04/07/06 1240

Received By: (Signature) *Ken Lyle*

4-3-06, 1240 Date/Time

Refnquished By: (Signature)

5/21/75  
Date/Time

Received By: (Signature)

4/2, 17/5

Nº 0214

WHITE - LABORATORY YELLOW - LABORATORY COPY PINK - OFFICE COPY GOLD - FIELD COPY

ALPHA ANALYTICAL LABORATORIES

Eight Walkup Drive  
Westborough, Massachusetts 01581-1019  
(508) 898-9220 www.alphalab.com

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

CERTIFICATE OF ANALYSIS

Client:	TRC Environmental Corporation	Laboratory Job Number:	L0605167
Address:	Boott Mills South 116 John Street Lowell, MA 01852	Date Received:	12-APR-2006
Attn:	Mr. Frank Calandra	Date Reported:	02-MAY-2006
Project Number:	52037	Delivery Method:	Client
Site:	NEWBURYPORT		

The following questions pertain only to MCP Analytical Methods

An affirmative response to questions A,B,C & D is required for "Presumptive Certainty" status

- A. Were all samples received by the laboratory in a condition consistent with those described on their Chain-of-Custody documentation for the data set? YES
- B. Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines? YES
- C. Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in section 2.0 of the MADEP document CAM VII-A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? YES
- D. VPH and EPH methods only: Was the VPH or EPH method run without significant modifications, as specified in Section 11.3? YES

A response to questions E and F is required for "Presumptive Certainty" status

- E. Were all QC performance standards and recommendations for the specified method(s) achieved? NO
- F. Were results for all analyte-list compounds/elements for the specified method(s) reported? YES

Any answers of NO to the above questions are addressed in the 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 report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized by:   
Technical Director

ALPHA ANALYTICAL LABORATORIES

Laboratory Job Number: L0605167

Date Reported: 02-MAY-2006

---

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L0605167-01	MW-9	NEWBURYPORT, MA
L0605167-02	MW-10	NEWBURYPORT, MA
L0605167-03	MW-2	NEWBURYPORT, MA
L0605167-04	MW-1	NEWBURYPORT, MA
L0605167-05	MW-4	NEWBURYPORT, MA



ALPHA ANALYTICAL LABORATORIES  
NARRATIVE REPORT

Laboratory Job Number: L0605167

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Report Submission

This report replaces the report issued April 19, 2006. The report has been amended to include the corrected Metals data on L0605167-02, as well as the report issued on April 21, 2006 to amend the EPH narrative section of the report.

MCP Related Narratives

EPH

WG235911:

Extraction method 3510C

In reference to question E:

The surrogate percent recovery for 1-chloro-octadecane on -02 is below method acceptance criteria possibly due to sample matrix. The sample was re-fractionated with confirming the low surrogate recovery for 1-chloro-octadecane. Both sets of data are reported.

One or more percent recoveries for matrix spike are outside the acceptance criteria for the method (decane, 1-chloro-octadecane). Since the LCS percent recoveries are within method acceptance criteria, the exceedences are most likely due to matrix interference.

Volatile Organics

In reference to question E:

The WG236307-4,5 LCS, LCSD have low % recoveries for Dichlorodifluoromethane and Chloromethane (in the LCSD), both difficult analytes.

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0605167-01

Date Collected: 12-APR-2006 10:15

MW-9

Date Received : 12-APR-2006

Sample Matrix: WATER

Date Reported : 02-MAY-2006

Condition of Sample: Satisfactory

Field Prep: NONE

Number & Type of Containers: 2-Amber,2-Plastic

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
<u>Total Metals by MCP 6000/7000 series</u>							
Antimony, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 18:53	BM
Arsenic, Total	0.0163	mg/l	0.0005	64 6020A	0413 20:00	0414 18:53	BM
Barium, Total	0.0395	mg/l	0.0005	64 6020A	0413 20:00	0414 18:53	BM
Beryllium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 18:53	BM
Cadmium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 18:53	BM
Chromium, Total	0.0142	mg/l	0.0005	64 6020A	0413 20:00	0414 18:53	BM
Lead, Total	0.0061	mg/l	0.0005	64 6020A	0413 20:00	0414 18:53	BM
Nickel, Total	0.0212	mg/l	0.0005	64 6020A	0413 20:00	0414 18:53	BM
Selenium, Total	ND	mg/l	0.001	64 6020A	0413 20:00	0414 18:53	BM
Silver, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 18:53	BM
Thallium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 18:53	BM
Vanadium, Total	0.0102	mg/l	0.0005	64 6020A	0413 20:00	0414 18:53	BM
Zinc, Total	0.0209	mg/l	0.0050	64 6020A	0413 20:00	0414 18:53	BM

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0605167-01  
MW-9

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Extractable Petroleum Hydrocarbons: 61 EPH-04-1 0413 10:30 0419 09:33 BN

Quality Control Information

Condition of sample received:	Satisfactory	
Aqueous preservative:	Laboratory Provided Preserved Container	
Sample temperature upon receipt:	Received on Ice	
Sample extraction method:	Extracted Per the Method	
Were all QA/QC procedures REQUIRED by the method followed?		YES
Were all performance/acceptance standards for the required procedures achieved?		NO
1. One or more of the MS/MSD recoveries was less than 40%.		
Were significant modifications made to the method as specified in Sect 11.3?		NO
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.		
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.		

C9-C18 Aliphatics	ND	ug/l	100
C19-C36 Aliphatics	ND	ug/l	100
C11-C22 Aromatics	ND	ug/l	100
C11-C22 Aromatics, Adjusted	ND	ug/l	100
Naphthalene	ND	ug/l	10.0
2-Methylnaphthalene	ND	ug/l	10.0
Acenaphthylene	ND	ug/l	10.0
Acenaphthene	ND	ug/l	10.0
Fluorene	ND	ug/l	10.0
Phenanthrene	ND	ug/l	10.0
Anthracene	ND	ug/l	10.0
Fluoranthene	ND	ug/l	10.0
Pyrene	ND	ug/l	10.0
Benzo (a) anthracene	ND	ug/l	10.0
Chrysene	ND	ug/l	10.0
Benzo (b) fluoranthene	ND	ug/l	10.0
Benzo (k) fluoranthene	ND	ug/l	10.0
Benzo (a) pyrene	ND	ug/l	10.0
Indeno (1,2,3-cd) Pyrene	ND	ug/l	10.0
Dibenzo (a,h) anthracene	ND	ug/l	10.0
Benzo (ghi) perylene	ND	ug/l	10.0
Surrogate (s)	Recovery		QC Criteria
Chloro-Octadecane	44.0	%	40-140
o-Terphenyl	68.0	%	40-140
2-Fluorobiphenyl	72.0	%	40-140
2-Bromonaphthalene	71.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0605167-02

Date Collected: 12-APR-2006 12:15

MW-10

Date Received : 12-APR-2006

Sample Matrix: WATER

Date Reported : 02-MAY-2006

Condition of Sample: Satisfactory

Field Prep: NONE

Number & Type of Containers: 4-Amber,9-Plastic,2-Vial

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Total Cyanide by MCP 9014							
Cyanide, Total	0.167	mg/l	0.005	64 9014	0413 09:45	0413 18:54	DD
Total Metals by MCP 6000/7000 series							
Antimony, Total	ND	mg/l	0.0005	64 6020A	0417 19:30	0419 00:06	BM
Arsenic, Total	0.0071	mg/l	0.0005	64 6020A	0417 19:30	0419 00:06	BM
Barium, Total	0.8272	mg/l	0.0005	64 6020A	0417 19:30	0419 00:06	BM
Beryllium, Total	ND	mg/l	0.0005	64 6020A	0417 19:30	0419 00:06	BM
Cadmium, Total	0.0006	mg/l	0.0005	64 6020A	0417 19:30	0419 00:06	BM
Chromium, Total	0.0031	mg/l	0.0005	64 6020A	0417 19:30	0419 00:06	BM
Lead, Total	0.0020	mg/l	0.0005	64 6020A	0417 19:30	0419 00:06	BM
Nickel, Total	0.6998	mg/l	0.0005	64 6020A	0417 19:30	0419 00:06	BM
Selenium, Total	ND	mg/l	0.001	64 6020A	0417 19:30	0419 00:06	BM
Silver, Total	ND	mg/l	0.0005	64 6020A	0417 19:30	0419 00:06	BM
Thallium, Total	ND	mg/l	0.0005	64 6020A	0417 19:30	0419 00:06	BM
Vanadium, Total	ND	mg/l	0.0005	64 6020A	0417 19:30	0419 00:06	BM
Zinc, Total	0.0335	mg/l	0.0050	64 6020A	0417 19:30	0419 00:06	BM
Volatile Organics by MCP 8260B							
Methylene chloride	ND	ug/l	5.0	60 8260B	0417 16:57	PD	
1,1-Dichloroethane	4.6	ug/l	0.75				
Chloroform	0.88	ug/l	0.75				
Carbon tetrachloride	ND	ug/l	0.50				
1,2-Dichloropropane	ND	ug/l	1.8				
Dibromochloromethane	ND	ug/l	0.50				
1,1,2-Trichloroethane	ND	ug/l	0.75				
Tetrachloroethene	0.73	ug/l	0.50				
Chlorobenzene	ND	ug/l	0.50				
Trichlorofluoromethane	ND	ug/l	2.5				
1,2-Dichloroethane	ND	ug/l	0.50				
1,1,1-Trichloroethane	3.8	ug/l	0.50				
Bromodichloromethane	ND	ug/l	0.50				
trans-1,3-Dichloropropene	ND	ug/l	0.50				
cis-1,3-Dichloropropene	ND	ug/l	0.50				
1,1-Dichloropropene	ND	ug/l	2.5				
Bromoform	ND	ug/l	2.0				
1,1,2,2-Tetrachloroethane	ND	ug/l	0.50				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0605167-02  
MW-10

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Volatile Organics by MCP 8260B cont'd							
Benzene	13	ug/l	0.50				
Toluene	1.6	ug/l	0.75				
Ethylbenzene	9.6	ug/l	0.50				
Chloromethane	ND	ug/l	2.5				
Bromomethane	ND	ug/l	1.0				
Vinyl chloride	7.8	ug/l	1.0				
Chloroethane	ND	ug/l	1.0				
1,1-Dichloroethene	ND	ug/l	0.50				
trans-1,2-Dichloroethene	ND	ug/l	0.75				
Trichloroethene	17	ug/l	0.50				
1,2-Dichlorobenzene	ND	ug/l	2.5				
1,3-Dichlorobenzene	ND	ug/l	2.5				
1,4-Dichlorobenzene	ND	ug/l	2.5				
Methyl tert butyl ether	ND	ug/l	1.0				
p/m-Xylene	4.8	ug/l	1.0				
o-Xylene	1.2	ug/l	1.0				
cis-1,2-Dichloroethene	14	ug/l	0.50				
Dibromomethane	ND	ug/l	5.0				
1,2,3-Trichloropropane	ND	ug/l	5.0				
Styrene	ND	ug/l	1.0				
Dichlorodifluoromethane	ND	ug/l	5.0				
Acetone	ND	ug/l	5.0				
Carbon disulfide	ND	ug/l	5.0				
2-Butanone	ND	ug/l	5.0				
4-Methyl-2-pentanone	ND	ug/l	5.0				
2-Hexanone	ND	ug/l	5.0				
Bromochloromethane	ND	ug/l	2.5				
Tetrahydrofuran	ND	ug/l	10.				
2,2-Dichloropropane	ND	ug/l	2.5				
1,2-Dibromoethane	ND	ug/l	2.0				
1,3-Dichloropropane	ND	ug/l	2.5				
1,1,1,2-Tetrachloroethane	ND	ug/l	0.50				
Bromobenzene	ND	ug/l	2.5				
n-Butylbenzene	5.5	ug/l	0.50				
sec-Butylbenzene	1.8	ug/l	0.50				
tert-Butylbenzene	ND	ug/l	2.5				
o-Chlorotoluene	ND	ug/l	2.5				
p-Chlorotoluene	ND	ug/l	2.5				
1,2-Dibromo-3-chloropropane	ND	ug/l	2.5				
Hexachlorobutadiene	ND	ug/l	0.60				
Isopropylbenzene	3.2	ug/l	0.50				
p-Isopropyltoluene	1.8	ug/l	0.50				
Naphthalene	9.3	ug/l	2.5				
n-Propylbenzene	8.8	ug/l	0.50				
1,2,3-Trichlorobenzene	ND	ug/l	2.5				
1,2,4-Trichlorobenzene	ND	ug/l	2.5				
1,3,5-Trimethylbenzene	4.0	ug/l	2.5				
1,2,4-Trimethylbenzene	23	ug/l	2.5				
Ethyl ether	ND	ug/l	2.5				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0605167-02  
MW-10

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
<hr/>							
Volatile Organics by MCP 8260B cont'd				60_8260B	041716:57		PD
Isopropyl Ether	ND	ug/l	2.0				
Ethyl-Tert-Butyl-Ether	ND	ug/l	2.0				
Tertiary-Amyl Methyl Ether	ND	ug/l	2.0				
1,4-Dioxane	ND	ug/l	250				
Surrogate(s)	Recovery			QC Criteria			
1,2-Dichloroethane-d4	102	%		70-130			
Toluene-d8	100	%		70-130			
4-Bromofluorobenzene	100	%		70-130			
Dibromofluoromethane	104	%		70-130			

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0605167-02  
MW-10

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP ANAL	ID
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Extractable Petroleum Hydrocarbons 61 EPH-04-1 0413 10:30 0418 15:11 BN

Quality Control Information

Condition of sample received: Satisfactory  
 Aqueous preservative: Laboratory Provided Preserved Container  
 Sample temperature upon receipt: Received on Ice  
 Sample extraction method: Extracted Per the Method  
 Were all QA/QC procedures REQUIRED by the method followed? YES  
 Were all performance/acceptance standards for the required procedures achieved? NO  
     1. One or more of the extraction surrogate recoveries were less than 40%.  
     2. One or more of the MS/MSD recoveries was less than 40%.  
 Were significant modifications made to the method as specified in Sect 11.3? NO  
 The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
 The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	ug/l	100
C19-C36 Aliphatics	ND	ug/l	100
C11-C22 Aromatics	ND	ug/l	100
C11-C22 Aromatics, Adjusted	ND	ug/l	100
Naphthalene	ND	ug/l	10.0
2-Methylnaphthalene	ND	ug/l	10.0
Acenaphthylene	ND	ug/l	10.0
Acenaphthene	ND	ug/l	10.0
Fluorene	ND	ug/l	10.0
Phenanthrene	ND	ug/l	10.0
Anthracene	ND	ug/l	10.0
Fluoranthene	ND	ug/l	10.0
Pyrene	ND	ug/l	10.0
Benzo(a)anthracene	ND	ug/l	10.0
Chrysene	ND	ug/l	10.0
Benzo(b)fluoranthene	ND	ug/l	10.0
Benzo(k)fluoranthene	ND	ug/l	10.0
Benzo(a)pyrene	ND	ug/l	10.0
Indeno(1,2,3-cd)Pyrene	ND	ug/l	10.0
Dibenzo(a,h)anthracene	ND	ug/l	10.0
Benzo(ghi)perylene	ND	ug/l	10.0

Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	36.0	%	40-140
o-Terphenyl	66.0	%	40-140
2-Fluorobiphenyl	73.0	%	40-140
2-Bromonaphthalene	70.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0605167-02  
MW-10

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	

Extractable Petroleum Hydrocarbons 61 EPH-04-1 0413 10:30 0419 10:39 BN

**Quality Control Information**

Condition of sample received: Satisfactory  
Aqueous preservative: Laboratory Provided Preserved Container  
Sample temperature upon receipt: Received on Ice  
Sample extraction method: Extracted Per the Method  
Were all QA/QC procedures REQUIRED by the method followed? YES  
Were all performance/acceptance standards for the required procedures achieved? NO  
1. One or more of the extraction surrogate recoveries were less than 40%.  
2. One or more of the MS/MSD recoveries was less than 40%.  
Were significant modifications made to the method as specified in Sect 11.3? NO  
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	ug/l	100
C19-C36 Aliphatics	ND	ug/l	100
C11-C22 Aromatics	ND	ug/l	100
C11-C22 Aromatics, Adjusted	ND	ug/l	100
Naphthalene	ND	ug/l	10.0
2-Methylnaphthalene	ND	ug/l	10.0
Acenaphthylene	ND	ug/l	10.0
Acenaphthene	ND	ug/l	10.0
Fluorene	ND	ug/l	10.0
Phenanthrene	ND	ug/l	10.0
Anthracene	ND	ug/l	10.0
Fluoranthene	ND	ug/l	10.0
Pyrene	ND	ug/l	10.0
Benzo(a)anthracene	ND	ug/l	10.0
Chrysene	ND	ug/l	10.0
Benzo(b)fluoranthene	ND	ug/l	10.0
Benzo(k)fluoranthene	ND	ug/l	10.0
Benzo(a)pyrene	ND	ug/l	10.0
Indeno(1,2,3-cd)Pyrene	ND	ug/l	10.0
Dibenzo(a,h)anthracene	ND	ug/l	10.0
Benzo(ghi)perylene	ND	ug/l	10.0
Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	33.0	%	40-140
o-Terphenyl	58.0	%	40-140
2-Fluorobiphenyl	65.0	%	40-140
2-Bromonaphthalene	61.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0605167-03

Date Collected: 12-APR-2006 14:15

MW-2

Date Received : 12-APR-2006

Sample Matrix: WATER

Date Reported : 02-MAY-2006

Condition of Sample: Satisfactory

Field Prep: NONE

Number & Type of Containers: 2-Amber,2-Plastic

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP ANAL	ID
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Total Metals by MCP 6000/7000 series

Antimony, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 19:26	BM
Arsenic, Total	0.0294	mg/l	0.0005	64 6020A	0413 20:00 0414 19:26	BM
Barium, Total	0.0568	mg/l	0.0005	64 6020A	0413 20:00 0414 19:26	BM
Beryllium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 19:26	BM
Cadmium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 19:26	BM
Chromium, Total	0.0005	mg/l	0.0005	64 6020A	0413 20:00 0414 19:26	BM
Lead, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 19:26	BM
Nickel, Total	0.0074	mg/l	0.0005	64 6020A	0413 20:00 0414 19:26	BM
Selenium, Total	ND	mg/l	0.001	64 6020A	0413 20:00 0414 19:26	BM
Silver, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 19:26	BM
Thallium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 19:26	BM
Vanadium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 19:26	BM
Zinc, Total	0.0524	mg/l	0.0050	64 6020A	0413 20:00 0414 19:26	BM

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0605167-03  
MW-2

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP      ANAL	ID
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Extractable Petroleum Hydrocarbons: 61-EPH-04-1 0413 10:30 0419 10:05 BN

**Quality Control Information**

Condition of sample received: Satisfactory  
 Aqueous preservative: Laboratory Provided Preserved Container  
 Sample temperature upon receipt: Received on Ice  
 Sample extraction method: Extracted Per the Method  
 Were all QA/QC procedures REQUIRED by the method followed? YES  
 Were all performance/acceptance standards for the required procedures achieved? NO  
     1. One or more of the MS/MSD recoveries was less than 40%.  
 Were significant modifications made to the method as specified in Sect 11.3? NO  
 The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.  
 The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.

C9-C18 Aliphatics	ND	ug/l	100
C19-C36 Aliphatics	ND	ug/l	100
C11-C22 Aromatics	ND	ug/l	100
C11-C22 Aromatics, Adjusted	ND	ug/l	100
Naphthalene	ND	ug/l	10.0
2-Methylnaphthalene	ND	ug/l	10.0
Acenaphthylene	ND	ug/l	10.0
Acenaphthene	ND	ug/l	10.0
Fluorene	ND	ug/l	10.0
Phenanthrene	ND	ug/l	10.0
Anthracene	ND	ug/l	10.0
Fluoranthene	ND	ug/l	10.0
Pyrene	ND	ug/l	10.0
Benzo(a)anthracene	ND	ug/l	10.0
Chrysene	ND	ug/l	10.0
Benzo(b)fluoranthene	ND	ug/l	10.0
Benzo(k)fluoranthene	ND	ug/l	10.0
Benzo(a)pyrene	ND	ug/l	10.0
Indeno(1,2,3-cd)Pyrene	ND	ug/l	10.0
Dibenzo(a,h)anthracene	ND	ug/l	10.0
Benzo(ghi)perylene	ND	ug/l	10.0

Surrogate(s)	Recovery	QC Criteria
Chloro-Octadecane	53.0 %	40-140
o-Terphenyl	75.0 %	40-140
2-Fluorobiphenyl	76.0 %	40-140
2-Bromonaphthalene	76.0 %	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0605167-04

MW-1

Sample Matrix:

WATER

Date Collected: 12-APR-2006 15:10

Date Received : 12-APR-2006

Date Reported : 02-MAY-2006

Condition of Sample: Satisfactory

Field Prep: NONE

Number & Type of Containers: 2-Amber,2-Plastic

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
<u>Total Metals by MCP 6000/7000 series</u>							
Antimony, Total	0.0008	mg/l	0.0005	64 6020A	0413 20:00	0414 19:32	BM
Arsenic, Total	0.0037	mg/l	0.0005	64 6020A	0413 20:00	0414 19:32	BM
Barium, Total	0.0773	mg/l	0.0005	64 6020A	0413 20:00	0414 19:32	BM
Beryllium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 19:32	BM
Cadmium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 19:32	BM
Chromium, Total	0.0019	mg/l	0.0005	64 6020A	0413 20:00	0414 19:32	BM
Lead, Total	0.0012	mg/l	0.0005	64 6020A	0413 20:00	0414 19:32	BM
Nickel, Total	0.0063	mg/l	0.0005	64 6020A	0413 20:00	0414 19:32	BM
Selenium, Total	0.006	mg/l	0.001	64 6020A	0413 20:00	0414 19:32	BM
Silver, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 19:32	BM
Thallium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 19:32	BM
Vanadium, Total	0.0012	mg/l	0.0005	64 6020A	0413 20:00	0414 19:32	BM
Zinc, Total	0.1386	mg/l	0.0050	64 6020A	0413 20:00	0414 19:32	BM

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0605167-04  
MW-1

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP      ANAL	ID
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Extractable Petroleum Hydrocarbons	1261 EPH-04-1	0413 10:30 0418 16:49 BN
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**Quality Control Information**

Condition of sample received:	Satisfactory
Aqueous preservative:	Laboratory Provided Preserved Container
Sample temperature upon receipt:	Received on Ice
Sample extraction method:	Extracted Per the Method
Were all QA/QC procedures REQUIRED by the method followed?	YES
Were all performance/acceptance standards for the required procedures achieved?	NO
1. One or more of the MS/MSD recoveries was less than 40%.	
Were significant modifications made to the method as specified in Sect 11.3?	NO
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.	
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.	

PARAMETER	RESULT	UNITS	RDL
C9-C18 Aliphatics	ND	ug/l	100
C19-C36 Aliphatics	ND	ug/l	100
C11-C22 Aromatics	ND	ug/l	100
C11-C22 Aromatics, Adjusted	ND	ug/l	100
Naphthalene	ND	ug/l	10.0
2-Methylnaphthalene	ND	ug/l	10.0
Acenaphthylene	ND	ug/l	10.0
Acenaphthene	ND	ug/l	10.0
Fluorene	ND	ug/l	10.0
Phenanthrene	ND	ug/l	10.0
Anthracene	ND	ug/l	10.0
Fluoranthene	ND	ug/l	10.0
Pyrene	ND	ug/l	10.0
Benzo(a)anthracene	ND	ug/l	10.0
Chrysene	ND	ug/l	10.0
Benzo(b)fluoranthene	ND	ug/l	10.0
Benzo(k)fluoranthene	ND	ug/l	10.0
Benzo(a)pyrene	ND	ug/l	10.0
Indeno(1,2,3-cd)Pyrene	ND	ug/l	10.0
Dibenzo(a,h)anthracene	ND	ug/l	10.0
Benzo(ghi)perylene	ND	ug/l	10.0

Surrogate(s)	Recovery	QC Criteria
Chloro-Octadecane	53.0 %	40-140
o-Terphenyl	72.0 %	40-140
2-Fluorobiphenyl	75.0 %	40-140
2-Bromonaphthalene	74.0 %	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0605167-05

Date Collected: 12-APR-2006 17:00

MW-4

Date Received : 12-APR-2006

Sample Matrix: WATER

Date Reported : 02-MAY-2006

Condition of Sample: Satisfactory

Field Prep: NONE

Number & Type of Containers: 2-Amber,2-Plastic

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Total Metals by MCP 6000/7000 series							
Antimony, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 19:37	BM
Arsenic, Total	0.0015	mg/l	0.0005	64 6020A	0413 20:00	0414 19:37	BM
Barium, Total	0.0182	mg/l	0.0005	64 6020A	0413 20:00	0414 19:37	BM
Beryllium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 19:37	BM
Cadmium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 19:37	BM
Chromium, Total	0.0009	mg/l	0.0005	64 6020A	0413 20:00	0414 19:37	BM
Lead, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 19:37	BM
Nickel, Total	0.0095	mg/l	0.0005	64 6020A	0413 20:00	0414 19:37	BM
Selenium, Total	0.002	mg/l	0.001	64 6020A	0413 20:00	0414 19:37	BM
Silver, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 19:37	BM
Thallium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 19:37	BM
Vanadium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00	0414 19:37	BM
Zinc, Total	ND	mg/l	0.0050	64 6020A	0413 20:00	0414 19:37	BM

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0605167-05  
MW-4

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP      ANAL	ID
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Extractable Petroleum Hydrocarbons	61.EPH-04-1	0413 10:30 0418 17:22 BN
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Quality Control Information
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Condition of sample received:	Satisfactory	
Aqueous preservative:	Laboratory Provided Preserved Container	
Sample temperature upon receipt:	Received on Ice	
Sample extraction method:	Extracted Per the Method	
Were all QA/QC procedures REQUIRED by the method followed?		YES
Were all performance/acceptance standards for the required procedures achieved?		NO
1. One or more of the MS/MSD recoveries was less than 40%.		
Were significant modifications made to the method as specified in Sect 11.3?		NO
The normal acceptance range for the extraction surrogates, Chloro-octadecane and o-Terphenyl, is 40-140%.		
The normal acceptance range for the fractionation surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, is 40-140%.		

C9-C18 Aliphatics	ND	ug/l	100
C19-C36 Aliphatics	ND	ug/l	100
C11-C22 Aromatics	ND	ug/l	100
C11-C22 Aromatics, Adjusted	ND	ug/l	100
Naphthalene	ND	ug/l	10.0
2-Methylnaphthalene	ND	ug/l	10.0
Acenaphthylene	ND	ug/l	10.0
Acenaphthene	ND	ug/l	10.0
Fluorene	ND	ug/l	10.0
Phenanthrene	ND	ug/l	10.0
Anthracene	ND	ug/l	10.0
Fluoranthene	ND	ug/l	10.0
Pyrene	ND	ug/l	10.0
Benzo(a)anthracene	ND	ug/l	10.0
Chrysene	ND	ug/l	10.0
Benzo(b)fluoranthene	ND	ug/l	10.0
Benzo(k)fluoranthene	ND	ug/l	10.0
Benzo(a)pyrene	ND	ug/l	10.0
Indeno(1,2,3-cd)Pyrene	ND	ug/l	10.0
Dibenzo(a,h)anthracene	ND	ug/l	10.0
Benzo(ghi)perylene	ND	ug/l	10.0
Surrogate(s)	Recovery		QC Criteria
Chloro-Octadecane	47.0	%	40-140
o-Terphenyl	72.0	%	40-140
2-Fluorobiphenyl	77.0	%	40-140
2-Bromonaphthalene	76.0	%	40-140

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L0605167

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
Total Cyanide by MCP 9014 for sample(s) 02 (L0605167-02, WG235888-6)					
Cyanide, Total	0.167	0.170	mg/l	2	20
Total Metals by MCP 6000/7000 series for sample(s) 02 (L0605167-02, WG236360-4)					
Antimony, Total	ND	ND	mg/l	NC	20
Arsenic, Total	0.0071	0.0074	mg/l	3	20
Barium, Total	0.8272	0.8322	mg/l	1	20
Beryllium, Total	ND	ND	mg/l	NC	20
Cadmium, Total	0.0006	0.0006	mg/l	8	20
Chromium, Total	0.0031	0.0039	mg/l	25	20
Lead, Total	0.0020	0.0021	mg/l	5	20
Nickel, Total	0.6998	0.7433	mg/l	6	20
Selenium, Total	ND	ND	mg/l	NC	20
Silver, Total	ND	ND	mg/l	NC	20
Thallium, Total	ND	ND	mg/l	NC	20
Vanadium, Total	ND	0.0005	mg/l	NC	20
Zinc, Total	0.0335	0.0386	mg/l	14	20
Extractable Petroleum Hydrocarbons for sample(s) 01-05 (L0605167-02, WG235911-5)					
C9-C18 Aliphatics	ND	ND	ug/l	NC	50
C19-C36 Aliphatics	ND	ND	ug/l	NC	50
C11-C22 Aromatics	ND	ND	ug/l	NC	50
C11-C22 Aromatics, Adjusted	ND	ND	ug/l	NC	50
Naphthalene	ND	ND	ug/l	NC	50
2-Methylnaphthalene	ND	ND	ug/l	NC	50
Acenaphthylene	ND	ND	ug/l	NC	50
Acenaphthene	ND	ND	ug/l	NC	50
Fluorene	ND	ND	ug/l	NC	50
Phenanthrene	ND	ND	ug/l	NC	50
Anthracene	ND	ND	ug/l	NC	50
Fluoranthene	ND	ND	ug/l	NC	50
Pyrene	ND	ND	ug/l	NC	50
Benzo(a)anthracene	ND	ND	ug/l	NC	50
Chrysene	ND	ND	ug/l	NC	50
Benzo(b)fluoranthene	ND	ND	ug/l	NC	50
Benzo(k)fluoranthene	ND	ND	ug/l	NC	50
Benzo(a)pyrene	ND	ND	ug/l	NC	50
Indeno(1,2,3-cd)Pyrene	ND	ND	ug/l	NC	50
Dibenzo(a,h)anthracene	ND	ND	ug/l	NC	50
Benzo(ghi)perylene	ND	ND	ug/l	NC	50
Surrogate(s)	Recovery				QC Criteria
Chloro-Octadecane	36.0	44.0	%		40-140
o-Terphenyl	66.0	63.0	%		40-140
2-Fluorobiphenyl	73.0	74.0	%		40-140
2-Bromonaphthalene	70.0	72.0	%		40-140

