ENVIRONMENTAL • GEOTECHNICAL
BUILDING SCIENCES • MATERIALS TESTING

Calart Tower
400 Reservoir Avenue, Suite 2C
Providence, RI 02907
Telephone 401-714-0306
www.atcgroupservices.com

June 8, 2017

Permit Coordination
U.S. Environmental Protection Agency
EPA-Region 1
5 Post Office Square
Mail Code OEP06-4
Boston, MA 02109-3912

RE: Notice of Intent for Remediation General Permit
M4 Services LLC
261 Boston Road, Billerica, MA 01862
MassDEP RTN 3-13002

Dear Permit Coordination:

ATC Group Services, LLC (ATC) provides the following Notice of Intent (NOI) for a Remediation General Permit (RGP) for construction dewatering, treatment, and discharge needed for an underground storage tank (UST) replacement project at 261 Boston Road, in Billerica, Massachusetts. Based upon the RGP Table 1, the proposed discharge activity would be considered "Type I" Petroleum-Related Site Remediation.

M4 Services LLC, is the owner and operator of the gasoline station. They are in the process of upgrading their three single-walled gasoline-containing USTs. Massachusetts Department of Environmental Protection (MassDEP) regulation requires the removal of single-walled gasoline USTs by August 8, 2017. For this permit application, ATC will be the "operator" of the treatment system.

## *Background*

The property at 261 Boston Road is an existing MassDEP waste site identified by release tracking number RTN 3-13002. RTN 3-13002 was issued in 1995 after gasoline-related soil and groundwater contamination was discovered during an environmental investigation. In the summer of 1996, a soil vapor extraction (SVE) system and air sparging remediation system was installed to mitigate the gasoline release. The SVE remained in operation until 2007 (nine year). Groundwater has been monitored on a periodic basis since 2007, to assess the progress of monitored natural attenuation to reach drinking water standards. Groundwater samples analyzed for volatile petroleum hydrocarbons (VPH) have been compliant with Massachusetts GW-3 surface water discharge criteria since at least 2007, and the achievement of drinking water standards is nearly complete.

The depth to groundwater is approximately four to five feet below grade. Previous hydrogeological assessments indicate the underlying sediments consist of coarse to fine sand, with some gravel and silt. Well gauging data indicates the water table is shallow, and varies from three to four feet below grade. Estimates of hydraulic conductivity based upon sieve grain size analysis and slug testing range from $2.6 \times 10^{-2}$ to $9.5 \times 10^{-2}$ cm/sec. Well gauging data indicates a hydraulic gradient of 0.004 directed to the east. As excavations are proposed to a depth of approximately thirteen (13) feet, temporary dewatering activities are required to facilitate removal and reinstallation installation of the USTs.

Ground water and surface water samples were obtained from monitoring well MW-8, which is located immediately adjacent to the three existing gasoline tanks to characterize the effluent, and a surface water sample was obtained from the wetland behind and west of the property building. The samples were analyzed following the method guidance listed in the March 9, 2017 RGP. Method detection limits were generally compliant with the requirements, however, some reporting limits were not. Please see the attached data summary table for the details.

Google Earth indicates the existing and proposed USTs are located at 71°17'02.09" west longitude, and 42°34'34.95" north latitude. A Site Locus map is presented in **Figure 1**. A Site Plan showing the existing and proposed UST layout is provided as **Figure 2**. **Figure 3** depicts the USGS StreamStat image showing the Boston Road property. A schematic line drawing of a typical treatment system is provided as **Figure 4**. The wetlands east and west of the property ultimately discharge to the north-flowing Concord River. A copy of the NOI application form and Best Management Practices for the operation of the temporary dewatering and treatment system are provided in **Attachment A**.

### *Treatment System Design*

The groundwater treatment system will be composed of the following: one or more submersible pneumatic or electric pumps to lift groundwater from the sheet pile lined excavation into two aboveground temporary storage tanks, plumed in series. The aboveground tanks have an approximate 20,000-gallon capacity. As needed, aeration will be supplied to the first tank to aid iron oxidation/flocculation. The first tank will be plumed to the second frac tank or weir tank by quick-connect hose. Suspended solids will settle out in both tanks. A skid-mounted transfer pump will be used to push the effluent through dual, parallel-oriented six-bag particulate filters capable of removing down to 5 micron-sized particles. Construction dewatering under this RGP will include piping and discharging the treated effluent to a gravel area bounding woods west of the paved parking lot, behind the property building. The sheet flow will enter a wetland 250 to 300 feet further to the west. ATC estimates the area covered by standing water in the wetland is 1,000 feet by 400 feet by 1.5 feet deep (a volume of 4.4 million gallons). The actual volume is likely much larger. To be conservative, ATC intentionally underestimated the area of standing water. These wetlands ultimately discharge to the Concord River downgradient of the Billerica Concord River drinking water intake. The location of Outfall 001 is depicted on **Figure 1** and **Figure 3**. Google Earth indicates the outfall coordinates are 71°17'04.14" west longitude, 42°34'34.38" north latitude.

The design capacity of the groundwater treatment system is 250 gpm based upon the opinions of dewatering treatment contractors that have furnished bids to ATC for dewatering and effluent treatment. The average flow is expected to be less, perhaps 100 to 150 GPM. Due to the short duration of this project, the discharge will likely not last for more than two weeks. The new tanks will be set and installed over a two to three-day period. Water pumped into the tanks as ballast will be pumped through the treatment system. Once the tanks are backfilled and installed, further dewatering will be unnecessary, and the discharge will be terminated.

### *Receiving Waters Information*

The proposed discharge location for the treated groundwater is a wooded area behind the property that drains into a nearby wetland. The wetland ultimately discharges to the Concord River, downstream of the Billerica Water Department drinking water intake. ATC attaches the MassDEP Phase I Primary Resources Map, which identifies nearby sensitive environmental receptors.

According to the online MassDEP 2014 Integrated List of Waters, the Concord River is located in the Sudbury-Assabet-Concord Rivers watershed. Its 2014 Assessment Unit ID was MA82A-08. In the property area, the Concord River is a Category 5, impaired water. The Concord River has TMDLs for phosphorous (nutrients) and metals. Background documentation on the receiving waters is provided in **Attachment B**. Because the wetland has essentially no flow, no dilution factors are requested from MassDEP or applied to effluent calculations.

Using an MS Excel spreadsheet made available by USEPA, ATC calculated water quality based effluent limits (WQBELs) for the discharge, to assess whether the RGP technology based effluent limits (TBEL) or WQBEL apply. Based upon ATC's calculation the only WQBEL that applies is total residual chlorine of 145 ug/L applies. ATC's spreadsheets are presented in **Attachment C**.

### *Influent Sample Analysis*

Groundwater samples were collected from monitoring well MW-8, which is located very near the existing USTs May 31, 2017. The samples were analyzed at the Eurofins Laboratory of Agawam, Massachusetts. The samples were handled under standard chain of custody protocol. Chemical analyses of the influent included all RGP Category A through F parameters. The receiving water was analyzed for ammonia and hardness. Copies of the laboratory reports and chain of custody are provided in **Attachment C**. A summary table of the data is included.

In 1996, a former fuel oil and waste oil UST (both 550-gallons) were removed. The results of confirmatory soil sampling beneath the tanks indicated petroleum hydrocarbons were non-detect. Therefore, Group I and Group II polynuclear hydrocarbons are marked "absent" on the NOI application. None were present above lab reporting limits. There has been no known industrial activity at or near the property that involved the use of the heavy metals antimony, cadmium, chromium III and chromium VI, mercury, selenium, and silver and they have been marked absent. Iron and arsenic are somewhat abundant in Massachusetts soils, and they have been marked present, as have nickel and zinc. Lead is present at very low levels and may be attributed to tetraethyl lead gasoline additive. There have been no known uses of selenium and cyanide; they are absent. PCBs have also been marked absent. There is no know source of PCBs on the property.

Although petroleum fuels have been stored at the property for many years, prior environmental remediation by excavation and soil vapor extraction has mitigated the historical release. Gasoline derived VOCs were not detected in the influent sample (from MW-8) in May 2017. Likewise, other halogenated and non-halogenated VOCs and SVOCs were not detected and they have been marked absent. TPH was reported non-detect at 1 mg/L using EPA Method 1664.

### *Evaluation of Threatened or Endangered Species or Critical Habitats*

ATC reviewed United States Department of the Interior, Fish and Wildlife Service, New England Ecological Services Field Office data via internet and telephone regarding the endangered species consultation required for the RGP application. We spoke by telephone with Ms. Maria Tur. Ms. Tur indicated our short duration project would not affect any endangered or threatened species, and showed ATC how to download a letter affirming this determination. A copy of the determination is provided in **Attachment D**.

### *Review of National Register of Historic Places*

This project does not involve the demolition or rehabilitation of historic properties. ATC has reviewed Massachusetts Historical Commission databases and found there are no nearby historical assets that will be negatively impacted by the project. The Billerica Pump House (a Concord River drinking water pump house) at 350 Boston Road is the nearest relevant property. It is ATC's opinion the scope, location, and short duration of this project will not have any long-term negative effects on the historical attributes of the nearest historical properties. The Pump House information is provided in **Attachment D**.

### *Notification of Local Officials*

ATC has provided copies of this RGP application to the Town of Billerica Public Works and Conservation Department, and to the two downstream property owner(s).

### *Regulation by the Massachusetts Contingency Plan*

Lastly, the work being completed is also governed by Massachusetts Contingency Plan (310 CMR 40.0000) under MassDEP RTN 3-13002. A Release Abatement Measure Plan will be provided to the MassDEP before the work is initiated. Discharges subject to the MCP do not require the completion of state application form BRPWM 12 or to pay state fees.

Should you have any questions regarding the contents of this letter or the NOI for the RGP, please do not hesitate to contact the undersigned at (401) 714-0306, extension 142.

Sincerely,
ATC Group Services LLC

Keith Sullivan, CHMM, LSP #1259
Senior Project Manager

cc: Moses Lawrence
Billerica Conservation and DPW
Catherine Vakalopoulos (MassDEP)
RAM Management Co. LLC
Resident, 5 Alison Drive, Westford, MA

# Figures

ENVIRONMENTAL • GEOTECHNICAL
BUILDING SCIENCES • MATERIALS TESTING

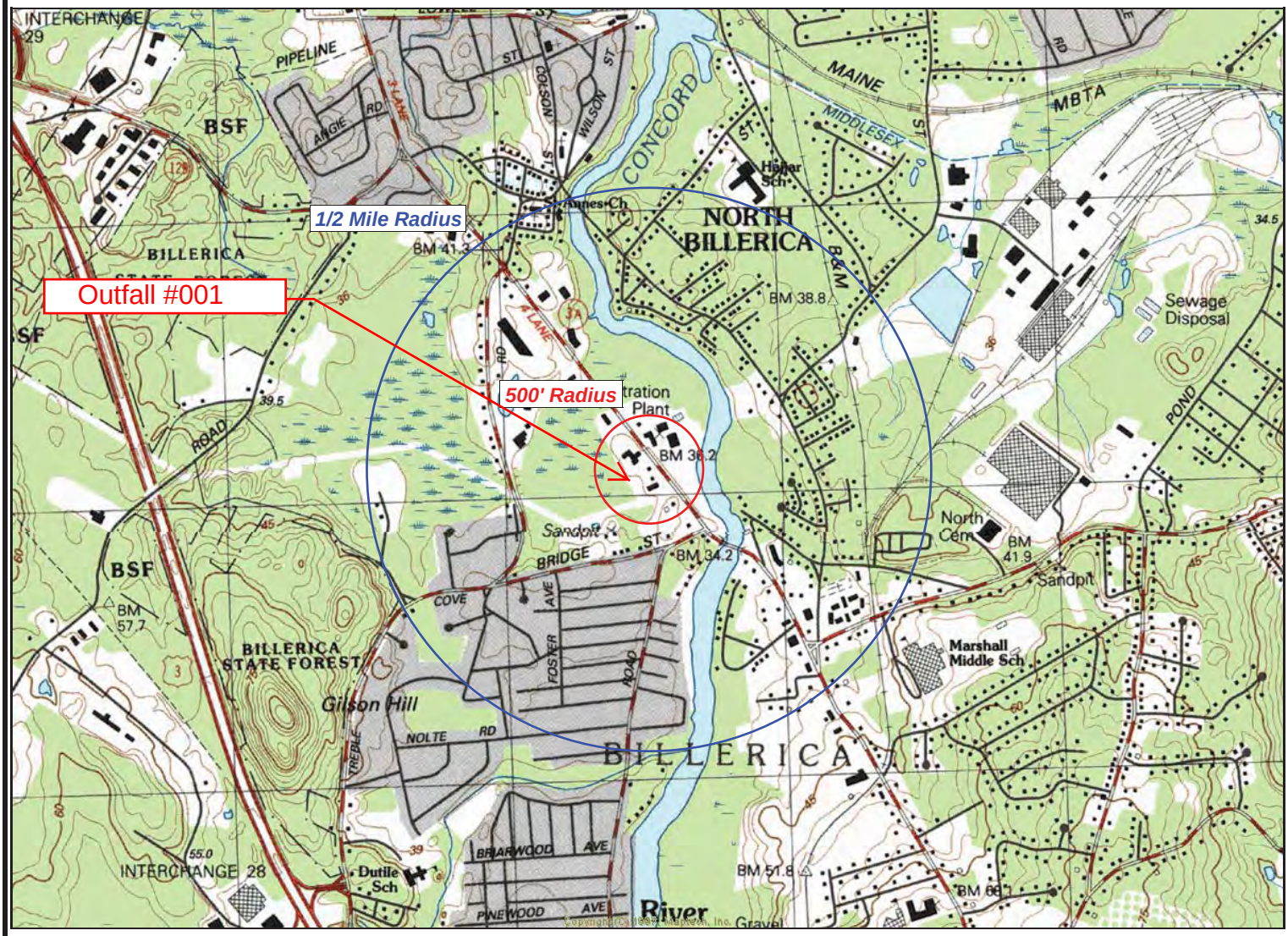
ATC Group Services LLC
500 West Cummings Park, Suite 3750
Woburn, Massachusetts 01801
Phone 781-932-9400 Fax 781-932-6211
www.atcgroupservices.com

# SITE LOCUS

***Figure:*** ***1***

***Pace Energy Service Station***
***261 Boston Street***
***Billerica, MA***

**Job Number:** J50213.00




1 | 1/2 | 0 | 1 Mile

***1 inch = 1500 feet***

***Contour Interval: 3 Meters***

North

***Base Map: U.S. Geological Survey; Quadrangle Location Billerica, MA***

***UTM Coordinates: 19 0312528 East / 47 16087 North***

***Map Edited:*** ***2987*** ***Map Revised:*** ***none*** ***Generated By:*** ***JMR***


## Legend

- Approximate Property Line
- Wetland Boundary
- Overhead Electric Line
- Approximate Easement Boundary
- Monitoring Well
- Detroyed Monitoring Well
- ECS-1 Well I.D.
- Wetland

## General Notes:

All locations, dimensions, and property lines depicted on this plan are approximate. This plan should not be used for construction or land conveyance purposes.

0 Approximate Feet 30

NAME/ADDRESS:

**Pace Energy Station**
**261 Boston Road**
**Billerica, Massachusetts**

DRAWING TITLE:

# Site Plan


ATC
500 West Cummings Park, Suite 3750
Woburn, Massachusetts 01801
(781) 932-9400
(781) 932-6211 FAX


| | |
|---|---|
| DRAWN BY: | AR |
| CHECKED BY: | KH |
| PROJECT NO. | 50213 |
| DATE: | MARCH 2017 |

FIGURE NO. **2**


## Legend

- Approximate Property Line
- Approximate Wetland Boundary
- Overhead Electric Line
- Approximate Easement Boundary
- Wetland

**General Notes:**

All locations, dimensions, and property lines depicted on this plan are approximate. This plan should not be used for construction or land conveyance purposes.

0 Approximate Feet 30

NAME/ADDRESS:

**Pace Energy Station**
**261 Boston Road**
**Billerica, Massachusetts**

DRAWING TITLE:

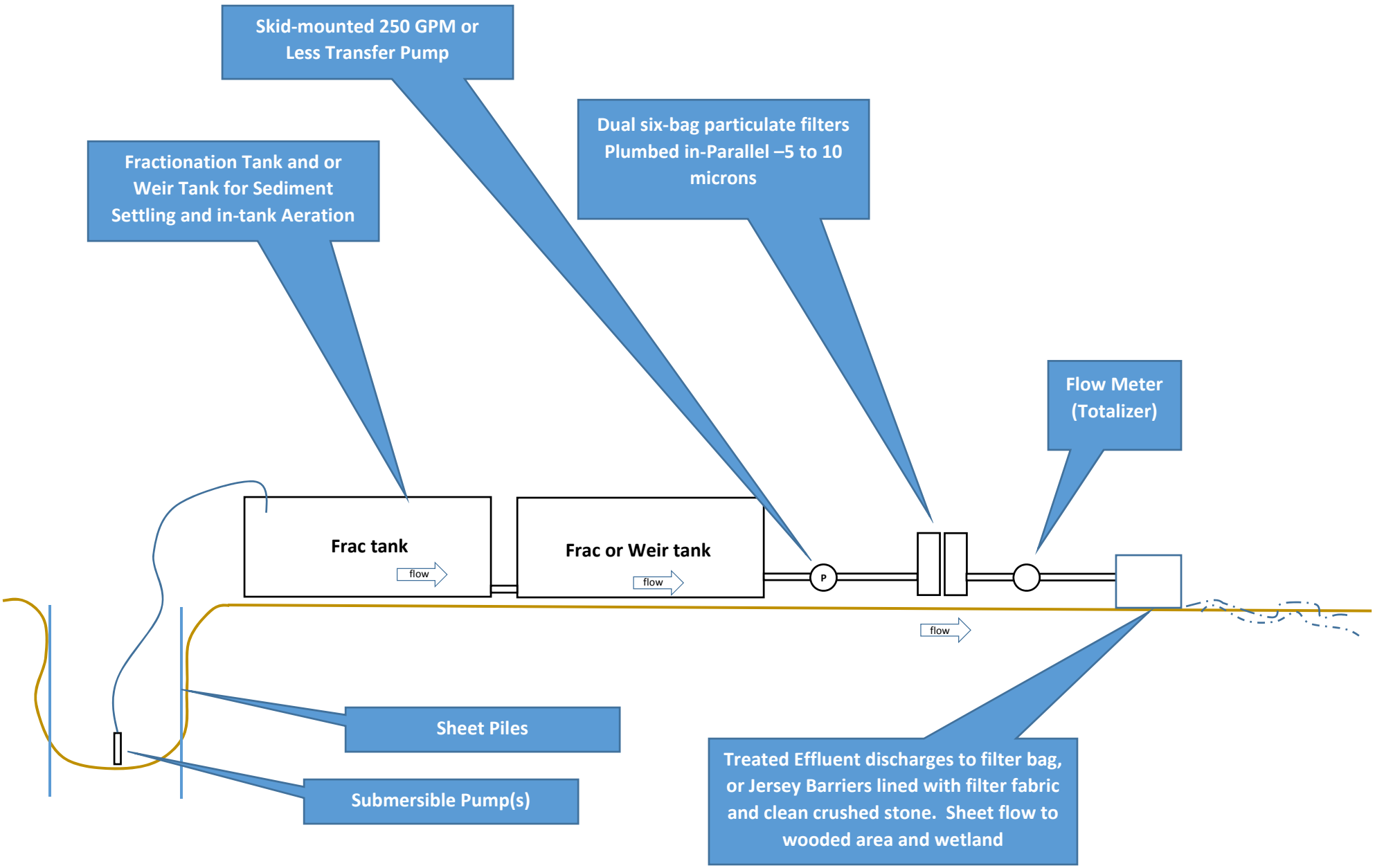
# Proposed USTs and Treatment System


ATC
500 West Cummings Park, Suite 3750
Woburn, Massachusetts 01801
(781) 932-9400
(781) 932-6211 FAX


| | |
|---|---|
| DRAWN BY: | KS |
| CHECKED BY: | KH |
| PROJECT NO. | 50213 |
| DATE: | MARCH 2017 |

FIGURE NO. **3**

## FIGURE 4 - SCHEMATIC LINE DRAWING OF TREATMENT SYSTEM



# Attachment A
## RGP NOI Application Form
## and
## Best Management Practices
## Temporary Construction Dewatering

## II. Suggested Format for the Remediation General Permit Notice of Intent (NOI)

### A. General site information:

<table>
<tr><td rowspan="3">1. Name of site:<br>Pace Energy Service Station</td><td colspan="3">Site address: 261 Boston Road<br>Street:</td></tr>
<tr><td colspan="2">City: Billerica</td><td>State: MA<br>Zip: 01862</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td rowspan="4">2. Site owner<br>M4 Services LLC<br><br>Owner is (check one): ☐ Federal ☐ State/Tribal ■ Private<br>☐ Other; if so, specify:</td><td colspan="3">Contact Person: Moses Lawrence</td></tr>
<tr><td colspan="2">Telephone: 508-270-2684</td><td>Email: moses.lawrence@gmail.com</td></tr>
<tr><td colspan="3">Mailing address: 261 Boston Road<br>Street:</td></tr>
<tr><td colspan="2">City: Billerica</td><td>State: MA<br>Zip: 01862</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner<br>ATC Group Services LLC</td><td colspan="3">Contact Person: Keith Sullivan</td></tr>
<tr><td colspan="2">Telephone: 401-714-0306 Ext. 142</td><td>Email: keith.sullivan@atcassociates.com</td></tr>
<tr><td colspan="3">Mailing address:<br>Street: 400 Reservoir Avenue, Suite 2C</td></tr>
<tr><td colspan="2">City: Providence</td><td>State: RI<br>Zip: 02907</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:<br><br>NPDES permit is (check all that apply: ■ RGP ☐ DGP ☐ CGP<br>☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:</td><td colspan="3">5. Other regulatory program(s) that apply to the site (check all that apply):<br>■ MA Chapter 21e; list RTN(s):<br>3-13002<br>☐ NH Groundwater Management Permit or Groundwater Release Detection Permit:<br>☐ CERCLA<br>☐ UIC Program<br>☐ POTW Pretreatment<br>☐ CWA Section 404</td></tr>
</table>

## B. Receiving water information:

| 1. Name of receiving water(s): | Waterbody identification of receiving water(s): | Classification of receiving water(s): |
|---|---|---|
| Wetland area west of the site, tributary of the Concord River | MA82A-08 | Class B |

Receiving water is (check any that apply): ☐ Outstanding Resource Water ☐ Ocean Sanctuary ☐ territorial sea ☐ Wild and Scenic River

2. Has the operator attached a location map in accordance with the instructions in B, above? (check one): ■ Yes ☐ No

Are sensitive receptors present near the site? (check one): ■ Yes ☐ No

If yes, specify: Wetlands 100 feet east and 350 feet west, Concord River 450 feet east, floodplain, medium yield aquifer, drinking water intake on Concord River

3. Indicate if the receiving water(s) is listed in the State's Integrated List of Waters (i.e., CWA Section 303(d)). Include which designated uses are impaired, and any pollutants indicated. Also, indicate if a final TMDL is available for any of the indicated pollutants. For more information, contact the appropriate State as noted in Part 4.6 of the RGP. Yes, on 303 list. TMDL for nutrient and metals.

| | |
|---|---|
| 4. Indicate the seven day-ten-year low flow (7Q10) of the receiving water determined in accordance with the instructions in Appendix V for sites located in Massachusetts and Appendix VI for sites located in New Hampshire. | Wetland none. Concord R. 33.7 ft3/s |
| 5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire. | None |

6. Has the operator received confirmation from the appropriate State for the 7Q10and dilution factor indicated? (check one): ☐ Yes ■ No

If yes, indicate date confirmation received:

7. Has the operator attached a summary of receiving water sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ■ Yes ☐ No

## C. Source water information:

1. Source water(s) is (check any that apply):

| | | | |
|---|---|---|---|
| ■ Contaminated groundwater<br><br>Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one):<br>■ Yes ☐ No | ☐ Contaminated surface water<br><br>Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one):<br>☐ Yes ☐ No | ☐ The receiving water<br><br>☐ A surface water other than the receiving water; if so, indicate waterbody: | ☐ Potable water; if so, indicate municipality or origin:<br><br>☐ Other; if so, specify: |

| | |
|---|---|
| 2. Source water contaminants: Remediated gasoline station | |
| a. For source waters that are contaminated groundwater or contaminated surface water, indicate are any contaminants present that are not included in the RGP? (check one): ☐ Yes ■ No If yes, indicate the contaminant(s) and the maximum concentration present in accordance with the instructions in Appendix VIII. | b. For a source water that is a surface water other than the receiving water, potable water or other, indicate any contaminants present at the maximum concentration in accordance with the instructions in Appendix VIII? (check one): ☐ Yes ■ No |
| 3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): ☐ Yes ■ No | |

