GEI Consultants

Consulting Engineers and Scientists

May 2, 2018
Project 1610515

Via E-mail: Little.Shauna@epa.gov

Ms. Shauna Little
Physical Scientist
USEPA New England
5 Post Office Square, Suite 100
Mail Code OEP06-1
Boston, MA 02109-3912

Dear Ms. Little:

Re: Notice of Intent
NPDES Remediation General Permit for
Alder Brook
West Roxbury Needham Reliability Project
NStar Electric Company d/b/a Eversource Energy
Needham, Massachusetts

On behalf of NStar Electric Company d/b/a Eversource Energy (Eversource), GEI Consultants, Inc. has prepared this Notice of Intent (NOI) for coverage under the National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP), Massachusetts General Permit (MAG910000). This NOI was prepared in accordance with the general requirements of the NPDES RGP under Federal Register, Vol. 82, No. 12, dated January 19, 2017, and related guidance documentation provided by the U.S. Environmental Protection Agency (EPA). The completed NOI forms for a 50 gallon per minute (GPM) discharge and for a 200 GPM discharge are provided in Appendix A and Appendix B, respectively.

Once EPA issues an RGP authorization for this project, and before the start of work, we will apply for a Town of Needham Department of Public Works (DPW) Street Occupancy Permit.

Site Information

This NOI has been prepared for the discharge of dewatering effluent during construction of the underground portion of the Eversource West Roxbury to Needham Reliability Project (WRNRP). The WRNRP is being constructed through West Roxbury, Dedham, and Needham, Massachusetts (Fig. 1). The Needham portion of WRNRP consists of construction of a new 2.5-miles-long underground electric transmission line in Needham, Massachusetts (the Project Area).

Construction dewatering may be necessary during portions of the work to keep excavations dry. The intent of the project is to recharge groundwater within the work area. However, if this is not possible, groundwater will be discharged to specific Town of Needham storm drains which discharge to Alder Brook via an existing outfall in accordance with the requirements of the RGP

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permit. Based on discussions with the Town of Needham, outfall identification numbers have not been assigned to this location.

Two NOIs are being submitted to cover two maximum flow rates of 50 GPM and 200 GPM. Eversource has assumed that the discharge rate for the project will generally be 50 GPM or less. However, Eversource is also including an NOI for 200 GPM in the event that higher dewatering rates are required due to unexpected heavy rain events.

Receiving Water Information

Alder Brook is classified as a Class B water body and is not listed as an Outstanding Resource Water. Receiving water quality data, collected by GEI on March 12, 2018 on behalf of Eversource, was used in support of this NOI. A sample from the Alder Brook, the receiving water, was collected approximately 10 feet upstream of the outfall. The results are summarized in Table 1 and the associated laboratory data report is provided in Appendix C. Receiving water temperature was obtained in the field and is noted on the effluent limitations input calculation page in Appendix A.

The seven-day-ten-year flow (7Q10) of 0.236 ft^3/sec for the receiving water (Alder Brook) was established using the U.S. Geological Survey (USGS) StreamStats program and confirmed by the Massachusetts Department of Environmental Protection (MassDEP) on April 20, 2018. Based on this 7Q10 we have calculated the following dilution factors:

- 50 GPM: Dilution Factor of 3.12
- 200 GPM: Dilution Factor of 1.53

The StreamStats report, dilution factor calculations, and MassDEP confirmation of the 7Q10 and Dilution Factors for the 50 GPM and 200 GPM discharges are included in Appendix A and Appendix B, respectively. Effluent limits were generated using the NPDES RGP NOI Dilution Factor Calculation spreadsheet. Copies of the "EnterData" and "FreshwaterResults" tabs from the spreadsheet are provided in Appendix A. The resulting calculated effluent limits are in Table 1.

Source Water Evaluation

In October through December 2017, GEI performed a subsurface investigation to assess soil and groundwater conditions in the proposed trench alignment and at planned future excavations for subsurface structures (riser pits, manholes, etc. along the proposed. The subsurface investigation included installation of eight groundwater monitoring wells at eight boring locations (B2[MW], B4[MW], B6[MW], B11[MW], B12[MW], B13[MW], B16[MW], and B20[MW]).

Between November 9 and 20, 2017, GEI gauged the monitoring wells and developed the wells where measurable groundwater was present. GEI encountered groundwater in five of the wells (B4[MW], B6[MW], B11[MW], B16[MW], and B20[MW]). Groundwater was not encountered in the remaining wells. Between December 1 and December 5, 2017, GEI collected groundwater samples using a peristaltic pump and low-flow methods. Groundwater samples were submitted to ESS Laboratory, Inc. (ESS) of Cranston, Rhode Island to be tested for the parameters required under the NPDES RGP. In addition, the pH of the proposed influent was measured in the field to evaluate existing conditions.

Testing results indicated the presence of individual semi-volatile organic compounds (SVOCs), Group I polycyclic aromatic hydrocarbons (PAHs), Group II PAHs, total metals (arsenic,

chromium, chromium III, copper, iron, lead, and zinc), dissolved metals (iron and zinc), ammonia, chloride, and phenols. The measured pH of groundwater within the Project Area ranged from approximately 5.6 to 6.2 standard units (s.u.) which exceeds the RGP effluent limit for Massachusetts waters (6.5 to 8.3 s.u.). Laboratory testing results are summarized in Table 2 and the associated laboratory data report for these samples are provided in Appendix D.

Treatment System Information

For discharge to Alder Brook, dewatered groundwater will be treated using a mobile treatment system before being discharged to the specific catch basins and into the Town of Needham storm water drainage system. During construction, the collected water will be treated to remove suspended solids using a combination of sedimentation tank and/or bag filters. Depending on the level of treatment required and discharge flow rate, the mobile treatment system may be mounted on a mobile trailer. The mounted treatment system will generally consist of particulate filter units, and bag filters. Additional vessels for flocculation, pH adjustment, and/or granular activated carbon (GAC)/clay filters may also be needed to treat groundwater prior to discharge. Based on effluent monitoring results, the treatment system or flow rate will be modified to comply with the effluent limits. The proposed conceptual treatment system is shown in the process flow diagram in Fig. 3.

Based on the pH ranges measured in the field and iron concentrations detected in the some of the groundwater samples and, pH correction or flocculation may be needed prior to discharge to the Needham storm water system. As shown on the process flow diagram (Fig 3.), the flocculation and pH adjustment step (if needed) will be performed prior to particulate filtration and, as necessary, use of GAC/clay filters. Based on effluent monitoring results, the treatment system or flow rate will be modified to comply with the effluent limits.

Although final components for additional treatment will be determined by the operator, example product information, including Safety Data Sheets (SDSs), associated hazards, operation recommendations, and product information for pH adjustment are provided in Appendix A. These systems will be mobilized as necessary to achieve effluent limitations. If required, pH adjustment will consist of a metered sulfuric acid (70-100%) system. Product information is provided in Appendix A. Sulfuric acid will be stored in 55-gallon drums with secondary containment systems. Procedures for proper handling and spill prevention are included in the site-specific Best Management Practices Plan. The addition of sulfuric acid to reduce pH levels is an established practice for temporary construction dewatering, and is not expected to exceed applicable effluent limits, water quality standards, or alter conditions in the receiving water. Therefore, it is our opinion, that no additional testing is necessary for use of sulfuric acid or to demonstrate that use of this product will adversely affect the receiving water.

Discharge Information

We anticipate that the treatment system will generally operate with a maximum treated effluent discharge rate of 50 gallons per minute (gpm) or less. We have also included an option for a treatment system that can operate at occasional peak flows up to 200 gpm during significant precipitation events. The treated water will be discharged to any of four storm drains located immediately northeast of Alder Brook at the intersection of South Street and Dedham Avenue. The discharge area is identified on an overview map in Fig. 2. An annotated copy of a Town of Needham plan showing the storm drains (labeled as Proposed Discharge Points 1 through 4), discharge path, and ultimate discharge outfall at Alder Brook is provided in Appendix E. According to plans we reviewed from the Town of Needham on February 9, 2018, these storm

drains are part of the Town of Needham storm water drainage system that discharge to an outfall at Alder Brook located adjacent to a portion of the transmission line alignment (Fig. 2.).

Endangered Species Act Eligibility

We reviewed the U.S. Fish and Wildlife Service (FWS) Information, Planning, and Conservation (IPAC) online database for the site and receiving water ("project action area"). A copy of the database report is provided in Appendix F. Based on this report, an Endangered Species (the northern long-eared bat) is present but there are no critical habitats within the Project Area. Additionally, since the Project Area is located on developed land and existing roadway, project activities are not expected to impact the northern long-eared bat.

We also reviewed the Federally Listed Endangered and Threatened Species in Massachusetts list and no species are listed for Norfolk County. A copy of this list is provided in Appendix F.

National Historic Preservation Requirements

We reviewed online records from the U.S. National Registry of Historic Places database and the Massachusetts Cultural Resource Information System (MACRIS). A map of the alignment and surrounding locations listed in the U.S. National Registry of Historic Places database is included provided in Appendix G. A list of sites in Needham in the MACRIS database is also included in Appendix G. Based on our review, the alignment is not located within a listed National Historic Place.

The point where the discharge reaches the receiving water at Alder Brook is not listed as a National Historic Place.

Coverage Under NPDES RGP

It is our opinion that the proposed discharge is eligible for coverage under the NPDES RGP based on the requirements of the NPDES RGP and our evaluation of the available site-specific information. The current intent of project dewatering activities is to recharge groundwater within the proposed alignment. However, if this is not possible, it will be discharged to the nearby storm water drainage system after treatment. On behalf of Eversource, we are requesting coverage under the NPDES RGP for the discharge of treated construction dewatering effluent to the surface waters of the Alder Brook via the Town of Needham storm water drainage system.

The enclosed NOI form and supporting documentation provides required information on the general site conditions, discharge, treatment system, receiving water, and consultation with federal services (Appendices A through G). For this project, Eversource is the owner and has operational control over the construction plans and specifications, including the ability to make modifications to those plans and specifications. The operator will be determined and will direct the personnel responsible for the implementation and day-to-day operations and activities that are necessary to ensure compliance with the NPDES RGP, including operation, inspection, monitoring, and reporting.

A Best Management Practice Plan (BMPP) will be implemented during construction that includes dewatering, treatment, and discharge.

Discharge of treated water, if necessary, is scheduled to begin in June 2018, although recharge within the trench alignment is planned if possible.

Please contact me at 781.721.4114 or msabulis@geiconsultants.com or Jim Ash at 781.721.4012 or jash@geiconsultants.com if you have any questions.

Very truly yours,

GEI CONSULTANTS, INC.

Michael W. Sabulis
Senior Project Manager

James R. Ash, P.E., LSP
Senior Vice President

JAW/MWS:jam
Attachments
c: Domenic Nicotera, Eversource
Michael Zylich, Eversource
Michael Howard, Epsilon Associates
Surface Water Discharge Program, MassDEP

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Tables

Table 1. Chemical Testing Results - Alder Brook Surface Water
Eversource West Roxbury - Needham Reliability Project
Needham, Massachusetts

			Sample Location:	Alder Brook
			Sample Name:	1610515-SW-Dedham
			Sample Date:	3/12/18
Analyte	**Method**	**Units**	**Site-Specific RGP Effluent Limitations[(1)]**	
Total Metals		µg/L		
Antimony	200.7		206	< 5.0
Arsenic	3113B		104	< 0.5
Cadmium	3113B		10.2	0.3
Chromium	200.7		323	< 2.0
Chromium III	200.7		323	< 10.0
Copper	200.7		242	2.3
Iron	200.7		5,000	220
Lead	3113B		160	< 2.0
Mercury	245.1		0.739	< 0.200
Nickel	200.7		1,450	< 5.0
Selenium	3113B		235.8	< 1.0
Silver	200.7		35.1	< 0.5
Zinc	200.7		420	24.2
Classical Chemistry				
Hardness	3113B	µg/L	Report	84,100
Ammonia as N	350.1	µg/L	Report	< 100
Hexavalent Chromium	3500	µg/L	323	< 10.0
Salinity	2520B	ppt	NS	0.4
Temperature	NM	°C	NS	5.83
pH	9040	S.U.	6.5-8.3	6.56

General Notes:
1. Effluent Limitations, where identified, are calculated using the US EPA's Dilution Factor and Effluent Limitation Calculations for Massachusetts Form (Appendix V). Effluent limits are subject to change pending EPA approval.
2. Analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
3. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
4. RGP = Remediation General Permit.
5. Report = No TBEL or WQBEL established but NPDES requires reporting.
6. NM = The laboratory data sheet did not establish a method for this analyte.
7. NS = No standard has been established for this analyte.
8. µg/L = micrograms per liter.
9. ppt = Parts Per Thousand.
10. °C = Degrees Celsius.
11. S.U. = Standard Units.
12. Temperature was measured in the field.
13. Dilution factor of 5.24 used to establish effluent limits.
14. Values in bold exceed the site specific effluent limitations.
15. Temperature and pH were measured in the field.

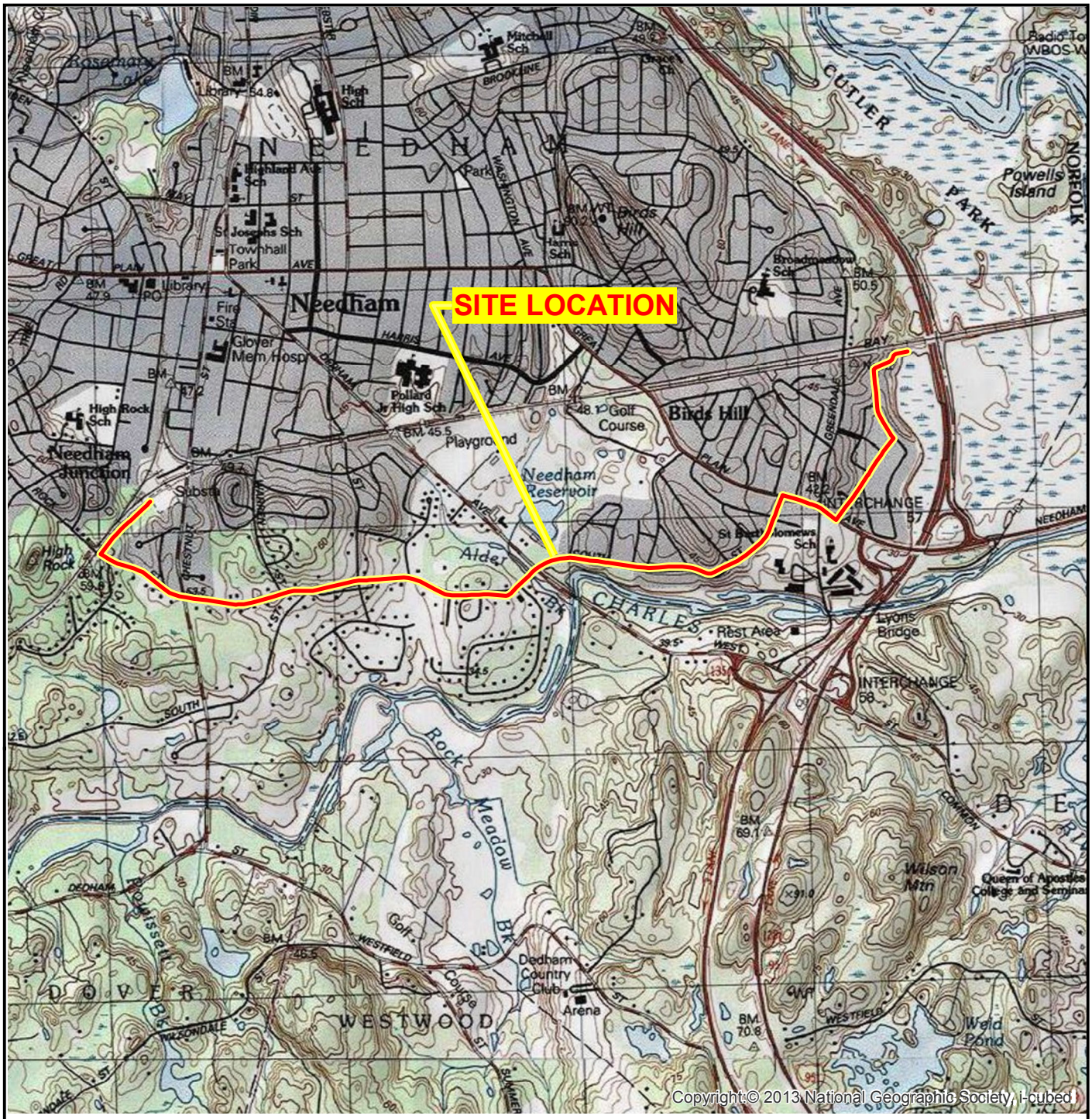
Table 2. Chemical Testing Results - Groundwater
Eversource West Roxbury - Needham Reliability Project
Needham, Massachusetts

Analyte	Method	Units	Site-Specific RGP Effluent Limitations[1]	Sample Location: B4(MW) Sample Name: B4(MW) Well Screen Interval (ft bgs): 2.79-9.79 Sample Date: 12/4/2017 & 12/5/2017	Sample Location: B6(MW) Sample Name: B6(MW) Well Screen Interval (ft bgs): 4.79-14.79 Sample Date: 12/1/17	Sample Location: B11(MW) Sample Name: B11(MW) Well Screen Interval (ft bgs): 3.79-9.79 Sample Date: 12/5/17	Sample Location: B16(MW) Sample Name: B16(MW) Well Screen Interval (ft bgs): 6.79-16.79 Sample Date: 12/1/17	Sample Location: B20(MW) Sample Name: B20(MW) Well Screen Interval (ft bgs): 19.8-29.8 Sample Date: 12/6/17
Volatile Organic Compounds (VOCs)	8260B	µg/L						
Ethylbenzene			NS	< 0.5	< 0.5	2.4	< 0.5	< 0.5
Naphthalene			NS	7.9	< 0.5	225	< 0.5	< 0.5
Xylene, o-			NS	< 0.5	< 0.5	5.9	< 0.5	< 0.5
Xylene, p,m			NS	< 0.5	< 0.5	6.7	< 0.5	< 0.5
Total BTEX			100	ND	ND	15.0	ND	ND
Total VOCs			NS	7.9	ND	240	ND	ND
Total Petroleum Hydrocarbons	1664	mg/L	5	< 6.41	< 6.25	< 4.72	< 4.67	< 4.67
Semi-Volatile Organic Compounds (SVOCs)	8270D	µg/L						
Acenaphthene			NS	0.89	< 0.19	10.8	< 0.19	< 0.19 G
Acenaphthylene			NS	0.72	0.50	0.69	< 0.19	< 0.19 G
Anthracene			NS	0.63	0.30	0.83	< 0.19	< 0.19 G
Benzo[a]anthracene			0.0078/0.1[2]	**0.35 G**	**0.52 G**	0.09 G	< 0.05 G	< 0.05 G
Benzo[a]pyrene			0.0078/0.1[2]	**0.26 G**	**0.59 G**	0.07 G	< 0.05 G	< 0.05 G
Benzo[b]fluoranthene			0.0078/0.1[2]	**0.33**	**0.60**	0.09	< 0.05	< 0.05 G
Benzo[g,h,i]perylene			NS	< 0.19 G	0.43 G	< 0.19 G	< 0.19 G	< 0.19 G
Benzo[k]fluoranthene			0.0078/0.1[2]	**0.14 G**	**0.20 G**	< 0.05 G	< 0.05 G	< 0.05 G
Bis(2-ethylhexyl)phthalate				**< 1.87 G**	**< 1.87 G**	< 1.89 G	< 1.87 G	< 1.87 G
Butyl benzyl phthalate				**< 2.34 G**	**< 2.34 G**	< 2.36 G	< 1.87 G	< 2.34 G
Chrysene			0.0078/0.1[2]	**0.40 G**	**0.65 G**	**0.10 G**	< 0.05 G	< 0.05 G
Dibenz[a,h]anthracene			0.0078/0.1[2]	0.05 G	**0.12 G**	< 0.05 G	< 0.05 G	< 0.05 G
Fluoranthene			NS	1.59	0.75	0.80	< 0.19	< 0.19
Fluorene			NS	1.97	< 0.19	6.51	< 0.19	< 0.19 G
Indeno[1,2,3-cd]pyrene			0.0078/0.1[2]	**0.19 G**	**0.43 G**	0.05 G	< 0.05 G	< 0.05 G
Naphthalene			20	0.22	< 0.19	**92.9**	< 0.19	< 0.19 G
Phenanthrene			NS	0.35	0.41	6.87	< 0.19	< 0.19 G
Pyrene			NS	1.37 G	1.18 G	0.60 G	< 0.19 G	< 0.19 G
Total Group I PAHs			1.0	**1.72 G**	**3.11 G**	0.40 G	ND	ND
Total Group II PAHs			100	7.74 G	3.57 G	**120 G**	ND	ND
1,2-Dibromoethane	8011	µg/L	0.05	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
1,4-Dioxane	8270D (SIM)	µg/L	200	< 0.250	< 0.250	< 0.250	< 0.250	< 0.250
Ethanol	D3695	mg/L	Report	< 10	< 10	< 10	< 10	< 10
Polychlorinated Biphenyls (PCBs)	608	µg/L						
PCBs, Total			0.000064/0.5[2]	ND	ND	ND	ND	ND
Total Metals		µg/L						
Antimony	200.7		206	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Arsenic	3113B		104	< 5.0	< 5.0	5.3	< 5.0	< 5.0
Cadmium	3113B		10.2	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Chromium	200.7		323	10.1	5.8	< 4.0	< 4.0	< 4.0
Chromium III	200.7		323	10.1	< 10.0	< 10.0	< 10.0	< 10.0
Copper	200.7		17	10.6	**29.6**	< 4.0	< 4.0	< 4.0
Iron	200.7		1,826	**5,080**	1,020	**18,300**	< 20.0	70.8
Lead	3113B		6.88	**15.8**	5.3	< 2.0	< 2.0	< 2.0
Mercury	245.1		0.739	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200
Nickel	200.7		1,450	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Selenium	3113B		235.8	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Silver	200.7		35.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	200.7		420	45.8	25.2	29.8	19.2	< 10.0
Dissolved Metals		µg/L						
Antimony	200.7		NS	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Arsenic	3113B		NS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cadmium	3113B		NS	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Chromium	200.7		NS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Copper	200.7		NS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Iron	200.7		NS	1,290	< 20.0	16,900	< 20.0	21.3
Lead	3113B		NS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Mercury	245.1		NS	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Nickel	200.7		NS	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Selenium	3113B		NS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Silver	200.7		NS	< 2.0	< 2.0	< 2.0	< 1.0	< 2.0
Zinc	200.7		NS	44.2	12.9	30.1	18.3	14.6
Classical Chemistry		µg/L						
Hardness	3113B		Report	62,400	81,500	125,000	40,700	54,500
Ammonia as N	350.1		Report	110	< 100	180	< 100	< 100
Chloride	300.0		Report	99,300	77,800	482,000	102,000	68,400
Hexavalent Chromium	3500		323	< 10.0 A	< 10.0 A	< 10.0 A	< 10.0 A	< 10.0 A
Phenols	420.1		1,080	< 100	< 100	< 100	105	< 100
Total Cyanide (LL)	4500 LL		178,000	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00
Total Residual Chlorine	4500-CL		23,000	< 20.0 A	< 20.0 A	< 20.0 A	< 20.0 A	< 20.0 A
Total Suspended Solids	2540D		30,000	**832,000**	**136,000**	**34,000**	< 5,000	< 5,000
pH	Field	S.U.	6.5-8.3	**6.20**	**6.18**	**6.11**	**5.61**	**5.89**

General Notes:
1. Effluent Limitations, where identified, are calculated using the US EPA's Dilution Factor and Effluent Limitation Calculations for Massachusetts Form (Appendix V). Effluent limits are subject to change pending EPA approval.
2. The second standard is the compliance level.
3. Analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
4. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
5. RGP = Remediation General Permit.
6. Report = No TBEL or WQBEL established but NPDES requires reporting.
7. ND = The analyte was not detected above the laboratory reporting limit. See the laboratory data sheets for the laboratory reporting limit.
8. NS = No standard has been established for this analyte.
9. µg/L = micrograms per liter.
10. mg/L = milligrams per liter.
11. °C = Degrees Celsius.
12. S.U. = Standard Units.
13. BTEX = The sum of benzene, toluene, ethylbenzene, and xylenes.
14. Group I PAHs = The sum of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.
15. Group II PAHS = The sum of acenaphthene, acenaphthylene, anthracene, benzo(g,h,i)perylene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene.
16. Naphthalene was tested as a non-halogenated VOC and non-halogenated SVOC. Per Chemical-Specific Effluent Limitations, detected concentrations of naphthalene were compared to the standard for non-halogenated SVOCs.
17. Dilution factor of 5.24 used to establish effluent limitations.
18. Values in bold exceed the site specific effluent limitations.

Qualifying Notes:
G The result is estimated due to duplicate precision outside control limits.
A The result is estimated due to holding time exceedance.

Figures



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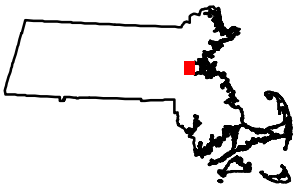
SCALE, FEET



MASSACHUSETTS
QUADRANGLE LOCATION

NPDES RGP Notice of Intent West-Roxbury Needham Reliability Project Needham, Massachusetts	GEI Consultants	SITE LOCATION MAP
Eversource Energy Westwood, Massachusetts	Project 1610515	April 2018 Fig. 1

B:\Working\EVERSOURCE\1610515 Epsilon WRNRP\07_GIS\REPORT FIGS\Site Location Map.mxd

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RGP Discharge Area

West Roxbury to Needham Reliability Project

EVERSOURCE

LOCUS

SCALE

1:12,000
1 inch = 1,000 feet

0 500 1,000 Feet

N

LEGEND

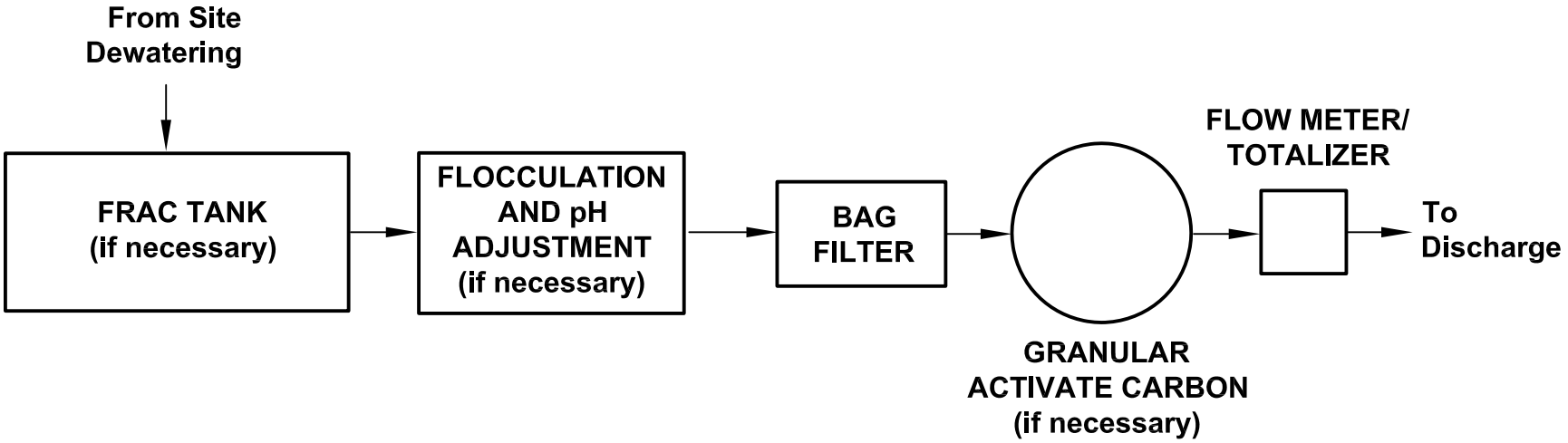
- Proposed Structure Location
- Drainage0Catch Basin
- Drainage0Dmh
- Drainage0dpipe
- Duct Bank Centerline
- Municipal Boundary
- Drainage0Catch Basin
- Drainage0Dmh
- Drainage0dpipe
- Drain Line
- Pavement, Concreate, Parking
- Buildings, Driveways
- Parcel/ROW Boundaries
- ROAD0UNPAVED
- Sport Layers
- Railway
- Subwatershed Boundary (Needham)
- WATER0WATER
- Open Space (MassGIS)

Town of Needham GIS Data

- Streams
- Waterbodies
- Wetlands

Overview

Stormwater Outfall Locations



PROCESS FLOW DIAGRAM

Not to Scale

NPDES RGP Notice of Intent West Roxbury-Needham Reliability Project Needham, Massachusetts	GEI Consultants	PROCESS FLOW DIAGRAM
Eversource Energy Westwood, Massachusetts	Project 1610515	April 2018 Fig. 3

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Appendix A

Remediation General Permit
Notice of Intent – 50 gpm

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

A. General site information:

<table>
<tr><td rowspan="2">1. Name of site:
West Roxbury to Needham Reliability Project - Needham Section</td><td colspan="3">Site address: Multiple addresses (See NOI Letter)
Street:</td></tr>
<tr><td>City: Needham</td><td>State: MA</td><td>Zip:</td></tr>
<tr><td rowspan="4">2. Site owner
NSTAR Electric Company d/b/a Eversource Energy