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0605167

Parameter	% Recovery	QC Criteria
<u>Total Cyanide, by MCP 9014 SPIKE for sample(s) 02 (L0605167-02, WG235888-4)</u>		
Cyanide, Total	100	75-125
<u>Total Metals by MCP 6000/7000 series SPIKE for sample(s) 02 (L0605167-02, WG236360-5)</u>		
Antimony, Total	100	75-125
Arsenic, Total	100	75-125
Barium, Total	99	75-125
Beryllium, Total	100	75-125
Cadmium, Total	103	75-125
Chromium, Total	99	75-125
Lead, Total	102	75-125
Nickel, Total	124	75-125
Selenium, Total	97	75-125
Silver, Total	96	75-125
Thallium, Total	97	75-125
Vanadium, Total	102	75-125
Zinc, Total	100	75-125
<u>Extractable Petroleum Hydrocarbons SPIKE for sample(s) 01-05 (L0605167-02, WG235911-4)</u>		
C9-C18 Aliphatics	43	40-140
C19-C36 Aliphatics	58	40-140
C11-C22 Aromatics	82	40-140
Naphthalene	71	40-140
2-Methylnaphthalene	68	40-140
Acenaphthylene	67	40-140
Acenaphthene	71	40-140
Fluorene	71	40-140
Phenanthrene	75	40-140
Anthracene	76	40-140
Fluoranthene	77	40-140
Pyrene	79	40-140
Benzo(a)anthracene	80	40-140
Chrysene	82	40-140
Benzo(b)fluoranthene	83	40-140
Benzo(k)fluoranthene	81	40-140
Benzo(a)pyrene	78	40-140
Indeno(1,2,3-cd)Pyrene	80	40-140
Dibenzo(a,h)anthracene	80	40-140
Benzo(ghi)perylene	83	40-140
Nonane (C9)	32	30-140
Decane (C10)	37	40-140
Dodecane (C12)	43	40-140
Tetradecane (C14)	46	40-140
Hexadecane (C16)	50	40-140
Octadecane (C18)	51	40-140
Nonadecane (C19)	54	40-140
Eicosane (C20)	56	40-140
Docosane (C22)	58	40-140
Tetracosane (C24)	59	40-140



ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0605167

Continued

Parameter	% Recovery	QC Criteria
<u>Extractable Petroleum Hydrocarbons SPIKE for sample(s) 01-05 (L0605167-02, WG235911-4)</u>		
Hexacosane (C26)	60	40-140
Octacosane (C28)	60	40-140
triacontane (C30)	60	40-140
Hexatriacontane (C36)	65	40-140
Surrogate(s)		
Chloro-Octadecane	37	40-140
o-Terphenyl	94	40-140
2-Fluorobiphenyl	74	40-140
2-Bromonaphthalene	74	40-140

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH LCS/LCSD ANALYSIS

Laboratory Job Number: L0605167

Parameter	LCS %	LCSD %	RPD	RPD Limit	QC Limits
Total Cyanide by MCP 9014 for sample(s) 02 (WG235888-2, WG235888-3)					
Cyanide, Total	102	106	4	20	80-120
Total Metals by MCP 6000/7000 series for sample(s) 01, 03-05 (WG236128-4, WG236128-5)					
Antimony, Total	94	93	1	20	80-120
Arsenic, Total	94	94	0	20	80-120
Barium, Total	95	95	0	20	80-120
Beryllium, Total	92	92	0	20	80-120
Cadmium, Total	102	104	2	20	80-120
Chromium, Total	99	98	1	20	80-120
Lead, Total	98	98	0	20	80-120
Nickel, Total	98	97	1	20	80-120
Selenium, Total	92	94	2	20	80-120
Silver, Total	96	98	2	20	80-120
Thallium, Total	93	94	1	20	80-120
Vanadium, Total	99	98	1	20	80-120
Zinc, Total	98	97	1	20	80-120
Total Metals by MCP 6000/7000 series for sample(s) 02 (WG236360-2, WG236360-3)					
Antimony, Total	96	94	2	20	80-120
Arsenic, Total	94	91	3	20	80-120
Barium, Total	98	95	3	20	80-120
Beryllium, Total	98	96	2	20	80-120
Cadmium, Total	106	103	3	20	80-120
Chromium, Total	102	97	5	20	80-120
Lead, Total	101	96	5	20	80-120
Nickel, Total	102	97	5	20	80-120
Selenium, Total	94	90	4	20	80-120
Silver, Total	99	96	3	20	80-120
Thallium, Total	97	92	5	20	80-120
Vanadium, Total	102	97	5	20	80-120
Zinc, Total	101	98	3	20	80-120
Volatile Organics by MCP 8260B for sample(s) 02 (WG236307-4, WG236307-5)					
Methylene chloride	98	92	6	25	70-130
1,1-Dichloroethane	101	96	5	25	70-130
Chloroform	97	90	7	25	70-130
Carbon tetrachloride	106	97	9	25	70-130
1,2-Dichloropropane	103	98	5	25	70-130
Dibromochloromethane	96	93	3	25	70-130
1,1,2-Trichloroethane	100	96	4	25	70-130
Tetrachloroethene	112	101	10	25	70-130
Chlorobenzene	104	97	7	25	70-130
Trichlorofluoromethane	98	90	9	25	70-130
1,2-Dichloroethane	107	103	4	25	70-130
1,1,1-Trichloroethane	106	98	8	25	70-130
Bromodichloromethane	102	95	7	25	70-130
trans-1,3-Dichloropropene	96	91	5	25	70-130
cis-1,3-Dichloropropene	96	92	4	25	70-130

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH LCS/LCSD ANALYSIS

Laboratory Job Number: L0605167

Continued

Parameter	LCS %	LCSD %	RPD	RPD Limit	QC Limits
Volatile Organics by MCP 8260B for sample(s) 02 (WG236307-4, WG236307-5)					
1,1-Dichloropropene	102	93	9	25	70-130
Bromoform	98	96	2	50	70-130
1,1,2,2-Tetrachloroethane	100	99	1	25	70-130
Benzene	104	96	8	25	70-130
Toluene	105	94	11	25	70-130
Ethylbenzene	105	96	9	25	70-130
Chloromethane	74	68	8	50	70-130
Bromomethane	95	89	7	50	70-130
Vinyl chloride	84	79	6	25	70-130
Chloroethane	89	80	11	25	70-130
1,1-Dichloroethene	95	87	9	25	70-130
trans-1,2-Dichloroethene	99	92	7	25	70-130
Trichloroethene	102	95	7	25	70-130
1,2-Dichlorobenzene	99	94	5	25	70-130
1,3-Dichlorobenzene	107	99	8	25	70-130
1,4-Dichlorobenzene	101	95	6	25	70-130
Methyl tert butyl ether	102	102	0	25	70-130
p/m-Xylene	108	98	10	25	70-130
o-Xylene	100	91	9	25	70-130
cis-1,2-Dichloroethene	106	100	6	25	70-130
Dibromomethane	102	103	1	25	70-130
1,2,3-Trichloropropane	103	104	1	25	70-130
Styrene	97	90	7	25	70-130
Dichlorodifluoromethane	43	40	7	50	70-130
Acetone	95	98	3	50	70-130
Carbon disulfide	80	74	8	25	70-130
2-Butanone	98	102	4	50	70-130
4-Methyl-2-pentanone	93	96	3	50	70-130
2-Hexanone	90	91	1	50	70-130
Bromochloromethane	106	101	5	25	70-130
Tetrahydrofuran	96	90	6	25	70-130
2,2-Dichloropropane	107	96	11	50	70-130
1,2-Dibromoethane	99	95	4	25	70-130
1,3-Dichloropropane	101	96	5	25	70-130
1,1,1,2-Tetrachloroethane	103	97	6	25	70-130
Bromobenzene	106	100	6	25	70-130
n-Butylbenzene	94	87	8	25	70-130
sec-Butylbenzene	100	92	8	25	70-130
tert-Butylbenzene	102	94	8	25	70-130
o-Chlorotoluene	104	96	8	25	70-130
p-Chlorotoluene	102	96	6	25	70-130
1,2-Dibromo-3-chloropropane	96	100	4	50	70-130
Hexachlorobutadiene	101	92	9	25	70-130
Isopropylbenzene	108	99	9	25	70-130
p-Isopropyltoluene	103	94	9	25	70-130
Naphthalene	79	82	4	25	70-130
n-Propylbenzene	104	96	8	25	70-130

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH LCS/LCSD ANALYSIS

Laboratory Job Number: L0605167

Continued

Parameter	LCS %	LCSD %	RPD	RPD Limit	QC Limits
<u>Volatile Organics by MCP-8260B for sample(s) 02 (WG236307-4, WG236307-5)</u>					
1,2,3-Trichlorobenzene	89	90	1	25	70-130
1,2,4-Trichlorobenzene	87	85	2	25	70-130
1,3,5-Trimethylbenzene	104	94	10	25	70-130
1,2,4-Trimethylbenzene	103	94	9	25	70-130
Ethyl ether	103	103	0	25	70-130
Isopropyl Ether	96	92	4	25	70-130
Ethyl-Tert-Butyl-Ether	95	91	4	25	70-130
Tertiary-Amyl Methyl Ether	92	91	1	25	70-130
1,4-Dioxane	77	90	16	50	70-130
Surrogate(s)					
1,2-Dichloroethane-d4	112	108	4		70-130
Toluene-d8	108	101	7		70-130
4-Bromofluorobenzene	102	97	5		70-130
Dibromofluoromethane	111	106	5		70-130
<u>Extractable Petroleum Hydrocarbons for sample(s) 01-05 (WG235911-2, WG235911-3)</u>					
C9-C18 Aliphatics	56	52	7	25	40-140
C19-C36 Aliphatics	68	67	1	25	40-140
C11-C22 Aromatics	72	78	8	25	40-140
Naphthalene	60	59	2	25	40-140
2-Methylnaphthalene	60	58	3	25	40-140
Acenaphthylene	61	60	2	25	40-140
Acenaphthene	63	63	0	25	40-140
Fluorene	64	65	2	25	40-140
Phenanthrene	68	72	6	25	40-140
Anthracene	69	74	7	25	40-140
Fluoranthene	70	76	8	25	40-140
Pyrene	71	77	8	25	40-140
Benzo(a)anthracene	73	79	8	25	40-140
Chrysene	75	81	8	25	40-140
Benzo(b)fluoranthene	77	83	8	25	40-140
Benzo(k)fluoranthene	75	81	8	25	40-140
Benzo(a)pyrene	72	78	8	25	40-140
Indeno(1,2,3-cd)Pyrene	75	80	6	25	40-140
Dibenzo(a,h)anthracene	75	80	6	25	40-140
Benzo(ghi)perylene	79	84	6	25	40-140
Nonane (C9)	44	40	10	25	30-140
Decane (C10)	51	47	8	25	40-140
Dodecane (C12)	56	52	7	25	40-140
Tetradecane (C14)	59	55	7	25	40-140
Hexadecane (C16)	64	59	8	25	40-140
Octadecane (C18)	65	61	6	25	40-140
Nonadecane (C19)	65	63	3	25	40-140
Eicosane (C20)	67	65	3	25	40-140
Docosane (C22)	69	66	4	25	40-140
Tetracosane (C24)	69	67	3	25	40-140

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH LCS/LCSD ANALYSIS

Laboratory Job Number: L0605167

Continued

Parameter	LCS %	LCSD %	RPD	RPD Limit	QC Limits
<del>Extractable Petroleum Hydrocarbons for sample(s) 01-05 (WG235911-2, WG235911-3)</del>					
Hexacosane (C26)	68	68	0	25	40-140
Octacosane (C28)	67	68	1	25	40-140
triacontane (C30)	66	69	4	25	40-140
Hexatriacontane (C36)	69	72	4	25	40-140
Surrogate(s)					
Chloro-Octadecane	51	45	13		40-140
o-Terphenyl	77	88	13		40-140
2-Fluorobiphenyl	70	67	4		40-140
2-Bromonaphthalene	69	69	0		40-140
% Naphthalene Breakthrough	0	0	NC		
% 2-Methylnaphthalene Breakthrough	0	0	NC		

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE FRACTIONATION CHECK

Laboratory Job Number: L0605167

Parameter	% Recovery	QC Criteria
<u>Fractionation Check Standard Recoveries for Lot FISH52618</u>		
C9-C18 Aliphatics	62	40-140
C19-C36 Aliphatics	71	40-140
C11-C22 Aromatics	80	40-140
Naphthalene	74	40-140
2-Methylnaphthalene	70	40-140
Acenaphthylene	69	40-140
Acenaphthene	72	40-140
Fluorene	72	40-140
Phenanthrene	72	40-140
Anthracene	77	40-140
Fluoranthene	75	40-140
Pyrene	75	40-140
Benzo(a)anthracene	74	40-140
Chrysene	88	40-140
Benzo(b)fluoranthene	72	40-140
Benzo(k)fluoranthene	74	40-140
Benzo(a)pyrene	73	40-140
Indeno(1,2,3-cd)Pyrene	72	40-140
Dibenzo(a,h)anthracene	73	40-140
Benzo(ghi)perylene	73	40-140
Nonane (C9)	57	30-140
Decane (C10)	62	40-140
Dodecane (C12)	65	40-140
Tetradecane (C14)	63	40-140
Hexadecane (C16)	64	40-140
Octadecane (C18)	64	40-140
Nonadecane (C19)	64	40-140
Eicosane (C20)	67	40-140
Docosane (C22)	71	40-140
Tetracosane (C24)	72	40-140
Hexacosane (C26)	72	40-140
Octacosane (C28)	73	40-140
triacontane (C30)	73	40-140
Hexatriacontane (C36)	76	40-140
Surrogate(s)		
Chloro-Octadecane	57	40-140
o-Terphenyl	78	40-140
2-Fluorobiphenyl	72	40-140
2-Bromonaphthalene	72	40-140

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0605167

PARAMETER	RESULT	UNITS	SDL	REF METHOD	DATE PREP ANAL	ID
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Blank Analysis for sample(s) 02 (WG235888-1)  
Total Cyanide by MCP 9014

Cyanide, Total	ND	mg/l	0.005	64 9014	0413 09:45 0413 18:43	DD
----------------	----	------	-------	---------	-----------------------	----

Blank Analysis for sample(s) 01,03-05 (WG236128-3)  
Total Metals by MCP 6000/7000 series

Antimony, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 18:20	BM
Arsenic, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 18:20	BM
Barium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 18:20	BM
Beryllium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 18:20	BM
Cadmium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 18:20	BM
Chromium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 18:20	BM
Lead, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 18:20	BM
Nickel, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 18:20	BM
Selenium, Total	ND	mg/l	0.001	64 6020A	0413 20:00 0414 18:20	BM
Silver, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 18:20	BM
Thallium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 18:20	BM
Vanadium, Total	ND	mg/l	0.0005	64 6020A	0413 20:00 0414 18:20	BM
Zinc, Total	ND	mg/l	0.0050	64 6020A	0413 20:00 0414 18:20	BM

Blank Analysis for sample(s) 02 (WG236360-1)  
Total Metals by MCP 6000/7000 series

Antimony, Total	ND	mg/l	0.0005	64 6020A	0417 19:30 0418 23:28	BM
Arsenic, Total	ND	mg/l	0.0005	64 6020A	0417 19:30 0418 23:28	BM
Barium, Total	ND	mg/l	0.0005	64 6020A	0417 19:30 0418 23:28	BM
Beryllium, Total	ND	mg/l	0.0005	64 6020A	0417 19:30 0418 23:28	BM
Cadmium, Total	ND	mg/l	0.0005	64 6020A	0417 19:30 0418 23:28	BM
Chromium, Total	ND	mg/l	0.0005	64 6020A	0417 19:30 0418 23:28	BM
Lead, Total	ND	mg/l	0.0005	64 6020A	0417 19:30 0418 23:28	BM
Nickel, Total	ND	mg/l	0.0005	64 6020A	0417 19:30 0418 23:28	BM
Selenium, Total	ND	mg/l	0.001	64 6020A	0417 19:30 0418 23:28	BM
Silver, Total	ND	mg/l	0.0005	64 6020A	0417 19:30 0418 23:28	BM
Thallium, Total	ND	mg/l	0.0005	64 6020A	0417 19:30 0418 23:28	BM
Vanadium, Total	ND	mg/l	0.0005	64 6020A	0417 19:30 0418 23:28	BM
Zinc, Total	ND	mg/l	0.0050	64 6020A	0417 19:30 0418 23:28	BM

Blank Analysis for sample(s) 02 (WG236307-6)  
Volatile Organics by MCP 8260B

Methylene chloride	ND	ug/l	5.0	60 8260B	0417 16:17	PD
1,1-Dichloroethane	ND	ug/l	0.75			
Chloroform	ND	ug/l	0.75			
Carbon tetrachloride	ND	ug/l	0.50			
1,2-Dichloropropane	ND	ug/l	1.8			
Dibromochloromethane	ND	ug/l	0.50			
1,1,2-Trichloroethane	ND	ug/l	0.75			

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0605167

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Blank Analysis for sample(s): 02 (WG236307-6)							
Volatile Organics by MCP 8260B cont'd				60 8260B	0417 16:17 PD		
Tetrachloroethene	ND	ug/l	0.50				
Chlorobenzene	ND	ug/l	0.50				
Trichlorofluoromethane	ND	ug/l	2.5				
1,2-Dichloroethane	ND	ug/l	0.50				
1,1,1-Trichloroethane	ND	ug/l	0.50				
Bromodichloromethane	ND	ug/l	0.50				
trans-1,3-Dichloropropene	ND	ug/l	0.50				
cis-1,3-Dichloropropene	ND	ug/l	0.50				
1,1-Dichloropropene	ND	ug/l	2.5				
Bromoform	ND	ug/l	2.0				
1,1,2,2-Tetrachloroethane	ND	ug/l	0.50				
Benzene	ND	ug/l	0.50				
Toluene	ND	ug/l	0.75				
Ethylbenzene	ND	ug/l	0.50				
Chloromethane	ND	ug/l	2.5				
Bromomethane	ND	ug/l	1.0				
Vinyl chloride	ND	ug/l	1.0				
Chloroethane	ND	ug/l	1.0				
1,1-Dichloroethene	ND	ug/l	0.50				
trans-1,2-Dichloroethene	ND	ug/l	0.75				
Trichloroethene	ND	ug/l	0.50				
1,2-Dichlorobenzene	ND	ug/l	2.5				
1,3-Dichlorobenzene	ND	ug/l	2.5				
1,4-Dichlorobenzene	ND	ug/l	2.5				
Methyl tert butyl ether	ND	ug/l	1.0				
p/m-Xylene	ND	ug/l	1.0				
o-Xylene	ND	ug/l	1.0				
cis-1,2-Dichloroethene	ND	ug/l	0.50				
Dibromomethane	ND	ug/l	5.0				
1,2,3-Trichloropropane	ND	ug/l	5.0				
Styrene	ND	ug/l	1.0				
Dichlorodifluoromethane	ND	ug/l	5.0				
Acetone	ND	ug/l	5.0				
Carbon disulfide	ND	ug/l	5.0				
2-Butanone	ND	ug/l	5.0				
4-Methyl-2-pentanone	ND	ug/l	5.0				
2-Hexanone	ND	ug/l	5.0				
Bromochloromethane	ND	ug/l	2.5				
Tetrahydrofuran	ND	ug/l	10.				
2,2-Dichloropropane	ND	ug/l	2.5				
1,2-Dibromoethane	ND	ug/l	2.0				
1,3-Dichloropropane	ND	ug/l	2.5				
1,1,1,2-Tetrachloroethane	ND	ug/l	0.50				
Bromobenzene	ND	ug/l	2.5				
n-Butylbenzene	ND	ug/l	0.50				
sec-Butylbenzene	ND	ug/l	0.50				



ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0605167

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE	ID
					PREP	ANAL
Blank Analysis for sample(s) 02 (WG236307-6)						
Volatile Organics by MCP 8260B cont'd				60 8260B	0417 16:17 PD	
tert-Butylbenzene	ND	ug/l	2.5			
o-Chlorotoluene	ND	ug/l	2.5			
p-Chlorotoluene	ND	ug/l	2.5			
1,2-Dibromo-3-chloropropane	ND	ug/l	2.5			
Hexachlorobutadiene	ND	ug/l	0.60			
Isopropylbenzene	ND	ug/l	0.50			
p-Isopropyltoluene	ND	ug/l	0.50			
Naphthalene	ND	ug/l	2.5			
n-Propylbenzene	ND	ug/l	0.50			
1,2,3-Trichlorobenzene	ND	ug/l	2.5			
1,2,4-Trichlorobenzene	ND	ug/l	2.5			
1,3,5-Trimethylbenzene	ND	ug/l	2.5			
1,2,4-Trimethylbenzene	ND	ug/l	2.5			
Ethyl ether	ND	ug/l	2.5			
Isopropyl Ether	ND	ug/l	2.0			
Ethyl-Tert-Butyl-Ether	ND	ug/l	2.0			
Tertiary-Amyl Methyl Ether	ND	ug/l	2.0			
1,4-Dioxane	ND	ug/l	250			
Surrogate(s)	Recovery		QC Criteria			
1,2-Dichloroethane-d4	106	%	70-130			
Toluene-d8	102	%	70-130			
4-Bromofluorobenzene	103	%	70-130			
Dibromofluoromethane	114	%	70-130			
Blank Analysis for sample(s) 01-05 (WG235911-1)						
Extractable Petroleum Hydrocarbons				61 EPH-04-1	0413 10:30 0418 12:25 BN	
C9-C18 Aliphatics	ND	ug/l	100			
C19-C36 Aliphatics	ND	ug/l	100			
C11-C22 Aromatics	ND	ug/l	100			
C11-C22 Aromatics, Adjusted	ND	ug/l	100			
Naphthalene	ND	ug/l	10.0			
2-Methylnaphthalene	ND	ug/l	10.0			
Acenaphthylene	ND	ug/l	10.0			
Acenaphthene	ND	ug/l	10.0			
Fluorene	ND	ug/l	10.0			
Phenanthrene	ND	ug/l	10.0			
Anthracene	ND	ug/l	10.0			
Fluoranthene	ND	ug/l	10.0			
Pyrene	ND	ug/l	10.0			
Benzo(a)anthracene	ND	ug/l	10.0			
Chrysene	ND	ug/l	10.0			
Benzo(b)fluoranthene	ND	ug/l	10.0			
Benzo(k)fluoranthene	ND	ug/l	10.0			
Benzo(a)pyrene	ND	ug/l	10.0			
Indeno(1,2,3-cd)Pyrene	ND	ug/l	10.0			

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0605167

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Blank Analysis for sample(s) 01-05 (WG235911-1)							
Extractable Petroleum Hydrocarbons cont'd				61-EPH-04-1	0413 10:30	0418 12:25	BN
Dibenzo (a,h) anthracene	ND	ug/l	10.0				
Benzo (ghi) perylene	ND	ug/l	10.0				
Surrogate(s)	Recovery			QC Criteria			
Chloro-Octadecane	52.0	%		40-140			
o-Terphenyl	66.0	%		40-140			
2-Fluorobiphenyl	71.0	%		40-140			
2-Bromonaphthalene	71.0	%		40-140			

ALPHA ANALYTICAL LABORATORIES  
ADDENDUM I

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REFERENCES

60. Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). May 2004.
61. Method for the Determination of Extractable Petroleum Hydrocarbons (EPH). Massachusetts Department of Environmental Protection, DEA/ORS/BWSC. May 2004, Revision 1.1.
64. Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). August 2004.

GLOSSARY OF TERMS AND SYMBOLS

REF      Reference number in which test method may be found.  
METHOD   Method number by which analysis was performed.  
ID        Initials of the analyst.  
ND        Not detected in comparison to the reported detection limit.  
NI        Not Ignitable.  
ug/cart   Micrograms per Cartridge.

LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.

**ALPHA ANALYTICAL LABORATORIES  
LOGIN SPECIFIC INFORMATION**

Laboratory Job Number: L0605167

Were project specific reporting limits specified?

YES

**Cooler Information**

Cooler	Custody Seal
A	Absent
B	Absent

**Container Information**

Container ID	Container Type	Cooler	pH	Temp	Pres	Seal	Analysis
L0605167-01A	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	MCP-AG-6020T, MCP-AS-6020T, MCP-BA-6020T, MCP-BE-6020T, MCP-CD-6020T, MCP-CR-6020T, MCP-CU-6020T, MCP-NI-6020T, MCP-PB-6020T, MCP-SB-6020T, MCP-SE-6020T, MCP-TL-6020T, MCP-V-6020T, MCP-ZN-6020T, PREPT
L0605167-01B	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	EPH-DELUX-04
L0605167-01C	Amber 1000ml HCl preserved	B	< 2	2.3 C	Y	Absent	EPH-DELUX-04
L0605167-01D	Amber 1000ml HCl preserved	B	< 2	2.3 C	Y	Absent	EPH-DELUX-04
L0605167-02A	Vial HCl preserved	A	N/A	2.5 C	Y	Absent	MCP-8260-04
L0605167-02B	Vial HCl preserved	A	N/A	2.5 C	Y	Absent	MCP-8260-04
L0605167-02C	Plastic 250ml NaOH preserved	A	> 122.5	C	Y	Absent	MCP-TCN9014-04
L0605167-02D	Plastic 250ml NaOH preserved	A	> 122.5	C	Y	Absent	MCP-TCN9014-04
L0605167-02E	Plastic 250ml NaOH preserved	A	> 122.5	C	Y	Absent	MCP-TCN9014-04
L0605167-02F	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	MCP-AG-6020T, MCP-AS-6020T, MCP-BA-6020T, MCP-BE-6020T, MCP-CD-6020T, MCP-CR-6020T, MCP-CU-6020T, MCP-NI-6020T, MCP-PB-6020T, MCP-SB-6020T, MCP-SE-6020T, MCP-TL-6020T, MCP-V-6020T, MCP-ZN-6020T, PREPT
L0605167-02G	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	MCP-AG-6020T, MCP-AS-6020T, MCP-BA-6020T, MCP-BE-6020T, MCP-CD-6020T, MCP-CR-6020T, MCP-CU-6020T, MCP-NI-6020T, MCP-PB-6020T, MCP-SB-6020T, MCP-SE-6020T, MCP-TL-6020T, MCP-V-6020T, MCP-

**ALPHA ANALYTICAL LABORATORIES**  
**LOGIN SPECIFIC INFORMATION**

Laboratory Job Number: L0605167

Continued

Container ID	Container Type	Cooler	pH	Temp	Pres	Seal	Analysis
L0605167-02H	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	ZN-6020T, PREPT MCP-AG-6020T, MCP-AS-6020T, MCP-BA-6020T, MCP-BE-6020T, MCP-CD-6020T, MCP-CR-6020T, MCP-CU-6020T, MCP-NI-6020T, MCP-PB-6020T, MCP-SB-6020T, MCP-SE-6020T, MCP-TL-6020T, MCP-V-6020T, MCP-ZN-6020T, PREPT
L0605167-02I	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	EPH-DELUX-04
L0605167-02J	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	EPH-DELUX-04
L0605167-02K	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	EPH-DELUX-04
L0605167-02L	Amber 1000ml HCl preserved	B	< 2	2.3 C	Y	Absent	EPH-DELUX-04
L0605167-02M	Amber 1000ml HCl preserved	B	< 2	2.3 C	Y	Absent	EPH-DELUX-04
L0605167-02N	Amber 1000ml HCl preserved	B	< 2	2.3 C	Y	Absent	EPH-DELUX-04
L0605167-02O	Amber 1000ml HCl preserved	B	< 2	2.3 C	Y	Absent	EPH-DELUX-04
L0605167-03A	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	MCP-AG-6020T, MCP-AS-6020T, MCP-BA-6020T, MCP-BE-6020T, MCP-CD-6020T, MCP-CR-6020T, MCP-CU-6020T, MCP-NI-6020T, MCP-PB-6020T, MCP-SB-6020T, MCP-SE-6020T, MCP-TL-6020T, MCP-V-6020T, MCP-ZN-6020T, PREPT
L0605167-03B	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	EPH-DELUX-04
L0605167-03C	Amber 1000ml HCl preserved	B	< 2	2.3 C	Y	Absent	EPH-DELUX-04
L0605167-03D	Amber 1000ml HCl preserved	B	< 2	2.3 C	Y	Absent	EPH-DELUX-04
L0605167-04A	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	MCP-AG-6020T, MCP-AS-6020T, MCP-BA-6020T, MCP-BE-6020T, MCP-CD-6020T, MCP-CR-6020T, MCP-CU-6020T, MCP-NI-6020T, MCP-PB-6020T, MCP-SB-6020T, MCP-SE-6020T, MCP-TL-6020T, MCP-V-6020T, MCP-ZN-6020T, PREPT
L0605167-04B	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	EPH-DELUX-04
L0605167-04C	Amber 1000ml HCl preserved	B	< 2	2.3 C	Y	Absent	EPH-DELUX-04
L0605167-04D	Amber 1000ml HCl preserved	B	< 2	2.3 C	Y	Absent	EPH-DELUX-04

ALPHA ANALYTICAL LABORATORIES  
LOGIN SPECIFIC INFORMATION

Laboratory Job Number: L0605167

Continued

Container ID	Container Type	Cooler	pH	Temp	Pres	Seal	Analysis
L0605167-05A	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	MCP-AG-6020T, MCP-AS-6020T, MCP-BA-6020T, MCP-BE-6020T, MCP-CD-6020T, MCP-CR-6020T, MCP-CU-6020T, MCP-NI-6020T, MCP-PB-6020T, MCP-SB-6020T, MCP-SE-6020T, MCP-TL-6020T, MCP-V-6020T, MCP-ZN-6020T, PREPT
L0605167-05B	Plastic 250ml HNO3 preserved	A	< 2	2.5 C	Y	Absent	EPH-DELUX-04
L0605167-05C	Amber 1000ml HCl preserved	B	< 2	2.3 C	Y	Absent	EPH-DELUX-04
L0605167-05D	Amber 1000ml HCl preserved	B	< 2	2.3 C	Y	Absent	EPH-DELUX-04

Container Comments

Container ID    Comments



WESTBORO, MA  
TEL: 508-898-9220  
FAX: 508-898-9193

# CHAIN OF CUSTODY

PAGE 1 OF 1

## Project Information

Project Name: Newbury Park, MA  
Project Location: Newbury Park, MA  
Project #: 52037  
Project Manager: Frank Calandra  
ALPHA Quote #:

## Client Information

Client: TRC  
Address: 116 JOHN STREET  
LOWELL, MA 01852  
Phone: 978-970-5600  
Fax: 978-453-1995

Email:

☐ These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

MCP METALS MINUS Hg

Hold ALL Dissolved MCP metals

## Turn-Around Time

☒ Standard ☐ RUSH  
Date Due: 4/19/06  
Time: 5:00 PM

## Report Information - Data Deliverables

☐ FAX ☐ EMAIL  
☒ ADEX ☐ Add'l Deliverables

## Regulatory Requirements/Report Limits

State / Fed Program

MA MCP

Criteria

per QAPP

## MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTOCOLS

☒ Yes ☐ No Are MCP Analytical Methods Required?  
☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

ALPHA Job #: LO605167

Date Rec'd In Lab: 4/12/06

## Billing Information

☐ Same as Client info

PO #:

## SAMPLE HANDLING

Filtration ☒ Done  
☐ Not needed  
☐ Lab to do  
Preservation ☐ Lab to do  
(Please specify below)

## Sample Specific Comments

ANALYSIS  
X TOTAL MCP METALS  
X EPH DELUXE  
X VOC 8260  
X TCN  
X Dissolved MCP metals

-MS/DUP

## PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT  
MA MCP or CT RCP?

Requested By:

Date/Time

Received By:

Date/Time

Container Type

Preservative

PA VPP

CB B E C WHITE

4/12/06-11:00

4/12/06 19:20

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms. See reverse side.