## D. Discharge information

| | |
|---|---|
| 1.The discharge(s) is a(n) (check any that apply): ☐ Existing discharge ■ New discharge ☐ New source | |
| Outfall(s):<br>Outfall 001 - Ground surface west of building at 261 Boston Road, Billerica, MA | Outfall location(s): (Latitude, Longitude)<br>42 degrees, 34' 34.38" N Latitude<br>71 degrees, 71' 04.14" W Longitude |
| Discharges enter the receiving water(s) via (check any that apply): ■ Direct discharge to the receiving water ☐ Indirect discharge, if so, specify:<br><br>☐ A private storm sewer system ☐ A municipal storm sewer system<br>If the discharge enters the receiving water via a private or municipal storm sewer system:<br>Has notification been provided to the owner of this system? (check one): ☐ Yes ☐ No<br>Has the operator has received permission from the owner to use such system for discharges? (check one): ☐ Yes ☐ No, if so, explain, with an estimated timeframe for obtaining permission: Not applicable<br>Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): ☐ Yes ☐ No | |
| Provide the expected start and end dates of discharge(s) (month/year): June 20, 2017 through June 30, 2017<br>Indicate if the discharge is expected to occur over a duration of: ■ less than 12 months ☐ 12 months or more ☐ is an emergency discharge | |
| Has the operator attached a site plan in accordance with the instructions in D, above? (check one): ■ Yes ☐ No | |

<table>
<tr><td>2. Activity Category: (check all that apply)</td><td colspan="2">3. Contamination Type Category: (check all that apply)</td></tr>
<tr><td rowspan="5">■ I – Petroleum-Related Site Remediation<br>☐ II – Non-Petroleum-Related Site Remediation<br>☐ III – Contaminated Site Dewatering<br>☐ IV – Dewatering of Pipelines and Tanks<br>☐ V – Aquifer Pump Testing<br>☐ VI – Well Development/Rehabilitation<br>☐ VII – Collection Structure Dewatering/Remediation<br>☐ VIII – Dredge-Related Dewatering</td><td colspan="2">a. If Activity Category I or II: (check all that apply)<br><br>■ A. Inorganics<br>■ B. Non-Halogenated Volatile Organic Compounds<br>■ C. Halogenated Volatile Organic Compounds<br>■ D. Non-Halogenated Semi-Volatile Organic Compounds<br>■ E. Halogenated Semi-Volatile Organic Compounds<br>■ F. Fuels Parameters</td></tr>
<tr><td colspan="2">b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)</td></tr>
<tr><td>☐ G. Sites with Known Contamination</td><td>☐ H. Sites with Unknown Contamination</td></tr>
<tr><td>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)<br><br>☐ A. Inorganics<br>☐ B. Non-Halogenated Volatile Organic Compounds<br>☐ C. Halogenated Volatile Organic Compounds<br>☐ D. Non-Halogenated Semi-Volatile Organic Compounds<br>☐ E. Halogenated Semi-Volatile Organic Compounds<br>☐ F. Fuels Parameters</td><td>d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply</td></tr>
</table>

4. Influent and Effluent Characteristics

| Parameter | Known or believed absent | Known or believed present | # of samples | Test method (#) | Detection limit (µg/l) | Influent | | Effluent Limitations | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Daily maximum (µg/l) | Daily average (µg/l) | TBEL | WQBEL |
| **A. Inorganics** | | | | | | | | | |
| Ammonia | | ✔ | 1 | E350.1 | 50 | 160 | 160 | Report mg/L | --- |
| Chloride | | ✔ | 1 | EPA300.0 | 897 | 260,000 | 260,000 | Report µg/l | --- |
| Total Residual Chlorine | ✔ | | 1 | SM4500CI | 6 | <20 | <20 | 0.2 mg/L | 0.011 mg/L |
| Total Suspended Solids | | ✔ | 1 | SM2540D | 400 | 5,200 | 5,200 | 30 mg/L | --- |
| Antimony | ✔ | | 1 | EPA200.8 | 0.07 | <0.45 | <0.45 | 206 µg/L | 640 ug/L |
| Arsenic | | ✔ | 1 | EPA200.8 | 0.06 | 4.18 | 4.18 | 104 µg/L | 10 ug/L |
| Cadmium | ✔ | | 1 | EPA200.8 | 0.04 | <0.25 | <0.25 | 10.2 µg/L | 2.5 ug/L |
| Chromium III | ✔ | | 1 | EPA200 | 5.3 | <2.4 | <2.4 | 323 µg/L | 74 ug/L |
| Chromium VI | ✔ | | 1 | SM3500C | 2 | <5 | <5 | 323 µg/L | 11 ug/L |
| Copper | | ✔ | 1 | EPA200.8 | 0.04 | 4.74 | 4.74 | 242 µg/L | 9.0 ug/L |
| Iron | | ✔ | 1 | EPA200.7 | 10.0 | 642 | 642 | 5,000 µg/L | 5,000 ug/L |
| Lead | | ✔ | 1 | EPA200.8 | 0.02 | 1.09 | 1.09 | 160 µg/L | 2.5 ug/L |
| Mercury | ✔ | | 1 | EPA245.1/ | 0.13 | <0.20 | <0.20 | 0.739 µg/L | 77 ug/L |
| Nickel | | ✔ | 1 | EPA200.8 | 0.05 | 2.50 | 2.50 | 1,450 µg/L | 52 ug/L |
| Selenium | ✔ | | 1 | EPA200.8 | 0.12 | <3.05 | <3.05 | 235.8 µg/L | 5.0 ug/L |
| Silver | ✔ | | 1 | EPA200.8 | 0.10 | <0.30 | <0.30 | 35.1 µg/L | 3.2 ug/L |
| Zinc | | ✔ | 1 | EPA200.8 | 1.16 | 11.0 | 11.0 | 420 µg/L | 12 ug/L |
| Cyanide | ✔ | | 1 | EPA335.4/ | 4.26 | <5.0 | <5.0 | 178 mg/L | 5.2 ug/L |
| **B. Non-Halogenated VOCs** | | | | | | | | | |
| Total BTEX | ✔ | | 1 | | | | | 100 µg/L | --- |
| Benzene | ✔ | | 1 | EPA624 | 0.3 | <1.0 | <1.0 | 5.0 µg/L | --- |
| 1,4 Dioxane | ✔ | | 1 | EPA624 | 11.4 | <20 | <20 | 200 µg/L | --- |
| Acetone | ✔ | | 1 | EPA624 | 0.8 | <10.0 | <10.0 | 7.97 mg/L | --- |
| Phenol | ✔ | | 1 | EPA625 | 0.658 | <5.10 | <5.10 | 1,080 µg/L | 300 ug/L |

| Parameter | Known or believed absent | Known or believed present | # of samples | Test method (#) | Detection limit (µg/l) | Influent | | Effluent Limitations | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Daily maximum (µg/l) | Daily average (µg/l) | TBEL | WQBEL |
| **C. Halogenated VOCs** | | | | | | | | | |
| Carbon Tetrachloride | ✔ | | 1 | EPA624 | 0.4 | <1.0 | <1.0 | 4.4 µg/L | 1.6 ug/L |
| 1,2 Dichlorobenzene | ✔ | | 1 | EPA624 | 0.3 | <1.0 | <1.0 | 600 µg/L | --- |
| 1,3 Dichlorobenzene | ✔ | | 1 | EPA624 | 0.3 | <1.0 | <1.0 | 320 µg/L | --- |
| 1,4 Dichlorobenzene | ✔ | | 1 | EPA624 | 0.3 | <1.0 | <1.0 | 5.0 µg/L | --- |
| Total dichlorobenzene | ✔ | | 1 | EPA624 | 0.3 | <1.0 | <1.0 | 763 µg/L in NH | --- |
| 1,1 Dichloroethane | ✔ | | 1 | EPA624 | 0.3 | <1.0 | <1.0 | 70 µg/L | --- |
| 1,2 Dichloroethane | ✔ | | 1 | EPA624 | 0.3 | <1.0 | <1.0 | 5.0 µg/L | --- |
| 1,1 Dichloroethylene | ✔ | | 1 | EPA624 | 0.7 | <1.0 | <1.0 | 3.2 µg/L | --- |
| Ethylene Dibromide | ✔ | | 1 | SW846 | 0.00336 | <0.0100 | <0.0100 | 0.05 µg/L | --- |
| Methylene Chloride | ✔ | | 1 | EPA624 | 0.7 | <10.0 | <10.0 | 4.6 µg/L | --- |
| 1,1,1 Trichloroethane | ✔ | | 1 | EPA624 | 0.5 | <1.0 | <1.0 | 200 µg/L | --- |
| 1,1,2 Trichloroethane | ✔ | | 1 | EPA624 | 0.3 | <1.0 | <1.0 | 5.0 µg/L | --- |
| Trichloroethylene | ✔ | | 1 | EPA624 | 0.5 | <1.0 | <1.0 | 5.0 µg/L | --- |
| Tetrachloroethylene | ✔ | | 1 | EPA624 | 0.8 | <1.0 | <1.0 | 5.0 µg/L | 3.3 ug/L |
| cis-1,2 Dichloroethylene | ✔ | | 1 | EPA624 | 0.3 | <1.0 | <1.0 | 70 µg/L | --- |
| Vinyl Chloride | ✔ | | 1 | EPA624 | 0.5 | <1.0 | <1.0 | 2.0 µg/L | --- |
| **D. Non-Halogenated SVOCs** | | | | | | | | | |
| Total Phthalates | ✔ | | 1 | EPA625 | 0.773 | <0.773 | <0.773 | 190 µg/L | 190 ug/L |
| Diethylhexyl phthalate | ✔ | | 1 | EPA625 | 0.651 | <0.651 | <0.651 | 101 µg/L | 2.2 ug/L |
| Total Group I PAHs | ✔ | | 1 | EPA625 | 0.592 | <0.592 | <0.592 | 1.0 µg/L | --- |
| Benzo(a)anthracene | ✔ | | 1 | EPA625 | 0.547 | <0.547 | <0.547 | As Total PAHs | 0.0038 |
| Benzo(a)pyrene | ✔ | | 1 | EPA625 | 0.573 | <0.573 | <0.573 | | 0.0038 |
| Benzo(b)fluoranthene | ✔ | | 1 | EPA625E | 0.446 | <0.446 | <0.446 | | 0.0038 |
| Benzo(k)fluoranthene | ✔ | | 1 | EPA625 | 0.49 | <0.49 | <0.49 | | 0.0038 |
| Chrysene | ✔ | | 1 | EPA625 | 0.543 | <0.543 | <0.543 | | 0.0038 |
| Dibenzo(a,h)anthracene | ✔ | | 1 | EPA625 | 0.459 | <0.459 | <0.459 | | 0.0038 |
| Indeno(1,2,3-cd)pyrene | ✔ | | 1 | EPA625 | 0.592 | <0.592 | <0.592 | | 0.0038 |

| Parameter | Known or believed absent | Known or believed present | # of samples | Test method (#) | Detection limit (µg/l) | Influent | | Effluent Limitations | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Daily maximum (µg/l) | Daily average (µg/l) | TBEL | WQBEL |
| Total Group II PAHs | ✔ | | 1 | EPA625 | 0.705 | <0.705 | <0.705 | 100 µg/L | --- |
| Naphthalene | ✔ | | 1 | EPA625 | 0.699 | <0.699 | <0.699 | 20 µg/L | --- |
| **E. Halogenated SVOCs** | | | | | | | | | |
| Total PCBs | ✔ | | 1 | EPA608 | 0.139 | <0.139 | <0.139 | 0.000064 µg/L | --- |
| Pentachlorophenol | ✔ | | 1 | EPA625 | 0.381 | <0.381 | <0.381 | 1.0 µg/L | --- |
| **F. Fuels Parameters** | | | | | | | | | |
| Total Petroleum Hydrocarbons | ✔ | | 1 | 1664 | 900 | <900 | <900 | 5.0 mg/L | --- |
| Ethanol | ✔ | | 1 | EPA8015 | 447 | <447 | <447 | Report mg/L | --- |
| Methyl-tert-Butyl Ether | ✔ | | 1 | EPA624 | 0.2 | <1 | <1 | 70 µg/L | 20 ug/L |
| tert-Butyl Alcohol | ✔ | | 1 | EPA8015 | 447 | <447 | <447 | 120 µg/L in MA<br>40 µg/L in NH | --- |
| tert-Amyl Methyl Ether | ✔ | | 1 | EPA524.2 | 0.49 | <0.005 | <0.005 | 90 µg/L in MA<br>140 µg/L in NH | --- |
| **Other (i.e., pH, temperature, hardness, salinity, $LC_{50}$, additional pollutants present); if so, specify:** | | | | | | | | | |
| Hardness | | ✔ | 1 | SM2340B | 456 | 160,000 | 160,000 | | |
| Calcium | | ✔ | 1 | EPA200.7 | 100 | 57,400 | 57,400 | | |
| Magnesium | | ✔ | 1 | EPA200.7 | 50 | 3,990 | 3,990 | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

## E. Treatment system information

1. Indicate the type(s) of treatment that will be applied to effluent prior to discharge: (check all that apply)

☐ Adsorption/Absorption ☐ Advanced Oxidation Processes ☐ Air Stripping ☐ Granulated Activated Carbon ("GAC")/Liquid Phase Carbon Adsorption
☐ Ion Exchange ☐ Precipitation/Coagulation/Flocculation ■ Separation/Filtration ☐ Other; if so, specify:

2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge.

Water from sheet pile excavation will be pumped into frac tank then weir tank in series. Aeration will be supplied. Solids will settle. Water is pumped from second tank in parallel to dual six-bag particulate filters of 5-10 micron size. Form the bag filters, effluent will pass through flow totalizer, and finally disperse onto gravel via larger filter bag, or jersey barriers lined with filter fabric and clean gravel.

Identify each major treatment component (check any that apply):
■ Fractionation tanks☐ Equalization tank ☐ Oil/water separator ☐ Mechanical filter ☐ Media filter
☐ Chemical feed tank ☐ Air stripping unit ■ Bag filter ☐ Other; if so, specify:

Indicate if either of the following will occur (check any that apply):
☐ Chlorination ☐ De-chlorination

| | |
|---|---|
| 3. Provide the **design flow capacity** in gallons per minute (gpm) of the most limiting component.<br>Indicate the most limiting component: Bag filtration<br>Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification: | 250 GPM |
| Provide the proposed maximum effluent flow in gpm. | 250 |
| Provide the average effluent flow in gpm. | 100-150 |
| If Activity Category IV applies, indicate the estimated total volume of water that will be discharged: | |

4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): ■ Yes ☐ No

## F. Chemical and additive information

1. Indicate the type(s) of chemical or additive that will be applied to effluent prior to discharge or that may otherwise be present in the discharge(s): (check all that apply)

☐ Algaecides/biocides ☐ Antifoams ☐ Coagulants ☐ Corrosion/scale inhibitors ☐ Disinfectants ☐ Flocculants ☐ Neutralizing agents ☐ Oxidants ☐ Oxygen ☐ scavengers ☐ pH conditioners ☐ Bioremedial agents, including microbes ☐ Chlorine or chemicals containing chlorine ☐ Other; if so, specify:

2. Provide the following information for each chemical/additive, using attachments, if necessary:

a. Product name, chemical formula, and manufacturer of the chemical/additive;
b. Purpose or use of the chemical/additive or remedial agent;
c. Material Safety Data Sheet (MSDS) and Chemical Abstracts Service (CAS) Registry number for each chemical/additive;
d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive;
e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks; and
f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)).

3. Has the operator attached an explanation which demonstrates that the addition of such chemicals/additives may be authorized under this general permit in accordance with the instructions in F, above? (check one): ☐ Yes ☐ No; if no, has the operator attached data that demonstrates each of the 126 priority pollutants in CWA Section 307(a) and 40 CFR Part 423.15(j)(1) are non-detect in discharges with the addition of the proposed chemical/additive? (check one): ☐ Yes ☐ No

## G. Endangered Species Act eligibility determination

1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:

☐ **FWS Criterion A**: No endangered or threatened species or critical habitat are in proximity to the discharges or related activities or come in contact with the "action area".

☐ **FWS Criterion B**: Formal or informal consultation with the FWS under section 7 of the ESA resulted in either a no jeopardy opinion (formal consultation) or a written concurrence by FWS on a finding that the discharges and related activities are "not likely to adversely affect" listed species or critical habitat (informal consultation). Has the operator completed consultation with FWS? (check one): ☐ Yes ☐ No; if no, is consultation underway? (check one): ☐ Yes ☐ No

■ **FWS Criterion C**: Using the best scientific and commercial data available, the effect of the discharges and related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by EPA, or by the operator and affirmed by EPA, that the discharges and related activities will have "no effect" on any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the FWS. This determination was made by: (check one) ■ the operator ☐ EPA ☐ Other; if so, specify: Consultation with FWS and MassDEP Maps

☐ **NMFS Criterion**: A determination made by EPA is affirmed by the operator that the discharges and related activities will have "no effect" or are "not likely to adversely affect" any federally threatened or endangered listed species or critical habitat under the jurisdiction of NMFS and will not result in any take of listed species. Has the operator previously completed consultation with NMFS? (check one): ☐ Yes ☐ No

2. Has the operator attached supporting documentation of ESA eligibility in accordance with the instructions in Appendix I, and G, above? (check one): ■ Yes ☐ No

Does the supporting documentation include any written concurrence or finding provided by the Services? (check one): ■ Yes ☐ No; if yes, attach.

## H. National Historic Preservation Act eligibility determination

1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:

☐ **Criterion A**: No historic properties are present. The discharges and discharge-related activities (e.g., BMPs) do not have the potential to cause effects on historic properties.

■ **Criterion B**: Historic properties are present. Discharges and discharge related activities do not have the potential to cause effects on historic properties.

☐ **Criterion C**: Historic properties are present. The discharges and discharge-related activities have the potential to have an effect or will have an adverse effect on historic properties.

2. Has the operator attached supporting documentation of NHPA eligibility in accordance with the instructions in H, above? (check one): ■ Yes ☐ No

Does the supporting documentation include any written agreement with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (TPHO), or other tribal representative that outlines measures the operator will carry out to mitigate or prevent any adverse effects on historic properties? (check one): ☐ Yes ■ No

## I. Supplemental information

Describe any supplemental information being provided with the NOI. Include attachments if required or otherwise necessary.

The property was remediated by soil vapor extraction and air sparging for nine years. Property groundwater has been monitored since 1996 (21) years. Groundwater concentrations have not exceeded MassDEP GW-3 surface water discharge for more than 15 year. Groundwater concentrations are nearly at drinking water levels.

Has the operator attached data, including any laboratory case narrative and chain of custody used to support the application? (check one): ■ Yes ☐ No

Has the operator attached the certification requirement for the Best Management Practices Plan (BMPP)? (check one): ■ Yes ☐ No

## J. Certification requirement

*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

| | |
|---|---|
| BMPP certification statement: | As part of the NOI, as required by Section 2.5.1.c., a BMPP meeting the requirements of this general permit will be developed and implemented upon initiation of discharge. |
| Notification provided to the appropriate State, including a copy of this NOI, if required. | Check one: Yes ■ No ☐ |
| Notification provided to the municipality in which the discharge is located, including a copy of this NOI, if requested. | Check one: Yes ■ No ☐ |
| Notification provided to the owner of a private or municipal storm sewer system, if such system is used for site discharges, including a copy of this NOI, if requested. | Check one: Yes ☐ No ☐ NA ■ |
| Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission. | Check one: Yes ☐ No ☐ NA ■ |
| Notification provided to the owner/operator of the area associated with activities covered by an additional discharge permit(s). Additional discharge permit is (check one): ☐ RGP ☐ DGP ☐ CGP ☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify: | Check one: Yes ☐ No ☐ NA ■ |
| Signature:  | Date: June 8, 2017 |
| Print Name and Title: Keith Sullivan, Project Manager | |

## Best Management Practices

## Remediation General Permit
## Temporary Construction Dewatering
## 261 Boston Road, Billerica, MA

A Notice of Intent for a Remediation General Permit (RGP) has been submitted to the US Environmental Protection Agency (EPA) in anticipation of temporary construction dewatering that may occur when three existing underground storage tanks (USTs) are removed from the ground and replaced with two new USTs. This Best Management Practices Plan (BMPP) has been prepared as an Appendix to the RGP and will be posted at the site during the time period that temporary construction dewatering is occurring at the site.

### *Water Treatment and Management*

The groundwater treatment system will be composed of the following: submersible pneumatic or electric pump(s) to lift groundwater from a sheet-piled excavation into an approximate frac tanks. The first frac tank will employ an aeration system to aid with iron oxidation. The first frac tank will be plumed to a second 21,000 frac tank by quick connect hose. Suspended solids will settle out in both tanks. A skid-mounted transfer pump will be used to push the effluent from the second tank through dual 6-bag, parallel-oriented particulate filters. Filtration will be to 5 to 10 microns. The total flow will be monitoring using a meter. The effluent will be dispersed as sheet flow to the ground surface by large filter bag, or Jersey Barriers lined with filter fabric and clean crushed stone. A line diagram of the groundwater treatment system is provided as **Figure Four**.

The average discharge rate into the wetland is expected to be approximately 150 gallons per minute (gpm). The design capacity of the groundwater treatment system is 250 gpm based upon the opinions of dewatering treatment contractors that have furnished bids to ATC for dewatering and effluent treatment.

The treatment system will be designed and operated by ATC. ATC will obtain and test all influent and effluent samples for compliance monitoring. The Proposed Treatment System Schematic is depicted as Figure Four in the RGP Application. Construction dewatering under this RGP will include piping and discharging the treated effluent to a wooded area west of the paved parking lot, behind the property building. The outfall is labelled “Outfall 001” on Figure One and Three of the RGP Application. The sheet flow will flow into a wetland that ultimately discharges to the Concord River downgradient of the Billerica Concord River drinking water intake.

### *Discharge Monitoring and Compliance*

Regular sampling and testing will be conducted by the Environmental Consultant at the treated effluent as required by the RGP. Due to the short duration of this project, the discharge will likely not last for more than two weeks. Daily monitoring to be completed by the Contractor / Operator will include checking the condition of the treatment system, assessing the need for treatment system adjustments based on monitoring data, observing and recording daily flow rates and discharge quantities, and verifying the flow path of the discharged effluent. The total daily flow will be monitored by checking and documenting the flow through the flow meter to be installed on the system. Flow will be maintained below the “system design flow” by regularly monitoring flow and adjusting the amount of construction dewatering as needed.

## *System Maintenance*

A number of methods will be used to minimize the potential for violations for the term of this permit. Scheduled regular maintenance of the treatment system will be conducted to verify proper operation. Regular maintenance will include checking the condition of the treatment system equipment such as the frac and weir tanks, bag filters, hoses, pumps, and flow meter. Equipment will be monitored daily for potential issues or unscheduled maintenance requirements.

Employees who have direct or indirect responsibility for ensuring compliance with the RGP will be trained by the Contractor / Operator.

## *Miscellaneous Items*

It is anticipated that the sheet-pile excavation support system, erosion control measures, and the nature of the site and surrounding infrastructure will minimize potential runoff to or from the site. The Contractor will include Best Management Practices for the prevention of sediment entrainment in storm water runoff. Wattle and hay-bales will be deployed around critical areas, and at the end of pavement west of the property building.

Site security for the treatment system will be covered within the overall Contractor site security plan.

No adverse effects are expected for downgradient surface water bodies. Dewatering effluent will be sufficiently treated prior to discharge to the woodland and wetland.

## *Management of Treatment System Materials*

With the exception of total suspended solids, untreated groundwater analytical data obtained for the RGP application was below the applicable Technology Based Effluent Limits, as they are currently written in the March 2017 RGP.

Dewatering effluent will be pumped directly into the treatment system from the excavation with use of hoses to minimize handling. The contractor will establish staging areas on the property for any equipment or materials storage which may be possible sources of pollution away from any dewatering activities.

Sediment from the fractionalization tank used in the treatment system will be characterized and disposed of as soil at an appropriate receiving facility in accordance with applicable laws and regulations. Bag filters will be placed in drums and manifested for off-site disposal.