Owner is (check one): ☐ Federal ☐ State/Tribal ☐ Private
■ Other; if so, specify: Utility on Public Right of Way</td><td colspan="3">Contact Person: Michael Zylich</td></tr>
<tr><td colspan="2">Telephone: 781.441.3804</td><td>Email: michael.zylich@eversource.com</td></tr>
<tr><td colspan="3">Mailing address: 247 Station Drive, SE270
Street:</td></tr>
<tr><td>City: Westwood</td><td>State: MA</td><td>Zip: 02090</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner
Operator to be selected. NSTAR Electric Company d/b/a Eversource Energy will retain coverage as a co-permitee until the Operator is selected.</td><td colspan="3">Contact Person:</td></tr>
<tr><td colspan="2">Telephone:</td><td>Email:</td></tr>
<tr><td colspan="3">Mailing address:
Street:</td></tr>
<tr><td>City:</td><td>State:</td><td>Zip:</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:

NPDES permit is (check all that apply: ■ RGP ☐ DGP ☐ CGP
☐ 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):
■ MA Chapter 21e; list RTN(s):
RTN to be provided
☐ NH Groundwater Management Permit or Groundwater Release Detection Permit:
☐ CERCLA
☐ UIC Program
☐ POTW Pretreatment
☐ 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):
Alder Brook	MA72-22	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:

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. Impaired water body - see attached Table 1 for impairment pollutants and completed TMDLs

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.	0.236 cfs
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.	3.12

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 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): ■ Yes ☐ No	☐ Contaminated surface water 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): ☐ Yes ☐ No	☐ The receiving water ☐ A surface water other than the receiving water; if so, indicate waterbody:	☐ Potable water; if so, indicate municipality or origin: ☐ Other; if so, specify:

2. Source water contaminants: SVOCs, PAHs, lead and copper	
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): See Appendix F of NOI package.	Outfall location(s): (Latitude, Longitude) 42.268706 degrees N 71.220550 degrees W
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ■ Indirect discharge, if so, specify: Town of Needham storm drains ☐ A private storm sewer system ■ A municipal storm sewer system If the discharge enters the receiving water via a private or municipal storm sewer system: Has notification been provided to the owner of this system? (check one): ■ Yes ☐ No 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: Prior to excavation, the Operator will obtain street opening permits from the Town of Needham 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): 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
☐ II – Non-Petroleum-Related Site Remediation
■ III – Contaminated Site Dewatering
☐ IV – Dewatering of Pipelines and Tanks
☐ V – Aquifer Pump Testing
☐ VI – Well Development/Rehabilitation
☐ VII – Collection Structure Dewatering/Remediation
☐ VIII – Dredge-Related Dewatering</td><td colspan="2">a. If Activity Category I or II: (check all that apply)

☐ A. Inorganics
☐ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
☐ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
☐ 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)

■ A. Inorganics
■ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
■ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
☐ 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		✔	5	350.1	100	180	145	Report mg/L	---
Chloride		✔	5	300.0	50,000	482,000	165900	Report µg/l	---
Total Residual Chlorine	✔		5	4500CL D	20.0	<20.0	0	0.2 mg/L	34
Total Suspended Solids		✔	5	2540D	5,000 and	832,000	334000	30 mg/L	---
Antimony	✔		5	200.7	10.0	<10.0	0	206 µg/L	---
Arsenic	✔		5	3113B	5.0	5.3	5.3	104 µg/L	---
Cadmium	✔		5	3113B	0.25	<0.25	0	10.2 µg/L	---
Chromium III	✔		5	200.7	10.0	10.1	10.1	323 µg/L	---
Chromium VI	✔		5	3500	10.0	<10.0	0	323 µg/L	---
Copper		✔	5	200.7	4.0	29.6	20.1	242 µg/L	23.5
Iron		✔	5	200.7	20.0	18300	6117.7	5,000 µg/L	2652
Lead	✔		5	3113B	2.0	15.8	10.55	160 µg/L	9.57
Mercury	✔		5	245.1	0.20	<0.20	0	0.739 µg/L	---
Nickel	✔		5	200.7	10.0	<10.0	0	1,450 µg/L	---
Selenium	✔		5	3113B	4.0	<4.0	0	235.8 µg/L	---
Silver	✔		5	200.7	1.0 and 2.0	<2.0	0	35.1 µg/L	---
Zinc		✔	5	200.7	10.0	45.8	30	420 µg/L	---
Cyanide	✔		5	4500LL	5.00	<5.0	0	178 mg/L	---
B. Non-Halogenated VOCs									
Total BTEX		✔	5	524.2		15	15	100 µg/L	---
Benzene	✔		5	524.2	0.5	<0.5	0	5.0 µg/L	---
1,4 Dioxane	✔		5	8270D	0.250	<0.250	0	200 µg/L	---
Acetone	✔		5	524.2	5.0	<5.0	0	7.97 mg/L	---
Phenol		✔	5	420.1	100	105	105	1,080 µg/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	✔		5	524.2	0.3	<0.3	0	4.4 µg/L	---
1,2 Dichlorobenzene	✔		5	524.2	0.5	<0.5	0	600 µg/L	---
1,3 Dichlorobenzene	✔		5	524.2	0.5	<0.5	0	320 µg/L	---
1,4 Dichlorobenzene	✔		5	524.2	0.5	<0.5	0	5.0 µg/L	---
Total dichlorobenzene	✔		5	524.2	0.5	<0.5	0	763 µg/L in NH	---
1,1 Dichloroethane	✔		5	524.2	0.5	<0.5	0	70 µg/L	---
1,2 Dichloroethane	✔		5	524.2	0.5	<0.5	0	5.0 µg/L	---
1,1 Dichloroethylene	✔		5	524.2	0.5	<0.5	0	3.2 µg/L	---
Ethylene Dibromide	✔		5	504.1	0.015	<0.015	0	0.05 µg/L	---
Methylene Chloride	✔		5	524.2	0.5	<0.5	0	4.6 µg/L	---
1,1,1 Trichloroethane	✔		5	524.2	0.5	<0.5	0	200 µg/L	---
1,1,2 Trichloroethane	✔		5	524.2	0.5	<0.5	0	5.0 µg/L	---
Trichloroethylene	✔		5	524.2	0.5	<0.5	0	5.0 µg/L	---
Tetrachloroethylene	✔		5	524.2	0.5	<0.5	0	5.0 µg/L	---
cis-1,2 Dichloroethylene	✔		5	524.2	0.5	<0.5	0	70 µg/L	---
Vinyl Chloride	✔		5	524.2	0.2	<0.2	0	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates		✔	5	625 SIM	1.87, 2.34,	<2.36	0	190 µg/L	---
Diethylhexyl phthalate	✔		5	625 SIM	1.87	<1.87	0	101 µg/L	---
Total Group I PAHs		✔	5	625 SIM	0.05	3.11	1.74	1.0 µg/L	---
Benzo(a)anthracene		✔	5	625 SIM	0.05	0.52	0.32	As Total PAHs	0.0118
Benzo(a)pyrene		✔	5	625 SIM	0.05	0.59	0.31		0.0118
Benzo(b)fluoranthene		✔	5	615 SIM	0.05	0.60	0.34		0.0118
Benzo(k)fluoranthene		✔	5	625 SIM	0.05	0.20	0.17		0.0118
Chrysene		✔	5	625 SIM	0.05	0.65	0.38		0.0118
Dibenzo(a,h)anthracene		✔	5	625 SIM	0.05	0.12	0.09		0.0118
Indeno(1,2,3-cd)pyrene		✔	5	625 SIM	0.05	0.43	0.22		0.0118

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		✔	5	625 SIM	0.19	120	43.77	100 µg/L	---
Naphthalene		✔	5	625 SIM	0.19 and	92.9	46.56	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✔		5	608	0.09	<0.09	0	0.000064 µg/L	---
Pentachlorophenol	✔		5	625 SIM	0.84	<0.84	0	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons	✔		5	1664A	4.67, 6.41,	<4.72	0	5.0 mg/L	---
Ethanol	✔		5	ASTM	10	<10	0	Report mg/L	---
Methyl-tert-Butyl Ether	✔		5	524.2	0.5	<0.5	0	70 µg/L	---
tert-Butyl Alcohol	✔		5	524.2	25.0	<25.0	0	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✔		5	524.2	1.0	<1.0	0	90 µg/L in MA 140 µg/L in NH	---
Other (i.e., pH, temperature, hardness, salinity, LC_{50}, additional pollutants present); if so, specify:									
Naphthalene		✔	5	524.2	0.5 and 5.0	225	116.45		
Hardness		✔	5	3113B	165 and 999	125,000	72,820		
pH		✔	6.5-8.3	Field	0 to 12	5.61	6.00		

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:
Granulated activated carbon and other treatments as need to meet effluent limits.

2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge.
Prior to discharge, dewatering effluent will be routed through bag filters and other treatment as need to meet effluent requirements. See attached Figure 3.

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: Granulated activated carbon and other treatments as need to meet effluent limits.

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. Indicate the most limiting component: Flow meter Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	50
Provide the proposed maximum effluent flow in gpm.	50
Provide the average effluent flow in gpm.	25
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	NA

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:
pH conditions may be added to the treatment system if necessary to meet effluent limits

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:

☐ **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.

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: A BMPP meeting the requirements of this general permit will be 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: 5/2/18
Print Name and Title: Michael Zylich, Sr. Environmental Scientist	

Table 1. Water Quality Assessment Status for Reporting Year 2014
Alder Brook

Designated Use	Designated Use Group	Status
Aesthetic	Aesthetic Value	Not Assessed
Fish Consumption	Aquatic Life Harvesting	Not Assessed
Fish, Other Aquatic Life And Wildlife	Fish, Shellfish, And Wildlife Protection And Propagation	Impaired
Primary Contact Recreation	Recreation	Not Assessed
Secondary Contact Recreation	Recreation	Not Assessed

Causes of Impairment for Reporting Year 2014

Cause of Impairment	Cause of Impairment Group	Designated Use(s)	State TMDL Development Status
Aquatic Macroinvertebrate Bioassessments	Cause Unknown - Impaired Biota	Fish, Other Aquatic Life And Wildlife	TMDL needed
Nutrient/Eutrophication Biological Indicators	Nutrients	Fish, Other Aquatic Life And Wildlife	TMDL completed

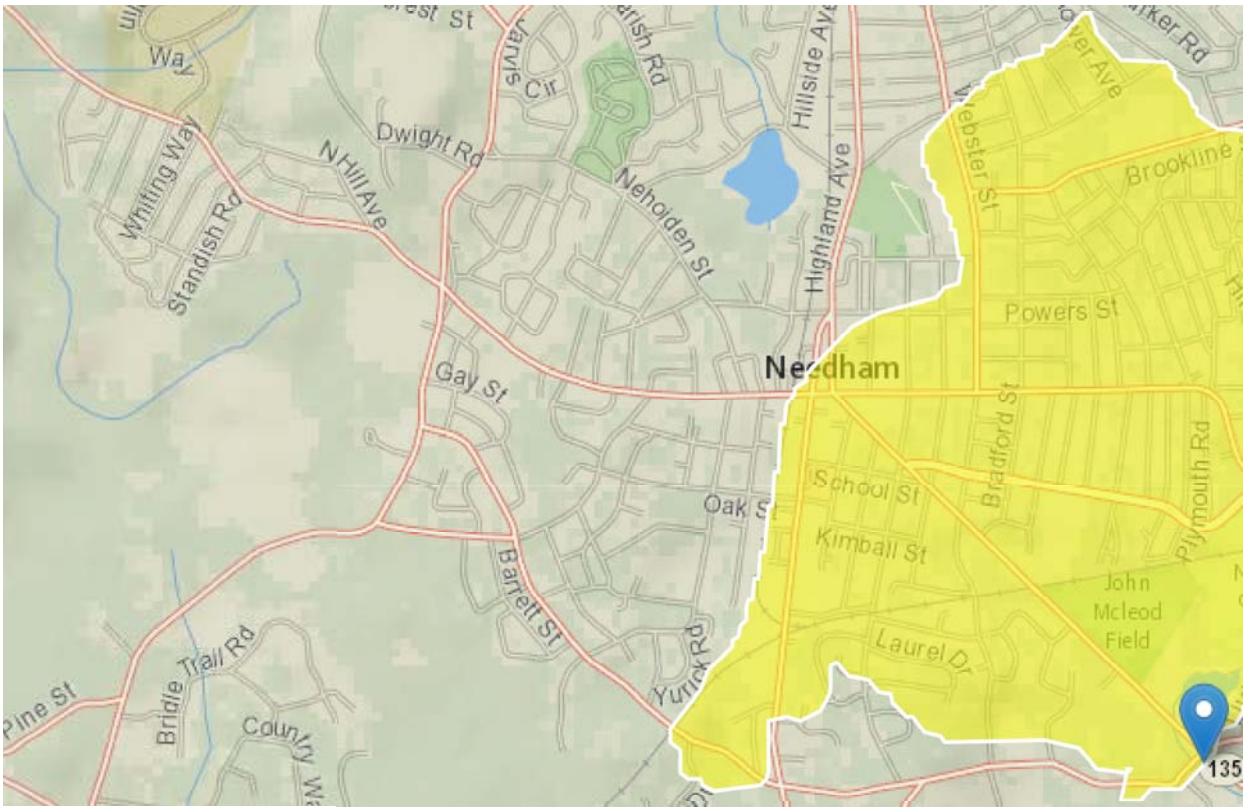
TMDLs That Apply to this waterbody

TMDL Document Name	TMDL Date	TMDL Pollutant Description	TMDL Pollutant Source Type	Cause(s) of Impairment Addressed
Upper/Middle Charles River	Jun-10-2011	Phosphorus, Total	Point/Nonpoint Source	Nutrient/Eutrophication Biological Indicators; Nutrients; Aquatic Macroinvertebrate Bioassessments

General Notes:
1. Information obtained from EPA website: https://ofmpub.epa.gov/waters10/attains_index.home on April 17, 2018

StreamStats Report

Region ID: MA
Workspace ID: MA20180312162351012000
Clicked Point (Latitude, Longitude): 42.26845, -71.22016
Time: 2018-03-12 12:24:05 -0400



The South Carolina StreamStats application is testing LiDAR-derived data and streams for delineation. This is a beta version and QA/QC is incomplete. It may calculate basin characteristics and flow statistics incorrectly. Please verify the drainage areas and flow stats carefully. Use at your own risk

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.72	square miles

Parameter Code	Parameter Description	Value	Unit
DRFTPERSTR	Area of stratified drift per unit of stream length	1.04	square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless
BSLDEM250	Mean basin slope computed from 1:250K DEM	1.766	percent
BSLDEM10M	Mean basin slope computed from 10 m DEM	4.292	percent
ELEV	Mean Basin Elevation	171	feet
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	1.68	percent
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	64.08	percent
FOREST	Percentage of area covered by forest	7.28	percent

Low-Flow Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.72	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	1.766	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	1.04	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

Low-Flow Statistics Flow Report [Statewide Low Flow WRIR00 4135]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	SE	SEp

Statistic	Value	Unit	PII	Plu	SE	SEp
7 Day 2 Year Low Flow	0.417	ft^3/s	0.0663	2.53	49.5	49.5
7 Day 10 Year Low Flow	0.236	ft^3/s	0.0311	1.67	70.8	70.8

Low-Flow Statistics Citations

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. (http://pubs.usgs.gov/wri/wri004135/)

Dilution Factor Calculation

Approach

The discharge dilution factor was calculated in accordance with Appendix V of the Remediation General Permit (RGP) application.

Formula

DF = (Qd + Qs)/Qd

DF = dilution factor

Qd = flow of discharge into receiving water body

Qs = estimated flow of receiving water body

Assumptions

Qs = 7Q10 in millions of gallons per day (MGD)

7Q10 = 0.236 cubic feet per second (cfs)[1]
Qs = 0.1525 MGD

Qd = flow of discharge into receiving water body

Qd = 50 gallons per minute (gpm) = 0.072 MGD[1]

Calculation

DF = (Qd + Qs)/Qd

DF = (0.072 + 0.1525)/(0.072)

DF = 3.12

Footnotes:

1. 7Q10 obtained from United States Geoglogic Survey (USGS) StreamStats Report dated March 12, 2018.

MWS/
B:\Working\EVERSOURCE\1610515 Epsilon WRNRP\11_NPDES RGP\NOI Alder Brook\AppA_NOI\AppA2 NOI dilution factor calculation.doc

Sabulis, Mike

From: Vakalopoulos, Catherine (DEP) <Catherine.Vakalopoulos@MassMail.State.MA.US>
Sent: Friday, April 20, 2018 9:16 AM
To: Sabulis, Mike
Subject: RE: NPDES RGP 7Q10 & Dilution Factor- Alder Brook Needham, MA

Hi Mike,
Thanks for answering my same question for both sites.
Have a nice weekend.
Cathy

Cathy Vakalopoulos, Massachusetts Department of Environmental Protection
1 Winter St., Boston, MA 02108, 617-348-4026

From: Sabulis, Mike [mailto:MSabulis@geiconsultants.com]
Sent: Thursday, April 19, 2018 8:29 PM
To: Vakalopoulos, Catherine (DEP)
Subject: RE: NPDES RGP 7Q10 & Dilution Factor- Alder Brook Needham, MA

Thanks again Cathy. This is for a different segment of the same utility project. Similar to Valley Rd the 200 gpm is to support a higher dewatering in the event a large rain event occurs and a higher dewatering rate is necessary to pump out the trench.

Mike

Michael Sabulis
Senior Project Manager
GEI Consultants, Inc.
T: 781.721.4114 | **M:** 508.633.9544

From: Vakalopoulos, Catherine (DEP) [mailto:Catherine.Vakalopoulos@MassMail.State.MA.US]
Sent: Thursday, April 19, 2018 7:05 PM
To: Sabulis, Mike <MSabulis@geiconsultants.com>
Subject: RE: NPDES RGP 7Q10 & Dilution Factor- Alder Brook Needham, MA

Hi Mike,
The calculations in your table are correct. I have the same question I had with the other location – did you add the 200 GPM in case a higher volume of dewatering is needed? Alder Brook has a segment ID of MA72-22, is Class B, is not an ORW, and has one TMDL for nutrients.
Please let me know if you have any further questions.
Cathy

Cathy Vakalopoulos, Massachusetts Department of Environmental Protection
1 Winter St., Boston, MA 02108, 617-348-4026

From: Sabulis, Mike [mailto:MSabulis@geiconsultants.com]
Sent: Wednesday, April 18, 2018 11:48 AM
To: Vakalopoulos, Catherine (DEP)
Subject: RE: NPDES RGP 7Q10 & Dilution Factor- Alder Brook Needham, MA

Hi Cathy,

Thanks for the correction and info, we have recalculated the Dilution Factors for the following two maximum flow rates and plan to submit NOIs for each:

Maximum Discharge Rate		Alder Brook 7Q10	Dilution Factor
50 GPM	0.072 MGD	0.153 MGD	3.12
200 GPM	0.288 MGD	0.153 MGD	1.53

Could you confirm these are correct?

Thanks,

Mike

Michael Sabulis
Senior Project Manager
GEI Consultants, Inc.
T: 781.721.4114 | **M:** 508.633.9544

From: Vakalopoulos, Catherine (DEP) [mailto:Catherine.Vakalopoulos@MassMail.State.MA.US]
Sent: Thursday, April 5, 2018 2:51 PM
To: Sabulis, Mike <MSabulis@geiconsultants.com>
Subject: RE: NPDES RGP 7Q10 & Dilution Factor- Alder Brook Needham, MA

Hi Mike,
I just want to check that the 50 gpm you provided is the design flow which is the maximum flow through the treatment system and not an average flow or what you think will be flowing through the system. We use the design flow to calculate the dilution factor.

If 50 gpm is the design flow, it doesn't matter how many hours a day you operate the system. We are interested in seeing the dilution at the time of discharge.

Using 50 gpm = 0.072 MGD and the 7Q10 is 0.236 cfs = 0.153 MGD (which is correct),
DF = (0.072 + 0.153)/0.072 = 3.125

Please let me know about the design flow.

Thanks,
Cathy

Cathy Vakalopoulos, Massachusetts Department of Environmental Protection
1 Winter St., Boston, MA 02108, 617-348-4026

Please consider the environment before printing this e-mail

From: Sabulis, Mike [mailto:MSabulis@geiconsultants.com]
Sent: Tuesday, April 03, 2018 4:53 PM
To: Vakalopoulos, Catherine (DEP)
Subject: NPDES RGP 7Q10 & Dilution Factor- Alder Brook Needham, MA

Hi Catherine,

I writing to confirm a 7Q10 value and Dilution Factor for Alder Brook located in Needham, Massachusetts. Based on the output from StreamStats (see attached), we should be using a 7Q10 of 0.236 ft^3/sec, could you confirm this is correct? Assuming a discharge rate of 50 gpm for a 12 hr. period, we have calculated a following Dilution Factor of 5.24. Could you confirm this is correct as well?

Let me know if you have any questions or if you'd like to discuss.

Thanks,

Mike

Michael Sabulis
Senior Project Manager
GEI Consultants
Consulting Engineers & Scientists
GEI Consultants, Inc.
400 Unicorn Park Drive | Woburn, MA 01801
T: 781.721.4114 | **M:** 508.633.9544
www.geiconsultants.com | vCard | LinkedIn | Twitter | Facebook

Enter number values in green boxes below

Enter values in the units specified

↓

0.1525	Q_R = Enter upstream flow in **MGD**	Freshwater: Q_R equal to the 7Q10; enter alternate Q_R if approved by the State; enter 0 if no dilution factor approved
0.072	Q_P = Enter discharge flow in **MGD**	Saltwater (estuarine and marine): enter Q_R if approved by the State; enter 0 if no entry
0	Downstream 7Q10	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

Enter a dilution factor, if other than zero

↓

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

Enter values in the units specified

↓

125	C_d = Enter influent hardness in **mg/L** $CaCO_3$	Freshwater only
84.1	C_s = Enter receiving water hardness in **mg/L** $CaCO_3$	

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

↓

6.56	pH in **Standard Units**	pH, temperature, and ammonia required for all discharges
5.83	Temperature in **°C**	Hardness required for freshwater
0	Ammonia in **mg/L**	Salinity required for saltwater (estuarine and marine)
84.1	Hardness in **mg/L** $CaCO_3$	Metals required for all discharges if present and if dilution factor is > 1
0.4	Salinity in **ppt**	Enter 0 if non-detect or testing not required
0	Antimony in **µg/L**	
0	Arsenic in **µg/L**	
0.3	Cadmium in **µg/L**	
0	Chromium III in **µg/L**	
0	Chromium VI in **µg/L**	
2.3	Copper in **µg/L**	
220	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**	
24.2	Zinc in **µg/L**	

Enter **influent** concentrations in the units specified

↓

0	TRC in **µg/L**	if >1 sample, enter maximum
0.18	Ammonia in **mg/L**	if >10 samples, may enter 95th percentile
0	Antimony in **µg/L**	Enter 0 if non-detect or testing not required
5.3	Arsenic in **µg/L**	
0	Cadmium in **µg/L**	
10.1	Chromium III in **µg/L**	
0	Chromium VI in **µg/L**	
29.6	Copper in **µg/L**	
18300	Iron in **µg/L**	
15.8	Lead in **µg/L**	
0	Mercury in **µg/L**	
0	Nickel in **µg/L**	
0	Selenium in **µg/L**	
0	Silver in **µg/L**	
45.8	Zinc in **µg/L**	
0	Cyanide in **µg/L**	
105	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**	
0.52	Benzo(a)anthracene in **µg/L**	
0.59	Benzo(a)pyrene in **µg/L**	
0.6	Benzo(b)fluoranthene in **µg/L**	
0.2	Benzo(k)fluoranthene in **µg/L**	
0.65	Chrysene in **µg/L**	
0.12	Dibenzo(a,h)anthracene in **µg/L**	
0.43	Indeno(1,2,3-cd)pyrene in **µg/L**	
0	Methyl-tert butyl ether in **µg/L**	

Notes:

Dilution Factor	3.1					
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	**34**	µg/L	50	µg/L
Total Suspended Solids	**30**	mg/L	---			
Antimony	**206**	µg/L	1996	µg/L		
Arsenic	**104**	µg/L	31	µg/L		
Cadmium	**10.2**	µg/L	0.8264	µg/L		
Chromium III	**323**	µg/L	262.6	µg/L		
Chromium VI	**323**	µg/L	35.7	µg/L		
Copper	242	µg/L	**23.5**	µg/L		
Iron	5000	µg/L	**2652**	µg/L		
Lead	160	µg/L	**9.57**	µg/L		
Mercury	**0.739**	µg/L	2.82	µg/L		
Nickel	**1450**	µg/L	158.8	µg/L		
Selenium	**235.8**	µg/L	15.6	µg/L		
Silver	**35.1**	µg/L	11.2	µg/L		
Zinc	**420**	µg/L	313.5	µg/L		
Cyanide	**178**	mg/L	16.2	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	935	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	**4.4**	µg/L	5.0	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	10.3	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	6.9	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---			
Benzo(a)anthracene	1.0	µg/L	**0.0118**	µg/L	0.1	µg/L
Benzo(a)pyrene	1.0	µg/L	**0.0118**	µg/L	0.1	µg/L
Benzo(b)fluoranthene	1.0	µg/L	**0.0118**	µg/L	0.1	µg/L
Benzo(k)fluoranthene	1.0	µg/L	**0.0118**	µg/L	0.1	µg/L
Chrysene	1.0	µg/L	**0.0118**	µg/L	0.1	µg/L
Dibenzo(a,h)anthracene	1.0	µg/L	**0.0118**	µg/L	0.1	µg/L
Indeno(1,2,3-cd)pyrene	1.0	µg/L	**0.0118**	µg/L	0.1	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	62	µg/L		
tert-Butyl Alcohol	**120**	µg/L	---			
tert-Amyl Methyl Ether	**90**	µg/L	---			

sc200™ UNIVERSAL CONTROLLER

Applications
- Drinking Water
- Wastewater
- Industrial Water
- Power

One Controller for the Broadest Range of Sensors.

Choose from 30 digital and analog sensor families for up to 17 different parameters.

Maximum Versatility

The sc200 controller allows the use of digital and analog sensors, either alone or in combination, to provide compatibility with Hach's broad range of sensors, eliminating the need for dedicated, parameter-specific controllers.

Ease of Use and Confidence in Results

Large, high-resolution, transreflective display provides optimal viewing resolution in any lighting condition. Guided calibration procedures in 19 languages minimize complexity and reduce operator error. Password-protected SD card reader offers a simple solution for data download and transfer. Visual warning system provides critical alerts.

Wide Variety of Communication Options

Utilize two to five analog outputs to transmit primary and secondary values for each sensor, or integrate Hach sensors and analyzers into MODBUS RS232/RS485, Profibus® DP, and HART networks.

Password protected SD card reader offers a simple solution for data download and transfer, and sc200 and digital sensor configuration file duplication and backup.

HACH®
Be Right™

Controller Comparison

Features	Previous Models sc100™ Controller	Previous Models GLI53 Controller	sc200™ Controller	Benefits
Display	64 x 128 pixels 33 x 66 mm (1.3 x 2.6 in.)	64 x 128 pixels 33 x 66 mm (1.3 x 2.6 in.)	160 x 240 pixels 48 x 68 mm (1.89 x 2.67 in.) Transreflective	• Improved user interface—50% bigger • Easier to read in daylight and sunlight
Data Management	irDA Port/PDA Service Cable	N/A	SD Card Service Cable	• Simplifies data transfer • Standardized accessories/max compatibility
Sensor Inputs	2 Max Direct Digital Analog via External Gateway	2 Max Analog Depending on Parameter	2 Max Digital and/or Analog with Sensor Card	• Simplifies analog sensor connections • Works with analog and digital sensors
Analog Inputs	N/A	N/A	1 Analog Input Signal Analog 4-20mA Card	• Enables non-sc analyzer monitoring • Accepts mA signals from other analyzers for local display • Consolidates analog mA signals to a digital output
4-20 mA Outputs	2 Standard	2 Standard	2 Standard Optional 3 Additional	• Total of five (5) 4-20 mA outputs allows multiple mA outputs per sensor input
Digital Communication	MODBUS RS232/RS485 Profibus DP V1.0	HART	MODBUS RS232/RS485 Profibus DP V1.0 HART 7.2	• Unprecedented combination of sensor breadth and digital communication options

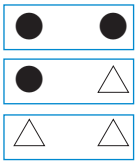
Choose from Hach's Broad Range of Digital and Analog Sensors

Parameter	Sensor	Digital or Analog
Ammonia	AMTAX™ sc, NH4D sc, AISE sc, AN-ISE sc	●
Chlorine	CLF10 sc, CLT10 sc, 9184 sc	●
Chlorine Dioxide	9185 sc	●
Conductivity	GLI 3400 Contacting, GLI 3700 Inductive	△
Dissolved Oxygen	LDO® Model 2, 5740 sc	●
Dissolved Oxygen	5500	△
Flow	U53, F53 Sensors	△
Nitrate	NITRATAX™ sc, NO3D sc, NISE sc, AN-ISE sc	●
Oil in Water	FP360 sc	●
Organics	UVAS sc	●
Ozone	9187 sc	●
pH/ORP	pHD	●
pH/ORP	pHD, pH Combination, LCP	△
Phosphate	PHOSPHAX™ sc	●
Sludge Level	SONATAX™ sc	●
Suspended Solids	SOLITAX™ sc, TSS sc	●
Turbidity	1720E, FT660 sc, SS7 sc, ULTRATURB sc, SOLITAX sc, TSS sc	●
Ultra Pure Conductivity	8310, 8311, 8312, 8315, 8316, 8317 Contacting	△
Ultra Pure pH/ORP	8362	△

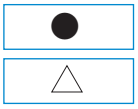
● = Digital △ = Analog

Connect up to two of any of the sensors listed above, in any combination, to meet your application needs. The diagrams below demonstrate the potential configurations. Operation of analog sensors requires the controller to be equipped with the appropriate sensor module. Contact Hach Technical Support for help with selecting the appropriate module.