## APPENDIX C – ABCA Cost Summary



Clipper City Rail Trail  
Newburyport, MA  
PCB Remedial Action Alternatives (3)

Last Updated28-Aug-17

Remedial Action Alternatives (RAA) (2)

	Primary Actions	Regulatory Compliance	Consulting and Plans (1)	Design	Specifications	Soil Remediation (4) (14)	RCRA Cap Construction	Confirmatory Sampling	AUL	Total (4)	Add Maintenance and Inspections - Out Years
RAA #1	Cover with asphalt as originally planned for the CCRT designed surface and no soil excavation	Low - due to leaving high concentrations of PCBs in soil behind. Pavement acts only as a minimal barrier	Phase IV and Phase V MCP deliverables, and Soil Management Plan	Current CCRT design completed	Minimal modification to existing specifications for construction	Direct contact potential risk pathway interrupted by asphalt. Asphalt would not be considered permanent. Side slopes will	None	Not Applicable	Necessary		Necessary twice per year minimum for 30 years, assumes full pavement replacement in year 15 and 30
			\$20,000		\$5,000	\$30,000	\$-	\$-	\$11,400	\$66,400	\$105,000
RAA #2	TSCA Soil Removal - Full Site - Estimated 1200 tons of soil for T&D as TSCA waste, plus backfill	High	TSCA Plan, Phase IV and Phase V MCP deliverables, erosion control plan and Soil Management Plan	None	New and updated Specs for construction	Soil removal to 1 ppm to a depth of 6 feet for 1200 tons of soil removed	Scrape around duct bank. Jack duct bank to excavate below - Included	None	None		None
			\$22,000	\$-	\$8,000	\$410,000		\$-	\$-	\$440,000	\$-
RAA#3	Target Excavation for Hot spot and cap the remainder of the site	Moderate	TSCA Plan, Phase IV and Phase V MCP deliverables, erosion control plan and Soil Management Plan	RCRA/TSCA Cap engineered fill and barrier	New and updated Specs for construction	Targeted Hot Spot removal as TSCA and Soil removal to below 50 ppm in Hot Spot	Cap includes area over the Duct Bank and Slope - 2 feet	None	Necessary		NA
			\$26,300	\$25,700	\$-	\$66,000	\$173,250	\$-	\$11,400	\$302,650	\$60,000
RAA #4	Soil Removal under MCP except for TSCA hot spot, cap over utilities	Moderate	TSCA Plan, Phase IV and Phase V MCP deliverables, erosion control plan and Soil Management Plan	RCRA/TSCA Cap engineered fill and barrier	Revise Specs for Cut & Fill	Soil removal to 2 feet, except near utilities	Over utilities	None	Necessary		Annual Inspection
			\$22,400	\$10,500	\$-	\$79,100	\$52,000	\$-	\$9,400	\$173,400	\$30,000

Notes (4)

- 1 Requires regulatory approval from USEPA and MassDEP under the Massachusetts Contingency Plan (MCP)
- 2 Additional investigation and remediation may be necessary off the trail due to where the contamination has come to be located which would increase costs
- 3 Assumes that the presence of metals or petroleum hydrocarbons from railroad operations does not cause additional remedial actions or disposal costs
- 4 Costs based on data collected to date and the extrapolation of data over a volume of soil. Additional data will help refine these numbers
- 5 Assumes that MassElectric has caused soil disturbance to a portion of the trail
- 6 Assumes that the presence of PCBs in soil is due to former Railroad operations and not the activities of MassElectric
- 7 TSCA Removal full site is defined as the areas samples where PCBs are present over 1 ppm, assumes soil has been mixed, and that all soil in this area is subject to TSCA
- 8 "As Found" assumes that remedial actions can be designed based on actual concentrations found by sampling and not subject to TSCA if below 50 ppm
- 9 "Hot Spot Area" is the locations where PCB impacted soils are present equal to or over 50 ppm.
- 10 "High Density Sampling" refers for 40 CFR 761 Subpart N and Subpart O on a 1.5 meter grid and 3 inches deep
- 11 A RCRA Cap refers to the Resource Conservation Recovery Act (RCRA) cap design having a minimum thickness of 25 cm (10 inches). A concrete or asphalt cap shall have a minimum thickness of 15 cm (6 inches). and the requirements of 716.75(b)
- 12 Assumes MassDEP will allow remedial actions to be conducted as an IRA and not have to go through the 5 phases of the MCP comprehensive response actions
- 13 Assumes and outcome of a permanent solution under the MCP
- 14 Volumes are estimated based on a extrapolated area that has not been surveyed or defined by multiple samples and varying depths

[illegible]

## APPENDIX D – 2017 Lab Data Reports



***Strategic Environmental Services, Inc.***

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December 5, 2016

Dan Gilgun, Project Manager  
E.T. & L. Corporation  
873 Great Road  
Stow, MA 01775

RE: Pre-Characterization Sampling Plan Analytical Results –Water Street Area  
Construction of the Clipper City Rail Trail (Phase II) in the Towns of Newbury and  
Newburyport  
MassDOT Contract No. 92335  
SES Project No. 15-0754

Dear Mr. Gilgun,

Strategic Environmental Services, Inc. (SES) has prepared this letter to supply you with the analytical results from “pre-characterization” soil sampling in the portion of the above referenced project from north of Water Street in Newburyport. Based on the analytical results that are above certain reporting criteria of the Massachusetts Contingency Plan (MCP), we felt that the City of Newburyport should be made aware of these results immediately in order to perform their own assessment of any necessary regulatory actions.

The purpose of this pre-characterization was to determine the contamination profile of soils within this section of the project corridor, in order to determine reuse options and suitable disposal facilities prior to their excavation by E.T. & L. Corporation. Pre-characterization would allow soils to be “live loaded” for disposal, which is necessary due to a lack of stockpiling locations within the project limits.

This letter details results for the portion of the proposed trail that we describe as the “Water Street Industrial Area” (approximately Station 56+00 to 92+00; see the maps attached in Appendix A). The soil in this area was analyzed via two composite samples: “South-1”, which was composed of soils sampled from Station 56+00 to 77+30, and “North-1”, which was composed of soil sampled from approximately Station 77+30 to Station 91+15. Individual samples from the “South” section of the Water Street Industrial Area were sent to the lab for further analysis, due to concentrations of PCBs and arsenic in composite sample “South-1” above MA Comm-97 (landfill) disposal criterial.

### **Soil Sampling**

On November 10, 2016, Patrick Hughes and Scott Brady, SES environmental professionals, sampled preselected locations along the proposed trail.

As described in the Pre-characterization sampling plan (dated September 9, 2016), two composite samples were collected for submittal for analysis. For the compositing of samples, the Water Street Industrial Area was subdivided into a “South” section (South-1 sample composed of soil from Station 56+ at Water Street to the property line that lies at approximately Station 77+30 and a “North” section (North-1 sample composed of soil from Station 77+30 to the end of the Project at Station 91+15).

“North” samples N-1 to N-13 were collected from the locations identified in Table 1 and depicted on the Sample Location Maps in Appendix A (Note that the true locations are +/- 10 ft. along the trail).

<b>South</b>	<b>Station</b>	<b>Depth (in):</b>	<b>TOV (ppm):</b>	<b>Description:</b>
S-1	57+00	36	0	Dk bn, silty sand
S-2	59+00	36	0	Med dk bn sand w/ silt
S-3	61+00	36-48	0	Med bn sand/gravel w/ silt, coal ash, fill
S-4	63+00	36-48	0	Med bn sand w/ silt, occ fill
S-5	65+00	36-48	0	bn sand w/ silt and gravel; some jet black fill
S-6	<b>67+00</b>	36-48	0	med bn sand w/ gravel, silt, fill
S-7	<b>68+30</b>	36-48	1	med bn sand, occ silt, gravel
S-8	<b>68+60</b>	36-48	0	med bn sand, occ silt, gravel
S-9	69+00	36-48	0	lt bn sand, occ silt, gravel
S-10	<b>72+00</b>	36-48	0	Blk slag, coal ash, fill
S-11	<b>76+00</b>	36-48	0	med bn sand, occ silt, gravel

North	Station	Depth	TOV (ppm):	Description:
N-1	<b>77+15</b>	36-48	0	Sand w/ gravel, black fill, bricks
N-2	<b>78+50</b>	36-48	0	Med dk bn sand and silt, occ coal ash
N-3	<b>79+50</b>	36-48	0	Med dk bn sand w/ silt and occ fill
N-4	<b>80+50</b>	36-48	2	med dk bn sand and silt, w/ coal and coal ash
N-5	<b>81+50</b>	36-48	1	med dk bn sand and silt, w/ coal and coal ash
N-6	<b>82+50</b>	36-48	1	dk bn med sand and silt w/ coal and coal ash
N-7	<b>82+90</b>	36-48	1	dk bn sand and gravel w/ silt, lt gy ash and shells
N-8	<b>83+50</b>	36-48	1	med dk bn sand w/ silt and boulders
N-9	84+00	36-48	0	dk bn sand w/ silt and gravel
N-10	<b>86+00</b>	36-48	1	dk bn sand w/ silt and gravel
N-11	<b>87+00</b>	36-48	4	dk bn sand w/ silt and gravel
N-12	90+00	12	0	med bn sand, occ silt, gravel
N-13	<b>91+00</b>	12	0	med bn sand, occ silt, gravel

**Table 1: Station locations, descriptions, and Total Organic Vapors (TOV) for individual samples comprising composite samples South-1 and North-1. Sample Locations further noted in the Location Maps shown in Appendix A. Samples S-7 and N-11 were packaged for VOC analysis.**

Samples were collected by excavating a hole over 36 inches depth using an excavator or backhoe (the two samples to 12 inches were collected using a shovel). No groundwater was encountered during sampling. The excavated soil was visually examined in order to assess the general character of the soil, and then hand-sampled into a gallon zip lock bag, taking care to represent any heterogeneity present in the material. Each grab sample was then assessed for Total Organic Volatiles (TOV) using a Photoionization Detector (PID) and a Total Headspace Method. No petroleum or chemical odors were detected.

Following the collection of all the individual samples, material from samples S-7 and N-11, which had the highest TOV values, were packaged to test for VOCs. Each of the individual samples was well mixed and then the two composite samples (South-1 and North-1) were created by taking 12 oz. of material (4 scoops of soil with a 3 oz. disposable cup) from each individual sample collected from the respective “South” or “North” area.

Each composite sample was then well mixed and then the samples were then packaged, sealed, labeled, preserved, and transported along with the material packaged for VOC analyses under Chain of Custody (COC) protocol to New England Testing Laboratory at 59 Greenhill Street in West Warwick, RI for analysis. The composite samples were analyzed for SVOC's, TPH, Pesticides, PCB's, MCP 14 Metals, Reactivity, Conductivity, Ignitability, and pH, most of which are specified in Item 180.6 of the Special Provisions.

## **Analytical Results**

A tabulated summary of the analytical results in comparison to the MCP RCS-1 and RCS-2 standards, as well as MA COMM-97 Disposal Criteria is attached as Appendix B. The laboratory reports are attached as Appendix C.

The North-1 sample contained concentrations of arsenic, lead, and benzo(a)pyrene above the RCS-1 standards but below the criteria of RCS-2. Residential properties are within 500 feet of the rail trail. The concentrations of all Contaminants of Concern in this sample are below MA COMM-97 Disposal Criteria for both lined and unlined landfills.

The South-1 sample contained concentrations of arsenic, lead, and Arochlor 1260 (a polycyclic biphenyl or PCB) above the RCS-1 standard, with Arsenic being above the RCS-2 standard as well. Arsenic, at 66 mg/kg, is above the Imminent Hazard Reporting Criteria (applies to concentrations in soil from 0-12 inches from surface). Arsenic and Arochlor 1260 in this sample are above the MA COMM-97 Disposal Criteria.

As a result of the MA COMM-97 results for South-1, the individual samples used to create the South-1 sample were tested for levels of arsenic and Arochlor 1260 in order to further delineate the sources of these Contaminants of Concern. A number of the individual "South" samples S-1 to S-11 contained Arsenic above RCS-1 reporting criteria, but below RCS-2 reporting criteria. Samples S-3, S-4, and S-5 contain levels of the PCB Arochlor 1260 above RCS-1 reporting criteria. Additionally, S-4, at 39,200 µg/kg (or 39 mg/kg) is above the RCS-2 and Imminent Hazard reporting criteria.

## **Conclusion**

Soil samples taken in order to determine possible reuse/disposal options along the proposed path of the Clipper City Rail Trail in Newburyport have concentrations that exceed MCP reporting criteria for a number of Contaminants of Concern. We felt that the City of Newburyport should be aware of these exceedances in order to make their own assessment of the data and the applicability of MA DEP notification criteria.

As the purpose of our sampling and analysis was for reuse/disposal characterization of soil to be excavated by E.T. & L. Corporation, the sampling protocol we used at each sampling station was a bulk characterization of soils all down to project depths (from surface to around 3-4 feet depth). MCP sampling protocols do not follow the same sampling criteria (for example Imminent Hazard Criteria dictate that contaminant concentrations reside in the upper 12 inches of soil). Strategic Environmental Services thus makes no judgment of the applicability of MCP reporting criteria to this analytical data.

Soil Pre-Characterization Sampling Results  
Clipper City Rail Trail

December 5, 2016  
SES Project # 15-0754

Should you have any questions regarding this or any other matter, please do not hesitate to contact the undersigned.

Sincerely,

A handwritten signature in blue ink, reading "Chris D. Glod". The signature is cursive and fluid, with the first name "Chris" being the most prominent.

Christopher D. Glod, PG, LSP  
Licensed Site Professional

**Strategic Environmental Services, Inc.**  
**Office: 508-757-7782**



## **Appendix A: Site Maps with Sample Locations**





SUBSURFACE DETENTION AND INFILTRATION  
SYSTEM 3.  
BY ADD OR APPROVED EQUAL SYSTEM  
SHALL INCLUDE 2 ROWS OF 12" ID.  
PERFORATED CORRUGATED HDPE PIPING  
MANFOLD, CONNECTIONS, & CLEANOUT  
PORTS AS NECESSARY. SEE DETAIL.  
BOTTOM OF STONE ELEV. = 8.63  
INVERT OF PIPING = 8.43  
APPROXIMATE LENGTH = 170 LINEAR FEET.  
INSTALL CLEANOUT PORTS IN LOCATIONS AS  
RECOMMENDED BY MANUFACTURER.

RET & PROTECT EXIST ELEC DUCT

28" - 12" HDPE

ABANDON AND PLUG EXIST  
DRAIN INLET IN PLACE RSD  
FRAME AND GRATE

8" - 12" HDPE

3" - 10" HDPE  
CONNECT TO SUB.  
SURFACE DET &  
INFIL. SYSTEM 3 W/  
10" X 12" HDPE TEE

10" - 12" HDPE

CONNECT TO SUB.  
SURFACE DET & INFIL.  
SYSTEM 3 W/ 12" HDPE  
TEE AT MANFOLD (TYP.)

150" - 12" HDPE

RET & PROTECT  
EXIST GUY WIRE

RET & PROTECT  
EXIST UTILITY POLE

RET & PROTECT  
EXIST CEMTER &  
GAS P/ AREA

WV=10.85

EX 24" BRICK ARCH  
PIPE (RECORD)  
ABANDON IN PLACE  
WITH FLOWABLE  
FILL

DRAINAGE STRUCTURES						
ID	TYPE	LOCATION	AW ELEV	TOP ELEV IN	BY ELEV OUT	REMARKS
21A	CB	53+72.50 6" R	10.21	12.00	10.43	(SYSTEM 3 CONNECTION)
21B	CB	52+55.86 7.5" R	11.50		10.50 21B	
21C	DM	51+42.30 6" R	10.74	11.42 21C	9.97 21A	8" 3" 2" D
21D	DM	53+13.64 1" R	10.72	10.43	11.50 21D	(OVERFLOW)
21E	DM	52+17.07 3" R	11.82	11.40 21E	9.70 21E	
21F	DM	51+14.04 3" R	11.64	11.40	11.40 21F	

CONTINUED ON  
SHEET NO. 4

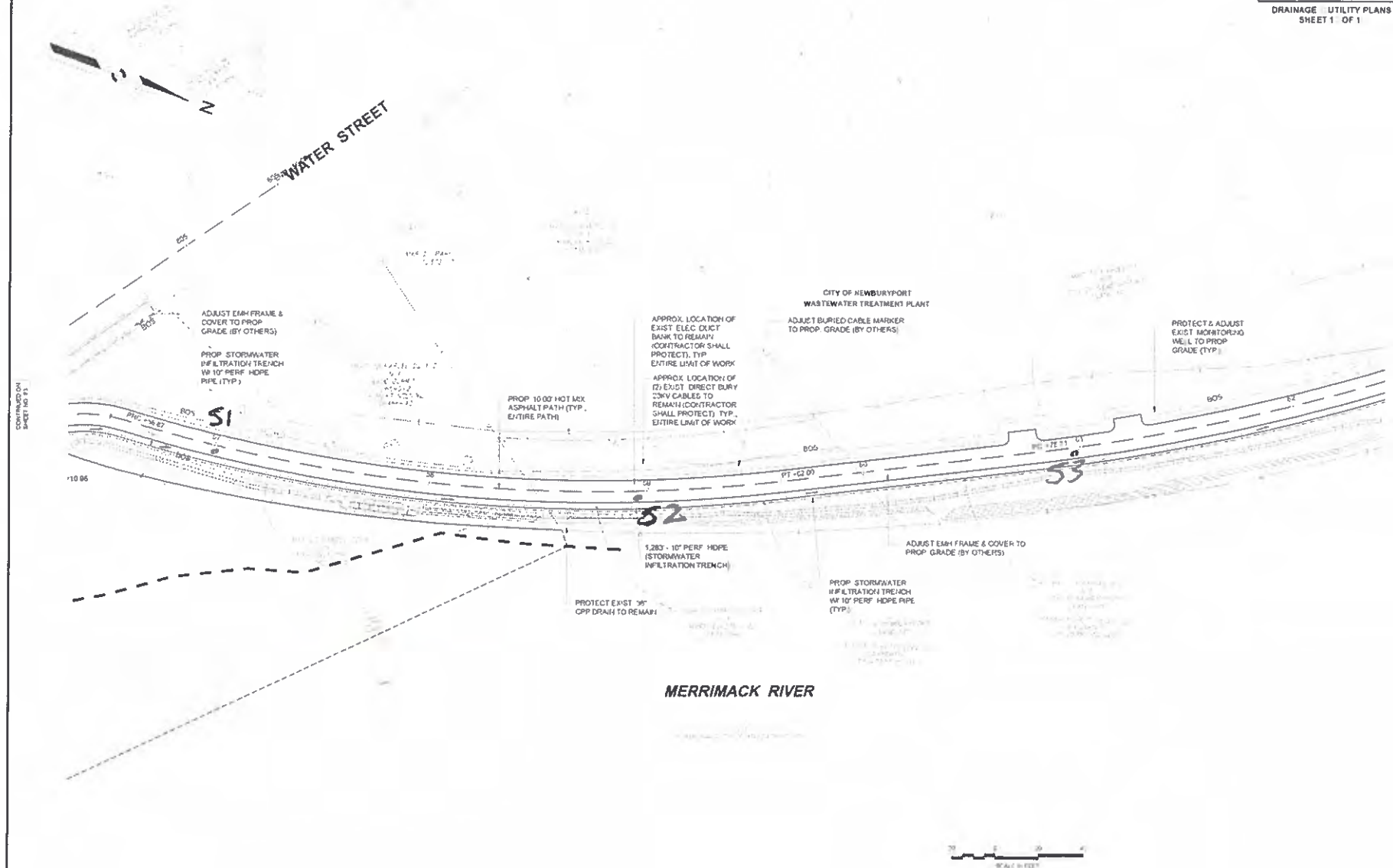


CONTINUED ON  
SHEET NO. 4

NEWBURYPORT / NEWBURY  
CLIPPER CITY RAIL TRAIL - PHASE 2

DATE	10/26/2010	BY	MM
REV	01	DATE	11/01/2010
PROJECT FILE NO.	100001		

DRAINAGE / UTILITY PLANS  
SHEET 1 OF 1



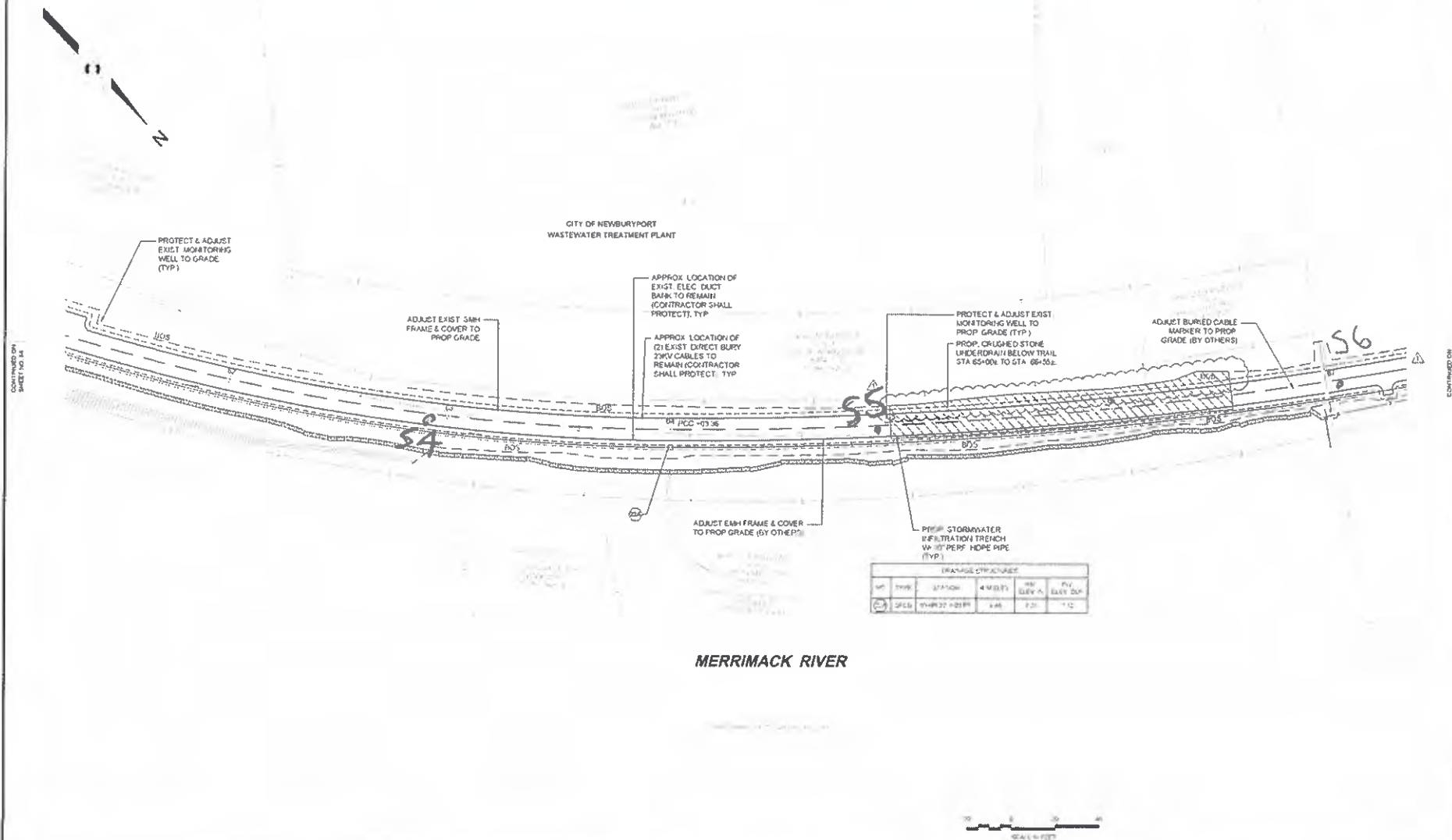


REV. NO	DESCRIPTION	DATE
1	EXTEND CRUSHED STONE UNDERDRAIN TO GRADING LIMIT	12-18-2015

NEWBURYPORT / NEWBURY  
CLIPPER CITY RAIL TRAIL - PHASE 2

2014	PER ALLIANCE MD	DATE	12-18-2015
446	PER ALLIANCE MD	DATE	12-18-2015
446	PER ALLIANCE MD	DATE	12-18-2015

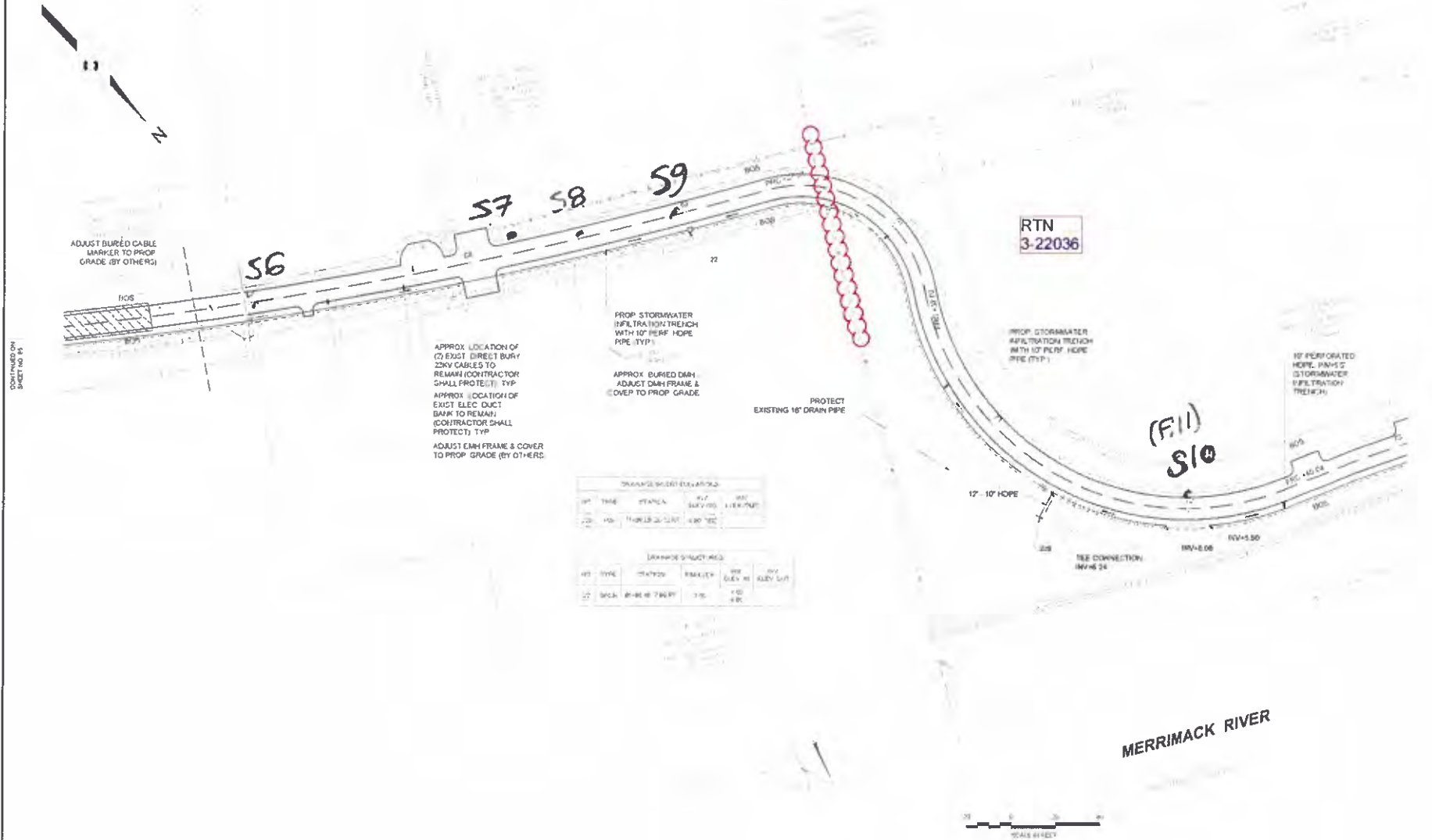
DRAINAGE - UTILITY PLANS  
SHEET 11 OF 1



NEWBURYPORT / NEWBURY  
CLIPPER CITY RAIL TRAIL PHASE 2

DATE	11/22/2010	BY	WJG
APP'D	11/22/2010	BY	WJG
PROJECT	CLIPPER CITY RAIL TRAIL PHASE 2		

DRAINAGE UTILITY PLANS  
SHEET 12 OF 1



NO.	TYPE	STATION	REMARKS	DATE
1	18" 10" HDPE	56.00	18" 10" HDPE	11/22/2010

NO.	TYPE	STATION	REMARKS	DATE
2	18" 10" HDPE	56.00	18" 10" HDPE	11/22/2010



NEWBURYPORT / NEWBURY  
CLIPPER CITY RAIL TRAIL - PHASE 2

DATE	1.15.15	PROJECT NO.	1772
NA	STATEMENT OF WORK	NO	177
PROJECT FILE NO.	1772		

DRAINAGE UTILITY PLANS  
SHEET 14 OF 1



WATER STREET

RET. & PROTECT EXIST CONC. VAULT  
RET. & PROTECT EXIST GATE CONTROL SYSTEM INCLUDING KEYPADS, DRIVE MOTOR AND ELEC. CONDUITS

RET. & PROTECT EXIST ELEC. TRANSFORMER  
ADJUST MH FRAME & COVER TO PROP. GRADE

R/O EXIST CB FRAME & GRATE. REPLACE AND ADJUST NEW FRAME & COVER TO PROP. GRADE

PROTECT & ADJUST EXISTING MONITORING WELL TO PROP. GRADE

PROTECT & ADJUST EXISTING MONITORING WELL TO PROP. GRADE

RET. & PROTECT EXIST EMH

25" - 10" PERF. HOPE (STORMWATER INFILTRATION TRENCH)

INV=7.61  
54" 10" PERF. HOPE (STORMWATER INFILTRATION TRENCH)

RTN  
3-13097

(F.11)  
N1

RTN  
3-22036

PROTECT & ADJUST DRAIN PIPE AS NEEDED NEAR EXISTING DRAIN MANHOLE (TYP.)