# Attachment B
## Background Documentation on the Concord River
## and
## Sensitive Receptors

# MassDEP - Bureau of Waste Site Cleanup

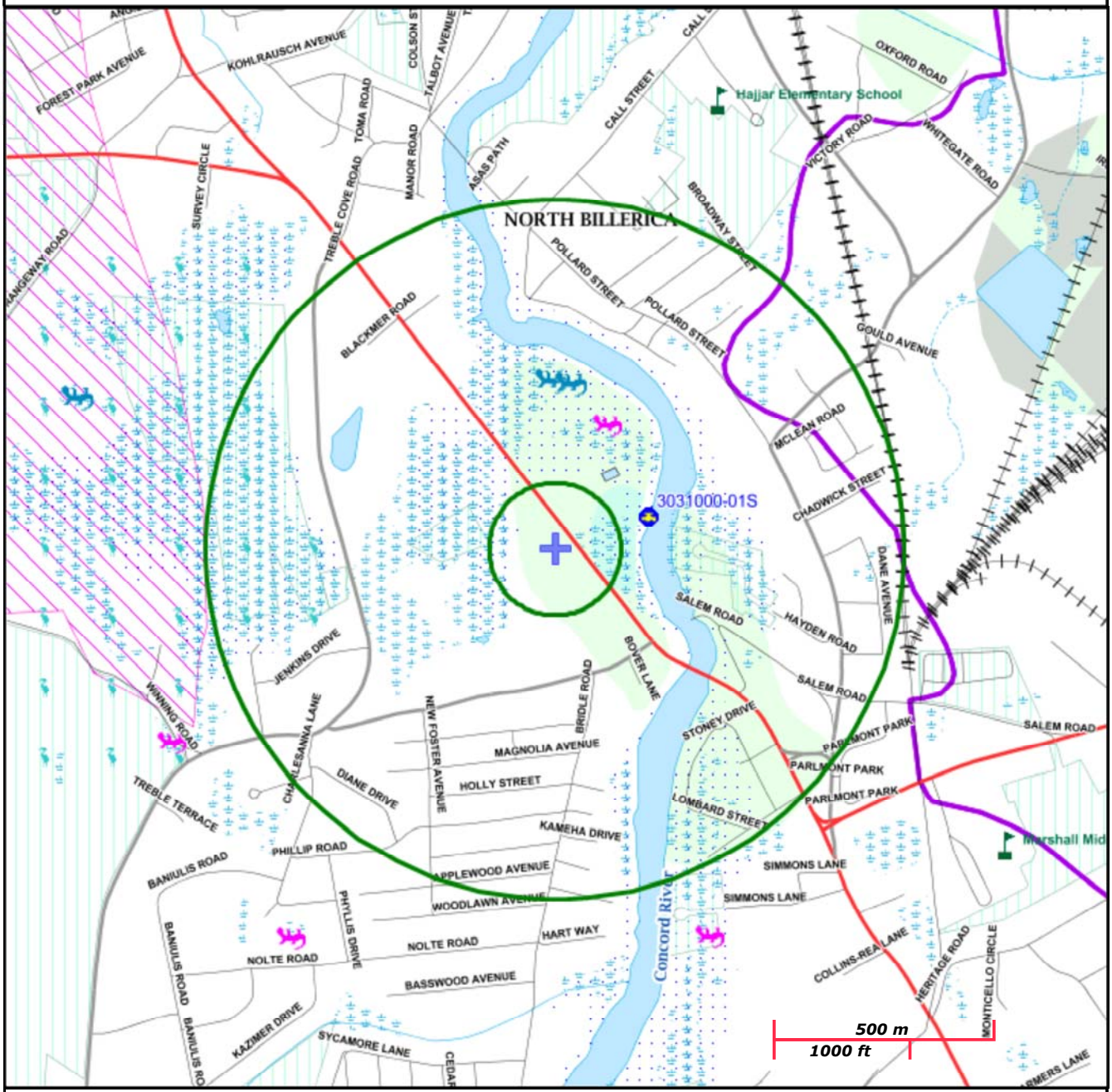
## Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

**Site Information:**
PACE ENERGY
261 BOSTON ROAD BILLERICA, MA
3-000013002

**NAD83 UTM Meters:**
4716329mN , 312543mE (Zone: 19)
June 8, 2017

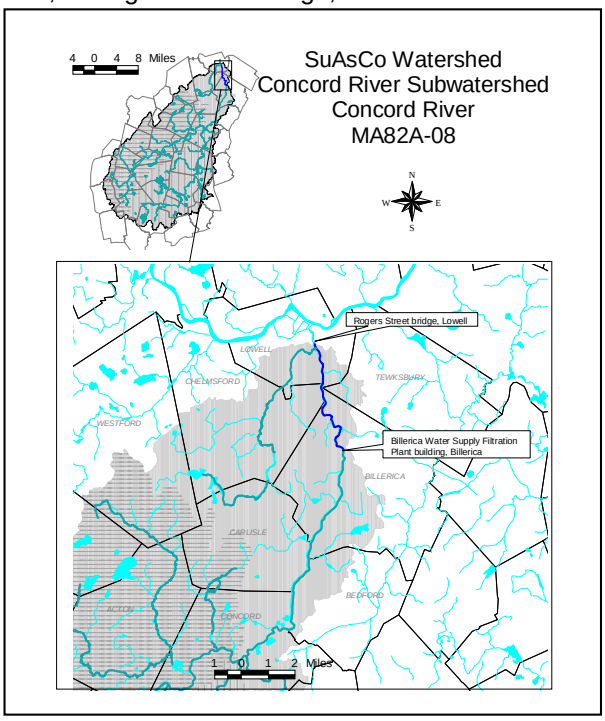
The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: http://www.mass.gov/mgis/.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection




Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail
Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct
Basins: Major,PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam
Aquifers: Medium Yield, High Yield, EPA Sole Source
Non Potential Drinking Water Source Area: Medium, High (Yield)
PWS Protection Areas: Zone II, IWPA, Zone A
Hydrography: Open Water, PWS Reservoir, Tidal Flat
Wetlands: Freshwater, Saltwater, Cranberry Bog
FEMA 100yr Floodplain; Protected Open Space; ACEC
Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential
Solid Waste Landfill; PWS: Com.GW,SW, Emerg.,Non-Com.

**CONCORD RIVER (SEGMENT MA82A-08)**
Description: From the Billerica Water Supply Intake, Billerica, to Rogers Street bridge, Lowell
Segment Length: 5.1 miles
Classification: Class B, Warm Water Fishery




Land-use estimates (top 3, excluding water) for the 399.6 $mi^2$ watershed (map inset, gray shaded area, includes the entire Assabet and Sudbury subwatersheds) are presented below. An estimate of the impervious area within this subwatershed is 48.4 $mi^2$ and the percentage of the imperviousness is 12.1%.

Forest.....44%
Residential .....31%
Open land.....7%

Based on the last evaluation of water quality conditions this segment of the Concord River is listed on the 2002 Integrated List of Waters in Category 5. This segment was assessed as impaired and requires a TMDL for metals and nutrients (MA DEP 2003a).

The history of the 27-mile long Middlesex Canal, completed in December of 1803 as a means of transporting freight from Boston to Merrimack, and Faulkner/Talbot's Dam in Billerica is available in the Middlesex Canal Association's September 2000 Towpath Topics newsletter (Middlesex Canal Association 2000). Additional information on the canal can be also obtained from the association's websites at http://www.middlesexcanal.org/.

**WMA WATER WITHDRAWAL SUMMARY**
Based on the available information there are no registered or permitted WMA withdrawals from this subwatershed.

**NPDES WASTEWATER DISCHARGE SUMMARY (APPENDIX E, TABLE E1-E4)**
The Town of Billerica (MA0101711) is permitted (2 November 2001) to discharge 5.4 MGD (annual average, not monthly average) of treated sanitary wastewater via outfall 001 to the Concord River. The permit expired in 2003. A new permit is being developed. The facility's whole effluent toxicity limit is C-NOEC $\geq$24% effluent and $LC_{50} \geq$ 100% effluent. There are seasonal limits for phosphorus (May 1-October 31 = 0.75 and November 1- April 31 = report) and ammonia-nitrogen (June 1 to September 30 =6 mg/L and October 1 – May 31 = report). Ammonia-nitrogen concentrations in the effluent ranged from a low of <0.05 to a high of 17 mg/L. The facility's TRC limit is 0.045 mg/L. TRC concentrations in the effluent ranged between <0.02 and 0.08 mg/L and of the 27 measurements only one exceeded the limit. The Billerica WWTP is a secondary WWTP that serves 37,000 people and receives wastewater from approximately 19 industrial users. The facility has requested an increase in flow rate due to the planned tie-in of the Billerica House of Corrections (MCI-Billerica). Following the tie-in the Town plans to take over the MCI-Billerica WWTP, rehabilitate it, and resume treating flow from the facility and a planned industrial park. The NPDES Permit for any future facility will be issued such that it is consistent with all other NPDES Permits issued in this segment of the Concord River (Casella 2005).

Baker Commodities, Incorporated (MAG250026) is permitted (4 June 2003) to discharge 0.1 MGD of NCCW to a tributary to this segment of the Concord River. Baker Commodities (MAR05C532) is also permitted to discharge storm water. The facility's individual permit (MA0031585) was closed.

**FERC**
In September of 1981 the Mass Bay Power Company was issued a FERC- exemption (Project No. 2998) to operate the Centennial Island Hydroelectric Project. The project consists of a 320-foot long masonry

and concrete dam with 8-inch high flashboards, a headpond, and a 2,300-foot long, 36-foot wide, and 8-foot deep canal that transports water to the powerhouse. The project is required to release a continuous minimum flow of 57 cfs, or inflow, into the bypass reach, between the dam and the tailrace (Grader 2004). The 57 cfs is released, in part, over the dam and thru the fishways (upstream and downstream - although only one may be operational at any particular point in time). The Denil fishway would normally be passing about 12 cfs (Quinn 2004). They also must always release a minimum below-project flow of 142 cfs (Grader 2004). However, the owner operates the project as true run-of-river (inflow = outflow, maintaining a stable headpond at the top of the flashboards) (Grader 2004). In 1994 the exemptee was required to install streamflow monitoring equipment that records minimum flow discharged to the bypass reach after a site visit by FERC, which was prompted by reports that showed that the minimum flows were not met (as low as 5 cfs in Nov 93 and June 94 completely dewatered). The fishway is adjacent to the dam and includes an upstream fish ladder and downstream chute for fish migration. The fishway also operates as the structure for the release of minimum flow. Depending on the upstream or downstream migration season flows are regulated or controlled by stoplogs (FERC undated). The upstream fish ladder typically begins operating one week after clupeids pass the Lawrence fish lift and closes July 31. The downstream ladder is opened for spent adults two weeks after the upstream passage begins and closes July 31. For juveniles the bypass operates from September 1 through November 15.

**LANDFILLS (APPENDIX K)**

The Corenco Industrial Landfill is located within this subwatershed.

**USE ASSESSMENT**

***AQUATIC LIFE***

Habitat and Flow

The estimated 7Q10 at the USGS streamflow gage (01099500) located downstream from this segment (300 feet downstream from Rogers Street in Lowell) is estimated to be 32.2 cfs (Wandell and Fontaine 1984). The USGS remarks that the discharge includes water released from the Sudbury River basin and Lake Cochituate and that low flow is regulated by mills in Lowell. Evidence of regulation at this stream gaging location can be observed using on-line real-time USGS gaging data (USGS 2004).

On 23 July 2001, ENSR measured streamflow in the Concord River at Station CR03, upstream from the Faulkner Dam in Billerica, to be 143.2 cfs (ENSR 2003). Additionally, on 23 August 2001 ENSR conducted a time-of-travel survey through five miles of the Concord River, beginning in Bedford, downstream from Ball Hill Road at river mile 13, and ending at River Street in Billerica at river mile 8. The estimated mean time-of-travel was 3.8 days (90 hours and 48 minutes) and the average velocity was estimated to be 0.08 ft/sec. On 10 September 2001 another time-of-travel study was again conducted using Rhodomine dye through the same five-mile reach. The estimated time-of-travel was 3.6 days (86 hours and 40 minutes) and the average velocity was estimated to be 0.09 ft/sec (ENSR 2003). The average streamflow at the USGS gage over the time-of-travel study in August was 97 cfs (3 times the 7Q10) and in September was 40 cfs (1.2 times the 7Q10).

Although the Concord River is not specifically mentioned in the *Strategic Plan for the Restoration of Atlantic Salmon for the Merrimack River 1990 through 2004* (Merrimack River Policy and Technical Committee 1990) it is mentioned in the Merrimack River Basin Fish Passage Action Plan for Anadromous Fish (Merrimack River Policy Committee 1988). The latter plan specifically identifies two dams on this segment of the Concord River requiring fish passage- Centennial Island in Lowell and Faulkner Dam (also referred to as the Talbot Mills or Billerica Dam) in East Billerica. The plan further states that "Construction of the Centennial Island and East Billerica fish passage facilities will provide anadromous fish access to the base of the Saxonville dam on the Sudbury River and to the base of the Damondale dam on the Assabet River". The fish passage facility at Faulkner Dam was to be operational five years following the passage of 500 shad at Centennial Island (Merrimack River Policy and Technical Committee 1990). At this time there are no functional plans for any upstream or downstream fishway at the Talbot/Billerica dam (Quinn 2004).

Mass Bay Power Company owns and operates the FERC exempt Centennial Island Hydroelectric Project No. 2998. The project is supposed to release a continuous minimum flow of 57 cfs, or inflow, into the bypass reach. The bypass reach extends from the dam to the confluence with the tailrace (approximately

0.4 river miles). FERC has received reports that flows in the bypass reach have been below the required minimum 57 cfs. In May 2002 a compliance investigation of Centennial Island was requested by a third party. During the spring of 2002 flashboards, approximately 16 inches high, were noted along the top of the falls and an adjacent fish ladder diverting water to the supply canal. The US Fish & Wildlife Service noted deficiencies at the fish ladder during a site visit in the summer of 1999. The fish ladder is to begin operating one week after clupeids pass the Lawrence fish lift and closes 31 July. For spent adults the bypass channel is opened two weeks after upstream passage begins and closes 31 July. For juveniles the bypass operates 1 September through 15 November. The USF&W Service initiated an alewife stocking program in 2000 above the Faulkner Dam (Talbot Mill Dam/Billerica Dam) in Billerica that was expected to last at least three years. As such the downstream bypass sluice should be opened earlier than in the past, around April 7 (FERC undated).

On 24 March 2004 DWM staff toured the Centennial Island Dam and fish ladder in Lowell. The eight foot high dam, located downstream from Lawrence Street, seemed to be in need of maintenance; logs and branches accumulated against the flash boards and some rooted shrubs appeared to be growing out of the dam. There were also three large deciduous trees growing out of the center of the stream below the dam. Water flows under the Flotsam Bridge and then encounters the Centennial Dam Project. Water may flow by the project in any of three courses. Water may pour over the dam and then travel down the right side of the island. Or, water may flow through the fish ladder and then mix with the water that has poured over the dam. Or, water may enter the canal that flows down the left side of the island.
It did not appear that the hydroelectric facility was operating. The fish ladder did not appear to be operating as water levels were insufficient to allow upstream migration. Instream cover downstream from the dam was good with the substrate in the main river channel consisting primarily of boulders and cobble. Less than 10% of the reach had submerged snags or logs. The bank on the left bank (facing downstream) was a cement wall. The right bank consisted mostly of large boulders. Undercut banks for habitat were minimal. Filamentous green algae were attached to the boulders and cobble. Current velocities were greater than 5 feet per second and water reached both banks. The width of the riparian zone on the right bank was less than six meters, with obvious human impacts (old warehouse and hydro facility), while on the right the riparian zone is 6-12 meters.

Biology

In July and September of 2001 ENSR conducted aquatic weed mapping along one reach of this segment of the Concord River upstream of the Faulkner Mills Dam in Billerica. These studies were conducted as part of the Phase I assessment for the Concord River nutrient TMDL development (ENSR 2003).

> In July the estimated biomass was 110,000 kg, while in September the estimated biomass was 140,000 kg. It should be noted that ESNR believes that the estimated biomass is artificially inflated due to the presence of high-density plants. Aquatic vegetation was limited to the areas along the stream banks in the main river. However, the impounded area behind the dam was 75-95% covered with dense to very dense aquatic vegetation. The non-native *Trapa natans* (water chestnut) dominated the aquatic vegetation (27%, 31,000 kg) in July. Filamentous green algae (22% and 3.7%), *Cladophora* sp. (23% and 14%), the non-native *Cabomba caroliana* (0.4% in July), and *Myriophyllum spicatum* (1.3% in September) were also identified. Duckweed (*Lemna minor*) was also identified in July (2.4%, 2,800kg) and was the dominant species identified during the September survey (37%, 52,000 kg).

As part of the USFWS river herring/alewife restoration program the Lowell Parks and Conservation Trust started a volunteer fish counting program at Wamesit Falls and Centennial Island Fish Ladder in Lowell in 2002. As of 2004 USFWS was not aware of any fish counted at Centennial Island by the Lowell volunteers (Quinn 2004).

MDFW conducted fish population sampling at one station on this segment of the Concord River, behind the fire station off of Lowell Street in Billerica, on 21 May 2001 using boat electroshocking equipment (Richards 2003a). One hundred thirty-eight bluegill, 71 pumpkinseed, 63 white perch, 56 common carp, 29 yellow perch, 30 black crappie, 21 largemouth bass, 16 white sucker, nine golden shiner, nine chain pickerel, eight brown bullhead, five alewife, four redfin pickerel, three American eel, two green sunfish, two smallmouth bass, one northern pike, and one yellow bullhead were collected. The total number of

fish collected was high. Macrohabitat generalists dominated the sample. Only one species, white sucker, is considered a fluvial specialist. All species present are considered moderately tolerant or tolerant to pollution. This segment of the Concord River is predominantly slow-moving and meandering. Given the nature of this segment the dominance by a diverse mix of tolerant and moderately tolerant macrohabitat generalists is to be expected. Few anadromous fish (alewife) and catadromous fish (American eel) were found.

Toxicity

*Effluent*

Between 14 July 1997 and 15 March 2004 the Town of Billerica conducted 23 whole effluent toxicity tests using the water flea (*Ceriodaphnia dubia)* and 25 tests using the fathead minnow (*Pimephales promelas)*. The effluent was acutely toxic to the water flea on only two occasions, once in February 2000 ($LC_{50}$ =58.8% effluent) and once in March 2002 ($LC_{50}$ = 70.7% effluent). The effluent was never acutely toxic to the minnow ($LC_{50}$ >100% effluent). The C-NOEC ranged from 12.5% effluent to 100% effluent for the *Ceriodaphnia* tests and from 24 to 100% effluent for the *Pimephales* tests. Of the tests conducted *C. dubia* was generally the more sensitive test species.

*Ambient*

The Town of Billerica collected water from the Concord River at the Pollard Street bridge (~one mile upstream from the discharge) for use as diluent in their whole effluent toxicity tests. Survival of *Ceriodaphnia* exposed to river water for seven days was good ($\geq$80%). Survival of *Pimephales* was fair and ranged between 38 and 100% survival and was less than 75% in seven of the 25 tests conducted. It should be noted that survival of the minnows from July 2001 to present has not been less than 75%.

Chemistry – water

As part of their whole effluent toxicity tests the Town of Billerica collected water from the Concord River. The water was analyzed for hardness, alkalinity, conductivity, ammonia-nitrogen, pH, and suspended solids.

*pH*

pH in the Concord River as measured in the Billerica toxicity tests ranged between 6.6 and 7.75 SU (n=27).

*Hardness*

Hardness in Concord River water as measured in the Billerica toxicity tests ranged between 27 and 100 mg/L)(n=27).

*Alkalinity*

The Billerica toxicity tests reported alkalinity of the Concord River between <10 and 80 mg/L (n=25).

*Conductivity*

Concord River conductivities, as reported in the Billerica toxicity tests, ranged between 254 and 587 µS/cm (n=27).

*Total Suspended solids*

TSS concentrations, according to the Billerica toxicity tests, ranged between <5 and 23 mg/L (n=24).

*Ammonia-nitrogen*

Concentrations of ammonia-nitrogen in Concord River water ranged between <0.05 and 0.580 mg/L (n=25).

*Total Residual Chlorine*

With the exception of one elevated TRC measurement (July 1997) of 0.12 mg/L, all TRC measurements were less than the minimum quantification level of 0.05 mg/L.

Chemistry-sediment

ENSR collected sediment samples from the Concord River at the Faulkner Dam forebay. Samples were analyzed for nutrient concentrations, total carbon, and Toxicity Characteristic Leaching Procedure (TCLP) metal analysis. Although the total phosphorus concentration did not exceed the L-EL guidance of 600 ppm (32.2 ppm) the sediment sample exceeded the S-EL guidance of 10 ppm for TOC by a factor of 2,500 (Persuad *et al.* 1993). TCLP analysis did not detect concentrations of arsenic, barium, cadmium, chromium, mercury, lead, selenium, or silver in the sediments from the Faulkner Dam forebay (ENSR 2003).

Based on the presence of the non-native macrophyte species, which compromise the native, naturally diverse community of aquatic flora, the *Aquatic Life Use* is assessed as impaired. It should also be noted that the Concord River is specifically listed in Table 1 (*Upstream Fish Passage Requirements For Anadromous Fish in The Merrimack River Basin, 1988-2005*) of Appendix III (*Merrimack River Basin Fish Passage Action Plan for Anadromous Fish*) within the *Strategic Plan for the Restoration of Atlantic Salmon for the Merrimack River 1990 through 2004* (Policy Committee for Anadromous Fishery Management of the Merrimack River 1990). Goals include an operational fish passage facility coincident with completion of hydroelectric facility at Centennial Island and an operational fish passage facility at East Billerica within five years of the passage of 500 shad at the Centennial Island ladder. According to the Strategic Plan fish passage facilities at these locations would "provide anadromous fish access to the base of the Saxonville dam on the Sudbury River and to the base of the Damondale dam on the Assabet River." The current lack of passage at Faulkner Dam also contributes to the impairment noted above. The USFWS is currently working with the owners of both the Centennial Island and Faulkner Dam to either improve (Centennial) or establish (Faulkner) fish passage facilities at these locations. There may also be issues with the hydropower project (e.g., lack of water in the bypass reach, evidence of stream flow fluctuations). Poor survival of minnows exposed to river water collected near the Pollard Street bridge prior to July 2001 was also documented.

***FISH CONSUMPTION***

Because of elevated mercury in fish tissue documented in the Concord and Sudbury rivers MDPH issued a fish consumption advisory for the Concord River in the towns of Concord, Carlisle, Bedford, and Billerica.

1. Children younger than 12 years, pregnant women, and nursing mothers should not eat any fish from this waterbody.
2. The general public should not consume any largemouth bass from this waterbody.
3. The general public should limit consumption of non-affected fish from this waterbody to two meals per month.

Currently, the MDPH advisory does not include the portion of the Concord River through the towns of Chelmsford and Lowell so the *Fish Consumption Use* is assessed as impaired for the upper 3.2 miles and not assessed for the lower 1.8 miles. Mercury contamination from the Nyanza Superfund Site is considered the primary cause of impairment but other potential sources include atmospheric deposition.

***PRIMARY CONTACT AND SECONDARY CONTACT RECREATION AND AESTHETICS***

As part of a reconnaissance of this segment downstream from the Lawrence Street bridge on 24 March 2004 DWM staff noted that there were very small amounts of trash and debris actually in the watercourse. However, the potential exists for large amounts of discarded materials (roof shingles, pipes, glass, wood, etc) from the abandoned factory buildings on the left bank to end up in the water. These materials were lying atop the cement retaining wall and could easily blow into the stream. There was also a footpath along this wall that provides potential access to the stream for recreation. The Massachusetts Community Water Watch conducted a shoreline survey on two miles of this segment of the Concord River upstream from the Lowell Cemetery on Lawrence Street. They noted improper disposal of yard waste, lack of erosion and sediment controls at the site of new dock construction, and concerns over the storage of trains over the river. With the exception of sporadic trash on the stream banks this section of the Concord River was aesthetically pleasing (Cornwell 2004).

Due to the lack of quality assured bacteria data the *Recreational* uses are currently not assessed. The *Aesthetics Use* is assessed as support. However, the Aesthetics Use is identified with an "Alert Status" due to the isolated areas of trash and debris along the streambanks and the urbanized nature of this segment.

Concord River (MA82A-08) Use Summary Table

| Designated Uses | | Status |
|---|---|---|
| Aquatic Life |  | IMPAIRED<br>Causes: Non-native aquatic plants<br>(Suspected Causes: Fish barriers)<br>(Suspected Sources: Hydrostructure impacts on fish passage, impacts from hydrostructure flow regulation/ modification) |
| Fish Consumption |  | IMPAIRED upper 3.2 miles<br>NOT ASSESSED lower 1.9 miles<br>Causes: Mercury<br>Sources: Nyanza Superfund Site<br>(Suspected Sources: Atmospheric deposition) |
| Primary Contact |  | NOT ASSESSED |
| Secondary Contact |  | NOT ASSESSED |
| Aesthetics |  | SUPPORT* |

* Alert Status issues identified—see details in use assessment section.

**RECOMMENDATIONS**

- Water quality and biological monitoring should be conducted to better evaluate the status of the *Aquatic Life Use*. Monitor the fish community along this segment of the Concord River to evaluate any changes resulting from efforts to improve/mimic natural flow regimes.
- Instream flow regimes along this segment of the Concord River (as affected by operation of the FERC-exempt hydropower projects) should be documented and attempts should be made to mimic natural flow regimes to the extent possible. Investigate the operating conditions at the Centennial Island Dam during periods of low flow. Determine if this project releases its required minimum flows. Evaluate and monitor operations for compliance with run-of-river requirements.
- A habitat assessment for anadromous fish should be conducted upstream and downstream from the Talbot/Billerica dam. An anadromous fish target species should be selected. Depending on the target species and returns expected a Denil fishway or a steeppass fishway would be appropriate. Funding sources should be explored to install and maintain the fishway. The possibility/feasibility of dam removal should also be explored
- A non-native aquatic macrophyte management plan should be developed for the Concord River aimed at controlling the populations and preventing the spread to waters downstream.
- The Town of Billerica WWTP NPDES permit should be renewed with appropriate limits and monitoring requirements. The toxicity testing requirements should be reduced to testing with *C. dubia* only since it has been the more sensitive test organism.
- Additional instream studies (ambient toxicity testing, benthic macroinvertebrate sampling bracketing the discharge, fish population sampling, habitat assessment) should be conducted due to the frequency of reduced survival of *P. promelas* in the Concord River upstream from the Billerica WWTP. If significant toxicity is detected determine cause(s) and source(s).
- MDPH should re-evaluate the fish consumption advisory for the Concord River to include all towns from the confluence with the Assabet and Sudbury rivers to the confluence with the Merrimack River.
- Bacteria monitoring should be conducted at multiple stations along this five-mile segment to assess status of the *Recreational* uses.
- Work with Massachusetts Community Water Watch to conduct a stream cleanup along this segment of the Concord River and continue performing shoreline surveys to document the aesthetic quality of this segment for use in assessing the *Aesthetics Use*.