2 Channel Configurations



1 Channel Configurations



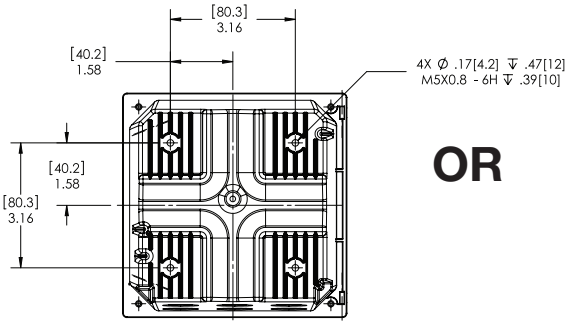
Specifications*

Dimensions (H x W x D)	5.7 in x 5.7 in x 7.1 in (144 mm x 144 mm x 181 mm)
Display	Graphic dot matrix LCD with LED backlighting, transreflective
Display Size	1.9 x 2.7 in. (48 mm x 68 mm)
Display Resolution	240 x 160 pixels
Weight	3.75 lbs. (1.70 kg)
Power Requirements (Voltage)	100 - 240 V AC, 24 V DC
Power Requirements (Hz)	50/60 Hz
Operating Temperature Range	-20 to 60 °C , 0 to 95% RH non-condensing
Analog Outputs	Two (Five with optional expansion module) to isolated current outputs, max 550 Ω , Accuracy: ± 0.1% of FS (20mA) at 25 °C, ± 0.5% of FS over -20 °C to 60 °C range Operational Mode: measurement or calculated value
Analog Output Functional Mode	Linear, Logarithmic, Bi-linear, PID
Security Levels	2 password-protected levels
Mounting Configurations	Wall, pole, and panel mounting
Enclosure Rating	NEMA 4X/IP66
Conduit Openings	1/2 in NPT Conduit
Relay: Operational Mode	Primary or secondary measurement, calculated value (dual channel only) or timer
Relay Functions	Scheduler (Timer), Alarm, Feeder Control, Event Control, Pulse Width Modulation, Frequency Control, and Warning
Relays	Four electromechanical SPDT (Form C) contacts, 1200 W, 5 A
Communication	MODBUS RS232/RS485, PROFIBUS DPV1, or HART 7.2 optional
Memory Backup	Flash memory
Electrical Certifications	EMC CE compliant for conducted and radiated emissions: - CISPR 11 (Class A limits) - EMC Immunity EN 61326-1 (Industrial limits) Safety cETLus safety mark for: - General Locations per ANSI/UL 61010-1 & CAN/CSA C22.2. No. 61010-1 - Hazardous Location Class I, Division 2, Groups A,B,C & D (Zone 2, Group IIC) per FM 3600 / FM 3611 & CSA C22.2 No. 213 M1987 with approved options and appropriately rated Class I, Division 2 or Zone 2 sensors cULus safety mark - General Locations per UL 61010-1 & CAN/CSA C22.2. No. 61010-1

Subject to change without notice.

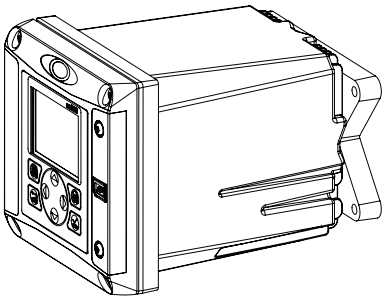
Dimensions

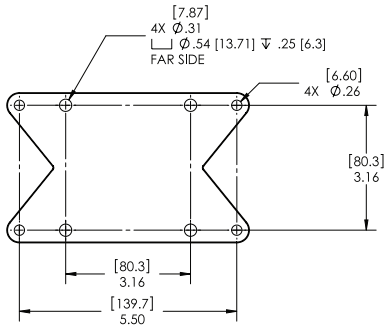
Surface Mounting Dimensions



Mounting Dimensions
(Rear View)

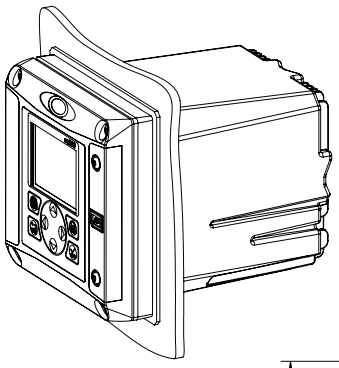
OR

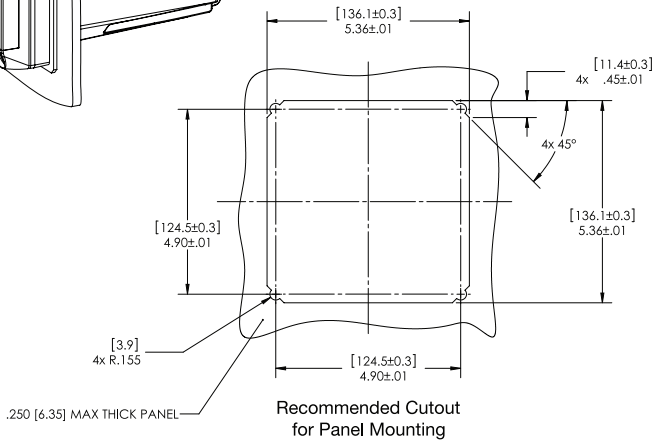




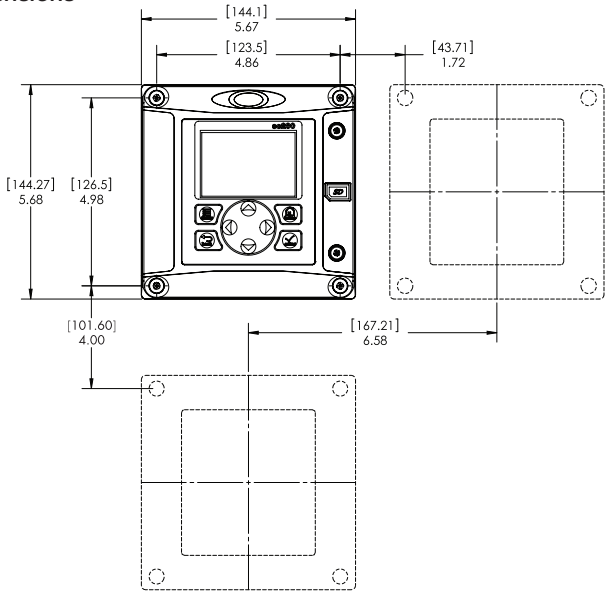
Bracket (supplied) for Surface Mounting
(Not compatible with Weather and Sun Shield p/n 9220600 when surface mounting.)

Panel Mounting Dimensions



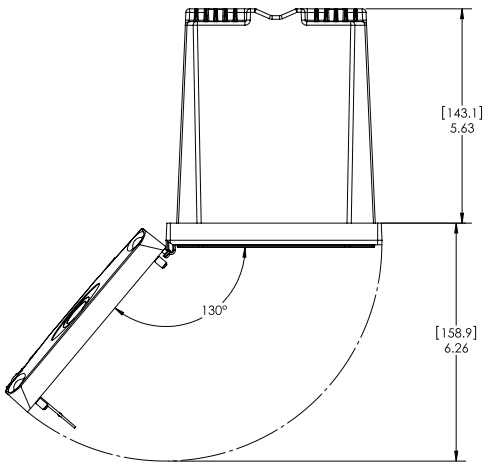


Recommended Cutout
for Panel Mounting

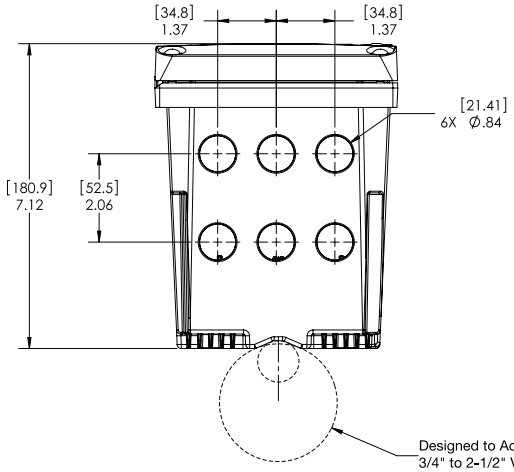


Minimum Spacing Dimensions
for Group Mounting

Top and Bottom Views



Door Opening Details



Ordering Information

sc200 for Hach Digital and Analog Sensors

LXV404.99.00552	sc200 controller, 2 channels, digital
LXV404.99.00502	sc200 controller, 1 channel, digital
LXV404.99.00102	sc200 controller, 1 channel, pH/DO
LXV404.99.00202	sc200 controller, 1 channel, Conductivity
LXV404.99.01552	sc200 controller, 2 channels, digital, Modbus RS232/RS485
LXV404.99.00112	sc200 controller, 2 channel, pH/DO

Note: Other Sensor combinations are available. Please contact Hach Technical Support or your Hach representative.

Note: Communication options (MODBUS, Profibus DPV1, and HART) are available. Please contact Hach Technical Support or your Hach representative.

sc200 for Ultrapure Sensors

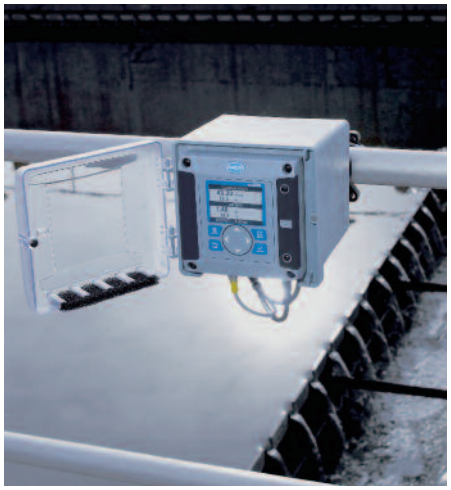
9500.99.00602	sc200 controller, 1 channel, ultrapure conductivity
9500.99.00702	sc200 controller, 1 channel, ultrapure pH
9500.99.00662	sc200 controller, 2 channel, ultrapure conductivity
9500.99.00772	sc200 controller, 2 channel, ultrapure pH

Sensor and Communication Modules

9012900	Analog pH/ORP and DO module for GLI Sensors
9013000	Analog Conductivity module for GLI Sensors
9012700	Flow module
9012800	4-20 mA Input Module
9525700	Analog pH/ORP Module for Polymetron Sensors
9525800	Analog Conductivity Module for Polymetron Sensors
9013200	Modbus 232/485 Module
9173900	Profibus DP Module
9328100	HART Module
9334600	4-20 mA Output Module (Provides 3 additional mA Outputs)

Accessories

9220600	sc200 Weather and Sun Shield with UV Protection Screen
8809200	sc200 UV Protection Screen
9218200	SD card reader (USB) for connection to PC
9218100	4 GB SD card



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Outside United States: 970-669-3050 tel 970-461-3939 fax int@hach.com
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Sulfuric Acid, 3M

SECTION 1 : Identification of the substance/mixture and of the supplier

Product name : **Sulfuric Acid, 3M**

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: **S25899**

Recommended uses of the product and uses restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

Supplier Details:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

Emergency telephone number:

Fisher Science Education Emergency Telephone No.: 800-535-5053

SECTION 2 : Hazards identification

Classification of the substance or mixture:

Health hazard
Skin corrosion, category 1A
Serious eye damage, category 1

Corrosive to metals, category 1
skin corr./irrit. 1A
Corrosive to metals. 1
Eye corr. 1

Signal word :Danger

Hazard statements:
May be corrosive to metals
Causes severe skin burns and eye damage
Causes serious eye damage

Precautionary statements:
If medical advice is needed, have product container or label at hand
Keep out of reach of children
Read label before use
Wear protective gloves/protective clothing/eye protection/face protection
Wash ... thoroughly after handling
Do not breathe dust/fume/gas/mist/vapours/spray
Keep only in original container
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing
Immediately call a POISON CENTER or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
Specific treatment (see ... on this label)
Absorb spillage to prevent material damage
Store locked up
Dispose of contents/container to ...

Other Non-GHS Classification:

WHMIS

D1A 

E 

NFPA/HMIS

NFPA SCALE (0-4)

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:		
CAS 7664-93-9	Sulfuric Acid, ACS	31.004 %
CAS 7732-18-5	Water	68.996 %
		Percentages are by weight

SECTION 4 : First aid measures

Description of first aid measures

After inhalation: Loosen clothing as necessary and position individual in a comfortable position.Move exposed to fresh air. Give artificial respiration if necessary. If breathing is difficult give oxygen.Get medical assistance if cough or other symptoms appear.

After skin contact: Rinse/flush exposed skin gently using soap and water for 15-20 minutes.Seek medical advice if discomfort or irritation persists.

After eye contact: Protect unexposed eye.Rinse/flush exposed eye(s) gently using water for 15-20 minutes.Remove contact lens(es) if able to do so during rinsing.Seek medical attention if irritation persists or if concerned.

After swallowing: Rinse mouth thoroughly. Do not induce vomiting. Seek medical attention if irritation, discomfort, or vomiting persists.

Most important symptoms and effects, both acute and delayed:

Irritation.Headache.Nausea.Shortness of breath.;

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention provide SDS document to physician. Physician should treat symptomatically.

SECTION 5 : Firefighting measures

Extinguishing media

Suitable extinguishing agents: Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

For safety reasons unsuitable extinguishing agents:

Special hazards arising from the substance or mixture:

Thermal decomposition can lead to release of irritating gases and vapors.

Advice for firefighters:

Protective equipment: Wear protective eyeware, gloves, and clothing. Refer to Section 8.Use NIOSH-approved respiratory protection/breathing apparatus.

Additional information (precautions): Avoid inhaling gases, fumes, dust, mist, vapor, and aerosols. Avoid contact with skin, eyes, and clothing.

SECTION 6 : Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Ensure adequate ventilation.Ensure that air-handling systems are operational.

Environmental precautions:

Should not be released into environment.Prevent from reaching drains, sewer, or waterway.

Methods and material for containment and cleaning up:

Wear protective eyeware, gloves, and clothing. Refer to Section 8.Always obey local regulations.Containerize for disposal. Refer to Section 13.If necessary use trained response staff or contractor. Evacuate personnel to safe areas. Keep in suitable closed containers for disposal.

Reference to other sections:

SECTION 7 : Handling and storage

Precautions for safe handling:

Avoid contact with skin, eyes, and clothing.Follow good hygiene procedures when handling chemical materials. Refer to Section 8.Follow proper disposal methods. Refer to Section 13.Do not eat, drink, smoke, or use personal products when handling chemical substances.

Conditions for safe storage, including any incompatibilities:

Store in a cool location. Keep away from food and beverages.Protect from freezing and physical damage.Provide ventilation for containers. Keep container tightly sealed.Store away from incompatible materials.

SECTION 8 : Exposure controls/personal protection

Control Parameters:	7664-93-9, Sulfuric Acid, ACS, OSHA PEL: 1mg/m3 7664-93-9, Sulfuric Acid, ACS, ACGIH TLV: 1 mg/m3
Appropriate Engineering controls:	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above.
Respiratory protection:	Not required under normal conditions of use. Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls.When necessary use NIOSH approved breathing equipment.
Protection of skin:	Select glove material impermeable and resistant to the substance.Select glove material based on rates of diffusion and degradation. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.Use proper glove removal technique without touching outer surface. Avoid skin contact with used gloves.Wear protective clothing.
Eye protection:	Wear equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).Safety glasses or goggles are appropriate eye protection.
General hygienic measures:	Perform routine housekeeping. Wash hands before breaks and at the end of work. Avoid contact with skin, eyes, and clothing.Before wearing wash contaminated clothing.

SECTION 9 : Physical and chemical properties

Appearance (physical state,color):	Clear, colorless liquid.	**Explosion limit lower**: **Explosion limit upper**:	Not Determined Not Determined
Odor:	Odorless	**Vapor pressure**:	<0.00120mmHg
Odor threshold:	Not Determined	**Vapor density**:	Not Determined
pH-value:	< 0.03	**Relative density**:	Not Determined
Melting/Freezing point:	11C	**Solubilities**:	Miscible
Boiling point/Boiling range:	105 - 325C	**Partition coefficient (n-octanol/water)**:	Not Determined
Flash point (closed cup):	Not Determined	**Auto/Self-ignition temperature**:	Not Determined
Evaporation rate:	Not Determined	**Decomposition temperature**:	Not Determined
Flammability (solid,gaseous):	Not Determined	**Viscosity**:	a. Kinematic:Not Determined b. Dynamic: Not Determined
Density: Not Determined			

SECTION 10 : Stability and reactivity

Reactivity: Nonreactive under normal conditions.
Chemical stability: Stable under normal conditions.
Possible hazardous reactions: None under normal processing.

Conditions to avoid: Incompatible materials.
Incompatible materials: Organics. Metals. Chlorates. Alkalines. Carbides. Fulminates. Reducing agents. Nitrates. Acetic acid. Oxidizing agents
Hazardous decomposition products: Oxides of sulfur.

SECTION 11 : Toxicological information

Acute Toxicity:		
Inhalation:	510 mg/m3 2 h	Inhalation LC50 Rat
Oral:	2140 mg/kg	Oral LD50 Rat
Chronic Toxicity: No additional information.		
Corrosion Irritation: No additional information.		
Sensitization:		No additional information.
Single Target Organ (STOT):		No additional information.
Numerical Measures:		No additional information.
Carcinogenicity:		No additional information.
Mutagenicity:		No additional information.
Reproductive Toxicity:		No additional information.

SECTION 12 : Ecological information

Ecotoxicity

Freshwater Fish: 96 Hr LC50 Brachydanio rerio: >500 mg/L [static]

Fish: LC50 - Gambusia affinis (Mosquito fish) - 42 mg/l - 96 h

Invertebrates: EC50 - Daphnia magna (Water flea) - 29 mg/l - 24 h

Persistence and degradability:
Bioaccumulative potential:
Mobility in soil:
Other adverse effects:

SECTION 13 : Disposal considerations

Waste disposal recommendations:

Contact a licensed professional waste disposal service to dispose of this material.Dispose of empty containers as unused product.It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.

SECTION 14 : Transport information

UN-Number

1830

UN proper shipping name

Sulfuric Acid Solution

Transport hazard class(es)

Class:
8 Corrosive substances

Packing group:II
Environmental hazard:
Transport in bulk:
Special precautions for user:

SECTION 15 : Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Acute, Chronic

SARA Section 313 (Specific toxic chemical listings):

7664-93-9 Sulfuric Acid

RCRA (hazardous waste code):

None of the ingredients is listed

TSCA (Toxic Substances Control Act):

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

7664-93-9 Sulfuric Acid 1000 lbs

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

None of the ingredients is listed

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

None of the ingredients is listed

SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the

SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases:

Abbreviations and acronyms:
IMDG: International Maritime Code for Dangerous Goods
PNEC: Predicted No-Effect Concentration (REACH)
CFR: Code of Federal Regulations (USA)
SARA: Superfund Amendments and Reauthorization Act (USA)
RCRA: Resource Conservation and Recovery Act (USA)
TSCA: Toxic Substances Control Act (USA)
NPRI: National Pollutant Release Inventory (Canada)
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)

Effective date : 02.15.2015
Last updated : 03.19.2015

Appendix B

Remediation General Permit
Notice of Intent – 200 gpm

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

A. General site information:

<table>
<tr><td rowspan="2">1. Name of site:
West Roxbury to Needham Reliability Project - Needham Section</td><td colspan="3">Site address: Multiple addresses (See NOI Letter)
Street:</td></tr>
<tr><td>City: Needham</td><td>State: MA</td><td>Zip:</td></tr>
<tr><td rowspan="4">2. Site owner
NSTAR Electric Company d/b/a Eversource Energy

Owner is (check one): ☐ Federal ☐ State/Tribal ☐ Private
■ Other; if so, specify: Utility on Public Right of Way</td><td colspan="3">Contact Person: Michael Zylich</td></tr>
<tr><td colspan="2">Telephone: 781.441.3804</td><td>Email: michael.zylich@eversource.com</td></tr>
<tr><td colspan="3">Mailing address: 247 Station Drive, SE270
Street:</td></tr>
<tr><td>City: Westwood</td><td>State: MA</td><td>Zip: 02090</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner
Operator to be selected. NSTAR Electric Company d/b/a Eversource Energy will retain coverage as a co-permitee until the Operator is selected.</td><td colspan="3">Contact Person:</td></tr>
<tr><td colspan="2">Telephone:</td><td>Email:</td></tr>
<tr><td colspan="3">Mailing address:
Street:</td></tr>
<tr><td>City:</td><td>State:</td><td>Zip:</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:

NPDES permit is (check all that apply: ■ RGP ☐ DGP ☐ CGP
☐ 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):
■ MA Chapter 21e; list RTN(s):
RTN to be provided
☐ NH Groundwater Management Permit or Groundwater Release Detection Permit:
☐ CERCLA
☐ UIC Program
☐ POTW Pretreatment
☐ 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):
Alder Brook	MA72-22	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:

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. Impaired water body - see attached Table 1 for impairment pollutants and completed TMDLs

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.	0.236 cfs
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.	1.53

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 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): ■ Yes ☐ No	☐ Contaminated surface water 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): ☐ Yes ☐ No	☐ The receiving water ☐ A surface water other than the receiving water; if so, indicate waterbody:	☐ Potable water; if so, indicate municipality or origin: ☐ Other; if so, specify:

2. Source water contaminants: SVOCs, PAHs, lead and copper	
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): See Appendix F of NOI package.	Outfall location(s): (Latitude, Longitude) 42.268706 degrees N 71.220550 degrees W
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ■ Indirect discharge, if so, specify: Town of Needham storm drains ☐ A private storm sewer system ■ A municipal storm sewer system If the discharge enters the receiving water via a private or municipal storm sewer system: Has notification been provided to the owner of this system? (check one): ■ Yes ☐ No 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: Prior to excavation, the Operator will obtain street opening permits from the Town of Needham 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 2018 to June 2019 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
☐ II – Non-Petroleum-Related Site Remediation
■ III – Contaminated Site Dewatering
☐ IV – Dewatering of Pipelines and Tanks
☐ V – Aquifer Pump Testing
☐ VI – Well Development/Rehabilitation
☐ VII – Collection Structure Dewatering/Remediation
☐ VIII – Dredge-Related Dewatering</td><td colspan="2">a. If Activity Category I or II: (check all that apply)

☐ A. Inorganics
☐ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
☐ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
☐ 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)

■ A. Inorganics
■ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
■ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
☐ 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		✔	5	350.1	100	180	145	Report mg/L	---
Chloride		✔	5	300.0	50,000	482,000	165900	Report µg/l	---
Total Residual Chlorine	✔		5	4500CL D	20.0	<20.0	0	0.2 mg/L	17
Total Suspended Solids		✔	5	2540D	5,000 and	832,000	334000	30 mg/L	---
Antimony	✔		5	200.7	10.0	<10.0	0	206 µg/L	---
Arsenic	✔		5	3113B	5.0	5.3	5.3	104 µg/L	---
Cadmium	✔		5	3113B	0.25	<0.25	0	10.2 µg/L	---
Chromium III	✔		5	200.7	10.0	10.1	10.1	323 µg/L	---
Chromium VI	✔		5	3500	10.0	<10.0	0	323 µg/L	---
Copper		✔	5	200.7	4.0	29.6	20.1	242 µg/L	14.4
Iron		✔	5	200.7	20.0	18300	6117.7	5,000 µg/L	1413
Lead	✔		5	3113B	2.0	15.8	10.55	160 µg/L	5.55
Mercury	✔		5	245.1	0.20	<0.20	0	0.739 µg/L	---
Nickel	✔		5	200.7	10.0	<10.0	0	1,450 µg/L	---
Selenium	✔		5	3113B	4.0	<4.0	0	235.8 µg/L	---
Silver	✔		5	200.7	1.0 and 2.0	<2.0	0	35.1 µg/L	---
Zinc		✔	5	200.7	10.0	45.8	30	420 µg/L	---
Cyanide	✔		5	4500LL	5.00	<5.0	0	178 mg/L	---
B. Non-Halogenated VOCs									
Total BTEX		✔	5	524.2		15	15	100 µg/L	---
Benzene	✔		5	524.2	0.5	<0.5	0	5.0 µg/L	---
1,4 Dioxane	✔		5	8270D	0.250	<0.250	0	200 µg/L	---
Acetone	✔		5	524.2	5.0	<5.0	0	7.97 mg/L	---
Phenol		✔	5	420.1	100	105	105	1,080 µg/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	✔		5	524.2	0.3	<0.3	0	4.4 µg/L	---
1,2 Dichlorobenzene	✔		5	524.2	0.5	<0.5	0	600 µg/L	---
1,3 Dichlorobenzene	✔		5	524.2	0.5	<0.5	0	320 µg/L	---
1,4 Dichlorobenzene	✔		5	524.2	0.5	<0.5	0	5.0 µg/L	---
Total dichlorobenzene	✔		5	524.2	0.5	<0.5	0	763 µg/L in NH	---
1,1 Dichloroethane	✔		5	524.2	0.5	<0.5	0	70 µg/L	---
1,2 Dichloroethane	✔		5	524.2	0.5	<0.5	0	5.0 µg/L	---
1,1 Dichloroethylene	✔		5	524.2	0.5	<0.5	0	3.2 µg/L	---
Ethylene Dibromide	✔		5	504.1	0.015	<0.015	0	0.05 µg/L	---
Methylene Chloride	✔		5	524.2	0.5	<0.5	0	4.6 µg/L	---
1,1,1 Trichloroethane	✔		5	524.2	0.5	<0.5	0	200 µg/L	---
1,1,2 Trichloroethane	✔		5	524.2	0.5	<0.5	0	5.0 µg/L	---
Trichloroethylene	✔		5	524.2	0.5	<0.5	0	5.0 µg/L	---
Tetrachloroethylene	✔		5	524.2	0.5	<0.5	0	5.0 µg/L	---
cis-1,2 Dichloroethylene	✔		5	524.2	0.5	<0.5	0	70 µg/L	---
Vinyl Chloride	✔		5	524.2	0.2	<0.2	0	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates		✔	5	625 SIM	1.87, 2.34,	<2.36	0	190 µg/L	---
Diethylhexyl phthalate	✔		5	625 SIM	1.87	<1.87	0	101 µg/L	---
Total Group I PAHs		✔	5	625 SIM	0.05	3.11	1.74	1.0 µg/L	---
Benzo(a)anthracene		✔	5	625 SIM	0.05	0.52	0.32	As Total PAHs	0.0058
Benzo(a)pyrene		✔	5	625 SIM	0.05	0.59	0.31		0.0058
Benzo(b)fluoranthene		✔	5	615 SIM	0.05	0.60	0.34		0.0058
Benzo(k)fluoranthene		✔	5	625 SIM	0.05	0.20	0.17		0.0058
Chrysene		✔	5	625 SIM	0.05	0.65	0.38		0.0058
Dibenzo(a,h)anthracene		✔	5	625 SIM	0.05	0.12	0.09		0.0058
Indeno(1,2,3-cd)pyrene		✔	5	625 SIM	0.05	0.43	0.22		0.0058

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		✔	5	625 SIM	0.19	120	43.77	100 µg/L	---
Naphthalene		✔	5	625 SIM	0.19 and	92.9	46.56	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✔		5	608	0.09	<0.09	0	0.000064 µg/L	---
Pentachlorophenol	✔		5	625 SIM	0.84	<0.84	0	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons	✔		5	1664A	4.67, 6.41,	<4.72	0	5.0 mg/L	---
Ethanol	✔		5	ASTM	10	<10	0	Report mg/L	---
Methyl-tert-Butyl Ether	✔		5	524.2	0.5	<0.5	0	70 µg/L	---
tert-Butyl Alcohol	✔		5	524.2	25.0	<25.0	0	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✔		5	524.2	1.0	<1.0	0	90 µg/L in MA 140 µg/L in NH	---
Other (i.e., pH, temperature, hardness, salinity, LC_{50}, additional pollutants present); if so, specify:									
Naphthalene		✔	5	524.2	0.5 and 5.0	225	116.45		
Hardness		✔	5	3113B	165 and 999	125,000	72,820		
pH		✔	6.5-8.3	Field	0 to 12	5.61	6.00		

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:
Granulated activated carbon and other treatments as need to meet effluent limits.

2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge.
Prior to discharge, dewatering effluent will be routed through bag filters and other treatment as need to meet effluent requirements. See attached Figure 3.

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: Granulated activated carbon and other treatments as need to meet effluent limits.

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. Indicate the most limiting component: Flow meter Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	200
Provide the proposed maximum effluent flow in gpm.	200
Provide the average effluent flow in gpm.	50
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	NA

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:
pH conditions may be added to the treatment system if necessary to meet effluent limits

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:

☐ **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.