ADJUST DMH FRAME & COVER TO PROP. GRADE  
10" PERFORATED HOPE PIPE (STORMWATER INFILTRATION TRENCH)

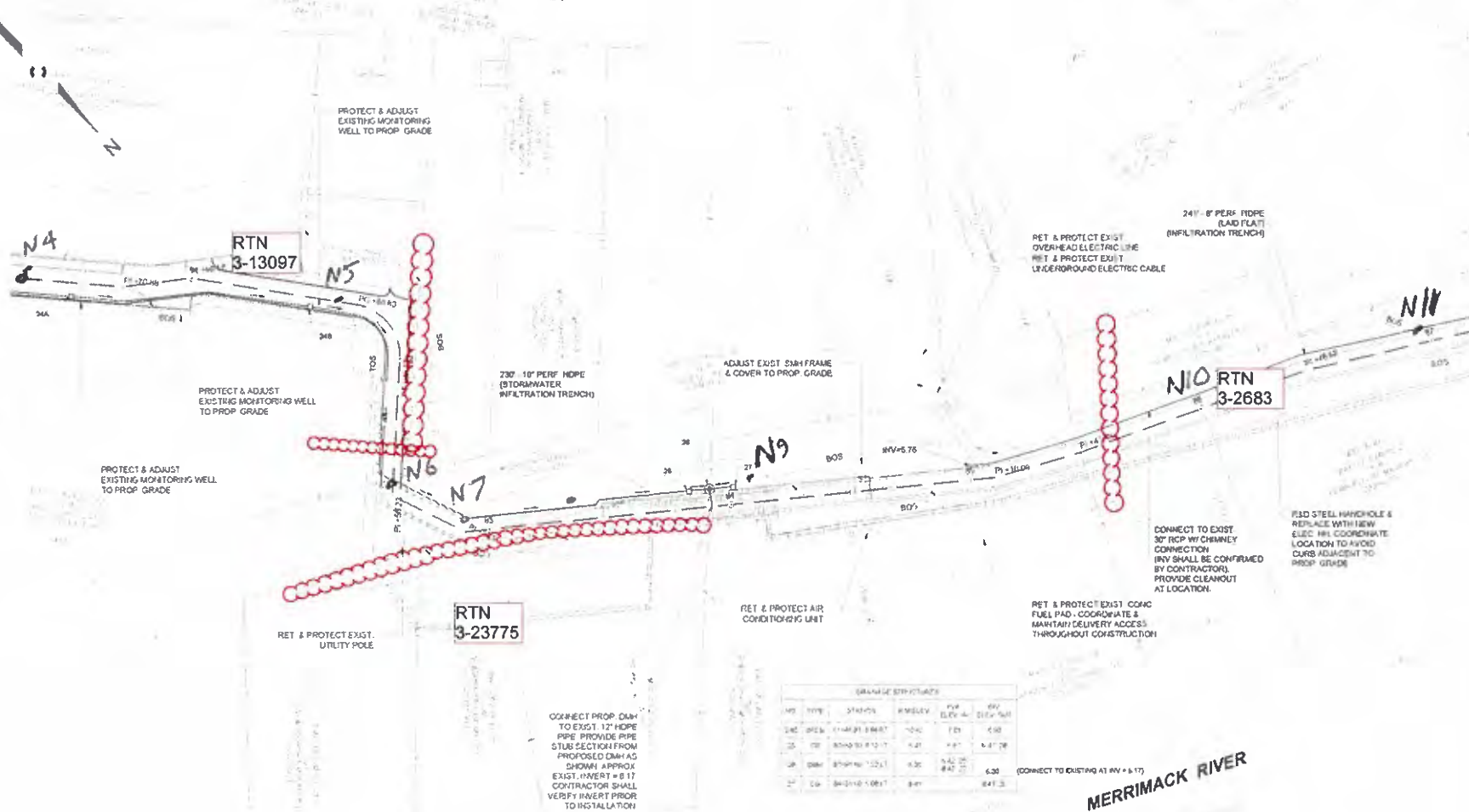
DRAINAGE STRUCTURES					
NO.	TYPE	STATION	REF. ELEV.	PO. ELEV. (F)	RV. ELEV. (F)
1	SPCE	7915.51 + 0.00	10.79	7.61	7.42
2	SPCE	8045.01 + 0.71	10.43	7.07	7.17





DATE:	10/24/2014	BY:	DAVID
REVISION:	10/24/2014	BY:	DAVID
PROJECT FILE NO:	100001		

WATER STREET



GRAVELL STATIONING						
NO.	TYPE	START/END	INVERT	PIPE	ELEV. @	REV.
1	PIPE	11+48.01 - 11+68.07	-0.40	12"	1.01	1.00
2	PIPE	11+68.07 - 12+11.17	-0.41	12"	1.01	6.41.00
3	PIPE	12+11.17 - 12+17.17	-0.40	12"	1.01	6.42.00
4	PIPE	12+17.17 - 12+18.17	-0.41	12"	1.01	6.43.00

(CONNECT TO EXISTING AT INV. + 6.17)

MERRIMACK RIVER

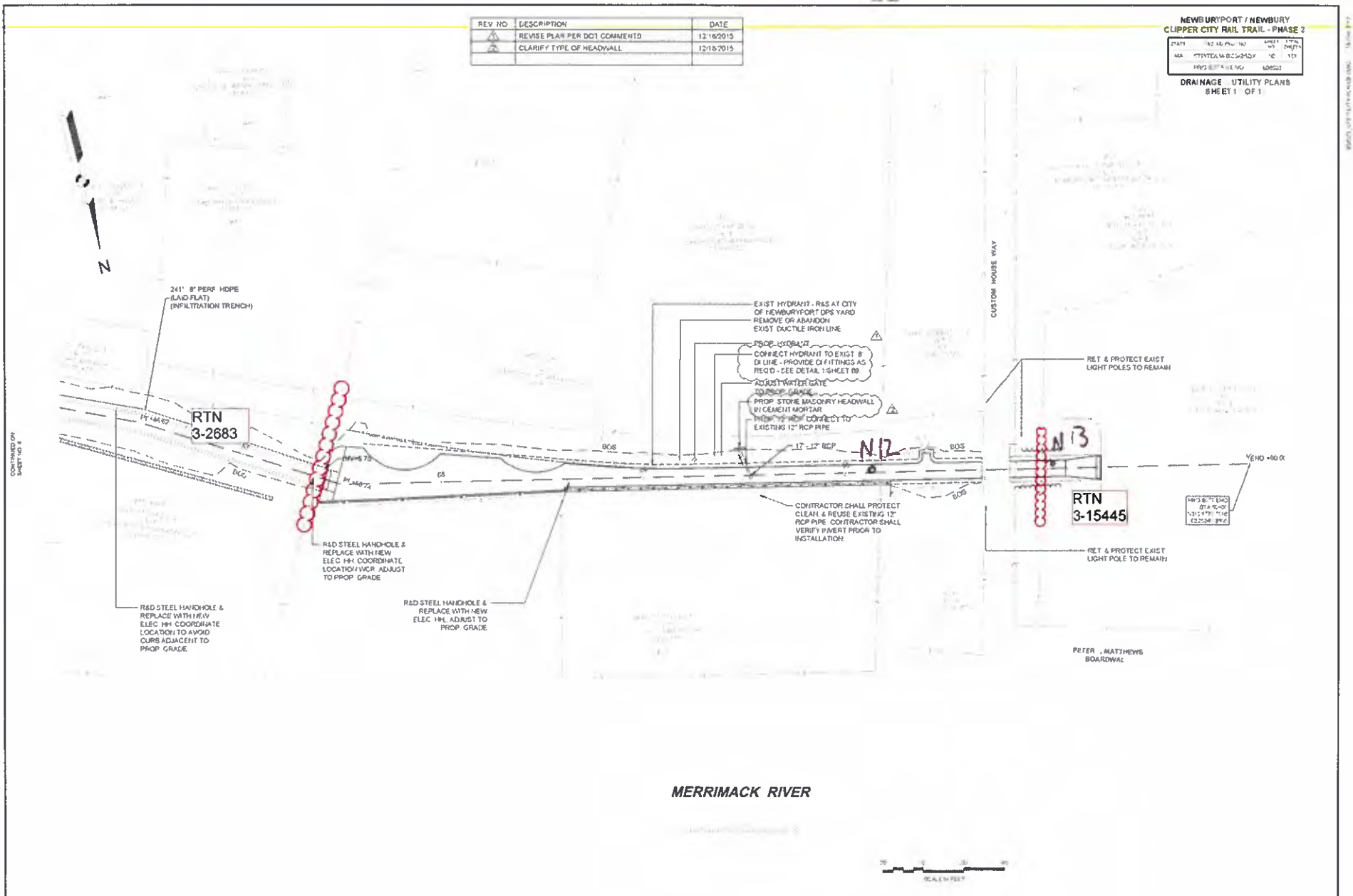


REV NO	DESCRIPTION	DATE
1	REVISE PLAN PER DOT COMMENTS	12/18/2015
2	CLARIFY TYPE OF HEADWALL	12/18/2015

NEWBURYPORT / NEWBURY  
CLIPPER CITY RAIL TRAIL - PHASE 2

DATE	12/18/2015	SHEET	1 OF 1
NAME	CLIPPER CITY RAIL TRAIL - PHASE 2	NO.	101
PROJECT	CLIPPER CITY RAIL TRAIL - PHASE 2	NO.	101

DRAINAGE UTILITY PLANS  
SHEET 1 OF 1



## **Appendix B: Analytical Results Tables**

Summary of Soil Analytical  
Composite Samples  
Newburyport-Clipper City

SES Job No. 15-0754

Parameter	Reportable Concentrations (RCs)		MA COMM-97 Disposal Criteria		DEP Coal/Wood Ash "Historic Fill"		
	RCS-1	RCS-2	Unlined	Lined		South-1	North-1
Sampling Date						11/10/2016	11/10/2016
Soil Classification						Comp	Comp
<b>MCP14 Metals</b>						<b>MG/KG DRY</b>	<b>MG/KG DRY</b>
ANTIMONY	20	30		~	7	ND (0.75)	ND (0.73)
ARSENIC	20	20	40	40	20	<b>66.3 (0.75)</b>	<b>25.3 (0.73)</b>
BARIUM	1000	3000	~	~	50	61.8 (0.37)	30.8 (0.36)
BERYLLIUM	90	200		~	0.9	ND (0.37)	ND (0.36)
CADMIUM	70	100	30	80	3	2.60 (0.37)	2.98 (0.36)
CHROMIUM	100	200	1000	1000	40	24.1 (0.37)	24.7 (0.36)
LEAD	200	600	1000	2000	600	<b>317 (0.37)</b>	<b>326 (0.36)</b>
MERCURY	20	30	10	10	1	0.660 (0.376)	0.636 (0.074)
NICKEL	600	1000		~	30	17.5 (0.37)	16.1 (0.36)
SELENIUM	400	700	~	~	1	ND (0.75)	ND (0.73)
SILVER	100	200	~	~	5	ND (0.37)	ND (0.36)
THALLIUM	8	60	~	~	5	ND (0.15)	ND (0.15)
VANADIUM	400	700	~	~	30	13.3 (0.37)	8.39 (0.36)
ZINC	1000	3000	~	~	300	125 (1.50)	65.7 (1.46)
<b>TCLP METALS</b>						<b>MG/L</b>	<b>MG/L</b>
LEAD						0.09 (0.02)	0.49 (0.02)
<b>Pesticides/Herbicides</b>						<b>UG/KG DRY</b>	<b>UG/KG DRY</b>
ALDRIN	80	500	~	~	~	ND (5.0)	ND (5.0)
ALPHA-BHC	50000	500000	~	~	~	ND (5.0)	ND (5.0)
BETA-BHC	10000	100000	~	~	~	ND (5.0)	ND (5.0)
DELTA-BHC	10000	100000	~	~	~	ND (5.0)	ND (5.0)
GAMMA-BHC (LINDANE)	3	500	~	~	~	ND (5.0)	ND (5.0)
ALPHA-CHLORDANE	5000	30000	~	~	~	ND (5.0)	ND (5.0)
GAMMA-CHLORDANE	5000	30000	~	~	~	ND (5.0)	ND (5.0)
CHLORDANE	5000	30000	~	~	~	ND (50.0)	ND (50.0)
4,4'-DDD	8000	40000	~	~	~	ND (5.0)	ND (5.0)
4,4'-DDE	6000	30000	~	~	~	ND (5.0)	ND (5.0)
4,4'-DDT	6000	30000	~	~	~	ND (10.0)	ND (10.0)
DIELDRIN	80	500	~	~	~	ND (5.0)	ND (5.0)
ENDOSULFAN I	500	1000	~	~	~	ND (5.0)	ND (5.0)
ENDOSULFAN II	500	1000	~	~	~	ND (5.0)	ND (5.0)
ENDOSULFAN SULFATE	~	~	~	~	~	ND (5.0)	ND (5.0)
ENDRIN	10000	20000	~	~	~	ND (5.0)	ND (5.0)
ENDRIN ALDEHYDE	~	~	~	~	~	ND (5.0)	ND (5.0)
ENDRIN KETONE	~	~	~	~	~	ND (5.0)	ND (5.0)
HEPTACHLOR	300	2000	~	~	~	ND (5.0)	ND (5.0)
HEPTACHLOR EPOXIDE	100	900	~	~	~	ND (5.0)	ND (5.0)
METHOXYCHLOR	200000	400000	~	~	~	ND (5.0)	ND (5.0)
TOXAPHENE	~	~	~	~	~	ND (50.0)	ND (50.0)
<b>PCBs</b>						<b>UG/KG DRY</b>	<b>UG/KG DRY</b>
PCB 1016	1000	4000	~	~	~	ND (100)	ND (100)
PCB 1221	1000	4000	~	~	~	ND (100)	ND (100)
PCB 1232	1000	4000	~	~	~	ND (100)	ND (100)
PCB 1242	1000	4000	~	~	~	ND (100)	ND (100)
PCB 1248	1000	4000	~	~	~	ND (100)	ND (100)
PCB 1254	1000	4000	~	~	~	ND (100)	ND (100)
PCB 1260	1000	4000	~	~	~	<b>3500 (100)</b>	ND (100)
PCB 1262	1000	4000	~	~	~	ND (100)	ND (100)
PCB 1268	1000	4000	~	~	~	ND (100)	ND (100)
<b>Total PCBs</b>	~	~	<2,000	<2,000		<b>3500</b>	ND
<b>Total Petroleum Hydrocarbons</b>						<b>MG/KG DRY</b>	<b>MG/KG DRY</b>
TPH	1000	3000	2500	5000		123 (27)	300 (28)
<b>Volatile Organic Compounds</b>						<b>UG/KG DRY</b>	<b>UG/KG DRY</b>
VINYL CHLORIDE	700	700	~	~	~	ND (27)	ND (33)
BROMOMETHANE	500	500	~	~	~	ND (27)	ND (33)
CHLOROETHANE	100000	1000000	~	~	~	ND (27)	ND (33)
ACETONE	6000	50000	~	~	~	ND (130)	ND (160)
1,1-DICHLOROETHENE	~	~	~	~	~	ND (27)	ND (33)
CARBON DISULFIDE	100000	1000000	~	~	~	ND (27)	ND (33)
METHYLENE CHLORIDE	100	20000	~	~	~	ND (27)	ND (33)
METHYL TERT-BUTYL ETHER (MTBE)	100	100000	~	~	~	ND (27)	ND (33)
TRANS-1,2-DICHLOROETHYLENE	1000	1000	~	~	~	ND (27)	ND (33)
1,1-DICHLOROETHANE	400	9000	~	~	~	ND (27)	ND (33)
2-BUTANONE (MEK)	4000	50000	~	~	~	ND (270)	ND (330)
2,2-DICHLOROPROPANE	100	200	~	~	~	ND (27)	ND (33)
CIS-1,2-DICHLOROETHYLENE	100	100	~	~	~	ND (27)	ND (33)
CHLOROFORM	200	200	~	~	~	ND (27)	ND (33)
BROMOCHLOROMETHANE	~	~	~	~	~	ND (27)	ND (33)
1,1,1-TRICHLOROETHANE	30000	600000	~	~	~	ND (27)	ND (33)
1,1-DICHLOROPROPENE	10	100	~	~	~	ND (27)	ND (33)
CARBON TETRACHLORIDE	5000	500	~	~	~	ND (27)	ND (33)
BENZENE	2000	200000	~	~	~	ND (27)	ND (33)
1,2-DICHLOROETHANE	100	100	~	~	~	ND (27)	ND (33)
TRICHLOROETHYLENE	300	300	~	~	~	ND (27)	ND (33)
1,2-DICHLOROPROPANE	100	100	~	~	~	ND (27)	ND (33)
BROMODICHLOROMETHANE	100	100	~	~	~	ND (27)	ND (33)
DIBROMOMETHANE	500000	5000000	~	~	~	ND (27)	ND (33)
4-METHYL-2-PENTANONE (MIBK)	400	50000	~	~	~	ND (130)	ND (160)
1,2-DIBROMOETHANE (EDB)	100	100	~	~	~	ND (27)	ND (33)
TOLUENE	30000	1000000	~	~	~	ND (27)	ND (33)
CIS-1,3-DICHLOROPROPENE	10	100	~	~	~	ND (27)	ND (33)
TRANS-1,3-DICHLOROPROPENE	10	100	~	~	~	ND (27)	ND (33)
1,1,2-TRICHLOROETHANE	100	2000	~	~	~	ND (27)	ND (33)
2-HEXANONE	100000	1000000	~	~	~	ND (130)	ND (160)
TETRACHLOROETHYLENE	1000	10000	~	~	~	ND (27)	ND (33)
CHLORODIBROMOMETHANE	5	30	~	~	~	ND (27)	ND (33)
CHLOROBENZENE	1000	3000	~	~	~	ND (27)	ND (33)
1,1,1,2-TETRACHLOROETHANE	100	100	~	~	~	ND (27)	ND (33)
ETHYLBENZENE	40000	1000000	~	~	~	ND (27)	ND (33)
M/P-XYLENE	100000	100000	~	~	~	ND (54)	ND (66)

Summary of Soil Analytical  
Composite Samples  
Newburyport-Clipper City

SES Job No. 15-0754

Parameter	Reportable Concentrations (RCs)		MA COMM-97 Disposal Criteria		DEP Coal/Wood Ash "Historic Fill"		
	RCS-1	RCS-2	Unlined	Lined		South-1	North-1
O-XYLENE	100000	100000	~	~	~	ND (27)	ND (33)
STYRENE	3000	4000	~	~	~	ND (27)	ND (33)
BROMOFORM	100	1000	~	~	~	ND (27)	ND (33)
ISOPROPYLBENZENE	1000000	10000000	~	~	~	ND (27)	ND (33)
1,1,2,2-TETRACHLOROETHANE	5	20	~	~	~	ND (27)	ND (33)
BROMOBENZENE	100000	1000000	~	~	~	ND (27)	ND (33)
1,2,3-TRICHLOROPROPANE	100000	1000000	~	~	~	ND (27)	ND (33)
2-CHLOROTOLUENE	100000	1000000	~	~	~	ND (27)	ND (33)
N-PROPYLBENZENE	100000	1000000	~	~	~	ND (27)	ND (33)
1,3,5-TRIMETHYLBENZENE	10000	100000	~	~	~	ND (27)	ND (33)
4-CHLOROTOLUENE	100000	1000000	~	~	~	ND (27)	ND (33)
TERT-BUTYLBENZENE	100000	1000000	~	~	~	ND (27)	ND (33)
1,2,4-TRIMETHYLBENZENE	1000000	10000000	~	~	~	ND (27)	ND (33)
SEC-BUTYLBENZENE	~	~	~	~	~	ND (27)	ND (33)
P-ISOPROPYLTOLUENE	100000	1000000	~	~	~	ND (27)	ND (33)
CHLOROMETHANE	100000	1000000	~	~	~	ND (27)	ND (33)
TERT-BUTYL ALCOHOL	~	~	~	~	~	ND (540)	ND (660)
1,3-DICHLOROBENZENE	3000	200000	~	~	~	ND (27)	ND (33)
TETRAHYDROFURAN	500000	5000000	~	~	~	ND (540)	ND (660)
1,4-DICHLOROBENZENE	700	1000	~	~	~	ND (27)	ND (33)
DIETHYL ETHER	100000	1000000	~	~	~	ND (27)	ND (33)
N-BUTYLBENZENE	~	~	~	~	~	ND (27)	ND (33)
1,2-DICHLOROBENZENE	9000	100000	~	~	~	ND (27)	ND (33)
1,2-DIBROMO-3-CHLOROPROPANE	10000	100000	~	~	~	ND (27)	ND (33)
1,2,4-TRICHLOROBENZENE	2000	6000	~	~	~	ND (27)	ND (33)
HEXACHLOROBUTADIENE	30000	100000	~	~	~	ND (27)	ND (33)
NAPHTHALENE	4000	20000	~	~	~	ND (27)	ND (33)
1,2,3-TRICHLOROBENZENE	~	~	~	~	~	ND (27)	ND (33)
TERT-AMYLMETHYL ETHER	~	~	~	~	~	ND (27)	ND (33)
DICHLORODIFLUOROMETHANE	1000000	10000000	~	~	~	ND (27)	ND (33)
1,3-DICHLOROPROPANE	500000	5000000	~	~	~	ND (27)	ND (33)
TRICHLOROFLUOROMETHANE	1000000	10000000	~	~	~	ND (27)	ND (33)
TERT-BUTYLETHYL ETHER	~	~	~	~	~	ND (27)	ND (33)
DIISOPROPYL ETHER	100000	1000000	~	~	~	ND (27)	ND (33)
1,4-DIOXANE	200	6000	~	~	~	ND (13000)	ND (16000)
Total VOCs	~	~	4,000	10,000		ND	ND
Semi-Volatile Organic Compounds						UG/KG DRY	UG/KG DRY
N-NITROSODIMETHYLAMINE	~	~	~	~	~	ND (220)	ND (200)
PYRIDINE	~	~	~	~	~	ND (150)	ND (140)
PHENOL	1000	20000	~	~	~	ND (150)	ND (140)
ANILINE	1000000	10000000	~	~	~	ND (150)	ND (140)
BIS(2-CHLOROETHYL)ETHER	700	700	~	~	~	ND (150)	ND (140)
2-CHLOROPHENOL	700	100000	~	~	~	ND (150)	ND (140)
1,3-DICHLOROBENZENE	3000	200000	~	~	~	ND (150)	ND (140)
1,4-DICHLOROBENZENE	700	1000	~	~	~	ND (150)	ND (140)
1,2-DICHLOROBENZENE	9000	100000	~	~	~	ND (150)	ND (140)
O-CRESOL	500000	5000000	~	~	~	ND (150)	ND (140)
2,2'-OXYBIS(2-CHLOROPROPANE)	~	~	~	~	~	ND (150)	ND (140)
M/P-CRESOL	500000	5000000	~	~	~	ND (300)	ND (270)
N-NITROSO-DI-N-PROPYLAMINE	~	~	~	~	~	ND (150)	ND (140)
HEXACHLOROETHANE	700	3000	~	~	~	ND (150)	ND (140)
NITROBENZENE	500000	5000000	~	~	~	ND (150)	ND (140)
ISOPHORONE	100000	1000000	~	~	~	ND (150)	ND (140)
2-NITROPHENOL	100000	1000000	~	~	~	ND (370)	ND (340)
2,4-DIMETHYLPHENOL	700	100000	~	~	~	ND (740)	ND (680)
BENZOIC ACID	~	~	~	~	~	ND (1100)	ND (1000)
BIS(2-CHLOROETHOXY)METHANE	500000	5000000	~	~	~	ND (150)	ND (140)
2,4-DICHLOROPHENOL	700	40000	~	~	~	ND (370)	ND (340)
1,2,4-TRICHLOROBENZENE	2000	6000	~	~	~	ND (150)	ND (140)
NAPHTHALENE	4000	20000	~	~	1000	ND (150)	180 (140)
4-CHLOROANILINE	1000	3000	~	~	~	ND (150)	ND (140)
HEXACHLOROBUTADIENE	30000	100000	~	~	~	ND (150)	ND (140)
4-CHLORO-3-METHYLPHENOL	~	~	~	~	~	ND (370)	ND (340)
2-METHYLNAPHTHALENE	700	80000	~	~	1000	ND (150)	170 (140)
HEXACHLOROCYCLOPENTADIENE	~	~	~	~	~	ND (150)	ND (140)
2,4,6-TRICHLOROPHENOL	700	20000	~	~	~	ND (150)	ND (140)
2,4,5-TRICHLOROPHENOL	4000	600000	~	~	~	ND (150)	ND (140)
2-CHLORONAPHTHALENE	1000000	10000000	~	~	~	ND (150)	ND (140)
2-NITROANILINE	~	~	~	~	~	ND (150)	ND (140)
DIMETHYLPHTHALATE	700	10000	~	~	~	ND (370)	ND (340)
ACENAPHTHYLENE	1000	10000	~	~	1000	180 (150)	290 (140)
2,6-DINITROTOLUENE	100000	1000000	~	~	~	ND (150)	ND (140)
3-NITROANILINE	~	~	~	~	~	ND (150)	ND (140)
ACENAPHTHENE	4000	3000000	~	~	2000	ND (150)	190 (140)
2,4-DINITROPHENOL	3000	50000	~	~	~	ND (370)	ND (340)
4-NITROPHENOL	100000	1000000	~	~	~	ND (370)	ND (340)
DIBENZOFURAN	100000	1000000	~	~	~	ND (150)	230 (140)
2,4-DINITROTOLUENE	700	10000	~	~	~	ND (150)	ND (140)
DIETHYLPHTHALATE	10000	200000	~	~	~	ND (150)	ND (140)
FLUORENE	1000000	3000000	~	~	2000	ND (150)	320 (140)
4-CHLOROPHENYL ETHER	~	~	~	~	~	ND (150)	ND (140)
4-NITROANILINE	~	~	~	~	~	ND (150)	ND (140)
4,6-DINITRO-2-METHYLPHENOL	~	~	~	~	~	ND (370)	ND (340)
N-NITROSODIPHENYLAMINE	~	~	~	~	~	ND (150)	ND (140)
4-BROMOPHENYL PHENYL ETHER	100000	1000000	~	~	~	ND (150)	ND (140)
HEXACHLOROBENZENE	700	800	~	~	~	ND (150)	ND (140)
PENTACHLOROPHENOL	3000	10000	~	~	~	ND (370)	ND (340)
PHENANTHRENE	10000	1000000	~	~	20	460 (150)	3300 (140)
ANTHRACENE	1000000	3000000	~	~	4000	160 (150)	830 (140)
DI-N-BUTYLPHTHALATE	50000	500000	~	~	~	ND (220)	ND (200)
FLUORANTHENE	1000000	3000000	~	~	10000	1100 (150)	4200 (140)
PYRENE	1000000	3000000	~	~	20000	1300 (150)	4400 (140)
BUTYLBENZYLPHTHALATE	100000	1000000	~	~	~	ND (150)	ND (140)

Summary of Soil Analytical  
Composite Samples  
Newburyport-Clipper City

SES Job No. 15-0754

Parameter	Reportable Concentrations (RCs)		MA COMM-97 Disposal Criteria		DEP Coal/Wood Ash "Historic Fill"		
	RCS-1	RCS-2	Unlined	Lined		South-1	North-1
3,3'-DICHLOROBENZIDINE	3000	20000	~	~	~	ND (370)	ND (340)
BENZO(A)ANTHRACENE	7000	40000	~	~	9000	770 (150)	2400 (140)
CHRYSENE	70000	400000	~	~	7000	880 (150)	2300 (140)
BIS(2-ETHYLHEXYL)PHTHALATE	90000	600000	~	~	~	ND (370)	ND (410)
DI-N-OCTYLPHTHALATE	1000000	10000000	~	~	~	ND (220)	ND (200)
BENZO(B)FLUORANTHENE	7000	40000	~	~	8000	960 (150)	2000 (140)
BENZO(K)FLUORANTHENE	70000	400000	~	~	4000	790 (150)	1800 (140)
BENZO(A)PYRENE	2000	7000	~	~	7000	900 (150)	<b>2200 (140)</b>
DIBENZO(A,H)ANTHRACENE	700	4000	~	~	1000	170 (150)	390 (140)
INDENO(1,2,3-CD)PYRENE	7000	40000	~	~	3000	630 (150)	1500 (140)
BENZO(G,H,I)PERYLENE	1000000	3000000	~	~	3000	570 (150)	1400 (140)
Total SVOCs	~	~	100,000	100,000	~	8870	28100
Specific Conductance	~	~	4000	8000	~	186.4	208.2
Flash Point (deg F)	~	~	~	~	~	>200	>200
pH (SU)	~	~	~	~	~	6.73	7.81
Reactivity - Sulfide (mg/kg)	~	~	~	~	~	ND (0.21)	ND (0.23)
Reactivity - Cyanide (mg/kg)	~	~	~	~	~	ND (0.22)	ND (0.22)

NOTES:  
ND = Not detected above the lab reporting limits shown in parenthesis.  
NT = Not tested.  
Bolded values exceed the MCP Reportable Concentrations (RCs).  
~ = No Standard or Criteria  
\* = Can be accepted on a case by case basis.



Summary of Soil Analytical  
South Individual Samples  
Newburyport-Clipper City  
SES Job No. 15-0754

Parameter	Reportable Concentrations (RCs)		Sample No.										
	RCS-1	RCS-2	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11
Sampling Date			11/10/2016	11/10/2016	11/10/2016	11/10/2016	11/10/2016	11/10/2016	11/10/2016	11/10/2016	11/10/2016	11/10/2016	11/10/2016
Soil Classification													
<b>MCP14 Metals</b>			MG/KG DRY	MG/KG DRY	MG/KG DRY	MG/KG DRY	MG/KG DRY	MG/KG DRY	MG/KG DRY	MG/KG DRY	MG/KG DRY	MG/KG DRY	MG/KG DRY
ARSENIC	20	20	<b>22.1 (0.95)</b>	17.2 (1.07)	16.3 (1.06)	16.4 (1.06)	<b>36.3 (0.96)</b>	<b>31.9 (1.05)</b>	<b>21.6 (0.98)</b>	14.7 (1.04)	<b>31.7 (0.99)</b>	16.1 (1.15)	<b>24.0 (1.02)</b>
<b>PCBs</b>			UG/KG DRY	UG/KG DRY	UG/KG DRY	UG/KG DRY	UG/KG DRY	UG/KG DRY	UG/KG DRY	UG/KG DRY	UG/KG DRY	UG/KG DRY	UG/KG DRY
PCB 1016	1000	4000	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
PCB 1221	1000	4000	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
PCB 1232	1000	4000	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
PCB 1242	1000	4000	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
PCB 1248	1000	4000	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
PCB 1254	1000	4000	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
PCB 1260	1000	4000	ND (100)	ND (100)	<b>1380 (100)</b>	<b>39200 (100)</b>	<b>1430 (100)</b>	371 (100)	ND (100)	ND (100)	139 (100)	ND (100)	ND (100)
PCB 1262	1000	4000	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
PCB 1268	1000	4000	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Total PCBs	~	~	ND	ND	<b>1380</b>	<b>39200</b>	<b>1430</b>	371	ND	ND	139	ND	ND

NOTES:

ND = Not detected above the lab reporting limits shown in parenthesis.

NT = Not tested.

Bolded values exceed the MCP Reportable Concentrations (RCs).

~ = No Standard or Criteria

\* = Can be accepted on a case by case basis.

## **Appendix C: Laboratory Analytical Reports**





## **REPORT OF ANALYTICAL RESULTS**

**NETLAB Case Number C1111-18**

Prepared for:

Strategic Environmental Services  
362 Putnam Hill Rd  
Sutton, MA 01590

Report Date: November 18, 2016

Director  
New England Testing Laboratory, Inc.  
Lab # RI010

**NEW ENGLAND TESTING LABORATORY, INC.**

59 Greenhill Street, West Warwick, RI 02893

(401) 353-3420

## MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc.

Project #: 15-754

Project Location: ET+L Newburyport

RTN:

**This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):**  
**C1111-18**

Matrices: Groundwater/Surface Water ☒ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other: \_\_\_\_\_

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

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

**Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status**

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

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

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

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

<sup>1</sup>All negative responses must be addressed in an attached laboratory narrative.

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

**Signature:** 

**Position:** Laboratory Director

**Printed Name:** Richard Warila

**Date:** 11/18/2016

## **SAMPLES SUBMITTED and REQUEST FOR ANALYSIS:**

The samples listed in Table I were submitted to New England Testing Laboratory on November 11, 2016. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is C1111-18.

Custody records are included in this report.