From StreamStats 3

StreamStats Version 3.0

# Flow Statistics Ungaged Site Report

**Date: Tues June 6, 2017 3:52:14 PM GMT-4**
**Study Area: Massachusetts**
**NAD 1983 Latitude: 42.581 ( 42 34 52)**
**NAD 1983 Longitude: -71.2847 (-71 17 05)**
**Drainage Area: 368 mi2**

| Low Flows Basin Characteristics | | | |
|---|---|---|---|
| **100% Statewide Low Flow WRIR00 4135 (368 mi2)** | | | |
| **Parameter** | **Value** | **Regression Equation Valid Range** | |
| | | **Min** | **Max** |
| Drainage Area (square miles) | 368 (above max value 149) | 1.61 | 149 |
| Mean Basin Slope from 250K DEM (percent) | 2.705 | 0.32 | 24.6 |
| Stratified Drift per Stream Length (square mile per mile) | 0.21 | 0 | 1.29 |
| Massachusetts Region (dimensionless) | 0 | 0 | 1 |

*Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.*

| Probability of Perennial Flow Basin Characteristics | | | |
|---|---|---|---|
| **100% Perennial Flow Probability (368 mi2)** | | | |
| **Parameter** | **Value** | **Regression Equation Valid Range** | |
| | | **Min** | **Max** |
| Drainage Area (square miles) | 368 (above max value 1.99) | 0.01 | 1.99 |
| Percent Underlain By Sand And Gravel (percent) | 45.19 | 0 | 100 |
| Percent Forest (percent) | 47.41 | 0 | 100 |
| Massachusetts Region (dimensionless) | 0 | 0 | 1 |

*Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.*

| Bankfull Flows Basin Characteristics | | | |
|---|---|---|---|
| **100% Bankfull Statewide SIR2013 5155 (368 mi2)** | | | |
| **Parameter** | **Value** | **Regression Equation Valid Range** | |
| | | **Min** | **Max** |
| Drainage Area (square miles) | 368 (above max value 329) | 0.6 | 329 |
| Mean Basin Slope from 10m DEM (percent) | 5.931 | 2.2 | 23.9 |

*Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.*

| Peak Flow Regions Basin Characteristics | | | |
|---|---|---|---|
| **100% Peak Statewide 2016 5156 (368 mi2)** | | | |
| **Parameter** | **Value** | **Regression Equation Valid Range** | |
| | | **Min** | **Max** |
| Drainage Area (square miles) | 368 | 0.16 | 512 |
| Mean Basin Elevation (feet) | 273 | 80.6 | 1948 |
| Percent Storage from NLCD2006 (percent) | 14.21 | 0 | 32.3 |

| Low Flows Statistics | | | | | | |
|---|---|---|---|---|---|---|
| **Statistic** | **Value** | **Unit** | **Prediction Error (percent)** | **Equivalent years of record** | **90-Percent Prediction Interval** | |
| | | | | | **Min** | **Max** |
| D50 | 396 | ft3/s | | | | |
| D60 | 327 | ft3/s | | | | |
| D70 | 222 | ft3/s | | | | |
| D75 | 181 | ft3/s | | | | |
| D80 | 143 | ft3/s | | | | |
| D85 | 116 | ft3/s | | | | |
| D90 | 90.9 | ft3/s | | | | |
| D95 | 62.5 | ft3/s | | | | |
| D98 | 41.5 | ft3/s | | | | |
| D99 | 34.7 | ft3/s | | | | |
| M7D2Y | 65.9 | ft3/s | | | | |
| AUGD50 | 123 | ft3/s | | | | |
| M7D10Y | 33.7 | ft3/s | | | | |

http://pubs.usgs.gov/wri/wri004135/ (http://pubs.usgs.gov/wri/wri004135/)
Ries_ K.G._ III_ 2000_ Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135_ 81 p.

| Probability of Perennial Flow Statistics | | | | | | |
|---|---|---|---|---|---|---|
| **Statistic** | **Value** | **Unit** | **Standard Error (percent)** | **Equivalent years of record** | **90-Percent Prediction Interval** | |
| | | | | | **Min** | **Max** |
| PROBPEREN | 1 | dim | | | | |

http://pubs.usgs.gov/sir/2006/5031/pdfs/SIR_2006-5031rev.pdf (http://pubs.usgs.gov/sir/2006/5031/pdfs/SIR_2006-5031rev.pdf)
Bent_ G.C._ and Steeves_ P.A._ 2006_ A revised logistic regression equation and an automated procedure for mapping the probability of a stream flowing perennially in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2006–5031_ 107 p.

| Bankfull Flows Statistics | | | | | | |
|---|---|---|---|---|---|---|
| **Statistic** | **Value** | **Unit** | **Prediction Error (percent)** | **Equivalent years of record** | **90-Percent Prediction Interval** | |
| | | | | | **Min** | **Max** |
| BFWDTH | 149 | ft | | | | |
| BFDPTH | 5.08 | ft | | | | |
| BFAREA | 759 | ft2 | | | | |
| BFFLOW | 2780 | ft3/s | | | | |

http://pubs.usgs.gov/sir/2013/5155/ (http://pubs.usgs.gov/sir/2013/5155/)
Bent_ G.C._ and Waite_ A.M._ 2013_ Equations for estimating bankfull channel geometry and discharge for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2013-5155_ 62 p._

| Peak Flow Regions Statistics | | | | | | |
|---|---|---|---|---|---|---|
| Statistic | Value | Unit | Prediction Error (percent) | Equivalent years of record | 90-Percent Prediction Interval | |
| | | | | | Min | Max |
| PK2 | 3750 | ft3/s | 42 | | | |
| PK5 | 5860 | ft3/s | 43 | | | |
| PK10 | 7450 | ft3/s | 45 | | | |
| PK25 | 9700 | ft3/s | 47 | | | |
| PK50 | 11500 | ft3/s | 49 | | | |
| PK100 | 13400 | ft3/s | 52 | | | |
| PK200 | 15500 | ft3/s | 54 | | | |
| PK500 | 18400 | ft3/s | 58 | | | |

https://dx.doi.org/10.3133/sir20165156 (https://dx.doi.org/10.3133/sir20165156)
Zarriello_ P.J._ 2017_ Magnitude of flood flows at selected annual exceedance probabilities for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2016-5156_ 99 p.

# Attachment C
## Data Summary Table, WQBEL Calculations
## and
## Laboratory Reports

## Summary of Analytical Test Results

| Analytical Parameter | | RGP TBEL (in mg/L) | RGP WQBEL (in mg/L) | Method Dectection Limit (mg/L) | RGP-1 Reporting Limit 6/1/2017 | SW-1 Reporting Limit 6/1/2017 |
|---|---|---|---|---|---|---|
| **INORGANICS** | | | | | | |
| **E350.1 (mg/L)** | | | | | | |
| 7664-41-7 | Ammonia as Nitrogen | Report mg/L | Report mg/L | 0.05 | 0.16 | 0.10 |
| **EPA 300.0 (mg/l)** | | | | | | |
| 16887-00-6 | Chloride | Report ug/L | Report ug/L | 0.987 | 260 | - |
| **SM4500-Cl-G (11) (mg/l)** | | | | | | |
| 7782-50-5 | Total Residual Chlorine | 0.2 | 0.011 | 0.006 | <0.020 | - |
| **SM2540D (11) (mg/l)** | | | | | | |
| TSS | Total Suspended Solids | 30 | 30 | 0.4 | 5.2 | - |
| **EPA 200.8 (mg/l)** | | | | | | |
| 7440-36-0 | Antimony | 0.206 | 0.640 | 0.0007 | <0.00045 | - |
| 7440-38-2 | Arsenic | 0.104 | 0.01 | 0.00006 | 0.00418 | - |
| 7440-43-9 | Cadmium | 0.01 | 0.00025 | 0.00004 | <0.00025 | - |
| 7440-47-3 | Chromium | 0.323 | 0.074 | 0.00015 | <0.00120 | - |
| 7440-50-8 | Copper | 0.242 | 0.009 | 0.00004 | 0.00474 | - |
| 7439-89-6 | Iron | 5.0 | 5.0 | 0.001 | 0.642 | - |
| 7439-92-1 | Lead | 0.16 | 0.0025 | 0.00002 | 0.00109 | - |
| 7440-02-0 | Nickel | 1.45 | 0.052 | 0.00005 | 0.00250 | - |
| 7782-49-2 | Selenium | 0.235 | 0.005 | 0.00012 | <0.00305 | - |
| 7440-22-4 | Silver | 0.351 | 0.0032 | 0.0001 | <0.00030 | - |
| 7440-66-6 | Zinc | 0.42 | 0.12 | 0.00116 | 0.0110 | - |
| **EPA 245.1/7470A (mg/l)** | | | | | | |
| 7439-97-6 | Mercury | 0.739 | 0.77 | 0.00013 | <0.00020 | - |
| **SM3500-Cr-B (11)/7196A (mg/l)** | | | | | | |
| 18540-29-9 | Hexavalent Chromium | 0.323 | 0.11 | 0.002 | <0.005 | - |
| **Calculation (mg/l)** | | | | | | |
| 16065-83-1 | Trivalent Chromium | 0.323 | 0.074 | 0.0053 | <0.0024 | - |
| **EPA 335.4 / SW846 9012B (mg/l)** | | | | | | |
| 57-12-5 | Cyanide (total) | 0.178 | 0.0052 | 0.00426 | <0.00500 | - |

= Orange highlight: Method Dection Limit Exceeds RGP Effluent Limit

## Summary of Analytical Test Results

| Analytical Parameter | | RGP TBEL (in ug/L) | RGP WQBEL (in ug/L) | Method Dectection Limit (ug/L) | RGP-1 Reporting Limit 6/1/2017 | SW-1 Reporting Limit 6/1/2017 |
|---|---|---|---|---|---|---|
| **NON-HALOGENATED VOCS** | | | | | | |
| **EPA 624 (µg/l)** | | | | | | |
| | ***Total BTEX*** | 100 | 100 | | <2.0 | - |
| 71-43-2 | Benzene | 5.0 | 5.0 | 0.3 | <1.0 | - |
| 108-88-3 | Toluene | | | 0.3 | <1.0 | - |
| 100-41-4 | Ethylbenzene | | | 0.3 | <1.0 | - |
| 179601-23-1 | m,p-Xylene | | | 0.4 | <2.0 | - |
| 95-47-6 | o-Xylene | | | 0.3 | <1.0 | - |
| 123-91-1 | 1,4-Dioxane | 200 | 200 | 11.4 | <20.0 | - |
| 67-64-1 | Acetone | 7.97 | 7.97 | 0.8 | <10.0 | - |
| **EPA 625 (µg/l)** | | | | | | |
| 108-95-2 | Phenol | 1,080 | 300 | 0.658 | <5.10 | - |
| **HALOGENATED VOCS** | | | | | | |
| **EPA 624 (µg/l) Halogenated VOCs** | | | | | | |
| 56-23-5 | Carbon tetrachloride | 4.4 | 1.6 | 0.4 | <1.0 | - |
| 95-50-1 | 1,2-Dichlorobenzene | 600 | 600 | 0.3 | <1.0 | - |
| 541-73-1 | 1,3-Dichlorobenzene | 320 | 320 | 0.3 | <1.0 | - |
| 106-46-7 | 1,4-Dichlorobenzene | 5 | 5 | 0.3 | <1.0 | - |
| 75-34-3 | 1,1-Dichloroethane | 70 | 70 | 0.3 | <1.0 | - |
| 107-06-2 | 1,2-Dichloroethane | 5 | 5 | 0.3 | <1.0 | - |
| 75-35-4 | 1,1-Dichloroethene | 3.2 | 3.2 | 0.7 | <1.0 | - |
| 156-59-2 | cis-1,2-Dichloroethene | 70 | 70 | 0.3 | <1.0 | - |
| 75-09-2 | Methylene chloride | 4.6 | 4.6 | 0.7 | <10.0 | - |
| 127-18-4 | Tetrachloroethene | 5.0 | 3.3 | 0.8 | <1.0 | - |
| 71-55-6 | 1,1,1-Trichloroethane | 200 | 200 | 0.5 | <1.0 | - |
| 79-00-5 | 1,1,2-Trichloroethane | 5.0 | 5.0 | 0.3 | <1.0 | - |
| 79-01-6 | Trichloroethene | 5.0 | 5.0 | 0.5 | <1.0 | - |
| 75-01-4 | Vinyl chloride | 2.0 | 2.0 | 0.5 | <1.0 | - |
| **SW846 8011 (µg/l)** | | | | | | |
| 106-93-4 | 1,2-Dibromoethane (EDB) | 0.05 | 0.05 | 0.00336 | <0.0100 | - |
| **NON-HALOGENATED SVOCS** | | | | | | |
| **EPA 625 (µg/l) Non-Halogenated VOCs** | | | | | | |
| | ***Total Phthalate*** | 190 | 190 | | <5.10 | |
| 85-68-7 | Butyl benzyl phthalate | | | 0.447 | <5.10 | - |
| 84-66-2 | Diethyl phthalate | | | 0.636 | <5.10 | - |
| 131-11-3 | Dimethyl phthalate | | | 0.773 | <5.10 | - |
| 84-74-2 | Di-n-butyl phthalate | | | 0.466 | <5.10 | - |
| 117-84-0 | Di-n-octyl phthalate | | | 0.414 | <5.10 | - |
| 117-81-7 | Bis(2-ethylhexyl)phthalate | 101 | 2.2 | 0.651 | <5.10 | - |
| | ***Total Group I PAHs*** | 1.0 | 1.0 | | | |
| 56-55-3 | Benzo (a) anthracene | As Total Group I PAH | 0.0038 | 0.547 | <5.10 | - |
| 50-32-8 | Benzo (a) pyrene | | 0.0038 | 0.573 | <5.10 | - |
| 205-99-2 | Benzo (b) fluoranthene | | 0.0038 | 0.446 | <5.10 | - |
| 207-08-9 | Benzo (k) fluoranthene | | 0.0038 | 0.49 | <5.10 | - |
| 218-01-9 | Chrysene | | 0.0038 | 0.543 | <5.10 | - |
| 53-70-3 | Dibenzo (a,h) anthracene | | 0.0038 | 0.459 | <5.10 | - |
| 193-39-5 | Indeno (1,2,3-cd) pyrene | | 0.0038 | 0.592 | <5.10 | - |

= Orange highlight: Method Dection Limit Exceeds RGP Effluent Limit

## Summary of Analytical Test Results

| Analytical Parameter | | RGP TBEL (in ug/L) | RGP WQBEL (in ug/L) | Method Dectection Limit (ug/L) | RGP-1 Reporting Limit 6/1/2017 | SW-1 Reporting Limit 6/1/2017 |
|---|---|---|---|---|---|---|
| **NON-HALOGENATED SVOCS** | | | | | | |
| **EPA 625 (µg/l) Non-Halogenated VOCs** | | | | | | |
| | ***Total Group II PAHs*** | 100 | 100 | | | |
| 91-20-3 | Naphthalene | 20 | 20 | 0.699 | <5.10 | - |
| 83-32-9 | Acenaphthene | | | 0.705 | <5.10 | |
| 208-96-8 | Acenaphthylene | | | 0.697 | <5.10 | |
| 120-12-7 | Anthracene | | | 0.62 | <5.10 | |
| 206-44-0 | Fluoranthene | | | 0.651 | <5.10 | |
| 86-73-7 | Fluorene | | | 0.624 | <5.10 | |
| 85-01-8 | Phenanthrene | | | 0.598 | <5.10 | |
| 129-00-0 | Pyrene | | | 0.622 | <5.10 | |
| **HALOGENATED SVOCS** | | | | | | |
| **EPA 608 (µg/l) Polychlorinated Biphenyls** | | | | | | |
| | ***Total PCB*** | | | | | |
| 12674-11-2 | Aroclor-1016 | 0.000064 | 0.000064 | 0.106 | <0.204 | - |
| 11104-28-2 | Aroclor-1221 | 0.000064 | 0.000064 | 0.117 | <0.204 | - |
| 11141-16-5 | Aroclor-1232 | 0.000064 | 0.000064 | 0.113 | <0.204 | - |
| 53469-21-9 | Aroclor-1242 | 0.000064 | 0.000064 | 0.109 | <0.204 | - |
| 12672-29-6 | Aroclor-1248 | 0.000064 | 0.000064 | 0.139 | <0.204 | - |
| 11097-69-1 | Aroclor-1254 | 0.000064 | 0.000064 | 0.118 | <0.204 | - |
| 11096-82-5 | Aroclor-1260 | 0.000064 | 0.000064 | 0.0868 | <0.204 | - |
| 37324-23-5 | Aroclor-1262 | 0.000064 | 0.000064 | 0.0914 | <0.204 | - |
| 11100-14-4 | Aroclor-1268 | 0.000064 | 0.000064 | 0.0934 | <0.204 | - |
| **EPA 625 (µg/l)** | | | | | | |
| 87-86-5 | Pentachlorophenol | 1 | 1 | 0.381 | <5.10 | - |

| Analytical Parameter | | RGP TBEL (in parentheses) | RGP WQBEL (in parentheses) | Dectection Limits | RGP-1 Reporting Limit 6/1/2017 | SW-1 Reporting Limit 6/1/2017 |
|---|---|---|---|---|---|---|
| **FUELS PARAMETERS** | | | | | | |
| **EPA 1664B (mg/l)** | | | | | | |
| TPHSGTHEM | Non-polar material (SGT-HEM) | 5.0 (mg/L) | 5.0 (mg/L) | 0.9 (mg/L) | <1.0 (mg/L) | - |
| **EPA 624 (µg/l)** | | | | | | |
| 1634-04-4 | Methyl tert-butyl ether | 0.07 (ug/L) | 0.02 (ug/L) | 0.2 (ug/L) | <1 (ug/L) | - |
| **SW846 8015 Mod (mg/l)** | | | | | | |
| 64-17-5 | Ethanol | Report mg/L | Report mg/L | 0.447 (mg/L) | <1.00 (mg/L) | - |
| 75-65-0 | Tert-Butanol / butyl alcohol | 0.12 (mg/L) | 0.12 (mg/L) | 0.473 (mg/L) | <1.00 (mg/L) | - |
| **EPA 524.2 (µg/l)** | | | | | | |
| 994-05-8 | Tert-amyl methyl ether | 90 (ug/L) | 90 (ug/L) | 0.49 (ug/L) | <0.5 (ug/L) | - |
| **OTHER PARAMETERS** | | | | | | |
| **EPA 200.7 (mg/l)** | | | | | | |
| 7440-70-2 | Calcium | | | 0.034 | 57.4 | 11.5 |
| 7439-95-4 | Magnesium | | | 0.0074 | 3.99 | 2.56 |
| **SM 2340B (11) (mg/l CaCO3)** | | | | | | |
| | Hardness | | | | 160 | 39.3 |
| **pH by YSI (Standard Units)** | | 6.5 - 8.3 | 6.5 - 8.3 | 0.01 SU | 6.71 | 6.34 |
| **Temp by YSI** | | 83 F (Class B Warm Water Fishery) | 83 F (Class B Warm Water Fishery) | 0.1 F | 60.8 F | 62.1 |

= Orange highlight: Method Dection Limit Exceeds RGP Effluent Limit

**Enter number values in green boxes below**

Enter values in the units specified

↓

| | |
|---|---|
| 4.4 | $Q_R$ = Enter upstream flow in **MGD** |
| 0.36 | $Q_P$ = Enter discharge flow in **MGD** |
| 0 | Downstream 7Q10 |

Enter a dilution factor, if other than zero

↓

| |
|---|
| 0 |

Enter values in the units specified

↓

| | |
|---|---|
| 160 | $C_d$ = Enter influent hardness in **mg/L** $CaCO_3$ |
| 39.3 | $C_s$ = Enter receiving water hardness in **mg/L** $CaCO_3$ |

Enter **receiving water** concentrations in the units specified

↓

| | |
|---|---|
| 6.3 | pH in **Standard Units** |
| 16.7 | Temperature in **°C** |
| 0.16 | Ammonia in **mg/L** |
| 39.3 | Hardness in **mg/L** $CaCO_3$ |
| 0 | Salinity in **ppt** |
| 0 | Antimony in **µg/L** |
| 0 | Arsenic in **µg/L** |
| 0 | Cadmium in **µg/L** |
| 0 | Chromium III in **µg/L** |
| 0 | Chromium VI in **µg/L** |
| 0 | Copper in **µg/L** |
| 0 | Iron in **µg/L** |
| 0 | Lead in **µg/L** |
| 0 | Mercury in **µg/L** |
| 0 | Nickel in **µg/L** |
| 0 | Selenium in **µg/L** |
| 0 | Silver in **µg/L** |
| 0 | Zinc in **µg/L** |

Enter **influent** concentrations in the units specified

↓

| | |
|---|---|
| 0 | TRC in **µg/L** |
| 0.1 | Ammonia in **mg/L** |
| 0 | Antimony in **µg/L** |
| 4.18 | Arsenic in **µg/L** |
| 0 | Cadmium in **µg/L** |
| 0 | Chromium III in **µg/L** |
| 0 | Chromium VI in **µg/L** |
| 4.74 | Copper in **µg/L** |
| 642 | Iron in **µg/L** |
| 1.09 | Lead in **µg/L** |
| 0 | Mercury in **µg/L** |
| 2.5 | Nickel in **µg/L** |
| 0 | Selenium in **µg/L** |
| 0 | Silver in **µg/L** |
| 11 | Zinc in **µg/L** |
| 0.01 | Cyanide in **µg/L** |
| 0 | Phenol in **µg/L** |
| 0 | Carbon Tetrachloride in **µg/L** |
| 0 | Tetrachloroethylene in **µg/L** |
| 0 | Total Phthalates in **µg/L** |
| 0 | Diethylhexylphthalate in **µg/L** |
| 0 | Benzo(a)anthracene in **µg/L** |
| 0 | Benzo(a)pyrene in **µg/L** |
| 0 | Benzo(b)fluoranthene in **µg/L** |
| 0 | Benzo(k)fluoranthene in **µg/L** |
| 0 | Chrysene in **µg/L** |
| 0 | Dibenzo(a,h)anthracene in **µg/L** |
| 0 | Indeno(1,2,3-cd)pyrene in **µg/L** |
| 0 | Methyl-tert butyl ether in **µg/L** |

**Notes:**

Freshwater: $Q_R$ equal to the 7Q10; enter alternate $Q_R$ if approved by the State; enter 0 if no dilution factor approved
Saltwater (estuarine and marine): enter $Q_R$ if approved by the State; enter 0 if no entry
Discharge flow is equal to the design flow or 1 MGD, whichever is less
Only if approved by State as the entry for $Q_R$; leave 0 if no entry

Saltwater (estuarine and marine): only if approved by the State
Leave 0 if no entry