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: A BMPP meeting the requirements of this general permit will be 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: 5/2/18
Print Name and Title: Michael Zylich, Sr. Environmental Scientist	

Table 1. Water Quality Assessment Status for Reporting Year 2014
Alder Brook

Designated Use	Designated Use Group	Status
Aesthetic	Aesthetic Value	Not Assessed
Fish Consumption	Aquatic Life Harvesting	Not Assessed
Fish, Other Aquatic Life And Wildlife	Fish, Shellfish, And Wildlife Protection And Propagation	Impaired
Primary Contact Recreation	Recreation	Not Assessed
Secondary Contact Recreation	Recreation	Not Assessed

Causes of Impairment for Reporting Year 2014

Cause of Impairment	Cause of Impairment Group	Designated Use(s)	State TMDL Development Status
Aquatic Macroinvertebrate Bioassessments	Cause Unknown - Impaired Biota	Fish, Other Aquatic Life And Wildlife	TMDL needed
Nutrient/Eutrophication Biological Indicators	Nutrients	Fish, Other Aquatic Life And Wildlife	TMDL completed

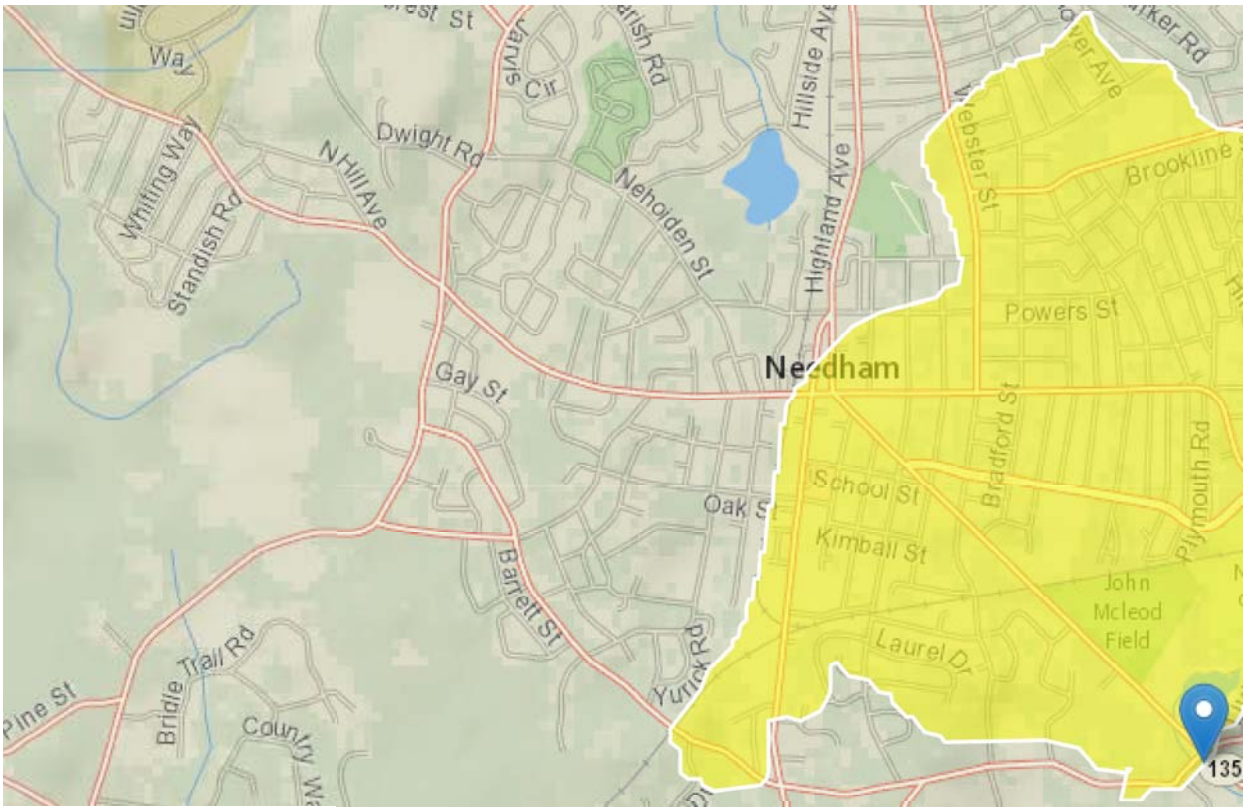
TMDLs That Apply to this waterbody

TMDL Document Name	TMDL Date	TMDL Pollutant Description	TMDL Pollutant Source Type	Cause(s) of Impairment Addressed
Upper/Middle Charles River	Jun-10-2011	Phosphorus, Total	Point/Nonpoint Source	Nutrient/Eutrophication Biological Indicators; Nutrients; Aquatic Macroinvertebrate Bioassessments

General Notes:
1. Information obtained from EPA website: https://ofmpub.epa.gov/waters10/attains_index.home on April 17, 2018

StreamStats Report

Region ID: MA
Workspace ID: MA20180312162351012000
Clicked Point (Latitude, Longitude): 42.26845, -71.22016
Time: 2018-03-12 12:24:05 -0400



The South Carolina StreamStats application is testing LiDAR-derived data and streams for delineation. This is a beta version and QA/QC is incomplete. It may calculate basin characteristics and flow statistics incorrectly. Please verify the drainage areas and flow stats carefully. Use at your own risk

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.72	square miles

Parameter Code	Parameter Description	Value	Unit
DRFTPERSTR	Area of stratified drift per unit of stream length	1.04	square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless
BSLDEM250	Mean basin slope computed from 1:250K DEM	1.766	percent
BSLDEM10M	Mean basin slope computed from 10 m DEM	4.292	percent
ELEV	Mean Basin Elevation	171	feet
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	1.68	percent
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	64.08	percent
FOREST	Percentage of area covered by forest	7.28	percent

Low-Flow Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.72	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	1.766	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	1.04	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

Low-Flow Statistics Flow Report [Statewide Low Flow WRIR00 4135]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	SE	SEp

Statistic	Value	Unit	PII	Plu	SE	SEp
7 Day 2 Year Low Flow	0.417	ft^3/s	0.0663	2.53	49.5	49.5
7 Day 10 Year Low Flow	0.236	ft^3/s	0.0311	1.67	70.8	70.8

Low-Flow Statistics Citations

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. (http://pubs.usgs.gov/wri/wri004135/)

Dilution Factor Calculation

Approach

The discharge dilution factor was calculated in accordance with Appendix V of the Remediation General Permit (RGP) application.

Formula

DF = (Qd + Qs)/Qd

DF = dilution factor

Qd = flow of discharge into receiving water body

Qs = estimated flow of receiving water body

Assumptions

Qs = 7Q10 in millions of gallons per day (MGD)

7Q10 = 0.236 cubic feet per second (cfs)[1]
Qs = 0.1525 MGD

Qd = flow of discharge into receiving water body

Qd = 200 gallons per minute (gpm) = 0.288 MGD[2]

Calculation

DF = (Qd + Qs)/Qd

DF = (0.288 + 0.1525)/(0.288)

DF = 1.53

Footnotes:

1. 7Q10 obtained from United States Geoglogic Survey (USGS) StreamStats Report dated March 12, 2018.

MWS/
B:\Working\EVERSOURCE\1610515 Epsilon WRNRP\11_NPDES RGP\NOI Alder Brook\AppA_NOI\AppA2 NOI dilution factor calculation.doc

Sabulis, Mike

From: Vakalopoulos, Catherine (DEP) <Catherine.Vakalopoulos@MassMail.State.MA.US>
Sent: Friday, April 20, 2018 9:16 AM
To: Sabulis, Mike
Subject: RE: NPDES RGP 7Q10 & Dilution Factor- Alder Brook Needham, MA

Hi Mike,
Thanks for answering my same question for both sites.
Have a nice weekend.
Cathy

Cathy Vakalopoulos, Massachusetts Department of Environmental Protection
1 Winter St., Boston, MA 02108, 617-348-4026

From: Sabulis, Mike [mailto:MSabulis@geiconsultants.com]
Sent: Thursday, April 19, 2018 8:29 PM
To: Vakalopoulos, Catherine (DEP)
Subject: RE: NPDES RGP 7Q10 & Dilution Factor- Alder Brook Needham, MA

Thanks again Cathy. This is for a different segment of the same utility project. Similar to Valley Rd the 200 gpm is to support a higher dewatering in the event a large rain event occurs and a higher dewatering rate is necessary to pump out the trench.

Mike

Michael Sabulis
Senior Project Manager
GEI Consultants, Inc.
T: 781.721.4114 | **M:** 508.633.9544

From: Vakalopoulos, Catherine (DEP) [mailto:Catherine.Vakalopoulos@MassMail.State.MA.US]
Sent: Thursday, April 19, 2018 7:05 PM
To: Sabulis, Mike <MSabulis@geiconsultants.com>
Subject: RE: NPDES RGP 7Q10 & Dilution Factor- Alder Brook Needham, MA

Hi Mike,
The calculations in your table are correct. I have the same question I had with the other location – did you add the 200 GPM in case a higher volume of dewatering is needed? Alder Brook has a segment ID of MA72-22, is Class B, is not an ORW, and has one TMDL for nutrients.
Please let me know if you have any further questions.
Cathy

Cathy Vakalopoulos, Massachusetts Department of Environmental Protection
1 Winter St., Boston, MA 02108, 617-348-4026

From: Sabulis, Mike [mailto:MSabulis@geiconsultants.com]
Sent: Wednesday, April 18, 2018 11:48 AM
To: Vakalopoulos, Catherine (DEP)
Subject: RE: NPDES RGP 7Q10 & Dilution Factor- Alder Brook Needham, MA

Hi Cathy,

Thanks for the correction and info, we have recalculated the Dilution Factors for the following two maximum flow rates and plan to submit NOIs for each:

Maximum Discharge Rate		Alder Brook 7Q10	Dilution Factor
50 GPM	0.072 MGD	0.153 MGD	3.12
200 GPM	0.288 MGD	0.153 MGD	1.53

Could you confirm these are correct?

Thanks,

Mike

Michael Sabulis
Senior Project Manager
GEI Consultants, Inc.
T: 781.721.4114 | **M:** 508.633.9544

From: Vakalopoulos, Catherine (DEP) [mailto:Catherine.Vakalopoulos@MassMail.State.MA.US]
Sent: Thursday, April 5, 2018 2:51 PM
To: Sabulis, Mike <MSabulis@geiconsultants.com>
Subject: RE: NPDES RGP 7Q10 & Dilution Factor- Alder Brook Needham, MA

Hi Mike,
I just want to check that the 50 gpm you provided is the design flow which is the maximum flow through the treatment system and not an average flow or what you think will be flowing through the system. We use the design flow to calculate the dilution factor.

If 50 gpm is the design flow, it doesn't matter how many hours a day you operate the system. We are interested in seeing the dilution at the time of discharge.

Using 50 gpm = 0.072 MGD and the 7Q10 is 0.236 cfs = 0.153 MGD (which is correct),
DF = (0.072 + 0.153)/0.072 = 3.125

Please let me know about the design flow.

Thanks,
Cathy

Cathy Vakalopoulos, Massachusetts Department of Environmental Protection
1 Winter St., Boston, MA 02108, 617-348-4026

Please consider the environment before printing this e-mail

From: Sabulis, Mike [mailto:MSabulis@geiconsultants.com]
Sent: Tuesday, April 03, 2018 4:53 PM
To: Vakalopoulos, Catherine (DEP)
Subject: NPDES RGP 7Q10 & Dilution Factor- Alder Brook Needham, MA

Hi Catherine,

I writing to confirm a 7Q10 value and Dilution Factor for Alder Brook located in Needham, Massachusetts. Based on the output from StreamStats (see attached), we should be using a 7Q10 of 0.236 ft^3/sec, could you confirm this is correct? Assuming a discharge rate of 50 gpm for a 12 hr. period, we have calculated a following Dilution Factor of 5.24. Could you confirm this is correct as well?

Let me know if you have any questions or if you'd like to discuss.

Thanks,

Mike

Michael Sabulis
Senior Project Manager
GEI Consultants
Consulting Engineers & Scientists
GEI Consultants, Inc.
400 Unicorn Park Drive | Woburn, MA 01801
T: 781.721.4114 | **M:** 508.633.9544
www.geiconsultants.com | vCard | LinkedIn | Twitter | Facebook

Enter number values in green boxes below

Enter values in the units specified

↓		
0.1525	Q_R = Enter upstream flow in **MGD**	Freshwater: Q_R equal to the 7Q10; enter alternate Q_R if approved by the State; enter 0 if no dilution factor approved
0.288	Q_P = Enter discharge flow in **MGD**	Saltwater (estuarine and marine): enter Q_R if approved by the State; enter 0 if no entry
0	Downstream 7Q10	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

Enter a dilution factor, if other than zero

↓	
1.53	

Saltwater (estuarine and marine): only if approved by the State

Leave 0 if no entry

Enter values in the units specified

↓		
125	C_d = Enter influent hardness in **mg/L** $CaCO_3$	Freshwater only
84.1	C_s = Enter receiving water hardness in **mg/L** $CaCO_3$	

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

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

↓	
6.56	pH in **Standard Units**
5.83	Temperature in **°C**
0	Ammonia in **mg/L**
84.1	Hardness in **mg/L** $CaCO_3$
0.4	Salinity in **ppt**
0	Antimony in **µg/L**
0	Arsenic in **µg/L**
0.3	Cadmium in **µg/L**
0	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
2.3	Copper in **µg/L**
220	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**
24.2	Zinc in **µg/L**

Enter **influent** concentrations in the units specified

if >1 sample, enter maximum

if >10 samples, may enter 95th percentile

Enter 0 if non-detect or testing not required

↓	
0	TRC in **µg/L**
0.18	Ammonia in **mg/L**
0	Antimony in **µg/L**
5.3	Arsenic in **µg/L**
0	Cadmium in **µg/L**
10.1	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
29.6	Copper in **µg/L**
18300	Iron in **µg/L**
15.8	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
45.8	Zinc in **µg/L**
0	Cyanide in **µg/L**
105	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**
0.52	Benzo(a)anthracene in **µg/L**
0.59	Benzo(a)pyrene in **µg/L**
0.6	Benzo(b)fluoranthene in **µg/L**
0.2	Benzo(k)fluoranthene in **µg/L**
0.65	Chrysene in **µg/L**
0.12	Dibenzo(a,h)anthracene in **µg/L**
0.43	Indeno(1,2,3-cd)pyrene in **µg/L**
0	Methyl-tert butyl ether in **µg/L**

Dilution Factor	1.5					
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	**17**	µg/L	50	µg/L
Total Suspended Solids	**30**	mg/L	---			
Antimony	**206**	µg/L	979	µg/L		
Arsenic	**104**	µg/L	15	µg/L		
Cadmium	**10.2**	µg/L	0.4467	µg/L		
Chromium III	**323**	µg/L	143.4	µg/L		
Chromium VI	**323**	µg/L	17.5	µg/L		
Copper	242	µg/L	**14.4**	µg/L		
Iron	5000	µg/L	**1413**	µg/L		
Lead	160	µg/L	**5.55**	µg/L		
Mercury	**0.739**	µg/L	1.39	µg/L		
Nickel	**1450**	µg/L	87.0	µg/L		
Selenium	**235.8**	µg/L	7.6	µg/L		
Silver	**35.1**	µg/L	6.9	µg/L		
Zinc	**420**	µg/L	187.1	µg/L		
Cyanide	**178**	mg/L	8.0	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	459	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	**4.4**	µg/L	2.4	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	5.0	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	3.4	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---			
Benzo(a)anthracene	1.0	µg/L	**0.0058**	µg/L	0.1	µg/L
Benzo(a)pyrene	1.0	µg/L	**0.0058**	µg/L	0.1	µg/L
Benzo(b)fluoranthene	1.0	µg/L	**0.0058**	µg/L	0.1	µg/L
Benzo(k)fluoranthene	1.0	µg/L	**0.0058**	µg/L	0.1	µg/L
Chrysene	1.0	µg/L	**0.0058**	µg/L	0.1	µg/L
Dibenzo(a,h)anthracene	1.0	µg/L	**0.0058**	µg/L	0.1	µg/L
Indeno(1,2,3-cd)pyrene	1.0	µg/L	**0.0058**	µg/L	0.1	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	31	µg/L		
tert-Butyl Alcohol	**120**	µg/L	---			
tert-Amyl Methyl Ether	**90**	µg/L	---			

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- Wastewater
- Industrial Water
- Power

One Controller for the Broadest Range of Sensors.

Choose from 30 digital and analog sensor families for up to 17 different parameters.

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Large, high-resolution, transreflective display provides optimal viewing resolution in any lighting condition. Guided calibration procedures in 19 languages minimize complexity and reduce operator error. Password-protected SD card reader offers a simple solution for data download and transfer. Visual warning system provides critical alerts.

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Utilize two to five analog outputs to transmit primary and secondary values for each sensor, or integrate Hach sensors and analyzers into MODBUS RS232/RS485, Profibus® DP, and HART networks.

Password protected SD card reader offers a simple solution for data download and transfer, and sc200 and digital sensor configuration file duplication and backup.

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Controller Comparison

Features	Previous Models sc100™ Controller	Previous Models GLI53 Controller	sc200™ Controller	Benefits
Display	64 x 128 pixels 33 x 66 mm (1.3 x 2.6 in.)	64 x 128 pixels 33 x 66 mm (1.3 x 2.6 in.)	160 x 240 pixels 48 x 68 mm (1.89 x 2.67 in.) Transreflective	• Improved user interface—50% bigger • Easier to read in daylight and sunlight
Data Management	irDA Port/PDA Service Cable	N/A	SD Card Service Cable	• Simplifies data transfer • Standardized accessories/max compatibility
Sensor Inputs	2 Max Direct Digital Analog via External Gateway	2 Max Analog Depending on Parameter	2 Max Digital and/or Analog with Sensor Card	• Simplifies analog sensor connections • Works with analog and digital sensors
Analog Inputs	N/A	N/A	1 Analog Input Signal Analog 4-20mA Card	• Enables non-sc analyzer monitoring • Accepts mA signals from other analyzers for local display • Consolidates analog mA signals to a digital output
4-20 mA Outputs	2 Standard	2 Standard	2 Standard Optional 3 Additional	• Total of five (5) 4-20 mA outputs allows multiple mA outputs per sensor input
Digital Communication	MODBUS RS232/RS485 Profibus DP V1.0	HART	MODBUS RS232/RS485 Profibus DP V1.0 HART 7.2	• Unprecedented combination of sensor breadth and digital communication options

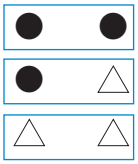
Choose from Hach's Broad Range of Digital and Analog Sensors

Parameter	Sensor	Digital or Analog
Ammonia	AMTAX™ sc, NH4D sc, AISE sc, AN-ISE sc	●
Chlorine	CLF10 sc, CLT10 sc, 9184 sc	●
Chlorine Dioxide	9185 sc	●
Conductivity	GLI 3400 Contacting, GLI 3700 Inductive	△
Dissolved Oxygen	LDO® Model 2, 5740 sc	●
Dissolved Oxygen	5500	△
Flow	U53, F53 Sensors	△
Nitrate	NITRATAX™ sc, NO3D sc, NISE sc, AN-ISE sc	●
Oil in Water	FP360 sc	●
Organics	UVAS sc	●
Ozone	9187 sc	●
pH/ORP	pHD	●
pH/ORP	pHD, pH Combination, LCP	△
Phosphate	PHOSPHAX™ sc	●
Sludge Level	SONATAX™ sc	●
Suspended Solids	SOLITAX™ sc, TSS sc	●
Turbidity	1720E, FT660 sc, SS7 sc, ULTRATURB sc, SOLITAX sc, TSS sc	●
Ultra Pure Conductivity	8310, 8311, 8312, 8315, 8316, 8317 Contacting	△
Ultra Pure pH/ORP	8362	△

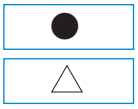
● = Digital △ = Analog

Connect up to two of any of the sensors listed above, in any combination, to meet your application needs. The diagrams below demonstrate the potential configurations. Operation of analog sensors requires the controller to be equipped with the appropriate sensor module. Contact Hach Technical Support for help with selecting the appropriate module.

2 Channel Configurations



1 Channel Configurations



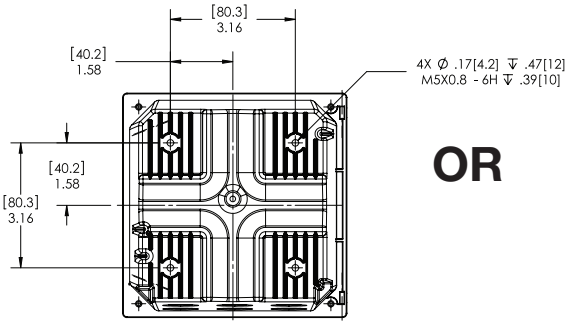
Specifications*

Dimensions (H x W x D)	5.7 in x 5.7 in x 7.1 in (144 mm x 144 mm x 181 mm)
Display	Graphic dot matrix LCD with LED backlighting, transreflective
Display Size	1.9 x 2.7 in. (48 mm x 68 mm)
Display Resolution	240 x 160 pixels
Weight	3.75 lbs. (1.70 kg)
Power Requirements (Voltage)	100 - 240 V AC, 24 V DC
Power Requirements (Hz)	50/60 Hz
Operating Temperature Range	-20 to 60 °C , 0 to 95% RH non-condensing
Analog Outputs	Two (Five with optional expansion module) to isolated current outputs, max 550 Ω , Accuracy: ± 0.1% of FS (20mA) at 25 °C, ± 0.5% of FS over -20 °C to 60 °C range Operational Mode: measurement or calculated value
Analog Output Functional Mode	Linear, Logarithmic, Bi-linear, PID
Security Levels	2 password-protected levels
Mounting Configurations	Wall, pole, and panel mounting
Enclosure Rating	NEMA 4X/IP66
Conduit Openings	1/2 in NPT Conduit
Relay: Operational Mode	Primary or secondary measurement, calculated value (dual channel only) or timer
Relay Functions	Scheduler (Timer), Alarm, Feeder Control, Event Control, Pulse Width Modulation, Frequency Control, and Warning
Relays	Four electromechanical SPDT (Form C) contacts, 1200 W, 5 A
Communication	MODBUS RS232/RS485, PROFIBUS DPV1, or HART 7.2 optional
Memory Backup	Flash memory
Electrical Certifications	EMC CE compliant for conducted and radiated emissions: - CISPR 11 (Class A limits) - EMC Immunity EN 61326-1 (Industrial limits) Safety cETLus safety mark for: - General Locations per ANSI/UL 61010-1 & CAN/CSA C22.2. No. 61010-1 - Hazardous Location Class I, Division 2, Groups A,B,C & D (Zone 2, Group IIC) per FM 3600 / FM 3611 & CSA C22.2 No. 213 M1987 with approved options and appropriately rated Class I, Division 2 or Zone 2 sensors cULus safety mark - General Locations per UL 61010-1 & CAN/CSA C22.2. No. 61010-1

Subject to change without notice.

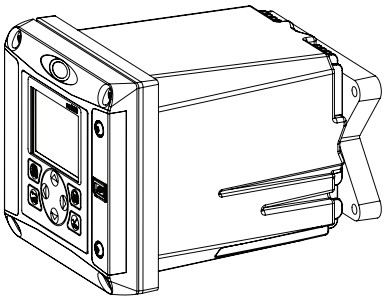
Dimensions

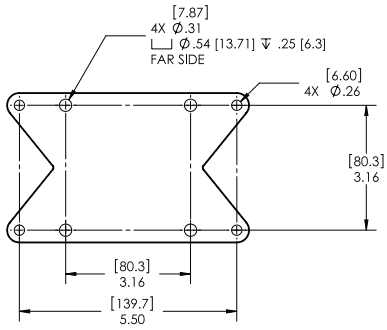
Surface Mounting Dimensions



Mounting Dimensions
(Rear View)

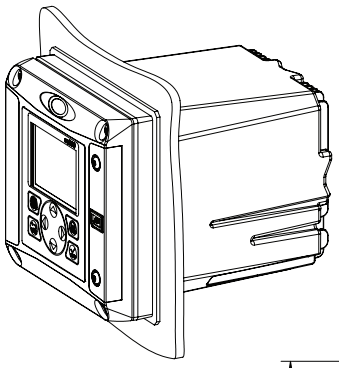
OR

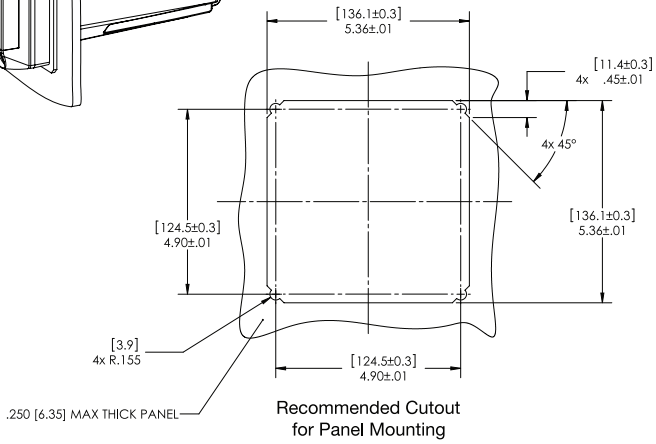




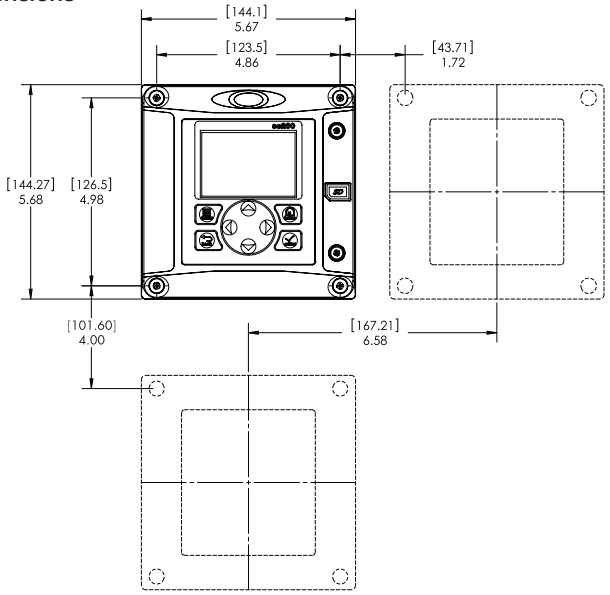
Bracket (supplied) for Surface Mounting
(Not compatible with Weather and Sun Shield p/n 9220600 when surface mounting.)

Panel Mounting Dimensions



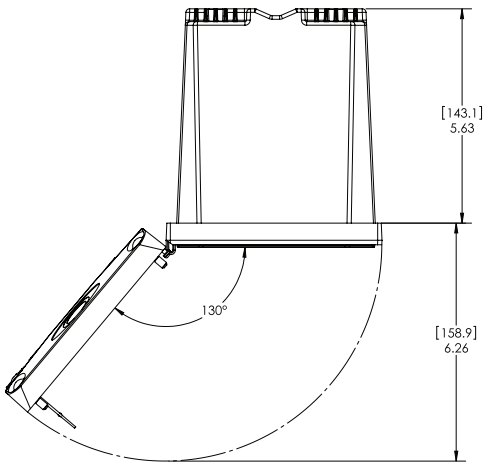


Recommended Cutout
for Panel Mounting

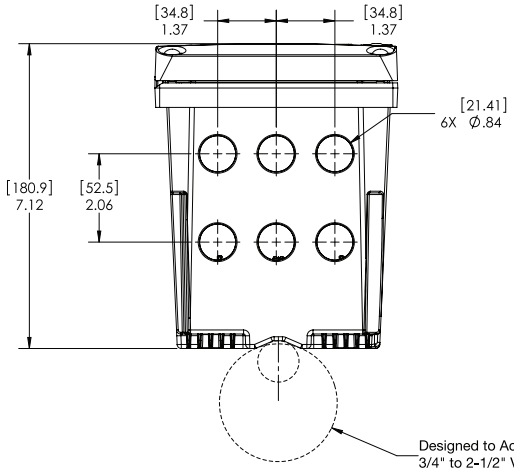


Minimum Spacing Dimensions
for Group Mounting

Top and Bottom Views



Door Opening Details



Ordering Information

sc200 for Hach Digital and Analog Sensors

LXV404.99.00552	sc200 controller, 2 channels, digital
LXV404.99.00502	sc200 controller, 1 channel, digital
LXV404.99.00102	sc200 controller, 1 channel, pH/DO
LXV404.99.00202	sc200 controller, 1 channel, Conductivity
LXV404.99.01552	sc200 controller, 2 channels, digital, Modbus RS232/RS485
LXV404.99.00112	sc200 controller, 2 channel, pH/DO

Note: Other Sensor combinations are available. Please contact Hach Technical Support or your Hach representative.