**Project: 15-754 – ET+L Newburyport**

**TABLE I, Samples Submitted**

Sample ID	Date Sampled	Matrix	Analysis Requested
South-1	11/10/2016	Soil	Table II
North-1	11/10/2016	Soil	Table II

**TABLE II, Analysis and Methods**

<b>ANALYSIS</b>	<b>PREPARATION METHOD</b>	<b>DETERMINATIVE METHOD</b>
Flashpoint	NA	1020
pH	NA	9045D
Reactive Cyanide	NA	SW-846 sec. 7.3
Reactive Sulfide	NA	SW-846 sec. 7.3
Specific Conductance	NA	9050A Modified
Total Metals		
Antimony	3050B	6010C
Arsenic	3050B	6010C
Barium	3050B	6010C
Beryllium	3050B	6010C
Cadmium	3050B	6010C
Chromium	3050B	6010C
Lead	3050B	6010C
Mercury	NA	7471B
Nickel	3050B	6010C
Selenium	3050B	6010C
Silver	3050B	6010C
Thallium	3050B	7010
Vanadium	3050B	6010C
Zinc	3050B	6010C
TCLP Extraction	1311	NA
Lead	3010A	6010C
PCB's	3546	8082A
Pesticides	3546	8081B
Semi-volatile Compounds	3546	8270D
Total Petroleum Hydrocarbons	3546	8100M
Volatile Organic Compounds	5035	8260C

These methods are documented in:

*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, USEPA/OSW.*

## **CASE NARRATIVE:**

### Sample Receipt

The samples were all appropriately cooled and preserved upon receipt. The samples were received in the appropriate containers. The chain of custody was adequately completed and corresponded to the samples submitted.

### Metals

All analyses were performed according to NETLAB's documented Standard Operating Procedures, within all required holding times, and with appropriate quality control measures. All QC was within laboratory established acceptance criteria. The samples were received, processed, and reported with no anomalies.

### PCBs

All samples were extracted and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

### Pesticides

All samples were extracted and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

### Semi-volatile Compounds

All samples were extracted and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

### Total Petroleum Hydrocarbons

All samples were extracted and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

### Volatile Organic Compounds

All samples were analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

### Wet Chemistry

All samples were analyzed within method specified holding times and according to NETLAB's documented standard operating procedures.

**South-1**

Parameter	Result	Reporting Limit	Date Analyzed
Flashpoint, °F	>200	NA	11/18/2016
Reactive Cyanide, mg/kg*	ND	0.22	11/15/2016
Reactive Sulfide, mg/kg*	ND	0.21	11/15/2016
pH, S.U.	6.73	NA	11/17/2016
Specific Conductance, umhos/cm	186.4	0.1	11/15/2016

**North-1**

Parameter	Result	Reporting Limit	Date Analyzed
Flashpoint, °F	>200	NA	11/18/2016
Reactive Cyanide, mg/kg*	ND	0.22	11/15/2016
Reactive Sulfide, mg/kg*	ND	0.23	11/15/2016
pH, S.U.	7.81	NA	11/18/2016
Specific Conductance, umhos/cm	208.2	0.1	11/15/2016

NA = Not Applicable

ND = Not Detected

\*Dry Weight Basis

**Sample: South-1**

Case No. C1111-18

Date TCLP Extracted: 11/15/2016

Date Analyzed\*: 11/17/2016

<u>TCLP Extractable Metals</u>	<u>Result, mg/L</u>	Detection Limit, <u>mg/L</u>
Lead	0.09	0.02

\* Date Completed

ND = Not Detected

**Sample: North-1**

Case No. C1111-18

Date TCLP Extracted: 11/15/2016

Date Analyzed\*: 11/17/2016

<u>TCLP Extractable Metals</u>	<u>Result, mg/L</u>	Detection Limit, <u>mg/L</u>
Lead	0.49	0.02

\* Date Completed

ND = Not Detected



## **METALS RESULTS**

The presence of the NETLAB LOGO in the top right corner of each page in this section indicates:

The Technical Manager of the Metals Analysis Department certifies that the results included in this section have been reviewed and approved. Any exceptions or qualifications of substance have been reported in the case narrative.

New England Testing Laboratory, Inc.

# METALS RESULTS



Case Number: C1111-18  
 Sample ID: NORTH-1  
 Date collected: 11/10/16  
 Matrix: SOIL  
 Solids, %: 87.53  
 Sample Type: Total

AEG/NC/NB

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.75	mg/kg	11/15/16	11/16/16
Arsenic	7440-38-2	3050B	6010C	66.3	0.75	mg/kg	11/15/16	11/16/16
Barium	7440-39-3	3050B	6010C	61.8	0.37	mg/kg	11/15/16	11/16/16
Beryllium	7440-41-7	3050B	6010C	ND	0.37	mg/kg	11/15/16	11/16/16
Cadmium	7440-43-9	3050B	6010C	2.60	0.37	mg/kg	11/15/16	11/16/16
Chromium	7440-47-3	3050B	6010C	24.1	0.37	mg/kg	11/15/16	11/16/16
Lead	7439-92-1	3050B	6010C	317	0.37	mg/kg	11/15/16	11/16/16
Mercury	7439-97-6	NA	7471B	0.660	0.379	mg/kg	11/15/16	11/15/16
Nickel	7440-02-0	3050B	6010C	17.5	0.37	mg/kg	11/15/16	11/16/16
Selenium	7782-49-2	3050B	6010C	ND	0.75	mg/kg	11/15/16	11/16/16
Silver	7440-22-4	3050B	6010C	ND	0.37	mg/kg	11/15/16	11/16/16
Thallium	7440-28-0	3050B	7010	ND	0.15	mg/kg	11/15/16	11/17/16
Vanadium	7440-62-2	3050B	6010C	13.3	0.37	mg/kg	11/15/16	11/16/16
Zinc	7440-66-6	3050B	6010C	125	1.50	mg/kg	11/15/16	11/16/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: C1111-18  
 Sample ID: SOUTH-1  
 Date collected: 11/10/16  
 Matrix: SOIL  
 Solids, %: 90.63  
 Sample Type: Total

AEG/NC/NB

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.73	mg/kg	11/15/16	11/16/16
Arsenic	7440-38-2	3050B	6010C	25.3	0.73	mg/kg	11/15/16	11/16/16
Barium	7440-39-3	3050B	6010C	30.8	0.36	mg/kg	11/15/16	11/16/16
Beryllium	7440-41-7	3050B	6010C	ND	0.36	mg/kg	11/15/16	11/16/16
Cadmium	7440-43-9	3050B	6010C	2.98	0.36	mg/kg	11/15/16	11/16/16
Chromium	7440-47-3	3050B	6010C	24.7	0.36	mg/kg	11/15/16	11/16/16
Lead	7439-92-1	3050B	6010C	326	0.36	mg/kg	11/15/16	11/16/16
Mercury	7439-97-6	NA	7471B	0.636	0.074	mg/kg	11/15/16	11/15/16
Nickel	7440-02-0	3050B	6010C	16.1	0.36	mg/kg	11/15/16	11/16/16
Selenium	7782-49-2	3050B	6010C	ND	0.73	mg/kg	11/15/16	11/16/16
Silver	7440-22-4	3050B	6010C	ND	0.36	mg/kg	11/15/16	11/16/16
Thallium	7440-28-0	3050B	7010	ND	0.15	mg/kg	11/15/16	11/17/16
Vanadium	7440-62-2	3050B	6010C	8.39	0.36	mg/kg	11/15/16	11/16/16
Zinc	7440-66-6	3050B	6010C	65.7	1.46	mg/kg	11/15/16	11/16/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Sample ID: Preparation Blank  
 Matrix SOIL  
 Solids, % 100  
 Sample Type: Total

AEG/NC/AHB

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.67	mg/kg	11/15/16	11/16/16
Arsenic	7440-38-2	3050B	6010C	ND	0.67	mg/kg	11/15/16	11/16/16
Barium	7440-39-3	3050B	6010C	ND	0.33	mg/kg	11/15/16	11/16/16
Beryllium	7440-41-7	3050B	6010C	ND	0.33	mg/kg	11/15/16	11/16/16
Cadmium	7440-43-9	3050B	6010C	ND	0.33	mg/kg	11/15/16	11/16/16
Chromium	7440-47-3	3050B	6010C	ND	0.33	mg/kg	11/15/16	11/16/16
Lead	7439-92-1	3050B	6010C	ND	0.33	mg/kg	11/15/16	11/16/16
Mercury	7439-97-6	NA	7471B	ND	0.033	mg/kg	11/15/16	11/15/16
Nickel	7440-02-0	3050B	6010C	ND	0.33	mg/kg	11/15/16	11/16/16
Selenium	7782-49-2	3050B	6010C	ND	0.67	mg/kg	11/15/16	11/16/16
Silver	7440-22-4	3050B	6010C	ND	0.33	mg/kg	11/15/16	11/16/16
Thallium	7440-28-0	3050B	7010	ND	0.13	mg/kg	11/15/16	11/17/16
Vanadium	7440-62-2	3050B	6010C	ND	0.33	mg/kg	11/15/16	11/16/16
Zinc	7440-66-6	3050B	6010C	ND	1.33	mg/kg	11/15/16	11/16/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

## LABORATORY CONTROL SAMPLE RECOVERY

Parameter	True Value	Result	Units	Recovery, %	Internal		Date Analyzed
					LCL, %	UCL, %	
Antimony	66.7	63.2	mg/kg	95	85	115	11/16/16
Arsenic	13.3	13.4	mg/kg	101	85	115	11/16/16
Barium	66.7	63.2	mg/kg	95	85	115	11/16/16
Beryllium	13.3	13.8	mg/kg	104	85	115	11/16/16
Cadmium	66.7	64.3	mg/kg	96	85	114	11/16/16
Chromium	66.7	62.8	mg/kg	94	85	115	11/16/16
Lead	66.7	61.9	mg/kg	93	85	115	11/16/16
Mercury	0.133	0.1	mg/kg	91	85	115	11/15/16
Nickel	66.7	62.9	mg/kg	94	85	112	11/16/16
Selenium	13.3	13.0	mg/kg	97	85	115	11/16/16
Silver	26.6	25.5	mg/kg	96	85	115	11/16/16
Thallium	1.33	1.4	mg/kg	108	85	115	11/16/16
Vanadium	66.7	61.1	mg/kg	92	85	115	11/16/16
Zinc	66.7	62.9	mg/kg	94	85	115	11/16/16

## **RESULTS: PCBs**

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The Technical Manager of the Organics Analysis Department certifies that the samples included in this section have been prepared and analyzed using the procedures cited and that the results have been reviewed and approved. Any exceptions or qualifications of substance have been reported in the case narrative.

<b>Sample: South-1</b>		Analyst's Initials: JD
<b>Case No.: C1111-18</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/15/16	11/15/16,11/16/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	3500	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	93	45-125
DCBP	96	42-131

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: North-1</b>		Analyst's Initials: JD
<b>Case No.: C1111-18</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/15/16	11/15/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	79	45-125
DCBP	83	42-131

\*Dry Weight Basis  
N.D. = Not Detected



<b>Sample: Method Blank</b>		Analyst's Initials: JD
<b>Case No.: C1111-18</b>		
<b>Date Collected: NA</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/15/16	11/15/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg (ppb)	Reporting Limit ug/kg (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	93	45-125
DCBP	100	42-131

N.D. = Not Detected

## PCB Laboratory Control Spike

<b>Sample Matrix: Soil</b>				
<b>Subject: PCB</b>	Date Extracted			Date Analyzed
<b>Prep Method: EPA 3546</b>	11/15/16			11/15/16
<b>Analytical Method: EPA 8082A</b>				
Compound	Amount Spiked mg/kg	Result mg/kg	Recovery %	Recovery Limits
Aroclor 1016	0.500	0.450	90	55-131
Aroclor 1260	0.500	0.415	83	63-133
Surrogates:				
Compound	% Recovery	Limits		
TCMX	90	45-125		
DCBP	89	42-131		

## **RESULTS: PESTICIDES**

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<b>Sample: South-1</b>		Analyst's Initials: JD
<b>Case No.: C1111-18</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: Pesticides</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/15/16	11/15/16
<b>Analytical Method: EPA 8081B</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aldrin	N.D.	5.0
alpha-BHC	N.D.	5.0
beta-BHC	N.D.	5.0
delta-BHC	N.D.	5.0
gamma-BHC	N.D.	5.0
alpha-Chlordane	N.D.	5.0
gamma-Chlordane	N.D.	5.0
Chlordane	N.D.	50.0
4,4'-DDD	N.D.	5.0
4,4'-DDE	N.D.	5.0
4,4'-DDT	N.D.	10.0
Dieldrin	N.D.	5.0
Endosulfan I	N.D.	5.0
Endosulfan II	N.D.	5.0
Endosulfan sulfate	N.D.	5.0
Endrin	N.D.	5.0
Endrin aldehyde	N.D.	5.0
Endrin Ketone	N.D.	5.0
Heptachlor	N.D.	5.0
Heptachlor epoxide	N.D.	5.0
Methoxychlor	N.D.	5.0
Toxaphene	N.D.	50.0
Surrogates:		
Compound	% Recovery	Limits
TCMX	54	38-106
DCBP	76	32-110

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: North-1</b>		Analyst's Initials: JD
<b>Case No.: C1111-18</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: Pesticides</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/15/16	11/15/16
<b>Analytical Method: EPA 8081B</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aldrin	N.D.	5.0
alpha-BHC	N.D.	5.0
beta-BHC	N.D.	5.0
delta-BHC	N.D.	5.0
gamma-BHC	N.D.	5.0
alpha-Chlordane	N.D.	5.0
gamma-Chlordane	N.D.	5.0
Chlordane	N.D.	50.0
4,4'-DDD	N.D.	5.0
4,4'-DDE	N.D.	5.0
4,4'-DDT	N.D.	10.0
Dieldrin	N.D.	5.0
Endosulfan I	N.D.	5.0
Endosulfan II	N.D.	5.0
Endosulfan sulfate	N.D.	5.0
Endrin	N.D.	5.0
Endrin aldehyde	N.D.	5.0
Endrin Ketone	N.D.	5.0
Heptachlor	N.D.	5.0
Heptachlor epoxide	N.D.	5.0
Methoxychlor	N.D.	5.0
Toxaphene	N.D.	50.0
Surrogates:		
Compound	% Recovery	Limits
TCMX	52	38-106
DCBP	70	32-110

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: Method Blank</b>		Analyst's Initials:JD
<b>Case No.: C1111-18</b>		
<b>Date Collected: N.A.</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: Pesticides</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/15/16	11/15/16
<b>Analytical Method: EPA 8081B</b>		
Compound	Concentration ug/kg (ppb)	Reporting Limit ug/kg (ppb)
Aldrin	N.D.	5.0
alpha-BHC	N.D.	5.0
beta-BHC	N.D.	5.0
delta-BHC	N.D.	5.0
gamma-BHC	N.D.	5.0
alpha-Chlordane	N.D.	5.0
gamma-Chlordane	N.D.	5.0
Chlordane	N.D.	50.0
4,4'-DDD	N.D.	5.0
4,4'-DDE	N.D.	5.0
4,4'-DDT	N.D.	5.0
Dieldrin	N.D.	5.0
Endosulfan I	N.D.	5.0
Endosulfan II	N.D.	5.0
Endosulfan sulfate	N.D.	5.0
Endrin	N.D.	5.0
Endrin aldehyde	N.D.	5.0
Endrin Ketone	N.D.	5.0
Heptachlor	N.D.	5.0
Heptachlor epoxide	N.D.	5.0
Methoxychlor	N.D.	5.0
Toxaphene	N.D.	50.0
Surrogates:		
Compound	% Recovery	Limits
TCMX	75	38-106
DCBP	84	32-110

\*Dry Weight Basis  
N.D. = Not Detected

# Pesticide Laboratory Control Spike



<b>Date Collected: NA</b>				
<b>Sample Matrix: SOIL</b>				
<b>Subject: Pesticides</b>	Date Extracted			Date Analyzed
<b>Prep Method: EPA 3546</b>	11/15/2016			11/15/2016
<b>Analytical Method: EPA 8081B</b>				
Compound	Spike Amount ng/mL (ppb)	Recovery ng/mL (ppb)	Recovery %	Recovery Limits
alpha-BHC	40	33.7	84	50-132
gamma-BHC	40	35.0	88	54-128
beta-BHC	40	34.3	86	69-126
delta-BHC	40	36.9	92	40-126
Heptachlor	40	45.4	114	55-125
Aldrin	40	33.3	83	45-135
Heptachlor epoxide	40	34.0	85	54-127
gamma-Chlordane	40	33.7	84	55-124
alpha-Chlordane	40	34.4	86	54-126
4,4'-DDE	40	33.0	83	63-130
Endosulfan I	40	35.1	88	53-128
Dieldrin	40	34.2	86	57-124
Endrin	40	35.3	88	40-140
4,4'-DDD	40	36.6	92	74-140
Endosulfan II	40	38.4	96	45-125
4,4'-DDT	40	50.7	127	60-140
Endrin aldehyde	40	43.5	109	40-140
Methoxychlor	40	52.3	131	71-140
Endosulfan sulfate	40	44.7	112	43-131
Endrin Ketone	40	46.7	117	56-131
Surrogates:				
Compound	% Recovery	Limits		
TCMX	78	38-106		
DCBP	86	32-110		

<b>Sample: South-1</b>		Analyst's Initials: JD
<b>Case No.: C1111-18</b>		
<b>Date Collected: 11/10/16</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: TPH</b>		
<b>Prep Method: EPA 3546</b>	Date Extracted	Date Analyzed
<b>Analytical Method: EPA 8100 M</b>	11/17/2016	11/18/2016
Compound	Concentration, mg/kg* (ppm)	Reporting Limit mg/kg* (ppm)
Total Petroleum Hydrocarbons	123	27
Surrogates:		
Compound	% Recovery	Limits
Chlorooctadecane	106	62-151

<b>Sample: North-1</b>		Analyst's Initials: JD
<b>Case No.: C1111-18</b>		
<b>Date Collected: 11/10/16</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: TPH</b>		
<b>Prep Method: EPA 3546</b>	Date Extracted	Date Analyzed
<b>Analytical Method: EPA 8100 M</b>	11/17/2016	11/18/2016
Compound	Concentration, mg/kg* (ppm)	Reporting Limit mg/kg* (ppm)
Total Petroleum Hydrocarbons	300	28
Surrogates:		
Compound	% Recovery	Limits
Chlorooctadecane	132	62-151

ND = Not Detected

\*Dry Weight Basis



## **RESULTS: SEMIVOLATILE ORGANIC COMPOUNDS**

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1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.



South-1

Lab Name: New England Testing Laboratory Contract: ET+L Newb

Lab Code: RI010 Case No.: C1111-18 SAS No.: Strategi SDG No.: Strategic E

Matrix: (soil/water) SOIL Lab Sample ID: South-1

Sample wt/vol: 15.353 (g/ml) G Lab File ID: B111803.D

Level: (low/med) LOW Date Received: 11/11/2016

% Moisture: 12.47 decanted:(Y/N) N Date Extracted: 11/17/2016

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/18/2016

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

62-75-9	n-Nitrosodimethylamine	220	U
110-86-1	Pyridine	150	U
108-95-2	Phenol	150	U
62-53-3	Aniline	150	U
111-44-4	bis(2-Chloroethyl)ether	150	U
95-57-8	2-Chlorophenol	150	U
541-73-1	1,3-Dichlorobenzene	150	U
106-46-7	1,4-Dichlorobenzene	150	U
95-50-1	1,2-Dichlorobenzene	150	U
95-48-7	2-Methylphenol	150	U
108-60-1	2,2'-oxybis (1-chloropropane)	150	U
106-44-5	3- & 4-Methylphenol	300	U
621-64-7	n-Nitroso-di-n-propylamine	150	U
67-72-1	Hexachloroethane	150	U
98-95-3	Nitrobenzene	150	U
78-59-1	Isophorone	150	U
88-75-5	2-Nitrophenol	370	U
105-67-9	2,4-Dimethylphenol	740	U
65-85-0	Benzoic acid	1100	U
111-91-1	bis(2-Chloroethoxy)methane	150	U
120-83-2	2,4-Dichlorophenol	370	U
120-82-1	1,2,4-Trichlorobenzene	150	U
91-20-3	Naphthalene	150	U
106-47-8	4-Chloroaniline	150	U
87-68-3	Hexachlorobutadiene	150	U
59-50-7	4-Chloro-3-methylphenol	370	U
91-57-6	2-Methylnaphthalene	150	U
77-47-4	Hexachlorocyclopentadiene	150	U
88-06-2	2,4,6-Trichlorophenol	150	U
95-95-4	2,4,5-Trichlorophenol	150	U
91-58-7	2-Chloronaphthalene	150	U
88-74-4	2-Nitroaniline	150	U
131-11-3	Dimethyl phthalate	370	U
208-96-8	Acenaphthylene	180	
606-20-2	2,6-Dinitrotoluene	150	U
99-09-2	3-Nitroaniline	150	U
83-32-9	Acenaphthene	150	U

## SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

South-1

Lab Name: New England Testing Laboratory Contract: ET+L Newb  
 Lab Code: RI010 Case No.: C1111-18 SAS No.: Strategi SDG No.: Strategic E  
 Matrix: (soil/water) SOIL Lab Sample ID: South-1  
 Sample wt/vol: 15.353 (g/ml) G Lab File ID: B111803.D  
 Level: (low/med) LOW Date Received: 11/11/2016  
 % Moisture: 12.47 decanted:(Y/N) N Date Extracted: 11/17/2016  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/18/2016  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH:         

## CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

51-28-5	2,4-Dinitrophenol	370	U
100-02-7	4-Nitrophenol	370	U
132-64-9	Dibenzofuran	150	U
121-14-2	2,4-Dinitrotoluene	150	U
84-66-2	Diethyl phthalate	150	U
86-73-7	Fluorene	150	U
7005-72-3	4-Chlorophenyl phenyl ether	150	U
100-01-6	4-Nitroaniline	150	U
534-52-1	4,6-Dinitro-2-methylphenol	370	U
86-30-6	n-Nitrosodiphenylamine	150	U
101-55-3	4-Bromophenyl phenyl ether	150	U
118-74-1	Hexachlorobenzene	150	U
87-86-5	Pentachlorophenol	370	U
85-01-8	Phenanthrene	460	
120-12-7	Anthracene	160	
84-74-2	Di-n-butylphthalate	220	U
206-44-0	Fluoranthene	1100	
129-00-0	Pyrene	1300	
85-68-7	Butyl benzyl phthalate	150	U
91-94-1	3,3'-Dichlorobenzidine	370	U
56-55-3	Benzo(a)anthracene	770	
218-01-9	Chrysene	880	
117-81-7	bis(2-Ethylhexyl)phthalate	440	U
117-84-0	Di-n-octyl phthalate	220	U
205-99-2	Benzo(b)fluoranthene	960	
207-08-9	Benzo(k)fluoranthene	790	
50-32-8	Benzo(a)pyrene	900	
53-70-3	Dibenz(a,h)anthracene	170	
193-39-5	Indeno(1,2,3-cd)pyrene	630	
191-24-2	Benzo(g,h,i)perylene	570	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.



North-1

Lab Name: New England Testing Laboratory Contract: ET+L Newb

Lab Code: RI010 Case No.: C1111-18 SAS No.: Strategi SDG No.: Strategic E

Matrix: (soil/water) SOIL Lab Sample ID: North-1

Sample wt/vol: 16.236 (g/ml) G Lab File ID: B111804.D

Level: (low/med) LOW Date Received: 11/11/2016

% Moisture: 9.37 decanted:(Y/N) N Date Extracted: 11/17/2016

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/18/2016

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

62-75-9	n-Nitrosodimethylamine	200	U
110-86-1	Pyridine	140	U
108-95-2	Phenol	140	U
62-53-3	Aniline	140	U
111-44-4	bis(2-Chloroethyl)ether	140	U
95-57-8	2-Chlorophenol	140	U
541-73-1	1,3-Dichlorobenzene	140	U
106-46-7	1,4-Dichlorobenzene	140	U
95-50-1	1,2-Dichlorobenzene	140	U
95-48-7	2-Methylphenol	140	U
108-60-1	2,2'-oxybis (1-chloropropane)	140	U
106-44-5	3- & 4-Methylphenol	270	U
621-64-7	n-Nitroso-di-n-propylamine	140	U
67-72-1	Hexachloroethane	140	U
98-95-3	Nitrobenzene	140	U
78-59-1	Isophorone	140	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	680	U
65-85-0	Benzoic acid	1000	U
111-91-1	bis(2-Chloroethoxy)methane	140	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	140	U
91-20-3	Naphthalene	180	
106-47-8	4-Chloroaniline	140	U
87-68-3	Hexachlorobutadiene	140	U
59-50-7	4-Chloro-3-methylphenol	340	U
91-57-6	2-Methylnaphthalene	170	
77-47-4	Hexachlorocyclopentadiene	140	U
88-06-2	2,4,6-Trichlorophenol	140	U
95-95-4	2,4,5-Trichlorophenol	140	U
91-58-7	2-Chloronaphthalene	140	U
88-74-4	2-Nitroaniline	140	U
131-11-3	Dimethyl phthalate	340	U
208-96-8	Acenaphthylene	290	
606-20-2	2,6-Dinitrotoluene	140	U
99-09-2	3-Nitroaniline	140	U
83-32-9	Acenaphthene	190	

## SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

North-1

Lab Name: New England Testing Laboratory Contract: ET+L Newb  
 Lab Code: RI010 Case No.: C1111-18 SAS No.: Strategi SDG No.: Strategic E  
 Matrix: (soil/water) SOIL Lab Sample ID: North-1  
 Sample wt/vol: 16.236 (g/ml) G Lab File ID: B111804.D  
 Level: (low/med) LOW Date Received: 11/11/2016  
 % Moisture: 9.37 decanted:(Y/N) N Date Extracted: 11/17/2016  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/18/2016  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH:         

## CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

51-28-5	2,4-Dinitrophenol	340	U
100-02-7	4-Nitrophenol	340	U
132-64-9	Dibenzofuran	230	
121-14-2	2,4-Dinitrotoluene	140	U
84-66-2	Diethyl phthalate	140	U
86-73-7	Fluorene	320	
7005-72-3	4-Chlorophenyl phenyl ether	140	U
100-01-6	4-Nitroaniline	140	U
534-52-1	4,6-Dinitro-2-methylphenol	340	U
86-30-6	n-Nitrosodiphenylamine	140	U
101-55-3	4-Bromophenyl phenyl ether	140	U
118-74-1	Hexachlorobenzene	140	U
87-86-5	Pentachlorophenol	340	U
85-01-8	Phenanthrene	3300	
120-12-7	Anthracene	830	
84-74-2	Di-n-butylphthalate	200	U
206-44-0	Fluoranthene	4200	
129-00-0	Pyrene	4400	
85-68-7	Butyl benzyl phthalate	140	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)anthracene	2400	
218-01-9	Chrysene	2300	
117-81-7	bis(2-Ethylhexyl)phthalate	410	U
117-84-0	Di-n-octyl phthalate	200	U
205-99-2	Benzo(b)fluoranthene	2000	
207-08-9	Benzo(k)fluoranthene	1800	
50-32-8	Benzo(a)pyrene	2200	
53-70-3	Dibenz(a,h)anthracene	390	
193-39-5	Indeno(1,2,3-cd)pyrene	1500	
191-24-2	Benzo(g,h,i)perylene	1400	

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.



**BSS111716**

Lab Name: New England Testing Laboratory Contract: ET+L Newb  
 Lab Code: RI010 Case No.: C1111-18 SAS No.: Strategi SDG No.: Strategic E  
 Matrix: (soil/water) SOIL Lab Sample ID: BSS111716  
 Sample wt/vol: 15 (g/ml) G Lab File ID: B111704.D  
 Level: (low/med) LOW Date Received: 11/11/2016  
 % Moisture: 0 decanted:(Y/N) N Date Extracted: 11/17/2016  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/17/2016  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

62-75-9	n-Nitrosodimethylamine	200	U
110-86-1	Pyridine	130	U
108-95-2	Phenol	130	U
62-53-3	Aniline	130	U
111-44-4	bis(2-Chloroethyl)ether	130	U
95-57-8	2-Chlorophenol	130	U
541-73-1	1,3-Dichlorobenzene	130	U
106-46-7	1,4-Dichlorobenzene	130	U
95-50-1	1,2-Dichlorobenzene	130	U
95-48-7	2-Methylphenol	130	U
108-60-1	2,2'-oxybis (1-chloropropane)	130	U
106-44-5	3- & 4-Methylphenol	270	U
621-64-7	n-Nitroso-di-n-propylamine	130	U
67-72-1	Hexachloroethane	130	U
98-95-3	Nitrobenzene	130	U
78-59-1	Isophorone	130	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	670	U
65-85-0	Benzoic acid	1000	U
111-91-1	bis(2-Chloroethoxy)methane	130	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	130	U
91-20-3	Naphthalene	130	U
106-47-8	4-Chloroaniline	130	U
87-68-3	Hexachlorobutadiene	130	U
59-50-7	4-Chloro-3-methylphenol	330	U
91-57-6	2-Methylnaphthalene	130	U
77-47-4	Hexachlorocyclopentadiene	130	U
88-06-2	2,4,6-Trichlorophenol	130	U
95-95-4	2,4,5-Trichlorophenol	130	U
91-58-7	2-Chloronaphthalene	130	U
88-74-4	2-Nitroaniline	130	U
131-11-3	Dimethyl phthalate	330	U
208-96-8	Acenaphthylene	130	U
606-20-2	2,6-Dinitrotoluene	130	U
99-09-2	3-Nitroaniline	130	U
83-32-9	Acenaphthene	130	U

1C  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.