Freshwater only

pH, temperature, and ammonia required for all discharges
Hardness required for freshwater
Salinity required for saltwater (estuarine and marine)
Metals required for all discharges if present and if dilution factor is > 1
Enter 0 if non-detect or testing not required

if >1 sample, enter maximum
if >10 samples, may enter 95th percentile
Enter 0 if non-detect or testing not required

| **Dilution Factor** | 13.2 | | | | | |
|---|---|---|---|---|---|---|
| **A. Inorganics** | TBEL applies if bolded | | WQBEL applies if bolded | | Compliance Level applies if shown | |
| Ammonia | **Report** | mg/L | --- | | | |
| Chloride | **Report** | µg/L | --- | | | |
| Total Residual Chlorine | 0.2 | mg/L | **145** | µg/L | --- | µg/L |
| Total Suspended Solids | **30** | mg/L | --- | | | |
| Antimony | **206** | µg/L | 8462 | µg/L | | |
| Arsenic | **104** | µg/L | 132 | µg/L | | |
| Cadmium | **10.2** | µg/L | 2.0910 | µg/L | | |
| Chromium III | **323** | µg/L | 629.2 | µg/L | | |
| Chromium VI | **323** | µg/L | 151.2 | µg/L | | |
| Copper | **242** | µg/L | 66.4 | µg/L | | |
| Iron | **5000** | µg/L | 13222 | µg/L | | |
| Lead | **160** | µg/L | 16.71 | µg/L | | |
| Mercury | **0.739** | µg/L | 11.98 | µg/L | | |
| Nickel | **1450** | µg/L | 373.5 | µg/L | | |
| Selenium | **235.8** | µg/L | 66.1 | µg/L | | |
| Silver | **35.1** | µg/L | 14.4 | µg/L | | |
| Zinc | **420** | µg/L | 857.1 | µg/L | | |
| Cyanide | **178** | mg/L | 68.8 | µg/L | --- | µg/L |
| **B. Non-Halogenated VOCs** | | | | | | |
| Total BTEX | **100** | µg/L | --- | | | |
| Benzene | **5.0** | µg/L | --- | | | |
| 1,4 Dioxane | **200** | µg/L | --- | | | |
| Acetone | **7970** | µg/L | --- | | | |
| Phenol | **1,080** | µg/L | 3967 | µg/L | | |
| **C. Halogenated VOCs** | | | | | | |
| Carbon Tetrachloride | **4.4** | µg/L | 21.2 | µg/L | | |
| 1,2 Dichlorobenzene | **600** | µg/L | --- | | | |
| 1,3 Dichlorobenzene | **320** | µg/L | --- | | | |
| 1,4 Dichlorobenzene | **5.0** | µg/L | --- | | | |
| Total dichlorobenzene | **---** | µg/L | --- | | | |
| 1,1 Dichloroethane | **70** | µg/L | --- | | | |
| 1,2 Dichloroethane | **5.0** | µg/L | --- | | | |
| 1,1 Dichloroethylene | **3.2** | µg/L | --- | | | |
| Ethylene Dibromide | **0.05** | µg/L | --- | | | |
| Methylene Chloride | **4.6** | µg/L | --- | | | |
| 1,1,1 Trichloroethane | **200** | µg/L | --- | | | |
| 1,1,2 Trichloroethane | **5.0** | µg/L | --- | | | |
| Trichloroethylene | **5.0** | µg/L | --- | | | |
| Tetrachloroethylene | **5.0** | µg/L | 43.6 | µg/L | | |
| cis-1,2 Dichloroethylene | **70** | µg/L | --- | | | |
| Vinyl Chloride | **2.0** | µg/L | --- | | | |
| **D. Non-Halogenated SVOCs** | | | | | | |
| Total Phthalates | **190** | µg/L | --- | µg/L | | |
| Diethylhexyl phthalate | **101** | µg/L | 29.1 | µg/L | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Total Group I Polycyclic Aromatic Hydrocarbons | **1.0** | µg/L | --- | | | |
| Benzo(a)anthracene | **1.0** | µg/L | 0.0502 | µg/L | --- | µg/L |
| Benzo(a)pyrene | **1.0** | µg/L | 0.0502 | µg/L | --- | µg/L |
| Benzo(b)fluoranthene | **1.0** | µg/L | 0.0502 | µg/L | --- | µg/L |
| Benzo(k)fluoranthene | **1.0** | µg/L | 0.0502 | µg/L | --- | µg/L |
| Chrysene | **1.0** | µg/L | 0.0502 | µg/L | --- | µg/L |
| Dibenzo(a,h)anthracene | **1.0** | µg/L | 0.0502 | µg/L | --- | µg/L |
| Indeno(1,2,3-cd)pyrene | **1.0** | µg/L | 0.0502 | µg/L | --- | µg/L |
| Total Group II Polycyclic Aromatic Hydrocarbons | **100** | µg/L | --- | | | |
| Naphthalene | **20** | µg/L | --- | | | |
| **E. Halogenated SVOCs** | | | | | | |
| Total Polychlorinated Biphenyls | **0.000064** | µg/L | --- | | 0.5 | µg/L |
| Pentachlorophenol | **1.0** | µg/L | --- | | | |
| **F. Fuels Parameters** | | | | | | |
| Total Petroleum Hydrocarbons | **5.0** | mg/L | --- | | | |
| Ethanol | **Report** | mg/L | --- | | | |
| Methyl-tert-Butyl Ether | **70** | µg/L | 264 | µg/L | | |
| tert-Butyl Alcohol | **120** | µg/L | --- | | | |
| tert-Amyl Methyl Ether | **90** | µg/L | --- | | | |

eurofins | Spectrum Analytical

☐ Final Report
☑ Revised Report

Report Date:
07-Jun-17 14:14

# *Laboratory Report*
# SC35291

ATC Group Services, LLC
400 Reservoir Ave, Suite 2C
Providence, RI 02907
Attn: Keith Sullivan

Project: 261 Boston Rd - Billerica, MA
Project #: 95-5021321

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

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87936
Maine # MA138
New Hampshire # 2972/2538
New Jersey # MA011
New York # 11393
Pennsylvania # 68-04426/68-02924
Rhode Island # LAO00348
USDA # P330-15-00375
Vermont # VT-11393

Authorized by:

Rebecca Merz
Quality Services Manager

Eurofins Spectrum Analytical holds primary certification in the State of Massachusetts for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of Massachusetts does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.
Please note that this report contains 28 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Eurofins Spectrum Analytical, Inc.

*Eurofins Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Eurofins Spectrum Analytical, Inc. is currently accredited for the specific method or analyte indicated. Please refer to our 'Quality' web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Eurofins Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey, Pennsylvania and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (PA-68-04426).*

*Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.*

## Sample Summary

**Work Order:** SC35291

**Project:** 261 Boston Rd - Billerica, MA

**Project Number:** 95-5021321

| Laboratory ID | Client Sample ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| SC35291-01 | RGP-1 | Ground Water | 01-Jun-17 11:45 | 01-Jun-17 19:35 |
| SC35291-02 | SW-1 | Surface Water | 01-Jun-17 12:30 | 01-Jun-17 19:35 |

# MassDEP Analytical Protocol Certification Form

| | |
|---|---|
| **Laboratory Name:** Eurofins Spectrum Analytical, Inc. | **Project #:** 95-5021321 |
| **Project Location:** 261 Boston Rd - Billerica, MA | **RTN:** |
| **This form provides certifications for the following data set:** | SC35291-01 through SC35291-02 |
| **Matrices:** Ground Water<br>Surface Water | |

**CAM Protocol**

| | | | | | |
|---|---|---|---|---|---|
| 8260 VOC<br>CAM II A | ✓ 7470/7471 Hg<br>CAM III B | MassDEP VPH<br>CAM IV A | 8081 Pesticides<br>CAM V B | ✓ 7196 Hex Cr<br>CAM VI B | MassDEP APH<br>CAM IX A |
| 8270 SVOC<br>CAM II B | 7010 Metals<br>CAM III C | MassDEP EPH<br>CAM IV B | 8151 Herbicides<br>CAM V C | 8330 Explosives<br>CAM VIII A | TO-15 VOC<br>CAM IX B |
| 6010 Metals<br>CAM III A | 6020 Metals<br>CAM III D | 8082 PCB<br>CAM V A | ✓ 9012 Total Cyanide/PAC<br>CAM VI A | 9014 Total Cyanide/PAC<br>CAM VI A | 6860 Perchlorate<br>CAM VIII B |

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

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

***Responses to questions G, H and I below are required for Presumptive Certainty status***

| | | |
|---|---|---|
| **G** | Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)? | ✓ Yes No |

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

| | | |
|---|---|---|
| **H** | Were all QC performance standards specified in the CAM protocol(s) achieved? | Yes ✓ No |
| **I** | Were results reported for the complete analyte list specified in the selected CAM protocol(s)? | Yes ✓ No |

***All negative responses are addressed in a case narrative on the cover page of this report.***

***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.***

Christina A. White
Laboratory Director
Date: 6/7/2017

**CASE NARRATIVE:**

Data has been reported to the RDL. This report excludes estimated concentrations detected below the RDL and above the MDL (J-Flag).

All non-detects and all results below the reporting limit are reported as "<" (less than) the reporting limit in this report.

The samples were received 2.1 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

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

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

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

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

Analyses for Total Hardness, pH, and Total Residual Chlorine fall under the state of Pennsylvania code Chapter 252.6 accreditation by rule.

**June 6, 2017 Report Revision Narrative:**

This report has been revised to include all BTEX compounds.

**June 7, 2017 Report Revision Case Narrative:**

This report has been revised to include the customzed analyte list.

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

## EPA 200.7

**Duplicates:**

1709133-DUP1 *Source: SC35291-02*

MRL raised to correlate to batch QC reporting limits.

Iron
Magnesium

**Samples:**

SC35291-01 *RGP-1*

MRL raised to correlate to batch QC reporting limits.

Iron
Magnesium

SC35291-02 *SW-1*

MRL raised to correlate to batch QC reporting limits.

Magnesium

## EPA 200.8

**Spikes:**

1709132-MS1 *Source: SC35291-01*

Analyte out of acceptance range in QC spike but no reportable concentration present in sample.

Antimony
Chromium
Selenium

The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

Arsenic
Lead
Zinc

**Duplicates:**

1709132-DUP1 *Source: SC35291-01*

Analyses are not controlled on RPD values from sample concentrations that are less than 5 times the reporting level. The batch is accepted based upon the difference between the sample and duplicate is less than or equal to the reporting limit.

Antimony
Selenium

MRL raised to correlate to batch QC reporting limits.

Antimony
Chromium
Selenium
Silver

**Samples:**

SC35291-01 *RGP-1*

MRL raised to correlate to batch QC reporting limits.

Antimony
Chromium
Selenium
Silver

## EPA 300.0

**Duplicates:**

1709275-DUP1 *Source: SC35291-01*

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

Chloride

**Samples:**

SC35291-01 *RGP-1*

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

Chloride

## EPA 625

**Calibration:**

1705033

## EPA 625

**Calibration:**

1705033

Analyte quantified by quadratic equation type calibration.

Pentachlorophenol

This affected the following samples:

1709122-BLK1
1709122-BS1
1709122-BSD1
RGP-1
S705020-CCV1

**Samples:**

S705020-CCV1

Analyte percent difference is outside individual acceptance criteria (20), but within overall method allowances.

Benzo (g,h,i) perylene (20.8%)

This affected the following samples:

1709122-BLK1
1709122-BS1
1709122-BSD1
RGP-1

SC35291-01 *RGP-1*

Acid surrogate recovery outside of control limits. The data was accepted based on valid recovery of remaining two acid surrogates.

Phenol-d5

Base/Neutral surrogate recovery outside of control limits. The data was accepted based on valid recovery of remaining two base/neutral surrogates.

Nitrobenzene-d5

## Sample Acceptance Check Form

| | |
|---|---|
| Client: | ATC Group Services, LLC - Providence, RI |
| Project: | 261 Boston Rd - Billerica, MA / 95-5021321 |
| Work Order: | SC35291 |
| Sample(s) received on: | 6/1/2017 |

***The following outlines the condition of samples for the attached Chain of Custody upon receipt.***

| | Yes | No | N/A |
|---|---|---|---|
| Were custody seals present? | ☐ | ☑ | ☐ |
| Were custody seals intact? | ☐ | ☐ | ☑ |
| Were samples received at a temperature of ≤ 6°C? | ☑ | ☐ | ☐ |
| Were samples refrigerated upon transfer to laboratory representative? | ☑ | ☐ | ☐ |
| Were sample containers received intact? | ☑ | ☐ | ☐ |
| Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)? | ☑ | ☐ | ☐ |
| Were samples accompanied by a Chain of Custody document? | ☑ | ☐ | ☐ |
| Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample? | ☑ | ☐ | ☐ |
| Did sample container labels agree with Chain of Custody document? | ☑ | ☐ | ☐ |
| Were samples received within method-specific holding times? | ☑ | ☐ | ☐ |

## Summary of Hits

**Lab ID:** SC35291-01 **Client ID:** RGP-1

| Parameter | Result | Flag | Reporting Limit | Units | Analytical Method |
|---|---|---|---|---|---|
| Ammonia as Nitrogen | 0.16 | | 0.05 | mg/L | E350.1 |
| Calcium | 57.4 | | 0.100 | mg/l | EPA 200.7 |
| Iron | 0.642 | R06 | 0.0400 | mg/l | EPA 200.7 |
| Magnesium | 3.99 | R06 | 0.0500 | mg/l | EPA 200.7 |
| Arsenic | 0.00418 | | 0.00025 | mg/l | EPA 200.8 |
| Copper | 0.00474 | | 0.00025 | mg/l | EPA 200.8 |
| Lead | 0.00109 | | 0.00025 | mg/l | EPA 200.8 |
| Nickel | 0.00250 | | 0.00025 | mg/l | EPA 200.8 |
| Zinc | 0.0110 | | 0.00250 | mg/l | EPA 200.8 |
| Chloride | 260 | D, GS1 | 10.0 | mg/l | EPA 300.0 |
| Hardness | 160 | | 0.456 | mg/l CaCO3 | SM 2340B (11) |
| Total Suspended Solids | 5.2 | | 1.0 | mg/l | SM2540D (11) |

**Lab ID:** SC35291-02 **Client ID:** SW-1

| Parameter | Result | Flag | Reporting Limit | Units | Analytical Method |
|---|---|---|---|---|---|
| Ammonia as Nitrogen | 0.10 | | 0.05 | mg/L | E350.1 |
| Calcium | 11.5 | | 0.100 | mg/l | EPA 200.7 |
| Magnesium | 2.56 | R06 | 0.0500 | mg/l | EPA 200.7 |
| Hardness | 39.3 | | 0.456 | mg/l CaCO3 | SM 2340B (11) |

*Please note that because there are no reporting limits associated with hazardous waste characterizations or micro analyses, this summary does not include hits from these analyses if included in this work order.*

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **RGP-1** | 95-5021321 | Ground Water | 01-Jun-17 11:45 | 01-Jun-17 |
| SC35291-01 | | | | |

| CAS No. | Analyte(s) | Result | Flag | Units | *RDL | MDL | Dilution | Method Ref. | Prepared | Analyzed | Analyst | Batch | Cert. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | | | | | |
| Purgeable Organic Compounds | | | | | | | | | | | | | |
| 994-05-8 | Tert-amyl methyl ether | < 0.50 | | µg/l | 0.50 | 0.49 | 1 | EPA 524.2 | 02-Jun-17 | 02-Jun-17 | EK | 1709154 | |
| *Surrogate recoveries:* | | | | | | | | | | | | | |
| *460-00-4* | *4-Bromofluorobenzene* | *89* | | | *80-120 %* | | | " | " | " | " | " | |
| *2037-26-5* | *Toluene-d8* | *98* | | | *80-120 %* | | | " | " | " | " | " | |
| *17060-07-0* | *1,2-Dichloroethane-d4* | *102* | | | *80-120 %* | | | " | " | " | " | " | |
| *1868-53-7* | *Dibromofluoromethane* | *102* | | | *80-120 %* | | | " | " | " | " | " | |
| Volatile Organic Compounds by GCMS | | | | | | | | | | | | | |
| 67-64-1 | Acetone | < 10.0 | | µg/l | 10.0 | 0.8 | 1 | EPA 624 | " | " | EK | " | |
| 71-43-2 | Benzene | < 1.0 | | µg/l | 1.0 | 0.3 | 1 | " | " | " | " | " | X |
| 56-23-5 | Carbon tetrachloride | < 1.0 | | µg/l | 1.0 | 0.4 | 1 | " | " | " | " | " | X |
| 95-50-1 | 1,2-Dichlorobenzene | < 1.0 | | µg/l | 1.0 | 0.3 | 1 | " | " | " | " | " | X |
| 541-73-1 | 1,3-Dichlorobenzene | < 1.0 | | µg/l | 1.0 | 0.3 | 1 | " | " | " | " | " | X |
| 106-46-7 | 1,4-Dichlorobenzene | < 1.0 | | µg/l | 1.0 | 0.3 | 1 | " | " | " | " | " | X |
| 75-34-3 | 1,1-Dichloroethane | < 1.0 | | µg/l | 1.0 | 0.3 | 1 | " | " | " | " | " | X |
| 107-06-2 | 1,2-Dichloroethane | < 1.0 | | µg/l | 1.0 | 0.3 | 1 | " | " | " | " | " | X |
| 75-35-4 | 1,1-Dichloroethene | < 1.0 | | µg/l | 1.0 | 0.7 | 1 | " | " | " | " | " | X |
| 156-59-2 | cis-1,2-Dichloroethene | < 1.0 | | µg/l | 1.0 | 0.3 | 1 | " | " | " | " | " | |
| 100-41-4 | Ethylbenzene | < 1.0 | | µg/l | 1.0 | 0.3 | 1 | " | " | " | " | " | X |
| 1634-04-4 | Methyl tert-butyl ether | < 1.0 | | µg/l | 1.0 | 0.2 | 1 | " | " | " | " | " | |
| 75-09-2 | Methylene chloride | < 10.0 | | µg/l | 10.0 | 0.7 | 1 | " | " | " | " | " | X |
| 127-18-4 | Tetrachloroethene | < 1.0 | | µg/l | 1.0 | 0.8 | 1 | " | " | " | " | " | X |
| 108-88-3 | Toluene | < 1.0 | | µg/l | 1.0 | 0.3 | 1 | " | " | " | " | " | X |
| 71-55-6 | 1,1,1-Trichloroethane | < 1.0 | | µg/l | 1.0 | 0.5 | 1 | " | " | " | " | " | X |
| 79-00-5 | 1,1,2-Trichloroethane | < 1.0 | | µg/l | 1.0 | 0.3 | 1 | " | " | " | " | " | X |
| 79-01-6 | Trichloroethene | < 1.0 | | µg/l | 1.0 | 0.5 | 1 | " | " | " | " | " | X |
| 75-01-4 | Vinyl chloride | < 1.0 | | µg/l | 1.0 | 0.5 | 1 | " | " | " | " | " | X |
| 179601-23-1 | m,p-Xylene | < 2.0 | | µg/l | 2.0 | 0.4 | 1 | " | " | " | " | " | X |
| 95-47-6 | o-Xylene | < 1.0 | | µg/l | 1.0 | 0.3 | 1 | " | " | " | " | " | X |
| 123-91-1 | 1,4-Dioxane | < 20.0 | | µg/l | 20.0 | 11.4 | 1 | " | " | " | " | " | |
| *Surrogate recoveries:* | | | | | | | | | | | | | |
| *460-00-4* | *4-Bromofluorobenzene* | *89* | | | *70-130 %* | | | " | " | " | " | " | |
| *2037-26-5* | *Toluene-d8* | *98* | | | *70-130 %* | | | " | " | " | " | " | |
| *17060-07-0* | *1,2-Dichloroethane-d4* | *102* | | | *70-130 %* | | | " | " | " | " | " | |
| *1868-53-7* | *Dibromofluoromethane* | *102* | | | *70-130 %* | | | " | " | " | " | " | |
| **Microextractable Organic Compounds** | | | | | | | | | | | | | |
| Prepared by method General Preparation SVOC | | | | | | | | | | | | | |
| 106-93-4 | 1,2-Dibromoethane (EDB) | < 0.0100 | | µg/l | 0.0100 | 0.00336 | 1 | SW846 8011 | 05-Jun-17 | 05-Jun-17 | DS | 1709212 | |
| **Organic Compounds by Modified SW846 8015** | | | | | | | | | | | | | |
| Alcohol Analysis | | | | | | | | | | | | | |
| Prepared by method General Preparation SVOC | | | | | | | | | | | | | |
| 64-17-5 | Ethanol | < 1.00 | | mg/l | 1.00 | 0.447 | 1 | SW846 8015 Mod | 03-Jun-17 | 03-Jun-17 | SM | 1709211 | |
| 75-65-0 | Tert-Butanol / butyl alcohol | < 1.00 | | mg/l | 1.00 | 0.473 | 1 | " | " | " | " | " | |
| *Surrogate recoveries:* | | | | | | | | | | | | | |
| *71-41-0* | *1-Pentanol* | *109* | | | *40-140 %* | | | " | " | " | " | " | |

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

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **RGP-1** | 95-5021321 | Ground Water | 01-Jun-17 11:45 | 01-Jun-17 |
| SC35291-01 | | | | |

| CAS No. | Analyte(s) | Result | Flag | Units | *RDL | MDL | Dilution | Method Ref. | Prepared | Analyzed | Analyst | Batch | Cert. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semivolatile Organic Compounds by GCMS** | | | | | | | | | | | | | |
| Semivolatile Organic Compounds | | | | | | | | | | | | | |
| 83-32-9 | Acenaphthene | < 5.10 | | µg/l | 5.10 | 0.705 | 1 | EPA 625 | 02-Jun-17 | 05-Jun-17 | MSL | 1709122 | X |
| 208-96-8 | Acenaphthylene | < 5.10 | | µg/l | 5.10 | 0.697 | 1 | " | " | " | " | " | X |
| 120-12-7 | Anthracene | < 5.10 | | µg/l | 5.10 | 0.620 | 1 | " | " | " | " | " | X |
| 56-55-3 | Benzo (a) anthracene | < 5.10 | | µg/l | 5.10 | 0.547 | 1 | " | " | " | " | " | X |
| 50-32-8 | Benzo (a) pyrene | < 5.10 | | µg/l | 5.10 | 0.573 | 1 | " | " | " | " | " | X |
| 205-99-2 | Benzo (b) fluoranthene | < 5.10 | | µg/l | 5.10 | 0.446 | 1 | " | " | " | " | " | X |
| 191-24-2 | Benzo (g,h,i) perylene | < 5.10 | | µg/l | 5.10 | 0.541 | 1 | " | " | " | " | " | X |
| 207-08-9 | Benzo (k) fluoranthene | < 5.10 | | µg/l | 5.10 | 0.490 | 1 | " | " | " | " | " | X |
| 117-81-7 | Bis(2-ethylhexyl)phthalate | < 5.10 | | µg/l | 5.10 | 0.651 | 1 | " | " | " | " | " | X |
| 85-68-7 | Butyl benzyl phthalate | < 5.10 | | µg/l | 5.10 | 0.447 | 1 | " | " | " | " | " | X |
| 218-01-9 | Chrysene | < 5.10 | | µg/l | 5.10 | 0.543 | 1 | " | " | " | " | " | X |
| 53-70-3 | Dibenzo (a,h) anthracene | < 5.10 | | µg/l | 5.10 | 0.459 | 1 | " | " | " | " | " | X |
| 84-66-2 | Diethyl phthalate | < 5.10 | | µg/l | 5.10 | 0.636 | 1 | " | " | " | " | " | X |
| 131-11-3 | Dimethyl phthalate | < 5.10 | | µg/l | 5.10 | 0.773 | 1 | " | " | " | " | " | X |
| 84-74-2 | Di-n-butyl phthalate | < 5.10 | | µg/l | 5.10 | 0.466 | 1 | " | " | " | " | " | X |
| 117-84-0 | Di-n-octyl phthalate | < 5.10 | | µg/l | 5.10 | 0.414 | 1 | " | " | " | " | " | X |
| 206-44-0 | Fluoranthene | < 5.10 | | µg/l | 5.10 | 0.651 | 1 | " | " | " | " | " | X |
| 86-73-7 | Fluorene | < 5.10 | | µg/l | 5.10 | 0.624 | 1 | " | " | " | " | " | X |
| 193-39-5 | Indeno (1,2,3-cd) pyrene | < 5.10 | | µg/l | 5.10 | 0.592 | 1 | " | " | " | " | " | X |
| 91-20-3 | Naphthalene | < 5.10 | | µg/l | 5.10 | 0.699 | 1 | " | " | " | " | " | X |
| 87-86-5 | Pentachlorophenol | < 5.10 | | µg/l | 5.10 | 0.381 | 1 | " | " | " | " | " | X |
| 85-01-8 | Phenanthrene | < 5.10 | | µg/l | 5.10 | 0.598 | 1 | " | " | " | " | " | X |
| 108-95-2 | Phenol | < 5.10 | | µg/l | 5.10 | 0.658 | 1 | " | " | " | " | " | X |
| 129-00-0 | Pyrene | < 5.10 | | µg/l | 5.10 | 0.622 | 1 | " | " | " | " | " | X |
| *Surrogate recoveries:* | | | | | | | | | | | | | |
| *321-60-8* | *2-Fluorobiphenyl* | *30* | | | *30-130 %* | | | " | " | " | " | " | |
| *367-12-4* | *2-Fluorophenol* | *22* | | | *15-110 %* | | | " | " | " | " | " | |
| *4165-60-0* | *Nitrobenzene-d5* | *29* | SBN | | *30-130 %* | | | " | " | " | " | " | |
| *4165-62-2* | *Phenol-d5* | *14* | SAC | | *15-110 %* | | | " | " | " | " | " | |
| *1718-51-0* | *Terphenyl-dl4* | *42* | | | *30-130 %* | | | " | " | " | " | " | |
| *118-79-6* | *2,4,6-Tribromophenol* | *38* | | | *15-110 %* | | | " | " | " | " | " | |
| **Semivolatile Organic Compounds by GC** | | | | | | | | | | | | | |
| Polychlorinated Biphenyls | | | | | | | | | | | | | |
| 12674-11-2 | Aroclor-1016 | < 0.204 | | µg/l | 0.204 | 0.106 | 1 | EPA 608 | 02-Jun-17 | 05-Jun-17 | EAB | 1709121 | X |
| 11104-28-2 | Aroclor-1221 | < 0.204 | | µg/l | 0.204 | 0.117 | 1 | " | " | " | " | " | X |
| 11141-16-5 | Aroclor-1232 | < 0.204 | | µg/l | 0.204 | 0.113 | 1 | " | " | " | " | " | X |
| 53469-21-9 | Aroclor-1242 | < 0.204 | | µg/l | 0.204 | 0.109 | 1 | " | " | " | " | " | X |
| 12672-29-6 | Aroclor-1248 | < 0.204 | | µg/l | 0.204 | 0.139 | 1 | " | " | " | " | " | X |
| 11097-69-1 | Aroclor-1254 | < 0.204 | | µg/l | 0.204 | 0.118 | 1 | " | " | " | " | " | X |
| 11096-82-5 | Aroclor-1260 | < 0.204 | | µg/l | 0.204 | 0.0868 | 1 | " | " | " | " | " | X |
| 37324-23-5 | Aroclor-1262 | < 0.204 | | µg/l | 0.204 | 0.0914 | 1 | " | " | " | " | " | |
| 11100-14-4 | Aroclor-1268 | < 0.204 | | µg/l | 0.204 | 0.0934 | 1 | " | " | " | " | " | |
| *Surrogate recoveries:* | | | | | | | | | | | | | |
| *10386-84-2* | *4,4-DB-Octafluorobiphenyl (Sr)* | *50* | | | *30-150 %* | | | " | " | " | " | " | |