Note: Communication options (MODBUS, Profibus DPV1, and HART) are available. Please contact Hach Technical Support or your Hach representative.

sc200 for Ultrapure Sensors

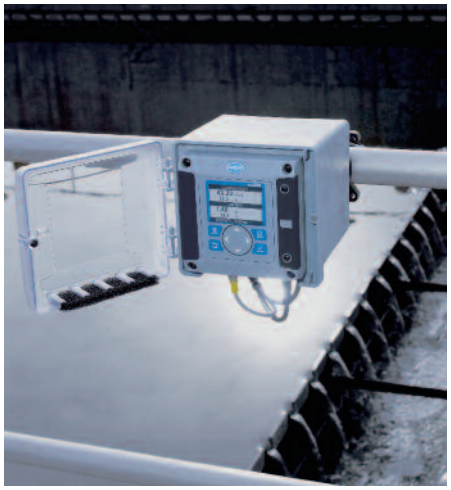
9500.99.00602	sc200 controller, 1 channel, ultrapure conductivity
9500.99.00702	sc200 controller, 1 channel, ultrapure pH
9500.99.00662	sc200 controller, 2 channel, ultrapure conductivity
9500.99.00772	sc200 controller, 2 channel, ultrapure pH

Sensor and Communication Modules

9012900	Analog pH/ORP and DO module for GLI Sensors
9013000	Analog Conductivity module for GLI Sensors
9012700	Flow module
9012800	4-20 mA Input Module
9525700	Analog pH/ORP Module for Polymetron Sensors
9525800	Analog Conductivity Module for Polymetron Sensors
9013200	Modbus 232/485 Module
9173900	Profibus DP Module
9328100	HART Module
9334600	4-20 mA Output Module (Provides 3 additional mA Outputs)

Accessories

9220600	sc200 Weather and Sun Shield with UV Protection Screen
8809200	sc200 UV Protection Screen
9218200	SD card reader (USB) for connection to PC
9218100	4 GB SD card



HACH COMPANY World Headquarters: Loveland, Colorado USA

United States: 800-227-4224 tel 970-669-2932 fax orders@hach.com
Outside United States: 970-669-3050 tel 970-461-3939 fax int@hach.com
hach.com

LIT2665 Rev 7
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HACH®
Be Right™

Sulfuric Acid, 3M

SECTION 1 : Identification of the substance/mixture and of the supplier

Product name : **Sulfuric Acid, 3M**

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: **S25899**

Recommended uses of the product and uses restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

Supplier Details:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

Emergency telephone number:

Fisher Science Education Emergency Telephone No.: 800-535-5053

SECTION 2 : Hazards identification

Classification of the substance or mixture:

Health hazard
Skin corrosion, category 1A
Serious eye damage, category 1

Corrosive to metals, category 1
skin corr./irrit. 1A
Corrosive to metals. 1
Eye corr. 1

Signal word :Danger

Hazard statements:
May be corrosive to metals
Causes severe skin burns and eye damage
Causes serious eye damage

Precautionary statements:
If medical advice is needed, have product container or label at hand
Keep out of reach of children
Read label before use
Wear protective gloves/protective clothing/eye protection/face protection
Wash ... thoroughly after handling
Do not breathe dust/fume/gas/mist/vapours/spray
Keep only in original container
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing
Immediately call a POISON CENTER or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
Specific treatment (see ... on this label)
Absorb spillage to prevent material damage
Store locked up
Dispose of contents/container to ...

Other Non-GHS Classification:

WHMIS

D1A 

E 

NFPA/HMIS

NFPA SCALE (0-4)

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:		
CAS 7664-93-9	Sulfuric Acid, ACS	31.004 %
CAS 7732-18-5	Water	68.996 %
		Percentages are by weight

SECTION 4 : First aid measures

Description of first aid measures

After inhalation: Loosen clothing as necessary and position individual in a comfortable position.Move exposed to fresh air. Give artificial respiration if necessary. If breathing is difficult give oxygen.Get medical assistance if cough or other symptoms appear.

After skin contact: Rinse/flush exposed skin gently using soap and water for 15-20 minutes.Seek medical advice if discomfort or irritation persists.

After eye contact: Protect unexposed eye.Rinse/flush exposed eye(s) gently using water for 15-20 minutes.Remove contact lens(es) if able to do so during rinsing.Seek medical attention if irritation persists or if concerned.

After swallowing: Rinse mouth thoroughly. Do not induce vomiting. Seek medical attention if irritation, discomfort, or vomiting persists.

Most important symptoms and effects, both acute and delayed:

Irritation.Headache.Nausea.Shortness of breath.;

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention provide SDS document to physician. Physician should treat symptomatically.

SECTION 5 : Firefighting measures

Extinguishing media

Suitable extinguishing agents: Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

For safety reasons unsuitable extinguishing agents:

Special hazards arising from the substance or mixture:

Thermal decomposition can lead to release of irritating gases and vapors.

Advice for firefighters:

Protective equipment: Wear protective eyeware, gloves, and clothing. Refer to Section 8.Use NIOSH-approved respiratory protection/breathing apparatus.

Additional information (precautions): Avoid inhaling gases, fumes, dust, mist, vapor, and aerosols. Avoid contact with skin, eyes, and clothing.

SECTION 6 : Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Ensure adequate ventilation.Ensure that air-handling systems are operational.

Environmental precautions:

Should not be released into environment.Prevent from reaching drains, sewer, or waterway.

Methods and material for containment and cleaning up:

Wear protective eyeware, gloves, and clothing. Refer to Section 8.Always obey local regulations.Containerize for disposal. Refer to Section 13.If necessary use trained response staff or contractor. Evacuate personnel to safe areas. Keep in suitable closed containers for disposal.

Reference to other sections:

SECTION 7 : Handling and storage

Precautions for safe handling:

Avoid contact with skin, eyes, and clothing.Follow good hygiene procedures when handling chemical materials. Refer to Section 8.Follow proper disposal methods. Refer to Section 13.Do not eat, drink, smoke, or use personal products when handling chemical substances.

Conditions for safe storage, including any incompatibilities:

Store in a cool location. Keep away from food and beverages.Protect from freezing and physical damage.Provide ventilation for containers. Keep container tightly sealed.Store away from incompatible materials.

SECTION 8 : Exposure controls/personal protection

Control Parameters:	7664-93-9, Sulfuric Acid, ACS, OSHA PEL: 1mg/m3 7664-93-9, Sulfuric Acid, ACS, ACGIH TLV: 1 mg/m3
Appropriate Engineering controls:	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above.
Respiratory protection:	Not required under normal conditions of use. Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls.When necessary use NIOSH approved breathing equipment.
Protection of skin:	Select glove material impermeable and resistant to the substance.Select glove material based on rates of diffusion and degradation. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.Use proper glove removal technique without touching outer surface. Avoid skin contact with used gloves.Wear protective clothing.
Eye protection:	Wear equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).Safety glasses or goggles are appropriate eye protection.
General hygienic measures:	Perform routine housekeeping. Wash hands before breaks and at the end of work. Avoid contact with skin, eyes, and clothing.Before wearing wash contaminated clothing.

SECTION 9 : Physical and chemical properties

Appearance (physical state,color):	Clear, colorless liquid.	**Explosion limit lower**: **Explosion limit upper**:	Not Determined Not Determined
Odor:	Odorless	**Vapor pressure**:	<0.00120mmHg
Odor threshold:	Not Determined	**Vapor density**:	Not Determined
pH-value:	< 0.03	**Relative density**:	Not Determined
Melting/Freezing point:	11C	**Solubilities**:	Miscible
Boiling point/Boiling range:	105 - 325C	**Partition coefficient (n-octanol/water)**:	Not Determined
Flash point (closed cup):	Not Determined	**Auto/Self-ignition temperature**:	Not Determined
Evaporation rate:	Not Determined	**Decomposition temperature**:	Not Determined
Flammability (solid,gaseous):	Not Determined	**Viscosity**:	a. Kinematic:Not Determined b. Dynamic: Not Determined
Density: Not Determined			

SECTION 10 : Stability and reactivity

Reactivity: Nonreactive under normal conditions.
Chemical stability: Stable under normal conditions.
Possible hazardous reactions: None under normal processing.

Conditions to avoid: Incompatible materials.
Incompatible materials: Organics. Metals. Chlorates. Alkalines. Carbides. Fulminates. Reducing agents. Nitrates. Acetic acid. Oxidizing agents
Hazardous decomposition products: Oxides of sulfur.

SECTION 11 : Toxicological information

Acute Toxicity:		
Inhalation:	510 mg/m3 2 h	Inhalation LC50 Rat
Oral:	2140 mg/kg	Oral LD50 Rat
Chronic Toxicity: No additional information.		
Corrosion Irritation: No additional information.		
Sensitization:		No additional information.
Single Target Organ (STOT):		No additional information.
Numerical Measures:		No additional information.
Carcinogenicity:		No additional information.
Mutagenicity:		No additional information.
Reproductive Toxicity:		No additional information.

SECTION 12 : Ecological information

Ecotoxicity

Freshwater Fish: 96 Hr LC50 Brachydanio rerio: >500 mg/L [static]

Fish: LC50 - Gambusia affinis (Mosquito fish) - 42 mg/l - 96 h

Invertebrates: EC50 - Daphnia magna (Water flea) - 29 mg/l - 24 h

Persistence and degradability:
Bioaccumulative potential:
Mobility in soil:
Other adverse effects:

SECTION 13 : Disposal considerations

Waste disposal recommendations:

Contact a licensed professional waste disposal service to dispose of this material.Dispose of empty containers as unused product.It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.

SECTION 14 : Transport information

UN-Number

1830

UN proper shipping name

Sulfuric Acid Solution

Transport hazard class(es)

Class:
8 Corrosive substances

Packing group:II
Environmental hazard:
Transport in bulk:
Special precautions for user:

SECTION 15 : Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Acute, Chronic

SARA Section 313 (Specific toxic chemical listings):

7664-93-9 Sulfuric Acid

RCRA (hazardous waste code):

None of the ingredients is listed

TSCA (Toxic Substances Control Act):

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

7664-93-9 Sulfuric Acid 1000 lbs

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

None of the ingredients is listed

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

None of the ingredients is listed

SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the

SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases:

Abbreviations and acronyms:
IMDG: International Maritime Code for Dangerous Goods
PNEC: Predicted No-Effect Concentration (REACH)
CFR: Code of Federal Regulations (USA)
SARA: Superfund Amendments and Reauthorization Act (USA)
RCRA: Resource Conservation and Recovery Act (USA)
TSCA: Toxic Substances Control Act (USA)
NPRI: National Pollutant Release Inventory (Canada)
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)

Effective date : 02.15.2015
Last updated : 03.19.2015

Appendix C

Receiving Water Laboratory Data Report

CERTIFICATE OF ANALYSIS

Mike Sabulis
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Eversource WRNRP - RGP (1610515)
ESS Laboratory Work Order Number: 1803257

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 5:22 pm, Mar 19, 2018

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1803257

SAMPLE RECEIPT

The following samples were received on March 12, 2018 for the analyses specified on the enclosed Chain of Custody Record.

The samples and analyses listed below were analyzed in accordance with the 2017 Remediation General Permit under the National Pollutant Discharge Elimination System (NPDES).

ESS Laboratory is unable to achieve the required detection limit of 0.4 mg/L for Ethanol for the RGP permit. We have also been unable to procure a subcontract laboatory that is able to achieve this limit. The data for Ethanol has been reported using our current method reporting limit.

Lab Number	Sample Name	Matrix	Analysis
1803257-01	1610515-SW - Dedham	Surface Water	200.7, 245.1, 2520B, 3113B, 350.1, 3500Cr B-2009, 9040

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1803257

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1803257

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-SW - Dedham
Date Sampled: 03/12/18 11:15
Percent Solids: N/A

ESS Laboratory Work Order: 1803257
ESS Laboratory Sample ID: 1803257-01
Sample Matrix: Surface Water
Units: ug/L

Extraction Method: 3005A/200.7

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (5.0)		200.7		1	KJK	03/15/18 2:08	100	10	CC81432
Arsenic	ND (0.5)		3113B		1	KJK	03/16/18 23:49	100	10	CC81432
Cadmium	**0.30** (0.08)		3113B		3	KJK	03/16/18 14:27	100	10	CC81432
Chromium	ND (2.0)		200.7		1	KJK	03/15/18 2:08	100	10	CC81432
Chromium III	ND (10.0)		200.7		1	JLK	03/15/18 2:08	1	1	[CALC]
Copper	**2.3** (2.0)		200.7		1	KJK	03/15/18 2:08	100	10	CC81432
Hardness	**84100** (82.4)		200.7		1	KJK	03/15/18 2:08	1	1	[CALC]
Iron	**220** (10.0)		200.7		1	KJK	03/15/18 2:08	100	10	CC81432
Lead	ND (2.0)		200.7		1	KJK	03/15/18 2:08	100	10	CC81432
Mercury	ND (0.200)		245.1		1	MJV	03/16/18 11:46	20	40	CC81435
Nickel	ND (5.0)		200.7		1	KJK	03/15/18 2:08	100	10	CC81432
Selenium	ND (1.0)		3113B		1	KJK	03/15/18 17:57	100	10	CC81432
Silver	ND (0.5)		200.7		1	KJK	03/15/18 2:08	100	10	CC81432
Zinc	**24.2** (5.0)		200.7		1	KJK	03/15/18 2:08	100	10	CC81432

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-SW - Dedham
Date Sampled: 03/12/18 11:15
Percent Solids: N/A

ESS Laboratory Work Order: 1803257
ESS Laboratory Sample ID: 1803257-01
Sample Matrix: Surface Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	EEM	03/15/18 12:15	mg/L	CC81438
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	03/12/18 19:20	ug/L	CC81241
pH	**6.56** (N/A)		9040		1	CCP	03/12/18 18:00	S.U.	CC81225
pH Sample Temp	**Aqueous pH measured in water at 12.3**								
Salinity	**0.4** (0.1)		2520B		1	EEM	03/16/18 15:45	ppt	CC81615

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1803257

Quality Control Data

Total Metals

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CC81241 - [CALC]										
Blank										
Chromium III	ND	10.0	ug/L							
LCS										
Chromium III	ND		ug/L							
LCS Dup										
Chromium III	ND		ug/L							
Batch CC81432 - 3005A/200.7										
Blank										
Antimony	ND	5.0	ug/L							
Arsenic	ND	0.5	ug/L							
Cadmium	ND	0.02	ug/L							
Chromium	ND	2.0	ug/L							
Chromium III	ND	2.00	ug/L							
Copper	ND	2.0	ug/L							
Hardness	ND	82.4	ug/L							
Iron	12.6	10.0	ug/L							
Lead	ND	2.0	ug/L							
Nickel	ND	5.0	ug/L							
Selenium	ND	1.0	ug/L							
Silver	ND	0.5	ug/L							
Zinc	ND	5.0	ug/L							
LCS										
Antimony	44.4	5.0	ug/L	50.00		89	85-115			
Arsenic	50.6	12.5	ug/L	50.00		101	85-115			
Cadmium	26.2	12.5	ug/L	25.00		105	85-115			
Chromium	44.2	2.0	ug/L	50.00		88	85-115			
Chromium III	44.2	2.00	ug/L							
Copper	44.7	2.0	ug/L	50.00		89	85-115			
Hardness	2930	82.4	ug/L							
Iron	216	10.0	ug/L	250.0		86	85-115			
Lead	44.7	2.0	ug/L	50.00		89	85-115			
Nickel	44.5	5.0	ug/L	50.00		89	85-115			
Selenium	94.4	25.0	ug/L	100.0		94	85-115			
Silver	22.2	0.5	ug/L	25.00		89	85-115			
Zinc	43.6	5.0	ug/L	50.00		87	85-115			
LCS Dup										
Arsenic	50.9	12.5	ug/L	50.00		102	85-115	0.6	20	
Cadmium	26.9	12.5	ug/L	25.00		107	85-115	2	20	
Chromium III	45.1	2.00	ug/L							
Hardness	2950	82.4	ug/L							
Selenium	93.1	25.0	ug/L	100.0		93	85-115	1	20	
Batch CC81435 - 245.1/7470A										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1803257

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CC81435 - 245.1/7470A										
Mercury	ND	0.200	ug/L							
LCS										
Mercury	5.84	0.200	ug/L	6.000		97	85-115			
LCS Dup										
Mercury	5.89	0.200	ug/L	6.000		98	85-115	0.9	20	
Classical Chemistry										
Batch CC81241 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	0.496		mg/L	0.4998		99	90-110			
LCS Dup										
Hexavalent Chromium	0.493		mg/L	0.4998		99	90-110	0.6	20	
Batch CC81438 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.11	0.10	mg/L	0.09994		112	80-120			
LCS										
Ammonia as N	0.98	0.10	mg/L	0.9994		98	80-120			
Batch CC81615 - General Preparation										
LCS										
Salinity	1.0		ppt	1.000		97	85-115			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP ESS Laboratory Work Order: 1803257

Notes and Definitions

Z16	Aqueous pH measured in water at 12.3 °C.
U	Analyte included in the analysis, but not detected
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1803257

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1803257
Date Received: 3/12/2018
Project Due Date: 3/19/2018
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.5 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	208204	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	208205	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
01	208206	Yes	NA	Yes	250 mL Poly - Unpres	NP	
01	208207	Yes	NA	Yes	250 mL Poly - Unpres	NP	
01	208208	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
01	208209	Yes	NA	Yes	250 mL Amber - Unpres	NP	

2nd Review
Are barcode labels on correct containers? (Yes) / No

Completed By: Date & Time: 3/12/18 1721
Reviewed By: Date & Time: 3/12/18 1743
Delivered By: 3/18/18 1743

ESS Laboratory

Division of Thielsch Engineering, Inc.

185 Frances Avenue, Cranston, RI 02910-2211

Tel. (401) 461-7181 Fax (401) 461-4486

www.esslaboratory.com

CHAIN OF CUSTODY

ESS LAB PROJECT ID: 1803257

Turn Time ___X___ Standard Rush_____ Approved By: _____

Reporting Limits - **Discharge into:** **Fresh Water** ☑ **Salt Water** ☐

State where samples were collected: **MA NH**

Is this project for: **RGP**

Electonic Deliverable Yes ✓ No ____

Format: Excel ___ Access ___ PDF ✓ Other ____

Project Manager: Mike Sabulis

Company: GEI

Address: 400 Unicorn Park Drive, Woburn, MA 01801

Project # 1610515

Project Name: Eversource WRNRP

PO # 1610515

ESS Lab Sample ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample Identification	# of Containers	RGP Metals Total		Hardness (Calculation)	pH	Salinity					Ammonia 350.1	Tri Cr (Calc. MUST run T. Cr)	Hex Cr 3500							Comment #
	~~3/12/2018~~		~~G~~	~~SW~~	~~1610515-SW(Valley)~~		~~X~~		~~X~~	~~X~~						~~X~~	~~X~~	~~X~~							SAW
1	3/12/2018	1115	G	SW	1610515-SW(Dedham)		X		X	X	X					X	X	X							
	~~3/12/2018~~		~~G~~	~~SW~~	~~1610515-SW(ROW)~~		~~X~~		~~X~~	~~X~~						~~X~~	~~X~~	~~X~~							SAW

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____	4	4	4	1	1	5	2	1	1	3	-	1	3	2	1	2	1	1
Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA	P	P	P	V	P	P	AG	P	P	P	-	P	AG	V	AG	V	AG	AG

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes ____ No

Seals Intact ___ Yes ___ No NA: ✓

Cooler Temperature: Ice Temp: 2-5

Sampled by :

Comments: 1) RGP Metals include Sb, As, Cd, Cu, Fe, Pb, Ni, Se, Ag and Zn by 200.7/3113B and Hg by 245.1

2) Parameters in **BOLD** have Short hold-time **PERMIT ATTACHED**

*** TSS, TRC and Cl taken from the same container**

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	3-12-18 1452	[signature] 3/12/18	[signature]	3/12/18 16:57	[signature] 3/12/18 1708
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Please E-mail all changes to Chain of Custody in writir

Page 1 of 1

Appendix D

Source Water Laboratory Data Report

CERTIFICATE OF ANALYSIS

Mike Sabulis
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Eversource WRNRP - RGP (1610515)
ESS Laboratory Work Order Number: 1712033

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 5:23 pm, Dec 12, 2017

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712033

SAMPLE RECEIPT

The following samples were received on December 01, 2017 for the analyses specified on the enclosed Chain of Custody Record.

The samples and analyses listed below were analyzed in accordance with the 2017 Remediation General Permit under the National Pollutant Discharge Elimination System (NPDES).

ESS Laboratory is unable to achieve the required detection limit of 0.4 mg/L for Ethanol for the RGP permit. We have also been unable to procure a subcontract laboatory that is able to achieve this limit. The data for Ethanol has been reported using our current method reporting limit.

Lab Number	Sample Name	Matrix	Analysis
1712033-01	1610515-B16 MW	Ground Water	1664A, 200.7, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 420.1, 4500 CN CE, 4500Cl D, 504.1, 524.2, 608, 625 SIM, 8270D SIM, ASTM D3695
1712033-02	1610515-B6 MW	Ground Water	200.7, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 4500 CN CE, 4500Cl D, 504.1, 524.2, ASTM D3695

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP ESS Laboratory Work Order: 1712033

PROJECT NARRATIVE

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane
1712033-01 **Surrogate recovery(ies) above upper control limit (S+).**
Pentachloroethane [2C] (153% @ 30-150%)

524.2 Volatile Organic Compounds
CL70636-BSD1 **Blank Spike recovery is above upper control limit (B+).**
Tertiary-butyl Alcohol (131% @ 70-130%)

625(SIM) Semi-Volatile Organic Compounds
CL70612-BS2 **Blank Spike recovery is above upper control limit (B+).**
2,4,6-Tribromophenol (130% @ 15-110%)
CL70612-BSD2 **Relative percent difference for duplicate is outside of criteria (D+).**
Benzo(a)anthracene (25% @ 20%), Benzo(a)pyrene (21% @ 20%), Benzo(g,h,i)perylene (23% @ 20%), Benzo(k)fluoranthene (28% @ 20%), bis(2-Ethylhexyl)phthalate (24% @ 20%), Butylbenzylphthalate (24% @ 20%), Chrysene (24% @ 20%), Dibenzo(a,h)Anthracene (21% @ 20%), Indeno(1,2,3-cd)Pyrene (22% @ 20%), Pyrene (23% @ 20%)
CL70612-BSD2 **Surrogate recovery(ies) above upper control limit (S+).**
2,4,6-Tribromophenol (135% @ 15-110%)

Classical Chemistry
1712033-01 **The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
1712033-02 **The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**

Total Metals
1712033-02 **Present in Method Blank (B).**
Iron

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712033

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B16 MW
Date Sampled: 12/01/17 09:20
Percent Solids: N/A

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-01
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Dissolved Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (10.0)		200.7		1	KJK	12/05/17 21:26	100	20	CL70434
Arsenic	ND (5.0)		3113B		5	KJK	12/06/17 1:49	100	20	CL70434
Cadmium	ND (0.25)		3113B		5	KJK	12/06/17 20:08	100	20	CL70434
Chromium	ND (4.0)		200.7		1	KJK	12/05/17 21:26	100	20	CL70434
Copper	ND (4.0)		200.7		1	KJK	12/06/17 17:47	100	20	CL70434
Iron	ND (20.0)		200.7		1	KJK	12/06/17 17:47	100	20	CL70434
Lead	ND (2.0)		3113B		5	KJK	12/05/17 23:29	100	20	CL70434
Mercury	ND (0.20)		245.1		1	BJV	12/05/17 14:04	20	40	CL70437
Nickel	ND (10.0)		200.7		1	KJK	12/05/17 21:26	100	20	CL70434
Selenium	ND (4.0)		3113B		5	KJK	12/06/17 23:08	100	20	CL70434
Silver	ND (1.0)		200.7		1	KJK	12/08/17 14:46	100	20	CL70731
Zinc	**18.3** (10.0)		200.7		1	KJK	12/05/17 21:26	100	20	CL70434

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B16 MW
Date Sampled: 12/01/17 09:20
Percent Solids: N/A

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-01
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (10.0)		200.7		1	KJK	12/05/17 21:38	100	20	CL70434
Arsenic	ND (5.0)		3113B		5	KJK	12/06/17 1:55	100	20	CL70434
Cadmium	ND (0.25)		3113B		5	KJK	12/06/17 20:36	100	20	CL70434
Chromium	ND (4.0)		200.7		1	KJK	12/05/17 21:38	100	20	CL70434
Chromium III	ND (10.0)		200.7		1	JLK	12/05/17 21:38	1	1	[CALC]
Copper	ND (4.0)		200.7		1	KJK	12/05/17 21:38	100	20	CL70434
Hardness	**40700** (999)		200.7		10	KJK	12/06/17 16:57	1	1	[CALC]
Iron	ND (20.0)		200.7		1	KJK	12/06/17 16:57	100	20	CL70434
Lead	ND (2.0)		3113B		5	KJK	12/05/17 23:47	100	20	CL70434
Mercury	ND (0.200)		245.1		1	BJV	12/05/17 13:45	20	40	CL70437
Nickel	ND (10.0)		200.7		1	KJK	12/05/17 21:38	100	20	CL70434
Selenium	ND (4.0)		3113B		5	KJK	12/06/17 23:14	100	20	CL70434
Silver	ND (1.0)		200.7		1	KJK	12/08/17 14:42	100	20	CL70731
Zinc	**19.2** (10.0)		200.7		1	KJK	12/05/17 21:38	100	20	CL70434

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B16 MW
Date Sampled: 12/01/17 09:20
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: DMC

524.2 Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1-Trichloroethane	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
1,1,2-Trichloroethane	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
1,1-Dichloroethane	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
1,1-Dichloroethene	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
1,2-Dichlorobenzene	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
1,2-Dichloroethane	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
1,3-Dichlorobenzene	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
1,4-Dichlorobenzene	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Acetone	ND (5.0)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Benzene	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Carbon Tetrachloride	ND (0.3)		524.2		1	12/06/17 19:26	C7L0083	CL70636
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Ethylbenzene	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Methylene Chloride	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Naphthalene	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Tetrachloroethene	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Toluene	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Trichloroethene	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Vinyl Chloride	ND (0.2)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Xylene O	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636
Xylene P,M	ND (0.5)		524.2		1	12/06/17 19:26	C7L0083	CL70636

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*105 %*		*80-120*
Surrogate: 4-Bromofluorobenzene	*99 %*		*80-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B16 MW
Date Sampled: 12/01/17 09:20
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: CAD
Prepared: 12/4/17 9:53

608 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.09)		608		1	12/04/17 19:51		CL70407
Aroclor 1221	ND (0.09)		608		1	12/04/17 19:51		CL70407
Aroclor 1232	ND (0.09)		608		1	12/04/17 19:51		CL70407
Aroclor 1242	ND (0.09)		608		1	12/04/17 19:51		CL70407
Aroclor 1248	ND (0.09)		608		1	12/04/17 19:51		CL70407
Aroclor 1254	ND (0.09)		608		1	12/04/17 19:51		CL70407
Aroclor 1260	ND (0.09)		608		1	12/04/17 19:51		CL70407
Aroclor 1262	ND (0.09)		608		1	12/04/17 19:51		CL70407
Aroclor 1268	ND (0.09)		608		1	12/04/17 19:51		CL70407

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*58 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*64 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*48 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*61 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B16 MW
Date Sampled: 12/01/17 09:20
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 12/6/17 14:36

625(SIM) Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acenaphthene	ND (0.19)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Acenaphthylene	ND (0.19)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Anthracene	ND (0.19)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Benzo(a)anthracene	ND (0.05)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Benzo(a)pyrene	ND (0.05)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Benzo(b)fluoranthene	ND (0.05)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Benzo(g,h,i)perylene	ND (0.19)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Benzo(k)fluoranthene	ND (0.05)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
bis(2-Ethylhexyl)phthalate	ND (1.87)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Butylbenzylphthalate	ND (1.87)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Chrysene	ND (0.05)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Dibenzo(a,h)Anthracene	ND (0.05)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Diethylphthalate	ND (2.34)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Dimethylphthalate	ND (2.34)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Di-n-butylphthalate	ND (2.34)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Di-n-octylphthalate	ND (2.34)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Fluoranthene	ND (0.19)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Fluorene	ND (0.19)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Indeno(1,2,3-cd)Pyrene	ND (0.05)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Naphthalene	ND (0.19)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Pentachlorophenol	ND (0.84)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Phenanthrene	ND (0.19)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612
Pyrene	ND (0.19)		625 SIM		1	12/11/17 11:43	C7L0142	CL70612

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*64 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*110 %*		*15-110*
Surrogate: 2-Fluorobiphenyl	*71 %*		*30-130*
Surrogate: Nitrobenzene-d5	*86 %*		*30-130*
Surrogate: p-Terphenyl-d14	*82 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B16 MW
Date Sampled: 12/01/17 09:20
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 12/8/17 14:00

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,4-Dioxane	ND (0.250)		8270D SIM		1	12/11/17 8:41	C7L0142	CL70747

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	*53 %*		*15-115*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B16 MW
Date Sampled: 12/01/17 09:20
Percent Solids: N/A

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-01
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	12/05/17 18:44	mg/L	CL70514
Chloride	**102** (50.0)		300.0		100	EEM	12/04/17 14:16	mg/L	CL70419
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	12/01/17 21:39	ug/L	CL70145
Phenols	**105** (100)		420.1		1	JLK	12/06/17 17:40	ug/L	CL70640
Total Cyanide (LL)	ND (5.00)		4500 CN CE		1	EEM	12/05/17 14:50	ug/L	CL70519
Total Petroleum Hydrocarbon	ND (4.67)		1664A		1	LAB	12/08/17 9:04	mg/L	CL70611
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	12/01/17 19:54	ug/L	CL70146
Total Suspended Solids	ND (5)		2540D		1	JLK	12/06/17 22:06	mg/L	CL70652

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B16 MW
Date Sampled: 12/01/17 09:20
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: SMR
Prepared: 12/8/17 11:35

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2-Dibromoethane	ND (0.015)		504.1		1	12/08/17 18:27		CL70822

	%Recovery	Qualifier	Limits
Surrogate: Pentachloroethane	*135 %*		*30-150*
Surrogate: Pentachloroethane [2C]	*153 %*	*S+*	*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B16 MW
Date Sampled: 12/01/17 09:20
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 12/6/17 8:27