**BSS111716**

Lab Name: New England Testing Laboratory Contract: ET+L Newb  
 Lab Code: RI010 Case No.: C1111-18 SAS No.: Strategi SDG No.: Strategic E  
 Matrix: (soil/water) SOIL Lab Sample ID: BSS111716  
 Sample wt/vol: 15 (g/ml) G Lab File ID: B111704.D  
 Level: (low/med) LOW Date Received: 11/11/2016  
 % Moisture: 0 decanted:(Y/N) N Date Extracted: 11/17/2016  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/17/2016  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

51-28-5	2,4-Dinitrophenol	330	U
100-02-7	4-Nitrophenol	330	U
132-64-9	Dibenzofuran	130	U
121-14-2	2,4-Dinitrotoluene	130	U
84-66-2	Diethyl phthalate	130	U
86-73-7	Fluorene	130	U
7005-72-3	4-Chlorophenyl phenyl ether	130	U
100-01-6	4-Nitroaniline	130	U
534-52-1	4,6-Dinitro-2-methylphenol	330	U
86-30-6	n-Nitrosodiphenylamine	130	U
101-55-3	4-Bromophenyl phenyl ether	130	U
118-74-1	Hexachlorobenzene	130	U
87-86-5	Pentachlorophenol	330	U
85-01-8	Phenanthrene	130	U
120-12-7	Anthracene	130	U
84-74-2	Di-n-butylphthalate	200	U
206-44-0	Fluoranthene	130	U
129-00-0	Pyrene	130	U
85-68-7	Butyl benzyl phthalate	130	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)anthracene	130	U
218-01-9	Chrysene	130	U
117-81-7	bis(2-Ethylhexyl)phthalate	400	U
117-84-0	Di-n-octyl phthalate	200	U
205-99-2	Benzo(b)fluoranthene	130	U
207-08-9	Benzo(k)fluoranthene	130	U
50-32-8	Benzo(a)pyrene	130	U
53-70-3	Dibenz(a,h)anthracene	130	U
193-39-5	Indeno(1,2,3-cd)pyrene	130	U
191-24-2	Benzo(g,h,i)perylene	130	U

## SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: New England Testing Laboratory Contract: ET+L NewburyporLab Code: RI010 Case No.: C1111-18 SAS No.: Strategi SDG No.: Strategic ELevel: (low/med) LOW

	EPA SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	TOT OUT
01	BSS111716	70	73	76	82	81	118	0
02	LSS111716	79	83	85	87	100	122	0
03	SOUTH-1	83	85	90	96	105	117	0
04	NORTH-1	83	86	89	96	105	125	0

## QC LIMITS

S1	=	2-Fluorophenol	(30-130)
S2	=	Phenol-d6	(30-130)
S3	=	Nitrobenzene-d5	(30-130)
S4	=	2-Fluorobiphenyl	(30-130)
S5	=	2,4,6-Tribromophenol	(30-130)
S6	=	Terphenyl-d14	(30-130)

# Column to be used to flag recovery values

\* Values outside of contract required QC limits

D Surrogate diluted out



## Semivolatile Laboratory Control Spike

Date Extracted: 11/17/2016

Date Analyzed: 11/17/2016

	Amount Spiked	Result,	Recovery	Lower Recovery	Upper Recovery
	ug/Kg	ug/Kg	%	Limit	Limit
n-Nitrosodimethylamine	3333	2121	64	40	130
Phenol	3333	2789	84	40	130
Aniline	3333	2266	68	40	130
bis(2-Chloroethyl)ether	3333	3027	91	40	130
2-Chlorophenol	3333	2865	86	40	130
1,3-Dichlorobenzene	3333	2674	80	40	130
1,4-Dichlorobenzene	3333	2709	81	40	130
1,2-Dichlorobenzene	3333	2725	82	40	130
2-Methylphenol	3333	2780	83	40	130
3- & 4-Methylphenol	3333	3060	92	40	130
n-Nitroso-di-n-propylamine	3333	2853	86	40	130
Hexachloroethane	3333	1545	46	40	130
Nitrobenzene	3333	2948	88	40	130
Isophorone	3333	3126	94	40	130
2-Nitrophenol	3333	2848	85	40	130
2,4-Dimethylphenol	3333	2900	87	40	130
bis(2-Chloroethoxy)methane	3333	3206	96	40	130
2,4-Dichlorophenol	3333	2963	89	40	130
1,2,4-Trichlorobenzene	3333	2851	86	40	130
Naphthalene	3333	2864	86	40	130
Hexachlorobutadiene	3333	2146	64	40	130
4-Chloro-3-methylphenol	3333	3273	98	40	130
2-Methylnaphthalene	3333	2924	88	40	130
2,4,6-Trichlorophenol	3333	3079	92	40	130
2,4,5-Trichlorophenol	3333	2884	87	40	130
2-Chloronaphthalene	3333	2992	90	40	130
2-Nitroaniline	3333	3219	97	40	130
Dimethyl phthalate	3333	3398	102	40	130
Acenaphthylene	3333	3008	90	40	130
2,6-Dinitrotoluene	3333	3346	100	40	130
Acenaphthene	3333	2965	89	40	130
4-Nitrophenol	3333	3558	107	40	130
Dibenzofuran	3333	3087	93	40	130
2,4-Dinitrotoluene	3333	3412	102	40	130
Diethyl phthalate	3333	3358	101	40	130
Fluorene	3333	3188	96	40	130

## Semivolatile Soil Laboratory Control Spike

Date Extracted: 11/17/2016

Date Analyzed: 11/17/2016

	Amount Spiked	Result,	Recovery	Lower Recovery	Upper Recovery
	ug/Kg	ug/Kg	%	Limit	Limit
4-Chlorophenyl phenyl ether	3333	3190	96	40	130
4-Bromophenyl phenyl ether	3333	3383	101	40	130
Hexachlorobenzene	3333	3283	98	40	130
Pentachlorophenol	3333	2972	89	40	130
Phenanthrene	3333	3292	99	40	130
Anthracene	3333	3292	99	40	130
Di-n-butylphthalate	3333	3291	99	40	130
Fluoranthene	3333	3410	102	40	130
Pyrene	3333	2930	88	40	130
Butyl benzyl phthalate	3333	3846	115	40	130
Benzo(a)anthracene	3333	3520	106	40	130
Chrysene	3333	3484	105	40	130
bis(2-Ethylhexyl)phthalate	3333	4097	123	40	130
Di-n-octyl phthalate	3333	4244	127	40	130
Benzo(b)fluoranthene	3333	3903	117	40	130
Benzo(k)fluoranthene	3333	3777	113	40	130
Benzo(a)pyrene	3333	3734	112	40	130
Indeno(1,2,3-cd)pyrene	3333	3656	110	40	130
Dibenz(a,h)anthracene	3333	3761	113	40	130
Benzo(g,h,i)perylene	3333	3661	110	40	130

## **RESULTS: VOLATILE ORGANIC COMPOUNDS**

The presence of the NETLAB LOGO in the top right corner of each page in this section indicates:

The Technical Manager of the Organics Analysis Department certifies that the samples included in this section have been prepared and analyzed using the procedures cited and that the results have been reviewed and approved. Any exceptions or qualifications of substance have been reported in the case narrative.

# VOLATILE ORGANICS ANALYSIS DATA SHEET

Case No.: C1111-18 Client Name: Strategic Environmental  
 Method: 8260 Lab Sample ID: SOUTH-1  
 Matrix: (soil/water) SOIL Lab File ID: C111708.D  
 Sample wt/vol: 20.5 (g/ml) G Date Sampled: 11/10/2016  
 % Moisture 9.37 Date Analyzed: 11/17/2016  
 Soil Extract Volume:            (uL) Dilution Factor: 1.0  
 Analyst's Initials: KC Soil Aliquot Volume:            (uL)

CAS NO.	COMPOUND	UNITS: <u>UG/KG</u>	Q
75-01-4	Vinyl Chloride	27	U
74-83-9	Bromomethane	27	U
75-00-3	Chloroethane	27	U
67-64-1	Acetone	130	U
75-35-4	1,1-Dichloroethene	27	U
75-15-0	Carbon Disulfide	27	U
75-09-2	Methylene Chloride	54	U
1634-04-4	tert-Butyl methyl ether	27	U
156-60-5	trans-1,2 Dichloroethene	27	U
75-34-3	1,1-Dichloroethane	27	U
78-93-3	2-Butanone	270	U
594-20-7	2,2-Dichloropropane	27	U
156-59-2	cis-1,2-Dichloroethene	27	U
67-66-3	Chloroform	27	U
74-97-5	Bromochloromethane	27	U
71-55-6	1,1,1-Trichloroethane	27	U
563-58-6	1,1-Dichloropropene	27	U
56-23-5	Carbon Tetrachloride	27	U
71-43-2	Benzene	27	U
107-06-2	1,2-Dichloroethane	27	U
79-01-6	Trichloroethene	27	U
78-87-5	1,2-Dichloropropane	27	U
75-27-4	Bromodichloromethane	27	U
74-95-3	Dibromomethane	27	U
108-10-1	4-Methyl-2-pentanone	130	U
106-93-4	Ethylene Dibromide	27	U
108-88-3	Toluene	27	U
10061-01-5	cis-1,3-Dichloropropene	27	U
10061-02-6	Trans-1,3-Dichloropropene	27	U
79-00-5	1,1,2-Trichloroethane	27	U
591-78-6	2-Hexanone	130	U
127-18-4	Tetrachloroethene	27	U
124-48-1	Chlorodibromomethane	27	U
108-90-7	Chlorobenzene	27	U
630-20-6	1,1,1,2-Tetrachloroethane	27	U

U=not detected, D=diluted, E=over range (another data sheet is included), J=below limit, B=found in blank

New England Testing Laboratory, Inc.

# VOLATILE ORGANICS ANALYSIS DATA SHEET

Case No.: C1111-18 Client Name: Strategic Environmental  
 Method: 8260 Lab Sample ID: SOUTH-1  
 Matrix: (soil/water) SOIL Lab File ID: C111708.D  
 Sample wt/vol: 20.5 (g/ml) G Date Sampled: 11/10/2016  
 % Moisture 9.37 Date Analyzed: 11/17/2016  
 Soil Extract Volume:                      (uL) Dilution Factor: 1.0  
 Analyst's Initials: KC Soil Aliquot Volume:                      (uL)

CAS NO.	COMPOUND	UNITS: <u>UG/KG</u>	Q
100-41-4	Ethylbenzene	27	U
1330-20-7	m & p-Xylene	54	U
95-47-6	o-Xylene	27	U
100-42-5	Styrene	27	U
75-25-2	Bromoform	27	U
98-82-8	Isopropylbenzene	27	U
79-34-5	1,1,2,2-Tetrachloroethane	27	U
108-86-1	Bromobenzene	27	U
96-18-4	1,2,3-Trichloropropane	27	U
95-49-8	2-Chlorotoluene	27	U
103-65-1	n-Propylbenzene	27	U
108-67-8	1,3,5-Trimethylbenzene	27	U
106-43-4	4-Chlorotoluene	27	U
98-06-6	tert-Butylbenzene	27	U
95-63-6	1,2,4-Trimethylbenzene	27	U
135-98-8	sec-Butylbenzene	27	U
99-87-6	p-Isopropyltoluene	27	U
75-87-3	Chloromethane	27	U
75-65-0	tert butyl alcohol	540	U
541-73-1	1,3-Dichlorobenzene	27	U
109-99-9	Tetrahydrofuran	540	U
106-46-7	1,4-Dichlorobenzene	27	U
60-29-7	Diethyl Ether	27	U
104-51-8	n-Butylbenzene	27	U
95-50-1	1,2-Dichlorobenzene	27	U
96-12-8	1,2-Dibromo-3-chloropropane	27	U
120-82-1	1,2,4-Trichlorobenzene	27	U
87-68-3	Hexachlorobutadiene	27	U
91-20-3	Naphthalene	27	U
87-61-6	1,2,3-Trichlorobenzene	27	U
994-05-8	Tert-amyl Methyl Ether	27	U
75-71-8	Dichlorodifluoromethane	27	U
142-28-9	1,3-Dichloropropane	27	U
75-69-4	Trichlorofluoromethane	27	U
637-92-3	Ethyl Tert-butyl ether	27	U

U=not detected, D=diluted, E=over range (another data sheet is included), J=below limit, B=found in blank

New England Testing Laboratory, Inc.

# VOLATILE ORGANICS ANALYSIS DATA SHEET

Case No.: C1111-18 Client Name: Strategic Environmental  
 Method: 8260 Lab Sample ID: SOUTH-1  
 Matrix: (soil/water) SOIL Lab File ID: C111708.D  
 Sample wt/vol: 20.5 (g/ml) G Date Sampled: 11/10/2016  
 % Moisture 9.37 Date Analyzed: 11/17/2016  
 Soil Extract Volume: \_\_\_\_\_ (uL) Dilution Factor: 1.0  
 Analyst's Initials: KC Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	UNITS: <u>UG/KG</u>	Q
108-20-3	Diisopropyl Ether	27	U
123-91-1	1,4-Dioxane	13000	U

U=not detected, D=diluted, E=over range (another data sheet is included), J=below limit, B=found in blank

New England Testing Laboratory, Inc.

# VOLATILE ORGANICS ANALYSIS DATA SHEET

Case No.: C1111-18 Client Name: Strategic Environmental  
 Method: 8260 Lab Sample ID: NORTH-1  
 Matrix: (soil/water) SOIL Lab File ID: C111709.D  
 Sample wt/vol: 17.3 (g/ml) G Date Sampled: 11/10/2016  
 % Moisture 12.45 Date Analyzed: 11/17/2016  
 Soil Extract Volume: \_\_\_\_\_ (uL) Dilution Factor: 1.0  
 Analyst's Initials: KC Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	UNITS: <u>UG/KG</u>	Q
75-01-4	Vinyl Chloride	33	U
74-83-9	Bromomethane	33	U
75-00-3	Chloroethane	33	U
67-64-1	Acetone	160	U
75-35-4	1,1-Dichloroethene	33	U
75-15-0	Carbon Disulfide	33	U
75-09-2	Methylene Chloride	66	U
1634-04-4	tert-Butyl methyl ether	33	U
156-60-5	trans-1,2 Dichloroethene	33	U
75-34-3	1,1-Dichloroethane	33	U
78-93-3	2-Butanone	330	U
594-20-7	2,2-Dichloropropane	33	U
156-59-2	cis-1,2-Dichloroethene	33	U
67-66-3	Chloroform	33	U
74-97-5	Bromochloromethane	33	U
71-55-6	1,1,1-Trichloroethane	33	U
563-58-6	1,1-Dichloropropene	33	U
56-23-5	Carbon Tetrachloride	33	U
71-43-2	Benzene	33	U
107-06-2	1,2-Dichloroethane	33	U
79-01-6	Trichloroethene	33	U
78-87-5	1,2-Dichloropropane	33	U
75-27-4	Bromodichloromethane	33	U
74-95-3	Dibromomethane	33	U
108-10-1	4-Methyl-2-pentanone	160	U
106-93-4	Ethylene Dibromide	33	U
108-88-3	Toluene	33	U
10061-01-5	cis-1,3-Dichloropropene	33	U
10061-02-6	Trans-1,3-Dichloropropene	33	U
79-00-5	1,1,2-Trichloroethane	33	U
591-78-6	2-Hexanone	160	U
127-18-4	Tetrachloroethene	33	U
124-48-1	Chlorodibromomethane	33	U
108-90-7	Chlorobenzene	33	U
630-20-6	1,1,1,2-Tetrachloroethane	33	U

U=not detected, D=diluted, E=over range (another data sheet is included), J=below limit, B=found in blank

New England Testing Laboratory, Inc.

# VOLATILE ORGANICS ANALYSIS DATA SHEET

Case No.: C1111-18 Client Name: Strategic Environmental  
 Method: 8260 Lab Sample ID: NORTH-1  
 Matrix: (soil/water) SOIL Lab File ID: C111709.D  
 Sample wt/vol: 17.3 (g/ml) G Date Sampled: 11/10/2016  
 % Moisture 12.45 Date Analyzed: 11/17/2016  
 Soil Extract Volume: \_\_\_\_\_ (uL) Dilution Factor: 1.0  
 Analyst's Initials: KC Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	UNITS: <u>UG/KG</u>	Q
100-41-4	Ethylbenzene	33	U
1330-20-7	m & p-Xylene	66	U
95-47-6	o-Xylene	33	U
100-42-5	Styrene	33	U
75-25-2	Bromoform	33	U
98-82-8	Isopropylbenzene	33	U
79-34-5	1,1,2,2-Tetrachloroethane	33	U
108-86-1	Bromobenzene	33	U
96-18-4	1,2,3-Trichloropropane	33	U
95-49-8	2-Chlorotoluene	33	U
103-65-1	n-Propylbenzene	33	U
108-67-8	1,3,5-Trimethylbenzene	33	U
106-43-4	4-Chlorotoluene	33	U
98-06-6	tert-Butylbenzene	33	U
95-63-6	1,2,4-Trimethylbenzene	33	U
135-98-8	sec-Butylbenzene	33	U
99-87-6	p-Isopropyltoluene	33	U
75-87-3	Chloromethane	33	U
75-65-0	tert butyl alcohol	660	U
541-73-1	1,3-Dichlorobenzene	33	U
109-99-9	Tetrahydrofuran	660	U
106-46-7	1,4-Dichlorobenzene	33	U
60-29-7	Diethyl Ether	33	U
104-51-8	n-Butylbenzene	33	U
95-50-1	1,2-Dichlorobenzene	33	U
96-12-8	1,2-Dibromo-3-chloropropane	33	U
120-82-1	1,2,4-Trichlorobenzene	33	U
87-68-3	Hexachlorobutadiene	33	U
91-20-3	Naphthalene	33	U
87-61-6	1,2,3-Trichlorobenzene	33	U
994-05-8	Tert-amyl Methyl Ether	33	U
75-71-8	Dichlorodifluoromethane	33	U
142-28-9	1,3-Dichloropropane	33	U
75-69-4	Trichlorofluoromethane	33	U
637-92-3	Ethyl Tert-butyl ether	33	U

U=not detected, D=diluted, E=over range (another data sheet is included), J=below limit, B=found in blank

New England Testing Laboratory, Inc.



# VOLATILE ORGANICS ANALYSIS DATA SHEET

Case No.: C1111-18 Client Name: Strategic Environmental  
 Method: 8260 Lab Sample ID: NORTH-1  
 Matrix: (soil/water) SOIL Lab File ID: C111709.D  
 Sample wt/vol: 17.3 (g/ml) G Date Sampled: 11/10/2016  
 % Moisture 12.45 Date Analyzed: 11/17/2016  
 Soil Extract Volume: \_\_\_\_\_ (uL) Dilution Factor: 1.0  
 Analyst's Initials: KC Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	UNITS: <u>UG/KG</u>	Q
108-20-3	Diisopropyl Ether	33	U
123-91-1	1,4-Dioxane	16000	U

U=not detected, D=diluted, E=over range (another data sheet is included), J=below limit, B=found in blank

New England Testing Laboratory, Inc.

# VOLATILE ORGANICS ANALYSIS DATA SHEET

Case No.: C1111-18 Client Name: Strategic Environmental  
 Method: 8260 Lab Sample ID: VBLANK 111816  
 Matrix: (soil/water) SOIL Lab File ID: C111707.D  
 Sample wt/vol: 10.0 (g/ml) G Date Sampled: 11/10/2016  
 % Moisture 0 Date Analyzed: 11/17/2016  
 Soil Extract Volume:            (uL) Dilution Factor: 1.0  
 Analyst's Initials: KC Soil Aliquot Volume:            (uL)

CAS NO.	COMPOUND	UNITS: <u>UG/KG</u>	Q
75-01-4	Vinyl Chloride	50	U
74-83-9	Bromomethane	50	U
75-00-3	Chloroethane	50	U
67-64-1	Acetone	250	U
75-35-4	1,1-Dichloroethene	50	U
75-15-0	Carbon Disulfide	50	U
75-09-2	Methylene Chloride	100	U
1634-04-4	tert-Butyl methyl ether	50	U
156-60-5	trans-1,2 Dichloroethene	50	U
75-34-3	1,1-Dichloroethane	50	U
78-93-3	2-Butanone	500	U
594-20-7	2,2-Dichloropropane	50	U
156-59-2	cis-1,2-Dichloroethene	50	U
67-66-3	Chloroform	50	U
74-97-5	Bromochloromethane	50	U
71-55-6	1,1,1-Trichloroethane	50	U
563-58-6	1,1-Dichloropropene	50	U
56-23-5	Carbon Tetrachloride	50	U
71-43-2	Benzene	50	U
107-06-2	1,2-Dichloroethane	50	U
79-01-6	Trichloroethene	50	U
78-87-5	1,2-Dichloropropane	50	U
75-27-4	Bromodichloromethane	50	U
74-95-3	Dibromomethane	50	U
108-10-1	4-Methyl-2-pentanone	250	U
106-93-4	Ethylene Dibromide	50	U
108-88-3	Toluene	50	U
10061-01-5	cis-1,3-Dichloropropene	50	U
10061-02-6	Trans-1,3-Dichloropropene	50	U
79-00-5	1,1,2-Trichloroethane	50	U
591-78-6	2-Hexanone	250	U
127-18-4	Tetrachloroethene	50	U
124-48-1	Chlorodibromomethane	50	U
108-90-7	Chlorobenzene	50	U
630-20-6	1,1,1,2-Tetrachloroethane	50	U

U=not detected, D=diluted, E=over range (another data sheet is included), J=below limit, B=found in blank

New England Testing Laboratory, Inc.

# VOLATILE ORGANICS ANALYSIS DATA SHEET

Case No.: C1111-18 Client Name: Strategic Environmental  
 Method: 8260 Lab Sample ID: VBLANK 111816  
 Matrix: (soil/water) SOIL Lab File ID: C111707.D  
 Sample wt/vol: 10.0 (g/ml) G Date Sampled: 11/10/2016  
 % Moisture 0 Date Analyzed: 11/17/2016  
 Soil Extract Volume:                      (uL) Dilution Factor: 1.0  
 Analyst's Initials: KC Soil Aliquot Volume:                      (uL)

CAS NO.	COMPOUND	UNITS: <u>UG/KG</u>	Q
100-41-4	Ethylbenzene	50	U
1330-20-7	m & p-Xylene	100	U
95-47-6	o-Xylene	50	U
100-42-5	Styrene	50	U
75-25-2	Bromoform	50	U
98-82-8	Isopropylbenzene	50	U
79-34-5	1,1,2,2-Tetrachloroethane	50	U
108-86-1	Bromobenzene	50	U
96-18-4	1,2,3-Trichloropropane	50	U
95-49-8	2-Chlorotoluene	50	U
103-65-1	n-Propylbenzene	50	U
108-67-8	1,3,5-Trimethylbenzene	50	U
106-43-4	4-Chlorotoluene	50	U
98-06-6	tert-Butylbenzene	50	U
95-63-6	1,2,4-Trimethylbenzene	50	U
135-98-8	sec-Butylbenzene	50	U
99-87-6	p-Isopropyltoluene	50	U
75-87-3	Chloromethane	50	U
75-65-0	tert butyl alcohol	1000	U
541-73-1	1,3-Dichlorobenzene	50	U
109-99-9	Tetrahydrofuran	1000	U
106-46-7	1,4-Dichlorobenzene	50	U
60-29-7	Diethyl Ether	50	U
104-51-8	n-Butylbenzene	50	U
95-50-1	1,2-Dichlorobenzene	50	U
96-12-8	1,2-Dibromo-3-chloropropane	50	U
120-82-1	1,2,4-Trichlorobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
91-20-3	Naphthalene	50	U
87-61-6	1,2,3-Trichlorobenzene	50	U
994-05-8	Tert-amyl Methyl Ether	50	U
75-71-8	Dichlorodifluoromethane	50	U
142-28-9	1,3-Dichloropropane	50	U
75-69-4	Trichlorofluoromethane	50	U
637-92-3	Ethyl Tert-butyl ether	50	U

U=not detected, D=diluted, E=over range (another data sheet is included), J=below limit, B=found in blank

New England Testing Laboratory, Inc.

# VOLATILE ORGANICS ANALYSIS DATA SHEET

Case No.: C1111-18 Client Name: Strategic Environmental  
 Method: 8260 Lab Sample ID: VBLANK 111816  
 Matrix: (soil/water) SOIL Lab File ID: C111707.D  
 Sample wt/vol: 10.0 (g/ml) G Date Sampled: 11/10/2016  
 % Moisture 0 Date Analyzed: 11/17/2016  
 Soil Extract Volume: \_\_\_\_\_ (uL) Dilution Factor: 1.0  
 Analyst's Initials: KC Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	UNITS: <u>UG/KG</u>	Q
108-20-3	Diisopropyl Ether	50	U
123-91-1	1,4-Dioxane	25000	U

U=not detected, D=diluted, E=over range (another data sheet is included), J=below limit, B=found in blank

New England Testing Laboratory, Inc.

2B

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: New England Testing Laboratory Contract: 15-754

Lab Code: RI010 Case No.: C1111-18 SAS No.: Strategi SDG No.: Strategic E

Level: (low/med) MED

	EPA SAMPLE NO.	SMC1 #	SMC2 #	SMC3 #	TOT OUT
01	LCS 111816	100	102	94	0
02	VBANK 111816	90	100	101	0
03	SOUTH-1	86	95	99	0
04	NORTH-1	88	100	111	0

QC LIMITS

SMC1	=	4-Bromofluorobenzene	(70-130)
SMC2	=	Toluene-D8	(70-130)
SMC3	=	1,2-Dichloroethane-D4	(70-130)

# Column to be used to flag recovery values

\* Values outside of contract required QC limits

D System Monitoring Compound diluted out

New England Testing Laboratory, Inc.

# Volatile Organics Laboratory Control Spike

Date Analyzed: 11/17/2016

Sample ID: LCS 111816

Compound	Spike Added	Spike Result	Recovery, %	Lower Control Limit, %	Upper Control Limit, %
1,1-Dichloroethene	50.0	62.1	124	70	129
Benzene	50.0	48.7	97	73	129
Trichloroethene	50.0	48.8	98	77	122
Toluene	50.0	46.4	93	75	123
Chlorobenzene	50.0	42.4	85	73	125

**1-888-863-8522**

# Chain of Custody Record

C1111-18

[illegible]



## **REPORT OF ANALYTICAL RESULTS**

**NETLAB Case Number C1122-20**

Prepared for:

Strategic Environmental Services  
362 Putnam Hill Rd  
Sutton, MA 01590

Report Date: December 2, 2016

Director  
New England Testing Laboratory, Inc.  
Lab # RI010

**NEW ENGLAND TESTING LABORATORY, INC.**

59 Greenhill Street, West Warwick, RI 02893

(401) 353-3420



## MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc.

Project #: 15-0754

Project Location: Newburyport

RTN:

**This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):**  
**C1122-20**

Matrices: Groundwater/Surface Water   x Soil/Sediment   Drinking Water   Air   Other: \_\_\_\_\_

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

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

**Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status**

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

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

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

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

<sup>1</sup>All negative responses must be addressed in an attached laboratory narrative.

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

**Signature:** 

**Position:** Laboratory Director

**Printed Name:** Richard Warila

**Date:** 12/2/2016

## **SAMPLES SUBMITTED and REQUEST FOR ANALYSIS:**

The samples listed in Table I were submitted to New England Testing Laboratory on November 22, 2016. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is C1122-20.

Custody records are included in this report.

**Project: 15-0754 – Newburyport**

**TABLE I, Samples Submitted**

Sample ID	Date Sampled	Matrix	Analysis Requested
S-1	11/10/2016	Soil	Table II
S-2	11/10/2016	Soil	Table II
S-3	11/10/2016	Soil	Table II
S-4	11/10/2016	Soil	Table II
S-5	11/10/2016	Soil	Table II
S-6	11/10/2016	Soil	Table II
S-7	11/10/2016	Soil	Table II
S-8	11/10/2016	Soil	Table II
S-9	11/10/2016	Soil	Table II
S-10	11/10/2016	Soil	Table II
S-11	11/10/2016	Soil	Table II

**TABLE II, Analysis and Methods**

ANALYSIS	PREPARATION METHOD	DETERMINATIVE METHOD
Total Metals		
Arsenic	3050B	6010C
PCB's	3546	8082A

These methods are documented in:

*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, USEPA/OSW.*



## **CASE NARRATIVE:**

### Sample Receipt

The samples were all appropriately cooled and preserved upon receipt. The samples were received in the appropriate containers. The chain of custody was adequately completed and corresponded to the samples submitted.

### Metals

All analyses were performed according to NETLAB's documented Standard Operating Procedures, within all required holding times, and with appropriate quality control measures. All QC was within laboratory established acceptance criteria. The samples were received, processed, and reported with no anomalies.

### PCBs

All samples were extracted and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

## METALS RESULTS

The presence of the NETLAB LOGO in the top right corner of each page in this section indicates:

The Technical Manager of the Metals Analysis Department certifies that the results included in this section have been reviewed and approved. Any exceptions or qualifications of substance have been reported in the case narrative.

New England Testing Laboratory, Inc.

# METALS RESULTS



Case Number: C1122-20  
 Sample ID: S-1  
 Date collected: 11/10/16  
 Matrix: SOIL  
 Solids, %: 92.78  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Arsenic	7440-38-2	3051A	6010C	22.1	0.95	mg/kg	11/30/16	12/1/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: C1122-20  
 Sample ID: S-2  
 Date collected: 11/10/16  
 Matrix: SOIL  
 Solids, %: 92.25  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Arsenic	7440-38-2	3051A	6010C	17.2	1.07	mg/kg	11/30/16	12/1/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: C1122-20  
 Sample ID: S-3  
 Date collected: 11/10/16  
 Matrix: SOIL  
 Solids, %: 90.24  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Arsenic	7440-38-2	3051A	6010C	16.3	1.06	mg/kg	11/30/16	12/1/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: C1122-20  
 Sample ID: S-4  
 Date collected: 11/10/16  
 Matrix: SOIL  
 Solids, %: 92.17  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Arsenic	7440-38-2	3051A	6010C	16.4	1.06	mg/kg	11/30/16	12/1/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.



# METALS RESULTS



Case Number: C1122-20  
 Sample ID: S-5  
 Date collected: 11/10/16  
 Matrix: SOIL  
 Solids, %: 93.61  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Arsenic	7440-38-2	3051A	6010C	36.3	0.96	mg/kg	11/30/16	12/1/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: C1122-20  
Sample ID: S-6  
Date collected: 11/10/16  
Matrix: SOIL  
Solids, %: 89.74  
Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Arsenic	7440-38-2	3051A	6010C	31.9	1.05	mg/kg	11/30/16	12/1/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: C1122-20  
 Sample ID: S-7  
 Date collected: 11/10/16  
 Matrix: SOIL  
 Solids, %: 91.98  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Arsenic	7440-38-2	3051A	6010C	21.6	0.98	mg/kg	11/30/16	12/1/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: C1122-20  
 Sample ID: S-8  
 Date collected: 11/10/16  
 Matrix: SOIL  
 Solids, %: 94.15  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Arsenic	7440-38-2	3051A	6010C	14.7	1.04	mg/kg	11/30/16	12/1/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: C1122-20  
 Sample ID: S-9  
 Date collected: 11/10/16  
 Matrix: SOIL  
 Solids, %: 91.54  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Arsenic	7440-38-2	3051A	6010C	31.7	0.99	mg/kg	11/30/16	12/1/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: C1122-20  
 Sample ID: S-10  
 Date collected: 11/10/16  
 Matrix: SOIL  
 Solids, %: 85.66  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Arsenic	7440-38-2	3051A	6010C	16.1	1.15	mg/kg	11/30/16	12/1/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: C1122-20  
 Sample ID: S-11  
 Date collected: 11/10/16  
 Matrix: SOIL  
 Solids, %: 92.76  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Arsenic	7440-38-2	3051A	6010C	24.0	1.02	mg/kg	11/30/16	12/1/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Sample ID: Preparation Blank  
 Matrix SOIL  
 Solids, % 100  
 Sample Type: Total

AEG/NC/NB

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Arsenic	7440-38-2	3051A	6010C	ND	1.00	mg/kg	11/30/16	12/1/16

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.



## LABORATORY CONTROL SAMPLE RECOVERY

Parameter	True Value	Result	Units	Recovery, %	Internal		Date Analyzed
					LCL, %	UCL, %	
Arsenic	13.3	12.8	mg/kg	96	85	115	12/1/16

New England Testing Laboratory, Inc.

## **RESULTS: PCBs**

The presence of the NETLAB LOGO in the top right corner of each page in this section indicates:

The Technical Manager of the Organics Analysis Department certifies that the samples included in this section have been prepared and analyzed using the procedures cited and that the results have been reviewed and approved. Any exceptions or qualifications of substance have been reported in the case narrative.