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

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **RGP-1**<br>SC35291-01 | 95-5021321 | Ground Water | 01-Jun-17 11:45 | 01-Jun-17 |

| CAS No. | Analyte(s) | Result | Flag | Units | *RDL | MDL | Dilution | Method Ref. | Prepared | Analyzed | Analyst | Batch | Cert. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semivolatile Organic Compounds by GC** | | | | | | | | | | | | | |
| Polychlorinated Biphenyls | | | | | | | | | | | | | |
| *10386-84-2* | *4,4-DB-Octafluorobiphenyl (Sr) [2C]* | *55* | | | *30-150 %* | | | EPA 608 | 02-Jun-17 | 05-Jun-17 | EAB | 1709121 | |
| *2051-24-3* | *Decachlorobiphenyl (Sr)* | *75* | | | *30-150 %* | | | " | " | " | " | " | |
| *2051-24-3* | *Decachlorobiphenyl (Sr) [2C]* | *80* | | | *30-150 %* | | | " | " | " | " | " | |
| **Extractable Petroleum Hydrocarbons** | | | | | | | | | | | | | |
| Prepared by method SW846 3510C | | | | | | | | | | | | | |
| | Non-polar material (SGT-HEM) | < 1.0 | | mg/l | 1.0 | 0.9 | 1 | EPA 1664B | 05-Jun-17 | 05-Jun-17 | KK | 1709217 | |
| **Total Metals by EPA 200/6000 Series Methods** | | | | | | | | | | | | | |
| Prepared by method General Prep-Metal | | | | | | | | | | | | | |
| | Preservation | **Field Preserved; pH<2 confirmed** | | N/A | | | 1 | EPA 200/6000 methods | 02-Jun-17 | | BK | 1709139 | |
| **Total Metals by EPA 200 Series Methods** | | | | | | | | | | | | | |
| 7440-22-4 | Silver | < 0.00030 | R06 | mg/l | 0.00030 | 0.00010 | 1 | EPA 200.8 | 02-Jun-17 | 02-Jun-17 | edt | 1709132 | X |
| 7440-38-2 | Arsenic | **0.00418** | | mg/l | 0.00025 | 0.00006 | 1 | " | " | " | " | " | X |
| 7440-70-2 | Calcium | **57.4** | | mg/l | 0.100 | 0.0340 | 1 | EPA 200.7 | " | 02-Jun-17 | tbc | 1709133 | X |
| 7440-43-9 | Cadmium | < 0.00025 | | mg/l | 0.00025 | 0.00004 | 1 | EPA 200.8 | " | 02-Jun-17 | edt | 1709132 | X |
| 7440-47-3 | Chromium | < 0.00120 | R06 | mg/l | 0.00120 | 0.00015 | 1 | " | " | " | " | " | X |
| 7440-50-8 | Copper | **0.00474** | | mg/l | 0.00025 | 0.00004 | 1 | " | " | " | " | " | X |
| 7439-89-6 | Iron | **0.642** | R06 | mg/l | 0.0400 | 0.0100 | 1 | EPA 200.7 | " | 02-Jun-17 | EDT/TBC | 1709133 | X |
| 7439-97-6 | Mercury | < 0.00020 | | mg/l | 0.00020 | 0.00013 | 1 | EPA 245.1/7470A | " | 02-Jun-17 | LNB | 1709134 | X |
| 7439-95-4 | Magnesium | **3.99** | R06 | mg/l | 0.0500 | 0.0074 | 1 | EPA 200.7 | " | 02-Jun-17 | EDT/TBC | 1709133 | X |
| 7440-02-0 | Nickel | **0.00250** | | mg/l | 0.00025 | 0.00005 | 1 | EPA 200.8 | " | 02-Jun-17 | edt | 1709132 | X |
| 7439-92-1 | Lead | **0.00109** | | mg/l | 0.00025 | 0.00002 | 1 | " | " | " | " | " | X |
| 7440-36-0 | Antimony | < 0.00045 | R06 | mg/l | 0.00045 | 0.00007 | 1 | " | " | " | " | " | X |
| 7782-49-2 | Selenium | < 0.00305 | R06 | mg/l | 0.00305 | 0.00012 | 1 | " | " | " | " | " | X |
| 7440-66-6 | Zinc | **0.0110** | | mg/l | 0.00250 | 0.00116 | 1 | " | " | 02-Jun-17 | " | " | X |
| **General Chemistry Parameters** | | | | | | | | | | | | | |
| Prepared by method EPA 200 Series | | | | | | | | | | | | | |
| 16065-83-1 | Trivalent Chromium | < 0.0024 | | mg/l | 0.0024 | 0.0053 | 1 | Calculation | 02-Jun-17 | 02-Jun-17 | edt | 1709132 | |
| | Hardness | **160** | HD | mg/l CaCO3 | 0.456 | 0.115 | 1 | SM 2340B (11) | " | 02-Jun-17 | EDT/TBC | [CALC] | |
| 7782-50-5 | Total Residual Chlorine | < 0.020 | CIHT | mg/l | 0.020 | 0.006 | 1 | SM4500-Cl-G (11) | 02-Jun-17 09:26 | 02-Jun-17 13:12 | RLT | 1709142 | X |
| 16887-00-6 | Chloride | **260** | D, GS1 | mg/l | 10.0 | 0.897 | 10 | EPA 300.0 | 05-Jun-17 | 05-Jun-17 | CAW | 1709275 | X |
| 18540-29-9 | Hexavalent Chromium | < 0.005 | | mg/l | 0.005 | 0.002 | 1 | SM3500-Cr-B (11)/7196A | 02-Jun-17 09:13 | 02-Jun-17 09:54 | RLT | 1709140 | |
| 57-12-5 | Cyanide (total) | < 0.00500 | | mg/l | 0.00500 | 0.00426 | 1 | EPA 335.4 / SW846 9012B | 03-Jun-17 | 03-Jun-17 | RLT | 1709210 | X |
| | Total Suspended Solids | **5.2** | | mg/l | 1.0 | 0.4 | 1 | SM2540D (11) | 02-Jun-17 | 03-Jun-17 | CMB | 1709141 | X |
| **Subcontracted Analyses** | | | | | | | | | | | | | |
| Prepared by method 388655 | | | | | | | | | | | | | |
| *Analysis performed by Phoenix Environmental Labs, Inc. * - MACT007* | | | | | | | | | | | | | |
| 7664-41-7 | Ammonia as Nitrogen | **0.16** | | mg/L | 0.05 | 0.05 | 1 | E350.1 | | 05-Jun-17 11:20 | MACT0 | 388655A | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **SW-1**<br>SC35291-02 | 95-5021321 | Surface Water | 01-Jun-17 12:30 | 01-Jun-17 |

| CAS No. | Analyte(s) | Result | Flag | Units | *RDL | MDL | Dilution | Method Ref. | Prepared | Analyzed | Analyst | Batch | Cert. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Metals by EPA 200/6000 Series Methods** | | | | | | | | | | | | | |
| Prepared by method General Prep-Metal | | | | | | | | | | | | | |
| | Preservation | **Field Preserved; pH<2 confirmed** | | N/A | | | 1 | EPA 200/6000 methods | 02-Jun-17 | | BK | 1709139 | |
| **Total Metals by EPA 200 Series Methods** | | | | | | | | | | | | | |
| 7440-70-2 | Calcium | **11.5** | | mg/l | 0.100 | 0.0340 | 1 | EPA 200.7 | 02-Jun-17 | 02-Jun-17 | tbc | 1709133 | X |
| 7439-95-4 | Magnesium | **2.56** | R06 | mg/l | 0.0500 | 0.0074 | 1 | " | " | 02-Jun-17 | " | " | X |
| **General Chemistry Parameters** | | | | | | | | | | | | | |
| | Hardness | **39.3** | HD | mg/l CaCO3 | 0.456 | 0.115 | 1 | SM 2340B (11) | 02-Jun-17 | 02-Jun-17 | EDT/TBC | [CALC] | |
| **Subcontracted Analyses** | | | | | | | | | | | | | |
| Prepared by method 388655 | | | | | | | | | | | | | |
| *Analysis performed by Phoenix Environmental Labs, Inc. * - MACT007* | | | | | | | | | | | | | |
| 7664-41-7 | Ammonia as Nitrogen | **0.10** | | mg/L | 0.05 | 0.05 | 1 | E350.1 | | 05-Jun-17 11:21 | MACT0 | 388655A | |

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EPA 524.2** | | | | | | | | | | |
| **Batch 1709154 - SW846 5030 Water MS** | | | | | | | | | | |
| **Blank (1709154-BLK1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Tert-amyl methyl ether | < 0.50 | | µg/l | 0.50 | | | | | | |
| *Surrogate: 4-Bromofluorobenzene* | *44.6* | | µg/l | | *50.0* | | *89* | *80-120* | | |
| *Surrogate: Toluene-d8* | *46.9* | | µg/l | | *50.0* | | *94* | *80-120* | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *50.2* | | µg/l | | *50.0* | | *100* | *80-120* | | |
| *Surrogate: Dibromofluoromethane* | *51.2* | | µg/l | | *50.0* | | *102* | *80-120* | | |
| **LCS (1709154-BS1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Tert-amyl methyl ether | **17.1** | | µg/l | | 20.0 | | 86 | 70-130 | | |
| *Surrogate: 4-Bromofluorobenzene* | *51.2* | | µg/l | | *50.0* | | *102* | *80-120* | | |
| *Surrogate: Toluene-d8* | *47.9* | | µg/l | | *50.0* | | *96* | *80-120* | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *47.7* | | µg/l | | *50.0* | | *95* | *80-120* | | |
| *Surrogate: Dibromofluoromethane* | *49.0* | | µg/l | | *50.0* | | *98* | *80-120* | | |
| **LCS Dup (1709154-BSD1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Tert-amyl methyl ether | **16.9** | | µg/l | | 20.0 | | 84 | 70-130 | 1 | 30 |
| *Surrogate: 4-Bromofluorobenzene* | *50.4* | | µg/l | | *50.0* | | *101* | *80-120* | | |
| *Surrogate: Toluene-d8* | *48.6* | | µg/l | | *50.0* | | *97* | *80-120* | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *47.6* | | µg/l | | *50.0* | | *95* | *80-120* | | |
| *Surrogate: Dibromofluoromethane* | *53.8* | | µg/l | | *50.0* | | *108* | *80-120* | | |
| **EPA 624** | | | | | | | | | | |
| **Batch 1709154 - SW846 5030 Water MS** | | | | | | | | | | |
| **Blank (1709154-BLK1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Acetone | < 10.0 | | µg/l | 10.0 | | | | | | |
| Benzene | < 1.0 | | µg/l | 1.0 | | | | | | |
| Carbon tetrachloride | < 1.0 | | µg/l | 1.0 | | | | | | |
| 1,2-Dichlorobenzene | < 1.0 | | µg/l | 1.0 | | | | | | |
| 1,3-Dichlorobenzene | < 1.0 | | µg/l | 1.0 | | | | | | |
| 1,4-Dichlorobenzene | < 1.0 | | µg/l | 1.0 | | | | | | |
| 1,1-Dichloroethane | < 1.0 | | µg/l | 1.0 | | | | | | |
| 1,2-Dichloroethane | < 1.0 | | µg/l | 1.0 | | | | | | |
| 1,1-Dichloroethene | < 1.0 | | µg/l | 1.0 | | | | | | |
| cis-1,2-Dichloroethene | < 1.0 | | µg/l | 1.0 | | | | | | |
| Ethylbenzene | < 1.0 | | µg/l | 1.0 | | | | | | |
| Methyl tert-butyl ether | < 1.0 | | µg/l | 1.0 | | | | | | |
| Methylene chloride | < 10.0 | | µg/l | 10.0 | | | | | | |
| Tetrachloroethene | < 1.0 | | µg/l | 1.0 | | | | | | |
| Toluene | < 1.0 | | µg/l | 1.0 | | | | | | |
| 1,1,1-Trichloroethane | < 1.0 | | µg/l | 1.0 | | | | | | |
| 1,1,2-Trichloroethane | < 1.0 | | µg/l | 1.0 | | | | | | |
| Trichloroethene | < 1.0 | | µg/l | 1.0 | | | | | | |
| Vinyl chloride | < 1.0 | | µg/l | 1.0 | | | | | | |
| m,p-Xylene | < 2.0 | | µg/l | 2.0 | | | | | | |
| o-Xylene | < 1.0 | | µg/l | 1.0 | | | | | | |
| 1,4-Dioxane | < 20.0 | | µg/l | 20.0 | | | | | | |
| *Surrogate: 4-Bromofluorobenzene* | *44.6* | | µg/l | | *50.0* | | *89* | *70-130* | | |
| *Surrogate: Toluene-d8* | *46.9* | | µg/l | | *50.0* | | *94* | *70-130* | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *50.2* | | µg/l | | *50.0* | | *100* | *70-130* | | |
| *Surrogate: Dibromofluoromethane* | *51.2* | | µg/l | | *50.0* | | *102* | *70-130* | | |
| **LCS (1709154-BS1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Acetone | **16.7** | | µg/l | | 20.0 | | 84 | 70-130 | | |

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EPA 624** | | | | | | | | | | |
| **Batch 1709154 - SW846 5030 Water MS** | | | | | | | | | | |
| **LCS (1709154-BS1)** | | | | | Prepared & Analyzed: 02-Jun-17 | | | | | |
| Benzene | **19.9** | | µg/l | | 20.0 | | 99 | 70-130 | | |
| Carbon tetrachloride | **23.8** | | µg/l | | 20.0 | | 119 | 70-140 | | |
| 1,2-Dichlorobenzene | **21.9** | | µg/l | | 20.0 | | 110 | 18-190 | | |
| 1,3-Dichlorobenzene | **23.3** | | µg/l | | 20.0 | | 116 | 59-156 | | |
| 1,4-Dichlorobenzene | **20.7** | | µg/l | | 20.0 | | 104 | 18-190 | | |
| 1,1-Dichloroethane | **17.9** | | µg/l | | 20.0 | | 89 | 59-155 | | |
| 1,2-Dichloroethane | **18.8** | | µg/l | | 20.0 | | 94 | 49-155 | | |
| 1,1-Dichloroethene | **17.9** | | µg/l | | 20.0 | | 89 | 70-130 | | |
| cis-1,2-Dichloroethene | **17.7** | | µg/l | | 20.0 | | 88 | 70-130 | | |
| Ethylbenzene | **21.9** | | µg/l | | 20.0 | | 110 | 37-162 | | |
| Methyl tert-butyl ether | **18.4** | | µg/l | | 20.0 | | 92 | 70-130 | | |
| Methylene chloride | **17.7** | | µg/l | | 20.0 | | 89 | 1-221 | | |
| Tetrachloroethene | **20.1** | | µg/l | | 20.0 | | 101 | 64-148 | | |
| Toluene | **18.8** | | µg/l | | 20.0 | | 94 | 70-130 | | |
| 1,1,1-Trichloroethane | **21.6** | | µg/l | | 20.0 | | 108 | 52-162 | | |
| 1,1,2-Trichloroethane | **19.8** | | µg/l | | 20.0 | | 99 | 52-150 | | |
| Trichloroethene | **19.2** | | µg/l | | 20.0 | | 96 | 71-157 | | |
| Vinyl chloride | **15.5** | | µg/l | | 20.0 | | 78 | 1-251 | | |
| m,p-Xylene | **21.0** | | µg/l | | 20.0 | | 105 | 70-130 | | |
| o-Xylene | **21.2** | | µg/l | | 20.0 | | 106 | 70-130 | | |
| 1,4-Dioxane | **188** | | µg/l | | 200 | | 94 | 70-130 | | |
| *Surrogate: 4-Bromofluorobenzene* | *51.2* | | µg/l | | *50.0* | | *102* | *70-130* | | |
| *Surrogate: Toluene-d8* | *47.9* | | µg/l | | *50.0* | | *96* | *70-130* | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *47.7* | | µg/l | | *50.0* | | *95* | *70-130* | | |
| *Surrogate: Dibromofluoromethane* | *49.0* | | µg/l | | *50.0* | | *98* | *70-130* | | |
| **LCS Dup (1709154-BSD1)** | | | | | Prepared & Analyzed: 02-Jun-17 | | | | | |
| Acetone | **17.8** | | µg/l | | 20.0 | | 89 | 70-130 | 6 | 30 |
| Benzene | **18.9** | | µg/l | | 20.0 | | 95 | 70-130 | 5 | 30 |
| Carbon tetrachloride | **21.9** | | µg/l | | 20.0 | | 110 | 70-140 | 8 | 30 |
| 1,2-Dichlorobenzene | **20.9** | | µg/l | | 20.0 | | 105 | 18-190 | 5 | 30 |
| 1,3-Dichlorobenzene | **22.3** | | µg/l | | 20.0 | | 111 | 59-156 | 4 | 30 |
| 1,4-Dichlorobenzene | **19.6** | | µg/l | | 20.0 | | 98 | 18-190 | 6 | 30 |
| 1,1-Dichloroethane | **17.0** | | µg/l | | 20.0 | | 85 | 59-155 | 5 | 30 |
| 1,2-Dichloroethane | **18.0** | | µg/l | | 20.0 | | 90 | 49-155 | 5 | 30 |
| 1,1-Dichloroethene | **17.1** | | µg/l | | 20.0 | | 86 | 70-130 | 4 | 30 |
| cis-1,2-Dichloroethene | **17.0** | | µg/l | | 20.0 | | 85 | 70-130 | 4 | 30 |
| Ethylbenzene | **20.7** | | µg/l | | 20.0 | | 103 | 37-162 | 6 | 30 |
| Methyl tert-butyl ether | **19.0** | | µg/l | | 20.0 | | 95 | 70-130 | 3 | 30 |
| Methylene chloride | **17.1** | | µg/l | | 20.0 | | 86 | 1-221 | 4 | 30 |
| Tetrachloroethene | **19.4** | | µg/l | | 20.0 | | 97 | 64-148 | 4 | 30 |
| Toluene | **18.7** | | µg/l | | 20.0 | | 93 | 70-130 | 0.6 | 30 |
| 1,1,1-Trichloroethane | **20.0** | | µg/l | | 20.0 | | 100 | 52-162 | 8 | 30 |
| 1,1,2-Trichloroethane | **19.9** | | µg/l | | 20.0 | | 99 | 52-150 | 0.5 | 30 |
| Trichloroethene | **18.6** | | µg/l | | 20.0 | | 93 | 71-157 | 3 | 30 |
| Vinyl chloride | **14.5** | | µg/l | | 20.0 | | 73 | 1-251 | 7 | 30 |
| m,p-Xylene | **19.6** | | µg/l | | 20.0 | | 98 | 70-130 | 7 | 30 |
| o-Xylene | **20.5** | | µg/l | | 20.0 | | 103 | 70-130 | 3 | 30 |
| 1,4-Dioxane | **212** | | µg/l | | 200 | | 106 | 70-130 | 12 | 25 |
| *Surrogate: 4-Bromofluorobenzene* | *50.4* | | µg/l | | *50.0* | | *101* | *70-130* | | |
| *Surrogate: Toluene-d8* | *48.6* | | µg/l | | *50.0* | | *97* | *70-130* | | |

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EPA 624** | | | | | | | | | | |
| **Batch 1709154 - SW846 5030 Water MS** | | | | | | | | | | |
| **LCS Dup (1709154-BSD1)** | | | | | Prepared & Analyzed: 02-Jun-17 | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *47.6* | | µg/l | | *50.0* | | *95* | *70-130* | | |
| *Surrogate: Dibromofluoromethane* | *53.8* | | µg/l | | *50.0* | | *108* | *70-130* | | |

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **SW846 8011** | | | | | | | | | | |
| **Batch 1709212 - General Preparation SVOC** | | | | | | | | | | |
| **Blank (1709212-BLK1)** | | | | | | Prepared & Analyzed: 05-Jun-17 | | | | |
| 1,2-Dibromoethane (EDB) | < 0.0100 | | µg/l | 0.0100 | | | | | | |
| **LCS (1709212-BS1)** | | | | | | Prepared & Analyzed: 05-Jun-17 | | | | |
| 1,2-Dibromoethane (EDB) | **0.214** | | µg/l | 0.0100 | 0.200 | | 107 | 60-140 | | |
| **LCS Dup (1709212-BSD1)** | | | | | | Prepared & Analyzed: 05-Jun-17 | | | | |
| 1,2-Dibromoethane (EDB) | **0.201** | | µg/l | 0.0100 | 0.200 | | 100 | 60-140 | 6 | 50 |
| **Duplicate (1709212-DUP1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 05-Jun-17 | | | | |
| 1,2-Dibromoethane (EDB) | < 0.0100 | | µg/l | 0.0100 | | BRL | | | | 30 |

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **SW846 8015 Mod** | | | | | | | | | | |
| **Batch 1709211 - General Preparation SVOC** | | | | | | | | | | |
| **Blank (1709211-BLK1)** | | | | | Prepared & Analyzed: 03-Jun-17 | | | | | |
| Ethanol | < 1.00 | | mg/l | 1.00 | | | | | | |
| Tert-Butanol / butyl alcohol | < 1.00 | | mg/l | 1.00 | | | | | | |
| *Surrogate: 1-Pentanol* | *50.6* | | mg/l | | *50.0* | | *101* | *40-140* | | |
| **LCS (1709211-BS1)** | | | | | Prepared & Analyzed: 03-Jun-17 | | | | | |
| Ethanol | **98.7** | | mg/l | 1.00 | 100 | | 99 | 40-140 | | |
| Tert-Butanol / butyl alcohol | **94.5** | | mg/l | 1.00 | 100 | | 95 | 40-140 | | |
| *Surrogate: 1-Pentanol* | *40.3* | | mg/l | | *50.0* | | *81* | *40-140* | | |
| **LCS Dup (1709211-BSD1)** | | | | | Prepared & Analyzed: 03-Jun-17 | | | | | |
| Ethanol | **98.0** | | mg/l | 1.00 | 100 | | 98 | 40-140 | 0.7 | 200 |
| Tert-Butanol / butyl alcohol | **93.8** | | mg/l | 1.00 | 100 | | 94 | 40-140 | 0.7 | 200 |
| *Surrogate: 1-Pentanol* | *40.3* | | mg/l | | *50.0* | | *81* | *40-140* | | |
| **Duplicate (1709211-DUP1)** | | | **Source: SC35291-01** | | Prepared & Analyzed: 03-Jun-17 | | | | | |
| Ethanol | < 1.00 | | mg/l | 1.00 | | BRL | | | | 200 |
| Tert-Butanol / butyl alcohol | < 1.00 | | mg/l | 1.00 | | BRL | | | | 200 |
| *Surrogate: 1-Pentanol* | *61.3* | | mg/l | | *50.0* | | *123* | *40-140* | | |