Alcohol Scan by GC/FID

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Ethanol	ND (10)		ASTM D3695		1	ZLC	12/06/17 13:18		CL70605

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B6 MW
Date Sampled: 12/01/17 13:30
Percent Solids: N/A

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-02
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (10.0)		200.7		1	KJK	12/05/17 22:15	100	20	CL70434
Arsenic	ND (5.0)		3113B		5	KJK	12/06/17 2:17	100	20	CL70434
Cadmium	ND (0.25)		3113B		5	KJK	12/06/17 21:29	100	20	CL70434
Chromium	**5.8** (4.0)		200.7		1	KJK	12/05/17 22:15	100	20	CL70434
Chromium III	ND (10.0)		200.7		1	JLK	12/05/17 22:15	1	1	[CALC]
Copper	**29.6** (4.0)		200.7		1	KJK	12/08/17 14:50	100	20	CL70731
Hardness	**81500** (999)		200.7		10	KJK	12/06/17 17:43	1	1	[CALC]
Iron	**B 1020** (20.0)		200.7		1	KJK	12/06/17 17:43	100	20	CL70434
Lead	**5.3** (2.0)		3113B		5	KJK	12/06/17 0:09	100	20	CL70434
Mercury	ND (0.200)		245.1		1	BJV	12/05/17 13:57	20	40	CL70437
Nickel	ND (10.0)		200.7		1	KJK	12/06/17 17:43	100	20	CL70434
Selenium	ND (4.0)		3113B		5	KJK	12/06/17 23:37	100	20	CL70434
Silver	ND (1.0)		200.7		1	KJK	12/08/17 14:50	100	20	CL70731
Zinc	**25.2** (10.0)		200.7		1	KJK	12/05/17 22:15	100	20	CL70434

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B6 MW
Date Sampled: 12/01/17 13:30
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: DMC

524.2 Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1-Trichloroethane	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
1,1,2-Trichloroethane	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
1,1-Dichloroethane	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
1,1-Dichloroethene	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
1,2-Dichlorobenzene	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
1,2-Dichloroethane	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
1,3-Dichlorobenzene	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
1,4-Dichlorobenzene	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Acetone	ND (5.0)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Benzene	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Carbon Tetrachloride	ND (0.3)		524.2		1	12/06/17 20:00	C7L0083	CL70636
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Ethylbenzene	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Methylene Chloride	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Naphthalene	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Tetrachloroethene	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Toluene	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Trichloroethene	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Vinyl Chloride	ND (0.2)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Xylene O	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636
Xylene P,M	ND (0.5)		524.2		1	12/06/17 20:00	C7L0083	CL70636

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*104 %*		*80-120*
Surrogate: 4-Bromofluorobenzene	*97 %*		*80-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B6 MW
Date Sampled: 12/01/17 13:30
Percent Solids: N/A

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-02
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	12/05/17 18:45	mg/L	CL70514
Chloride	**77.8** (50.0)		300.0		100	EEM	12/04/17 14:32	mg/L	CL70419
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	12/01/17 21:39	ug/L	CL70145
Total Cyanide (LL)	ND (5.00)		4500 CN CE		1	EEM	12/05/17 14:50	ug/L	CL70519
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	12/01/17 19:54	ug/L	CL70146
Total Suspended Solids	**136** (5)		2540D		1	JLK	12/06/17 22:06	mg/L	CL70652

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B6 MW
Date Sampled: 12/01/17 13:30
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: SMR
Prepared: 12/8/17 11:35

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2-Dibromoethane	ND (0.015)		504.1		1	12/08/17 19:17		CL70822

	%Recovery	Qualifier	Limits
Surrogate: Pentachloroethane	*139 %*		*30-150*
Surrogate: Pentachloroethane [2C]	*143 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B6 MW
Date Sampled: 12/01/17 13:30
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1712033
ESS Laboratory Sample ID: 1712033-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 12/6/17 8:27

Alcohol Scan by GC/FID

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Ethanol	ND (10)		ASTM D3695		1	ZLC	12/06/17 14:07		CL70605

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712033

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Dissolved Metals										
Batch CL70434 - 3005A/200.7										
Blank										
Antimony	ND	10.0	ug/L							
Arsenic	ND	1.0	ug/L							
Cadmium	ND	0.05	ug/L							
Chromium	ND	4.0	ug/L							
Copper	7.1	4.0	ug/L							
Iron	22.6	20.0	ug/L							
Lead	ND	0.4	ug/L							
Nickel	ND	10.0	ug/L							
Selenium	ND	0.8	ug/L							
Zinc	ND	10.0	ug/L							
LCS										
Antimony	101	10.0	ug/L	100.0		101	85-115			
Arsenic	102	25.0	ug/L	100.0		102	85-115			
Cadmium	44.9	25.0	ug/L	50.00		90	80-120			
Chromium	97.8	4.0	ug/L	100.0		98	80-120			
Copper	101	4.0	ug/L	100.0		101	80-120			
Iron	427	20.0	ug/L	500.0		85	80-120			
Lead	110	10.0	ug/L	100.0		110	80-120			
Nickel	103	10.0	ug/L	100.0		103	85-115			
Selenium	226	20.0	ug/L	200.0		113	80-120			
Zinc	104	10.0	ug/L	100.0		104	85-115			
LCS Dup										
Antimony	100	10.0	ug/L	100.0		100	85-115	0.7	20	
Arsenic	101	25.0	ug/L	100.0		101	85-115	0.9	20	
Cadmium	45.8	25.0	ug/L	50.00		92	80-120	2	20	
Chromium	97.1	4.0	ug/L	100.0		97	80-120	0.8	20	
Copper	100	4.0	ug/L	100.0		100	80-120	0.8	20	
Iron	424	20.0	ug/L	500.0		85	80-120	0.6	20	
Lead	109	10.0	ug/L	100.0		109	80-120	1	20	
Nickel	103	10.0	ug/L	100.0		103	85-115	0.8	20	
Selenium	220	20.0	ug/L	200.0		110	80-120	3	20	
Zinc	103	10.0	ug/L	100.0		103	85-115	2	20	
Batch CL70437 - 245.1/7470A										
Blank										
Mercury	ND	0.20	ug/L							
LCS										
Mercury	5.98	0.20	ug/L	6.000		100	85-115			
LCS Dup										
Mercury	5.93	0.20	ug/L	6.000		99	85-115	0.9	20	
Batch CL70731 - 3005A/200.7										
Blank										
Silver	ND	1.0	ug/L							

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Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Dissolved Metals										
Batch CL70731 - 3005A/200.7										
LCS										
Silver	50.7	1.0	ug/L	50.00		101	85-115			
LCS Dup										
Silver	49.5	1.0	ug/L	50.00		99	85-115	2	20	
Total Metals										
Batch CL70145 - [CALC]										
Blank										
Chromium III	ND	10.0	ug/L							
LCS										
Chromium III	ND		ug/L							
LCS Dup										
Chromium III	ND		ug/L							
Batch CL70434 - 3005A/200.7										
Blank										
Antimony	ND	10.0	ug/L							
Arsenic	ND	1.0	ug/L							
Cadmium	ND	0.05	ug/L							
Chromium	ND	4.0	ug/L							
Chromium III	ND	4.00	ug/L							
Copper	7.1	4.0	ug/L							
Hardness	ND	165	ug/L							
Iron	22.6	20.0	ug/L							
Lead	ND	0.4	ug/L							
Nickel	ND	10.0	ug/L							
Selenium	ND	0.8	ug/L							
Zinc	ND	10.0	ug/L							
LCS										
Antimony	101	10.0	ug/L	100.0		101	85-115			
Arsenic	102	25.0	ug/L	100.0		102	85-115			
Cadmium	44.9	25.0	ug/L	50.00		90	85-115			
Chromium	97.8	4.0	ug/L	100.0		98	85-115			
Chromium III	97.8	4.00	ug/L							
Copper	101	4.0	ug/L	100.0		101	85-115			
Hardness	5870	165	ug/L							
Iron	427	20.0	ug/L	500.0		85	85-115			
Lead	110	10.0	ug/L	100.0		110	85-115			
Nickel	103	10.0	ug/L	100.0		103	85-115			
Selenium	226	20.0	ug/L	200.0		113	85-115			
Zinc	104	10.0	ug/L	100.0		104	85-115			
LCS Dup										
Arsenic	101	25.0	ug/L	100.0		101	85-115	0.9	20	
Cadmium	45.8	25.0	ug/L	50.00		92	85-115	2	20	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CL70434 - [CALC]										
Chromium III	97.1	4.00	ug/L							
Hardness	5820	165	ug/L							
Lead	109	10.0	ug/L	100.0		109	85-115	1	20	
Selenium	220	20.0	ug/L	200.0		110	85-115	3	20	
Batch CL70437 - 245.1/7470A										
Blank										
Mercury	ND	0.200	ug/L							
LCS										
Mercury	5.98	0.200	ug/L	6.000		100	85-115			
LCS Dup										
Mercury	5.93	0.200	ug/L	6.000		99	85-115	0.9	20	
Batch CL70731 - 3005A/200.7										
Blank										
Copper	ND	4.0	ug/L							
Silver	ND	1.0	ug/L							
LCS										
Copper	101	4.0	ug/L	100.0		101	85-115			
Silver	50.7	1.0	ug/L	50.00		101	85-115			
LCS Dup										
Copper	98.4	4.0	ug/L	100.0		98	85-115	3	20	
Silver	49.5	1.0	ug/L	50.00		99	85-115	2	20	
524.2 Volatile Organic Compounds										
Batch CL70636 - 524.2										
Blank										
1,1,1-Trichloroethane	ND	0.5	ug/L							
1,1,2-Trichloroethane	ND	0.5	ug/L							
1,1-Dichloroethane	ND	0.5	ug/L							
1,1-Dichloroethene	ND	0.5	ug/L							
1,2-Dichlorobenzene	ND	0.5	ug/L							
1,2-Dichloroethane	ND	0.5	ug/L							
1,3-Dichlorobenzene	ND	0.5	ug/L							
1,4-Dichlorobenzene	ND	0.5	ug/L							
Acetone	ND	5.0	ug/L							
Benzene	ND	0.5	ug/L							
Carbon Tetrachloride	ND	0.3	ug/L							
cis-1,2-Dichloroethene	ND	0.5	ug/L							
Ethylbenzene	ND	0.5	ug/L							
Methyl tert-Butyl Ether	ND	0.5	ug/L							
Methylene Chloride	ND	0.5	ug/L							
Naphthalene	ND	0.5	ug/L							
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tertiary-butyl Alcohol	ND	25.0	ug/L							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch CL70636 - 524.2										
Tetrachloroethene	ND	0.5	ug/L							
Toluene	ND	0.5	ug/L							
Trichloroethene	ND	0.5	ug/L							
Vinyl Chloride	ND	0.2	ug/L							
Xylene O	ND	0.5	ug/L							
Xylene P,M	ND	0.5	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*5.20*		ug/L	*5.000*		*104*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.88*		ug/L	*5.000*		*98*	*80-120*			
LCS										
1,1,1-Trichloroethane	10.3		ug/L	10.00		103	70-130			
1,1,2-Trichloroethane	10.1		ug/L	10.00		101	70-130			
1,1-Dichloroethane	9.9		ug/L	10.00		99	70-130			
1,1-Dichloroethene	10.7		ug/L	10.00		107	70-130			
1,2-Dichlorobenzene	10.5		ug/L	10.00		105	70-130			
1,2-Dichloroethane	10.6		ug/L	10.00		106	70-130			
1,3-Dichlorobenzene	10.4		ug/L	10.00		104	70-130			
1,4-Dichlorobenzene	10.3		ug/L	10.00		103	70-130			
Acetone	52.7		ug/L	50.00		105	70-130			
Benzene	10.4		ug/L	10.00		104	70-130			
Carbon Tetrachloride	10.3		ug/L	10.00		103	70-130			
cis-1,2-Dichloroethene	10.3		ug/L	10.00		103	70-130			
Ethylbenzene	10.2		ug/L	10.00		102	70-130			
Methyl tert-Butyl Ether	10.0		ug/L	10.00		100	70-130			
Methylene Chloride	10.4		ug/L	10.00		104	70-130			
Naphthalene	10.7		ug/L	10.00		107	70-130			
Tertiary-amyl methyl ether	10.1		ug/L	10.00		101	70-130			
Tertiary-butyl Alcohol	64.9		ug/L	50.00		130	70-130			
Tetrachloroethene	7.9		ug/L	10.00		79	70-130			
Toluene	10.2		ug/L	10.00		102	70-130			
Trichloroethene	10.3		ug/L	10.00		103	70-130			
Vinyl Chloride	10.3		ug/L	10.00		103	70-130			
Xylene O	10.1		ug/L	10.00		101	70-130			
Xylene P,M	20.2		ug/L	20.00		101	70-130			
Surrogate: 1,2-Dichlorobenzene-d4	*5.21*		ug/L	*5.000*		*104*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*5.16*		ug/L	*5.000*		*103*	*80-120*			
LCS Dup										
1,1,1-Trichloroethane	10.1		ug/L	10.00		101	70-130	2	20	
1,1,2-Trichloroethane	10.0		ug/L	10.00		100	70-130	1	20	
1,1-Dichloroethane	9.7		ug/L	10.00		97	70-130	2	20	
1,1-Dichloroethene	10.5		ug/L	10.00		105	70-130	2	20	
1,2-Dichlorobenzene	10.1		ug/L	10.00		101	70-130	4	20	
1,2-Dichloroethane	10.5		ug/L	10.00		105	70-130	2	20	
1,3-Dichlorobenzene	10.2		ug/L	10.00		102	70-130	1	20	
1,4-Dichlorobenzene	10.2		ug/L	10.00		102	70-130	1	20	
Acetone	51.0		ug/L	50.00		102	70-130	3	20	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch CL70636 - 524.2										
Benzene	10.3		ug/L	10.00		103	70-130	0.8	20	
Carbon Tetrachloride	10.0		ug/L	10.00		100	70-130	3	20	
cis-1,2-Dichloroethene	9.9		ug/L	10.00		99	70-130	4	20	
Ethylbenzene	10.0		ug/L	10.00		100	70-130	2	20	
Methyl tert-Butyl Ether	10.1		ug/L	10.00		101	70-130	1	20	
Methylene Chloride	10.2		ug/L	10.00		102	70-130	3	20	
Naphthalene	10.7		ug/L	10.00		107	70-130	0.6	20	
Tertiary-amyl methyl ether	10.0		ug/L	10.00		100	70-130	2	20	
Tertiary-butyl Alcohol	65.4		ug/L	50.00		131	70-130	0.8	25	B+
Tetrachloroethene	7.8		ug/L	10.00		78	70-130	2	20	
Toluene	10.2		ug/L	10.00		102	70-130	0.5	20	
Trichloroethene	10.2		ug/L	10.00		102	70-130	2	20	
Vinyl Chloride	10.0		ug/L	10.00		100	70-130	3	20	
Xylene O	10.0		ug/L	10.00		100	70-130	0.8	20	
Xylene P,M	20.1		ug/L	20.00		100	70-130	0.7	20	
Surrogate: 1,2-Dichlorobenzene-d4	*5.06*		ug/L	*5.000*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*5.10*		ug/L	*5.000*		*102*	*80-120*			
608 Polychlorinated Biphenyls (PCB)										
Batch CL70407 - 3510C										
Blank										
Aroclor 1016	ND	0.10	ug/L							
Aroclor 1016 [2C]	ND	0.10	ug/L							
Aroclor 1221	ND	0.10	ug/L							
Aroclor 1221 [2C]	ND	0.10	ug/L							
Aroclor 1232	ND	0.10	ug/L							
Aroclor 1232 [2C]	ND	0.10	ug/L							
Aroclor 1242	ND	0.10	ug/L							
Aroclor 1242 [2C]	ND	0.10	ug/L							
Aroclor 1248	ND	0.10	ug/L							
Aroclor 1248 [2C]	ND	0.10	ug/L							
Aroclor 1254	ND	0.10	ug/L							
Aroclor 1254 [2C]	ND	0.10	ug/L							
Aroclor 1260	ND	0.10	ug/L							
Aroclor 1260 [2C]	ND	0.10	ug/L							
Aroclor 1262	ND	0.10	ug/L							
Aroclor 1262 [2C]	ND	0.10	ug/L							
Aroclor 1268	ND	0.10	ug/L							
Aroclor 1268 [2C]	ND	0.10	ug/L							
Surrogate: Decachlorobiphenyl	*0.0390*		ug/L	*0.05000*		*78*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0396*		ug/L	*0.05000*		*79*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0328*		ug/L	*0.05000*		*66*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0373*		ug/L	*0.05000*		*75*	*30-150*			
LCS										

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Client Project ID: Eversource WRNRP - RGP

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
608 Polychlorinated Biphenyls (PCB)										
Batch CL70407 - 3510C										
Aroclor 1016	0.91	0.10	ug/L	1.000		91	40-140			
Aroclor 1016 [2C]	1.01	0.10	ug/L	1.000		101	40-140			
Aroclor 1260	0.95	0.10	ug/L	1.000		95	40-140			
Aroclor 1260 [2C]	1.05	0.10	ug/L	1.000		105	40-140			
Surrogate: Decachlorobiphenyl	*0.0477*		ug/L	*0.05000*		*95*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0485*		ug/L	*0.05000*		*97*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0427*		ug/L	*0.05000*		*85*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0444*		ug/L	*0.05000*		*89*	*30-150*			
LCS Dup										
Aroclor 1016	0.94	0.10	ug/L	1.000		94	40-140	4	20	
Aroclor 1016 [2C]	1.08	0.10	ug/L	1.000		108	40-140	7	20	
Aroclor 1260	0.95	0.10	ug/L	1.000		95	40-140	0.8	20	
Aroclor 1260 [2C]	1.10	0.10	ug/L	1.000		110	40-140	4	20	
Surrogate: Decachlorobiphenyl	*0.0478*		ug/L	*0.05000*		*96*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0499*		ug/L	*0.05000*		*100*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0417*		ug/L	*0.05000*		*83*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0445*		ug/L	*0.05000*		*89*	*30-150*			
625(SIM) Semi-Volatile Organic Compounds										
Batch CL70612 - 3510C										
Blank										
Acenaphthene	ND	0.20	ug/L							
Acenaphthylene	ND	0.20	ug/L							
Anthracene	ND	0.20	ug/L							
Benzo(a)anthracene	ND	0.05	ug/L							
Benzo(a)pyrene	ND	0.05	ug/L							
Benzo(b)fluoranthene	ND	0.05	ug/L							
Benzo(g,h,i)perylene	ND	0.20	ug/L							
Benzo(k)fluoranthene	ND	0.05	ug/L							
bis(2-Ethylhexyl)phthalate	ND	2.00	ug/L							
Butylbenzylphthalate	ND	2.50	ug/L							
Chrysene	ND	0.05	ug/L							
Dibenzo(a,h)Anthracene	ND	0.05	ug/L							
Diethylphthalate	ND	2.50	ug/L							
Dimethylphthalate	ND	2.50	ug/L							
Di-n-butylphthalate	ND	2.50	ug/L							
Di-n-octylphthalate	ND	2.50	ug/L							
Fluoranthene	ND	0.20	ug/L							
Fluorene	ND	0.20	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	0.05	ug/L							
Naphthalene	ND	0.20	ug/L							
Pentachlorophenol	ND	0.90	ug/L							
Phenanthrene	ND	0.20	ug/L							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625(SIM) Semi-Volatile Organic Compounds										
Batch CL70612 - 3510C										
Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*1.32*		ug/L	*2.500*		*53*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.40*		ug/L	*3.750*		*91*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.64*		ug/L	*2.500*		*66*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.03*		ug/L	*2.500*		*81*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.09*		ug/L	*2.500*		*84*	*30-130*			
LCS										
Acenaphthene	3.02	0.20	ug/L	4.000		75	40-140			
Acenaphthylene	3.04	0.20	ug/L	4.000		76	40-140			
Anthracene	3.09	0.20	ug/L	4.000		77	40-140			
Benzo(a)anthracene	2.33	0.05	ug/L	4.000		58	40-140			
Benzo(a)pyrene	2.57	0.05	ug/L	4.000		64	40-140			
Benzo(b)fluoranthene	2.64	0.05	ug/L	4.000		66	40-140			
Benzo(g,h,i)perylene	2.60	0.20	ug/L	4.000		65	40-140			
Benzo(k)fluoranthene	2.38	0.05	ug/L	4.000		59	40-140			
bis(2-Ethylhexyl)phthalate	2.90	2.00	ug/L	4.000		72	40-140			
Butylbenzylphthalate	3.06	2.50	ug/L	4.000		77	40-140			
Chrysene	2.41	0.05	ug/L	4.000		60	40-140			
Dibenzo(a,h)Anthracene	2.69	0.05	ug/L	4.000		67	40-140			
Diethylphthalate	3.53	2.50	ug/L	4.000		88	40-140			
Dimethylphthalate	3.47	2.50	ug/L	4.000		87	40-140			
Di-n-butylphthalate	3.47	2.50	ug/L	4.000		87	40-140			
Di-n-octylphthalate	3.15	2.50	ug/L	4.000		79	40-140			
Fluoranthene	3.23	0.20	ug/L	4.000		81	40-140			
Fluorene	3.25	0.20	ug/L	4.000		81	40-140			
Indeno(1,2,3-cd)Pyrene	2.70	0.05	ug/L	4.000		67	40-140			
Naphthalene	2.79	0.20	ug/L	4.000		70	40-140			
Pentachlorophenol	4.05	0.90	ug/L	4.000		101	30-130			
Phenanthrene	3.06	0.20	ug/L	4.000		76	40-140			
Pyrene	2.48	0.20	ug/L	4.000		62	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.84*		ug/L	*2.500*		*74*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.88*		ug/L	*3.750*		*130*	*15-110*			*B+*
Surrogate: 2-Fluorobiphenyl	*2.11*		ug/L	*2.500*		*84*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.48*		ug/L	*2.500*		*99*	*30-130*			
Surrogate: p-Terphenyl-d14	*1.82*		ug/L	*2.500*		*73*	*30-130*			
LCS Dup										
Acenaphthene	3.04	0.20	ug/L	4.000		76	40-140	0.8	20	
Acenaphthylene	3.02	0.20	ug/L	4.000		75	40-140	0.7	20	
Anthracene	3.12	0.20	ug/L	4.000		78	40-140	1	20	
Benzo(a)anthracene	3.01	0.05	ug/L	4.000		75	40-140	25	20	D+
Benzo(a)pyrene	3.18	0.05	ug/L	4.000		79	40-140	21	20	D+
Benzo(b)fluoranthene	3.10	0.05	ug/L	4.000		78	40-140	16	20	
Benzo(g,h,i)perylene	3.28	0.20	ug/L	4.000		82	40-140	23	20	D+
Benzo(k)fluoranthene	3.16	0.05	ug/L	4.000		79	40-140	28	20	D+
bis(2-Ethylhexyl)phthalate	3.70	2.00	ug/L	4.000		93	40-140	24	20	D+

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Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625(SIM) Semi-Volatile Organic Compounds										
Batch CL70612 - 3510C										
Butylbenzylphthalate	3.89	2.50	ug/L	4.000		97	40-140	24	20	D+
Chrysene	3.06	0.05	ug/L	4.000		77	40-140	24	20	D+
Dibenzo(a,h)Anthracene	3.34	0.05	ug/L	4.000		84	40-140	21	20	D+
Diethylphthalate	3.54	2.50	ug/L	4.000		88	40-140	0.4	20	
Dimethylphthalate	3.46	2.50	ug/L	4.000		86	40-140	0.6	20	
Di-n-butylphthalate	3.48	2.50	ug/L	4.000		87	40-140	0.1	20	
Di-n-octylphthalate	3.79	2.50	ug/L	4.000		95	40-140	19	20	
Fluoranthene	3.24	0.20	ug/L	4.000		81	40-140	0.3	20	
Fluorene	3.17	0.20	ug/L	4.000		79	40-140	2	20	
Indeno(1,2,3-cd)Pyrene	3.38	0.05	ug/L	4.000		84	40-140	22	20	D+
Naphthalene	2.79	0.20	ug/L	4.000		70	40-140	0.03	20	
Pentachlorophenol	4.06	0.90	ug/L	4.000		101	30-130	0.2	20	
Phenanthrene	3.11	0.20	ug/L	4.000		78	40-140	2	20	
Pyrene	3.13	0.20	ug/L	4.000		78	40-140	23	20	D+
Surrogate: 1,2-Dichlorobenzene-d4	*1.83*		ug/L	*2.500*		*73*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*5.08*		ug/L	*3.750*		*135*	*15-110*			*S+*
Surrogate: 2-Fluorobiphenyl	*2.10*		ug/L	*2.500*		*84*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.46*		ug/L	*2.500*		*98*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.30*		ug/L	*2.500*		*92*	*30-130*			
8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution										
Batch CL70747 - 3535A										
Blank										
1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	*3.34*		ug/L	*5.000*		*67*	*15-115*			
LCS										
1,4-Dioxane	9.50	0.250	ug/L	10.00		95	40-140			
Surrogate: 1,4-Dioxane-d8	*3.83*		ug/L	*5.000*		*77*	*15-115*			
LCS Dup										
1,4-Dioxane	9.06	0.250	ug/L	10.00		91	40-140	5	20	
Surrogate: 1,4-Dioxane-d8	*3.22*		ug/L	*5.000*		*64*	*15-115*			
Classical Chemistry										
Batch CL70145 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	0.495		mg/L	0.4998		99	90-110			
LCS Dup										
Hexavalent Chromium	0.496		mg/L	0.4998		99	90-110	0.2	20	
Batch CL70146 - General Preparation										
Blank										
Total Residual Chlorine	ND	20.0	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712033

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CL70146 - General Preparation										
LCS										
Total Residual Chlorine	1.78		mg/L	1.800		99	85-115			
Batch CL70419 - General Preparation										
Blank										
Chloride	ND	0.5	mg/L							
LCS										
Chloride	2.4		mg/L	2.500		97	90-110			
Batch CL70514 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.09	0.10	mg/L	0.09994		95	80-120			
LCS										
Ammonia as N	0.99	0.10	mg/L	0.9994		99	80-120			
Batch CL70519 - TCN Prep										
Blank										
Total Cyanide (LL)	ND	5.00	ug/L							
LCS										
Total Cyanide (LL)	20.1	5.00	ug/L	20.06		100	90-110			
LCS										
Total Cyanide (LL)	149	5.00	ug/L	150.4		99	90-110			
LCS Dup										
Total Cyanide (LL)	148	5.00	ug/L	150.4		98	90-110	0.7	20	
Batch CL70611 - General Preparation										
Blank										
Total Petroleum Hydrocarbon	ND	5.00	mg/L							
LCS										
Total Petroleum Hydrocarbon	17.3	5.00	mg/L	19.38		89	66-114			
Batch CL70640 - General Preparation										
Blank										
Phenols	ND	100	ug/L							
LCS										
Phenols	105	100	ug/L	100.0		105	80-120			
LCS										
Phenols	1020	100	ug/L	1000		102	80-120			
Batch CL70652 - General Preparation										
Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	32		mg/L	34.10		94	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712033

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane										
Batch CL70822 - 504/8011										
Blank										
1,2-Dibromoethane	ND	0.015	ug/L							
1,2-Dibromoethane [2C]	ND	0.015	ug/L							
Surrogate: Pentachloroethane	*0.190*		ug/L	*0.2000*		*95*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.216*		ug/L	*0.2000*		*108*	*30-150*			
LCS										
1,2-Dibromoethane	0.057	0.015	ug/L	0.08000		72	70-130			
1,2-Dibromoethane [2C]	0.082	0.015	ug/L	0.08000		102	70-130			
Surrogate: Pentachloroethane	*0.0803*		ug/L	*0.2000*		*40*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.0909*		ug/L	*0.2000*		*45*	*30-150*			
LCS										
1,2-Dibromoethane	0.152	0.015	ug/L	0.2000		76	70-130			
1,2-Dibromoethane [2C]	0.204	0.015	ug/L	0.2000		102	70-130			
Surrogate: Pentachloroethane	*0.277*		ug/L	*0.2000*		*139*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.296*		ug/L	*0.2000*		*148*	*30-150*			
Alcohol Scan by GC/FID										
Batch CL70605 - No Prep										
Blank										
Ethanol	ND	10	mg/L							
LCS										
Ethanol	1160	10	mg/L	1007		115	60-140			
LCS Dup										
Ethanol	1020	10	mg/L	1007		102	60-140	12	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP ESS Laboratory Work Order: 1712033

Notes and Definitions

U	Analyte included in the analysis, but not detected
S+	Surrogate recovery(ies) above upper control limit (S+).
HT	The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B+	Blank Spike recovery is above upper control limit (B+).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712033

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1712033
Date Received: 12/1/2017
Project Due Date: 12/8/2017
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.5 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / ~~No~~
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	186969	Yes	No	Yes	VOA Vial - HCl	HCl	
01	186970	Yes	No	Yes	VOA Vial - HCl	HCl	
01	186971	Yes	No	Yes	VOA Vial - HCl	HCl	
01	186972	Yes	No	Yes	VOA Vial - HCl	HCl	
01	186973	Yes	No	Yes	VOA Vial - HCl	HCl	
01	186974	Yes	No	Yes	VOA Vial - HCl	HCl	
01	186975	Yes	No	Yes	VOA Vial - HCl	HCl	
01	186982	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	186983	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	186984	Yes	NA	Yes	1L Amber - Unpres	NP	
01	186985	Yes	NA	Yes	1L Amber - Unpres	NP	
01	186986	Yes	NA	Yes	1L Amber - Unpres	NP	
01	186987	Yes	NA	Yes	1L Amber - Unpres	NP	
01	186988	Yes	NA	Yes	1L Amber - Unpres	NP	
01	186989	Yes	NA	Yes	1L Amber - Unpres	NP	
01	186990	Yes	NA	Yes	1L Poly - Unpres	NP	
01	186991	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
01	186992	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	186993	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	186994	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
01	186995	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	pH > 12 RL 12/1/17 1755
01	186996	Yes	NA	Yes	250 mL Poly - Unpres	NP	
02	186962	Yes	No	Yes	VOA Vial - HCl	HCl	
02	186963	Yes	No	Yes	VOA Vial - HCl	HCl	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1712033

Date Received: 12/1/2017

02	186964	Yes	No	Yes	VOA Vial - HCl	HCl	
02	186965	Yes	No	Yes	VOA Vial - HCl	HCl	
02	186966	Yes	No	Yes	VOA Vial - HCl	HCl	
02	186967	Yes	No	Yes	VOA Vial - HCl	HCl	
02	186968	Yes	No	Yes	VOA Vial - HCl	HCl	
02	186976	Yes	NA	Yes	1L Poly - Unpres	NP	
02	186977	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
02	186978	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
02	186979	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
02	186980	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	pH > 12 @ 12/1/17 1755
02	186981	Yes	NA	Yes	250 mL Poly - Unpres	NP	

2nd Review

Are barcode labels on correct containers? (Yes) / No

Completed By: _____ Date & Time: 12/1/17 1755

Reviewed By: _____ Date & Time: 12/1/17 1800

Delivered By: _____ 12/1/17 1800

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS LAB PROJECT ID: 1712033

Turn Time ✓ Standard Rush _____ Approved By: _____

Reporting Limits -

State where samples were collected: (MA) NH

Discharge into: Fresh Water ☑ Salt Water ☐

Is this project for: **RGP**

Electonic Deliverable Yes ✓ No ____
Format: Excel ___ Access ___ PDF ✓ Other ____

Project Manager: Mike Sabourin
Company: ~~AMEC~~ GEI
Address: 400 Unicorn Park Drive, Woburn MA

Project # 1610575
Project Name: Eversource WRMRP
PO #

ESS Lab Sample ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample Identification	# of Containers	RGP Metals Total	RGP Metals Dissolved	Hardness (Calculation)	Ethanol ASTM D3695	Chloride 300.0*	Total Cyanide 4500 LL	TPH 1664	TSS 2540D*	TRC 4500-CL D*	Ammonia 350.1	Tri Cr (Calc. MUST run T. Cr)	Hex Cr 3500	Phenol 420.1	RGP VOC Long List 524	1,4-Dioxane 8270-SIM	EDB 504.1	RGP SVOC Log List 625-SIM	PCB 608	Comment #
					Analysis																				
1	12-1-17	0920	G	Water	1610575-B16CMWS	22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1,2
		~~0930~~ SAW																							
2	12-1-17	1330	G	Water	1610575-B6CMWS		X		X	X	X	X		X	X	X	X	X		X		X			

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

4	4	4	1	1	5	2	1	1	3	-	1	3	2	1	2	1	1								
P	P	P	V	P	P	AG	P	P	P	-	P	AG	V	AG	V	AG	AG								

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes ____ No

Seals Intact ___ Yes ✓ No NA: ___

Cooler Temperature: 2.5 ice BLW JP

Sampled by : Josh Wolpert

added Cr III. mkm 12/8/17

Comments: 1) RGP Metals include Sb, As, Cd, Cu, Fe, Pb, Ni, Se, Ag and Zn by 200.7/3113B and Hg by 245.1
2) Parameters in **BOLD** have Short hold-time **PERMIT ATTACHED**
*** TSS, TRC and Cl taken from the same container**

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	12-1-17	1538 [signature] 12/1/17 1538	[signature] 12/1/17 1703	12/1/17 1703	[signature] 12/1/17 1729
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Please E-mail all changes to Chain of Custody in writir

Page 1 of 1

CERTIFICATE OF ANALYSIS

Mike Sabulis
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Eversource WRNRP - RGP (1610515)
ESS Laboratory Work Order Number: 1712097

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:26 pm, Dec 13, 2017

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

SAMPLE RECEIPT

The following samples were received on December 05, 2017 for the analyses specified on the enclosed Chain of Custody Record.