<b>Sample: S-1</b>		Analyst's Initials: BJ
<b>Case No.: C1122-20</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16	11/30/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	75	45-125
DCBP	86	42-131

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: S-2</b>		Analyst's Initials: BJ
<b>Case No.: C1122-20</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16	11/30/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	97	45-125
DCBP	96	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: S-3</b>		Analyst's Initials: BJ
<b>Case No.: C1122-20</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16	11/30/16, 12/1/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	1380	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	74	45-125
DCBP	89	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: S-4</b>		Analyst's Initials: BJ
<b>Case No.: C1122-20</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16	11/30/16, 12/1/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	39200	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	67	45-125
DCBP	100	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: S-5</b>		Analyst's Initials: BJ
<b>Case No.: C1122-20</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16	11/30/16, 12/1/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	1430	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	69	45-125
DCBP	92	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: S-6</b>		Analyst's Initials: BJ
<b>Case No.: C1122-20</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16	11/30/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	371	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	81	45-125
DCBP	82	42-131

\*Dry Weight Basis  
N.D. = Not Detected



<b>Sample: S-7</b>		Analyst's Initials: BJ
<b>Case No.: C1122-20</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16	11/30/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	78	45-125
DCBP	96	42-131

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: S-8</b>		Analyst's Initials: BJ
<b>Case No.: C1122-20</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16	11/30/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	93	45-125
DCBP	104	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: S-9</b>		Analyst's Initials: BJ
<b>Case No.: C1122-20</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16	11/30/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	139	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	82	45-125
DCBP	114	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: S-10</b>		Analyst's Initials: BJ
<b>Case No.: C1122-20</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16	11/30/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	96	45-125
DCBP	102	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: S-11</b>		Analyst's Initials: BJ
<b>Case No.: C1122-20</b>		
<b>Date Collected: 11/10/2016</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16	11/30/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	93	45-125
DCBP	100	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: Method Blank</b>		Analyst's Initials: BJ
<b>Case No.: C1122-20</b>		
<b>Date Collected: NA</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16	11/30/16
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg (ppb)	Reporting Limit ug/kg (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	54	45-125
DCBP	82	42-131

N.D. = Not Detected

## PCB Laboratory Control Spike

<b>Sample Matrix: Soil</b>				
<b>Subject: PCB</b>	Date Extracted			Date Analyzed
<b>Prep Method: EPA 3546</b>	11/29/16			11/30/16
<b>Analytical Method: EPA 8082A</b>				
Compound	Amount Spiked mg/kg	Result mg/kg	Recovery %	Recovery Limits
Aroclor 1016	0.500	0.476	95	55-131
Aroclor 1260	0.500	0.556	111	63-133
Surrogates:				
Compound	% Recovery	Limits		
TCMX	90	45-125		
DCBP	123	42-131		

# New England Testing Laboratory

59 Greenhill Street  
West Warwick, RI 02893  
1-888-863-8522

## Chain of Custody Record

C1122-20

Project No. 15-0734		Project Name/Location: Newburyport		Matrix		Preservative		Tests**	
Client: Strategic Environmental Services		Report To: phughes@strategic-es.com		Aqueous		No		X PCBs (extra hold) X Arsenic (Total)	
Invoice To: Same		Sample I.D.		Other		No			
Date	Time	Comp	Grab	No. of Containers					
11/10	7:30	X	S-1	40					
	7:35	X	S-2						
	7:50	X	S-3						
	8:10	X	S-4						
	8:16	X	S-5						
	8:30	X	S-6						
	8:40	X	S-7						
	8:45	X	S-8						
	8:52	X	S-9						
	9:15	X	S-10						
	10:05	X	S-11						
Sampled By: Pat Hughes		Date/Time	Received By:	Date/Time	Laboratory Remarks:	Special Instructions:			
Pat Hughes		11/21	12:00	11/22/16	7:45	Extract & hold please for both samples released for analysis per Pat via email, 11/22			
Relinquished By: Pat Hughes		Date/Time	Received By:	Date/Time	Temp. Received:				
Pat Hughes		11/22/16	2:40	11/22/16	1440				
**Netlab Subcontracts the following tests: Radiologicals, Radon, TOC, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates									
Turnaround Time (Business Days): 5 Days									





## **REPORT OF ANALYTICAL RESULTS**

**NETLAB Case Number D0120-10**

Prepared for:

Strategic Environmental Services, Inc.  
362 Putnam Hill Road  
Sutton, MA 01590

Report Date: January 25, 2017

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Director  
New England Testing Laboratory, Inc.  
Lab # RI010

**NEW ENGLAND TESTING LABORATORY, INC.**

59 Greenhill Street, West Warwick, RI 02893

(401) 353-3420

## MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc.

Project #: 15-0754

Project Location: Clipper City, Newburyport

RTN:

**This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):**  
**D0120-10**

Matrices: Groundwater/Surface Water ☒ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other: \_\_\_\_\_

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

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

**Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status**

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

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

<b>G</b>	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <sup>1</sup>
----------	-----------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------

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

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

<sup>1</sup>All negative responses must be addressed in an attached laboratory narrative.

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

**Signature:** 

**Position:** Laboratory Director

**Printed Name:** Richard Warila

**Date:** 1/25/2017

## **SAMPLES SUBMITTED and REQUEST FOR ANALYSIS:**

The samples listed in Table I were submitted to New England Testing Laboratory on January 20, 2017. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is D0120-10.

Custody records are included in this report.

**TABLE I, Samples Submitted**

Sample ID	Date Sampled	Matrix	Analysis Requested
61-E-1	1/19/2017	Soil	Table II
61-E-3	1/19/2017	Soil	Table II
61-M-1	1/19/2017	Soil	Table II
61-M-3	1/19/2017	Soil	Table II
61-W-1	1/19/2017	Soil	Table II
61-W-3	1/19/2017	Soil	Table II
61-O-0	1/19/2017	Soil	Table II
63-E-1	1/19/2017	Soil	Table II
63-E-3	1/19/2017	Soil	Table II
63-M-1	1/19/2017	Soil	Table II
63-M-3	1/19/2017	Soil	Table II
63-W-1	1/19/2017	Soil	Table II
63-W-3	1/19/2017	Soil	Table II
63-O-0	1/19/2017	Soil	Table II
65-E-1	1/19/2017	Soil	Table II
65-E-3	1/19/2017	Soil	Table II
65-M-1	1/19/2017	Soil	Table II
65-M-3	1/19/2017	Soil	Table II
65-W-1	1/19/2017	Soil	Table II
65-W-3	1/19/2017	Soil	Table II
65-O-0	1/19/2017	Soil	Table II
6075-M-0	1/19/2017	Soil	Table II
6150-M-0	1/19/2017	Soil	Table II
6250-M-0	1/19/2017	Soil	Table II
6350-M-0	1/19/2017	Soil	Table II
6450-M-0	1/19/2017	Soil	Table II
6525-M-0	1/19/2017	Soil	Table II
61-E-0	1/19/2017	Soil	Table II, III
61-M-0	1/19/2017	Soil	Table II, III
61-W-0	1/19/2017	Soil	Table II, III
63-E-0	1/19/2017	Soil	Table II, III
63-M-0	1/19/2017	Soil	Table II, III
63-W-0	1/19/2017	Soil	Table II, III



**TABLE I, Samples Submitted, Continued**

Sample ID	Date Sampled	Matrix	Analysis Requested
65-E-0	1/19/2017	Soil	Table II, III
65-M-0	1/19/2017	Soil	Table II, III
65-W-0	1/19/2017	Soil	Table II, III

**TABLE II, Analysis and Methods**

ANALYSIS	PREPARATION METHOD	DETERMINATIVE METHOD
PCB's	3546	8082A

**TABLE III, Analysis and Methods**

ANALYSIS	PREPARATION METHOD	DETERMINATIVE METHOD
Total Metals		
Antimony	3050B	6010C
Arsenic	3050B	6010C
Barium	3050B	6010C
Beryllium	3050B	6010C
Cadmium	3050B	6010C
Chromium	3050B	6010C
Copper	3050B	6010C
Lead	3050B	6010C
Mercury	NA	7471B
Nickel	3050B	6010C
Selenium	3050B	6010C
Silver	3050B	6010C
Thallium	3050B	7010
Zinc	3050B	6010C

These methods are documented in:

*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, USEPA/OSW.*

## **CASE NARRATIVE:**

### Sample Receipt

The samples were all appropriately cooled and preserved upon receipt. The samples were received in the appropriate containers. The chain of custody was adequately completed and corresponded to the samples submitted.

### Metals

All analyses were performed according to NETLAB's documented Standard Operating Procedures, within all required holding times, and with appropriate quality control measures. All QC was within laboratory established acceptance criteria. The samples were received, processed, and reported with no anomalies.

### PCBs

All samples were extracted and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

## **METALS RESULTS**

The presence of the NETLAB LOGO in the top right corner of each page in this section indicates:

The Technical Manager of the Metals Analysis Department certifies that the results included in this section have been reviewed and approved. Any exceptions or qualifications of substance have been reported in the case narrative.

New England Testing Laboratory, Inc.

# METALS RESULTS



Case Number: D0120-10  
 Sample ID: 61-E-0  
 Date collected: 1/19/17  
 Matrix: SOIL  
 Solids, %: 84.53  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.78	mg/kg	1/23/17	1/24/17
Arsenic	7440-38-2	3050B	6010C	12.7	0.78	mg/kg	1/23/17	1/24/17
Barium	7440-39-3	3050B	6010C	53.5	0.39	mg/kg	1/23/17	1/24/17
Beryllium	7440-41-7	3050B	6010C	ND	0.39	mg/kg	1/23/17	1/24/17
Cadmium	7440-43-9	3050B	6010C	1.09	0.39	mg/kg	1/23/17	1/24/17
Chromium	7440-47-3	3050B	6010C	19.8	0.39	mg/kg	1/23/17	1/24/17
Lead	7439-92-1	3050B	6010C	192	0.39	mg/kg	1/23/17	1/24/17
Mercury	7439-97-6	NA	7471B	0.398	0.082	mg/kg	1/23/17	1/24/17
Nickel	7440-02-0	3050B	6010C	11.0	0.39	mg/kg	1/23/17	1/24/17
Selenium	7782-49-2	3050B	6010C	ND	0.78	mg/kg	1/23/17	1/24/17
Silver	7440-22-4	3050B	6010C	ND	0.39	mg/kg	1/23/17	1/24/17
Thallium	7440-28-0	3050B	7010	ND	0.16	mg/kg	1/23/17	1/24/17
Vanadium	7440-62-2	3050B	6010C	13.3	0.39	mg/kg	1/23/17	1/24/17
Zinc	7440-66-6	3050B	6010C	74.1	1.56	mg/kg	1/23/17	1/24/17

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: D0120-10  
 Sample ID: 61-M-0  
 Date collected: 1/19/17  
 Matrix: SOIL  
 Solids, %: 86.32  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.74	mg/kg	1/23/17	1/24/17
Arsenic	7440-38-2	3050B	6010C	17.9	0.74	mg/kg	1/23/17	1/24/17
Barium	7440-39-3	3050B	6010C	71.7	0.37	mg/kg	1/23/17	1/24/17
Beryllium	7440-41-7	3050B	6010C	ND	0.37	mg/kg	1/23/17	1/24/17
Cadmium	7440-43-9	3050B	6010C	1.02	0.37	mg/kg	1/23/17	1/24/17
Chromium	7440-47-3	3050B	6010C	15.3	0.37	mg/kg	1/23/17	1/24/17
Lead	7439-92-1	3050B	6010C	241	0.37	mg/kg	1/23/17	1/24/17
Mercury	7439-97-6	NA	7471B	0.704	0.073	mg/kg	1/23/17	1/24/17
Nickel	7440-02-0	3050B	6010C	13.6	0.37	mg/kg	1/23/17	1/24/17
Selenium	7782-49-2	3050B	6010C	ND	0.74	mg/kg	1/23/17	1/24/17
Silver	7440-22-4	3050B	6010C	ND	0.37	mg/kg	1/23/17	1/24/17
Thallium	7440-28-0	3050B	7010	ND	0.15	mg/kg	1/23/17	1/24/17
Vanadium	7440-62-2	3050B	6010C	12.2	0.37	mg/kg	1/23/17	1/24/17
Zinc	7440-66-6	3050B	6010C	101	1.48	mg/kg	1/23/17	1/24/17

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.



# METALS RESULTS



Case Number: D0120-10  
 Sample ID: 61-W-0  
 Date collected: 1/19/17  
 Matrix: SOIL  
 Solids, %: 88.73  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.73	mg/kg	1/23/17	1/24/17
Arsenic	7440-38-2	3050B	6010C	16.2	0.73	mg/kg	1/23/17	1/24/17
Barium	7440-39-3	3050B	6010C	32.2	0.36	mg/kg	1/23/17	1/24/17
Beryllium	7440-41-7	3050B	6010C	ND	0.36	mg/kg	1/23/17	1/24/17
Cadmium	7440-43-9	3050B	6010C	0.89	0.36	mg/kg	1/23/17	1/24/17
Chromium	7440-47-3	3050B	6010C	17.8	0.36	mg/kg	1/23/17	1/24/17
Lead	7439-92-1	3050B	6010C	78.4	0.36	mg/kg	1/23/17	1/24/17
Mercury	7439-97-6	NA	7471B	0.587	0.077	mg/kg	1/23/17	1/24/17
Nickel	7440-02-0	3050B	6010C	13.4	0.36	mg/kg	1/23/17	1/24/17
Selenium	7782-49-2	3050B	6010C	ND	0.73	mg/kg	1/23/17	1/24/17
Silver	7440-22-4	3050B	6010C	ND	0.36	mg/kg	1/23/17	1/24/17
Thallium	7440-28-0	3050B	7010	ND	0.15	mg/kg	1/23/17	1/24/17
Vanadium	7440-62-2	3050B	6010C	11.3	0.36	mg/kg	1/23/17	1/24/17
Zinc	7440-66-6	3050B	6010C	53.4	1.45	mg/kg	1/23/17	1/24/17

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: D0120-10  
 Sample ID: 63-E-0  
 Date collected: 1/19/17  
 Matrix: SOIL  
 Solids, %: 91.54  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.72	mg/kg	1/23/17	1/24/17
Arsenic	7440-38-2	3050B	6010C	12.2	0.72	mg/kg	1/23/17	1/24/17
Barium	7440-39-3	3050B	6010C	69.0	0.36	mg/kg	1/23/17	1/24/17
Beryllium	7440-41-7	3050B	6010C	ND	0.36	mg/kg	1/23/17	1/24/17
Cadmium	7440-43-9	3050B	6010C	1.15	0.36	mg/kg	1/23/17	1/24/17
Chromium	7440-47-3	3050B	6010C	31.1	0.36	mg/kg	1/23/17	1/24/17
Lead	7439-92-1	3050B	6010C	90.1	0.36	mg/kg	1/23/17	1/24/17
Mercury	7439-97-6	NA	7471B	0.987	0.343	mg/kg	1/23/17	1/24/17
Nickel	7440-02-0	3050B	6010C	27.5	0.36	mg/kg	1/23/17	1/24/17
Selenium	7782-49-2	3050B	6010C	ND	0.72	mg/kg	1/23/17	1/24/17
Silver	7440-22-4	3050B	6010C	ND	0.36	mg/kg	1/23/17	1/24/17
Thallium	7440-28-0	3050B	7010	ND	0.14	mg/kg	1/23/17	1/24/17
Vanadium	7440-62-2	3050B	6010C	20.2	0.36	mg/kg	1/23/17	1/24/17
Zinc	7440-66-6	3050B	6010C	55.5	1.44	mg/kg	1/23/17	1/24/17

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: D0120-10  
 Sample ID: 63-M-0  
 Date collected: 1/19/17  
 Matrix: SOIL  
 Solids, %: 91.1  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.71	mg/kg	1/23/17	1/24/17
Arsenic	7440-38-2	3050B	6010C	27.4	0.71	mg/kg	1/23/17	1/24/17
Barium	7440-39-3	3050B	6010C	35.7	0.36	mg/kg	1/23/17	1/24/17
Beryllium	7440-41-7	3050B	6010C	ND	0.36	mg/kg	1/23/17	1/24/17
Cadmium	7440-43-9	3050B	6010C	1.55	0.36	mg/kg	1/23/17	1/24/17
Chromium	7440-47-3	3050B	6010C	19.5	0.36	mg/kg	1/23/17	1/24/17
Lead	7439-92-1	3050B	6010C	72.7	0.36	mg/kg	1/23/17	1/24/17
Mercury	7439-97-6	NA	7471B	2.59	0.340	mg/kg	1/23/17	1/24/17
Nickel	7440-02-0	3050B	6010C	16.0	0.36	mg/kg	1/23/17	1/24/17
Selenium	7782-49-2	3050B	6010C	ND	0.71	mg/kg	1/23/17	1/24/17
Silver	7440-22-4	3050B	6010C	ND	0.36	mg/kg	1/23/17	1/24/17
Thallium	7440-28-0	3050B	7010	ND	0.14	mg/kg	1/23/17	1/24/17
Vanadium	7440-62-2	3050B	6010C	15.1	0.36	mg/kg	1/23/17	1/24/17
Zinc	7440-66-6	3050B	6010C	57.9	1.43	mg/kg	1/23/17	1/24/17

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: D0120-10  
 Sample ID: 63-W-0  
 Date collected: 1/19/17  
 Matrix: SOIL  
 Solids, %: 86.48  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.72	mg/kg	1/23/17	1/24/17
Arsenic	7440-38-2	3050B	6010C	18.6	0.72	mg/kg	1/23/17	1/24/17
Barium	7440-39-3	3050B	6010C	34.2	0.36	mg/kg	1/23/17	1/24/17
Beryllium	7440-41-7	3050B	6010C	ND	0.36	mg/kg	1/23/17	1/24/17
Cadmium	7440-43-9	3050B	6010C	1.17	0.36	mg/kg	1/23/17	1/24/17
Chromium	7440-47-3	3050B	6010C	17.2	0.36	mg/kg	1/23/17	1/24/17
Lead	7439-92-1	3050B	6010C	59.5	0.36	mg/kg	1/23/17	1/24/17
Mercury	7439-97-6	NA	7471B	0.689	0.074	mg/kg	1/23/17	1/24/17
Nickel	7440-02-0	3050B	6010C	16.1	0.36	mg/kg	1/23/17	1/24/17
Selenium	7782-49-2	3050B	6010C	ND	0.72	mg/kg	1/23/17	1/24/17
Silver	7440-22-4	3050B	6010C	ND	0.36	mg/kg	1/23/17	1/24/17
Thallium	7440-28-0	3050B	7010	ND	0.14	mg/kg	1/23/17	1/24/17
Vanadium	7440-62-2	3050B	6010C	19.9	0.36	mg/kg	1/23/17	1/24/17
Zinc	7440-66-6	3050B	6010C	44.0	1.44	mg/kg	1/23/17	1/24/17

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: D0120-10  
 Sample ID: 65-E-0  
 Date collected: 1/19/17  
 Matrix: SOIL  
 Solids, %: 82.28  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.75	mg/kg	1/23/17	1/24/17
Arsenic	7440-38-2	3050B	6010C	22.9	0.75	mg/kg	1/23/17	1/24/17
Barium	7440-39-3	3050B	6010C	27.8	0.38	mg/kg	1/23/17	1/24/17
Beryllium	7440-41-7	3050B	6010C	ND	0.38	mg/kg	1/23/17	1/24/17
Cadmium	7440-43-9	3050B	6010C	0.75	0.38	mg/kg	1/23/17	1/24/17
Chromium	7440-47-3	3050B	6010C	13.4	0.38	mg/kg	1/23/17	1/24/17
Lead	7439-92-1	3050B	6010C	429	0.38	mg/kg	1/23/17	1/24/17
Mercury	7439-97-6	NA	7471B	0.275	0.079	mg/kg	1/23/17	1/24/17
Nickel	7440-02-0	3050B	6010C	10.6	0.38	mg/kg	1/23/17	1/24/17
Selenium	7782-49-2	3050B	6010C	ND	0.75	mg/kg	1/23/17	1/24/17
Silver	7440-22-4	3050B	6010C	ND	0.38	mg/kg	1/23/17	1/24/17
Thallium	7440-28-0	3050B	7010	ND	0.15	mg/kg	1/23/17	1/24/17
Vanadium	7440-62-2	3050B	6010C	9.88	0.38	mg/kg	1/23/17	1/24/17
Zinc	7440-66-6	3050B	6010C	52.7	1.51	mg/kg	1/23/17	1/24/17

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: D0120-10  
 Sample ID: 65-M-O  
 Date collected: 1/19/17  
 Matrix: SOIL  
 Solids, %: 90.47  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.68	mg/kg	1/23/17	1/24/17
Arsenic	7440-38-2	3050B	6010C	20.7	0.68	mg/kg	1/23/17	1/24/17
Barium	7440-39-3	3050B	6010C	32.0	0.34	mg/kg	1/23/17	1/24/17
Beryllium	7440-41-7	3050B	6010C	ND	0.34	mg/kg	1/23/17	1/24/17
Cadmium	7440-43-9	3050B	6010C	1.11	0.34	mg/kg	1/23/17	1/24/17
Chromium	7440-47-3	3050B	6010C	17.6	0.34	mg/kg	1/23/17	1/24/17
Lead	7439-92-1	3050B	6010C	37.5	0.34	mg/kg	1/23/17	1/24/17
Mercury	7439-97-6	NA	7471B	0.601	0.071	mg/kg	1/23/17	1/24/17
Nickel	7440-02-0	3050B	6010C	15.3	0.34	mg/kg	1/23/17	1/24/17
Selenium	7782-49-2	3050B	6010C	ND	0.68	mg/kg	1/23/17	1/24/17
Silver	7440-22-4	3050B	6010C	ND	0.34	mg/kg	1/23/17	1/24/17
Thallium	7440-28-0	3050B	7010	ND	0.14	mg/kg	1/23/17	1/24/17
Vanadium	7440-62-2	3050B	6010C	14.7	0.34	mg/kg	1/23/17	1/24/17
Zinc	7440-66-6	3050B	6010C	36.9	1.36	mg/kg	1/23/17	1/24/17

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Case Number: D0120-10  
 Sample ID: 65-W-0  
 Date collected: 1/19/17  
 Matrix: SOIL  
 Solids, %: 88.89  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.70	mg/kg	1/23/17	1/24/17
Arsenic	7440-38-2	3050B	6010C	19.7	0.70	mg/kg	1/23/17	1/24/17
Barium	7440-39-3	3050B	6010C	40.9	0.35	mg/kg	1/23/17	1/24/17
Beryllium	7440-41-7	3050B	6010C	ND	0.35	mg/kg	1/23/17	1/24/17
Cadmium	7440-43-9	3050B	6010C	1.18	0.35	mg/kg	1/23/17	1/24/17
Chromium	7440-47-3	3050B	6010C	22.2	0.35	mg/kg	1/23/17	1/24/17
Lead	7439-92-1	3050B	6010C	46.0	0.35	mg/kg	1/23/17	1/24/17
Mercury	7439-97-6	NA	7471B	0.388	0.077	mg/kg	1/23/17	1/24/17
Nickel	7440-02-0	3050B	6010C	17.4	0.35	mg/kg	1/23/17	1/24/17
Selenium	7782-49-2	3050B	6010C	ND	0.70	mg/kg	1/23/17	1/24/17
Silver	7440-22-4	3050B	6010C	ND	0.35	mg/kg	1/23/17	1/24/17
Thallium	7440-28-0	3050B	7010	ND	0.14	mg/kg	1/23/17	1/24/17
Vanadium	7440-62-2	3050B	6010C	20.3	0.35	mg/kg	1/23/17	1/24/17
Zinc	7440-66-6	3050B	6010C	48.8	1.40	mg/kg	1/23/17	1/24/17

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.

# METALS RESULTS



Sample ID: Preparation Blank  
 Matrix SOIL  
 Solids, % 100  
 Sample Type: Total

NC/NB/DC

		Preparative	Analytical		Reporting		Date of	Date
Parameter	CAS Number	Method	Method	Result	Limit	Units	Preparation	Analyzed
Antimony	7440-36-0	3050B	6010C	ND	0.67	mg/kg	1/23/17	1/24/17
Arsenic	7440-38-2	3050B	6010C	ND	0.67	mg/kg	1/23/17	1/24/17
Barium	7440-39-3	3050B	6010C	ND	0.33	mg/kg	1/23/17	1/24/17
Beryllium	7440-41-7	3050B	6010C	ND	0.33	mg/kg	1/23/17	1/24/17
Cadmium	7440-43-9	3050B	6010C	ND	0.33	mg/kg	1/23/17	1/24/17
Chromium	7440-47-3	3050B	6010C	ND	0.33	mg/kg	1/23/17	1/24/17
Lead	7439-92-1	3050B	6010C	ND	0.33	mg/kg	1/23/17	1/24/17
Mercury	7439-97-6	NA	7471B	ND	0.033	mg/kg	1/23/17	1/24/17
Nickel	7440-02-0	3050B	6010C	ND	0.33	mg/kg	1/23/17	1/24/17
Selenium	7782-49-2	3050B	6010C	ND	0.67	mg/kg	1/23/17	1/24/17
Silver	7440-22-4	3050B	6010C	ND	0.33	mg/kg	1/23/17	1/24/17
Thallium	7440-28-0	3050B	7010	ND	0.13	mg/kg	1/23/17	1/24/17
Vanadium	7440-62-2	3050B	6010C	ND	0.33	mg/kg	1/23/17	1/24/17
Zinc	7440-66-6	3050B	6010C	ND	1.33	mg/kg	1/23/17	1/24/17

ND indicates Not Detected.

NA indicates Not Applicable

All results are reported on a dry weight basis.



## LABORATORY CONTROL SAMPLE RECOVERY

Parameter	True Value	Result	Units	Recovery, %	Internal		Date Analyzed
					LCL, %	UCL, %	
Antimony	66.7	59.8	mg/kg	90	85	115	1/24/17
Arsenic	13.3	12.7	mg/kg	96	85	115	1/24/17
Barium	66.7	61.6	mg/kg	92	85	115	1/24/17
Beryllium	13.3	13.6	mg/kg	102	85	115	1/24/17
Cadmium	66.7	60.3	mg/kg	90	85	114	1/24/17
Chromium	66.7	61.6	mg/kg	92	85	115	1/24/17
Lead	66.7	57.0	mg/kg	85	85	115	1/24/17
Mercury	0.133	0.1	mg/kg	101	85	115	1/24/17
Nickel	66.7	59.1	mg/kg	89	85	112	1/24/17
Selenium	13.3	12.1	mg/kg	91	85	115	1/24/17
Silver	26.6	24.3	mg/kg	91	85	115	1/24/17
Thallium	1.33	1.3	mg/kg	100	85	115	1/24/17
Vanadium	66.7	71.5	mg/kg	107	85	115	1/24/17
Zinc	66.7	66.1	mg/kg	99	85	115	1/24/17

## **RESULTS: PCBs**

The presence of the NETLAB LOGO in the top right corner of each page in this section indicates:

The Technical Manager of the Organics Analysis Department certifies that the samples included in this section have been prepared and analyzed using the procedures cited and that the results have been reviewed and approved. Any exceptions or qualifications of substance have been reported in the case narrative.

<b>Sample: 61-E-1</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	281	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	53	45-125
DCBP	73	42-131

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: 61-E-3</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	87	45-125
DCBP	94	42-131

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: 61-M-1</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	104	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	82	45-125
DCBP	91	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 61-M-3</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	86	45-125
DCBP	99	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 61-W-1</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	402	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	80	45-125
DCBP	93	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 61-W-3</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	65	45-125
DCBP	88	42-131

\*Dry Weight Basis  
N.D. = Not Detected



<b>Sample: 61-O-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	648	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	71	45-125
DCBP	83	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 63-E-1</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	343	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	87	45-125
DCBP	98	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 63-E-3</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	81	45-125
DCBP	92	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 63-M-1</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17, 1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	3490	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	75	45-125
DCBP	87	42-131

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: 63-M-3</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	92	45-125
DCBP	98	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 63-W-1</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17, 1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	5240	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	67	45-125
DCBP	84	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 63-W-3</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	83	45-125
DCBP	93	42-131

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: 63-O-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17, 1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	51000	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	68	45-125
DCBP	101	42-131

\*Dry Weight Basis

N.D. = Not Detected



<b>Sample: 65-E-1</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	85	45-125
DCBP	94	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 65-E-3</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	83	45-125
DCBP	89	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 65-M-1</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17, 1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	1820	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	80	45-125
DCBP	90	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 65-M-3</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	84	45-125
DCBP	89	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 65-W-1</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/23/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	428	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	89	45-125
DCBP	85	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 65-W-3</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	1200	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	92	45-125
DCBP	84	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 65-O-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	1990	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	86	45-125
DCBP	94	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6075-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	538	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	72	45-125
DCBP	79	42-131

\*Dry Weight Basis

N.D. = Not Detected



<b>Sample: 6150-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	2300	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	79	45-125
DCBP	78	42-131

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: 6250-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	10300	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	73	45-125
DCBP	79	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6350-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	7380	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	79	45-125
DCBP	96	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6450-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	2340	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	94	45-125
DCBP	93	42-131

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: 6525-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	3030	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	92	45-125
DCBP	94	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 61-E-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	635	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	88	45-125
DCBP	83	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 61-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	618	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	77	45-125
DCBP	89	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 61-W-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	273	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	78	45-125
DCBP	85	42-131

\*Dry Weight Basis

N.D. = Not Detected



<b>Sample: 63-E-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	5910	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	61	45-125
DCBP	70	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 63-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	115000	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	75	45-125
DCBP	107	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 63-W-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	27300	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	78	45-125
DCBP	90	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 65-E-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	27800	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	57	45-125
DCBP	61	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 65-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	1370	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	83	45-125
DCBP	82	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 65-W-0</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	81	45-125
DCBP	79	42-131

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: Method Blank</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: NA</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17	1/20/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg (ppb)	Reporting Limit ug/kg (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	79	45-125
DCBP	88	42-131

N.D. = Not Detected

<b>Sample: Method Blank</b>		Analyst's Initials: BJ
<b>Case No.: D0120-10</b>		
<b>Date Collected: NA</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17	1/24/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg (ppb)	Reporting Limit ug/kg (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	71	45-125
DCBP	92	42-131

N.D. = Not Detected



## PCB Laboratory Control Spike

<b>Sample Matrix: Soil</b>				
<b>Subject: PCB</b>	Date Extracted			Date Analyzed
<b>Prep Method: EPA 3546</b>	1/20/17			1/20/17
<b>Analytical Method: EPA 8082A</b>				
Compound	Amount Spiked mg/kg	Result mg/kg	Recovery %	Recovery Limits
Aroclor 1016	0.500	0.524	105	55-131
Aroclor 1260	0.500	0.642	128	63-133
Surrogates:				
Compound	% Recovery	Limits		
TCMX	82	45-125		
DCBP	100	42-131		

## PCB Laboratory Control Spike

<b>Sample Matrix: Soil</b>				
<b>Subject: PCB</b>	Date Extracted			Date Analyzed
<b>Prep Method: EPA 3546</b>	1/23/17			1/24/17
<b>Analytical Method: EPA 8082A</b>				
Compound	Amount Spiked mg/kg	Result mg/kg	Recovery %	Recovery Limits
Aroclor 1016	0.500	0.454	91	55-131
Aroclor 1260	0.500	0.491	98	63-133
Surrogates:				
Compound	% Recovery	Limits		
TCMX	96	45-125		
DCBP	96	42-131		

NEW ENGLAND TESTING LABORATORY, INC.  
 59 Greenhill Street  
 West Warwick, RI 02893  
 1-888-863-8522

# CHAIN OF CUSTODY RECORD

D0120-10

PROJ. NO.		PROJECT NAME/LOCATION				PRESERVATIVE	TESTS**	REMARKS
CLIENT		AQUEOUS	SOIL	OTHER	NO. OF CONTAINERS			
15-0754						Clipper City / Newburyport		
Strategic Environmental								
REPORT TO: Pat Hughes, Chris Glod								
INVOICE TO: Pat Hughes								
DATE	TIME	COMP	GRAB	SAMPLE I.D.				
1/19	1028		X	61-E-1	X	1 Glass	N=	X
	1028			61-E-3				
	1022			61-M-1				
	1022			61-M-3				
	1040			61-W-1				
	1040			61-W-3				
	1015			61-O-0				
	1002			63-E-1				
	1002			63-E-3				
	950			63-M-1				
	950			63-M-3				
	946			63-W-1				
	946			63-W-3				
	940			63-O-0				
Sampled by: (Signature)		Date/Time		Received by: (Signature)		Date/Time		Laboratory Remarks: Temp. received: <u>42</u> Cooled <input checked="" type="checkbox"/>
Relinquished by: (Signature)		Date/Time		Received by: (Signature)		Date/Time		
Relinquished by: (Signature)		Date/Time		Received for Laboratory by: (Signature)		Date/Time		
Pat TL		1/19 1800		Just [Signature]		1/20/17 1035		Special Instructions: List Specific Detection Limit Requirements:  Turnaround (Business Days) <u>48hr TUSH</u>
Just [Signature]		1/20/17 1245		[Signature]		1/20/17 1245		

\*\*Netlab subcontracts the following tests: Radiologicals, Radon, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates

NEW ENGLAND TESTING LABORATORY, INC.  
59 Greenhill Street  
West Warwick, RI 02893  
1-888-863-8522

# CHAIN OF CUSTODY RECORD

00120-10

PROJ. NO.		PROJECT NAME/LOCATION				PRESERVATIVE	TESTS**										REMARKS	
15-0754		Clipper City / Newburyport					PCBs											
CLIENT						AQUEOUS	SOIL	OTHER	NO. OF CONTAINERS									
Strategic Environmental																		
REPORT TO: Pat Hughes, Chris Glad																		
INVOICE TO: Pat Hughes																		
DATE	TIME	COMP	GRAB	SAMPLE I.D.														
1/19	917			65-E-1	.	X			16 glass	No	X							
	917			65-E-3	.													
	900			65-M-1	.													
	900			65-M-3	.													
	925			65-W-1	.													
	925			65-W-3	.													
	330			65-O-0	.													
	1105			6075-M-0	.													
	1120			6150-M-0	.													
	1142			6250-M-0	.													
	1202			6350-M-0	.													
	127			6450-M-0	.													
	208			6525-M-0	.													