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EPA 625** | | | | | | | | | | |
| **Batch 1709122 - SW846 3510C** | | | | | | | | | | |
| **Blank (1709122-BLK1)** | | | | | Prepared: 02-Jun-17 Analyzed: 05-Jun-17 | | | | | |
| Acenaphthene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Acenaphthylene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Anthracene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Benzo (a) anthracene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Benzo (a) pyrene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Benzo (b) fluoranthene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Benzo (g,h,i) perylene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Benzo (k) fluoranthene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Bis(2-ethylhexyl)phthalate | < 5.00 | | µg/l | 5.00 | | | | | | |
| Butyl benzyl phthalate | < 5.00 | | µg/l | 5.00 | | | | | | |
| Chrysene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Dibenzo (a,h) anthracene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Diethyl phthalate | < 5.00 | | µg/l | 5.00 | | | | | | |
| Dimethyl phthalate | < 5.00 | | µg/l | 5.00 | | | | | | |
| Di-n-butyl phthalate | < 5.00 | | µg/l | 5.00 | | | | | | |
| Di-n-octyl phthalate | < 5.00 | | µg/l | 5.00 | | | | | | |
| Fluoranthene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Fluorene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Indeno (1,2,3-cd) pyrene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Naphthalene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Pentachlorophenol | < 5.00 | | µg/l | 5.00 | | | | | | |
| Phenanthrene | < 5.00 | | µg/l | 5.00 | | | | | | |
| Phenol | < 5.00 | | µg/l | 5.00 | | | | | | |
| Pyrene | < 5.00 | | µg/l | 5.00 | | | | | | |
| *Surrogate: 2-Fluorobiphenyl* | *42.5* | | µg/l | | *50.0* | | *85* | *30-130* | | |
| *Surrogate: 2-Fluorophenol* | *42.9* | | µg/l | | *50.0* | | *86* | *15-110* | | |
| *Surrogate: Nitrobenzene-d5* | *43.6* | | µg/l | | *50.0* | | *87* | *30-130* | | |
| *Surrogate: Phenol-d5* | *42.2* | | µg/l | | *50.0* | | *84* | *15-110* | | |
| *Surrogate: Terphenyl-dl4* | *43.3* | | µg/l | | *50.0* | | *87* | *30-130* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *41.0* | | µg/l | | *50.0* | | *82* | *15-110* | | |
| **LCS (1709122-BS1)** | | | | | Prepared: 02-Jun-17 Analyzed: 05-Jun-17 | | | | | |
| Acenaphthene | **37.0** | | µg/l | 5.00 | 50.0 | | 74 | 47-145 | | |
| Acenaphthylene | **36.0** | | µg/l | 5.00 | 50.0 | | 72 | 33-145 | | |
| Anthracene | **38.1** | | µg/l | 5.00 | 50.0 | | 76 | 27-133 | | |
| Benzo (a) anthracene | **38.4** | | µg/l | 5.00 | 50.0 | | 77 | 33-143 | | |
| Benzo (a) pyrene | **38.6** | | µg/l | 5.00 | 50.0 | | 77 | 17-163 | | |
| Benzo (b) fluoranthene | **37.6** | | µg/l | 5.00 | 50.0 | | 75 | 24-159 | | |
| Benzo (g,h,i) perylene | **38.7** | | µg/l | 5.00 | 50.0 | | 77 | 1-219 | | |
| Benzo (k) fluoranthene | **36.7** | | µg/l | 5.00 | 50.0 | | 73 | 11-162 | | |
| Bis(2-ethylhexyl)phthalate | **37.3** | | µg/l | 5.00 | 50.0 | | 75 | 8-158 | | |
| Butyl benzyl phthalate | **34.9** | | µg/l | 5.00 | 50.0 | | 70 | 1-152 | | |
| Chrysene | **37.4** | | µg/l | 5.00 | 50.0 | | 75 | 17-168 | | |
| Dibenzo (a,h) anthracene | **42.6** | | µg/l | 5.00 | 50.0 | | 85 | 1-227 | | |
| Diethyl phthalate | **36.6** | | µg/l | 5.00 | 50.0 | | 73 | 1-114 | | |
| Dimethyl phthalate | **33.3** | | µg/l | 5.00 | 50.0 | | 67 | 1-112 | | |
| Di-n-butyl phthalate | **37.7** | | µg/l | 5.00 | 50.0 | | 75 | 1-118 | | |
| Di-n-octyl phthalate | **35.3** | | µg/l | 5.00 | 50.0 | | 71 | 4-146 | | |
| Fluoranthene | **39.0** | | µg/l | 5.00 | 50.0 | | 78 | 26-137 | | |
| Fluorene | **36.2** | | µg/l | 5.00 | 50.0 | | 72 | 59-121 | | |
| Indeno (1,2,3-cd) pyrene | **39.8** | | µg/l | 5.00 | 50.0 | | 80 | 1-171 | | |

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EPA 625** | | | | | | | | | | |
| **Batch 1709122 - SW846 3510C** | | | | | | | | | | |
| **LCS (1709122-BS1)** | | | | | Prepared: 02-Jun-17 Analyzed: 05-Jun-17 | | | | | |
| Naphthalene | **34.9** | | µg/l | 5.00 | 50.0 | | 70 | 21-133 | | |
| Pentachlorophenol | **36.8** | | µg/l | 5.00 | 50.0 | | 74 | 14-176 | | |
| Phenanthrene | **37.5** | | µg/l | 5.00 | 50.0 | | 75 | 54-120 | | |
| Phenol | **34.5** | | µg/l | 5.00 | 50.0 | | 69 | 5-112 | | |
| Pyrene | **35.5** | | µg/l | 5.00 | 50.0 | | 71 | 52-115 | | |
| *Surrogate: 2-Fluorobiphenyl* | *42.9* | | µg/l | | *50.0* | | *86* | *30-130* | | |
| *Surrogate: 2-Fluorophenol* | *43.2* | | µg/l | | *50.0* | | *86* | *15-110* | | |
| *Surrogate: Nitrobenzene-d5* | *44.1* | | µg/l | | *50.0* | | *88* | *30-130* | | |
| *Surrogate: Phenol-d5* | *36.8* | | µg/l | | *50.0* | | *74* | *15-110* | | |
| *Surrogate: Terphenyl-dl4* | *43.1* | | µg/l | | *50.0* | | *86* | *30-130* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *53.4* | | µg/l | | *50.0* | | *107* | *15-110* | | |
| **LCS Dup (1709122-BSD1)** | | | | | Prepared: 02-Jun-17 Analyzed: 05-Jun-17 | | | | | |
| Acenaphthene | **40.0** | | µg/l | 5.00 | 50.0 | | 80 | 47-145 | 8 | 20 |
| Acenaphthylene | **41.9** | | µg/l | 5.00 | 50.0 | | 84 | 33-145 | 15 | 20 |
| Anthracene | **41.8** | | µg/l | 5.00 | 50.0 | | 84 | 27-133 | 9 | 20 |
| Benzo (a) anthracene | **39.0** | | µg/l | 5.00 | 50.0 | | 78 | 33-143 | 2 | 20 |
| Benzo (a) pyrene | **40.1** | | µg/l | 5.00 | 50.0 | | 80 | 17-163 | 4 | 20 |
| Benzo (b) fluoranthene | **38.8** | | µg/l | 5.00 | 50.0 | | 78 | 24-159 | 3 | 20 |
| Benzo (g,h,i) perylene | **41.0** | | µg/l | 5.00 | 50.0 | | 82 | 1-219 | 6 | 20 |
| Benzo (k) fluoranthene | **39.1** | | µg/l | 5.00 | 50.0 | | 78 | 11-162 | 6 | 20 |
| Bis(2-ethylhexyl)phthalate | **38.2** | | µg/l | 5.00 | 50.0 | | 76 | 8-158 | 2 | 20 |
| Butyl benzyl phthalate | **38.5** | | µg/l | 5.00 | 50.0 | | 77 | 1-152 | 10 | 20 |
| Chrysene | **40.3** | | µg/l | 5.00 | 50.0 | | 81 | 17-168 | 8 | 20 |
| Dibenzo (a,h) anthracene | **41.9** | | µg/l | 5.00 | 50.0 | | 84 | 1-227 | 2 | 20 |
| Diethyl phthalate | **38.3** | | µg/l | 5.00 | 50.0 | | 77 | 1-114 | 5 | 20 |
| Dimethyl phthalate | **38.8** | | µg/l | 5.00 | 50.0 | | 78 | 1-112 | 15 | 20 |
| Di-n-butyl phthalate | **42.3** | | µg/l | 5.00 | 50.0 | | 85 | 1-118 | 11 | 20 |
| Di-n-octyl phthalate | **33.6** | | µg/l | 5.00 | 50.0 | | 67 | 4-146 | 5 | 20 |
| Fluoranthene | **44.0** | | µg/l | 5.00 | 50.0 | | 88 | 26-137 | 12 | 20 |
| Fluorene | **39.6** | | µg/l | 5.00 | 50.0 | | 79 | 59-121 | 9 | 20 |
| Indeno (1,2,3-cd) pyrene | **40.7** | | µg/l | 5.00 | 50.0 | | 81 | 1-171 | 2 | 20 |
| Naphthalene | **36.1** | | µg/l | 5.00 | 50.0 | | 72 | 21-133 | 3 | 20 |
| Pentachlorophenol | **37.1** | | µg/l | 5.00 | 50.0 | | 74 | 14-176 | 0.8 | 20 |
| Phenanthrene | **38.9** | | µg/l | 5.00 | 50.0 | | 78 | 54-120 | 4 | 20 |
| Phenol | **36.9** | | µg/l | 5.00 | 50.0 | | 74 | 5-112 | 7 | 20 |
| Pyrene | **40.8** | | µg/l | 5.00 | 50.0 | | 82 | 52-115 | 14 | 20 |
| *Surrogate: 2-Fluorobiphenyl* | *47.7* | | µg/l | | *50.0* | | *95* | *30-130* | | |
| *Surrogate: 2-Fluorophenol* | *42.2* | | µg/l | | *50.0* | | *84* | *15-110* | | |
| *Surrogate: Nitrobenzene-d5* | *49.3* | | µg/l | | *50.0* | | *99* | *30-130* | | |
| *Surrogate: Phenol-d5* | *40.2* | | µg/l | | *50.0* | | *80* | *15-110* | | |
| *Surrogate: Terphenyl-dl4* | *45.1* | | µg/l | | *50.0* | | *90* | *30-130* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *52.6* | | µg/l | | *50.0* | | *105* | *15-110* | | |

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EPA 608** | | | | | | | | | | |
| **Batch 1709121 - SW846 3510C** | | | | | | | | | | |
| **Blank (1709121-BLK1)** | | | | | Prepared: 02-Jun-17 Analyzed: 05-Jun-17 | | | | | |
| Aroclor-1016 | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1016 [2C] | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1221 | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1221 [2C] | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1232 | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1232 [2C] | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1242 | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1242 [2C] | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1248 | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1248 [2C] | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1254 | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1254 [2C] | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1260 | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1260 [2C] | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1262 | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1262 [2C] | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1268 | < 0.200 | | µg/l | 0.200 | | | | | | |
| Aroclor-1268 [2C] | < 0.200 | | µg/l | 0.200 | | | | | | |
| *Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)* | *0.180* | | µg/l | | *0.200* | | *90* | *30-150* | | |
| *Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]* | *0.190* | | µg/l | | *0.200* | | *95* | *30-150* | | |
| *Surrogate: Decachlorobiphenyl (Sr)* | *0.240* | | µg/l | | *0.200* | | *120* | *30-150* | | |
| *Surrogate: Decachlorobiphenyl (Sr) [2C]* | *0.250* | | µg/l | | *0.200* | | *125* | *30-150* | | |
| **LCS (1709121-BS1)** | | | | | Prepared: 02-Jun-17 Analyzed: 05-Jun-17 | | | | | |
| Aroclor-1016 | **2.17** | | µg/l | 0.200 | 2.50 | | 87 | 50-114 | | |
| Aroclor-1016 [2C] | **2.34** | | µg/l | 0.200 | 2.50 | | 94 | 50-114 | | |
| Aroclor-1260 | **2.30** | | µg/l | 0.200 | 2.50 | | 92 | 40-127 | | |
| Aroclor-1260 [2C] | **2.59** | | µg/l | 0.200 | 2.50 | | 104 | 40-127 | | |
| *Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)* | *0.160* | | µg/l | | *0.200* | | *80* | *30-150* | | |
| *Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]* | *0.170* | | µg/l | | *0.200* | | *85* | *30-150* | | |
| *Surrogate: Decachlorobiphenyl (Sr)* | *0.210* | | µg/l | | *0.200* | | *105* | *30-150* | | |
| *Surrogate: Decachlorobiphenyl (Sr) [2C]* | *0.240* | | µg/l | | *0.200* | | *120* | *30-150* | | |
| **LCS Dup (1709121-BSD1)** | | | | | Prepared: 02-Jun-17 Analyzed: 05-Jun-17 | | | | | |
| Aroclor-1016 | **1.98** | | µg/l | 0.200 | 2.50 | | 79 | 50-114 | 9 | 20 |
| Aroclor-1016 [2C] | **2.16** | | µg/l | 0.200 | 2.50 | | 86 | 50-114 | 8 | 20 |
| Aroclor-1260 | **2.05** | | µg/l | 0.200 | 2.50 | | 82 | 40-127 | 11 | 20 |
| Aroclor-1260 [2C] | **2.36** | | µg/l | 0.200 | 2.50 | | 94 | 40-127 | 9 | 20 |
| *Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)* | *0.150* | | µg/l | | *0.200* | | *75* | *30-150* | | |
| *Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]* | *0.160* | | µg/l | | *0.200* | | *80* | *30-150* | | |
| *Surrogate: Decachlorobiphenyl (Sr)* | *0.170* | | µg/l | | *0.200* | | *85* | *30-150* | | |
| *Surrogate: Decachlorobiphenyl (Sr) [2C]* | *0.220* | | µg/l | | *0.200* | | *110* | *30-150* | | |

## Extractable Petroleum Hydrocarbons - Quality Control

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EPA 1664B** | | | | | | | | | | |
| **Batch 1709217 - SW846 3510C** | | | | | | | | | | |
| **Blank (1709217-BLK1)** | | | | | | Prepared & Analyzed: 05-Jun-17 | | | | |
| Non-polar material (SGT-HEM) | < 1.0 | | mg/l | 1.0 | | | | | | |
| **LCS (1709217-BS1)** | | | | | | Prepared & Analyzed: 05-Jun-17 | | | | |
| Non-polar material (SGT-HEM) | **27.1** | | mg/l | 1.0 | 39.7 | | 68 | 64-132 | | |

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EPA 200.7** | | | | | | | | | | |
| **Batch 1709133 - EPA 200 Series** | | | | | | | | | | |
| **Blank (1709133-BLK1)** | | | | | Prepared & Analyzed: 02-Jun-17 | | | | | |
| Iron | < 0.0400 | | mg/l | 0.0400 | | | | | | |
| Calcium | < 0.100 | | mg/l | 0.100 | | | | | | |
| Magnesium | < 0.0500 | | mg/l | 0.0500 | | | | | | |
| **LCS (1709133-BS1)** | | | | | Prepared & Analyzed: 02-Jun-17 | | | | | |
| Iron | **1.20** | | mg/l | 0.0400 | 1.25 | | 96 | 85-115 | | |
| Calcium | **6.26** | | mg/l | 0.100 | 6.25 | | 100 | 85-115 | | |
| Magnesium | **1.40** | | mg/l | 0.0500 | 1.25 | | 112 | 85-115 | | |
| **Duplicate (1709133-DUP1)** | | | **Source: SC35291-02** | | Prepared & Analyzed: 02-Jun-17 | | | | | |
| Magnesium | **2.50** | R06 | mg/l | 0.0500 | | 2.56 | | | 2 | 20 |
| Calcium | **10.7** | | mg/l | 0.100 | | 11.5 | | | 7 | 20 |
| **Matrix Spike (1709133-MS1)** | | | **Source: SC35291-02** | | Prepared & Analyzed: 02-Jun-17 | | | | | |
| Magnesium | **3.82** | | mg/l | 0.0500 | 1.25 | 2.56 | 101 | 70-130 | | |
| Calcium | **16.9** | | mg/l | 0.100 | 6.25 | 11.5 | 85 | 70-130 | | |
| **Post Spike (1709133-PS1)** | | | **Source: SC35291-02** | | Prepared & Analyzed: 02-Jun-17 | | | | | |
| Magnesium | **3.90** | | mg/l | 0.0500 | 1.25 | 2.56 | 108 | 85-115 | | |
| Calcium | **18.4** | | mg/l | 0.100 | 6.25 | 11.5 | 110 | 85-115 | | |
| **EPA 200.8** | | | | | | | | | | |
| **Batch 1709132 - EPA 200 Series** | | | | | | | | | | |
| **Blank (1709132-BLK1)** | | | | | Prepared & Analyzed: 02-Jun-17 | | | | | |
| Antimony | < 0.00045 | | mg/l | 0.00045 | | | | | | |
| Selenium | < 0.00305 | | mg/l | 0.00305 | | | | | | |
| Lead | < 0.00025 | | mg/l | 0.00025 | | | | | | |
| Zinc | < 0.00250 | | mg/l | 0.00250 | | | | | | |
| Silver | < 0.00030 | | mg/l | 0.00030 | | | | | | |
| Nickel | < 0.00025 | | mg/l | 0.00025 | | | | | | |
| Copper | < 0.00025 | | mg/l | 0.00025 | | | | | | |
| Chromium | < 0.00120 | | mg/l | 0.00120 | | | | | | |
| Arsenic | < 0.00025 | | mg/l | 0.00025 | | | | | | |
| Cadmium | < 0.00025 | | mg/l | 0.00025 | | | | | | |
| **LCS (1709132-BS1)** | | | | | Prepared & Analyzed: 02-Jun-17 | | | | | |
| Lead | **0.0527** | D | mg/l | 0.00250 | 0.0500 | | 105 | 85-115 | | |
| Antimony | **0.0494** | D | mg/l | 0.00450 | 0.0500 | | 99 | 85-115 | | |
| Selenium | **0.226** | D | mg/l | 0.0305 | 0.250 | | 90 | 85-115 | | |
| Zinc | **0.0540** | D | mg/l | 0.0250 | 0.0500 | | 108 | 85-115 | | |
| Arsenic | **0.0508** | D | mg/l | 0.00250 | 0.0500 | | 102 | 85-115 | | |
| Silver | **0.0502** | D | mg/l | 0.00300 | 0.0500 | | 100 | 85-115 | | |
| Nickel | **0.0498** | D | mg/l | 0.00250 | 0.0500 | | 100 | 85-115 | | |
| Chromium | **0.0524** | D | mg/l | 0.0120 | 0.0500 | | 105 | 85-115 | | |
| Cadmium | **0.0508** | D | mg/l | 0.00250 | 0.0500 | | 102 | 85-115 | | |
| Copper | **0.0520** | D | mg/l | 0.00250 | 0.0500 | | 104 | 85-115 | | |
| **Duplicate (1709132-DUP1)** | | | **Source: SC35291-01** | | Prepared & Analyzed: 02-Jun-17 | | | | | |
| Zinc | **0.0124** | | mg/l | 0.00250 | | 0.0110 | | | 12 | 20 |
| Lead | **0.00116** | | mg/l | 0.00025 | | 0.00109 | | | 6 | 20 |
| Antimony | **0.00042** | J,QR8, R06 | mg/l | 0.00045 | | 0.00035 | | | 19 | 20 |
| Selenium | **0.00114** | J,QR8, R06 | mg/l | 0.00305 | | 0.00301 | | | 90 | 20 |
| Cadmium | **0.00015** | J | mg/l | 0.00025 | | 0.00015 | | | 4 | 20 |
| Arsenic | **0.00421** | | mg/l | 0.00025 | | 0.00418 | | | 0.7 | 20 |
| Silver | **0.00029** | J,R06 | mg/l | 0.00030 | | BRL | | | | 20 |

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EPA 200.8** | | | | | | | | | | |
| **Batch 1709132 - EPA 200 Series** | | | | | | | | | | |
| **Duplicate (1709132-DUP1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Nickel | **0.00265** | | mg/l | 0.00025 | | 0.00250 | | | 6 | 20 |
| Copper | **0.00510** | | mg/l | 0.00025 | | 0.00474 | | | 7 | 20 |
| Chromium | **0.00116** | J,R06 | mg/l | 0.00120 | | 0.00101 | | | 14 | 20 |
| **Matrix Spike (1709132-MS1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Antimony | **0.0661** | QC2, D | mg/l | 0.00450 | 0.0500 | BRL | 132 | 70-130 | | |
| Zinc | **0.0778** | QM7, D | mg/l | 0.0250 | 0.0500 | BRL | 156 | 70-130 | | |
| Lead | **0.0686** | QM7, D | mg/l | 0.00250 | 0.0500 | 0.00109 | 135 | 70-130 | | |
| Selenium | **0.335** | QC2, D | mg/l | 0.0305 | 0.250 | 0.00301 | 133 | 70-130 | | |
| Arsenic | **0.0773** | QM7, D | mg/l | 0.00250 | 0.0500 | 0.00418 | 146 | 70-130 | | |
| Copper | **0.0680** | D | mg/l | 0.00250 | 0.0500 | 0.00474 | 126 | 70-130 | | |
| Chromium | **0.0661** | QC2, D | mg/l | 0.0120 | 0.0500 | BRL | 132 | 70-130 | | |
| Cadmium | **0.0650** | D | mg/l | 0.00250 | 0.0500 | BRL | 130 | 70-130 | | |
| Nickel | **0.0626** | D | mg/l | 0.00250 | 0.0500 | 0.00250 | 120 | 70-130 | | |
| Silver | **0.0618** | D | mg/l | 0.00300 | 0.0500 | BRL | 124 | 70-130 | | |
| **Post Spike (1709132-PS1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Antimony | **0.0518** | D | mg/l | 0.00450 | 0.0500 | BRL | 104 | 85-115 | | |
| Selenium | **0.362** | QC2, D | mg/l | 0.0305 | 0.250 | 0.00301 | 144 | 85-115 | | |
| Cadmium | **0.0649** | QC2, D | mg/l | 0.00250 | 0.0500 | BRL | 130 | 85-115 | | |
| Silver | **0.0615** | D, QC2 | mg/l | 0.00300 | 0.0500 | BRL | 123 | 85-115 | | |
| Chromium | **0.0672** | QC2, D | mg/l | 0.0120 | 0.0500 | BRL | 134 | 85-115 | | |
| **EPA 245.1/7470A** | | | | | | | | | | |
| **Batch 1709134 - EPA200/SW7000 Series** | | | | | | | | | | |
| **Blank (1709134-BLK1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Mercury | < 0.00020 | | mg/l | 0.00020 | | | | | | |
| **LCS (1709134-BS1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Mercury | **0.00452** | | mg/l | 0.00020 | 0.00500 | | 90 | 85-115 | | |
| **Duplicate (1709134-DUP1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Mercury | < 0.00020 | | mg/l | 0.00020 | | BRL | | | | 20 |
| **Matrix Spike (1709134-MS1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Mercury | **0.00485** | | mg/l | 0.00020 | 0.00500 | BRL | 97 | 80-120 | | |
| **Post Spike (1709134-PS1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Mercury | **0.00437** | | mg/l | 0.00020 | 0.00500 | BRL | 87 | 85-115 | | |

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EPA 300.0** | | | | | | | | | | |
| **Batch 1709275 - General Preparation** | | | | | | | | | | |
| **Blank (1709275-BLK1)** | | | | | | Prepared & Analyzed: 05-Jun-17 | | | | |
| Chloride | < 1.00 | | mg/l | 1.00 | | | | | | |
| **LCS (1709275-BS1)** | | | | | | Prepared & Analyzed: 05-Jun-17 | | | | |
| Chloride | **21.4** | | mg/l | 1.00 | 20.0 | | 107 | 90-110 | | |
| **Duplicate (1709275-DUP1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 05-Jun-17 | | | | |
| Chloride | **261** | GS1, D | mg/l | 10.0 | | 260 | | | 0.5 | 20 |
| **Matrix Spike (1709275-MS1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 05-Jun-17 | | | | |
| Chloride | **340** | | mg/l | 10.0 | 80.0 | 260 | 100 | 90-110 | | |
| **Matrix Spike Dup (1709275-MSD1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 05-Jun-17 | | | | |
| Chloride | **340** | | mg/l | 10.0 | 80.0 | 260 | 101 | 90-110 | 0.2 | 20 |
| **Reference (1709275-SRM1)** | | | | | | Prepared & Analyzed: 05-Jun-17 | | | | |
| Chloride | **25.2** | | mg/l | 1.00 | 25.0 | | 101 | 90-110 | | |
| **EPA 335.4 / SW846 9012B** | | | | | | | | | | |
| **Batch 1709210 - General Preparation** | | | | | | | | | | |
| **Blank (1709210-BLK1)** | | | | | | Prepared & Analyzed: 03-Jun-17 | | | | |
| Cyanide (total) | < 0.00500 | | mg/l | 0.00500 | | | | | | |
| **Blank (1709210-BLK2)** | | | | | | Prepared & Analyzed: 03-Jun-17 | | | | |
| Cyanide (total) | < 0.00500 | | mg/l | 0.00500 | | | | | | |
| **LCS (1709210-BS1)** | | | | | | Prepared & Analyzed: 03-Jun-17 | | | | |
| Cyanide (total) | **0.301** | | mg/l | 0.00500 | 0.300 | | 100 | 90-110 | | |
| **LCS (1709210-BS2)** | | | | | | Prepared & Analyzed: 03-Jun-17 | | | | |
| Cyanide (total) | **0.241** | QC3 | mg/l | 0.00500 | 0.300 | | 80 | 90-110 | | |
| **Duplicate (1709210-DUP1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 03-Jun-17 | | | | |
| Cyanide (total) | < 0.00500 | | mg/l | 0.00500 | | BRL | | | | 20 |
| **Matrix Spike (1709210-MS1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 03-Jun-17 | | | | |
| Cyanide (total) | **0.323** | | mg/l | 0.00500 | 0.300 | BRL | 108 | 90-110 | | |
| **Matrix Spike Dup (1709210-MSD1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 03-Jun-17 | | | | |
| Cyanide (total) | **0.327** | | mg/l | 0.00500 | 0.300 | BRL | 109 | 90-110 | 1 | 20 |
| **Reference (1709210-SRM1)** | | | | | | Prepared & Analyzed: 03-Jun-17 | | | | |
| Cyanide (total) | **0.334** | | mg/l | 0.00500 | 0.336 | | 99 | 73.5-126 | | |
| **SM2540D (11)** | | | | | | | | | | |
| **Batch 1709141 - General Preparation** | | | | | | | | | | |
| **Blank (1709141-BLK1)** | | | | | | Prepared: 02-Jun-17 Analyzed: 03-Jun-17 | | | | |
| Total Suspended Solids | < 0.5 | | mg/l | 0.5 | | | | | | |
| **LCS (1709141-BS1)** | | | | | | Prepared: 02-Jun-17 Analyzed: 03-Jun-17 | | | | |
| Total Suspended Solids | **96.0** | | mg/l | 10.0 | 100 | | 96 | 90-110 | | |
| **SM3500-Cr-B (11)/7196A** | | | | | | | | | | |
| **Batch 1709140 - General Preparation** | | | | | | | | | | |
| **Blank (1709140-BLK1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Hexavalent Chromium | < 0.005 | | mg/l | 0.005 | | | | | | |
| **LCS (1709140-BS1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Hexavalent Chromium | **0.050** | | mg/l | 0.005 | 0.0500 | | 99 | 90-111 | | |
| **Duplicate (1709140-DUP1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Hexavalent Chromium | **0.003** | J | mg/l | 0.005 | | BRL | | | | 20 |
| **Matrix Spike (1709140-MS1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Hexavalent Chromium | **0.054** | | mg/l | 0.005 | 0.0500 | BRL | 108 | 85-115 | | |
| **Matrix Spike Dup (1709140-MSD1)** | | | **Source: SC35291-01** | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Hexavalent Chromium | **0.054** | | mg/l | 0.005 | 0.0500 | BRL | 109 | 85-115 | 0.4 | 20 |