The samples and analyses listed below were analyzed in accordance with the 2017 Remediation General Permit under the National Pollutant Discharge Elimination System (NPDES).

ESS Laboratory is unable to achieve the required detection limit of 0.4 mg/L for Ethanol for the RGP permit. We have also been unable to procure a subcontract laboatory that is able to achieve this limit. The data for Ethanol has been reported using our current method reporting limit.

Lab Number	Sample Name	Matrix	Analysis
1712097-01	1610515-B4 MW	Ground Water	200.7, 245.1, 3113B, 608, 625 SIM, 8270D SIM
1712097-02	1610515-B11 MW	Ground Water	1664A, 200.7, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 420.1, 4500 CN CE, 4500Cl D, 504.1, 524.2, 608, 625 SIM, 8270D SIM, ASTM D3695

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP ESS Laboratory Work Order: 1712097

PROJECT NARRATIVE

524.2 Volatile Organic Compounds

C7L0135-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Tertiary-butyl Alcohol (40% @ 30%)

625(SIM) Semi-Volatile Organic Compounds

1712097-02 **Surrogate recovery(ies) above upper control limit (S+).**
2,4,6-Tribromophenol (121% @ 15-110%)

C7L0142-CCV1 **Calibration required quadratic regression (Q).**
2,4,6-Tribromophenol (116% @ 80-120%), Pentachlorophenol (103% @ 80-120%)

C7L0163-CCV1 **Calibration required quadratic regression (Q).**
2,4,6-Tribromophenol (139% @ 80-120%), Pentachlorophenol (137% @ 80-120%)

C7L0163-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4,6-Tribromophenol (39% @ 20%), Pentachlorophenol (37% @ 20%)

CL70612-BS2 **Surrogate recovery(ies) above upper control limit (S+).**
2,4,6-Tribromophenol (130% @ 15-110%)

CL70612-BSD2 **Relative percent difference for duplicate is outside of criteria (D+).**
Benzo(a)anthracene (25% @ 20%), Benzo(a)pyrene (21% @ 20%), Benzo(g,h,i)perylene (23% @ 20%), Benzo(k)fluoranthene (28% @ 20%), bis(2-Ethylhexyl)phthalate (24% @ 20%), Butylbenzylphthalate (24% @ 20%), Chrysene (24% @ 20%), Dibenzo(a,h)Anthracene (21% @ 20%), Indeno(1,2,3-cd)Pyrene (22% @ 20%), Pyrene (23% @ 20%)

CL70612-BSD2 **Surrogate recovery(ies) above upper control limit (S+).**
2,4,6-Tribromophenol (135% @ 15-110%)

Classical Chemistry

1712097-02 **The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B4 MW
Date Sampled: 12/05/17 09:30
Percent Solids: N/A

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-01
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Dissolved Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (10.0)		200.7		1	KJK	12/07/17 17:07	100	20	CL70554
Arsenic	ND (5.0)		3113B		5	KJK	12/07/17 21:28	100	20	CL70554
Cadmium	ND (0.25)		3113B		5	KJK	12/07/17 15:33	100	20	CL70554
Chromium	ND (4.0)		200.7		1	KJK	12/07/17 17:07	100	20	CL70554
Copper	ND (4.0)		200.7		1	KJK	12/07/17 17:07	100	20	CL70554
Iron	**1290** (20.0)		200.7		1	KJK	12/07/17 17:07	100	20	CL70554
Lead	ND (2.0)		3113B		5	KJK	12/07/17 18:57	100	20	CL70554
Mercury	ND (0.20)		245.1		1	MJV	12/08/17 14:49	20	40	CL70557
Nickel	ND (10.0)		200.7		1	KJK	12/07/17 17:07	100	20	CL70554
Selenium	ND (4.0)		3113B		5	KJK	12/07/17 23:52	100	20	CL70554
Silver	ND (2.0)		200.7		1	KJK	12/07/17 17:07	100	20	CL70554
Zinc	**44.2** (10.0)		200.7		1	KJK	12/07/17 17:07	100	20	CL70554

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B4 MW
Date Sampled: 12/05/17 09:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: CAD
Prepared: 12/6/17 11:02

608 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.09)		608		1	12/06/17 19:52		CL70606
Aroclor 1221	ND (0.09)		608		1	12/06/17 19:52		CL70606
Aroclor 1232	ND (0.09)		608		1	12/06/17 19:52		CL70606
Aroclor 1242	ND (0.09)		608		1	12/06/17 19:52		CL70606
Aroclor 1248	ND (0.09)		608		1	12/06/17 19:52		CL70606
Aroclor 1254	ND (0.09)		608		1	12/06/17 19:52		CL70606
Aroclor 1260	ND (0.09)		608		1	12/06/17 19:52		CL70606
Aroclor 1262	ND (0.09)		608		1	12/06/17 19:52		CL70606
Aroclor 1268	ND (0.09)		608		1	12/06/17 19:52		CL70606

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*59 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*72 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*56 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*67 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B4 MW
Date Sampled: 12/05/17 09:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 12/6/17 14:36

625(SIM) Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acenaphthene	**0.89** (0.19)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Acenaphthylene	**0.72** (0.19)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Anthracene	**0.63** (0.19)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Benzo(a)anthracene	**0.35** (0.05)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Benzo(a)pyrene	**0.26** (0.05)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Benzo(b)fluoranthene	**0.33** (0.05)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Benzo(g,h,i)perylene	ND (0.19)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Benzo(k)fluoranthene	**0.14** (0.05)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
bis(2-Ethylhexyl)phthalate	ND (1.87)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Butylbenzylphthalate	ND (2.34)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Chrysene	**0.40** (0.05)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Dibenzo(a,h)Anthracene	**0.05** (0.05)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Diethylphthalate	ND (2.34)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Dimethylphthalate	ND (2.34)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Di-n-butylphthalate	ND (2.34)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Di-n-octylphthalate	ND (2.34)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Fluoranthene	**1.59** (0.19)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Fluorene	**1.97** (0.19)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Indeno(1,2,3-cd)Pyrene	**0.19** (0.05)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Naphthalene	**0.22** (0.19)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Pentachlorophenol	ND (0.84)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Phenanthrene	**0.35** (0.19)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612
Pyrene	**1.37** (0.19)		625 SIM		1	12/11/17 23:52	C7L0163	CL70612

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*50 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*102 %*		*15-110*
Surrogate: 2-Fluorobiphenyl	*59 %*		*30-130*
Surrogate: Nitrobenzene-d5	*62 %*		*30-130*
Surrogate: p-Terphenyl-d14	*76 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B4 MW
Date Sampled: 12/05/17 09:30
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 12/7/17 16:00

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,4-Dioxane	ND (0.250)		8270D SIM		1	12/08/17 0:33	C7L0096	CL70747

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	64 %		15-115

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B11 MW
Date Sampled: 12/05/17 14:00
Percent Solids: N/A

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-02
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Dissolved Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (10.0)		200.7		1	KJK	12/07/17 17:39	100	20	CL70554
Arsenic	ND (5.0)		3113B		5	KJK	12/07/17 21:51	100	20	CL70554
Cadmium	ND (0.25)		3113B		5	KJK	12/07/17 16:32	100	20	CL70554
Chromium	ND (4.0)		200.7		1	KJK	12/07/17 17:39	100	20	CL70554
Copper	ND (4.0)		200.7		1	KJK	12/07/17 17:39	100	20	CL70554
Iron	**16900** (20.0)		200.7		1	KJK	12/07/17 17:39	100	20	CL70554
Lead	ND (2.0)		3113B		5	KJK	12/07/17 19:38	100	20	CL70554
Mercury	ND (0.20)		245.1		1	MJV	12/08/17 14:58	20	40	CL70557
Nickel	ND (10.0)		200.7		1	KJK	12/07/17 17:39	100	20	CL70554
Selenium	ND (4.0)		3113B		5	KJK	12/08/17 0:16	100	20	CL70554
Silver	ND (2.0)		200.7		1	KJK	12/07/17 17:39	100	20	CL70554
Zinc	**30.1** (10.0)		200.7		1	KJK	12/07/17 17:39	100	20	CL70554

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B11 MW
Date Sampled: 12/05/17 14:00
Percent Solids: N/A

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-02
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (10.0)		200.7		1	KJK	12/07/17 17:56	100	20	CL70554
Arsenic	**5.3** (5.0)		3113B		5	KJK	12/07/17 22:08	100	20	CL70554
Cadmium	ND (0.25)		3113B		5	KJK	12/07/17 16:54	100	20	CL70554
Chromium	ND (4.0)		200.7		1	KJK	12/07/17 17:56	100	20	CL70554
Chromium III	ND (10.0)		200.7		1	JLK	12/07/17 17:56	1	1	[CALC]
Copper	ND (4.0)		200.7		1	KJK	12/07/17 17:56	100	20	CL70554
Hardness	**125000** (165)		200.7		1	KJK	12/07/17 17:56	1	1	[CALC]
Iron	**18300** (20.0)		200.7		1	KJK	12/07/17 17:56	100	20	CL70554
Lead	ND (2.0)		3113B		5	KJK	12/07/17 19:50	100	20	CL70554
Mercury	ND (0.200)		245.1		1	MJV	12/08/17 14:51	20	40	CL70557
Nickel	ND (10.0)		200.7		1	KJK	12/07/17 17:56	100	20	CL70554
Selenium	ND (4.0)		3113B		5	KJK	12/08/17 1:01	100	20	CL70554
Silver	ND (1.0)		200.7		1	KJK	12/07/17 17:56	100	20	CL70554
Zinc	**29.8** (10.0)		200.7		1	KJK	12/07/17 17:56	100	20	CL70554

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B11 MW
Date Sampled: 12/05/17 14:00
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: DMC

524.2 Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1-Trichloroethane	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
1,1,2-Trichloroethane	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
1,1-Dichloroethane	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
1,1-Dichloroethene	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
1,2-Dichlorobenzene	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
1,2-Dichloroethane	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
1,3-Dichlorobenzene	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
1,4-Dichlorobenzene	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Acetone	ND (5.0)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Benzene	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Carbon Tetrachloride	ND (0.3)		524.2		1	12/07/17 16:49	C7L0109	CL70736
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Ethylbenzene	**2.4** (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Methylene Chloride	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Naphthalene	**225** (5.0)		524.2		10	12/08/17 12:59	C7L0109	CL70736
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Tetrachloroethene	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Toluene	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Trichloroethene	ND (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Vinyl Chloride	ND (0.2)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Xylene O	**5.9** (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736
Xylene P,M	**6.7** (0.5)		524.2		1	12/07/17 16:49	C7L0109	CL70736

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*105 %*		*80-120*
Surrogate: 4-Bromofluorobenzene	*101 %*		*80-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B11 MW
Date Sampled: 12/05/17 14:00
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: CAD
Prepared: 12/6/17 11:02

608 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.09)		608		1	12/08/17 10:31		CL70825
Aroclor 1221	ND (0.09)		608		1	12/08/17 10:31		CL70825
Aroclor 1232	ND (0.09)		608		1	12/08/17 10:31		CL70825
Aroclor 1242	ND (0.09)		608		1	12/08/17 10:31		CL70825
Aroclor 1248	ND (0.09)		608		1	12/08/17 10:31		CL70825
Aroclor 1254	ND (0.09)		608		1	12/08/17 10:31		CL70825
Aroclor 1260	ND (0.09)		608		1	12/08/17 10:31		CL70825
Aroclor 1262	ND (0.09)		608		1	12/08/17 10:31		CL70825
Aroclor 1268	ND (0.09)		608		1	12/08/17 10:31		CL70825

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*72 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*83 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*61 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*60 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B11 MW
Date Sampled: 12/05/17 14:00
Percent Solids: N/A
Initial Volume: 1060
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 12/6/17 14:36

625(SIM) Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acenaphthene	**10.8** (0.19)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Acenaphthylene	**0.69** (0.19)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Anthracene	**0.83** (0.19)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Benzo(a)anthracene	**0.09** (0.05)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Benzo(a)pyrene	**0.07** (0.05)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Benzo(b)fluoranthene	**0.09** (0.05)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Benzo(g,h,i)perylene	ND (0.19)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Benzo(k)fluoranthene	ND (0.05)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
bis(2-Ethylhexyl)phthalate	ND (1.89)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Butylbenzylphthalate	ND (2.36)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Chrysene	**0.10** (0.05)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Dibenzo(a,h)Anthracene	ND (0.05)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Diethylphthalate	ND (2.36)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Dimethylphthalate	ND (2.36)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Di-n-butylphthalate	ND (2.36)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Di-n-octylphthalate	ND (2.36)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Fluoranthene	**0.80** (0.19)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Fluorene	**6.51** (0.19)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Indeno(1,2,3-cd)Pyrene	**0.05** (0.05)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Naphthalene	**92.9** (1.89)		625 SIM		10	12/12/17 15:47	C7L0163	CL70612
Pentachlorophenol	ND (0.85)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Phenanthrene	**6.87** (0.19)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612
Pyrene	**0.60** (0.19)		625 SIM		1	12/12/17 0:42	C7L0163	CL70612

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*76 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*121 %*	*S+*	*15-110*
Surrogate: 2-Fluorobiphenyl	*77 %*		*30-130*
Surrogate: Nitrobenzene-d5	*97 %*		*30-130*
Surrogate: p-Terphenyl-d14	*84 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B11 MW
Date Sampled: 12/05/17 14:00
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 12/7/17 16:00

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,4-Dioxane	ND (0.250)		8270D SIM		1	12/08/17 1:23	C7L0096	CL70747

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	40 %		15-115

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B11 MW
Date Sampled: 12/05/17 14:00
Percent Solids: N/A

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-02
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	**0.18** (0.10)		350.1		1	JLK	12/11/17 17:14	mg/L	CL70811
Chloride	**482** (50.0)		300.0		100	JLK	12/08/17 18:48	mg/L	CL70846
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	12/05/17 21:34	ug/L	CL70548
Phenols	ND (100)		420.1		1	JLK	12/11/17 17:15	ug/L	CL71143
Total Cyanide (LL)	ND (5.00)		4500 CN CE		1	EEM	12/06/17 12:05	ug/L	CL70628
Total Petroleum Hydrocarbon	ND (4.72)		1664A		1	LAB	12/12/17 13:50	mg/L	CL71109
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	12/05/17 20:44	ug/L	CL70549
Total Suspended Solids	**34** (5)		2540D		1	JLK	12/08/17 21:02	mg/L	CL70845

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B11 MW
Date Sampled: 12/05/17 14:00
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: SMR
Prepared: 12/8/17 11:35

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2-Dibromoethane	ND (0.015)		504.1		1	12/08/17 19:43		CL70822

	%Recovery	Qualifier	Limits
Surrogate: Pentachloroethane	*126 %*		*30-150*
Surrogate: Pentachloroethane [2C]	*113 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B11 MW
Date Sampled: 12/05/17 14:00
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1712097
ESS Laboratory Sample ID: 1712097-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 12/6/17 8:27

Alcohol Scan by GC/FID

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Ethanol	ND (10)		ASTM D3695		1	ZLC	12/06/17 14:52		CL70605