Sampled by: (Signature) <i>Pat H</i>	Date/Time 1/19 1800	Received by: (Signature) <i>[Signature]</i>	Date/Time 1/20/17 1035	Laboratory Remarks: Temp. received: <u>4A</u> Cooled <input type="checkbox"/>	Special Instructions: List Specific Detection Limit Requirements:  Turnaround (Business Days) <u>48hr Rush</u>
Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 1/20/17 1245	Received for Laboratory by: (Signature) <i>[Signature]</i>	Date/Time 1/20/17 1245		
Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 1/20/17 1245	Received for Laboratory by: (Signature) <i>[Signature]</i>	Date/Time 1/20/17 1245		

\*\*Netlab subcontracts the following tests: Radiologicals, Radon, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates

DO120-10

\*\*Netlab subcontracts the following tests: Radiologicals, Radon, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates



## **REPORT OF ANALYTICAL RESULTS**

**NETLAB Case Number D0127-19**

Prepared for:

Strategic Environmental Services, Inc.  
362 Putnam Hill Road  
Sutton, MA 01590

Report Date: February 2, 2017

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Director  
New England Testing Laboratory, Inc.  
Lab # RI010

**NEW ENGLAND TESTING LABORATORY, INC.**

59 Greenhill Street, West Warwick, RI 02893

(401) 353-3420



## **REPORT OF ANALYTICAL RESULTS**

**NETLAB Case Number D0306-28**

Prepared for:

Strategic Environmental Services, Inc.  
362 Putnam Hill Road  
Sutton, MA 01590

Report Date: March 9, 2017

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Director  
New England Testing Laboratory, Inc.  
Lab # RI010

**NEW ENGLAND TESTING LABORATORY, INC.**

59 Greenhill Street, West Warwick, RI 02893

(401) 353-3420

## MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc.

Project #: 15-0754

Project Location: Clipper City, Newburyport

RTN:

**This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):**  
**D0306-28**

Matrices: Groundwater/Surface Water   x Soil/Sediment   Drinking Water   Air   Other: \_\_\_\_\_

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

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

**Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status**

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

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

<b>G</b>	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	x Yes   No <sup>1</sup>
----------	-----------------------------------------------------------------------------------------------------------	-------------------------

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

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

<sup>1</sup>All negative responses must be addressed in an attached laboratory narrative.

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

Signature: Richard Warila

Position: Laboratory Director

Printed Name: Richard Warila

Date: 3/9/2017



## **SAMPLES SUBMITTED and REQUEST FOR ANALYSIS:**

The samples listed in Table I were submitted to New England Testing Laboratory on March 6, 2017. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is D0306-28.

Custody records are included in this report.

**TABLE I, Samples Submitted**

Sample ID	Date Sampled	Matrix	Analysis Requested
6250-E-1	1/19/2017	Soil	Table II
6250-E-3	1/19/2017	Soil	Table II
6275-M-1	1/20/2017	Soil	Table II
6275-M-3	1/20/2017	Soil	Table II
6350-W-1	1/19/2017	Soil	Table II
6350-W-3	1/19/2017	Soil	Table II
6475-M-0	1/20/2017	Soil	Table II
6475-M-1	1/20/2017	Soil	Table II
6475-M-3	1/20/2017	Soil	Table II

**TABLE II, Analysis and Methods**

ANALYSIS	PREPARATION METHOD	DETERMINATIVE METHOD
PCB's	3546	8082A

These methods are documented in:

*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, USEPA/OSW.*

## **CASE NARRATIVE:**

### Sample Receipt

The samples were all appropriately cooled and preserved upon receipt. The samples were received in the appropriate containers. The chain of custody was adequately completed and corresponded to the samples submitted.

### PCBs

All samples were extracted and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

Samples were received to the laboratory outside of the method recommended holding time of 14 days.

## **RESULTS: PCBs**

The presence of the NETLAB LOGO in the top right corner of each page in this section indicates:

The Technical Manager of the Organics Analysis Department certifies that the samples included in this section have been prepared and analyzed using the procedures cited and that the results have been reviewed and approved. Any exceptions or qualifications of substance have been reported in the case narrative.

<b>Sample: 6250-E-1</b>		Analyst's Initials: BJ
<b>Case No.: D0306-28</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	3/7/17	3/8/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	91	45-125
DCBP	87	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6250-E-3</b>		Analyst's Initials: BJ
<b>Case No.: D0306-28</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	3/7/17	3/8/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	79	45-125
DCBP	102	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6275-M-1</b>		Analyst's Initials: BJ
<b>Case No.: D0306-28</b>		
<b>Date Collected: 1/20/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	3/7/17	3/8/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	4310	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	77	45-125
DCBP	75	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6275-M-3</b>		Analyst's Initials: BJ
<b>Case No.: D0306-28</b>		
<b>Date Collected: 1/20/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	3/7/17	3/8/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	102	45-125
DCBP	108	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6350-W-1</b>		Analyst's Initials: BJ
<b>Case No.: D0306-28</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	3/7/17	3/8/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	443	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	78	45-125
DCBP	81	42-131

\*Dry Weight Basis  
N.D. = Not Detected



<b>Sample: 6350-W-3</b>		Analyst's Initials: BJ
<b>Case No.: D0306-28</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	3/7/17	3/8/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	92	45-125
DCBP	91	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6475-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0306-28</b>		
<b>Date Collected: 1/20/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	3/7/17	3/8/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	375	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	94	45-125
DCBP	92	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6475-M-1</b>		Analyst's Initials: BJ
<b>Case No.: D0306-28</b>		
<b>Date Collected: 1/20/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	3/7/17	3/8/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	3920	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	98	45-125
DCBP	104	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6475-M-3</b>		Analyst's Initials: BJ
<b>Case No.: D0306-28</b>		
<b>Date Collected: 1/20/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	3/7/17	3/8/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	93	45-125
DCBP	96	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: Method Blank</b>		Analyst's Initials: BJ
<b>Case No.: D0306-28</b>		
<b>Date Collected: NA</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	3/7/17	3/7/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg (ppb)	Reporting Limit ug/kg (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	71	45-125
DCBP	78	42-131

N.D. = Not Detected

## PCB Laboratory Control Spike

<b>Sample Matrix: Soil</b>				
<b>Subject: PCB</b>	Date Extracted			Date Analyzed
<b>Prep Method: EPA 3546</b>	3/7/17			3/7/17
<b>Analytical Method: EPA 8082A</b>				
Compound	Amount Spiked mg/kg	Result mg/kg	Recovery %	Recovery Limits
Aroclor 1016	0.500	0.430	86	55-131
Aroclor 1260	0.500	0.377	75	63-133
Surrogates:				
Compound	% Recovery	Limits		
TCMX	90	45-125		
DCBP	99	42-131		

# New England Testing Laboratory

59 Greenhill Street  
West Warwick, RI 02893  
1-888-863-8522

D0306 - 28

## Chain of Custody Record

Project No. 15-0754		Project Name/Location: Newburyport, MA		Matrix		Preservative		Tests**	
Client: Strategic Environmental Services		Report To: cglob@strategic-es.com		Aqueous		No. of Containers			
Invoice To: Sashon Pichele		Sample I.D.		Other					
Date	Time	Comp	Grab						
1/19/17	11:48	X		X		1		PCBs	
1/19/17	11:48								
1/20/17	9:05								
1/20/17	9:05								
1/19/17	11:24								
1/19/17	11:54								
1/20/17	9:10								
1/20/17	9:18								
1/20/17	9:18								
Sampled By:		Date/Time	Received By:	Date/Time		Laboratory Remarks:		Special Instructions:	
				3/6/17					
Relinquished By:		Date/Time	Received By:	Date/Time		Temp. Received:			
		3/6/17		3/6/17		4°			
		4:40pm		10:40					

\*\*Netlab Subcontracts the following tests: Radiologicals, Radon, TOC, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates

Turnaround Time [Business Days]: 5 Days

## MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc.

Project #: 15-0754

Project Location: Clipper City, Newburyport

RTN:

**This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):**  
**D0127-19**

Matrices: Groundwater/Surface Water   x Soil/Sediment   Drinking Water   Air   Other: \_\_\_\_\_

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

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

**Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status**

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

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

<b>G</b>	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	x Yes   No <sup>1</sup>
----------	-----------------------------------------------------------------------------------------------------------	-------------------------

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

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

<sup>1</sup>All negative responses must be addressed in an attached laboratory narrative.

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

**Signature:** 

**Position:** Laboratory Director

**Printed Name:** Richard Warila

**Date:** 2/2/2017



## **SAMPLES SUBMITTED and REQUEST FOR ANALYSIS:**

The samples listed in Table I were submitted to New England Testing Laboratory on January 27, 2017. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is D0127-19.

Custody records are included in this report.

**TABLE I, Samples Submitted**

Sample ID	Date Sampled	Matrix	Analysis Requested
6550-M-0	1/20/2017	Soil	Table II
6525-E-0	1/19/2017	Soil	Table II
6525-W-0	1/19/2017	Soil	Table II
6450-M-1	1/19/2017	Soil	Table II
6450-E-0	1/19/2017	Soil	Table II
6450-W-0	1/19/2017	Soil	Table II
6350-M-1	1/19/2017	Soil	Table II
6350-E-0	1/19/2017	Soil	Table II
6350-W-0	1/19/2017	Soil	Table II
6325-M-0	1/20/2017	Soil	Table II
6275-M-0	1/20/2017	Soil	Table II
6250-M-1	1/19/2017	Soil	Table II
6250-E-0	1/19/2017	Soil	Table II
6250-W-0	1/19/2017	Soil	Table II
6150-M-1	1/19/2017	Soil	Table II
6150-E-0	1/19/2017	Soil	Table II
6150-W-0	1/19/2017	Soil	Table II
6125-M-0	1/20/2017	Soil	Table II

**TABLE II, Analysis and Methods**

ANALYSIS	PREPARATION METHOD	DETERMINATIVE METHOD
PCB's	3546	8082A

These methods are documented in:

*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, USEPA/OSW.*



## **CASE NARRATIVE:**

### Sample Receipt

The samples were all appropriately cooled and preserved upon receipt. The samples were received in the appropriate containers. The chain of custody was adequately completed and corresponded to the samples submitted.

### PCBs

All samples were extracted and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria.

## **RESULTS: PCBs**

The presence of the NETLAB LOGO in the top right corner of each page in this section indicates:

The Technical Manager of the Organics Analysis Department certifies that the samples included in this section have been prepared and analyzed using the procedures cited and that the results have been reviewed and approved. Any exceptions or qualifications of substance have been reported in the case narrative.

<b>Sample: 6550-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/20/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	866	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	65	45-125
DCBP	71	42-131

\*Dry Weight Basis  
N.D. = Not Detected

<b>Sample: 6525-E-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	2300	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	72	45-125
DCBP	98	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6525-W-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	227	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	82	45-125
DCBP	79	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6450-M-1</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	2160	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	82	45-125
DCBP	82	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6450-E-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	960	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	67	45-125
DCBP	67	42-131

\*Dry Weight Basis

N.D. = Not Detected



<b>Sample: 6450-W-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	901	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	83	45-125
DCBP	75	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6350-M-1</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	3530	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	78	45-125
DCBP	82	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6350-E-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	9710	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	68	45-125
DCBP	92	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6350-W-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	23300	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	71	45-125
DCBP	86	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6325-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/20/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	39300	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	74	45-125
DCBP	100	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6275-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/20/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	24200	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	82	45-125
DCBP	98	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6250-M-1</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	507	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	66	45-125
DCBP	78	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6250-E-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	17300	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	58	45-125
DCBP	66	42-131

\*Dry Weight Basis

N.D. = Not Detected



<b>Sample: 6250-W-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	9170	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	68	45-125
DCBP	78	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6150-M-1</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	299	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	93	45-125
DCBP	108	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6150-E-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	4070	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	79	45-125
DCBP	76	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6150-W-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/19/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	642	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	64	45-125
DCBP	67	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: 6125-M-0</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: 1/20/2017</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17, 2/1/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg* (ppb)	Reporting Limit ug/kg* (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	3620	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	72	45-125
DCBP	75	42-131

\*Dry Weight Basis

N.D. = Not Detected

<b>Sample: Method Blank</b>		Analyst's Initials: BJ
<b>Case No.: D0127-19</b>		
<b>Date Collected: NA</b>		
<b>Sample Matrix: Soil</b>		
<b>Subject: PCBs</b>	Date Extracted	Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17	1/31/17
<b>Analytical Method: EPA 8082A</b>		
Compound	Concentration ug/kg (ppb)	Reporting Limit ug/kg (ppb)
Aroclor-1221	N.D.	100
Aroclor-1232	N.D.	100
Aroclor-1016	N.D.	100
Aroclor-1242	N.D.	100
Aroclor-1248	N.D.	100
Aroclor-1254	N.D.	100
Aroclor-1260	N.D.	100
Aroclor-1262	N.D.	100
Aroclor-1268	N.D.	100
Surrogates:		
Compound	% Recovery	Limits
TCMX	81	45-125
DCBP	96	42-131

N.D. = Not Detected

## PCB Laboratory Control Spike

<b>Sample Matrix: Soil</b>				
<b>Subject: PCB</b>	Date Extracted			Date Analyzed
<b>Prep Method: EPA 3546</b>	1/30/17			1/31/17
<b>Analytical Method: EPA 8082A</b>				
Compound	Amount Spiked mg/kg	Result mg/kg	Recovery %	Recovery Limits
Aroclor 1016	0.500	0.480	96	55-131
Aroclor 1260	0.500	0.552	110	63-133
Surrogates:				
Compound	% Recovery	Limits		
TCMX	94	45-125		
DCBP	114	42-131		

NEW ENGLAND TESTING LABORATORY, INC.  
59 Greenhill Street  
West Warwick, RI 02893  
1-888-863-8522

# CHAIN OF CUSTODY RECORD

00127-19

PROJ. NO.		PROJECT NAME/LOCATION																			
15-0754		Clipper City - Newbury port																			
CLIENT				REPORT TO:		INVOICE TO:		AQUEOUS		SOIL		OTHER		NO. OF CONTAINERS		PRESERVATIVE		TESTS		REMARKS	
Strategic Environment				Pat Hughes, Chris Glod		Pat Hughes, Sandra Puchek												PCB-Microwave			
DATE	TIME	COMP	GRAB	SAMPLE I.D.																	
1/20	9:25		X	6550-M-0				X		1						X					
1/19	2:16			6525-E-0																	
1/19	2:00			6525-W-0																	
1/19	1:27			6450-M-1																	
1/19	1:47			6450-E-0																	
1/19	1:15			6450-W-0																	
1/19	12:02			6350-M-1																	
1/19	12:10			6350-E-0																	
1/19	11:54			6350-W-0																	
1/20	9:00			6325-M-0																	
1/20	9:05			6275-M-0																	
1/19	11:42			6250-M-1																	
1/19	11:48			6250-E-0																	
1/19	11:35			6250-W-0																	

Sampled by: (Signature)		Date/Time		Received by: (Signature)		Date/Time		Laboratory Remarks:		Special Instructions:	
Pat 7/		1/20 5:00PM		Robert Lee		1/27/17 12:10		Temp. received: 3° Cooled		List Specific Detection Limit Requirements:	
Relinquished by: (Signature)		Date/Time		Received by: (Signature)		Date/Time					
Relinquished by: (Signature)		Date/Time		Received for Laboratory by: (Signature)		Date/Time					
Robert Lee		1/27/17 1:320		[Signature]		1/27/17 1:320					

Turnaround (Business Days) Std. 5 day

\*\*Netlab subcontracts the following tests: Radiologicals, Radon, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates



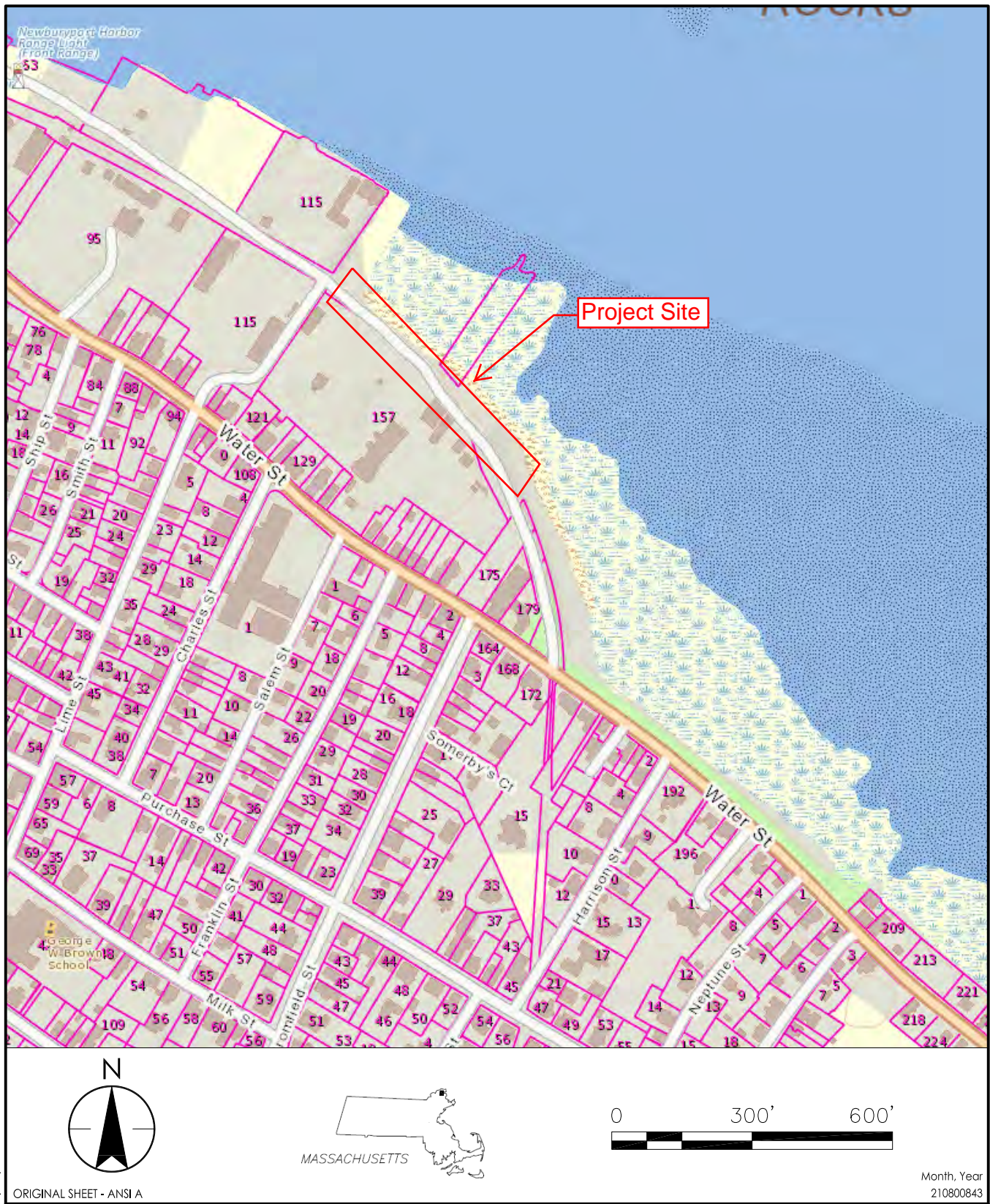
59 Greenhill Street  
West Warwick, RI 02893

## Chain of Custody Record

00127-19

[illegible]

C:\USERS\BFOLEY\DESKTOP\EMAIL TO BOB\NEWBURYPORT LOCUS MAP.DWG  
3/21/2017 4:14 PM



Month, Year  
210800843



5 Burlington Woods Drive  
Burlington, MA  
www.stantec.com

Client/Project

City of Newburyport  
Clipper City Rail Trail  
Newburyport, MA

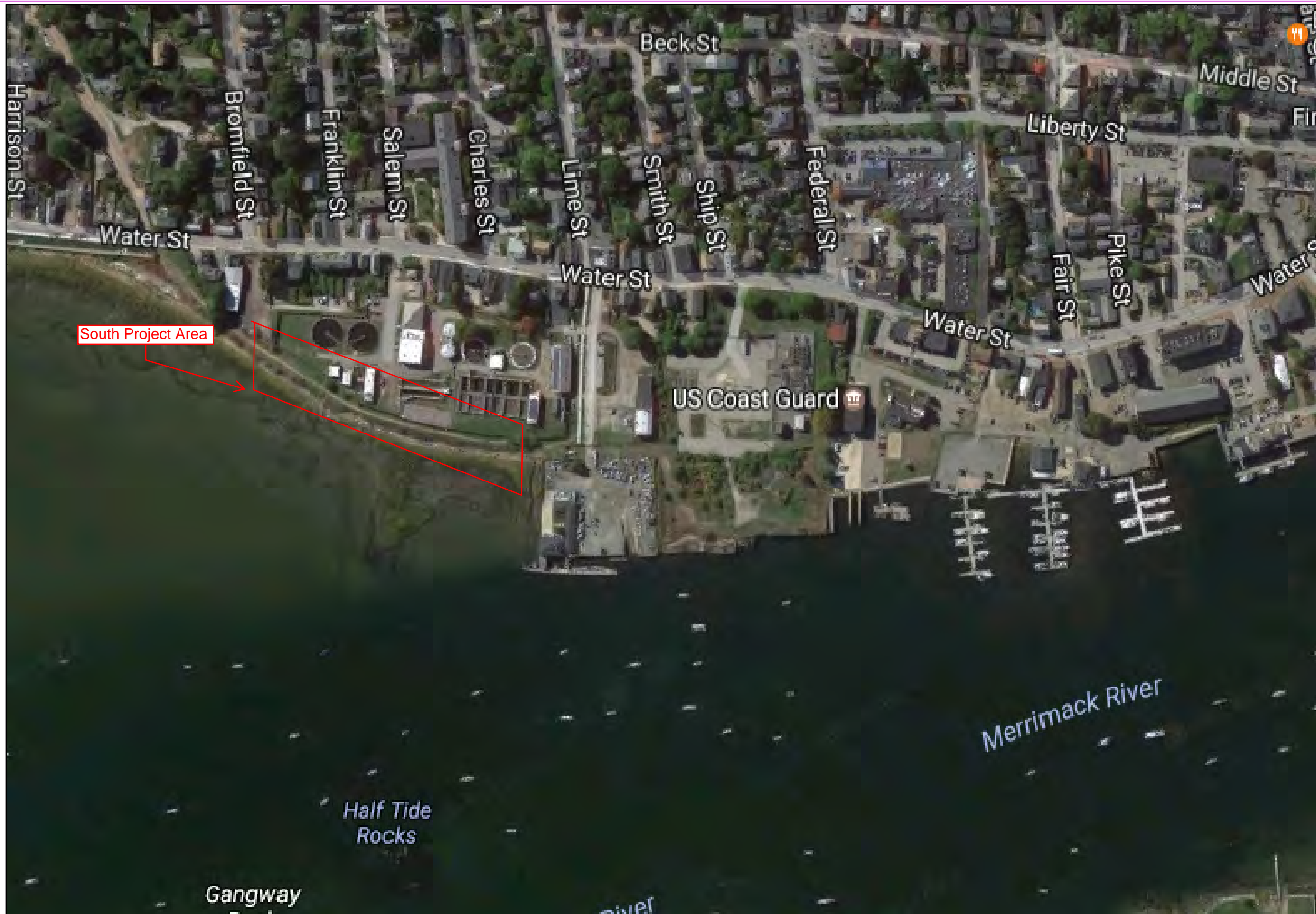
Figure No.

1.0

Title

Site Location Map



[illegible]

Client/Project  
NEWBURYPORT CITY RAIL TRAIL  
UPGRADE ...

NEWBURYPORT, MASSACHUSETTS

## Permit-Seal

Project Number:		195112946	
File Name:			
			12.01.16
Dwn.	Chkd.	Dtan.	YY.MM.DD

Revision Sheet  
0 of XX





NEWBURYPORT / NEWBURY  
CLIPPER CITY RAIL TRAIL - PHASE 2

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/TE/CM-002S(852)X		181
PROJECT FILE NO.		606503	

PRELIMINARY  
CONTAMINATED SOIL AREAS  
SHEET 2 OF 3

CITY OF NEWBURYPORT  
WASTEWATER TREATMENT PLANT

MAP 20 PARCEL 8  
N/F  
CITY OF NEWBURYPORT  
6364/536  
PL BK 143/92

MAP 23 PARCEL 11  
N/F  
CITY OF NEWBURYPORT  
6364/536  
PL BK 143/92

MAP 23 PARCEL 23  
N/F  
CITY OF NEWBURYPORT  
25956/191

MASSACHUSETTS ELEC. CO.  
EASEMENT  
BK 25953 PG 463

MERRIMACK RIVER



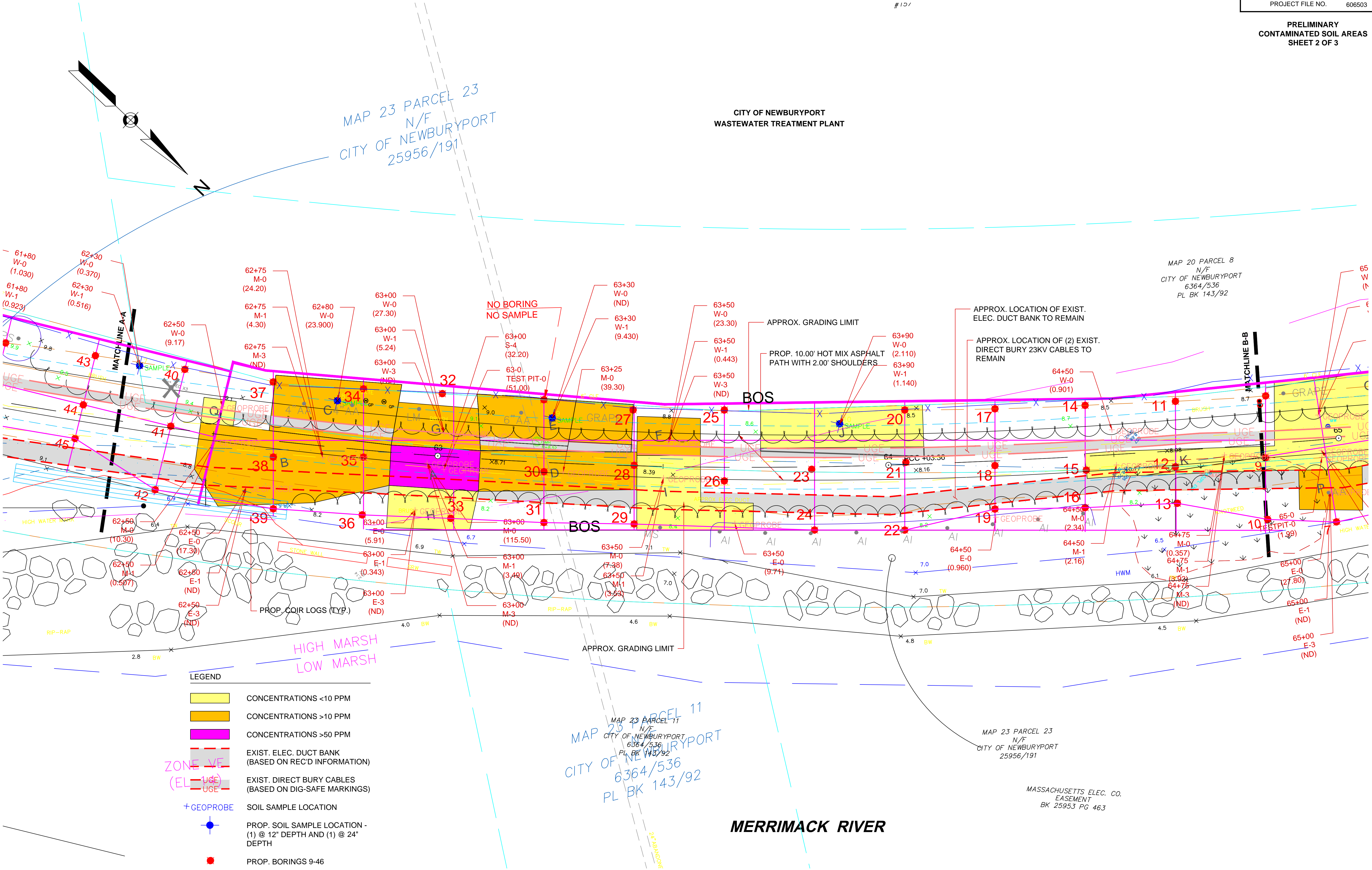
LEGEND

- CONCENTRATIONS <10 PPM
- CONCENTRATIONS >10 PPM
- CONCENTRATIONS >50 PPM
- EXIST. ELEC. DUCT BANK (BASED ON REC'D INFORMATION)
- EXIST. DIRECT BURY CABLES (BASED ON DIG-SAFE MARKINGS)
- SOIL SAMPLE LOCATION
- PROP. SOIL SAMPLE LOCATION - (1) @ 12" DEPTH AND (1) @ 24" DEPTH
- PROP. BORINGS 9-46

ZONE VE  
(EL-UG)

+ GEOPROBE

MAP 23 PARCEL 23  
N/F  
CITY OF NEWBURYPORT  
25956/191





STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/TE/CM-002S(852)X		181
PROJECT FILE NO.		606503	

APPROX. 4" TELE/CABLE/FIBER CONDUITS