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **SM3500-Cr-B (11)/7196A** | | | | | | | | | | |
| **Batch 1709140 - General Preparation** | | | | | | | | | | |
| **Reference (1709140-SRM1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Hexavalent Chromium | **0.026** | | mg/l | 0.005 | 0.0250 | | 105 | 85-115 | | |
| **SM4500-Cl-G (11)** | | | | | | | | | | |
| **Batch 1709142 - General Preparation** | | | | | | | | | | |
| **Blank (1709142-BLK1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Total Residual Chlorine | < 0.020 | | mg/l | 0.020 | | | | | | |
| **LCS (1709142-BS1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Total Residual Chlorine | **0.045** | | mg/l | 0.020 | 0.0500 | | 90 | 90-110 | | |
| **Reference (1709142-SRM1)** | | | | | | Prepared & Analyzed: 02-Jun-17 | | | | |
| Total Residual Chlorine | **0.097** | | mg/l | 0.020 | 0.105 | | 92 | 85-115 | | |

## Subcontracted Analyses - Quality Control

| Analyte(s) | Result | Flag | Units | *RDL | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **E350.1** | | | | | | | | | | |
| **Batch 388655A - 388655** | | | | | | | | | | |
| **BLK (BY31536-BLK)** | | | | | | Prepared: 02-Jun-17 Analyzed: 05-Jun-17 | | | | |
| Ammonia as Nitrogen | < 0.05 | | mg/L | 0.05 | | | | - | | |
| **DUP (BY31536-DUP)** | | | **Source: BY31536** | | | Prepared: 02-Jun-17 Analyzed: 05-Jun-17 | | | | |
| Ammonia as Nitrogen | **26.8** | | mg/L | 0.50 | | | | - | 2.3 | 20 |
| **LCS (BY31536-LCS)** | | | | | | Prepared: 02-Jun-17 Analyzed: 05-Jun-17 | | | | |
| Ammonia as Nitrogen | **3.570** | | mg/L | 0.05 | 3.74 | | 95.5 | 90-110 | | 20 |
| **MS (BY31536-MS)** | | | **Source: BY31536** | | | Prepared: 02-Jun-17 Analyzed: 05-Jun-17 | | | | |
| Ammonia as Nitrogen | **47.70** | | mg/L | 0.05 | 20 | | 108 | 90-110 | | 20 |

## Notes and Definitions

| | |
|---|---|
| D | Data reported from a dilution |
| GS1 | Sample dilution required for high concentration of target analytes to be within the instrument calibration range. |
| QC2 | Analyte out of acceptance range in QC spike but no reportable concentration present in sample. |
| QC3 | The spike recovery is outside acceptable limits for the LCS. The batch was accepted based upon the MS and/or MSD meeting the LCS limits criteria. |
| QM7 | The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery. |
| QR8 | Analyses are not controlled on RPD values from sample concentrations that are less than 5 times the reporting level. The batch is accepted based upon the difference between the sample and duplicate is less than or equal to the reporting limit. |
| R06 | MRL raised to correlate to batch QC reporting limits. |
| SAC | Acid surrogate recovery outside of control limits. The data was accepted based on valid recovery of remaining two acid surrogates. |
| SBN | Base/Neutral surrogate recovery outside of control limits. The data was accepted based on valid recovery of remaining two base/neutral surrogates. |
| dry | Sample results reported on a dry weight basis |
| NR | Not Reported |
| RPD | Relative Percent Difference |
| J | Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). |
| ClHT | The method for residual chlorine indicates that samples should be analyzed immediately. 40 CFR 136 specifies a holding time of 15 minutes from sampling to analysis. Therefore all aqueous residual chlorine samples not analyzed in the field are considered out of hold time at the time of sample receipt. |
| HD | Total Hardness is a calculation based on the reported values of Ca and Mg. |

Interpretation of Total Petroleum Hydrocarbon Report

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from analyses of various petroleum products. Possible match categories are as follows:

Gasoline - includes regular, unleaded, premium, etc.
Fuel Oil #2 - includes home heating oil, #2 fuel oil, and diesel
Fuel Oil #4 - includes #4 fuel oil
Fuel Oil #6 - includes #6 fuel oil and bunker "C" oil
Motor Oil - includes virgin and waste automobile oil
Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha
Aviation Fuel - includes kerosene, Jet A and JP-4
Other Oil - includes lubricating and cutting oil, and silicon oil

At times, the unidentified petroleum product is quantified using a calibration that most closely approximates the distribution of compounds in the sample. When this occurs, the result is qualified as Calculated as.

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

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

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

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

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

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

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

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

SC35291

SPECTRUM ANALYTICAL, INC.
*Featuring*
HANIBAL TECHNOLOGY

# CHAIN OF CUSTODY RECORD

Page 1 of 1

**Special Handling:**
- ☐ Standard TAT - 7 to 10 business days
- ☑ Rush TAT - Date Needed: 24-hr

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed.

Report To: ATC - Providence
400 Reservoir Avenue, Suite 2C
Providence, RI 02907
Telephone #: 401-714-0306, xt 142
Project Mgr: Keith Sullivan

Invoice To: ATC - Providence
400 Reservoir Avenue, Suite 2C
Providence, RI 02907
P.O No.: 95-5021321 RQN: Lawrence

Project No: 95-5021321
Site Name: 261 Boston Road, Billerica, MA
Location: 261 Boston Road, Billerica State: MA
Sampler(s): Jessica Colby

1=$Na_2S2O_3$ 2=HCl 3=$H_2SO_4$ 4=$HNO_3$ 5=NaOH 6=Ascorbic Acid 7=$CH_3OH$
8= $NaHSO_4$ 9= Deionized Water 10=$H_3PO_4$ 11= None 12=

DW=Dinking Water GW= Groundwater WW= Waste Water
O= Oil SW= surface Water SO=Soil SL= Sludge A= Air
X1= X2= X3=

G= Grab C=Compsite

| Lab ID: | Sample ID: | Date: | Time: | Type | Matrix | # of VOA Vials | # of Amber Glass | # of Clear Glass | # of Plastic | TSS, Residual Chlorine, Chloride | Total Sb, As, Cd, Cr III, Cr VI, Cu, Fe, Pb | Total Hg, Ni, Se, Ag, Zn, Cyanide | PCB, Pentachlorophnol, Cyanide | TPH, Ethanol, MTBE, TAME, TBA, TAME | PAHs, Acetone, 1,4 Dioxane | VOCs (haolgentated and nonhalogenated) | Naphthalene | Hardness/Amonia |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SC35291-01 | RGP-1 | ~~5/30/2017~~ JC 6/1/17 | 11:45 | G | GW | 7 | 4 | | 6 | x | x | x | x | x | x | x | x | x |
| -02 | SW-1 | ~~5/30/2017~~ 6/1/17 | 12:30 | G | SW | | | | 2 | | | | | | | | | x |

List Preservative Code below:

| 1 | 2 | 3 | 4 | 11 | | | |
|---|---|---|---|---|---|---|---|

**QA/QC Reporting Notes:**
*additional charges may appply

MA DEP MCP CAM Report? ☑ Yes ☐ No
CT DPH RCP Report? ☐ Yes ☒ No
☐ Standard ☐ No QC ☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ Tier II* ☐ Tier IV*
☐ Other:
State-specific reporting standards:

See Attached EPA RGP Diuments

Need to follow RGP analyses
and attempt to reach detction limits to
Meet RGP effluent detcetion limits

| Relinquished by: | Received by: | Date: | Time: |
|---|---|---|---|
| | | | |
| | | 6/1/17 | 16:00 |
| | | 6/1/17 | 1935 |
| | | | |

Temp °C
Observed 2.1
Correction Factor 0
Corrected 2.1
IR ID # 9

☑ EDD format: Excel/pdf/
☑ E-mail to: keith.sullivan@atcassociates.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☐ Iced ☐ Refrigerated ☒ DI VOA Frozen ☐ Soil Jar Frozen

# Batch Summary

**[CALC]**

*General Chemistry Parameters*

SC35291-01 (RGP-1)
SC35291-02 (SW-1)

**1709121**

*Semivolatile Organic Compounds by GC*

1709121-BLK1
1709121-BS1
1709121-BSD1
SC35291-01 (RGP-1)

**1709122**

*Semivolatile Organic Compounds by GCMS*

1709122-BLK1
1709122-BS1
1709122-BSD1
SC35291-01 (RGP-1)

**1709132**

*Total Metals by EPA 200 Series Methods*

1709132-BLK1
1709132-BS1
1709132-DUP1
1709132-MS1
1709132-PS1
SC35291-01 (RGP-1)
SC35291-01 (RGP-1)

**1709133**

*Total Metals by EPA 200 Series Methods*

1709133-BLK1
1709133-BS1
1709133-DUP1
1709133-MS1
1709133-PS1
SC35291-01 (RGP-1)
SC35291-02 (SW-1)

**1709134**

*Total Metals by EPA 200 Series Methods*

1709134-BLK1
1709134-BS1
1709134-DUP1
1709134-MS1
1709134-PS1
SC35291-01 (RGP-1)

**1709139**

*Total Metals by EPA 200/6000 Series Methods*

SC35291-01 (RGP-1)
SC35291-02 (SW-1)

**1709140**

*General Chemistry Parameters*

1709140-BLK1
1709140-BS1
1709140-DUP1
1709140-MS1
1709140-MSD1
1709140-SRM1
SC35291-01 (RGP-1)

**1709141**

*General Chemistry Parameters*

1709141-BLK1
1709141-BS1
SC35291-01 (RGP-1)

**1709142**

*General Chemistry Parameters*

1709142-BLK1
1709142-BS1
1709142-SRM1
SC35291-01 (RGP-1)

**1709154**

*Volatile Organic Compounds*

1709154-BLK1
1709154-BS1
1709154-BSD1
SC35291-01 (RGP-1)

**1709210**

*General Chemistry Parameters*

1709210-BLK1
1709210-BLK2
1709210-BS1
1709210-BS2
1709210-DUP1
1709210-MS1
1709210-MSD1
1709210-SRM1
SC35291-01 (RGP-1)

**1709211**

*Organic Compounds by Modified SW846 8015*

1709211-BLK1
1709211-BS1
1709211-BSD1
1709211-DUP1
SC35291-01 (RGP-1)

**1709212**

*Microextractable Organic Compounds*

1709212-BLK1
1709212-BS1
1709212-BSD1
1709212-DUP1
SC35291-01 (RGP-1)

**1709217**

*Extractable Petroleum Hydrocarbons*

1709217-BLK1
1709217-BS1
SC35291-01 (RGP-1)

**1709275**

*General Chemistry Parameters*

1709275-BLK1
1709275-BS1
1709275-DUP1
1709275-MS1
1709275-MSD1
1709275-SRM1
SC35291-01 (RGP-1)

**388655A**

*Subcontracted Analyses*

BY31536-BLK
BY31536-DUP
BY31536-LCS
BY31536-MS
SC35291-01 (RGP-1)
SC35291-02 (SW-1)

**S605424**

*Organic Compounds by Modified SW846 8015*

S605424-CAL1
S605424-CAL2
S605424-CAL3
S605424-CAL4
S605424-CAL5
S605424-CAL6
S605424-CAL7
S605424-ICV1
S605424-LCV1

**S702336**

*Semivolatile Organic Compounds by GC*

S702336-CAL1
S702336-CAL2
S702336-CAL3
S702336-CAL4
S702336-CAL5
S702336-CAL6
S702336-CAL7
S702336-CAL8
S702336-CAL9
S702336-CALA
S702336-CALB
S702336-CALC
S702336-CALD
S702336-CALE
S702336-CALF
S702336-CALG
S702336-CALH
S702336-CALI
S702336-CALJ
S702336-CALK
S702336-CALL
S702336-CALM
S702336-CALN
S702336-CALO
S702336-CALP
S702336-CALQ
S702336-CALR
S702336-CALS
S702336-CALT
S702336-CALU
S702336-ICV1
S702336-ICV2
S702336-ICV3
S702336-ICV4
S702336-ICV5
S702336-ICV6
S702336-LCV1
S702336-LCV2
S702336-LCV3
S702336-LCV4
S702336-LCV5
S702336-LCV6

**S704664**

*Volatile Organic Compounds*

S704664-CAL1
S704664-CAL2
S704664-CAL3
S704664-CAL4
S704664-CAL5
S704664-CAL6
S704664-CAL7
S704664-CAL8
S704664-CAL9
S704664-CALA
S704664-CALB
S704664-ICV1
S704664-LCV1
S704664-LCV2
S704664-TUN1

**S704839**

*Semivolatile Organic Compounds by GCMS*

S704839-CAL1
S704839-CAL2
S704839-CAL3
S704839-CAL4
S704839-CAL5
S704839-CAL6
S704839-CAL7
S704839-CAL8
S704839-CAL9
S704839-CALA
S704839-ICV1
S704839-LCV1
S704839-LCV2
S704839-TUN1

**S704994**

*Volatile Organic Compounds*

S704994-CCV1
S704994-TUN1

**S705014**

*Microextractable Organic Compounds*

S705014-CAL1
S705014-CAL2
S705014-CAL3
S705014-CAL4
S705014-CAL5
S705014-CAL6
S705014-CAL7
S705014-ICV1
S705014-LCV1

**S705020**

*Semivolatile Organic Compounds by GCMS*

S705020-CCV1
S705020-TUN1

**S705024**

*Organic Compounds by Modified SW846 8015*

S705024-CCV1
S705024-CCV2

**S705025**

*Semivolatile Organic Compounds by GC*

S705025-CCV1
S705025-CCV2
S705025-IBL1
S705025-IBL2

**S705046**

*Microextractable Organic Compounds*

S705046-CCV1

# Attachment D
## Review of Threatened or Endangered Species
## And
## National Historic Preservation Act Review

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
http://www.fws.gov/newengland

January 20, 2017

To Whom It May Concern:

This project was reviewed for the presence of federally listed or proposed, threatened or endangered species or critical habitat per instructions provided on the U.S. Fish and Wildlife Service's New England Field Office website:

*http://www.fws.gov/newengland/EndangeredSpec-Consultation.htm* (accessed January 2017)

Based on information currently available to us, no federally listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under section 7 of the Endangered Species Act is not required. No further Endangered Species Act coordination is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Thank you for your cooperation. Please contact Maria Tur of this office at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Thomas R. Chapman
Supervisor
New England Field Office

# Massachusetts Cultural Resource Information System

## Scanned Record Cover Page

| | |
|---|---|
| **Inventory No:** | BIL.132 |
| **Historic Name:** | Billerica Town Water Supply Pumping Station |
| **Common Name:** | |
| **Address:** | 250 Boston Rd |
| **City/Town:** | Billerica |
| **Village/Neighborhood:** | North Billerica |
| **Local No:** | 244 |
| **Year Constructed:** | 1898 |
| **Architect(s):** | Boyden, Ernest Niebuhr |
| **Architectural Style(s):** | Victorian Eclectic |
| **Use(s):** | Parking Garage; Pumping Station |
| **Significance:** | Architecture; Community Planning; Engineering |
| **Area(s):** | |
| **Designation(s):** | |
| **Building Materials(s):** | Roof: Slate<br>Wall: Brick; Wood; Wood Shingle |



Commonwealth of Massachusetts
Massachusetts Historical Commission
220 Morrissey Boulevard, Boston, Massachusetts 02125
www.sec.state.ma.us/mhc

PL-N. B,11 BIL·132
USGS. B11 SEE A

BILLERICA QUAD
ASSESSOR'S #
PAGE 22, LOT 18

FORM B - BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
Office of the Secretary, State House, Boston

| In Area no. | Form no. |
|---|---|
| | ~~244~~ 132 |


n Billerica, Massachusetts

ress 250 Boston Road

e Pumping Station (Original)

sent use Garage for DPW

sent owner Town of Billerica

cription:

1898

ource Report of the Committee for Water Supply for the Town of Billerica 1897/1898

Unique 78'x37'x34'

Architect Ernest M. Boyden 35 Congress Street, Boston

Exterior wall fabric Red Brick with clapboard clerestory

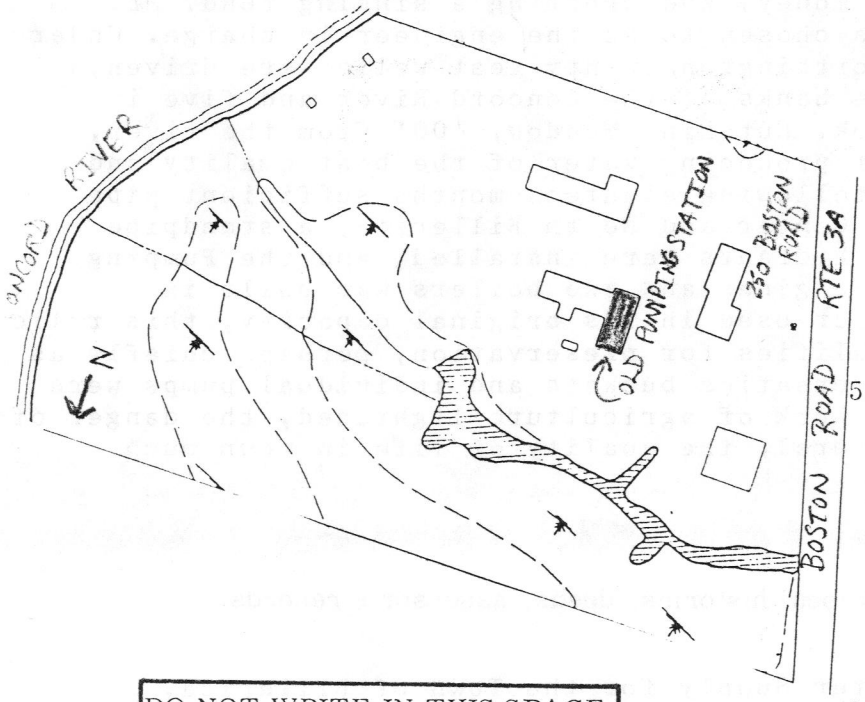
Outbuildings (describe) Garages extended from east end

Other features Hip style slate roof with similarly proportioned ~~clerestory; Detailed~~ six column main entrance with two half columns flush to building; segmented arch above windows exclusive of clerestory.

Altered Yes Date 1933 coal to oil converted again in 1950's?

Moved No Date

4. Map. Draw sketch of building location in relation to nearest cross streets and other buildings. Indicate north.




5. Lot size: Part of thirteen acre DPW yard Page 22, Plate 18 Accessor's Map

One acre or less ____ Over one acre x

Approximate frontage 700'

Approximate distance of building from street 400' feet from Concord River and immediately behind the current water department office at 250 Boston Road

6. Recorded by Margaret and Alec Ingraham

Organization Billerica Historical Commission

Date May 26, 1993

DO NOT WRITE IN THIS SPACE
USGS Quadrant ____

MHC Photo no. ____

(over)

BIL. 132

7. Original owner (if known) Town of Billerica

Original use Coal fired Pumping Station

Subsequent uses (if any) and dates Garage for Water Department Vehicles

8. Themes (check as many as applicable)

| | | | | | |
|---|---|---|---|---|---|
| Aboriginal | | Conservation | | Recreation | |
| Agricultural | | Education | | Religion | |
| Architectural | | Exploration/ | | Science/ | |
| The Arts | | settlement | | invention | |
| Commerce | x | Industry | x | Social/ | |
| Communication | | Military | | humanitarian | |
| Community development | x | Political | | Transportation | |

9. Historical significance (include explanation of themes checked above)

The Pumping Station is in a sense symbolic of a monumentous step taken by the Town of Billerica on September 16, 1897. Briefly, on that date at a special town meeting it was voted under the provisions of Act 471 of the Massachusetts State Legislature of 1897 to obtain the right to proceed with the necessary steps to procure a permanent supply of water "for domestic and fire purposes for general use in the town." Three water commissioners were appointed to act for the townspeople. Their authority included any land taking, use of water sourses, necessary easements, issuing of bonds, borrowing of money, and creating a sinking fund. Mr. Percy M. Blake of Hyde Park was chosen to be the engineer in charge. Under his direction and that of E. Worthington, twenty test wells were driven, of which thirteen were near the banks of the Concord River and five in the meadowlands of Content Brook. Hutchins Meadow, 400' from the river, was determined to be capable of producing water of the best quality and greatest quantity. During the following eighteen months sufficient pipe was laid to serve parts of the Center and North Billerica, a standpipe was erected on Crosby Hill, 94 hydrants were installed, and the Pumping Station containing two pumping engines and two boilers was built in Hutchins Meadow. Though no longer used in its original capacity, this relic of nearly one hundred years qualifies for preservation, perhaps chiefly as a reminder that along with its creation buckets and individual pumps were outmoted, health improved, the work of agriculture lightened, the danger of fire loss lessened, and, in general, the quality of life in town much improved.

10. Bibliography and/or references (such as local histories, deeds, assessor's records, early maps, etc.)

"Report of the Committee of Water Supply for the Town of Billerica, 1897/8", Percy M. Blake, Civil Engineer.

Billerica Town Report of 1898.

Interview with John McGovern current Water Department Superintendent May 25, 1993

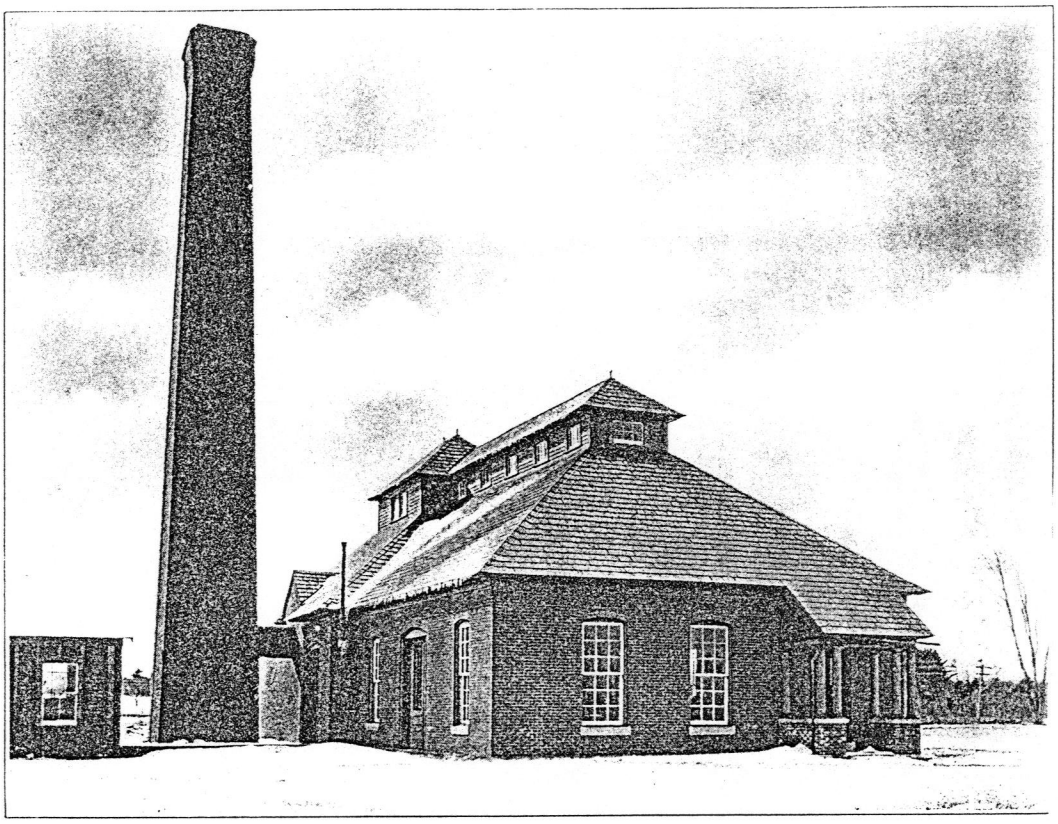
BIL.132

INVENTORY FORM CONTINUATION SHEET

MASSACHUSETTS HISTORICAL COMMISSION
Office of the Secretary, Boston

| Community: Billerica | Form No: 244 |
|---|---|
| Property Name: Pumping Station | |

Indicate each item on inventory form which is being continued below.



BILLERICA PUMPING STATION

This is an early photo showing the chimney.

Staple to Inventory form at bottom