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Dissolved Metals										
Batch CL70554 - 3005A/200.7										
Blank										
Antimony	ND	10.0	ug/L							
Arsenic	ND	1.0	ug/L							
Cadmium	ND	0.05	ug/L							
Chromium	ND	4.0	ug/L							
Copper	ND	4.0	ug/L							
Iron	ND	20.0	ug/L							
Lead	ND	0.4	ug/L							
Nickel	ND	10.0	ug/L							
Selenium	ND	0.8	ug/L							
Silver	ND	2.0	ug/L							
Zinc	ND	10.0	ug/L							
LCS										
Antimony	91.2	10.0	ug/L	100.0		91	85-115			
Arsenic	87.6	25.0	ug/L	100.0		88	85-115			
Cadmium	49.8	25.0	ug/L	50.00		100	85-115			
Chromium	92.4	4.0	ug/L	100.0		92	80-120			
Copper	95.0	4.0	ug/L	100.0		95	80-120			
Iron	438	20.0	ug/L	500.0		88	80-120			
Lead	92.5	10.0	ug/L	100.0		93	85-115			
Nickel	94.2	10.0	ug/L	100.0		94	85-115			
Selenium	231	20.0	ug/L	200.0		115	85-115			
Silver	43.2	4.0	ug/L	50.00		86	85-115			
Zinc	98.8	10.0	ug/L	100.0		99	85-115			
Batch CL70557 - 245.1/7470A										
Blank										
Mercury	ND	0.20	ug/L							
LCS										
Mercury	5.95	0.20	ug/L	6.000		99	85-115			
LCS Dup										
Mercury	5.65	0.20	ug/L	6.000		94	85-115	5	20	
Total Metals										
Batch CL70548 - [CALC]										
Blank										
Chromium III	ND	10.0	ug/L							
LCS										
Chromium III	ND		ug/L							
LCS Dup										
Chromium III	ND		ug/L							
Batch CL70554 - 3005A/200.7										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CL70554 - 3005A/200.7										
Antimony	ND	10.0	ug/L							
Arsenic	ND	1.0	ug/L							
Cadmium	ND	0.05	ug/L							
Chromium	ND	4.0	ug/L							
Chromium III	ND	4.00	ug/L							
Copper	ND	4.0	ug/L							
Hardness	ND	165	ug/L							
Iron	ND	20.0	ug/L							
Lead	ND	0.4	ug/L							
Nickel	ND	10.0	ug/L							
Selenium	ND	0.8	ug/L							
Silver	ND	1.0	ug/L							
Zinc	ND	10.0	ug/L							
LCS										
Antimony	91.2	10.0	ug/L	100.0		91	85-115			
Arsenic	87.6	25.0	ug/L	100.0		88	85-115			
Cadmium	49.8	25.0	ug/L	50.00		100	85-115			
Chromium	92.4	4.0	ug/L	100.0		92	85-115			
Chromium III	92.4	4.00	ug/L							
Copper	95.0	4.0	ug/L	100.0		95	85-115			
Hardness	6040	165	ug/L							
Iron	438	20.0	ug/L	500.0		88	85-115			
Lead	92.5	10.0	ug/L	100.0		93	85-115			
Nickel	94.2	10.0	ug/L	100.0		94	85-115			
Selenium	231	20.0	ug/L	200.0		115	85-115			
Silver	43.2	2.0	ug/L	50.00		86	85-115			
Zinc	98.8	10.0	ug/L	100.0		99	85-115			
LCS Dup										
Chromium III	92.1	4.00	ug/L							
Hardness	5970	165	ug/L							
Batch CL70557 - 245.1/7470A										
Blank										
Mercury	ND	0.200	ug/L							
LCS										
Mercury	5.95	0.200	ug/L	6.000		99	85-115			
LCS Dup										
Mercury	5.65	0.200	ug/L	6.000		94	85-115	5	20	
524.2 Volatile Organic Compounds										
Batch CL70736 - 524.2										
Blank										
1,1,1-Trichloroethane	ND	0.5	ug/L							
1,1,2-Trichloroethane	ND	0.5	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch CL70736 - 524.2										
1,1-Dichloroethane	ND	0.5	ug/L							
1,1-Dichloroethene	ND	0.5	ug/L							
1,2-Dichlorobenzene	ND	0.5	ug/L							
1,2-Dichloroethane	ND	0.5	ug/L							
1,3-Dichlorobenzene	ND	0.5	ug/L							
1,4-Dichlorobenzene	ND	0.5	ug/L							
Acetone	ND	5.0	ug/L							
Benzene	ND	0.5	ug/L							
Carbon Tetrachloride	ND	0.3	ug/L							
cis-1,2-Dichloroethene	ND	0.5	ug/L							
Ethylbenzene	ND	0.5	ug/L							
Methyl tert-Butyl Ether	ND	0.5	ug/L							
Methylene Chloride	ND	0.5	ug/L							
Naphthalene	ND	0.5	ug/L							
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tertiary-butyl Alcohol	ND	25.0	ug/L							
Tetrachloroethene	ND	0.5	ug/L							
Toluene	ND	0.5	ug/L							
Trichloroethene	ND	0.5	ug/L							
Vinyl Chloride	ND	0.2	ug/L							
Xylene O	ND	0.5	ug/L							
Xylene P,M	ND	0.5	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*5.19*		ug/L	*5.000*		*104*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.99*		ug/L	*5.000*		*100*	*80-120*			
LCS										
1,1,1-Trichloroethane	10.2		ug/L	10.00		102	70-130			
1,1,2-Trichloroethane	10.1		ug/L	10.00		101	70-130			
1,1-Dichloroethane	9.9		ug/L	10.00		99	70-130			
1,1-Dichloroethene	10.9		ug/L	10.00		109	70-130			
1,2-Dichlorobenzene	10.4		ug/L	10.00		104	70-130			
1,2-Dichloroethane	10.5		ug/L	10.00		105	70-130			
1,3-Dichlorobenzene	10.3		ug/L	10.00		103	70-130			
1,4-Dichlorobenzene	10.5		ug/L	10.00		105	70-130			
Acetone	48.6		ug/L	50.00		97	70-130			
Benzene	10.4		ug/L	10.00		104	70-130			
Carbon Tetrachloride	10.3		ug/L	10.00		103	70-130			
cis-1,2-Dichloroethene	10.9		ug/L	10.00		109	70-130			
Ethylbenzene	10.2		ug/L	10.00		102	70-130			
Methyl tert-Butyl Ether	10.6		ug/L	10.00		106	70-130			
Methylene Chloride	10.4		ug/L	10.00		104	70-130			
Naphthalene	10.9		ug/L	10.00		109	70-130			
Tertiary-amyl methyl ether	10.1		ug/L	10.00		101	70-130			
Tertiary-butyl Alcohol	64.2		ug/L	50.00		128	70-130			
Tetrachloroethene	8.1		ug/L	10.00		81	70-130			
Toluene	10.3		ug/L	10.00		103	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch CL70736 - 524.2										
Trichloroethene	10.5		ug/L	10.00		105	70-130			
Vinyl Chloride	10.4		ug/L	10.00		104	70-130			
Xylene O	10.1		ug/L	10.00		101	70-130			
Xylene P,M	20.3		ug/L	20.00		102	70-130			
Surrogate: 1,2-Dichlorobenzene-d4	*5.02*		ug/L	*5.000*		*100*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*5.02*		ug/L	*5.000*		*100*	*80-120*			
LCS Dup										
1,1,1-Trichloroethane	9.9		ug/L	10.00		99	70-130	3	20	
1,1,2-Trichloroethane	10.1		ug/L	10.00		101	70-130	0.2	20	
1,1-Dichloroethane	9.9		ug/L	10.00		99	70-130	0.6	20	
1,1-Dichloroethene	11.0		ug/L	10.00		110	70-130	0.8	20	
1,2-Dichlorobenzene	10.5		ug/L	10.00		105	70-130	1	20	
1,2-Dichloroethane	10.5		ug/L	10.00		105	70-130	0.2	20	
1,3-Dichlorobenzene	10.5		ug/L	10.00		105	70-130	2	20	
1,4-Dichlorobenzene	10.6		ug/L	10.00		106	70-130	1	20	
Acetone	53.8		ug/L	50.00		108	70-130	10	20	
Benzene	10.3		ug/L	10.00		103	70-130	2	20	
Carbon Tetrachloride	9.8		ug/L	10.00		98	70-130	4	20	
cis-1,2-Dichloroethene	10.5		ug/L	10.00		105	70-130	3	20	
Ethylbenzene	10.2		ug/L	10.00		102	70-130	0	20	
Methyl tert-Butyl Ether	10.5		ug/L	10.00		105	70-130	0.5	20	
Methylene Chloride	10.5		ug/L	10.00		105	70-130	0.8	20	
Naphthalene	11.3		ug/L	10.00		113	70-130	4	20	
Tertiary-amyl methyl ether	10.2		ug/L	10.00		102	70-130	1	20	
Tertiary-butyl Alcohol	62.9		ug/L	50.00		126	70-130	2	25	
Tetrachloroethene	7.7		ug/L	10.00		77	70-130	4	20	
Toluene	10.0		ug/L	10.00		100	70-130	3	20	
Trichloroethene	10.4		ug/L	10.00		104	70-130	1	20	
Vinyl Chloride	10.3		ug/L	10.00		103	70-130	0.4	20	
Xylene O	10.2		ug/L	10.00		102	70-130	2	20	
Xylene P,M	20.7		ug/L	20.00		104	70-130	2	20	
Surrogate: 1,2-Dichlorobenzene-d4	*5.11*		ug/L	*5.000*		*102*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*5.22*		ug/L	*5.000*		*104*	*80-120*			
608 Polychlorinated Biphenyls (PCB)										
Batch CL70606 - 3510C										
Blank										
Aroclor 1016	ND	0.10	ug/L							
Aroclor 1016 [2C]	ND	0.10	ug/L							
Aroclor 1221	ND	0.10	ug/L							
Aroclor 1221 [2C]	ND	0.10	ug/L							
Aroclor 1232	ND	0.10	ug/L							
Aroclor 1232 [2C]	ND	0.10	ug/L							
Aroclor 1242	ND	0.10	ug/L							
Aroclor 1242 [2C]	ND	0.10	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
608 Polychlorinated Biphenyls (PCB)										
Batch CL70606 - 3510C										
Aroclor 1248	ND	0.10	ug/L							
Aroclor 1248 [2C]	ND	0.10	ug/L							
Aroclor 1254	ND	0.10	ug/L							
Aroclor 1254 [2C]	ND	0.10	ug/L							
Aroclor 1260	ND	0.10	ug/L							
Aroclor 1260 [2C]	ND	0.10	ug/L							
Aroclor 1262	ND	0.10	ug/L							
Aroclor 1262 [2C]	ND	0.10	ug/L							
Aroclor 1268	ND	0.10	ug/L							
Aroclor 1268 [2C]	ND	0.10	ug/L							
Surrogate: Decachlorobiphenyl	*0.0384*		ug/L	*0.05000*		*77*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0438*		ug/L	*0.05000*		*88*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0311*		ug/L	*0.05000*		*62*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0373*		ug/L	*0.05000*		*75*	*30-150*			
LCS										
Aroclor 1016	0.88	0.10	ug/L	1.000		88	40-140			
Aroclor 1016 [2C]	0.89	0.10	ug/L	1.000		89	40-140			
Aroclor 1260	1.02	0.10	ug/L	1.000		102	40-140			
Aroclor 1260 [2C]	0.92	0.10	ug/L	1.000		92	40-140			
Surrogate: Decachlorobiphenyl	*0.0501*		ug/L	*0.05000*		*100*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0533*		ug/L	*0.05000*		*107*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0403*		ug/L	*0.05000*		*81*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0402*		ug/L	*0.05000*		*80*	*30-150*			
LCS Dup										
Aroclor 1016	0.98	0.10	ug/L	1.000		98	40-140	11	20	
Aroclor 1016 [2C]	1.02	0.10	ug/L	1.000		102	40-140	14	20	
Aroclor 1260	1.07	0.10	ug/L	1.000		107	40-140	5	20	
Aroclor 1260 [2C]	0.97	0.10	ug/L	1.000		97	40-140	5	20	
Surrogate: Decachlorobiphenyl	*0.0488*		ug/L	*0.05000*		*98*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0496*		ug/L	*0.05000*		*99*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0428*		ug/L	*0.05000*		*86*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0451*		ug/L	*0.05000*		*90*	*30-150*			
Batch CL70825 - 3510C										
Blank										
Aroclor 1016	ND	0.10	ug/L							
Aroclor 1016 [2C]	ND	0.10	ug/L							
Aroclor 1221	ND	0.10	ug/L							
Aroclor 1221 [2C]	ND	0.10	ug/L							
Aroclor 1232	ND	0.10	ug/L							
Aroclor 1232 [2C]	ND	0.10	ug/L							
Aroclor 1242	ND	0.10	ug/L							
Aroclor 1242 [2C]	ND	0.10	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
608 Polychlorinated Biphenyls (PCB)										
Batch CL70825 - 3510C										
Aroclor 1248	ND	0.10	ug/L							
Aroclor 1248 [2C]	ND	0.10	ug/L							
Aroclor 1254	ND	0.10	ug/L							
Aroclor 1254 [2C]	ND	0.10	ug/L							
Aroclor 1260	ND	0.10	ug/L							
Aroclor 1260 [2C]	ND	0.10	ug/L							
Aroclor 1262	ND	0.10	ug/L							
Aroclor 1262 [2C]	ND	0.10	ug/L							
Aroclor 1268	ND	0.10	ug/L							
Aroclor 1268 [2C]	ND	0.10	ug/L							
Surrogate: Decachlorobiphenyl	*0.0393*		ug/L	*0.05000*		*79*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0472*		ug/L	*0.05000*		*94*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0330*		ug/L	*0.05000*		*66*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0422*		ug/L	*0.05000*		*84*	*30-150*			
LCS										
Aroclor 1016	0.95	0.10	ug/L	1.000		95	40-140			
Aroclor 1016 [2C]	0.98	0.10	ug/L	1.000		98	40-140			
Aroclor 1260	1.09	0.10	ug/L	1.000		109	40-140			
Aroclor 1260 [2C]	1.01	0.10	ug/L	1.000		101	40-140			
Surrogate: Decachlorobiphenyl	*0.0521*		ug/L	*0.05000*		*104*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0574*		ug/L	*0.05000*		*115*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0429*		ug/L	*0.05000*		*86*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0444*		ug/L	*0.05000*		*89*	*30-150*			
LCS Dup										
Aroclor 1016	1.05	0.10	ug/L	1.000		105	40-140	10	20	
Aroclor 1016 [2C]	1.13	0.10	ug/L	1.000		113	40-140	15	20	
Aroclor 1260	1.16	0.10	ug/L	1.000		116	40-140	7	20	
Aroclor 1260 [2C]	1.06	0.10	ug/L	1.000		106	40-140	5	20	
Surrogate: Decachlorobiphenyl	*0.0542*		ug/L	*0.05000*		*108*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0575*		ug/L	*0.05000*		*115*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0478*		ug/L	*0.05000*		*96*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0510*		ug/L	*0.05000*		*102*	*30-150*			
625(SIM) Semi-Volatile Organic Compounds										
Batch CL70612 - 3510C										
Blank										
Acenaphthene	ND	0.20	ug/L							
Acenaphthylene	ND	0.20	ug/L							
Anthracene	ND	0.20	ug/L							
Benzo(a)anthracene	ND	0.05	ug/L							
Benzo(a)pyrene	ND	0.05	ug/L							
Benzo(b)fluoranthene	ND	0.05	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625(SIM) Semi-Volatile Organic Compounds										
Batch CL70612 - 3510C										
Benzo(g,h,i)perylene	ND	0.20	ug/L							
Benzo(k)fluoranthene	ND	0.05	ug/L							
bis(2-Ethylhexyl)phthalate	ND	2.00	ug/L							
Butylbenzylphthalate	ND	2.50	ug/L							
Chrysene	ND	0.05	ug/L							
Dibenzo(a,h)Anthracene	ND	0.05	ug/L							
Diethylphthalate	ND	2.50	ug/L							
Dimethylphthalate	ND	2.50	ug/L							
Di-n-butylphthalate	ND	2.50	ug/L							
Di-n-octylphthalate	ND	2.50	ug/L							
Fluoranthene	ND	0.20	ug/L							
Fluorene	ND	0.20	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	0.05	ug/L							
Naphthalene	ND	0.20	ug/L							
Pentachlorophenol	ND	0.90	ug/L							
Phenanthrene	ND	0.20	ug/L							
Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*1.32*		ug/L	*2.500*		*53*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.40*		ug/L	*3.750*		*91*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.64*		ug/L	*2.500*		*66*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.03*		ug/L	*2.500*		*81*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.09*		ug/L	*2.500*		*84*	*30-130*			
LCS										
Acenaphthene	3.02	0.20	ug/L	4.000		75	40-140			
Acenaphthylene	3.04	0.20	ug/L	4.000		76	40-140			
Anthracene	3.09	0.20	ug/L	4.000		77	40-140			
Benzo(a)anthracene	2.33	0.05	ug/L	4.000		58	40-140			
Benzo(a)pyrene	2.57	0.05	ug/L	4.000		64	40-140			
Benzo(b)fluoranthene	2.64	0.05	ug/L	4.000		66	40-140			
Benzo(g,h,i)perylene	2.60	0.20	ug/L	4.000		65	40-140			
Benzo(k)fluoranthene	2.38	0.05	ug/L	4.000		59	40-140			
bis(2-Ethylhexyl)phthalate	2.90	2.00	ug/L	4.000		72	40-140			
Butylbenzylphthalate	3.06	2.50	ug/L	4.000		77	40-140			
Chrysene	2.41	0.05	ug/L	4.000		60	40-140			
Dibenzo(a,h)Anthracene	2.69	0.05	ug/L	4.000		67	40-140			
Diethylphthalate	3.53	2.50	ug/L	4.000		88	40-140			
Dimethylphthalate	3.47	2.50	ug/L	4.000		87	40-140			
Di-n-butylphthalate	3.47	2.50	ug/L	4.000		87	40-140			
Di-n-octylphthalate	3.15	2.50	ug/L	4.000		79	40-140			
Fluoranthene	3.23	0.20	ug/L	4.000		81	40-140			
Fluorene	3.25	0.20	ug/L	4.000		81	40-140			
Indeno(1,2,3-cd)Pyrene	2.70	0.05	ug/L	4.000		67	40-140			
Naphthalene	2.79	0.20	ug/L	4.000		70	40-140			
Pentachlorophenol	4.05	0.90	ug/L	4.000		101	30-130			
Phenanthrene	3.06	0.20	ug/L	4.000		76	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625(SIM) Semi-Volatile Organic Compounds										
Batch CL70612 - 3510C										
Pyrene	2.48	0.20	ug/L	4.000		62	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.84*		ug/L	*2.500*		*74*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.88*		ug/L	*3.750*		*130*	*15-110*			*S+*
Surrogate: 2-Fluorobiphenyl	*2.11*		ug/L	*2.500*		*84*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.48*		ug/L	*2.500*		*99*	*30-130*			
Surrogate: p-Terphenyl-d14	*1.82*		ug/L	*2.500*		*73*	*30-130*			
LCS Dup										
Acenaphthene	3.04	0.20	ug/L	4.000		76	40-140	0.8	20	
Acenaphthylene	3.02	0.20	ug/L	4.000		75	40-140	0.7	20	
Anthracene	3.12	0.20	ug/L	4.000		78	40-140	1	20	
Benzo(a)anthracene	3.01	0.05	ug/L	4.000		75	40-140	25	20	D+
Benzo(a)pyrene	3.18	0.05	ug/L	4.000		79	40-140	21	20	D+
Benzo(b)fluoranthene	3.10	0.05	ug/L	4.000		78	40-140	16	20	
Benzo(g,h,i)perylene	3.28	0.20	ug/L	4.000		82	40-140	23	20	D+
Benzo(k)fluoranthene	3.16	0.05	ug/L	4.000		79	40-140	28	20	D+
bis(2-Ethylhexyl)phthalate	3.70	2.00	ug/L	4.000		93	40-140	24	20	D+
Butylbenzylphthalate	3.89	2.50	ug/L	4.000		97	40-140	24	20	D+
Chrysene	3.06	0.05	ug/L	4.000		77	40-140	24	20	D+
Dibenzo(a,h)Anthracene	3.34	0.05	ug/L	4.000		84	40-140	21	20	D+
Diethylphthalate	3.54	2.50	ug/L	4.000		88	40-140	0.4	20	
Dimethylphthalate	3.46	2.50	ug/L	4.000		86	40-140	0.6	20	
Di-n-butylphthalate	3.48	2.50	ug/L	4.000		87	40-140	0.1	20	
Di-n-octylphthalate	3.79	2.50	ug/L	4.000		95	40-140	19	20	
Fluoranthene	3.24	0.20	ug/L	4.000		81	40-140	0.3	20	
Fluorene	3.17	0.20	ug/L	4.000		79	40-140	2	20	
Indeno(1,2,3-cd)Pyrene	3.38	0.05	ug/L	4.000		84	40-140	22	20	D+
Naphthalene	2.79	0.20	ug/L	4.000		70	40-140	0.03	20	
Pentachlorophenol	4.06	0.90	ug/L	4.000		101	30-130	0.2	20	
Phenanthrene	3.11	0.20	ug/L	4.000		78	40-140	2	20	
Pyrene	3.13	0.20	ug/L	4.000		78	40-140	23	20	D+
Surrogate: 1,2-Dichlorobenzene-d4	*1.83*		ug/L	*2.500*		*73*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*5.08*		ug/L	*3.750*		*135*	*15-110*			*S+*
Surrogate: 2-Fluorobiphenyl	*2.10*		ug/L	*2.500*		*84*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.46*		ug/L	*2.500*		*98*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.30*		ug/L	*2.500*		*92*	*30-130*			
8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution										
Batch CL70747 - 3535A										
Blank										
1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	*3.34*		ug/L	*5.000*		*67*	*15-115*			
LCS										
1,4-Dioxane	9.50	0.250	ug/L	10.00		95	40-140			
Surrogate: 1,4-Dioxane-d8	*3.83*		ug/L	*5.000*		*77*	*15-115*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution										
Batch CL70747 - 3535A										
LCS Dup										
1,4-Dioxane	9.06	0.250	ug/L	10.00		91	40-140	5	20	
Surrogate: 1,4-Dioxane-d8	*3.22*		ug/L	*5.000*		*64*	*15-115*			
Classical Chemistry										
Batch CL70548 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	0.490		mg/L	0.4998		98	90-110			
LCS Dup										
Hexavalent Chromium	0.491		mg/L	0.4998		98	90-110	0.2	20	
Batch CL70549 - General Preparation										
Blank										
Total Residual Chlorine	ND	20.0	ug/L							
LCS										
Total Residual Chlorine	1.82		mg/L	1.800		101	85-115			
Batch CL70628 - TCN Prep										
Blank										
Total Cyanide (LL)	ND	5.00	ug/L							
LCS										
Total Cyanide (LL)	20.1	5.00	ug/L	20.06		100	90-110			
LCS										
Total Cyanide (LL)	150	5.00	ug/L	150.4		99	90-110			
LCS Dup										
Total Cyanide (LL)	148	5.00	ug/L	150.4		99	90-110	0.7	20	
Batch CL70811 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.11	0.10	mg/L	0.09994		113	80-120			
LCS										
Ammonia as N	0.94	0.10	mg/L	0.9994		94	80-120			
Batch CL70845 - General Preparation										
Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	32		mg/L	34.10		94	80-120			
Batch CL70846 - General Preparation										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CL70846 - General Preparation										
Chloride	ND	0.5	mg/L							
LCS										
Chloride	2.4		mg/L	2.500		98	90-110			
Batch CL71109 - General Preparation										
Blank										
Total Petroleum Hydrocarbon	ND	5.00	mg/L							
LCS										
Total Petroleum Hydrocarbon	15.1	5.00	mg/L	19.38		78	66-114			
Batch CL71143 - General Preparation										
Blank										
Phenols	ND	100	ug/L							
LCS										
Phenols	115	100	ug/L	100.0		115	80-120			
LCS										
Phenols	1000	100	ug/L	1000		100	80-120			
504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane										
Batch CL70822 - 504/8011										
Blank										
1,2-Dibromoethane	ND	0.015	ug/L							
1,2-Dibromoethane [2C]	ND	0.015	ug/L							
Surrogate: Pentachloroethane	*0.190*		ug/L	*0.2000*		*95*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.216*		ug/L	*0.2000*		*108*	*30-150*			
LCS										
1,2-Dibromoethane	0.057	0.015	ug/L	0.08000		72	70-130			
1,2-Dibromoethane [2C]	0.082	0.015	ug/L	0.08000		102	70-130			
Surrogate: Pentachloroethane	*0.0803*		ug/L	*0.2000*		*40*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.0909*		ug/L	*0.2000*		*45*	*30-150*			
LCS										
1,2-Dibromoethane	0.152	0.015	ug/L	0.2000		76	70-130			
1,2-Dibromoethane [2C]	0.204	0.015	ug/L	0.2000		102	70-130			
Surrogate: Pentachloroethane	*0.277*		ug/L	*0.2000*		*139*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.296*		ug/L	*0.2000*		*148*	*30-150*			
Alcohol Scan by GC/FID										
Batch CL70605 - No Prep										
Blank										
Ethanol	ND	10	mg/L							
LCS										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Alcohol Scan by GC/FID										
Batch CL70605 - No Prep										
Ethanol	1160	10	mg/L	1007		115	60-140			
LCS Dup										
Ethanol	1020	10	mg/L	1007		102	60-140	12	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP ESS Laboratory Work Order: 1712097

Notes and Definitions

U	Analyte included in the analysis, but not detected
S+	Surrogate recovery(ies) above upper control limit (S+).
Q	Calibration required quadratic regression (Q).
HT	The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712097

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1712097
Date Received: 12/5/2017
Project Due Date: 12/12/2017
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	187772	Yes	NA	Yes	1L Amber - Unpres	NP	
01	187773	Yes	NA	Yes	1L Amber - Unpres	NP	
01	187774	Yes	NA	Yes	1L Amber - Unpres	NP	
01	187775	Yes	NA	Yes	1L Amber - Unpres	NP	
01	187776	Yes	NA	Yes	1L Amber - Unpres	NP	
01	187777	Yes	NA	Yes	1L Amber - Unpres	NP	
~~01~~	~~187778~~	~~Yes~~	~~NA~~	~~Yes~~	~~1L Amber - H2SO4~~	~~H2SO4~~	
01	187810	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
02	187762	Yes	NA	Yes	1L Amber - Unpres	NP	
02	187763	Yes	NA	Yes	1L Amber - Unpres	NP	
02	187764	Yes	NA	Yes	1L Amber - Unpres	NP	
02	187765	Yes	NA	Yes	1L Amber - Unpres	NP	
02	187766	Yes	NA	Yes	1L Amber - Unpres	NP	
02	187767	Yes	NA	Yes	1L Amber - Unpres	NP	
02	187768	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
02	187769	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
02	188122	Yes	No	Yes	VOA Vial - HCl	HCl	
02	188123	Yes	No	Yes	VOA Vial - HCl	HCl	
02	188124	Yes	No	Yes	VOA Vial - HCl	HCl	
02	188125	Yes	No	Yes	VOA Vial - HCl	HCl	
02	188126	Yes	No	Yes	VOA Vial - HCl	HCl	
02	188127	Yes	No	Yes	VOA Vial - HCl	HCl	
02	188128	Yes	NA	Yes	VOA Vial - Unpres	NP	
02	188129	Yes	NA	Yes	1L Poly - Unpres	NP	

~~01 187778 Yes NA Yes 1L Amber - H2SO4 H2SO4~~ QA 12/6/17 Moved to sample 2 pan

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1712097

Date Received: 12/5/2017

02	188130	Yes	NA	Yes	500 mL Poly - HNO3	HNO3
02	188131	Yes	NA	Yes	500 mL Poly - HNO3	HNO3
02	188132	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4
02	188134	Yes	NA	Yes	250 mL Poly - NaOH	NaOH pH>12 1908 12/5/17 GA
02	188135	Yes	NA	Yes	250 mL Poly - Unpres	NP
02	189546	Yes	NA	Yes	1L Amber H2SO4	H2SO4 GA 12/8/17

2nd Review
Are barcode labels on correct containers? (Yes / No)

Completed By: _____ Date & Time: 12/5/17 1915 / GA 12/8/17 1639

Reviewed By: _____ Date & Time: 12/5/17 1932 / 12/8/17 1648

Delivered By: _____ 12/5/17 1932 / 12/8/17 1648

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1712097
Date Received: 12/5/2017
Project Due Date: 12/12/2017
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	187772	Yes	NA	Yes	1L Amber - Unpres	NP	
01	187773	Yes	NA	Yes	1L Amber - Unpres	NP	
01	187774	Yes	NA	Yes	1L Amber - Unpres	NP	
01	187775	Yes	NA	Yes	1L Amber - Unpres	NP	
01	187776	Yes	NA	Yes	1L Amber - Unpres	NP	
01	187777	Yes	NA	Yes	1L Amber - Unpres	NP	
01	187778	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	187810	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
02	187762	Yes	NA	Yes	1L Amber - Unpres	NP	
02	187763	Yes	NA	Yes	1L Amber - Unpres	NP	
02	187764	Yes	NA	Yes	1L Amber - Unpres	NP	
02	187765	Yes	NA	Yes	1L Amber - Unpres	NP	
02	187766	Yes	NA	Yes	1L Amber - Unpres	NP	
02	187767	Yes	NA	Yes	1L Amber - Unpres	NP	
02	187768	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
02	187769	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
02	188122	Yes	No	Yes	VOA Vial - HCl	HCl	
02	188123	Yes	No	Yes	VOA Vial - HCl	HCl	
02	188124	Yes	No	Yes	VOA Vial - HCl	HCl	
02	188125	Yes	No	Yes	VOA Vial - HCl	HCl	
02	188126	Yes	No	Yes	VOA Vial - HCl	HCl	
02	188127	Yes	No	Yes	VOA Vial - HCl	HCl	
02	188128	Yes	NA	Yes	VOA Vial - Unpres	NP	
02	188129	Yes	NA	Yes	1L Poly - Unpres	NP	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1712097

Date Received: 12/5/2017

02	188130	Yes	NA	Yes	500 mL Poly - HNO3	HNO3
02	188131	Yes	NA	Yes	500 mL Poly - HNO3	HNO3
02	188132	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4
02	188134	Yes	NA	Yes	250 mL Poly - NaOH	NaOH pH>12 1908 12/5/17
02	188135	Yes	NA	Yes	250 mL Poly - Unpres	NP

2nd Review
Are barcode labels on correct containers? (Yes / No)

Completed By: _____ Date & Time: 12/5/17 1915

Reviewed By: _____ Date & Time: 12/5/17 1932

Delivered By: _____ 12/5/17 1932

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS LAB PROJECT ID: 712097

Turn Time: ✓ Standard Rush _____ Approved By: _____

Reporting Limits -

State where samples were collected: (MA) NH

Discharge into: Fresh Water ☐ Salt Water ✓

Is this project for: **RGP**

Electonic Deliverable Yes ✓ No ____
Format: Excel ___ Access ___ PDF ✓ Other ____

Project Manager: Mike Sabourin
Company: GEI
Address: 400 Unicorn Park Drive, Woburn, MA 01801

Project #: 160575
Project Name: Eversource WRVRP
PO #

ESS Lab Sample ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample Identification	# of Containers	RGP Metals Total	RGP Metals Dissolved	Hardness (Calculation)	Ethanol ASTM D3695	Chloride 300.0*	Total Cyanide 4500 LL	TPH 1664	TSS 2540D*	TRC 4500-CL D*	Ammonia 350.1	Tri Cr (Calc. MUST run T. Cr)	Hex Cr 3500	Phenol 420.1	RGP VOC Long List 524	1,4-Dioxane 8270-SIM	EDB 504.1	RGP SVOC Log List 625-SIM	PCB 608	Comment #
1	12-5-17	0930	G	Water	160575-B4(MW)	7 ~~22~~		X					X						X	X	X		X	X	1,2
2	12-5-17	1400	G	Water	160575-B11(MW)	22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

	4	4	4	1	1	5	2	1	1	3	-	1	3	2	1	2	1	1	
Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA	P	P	P	V	P	P	AG	P	P	P	-	P	AG	V	AG	V	AG	AG	

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes ____ No
Seals Intact ___ Yes ___ No NA: X
Cooler Temperature: 2.8

Sampled by : JAW

check box correction per MS. mkm 12/8/17

Comments: 1) RGP Metals include Sb, As, Cd, Cu, Fe, Pb, Ni, Se, Ag and Zn by 200.7/3113B and Hg by 245.1
2) Parameters in **BOLD** have Short hold-time
PERMIT ATTACHED
* **TSS, TRC and Cl taken from the same container**

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	12-5-17	12/5/17 1653	12/5/17 1824	12/5/17 1852	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Cooler #2 2.1 Temp ice Blank JP

Please E-mail all changes to Chain of Custody in writin

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ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS LAB PROJECT ID: 712097

Turn Time: ✓ Standard Rush _____ Approved By: _____

Reporting Limits -

State where samples were collected: MA NH

Discharge into: Fresh Water ☐ Salt Water ✓ ☐

Is this project for: **RGP**

Electonic Deliverable Yes ✓ No ____
Format: Excel ___ Access ___ PDF ✓ Other ____

Project Manager: Mike Sabourin
Company: GEI
Address: 400 Unicorn Park Drive, Woburn, MA 01801

Project #: 160575
Project Name: Eversource WRWRP
PO #

ESS Lab Sample ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample Identification	# of Containers	Analysis: RGP Metals Total	RGP Metals Dissolved	Hardness (Calculation)	Ethanol ASTM D3695	Chloride 300.0*	Total Cyanide 4500 LL	TPH 1664	TSS 2540D*	TRC 4500-CL D*	Ammonia 350.1	Tri Cr (Calc. MUST run T. Cr)	Hex Cr 3500	Phenol 420.1	RGP VOC Long List 524	1,4-Dioxane 8270-SIM	EDB 504.1	RGP SVOC Log List 625-SIM	PCB 608	Comment #
1	12-5-17	0930	G	Water	160575-B4(MW)	7 ~~22~~		X					X						X		X		X	X	1,2
2	12-5-17	1400	G	Water	160575-B11(MW)	22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____							4	4	4	1	1	5	2	1	1	3	-	1	3	2	1	2	1	1	
Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA							P	P	P	V	P	P	AG	P	P	P	-	P	AG	V	AG	V	AG	AG	

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes ____ No
Seals Intact ___ Yes ___ No NA: X
Cooler Temperature: 2.8

Sampled by : JAW

Comments: 1) RGP Metals include Sb, As, Cd, Cu, Fe, Pb, Ni, Se, Ag and Zn by 200.7/3113B and Hg by 245.1
2) Parameters in **BOLD** have Short hold-time **PERMIT ATTACHED**
* **TSS, TRC and Cl taken from the same container**

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	12-5-17	[signature] 12/5/17 1653	[signature]	12/5/17 1824	[signature] 12/5/17 1852
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Cooler #2 2.1 Temp ice Blank JP

Please E-mail all changes to Chain of Custody in writin

Page 1 of 1

CERTIFICATE OF ANALYSIS

Mike Sabulis
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Eversource WRNRP - RGP (1610515)
ESS Laboratory Work Order Number: 1712102

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 5:20 pm, Dec 12, 2017

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

SAMPLE RECEIPT

The following samples were received on December 05, 2017 for the analyses specified on the enclosed Chain of Custody Record.

The samples and analyses listed below were analyzed in accordance with the 2017 Remediation General Permit under the National Pollutant Discharge Elimination System (NPDES).

ESS Laboratory is unable to achieve the required detection limit of 0.4 mg/L for Ethanol for the RGP permit. We have also been unable to procure a subcontract laboatory that is able to achieve this limit. The data for Ethanol has been reported using our current method reporting limit.

Sample 1712102-01 for Total Residual Chlorine and Hexavalent Chromium was received outside of the holding time.

Lab Number	Sample Name	Matrix	Analysis
1712102-01	1610515-B4 MW	Ground Water	1664A, 200.7, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 420.1, 4500 CN CE, 4500Cl D, 504.1, 524.2, ASTM D3695
1712102-02	1610515-B6 MW	Ground Water	1664A, 200.7, 245.1, 3113B, 420.1, 608, 625 SIM, 8270D SIM

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP ESS Laboratory Work Order: 1712102

PROJECT NARRATIVE

625(SIM) Semi-Volatile Organic Compounds

1712102-02	**Surrogate recovery(ies) above upper control limit (S+).**
	2,4,6-Tribromophenol (210% @ 15-110%)
C7L0142-CCV1	**Calibration required quadratic regression (Q).**
	2,4,6-Tribromophenol (116% @ 80-120%), Pentachlorophenol (103% @ 80-120%)
C7L0164-CCV1	**Calibration required quadratic regression (Q).**
	2,4,6-Tribromophenol (137% @ 80-120%), Pentachlorophenol (131% @ 80-120%)
C7L0164-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	2,4,6-Tribromophenol (37% @ 20%), Pentachlorophenol (31% @ 20%)
C7L0164-TUN1	**DDT breakdown > 20%**
CL70612-BS2	**Surrogate recovery(ies) above upper control limit (S+).**
	2,4,6-Tribromophenol (130% @ 15-110%)
CL70612-BSD2	**Relative percent difference for duplicate is outside of criteria (D+).**
	Benzo(a)anthracene (25% @ 20%), Benzo(a)pyrene (21% @ 20%), Benzo(g,h,i)perylene (23% @ 20%), Benzo(k)fluoranthene (28% @ 20%), bis(2-Ethylhexyl)phthalate (24% @ 20%), Butylbenzylphthalate (24% @ 20%), Chrysene (24% @ 20%), Dibenzo(a,h)Anthracene (21% @ 20%), Indeno(1,2,3-cd)Pyrene (22% @ 20%), Pyrene (23% @ 20%)
CL70612-BSD2	**Surrogate recovery(ies) above upper control limit (S+).**
	2,4,6-Tribromophenol (135% @ 15-110%)

Classical Chemistry

1712102-01	**Estimated value. Sample hold times were exceeded (H).**
	Hexavalent Chromium
1712102-01	**The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B4 MW
Date Sampled: 12/04/17 14:00
Percent Solids: N/A

ESS Laboratory Work Order: 1712102
ESS Laboratory Sample ID: 1712102-01
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (10.0)		200.7		1	KJK	12/07/17 18:00	100	20	CL70554
Arsenic	ND (5.0)		3113B		5	KJK	12/07/17 22:25	100	20	CL70554
Cadmium	ND (0.25)		3113B		5	KJK	12/07/17 17:00	100	20	CL70554
Chromium	**10.1** (4.0)		200.7		1	KJK	12/07/17 18:00	100	20	CL70554
Chromium III	**10.1** (10.0)		200.7		1	JLK	12/07/17 18:00	1	1	[CALC]
Copper	**10.6** (4.0)		200.7		1	KJK	12/07/17 18:00	100	20	CL70554
Hardness	**62400** (165)		200.7		1	KJK	12/07/17 18:00	1	1	[CALC]
Iron	**5080** (20.0)		200.7		1	KJK	12/07/17 18:00	100	20	CL70554
Lead	**15.8** (2.0)		3113B		5	KJK	12/07/17 19:55	100	20	CL70554
Mercury	ND (0.200)		245.1		1	MJV	12/08/17 15:00	20	40	CL70557
Nickel	ND (10.0)		200.7		1	KJK	12/07/17 18:00	100	20	CL70554
Selenium	ND (4.0)		3113B		5	KJK	12/08/17 1:07	100	20	CL70554
Silver	ND (1.0)		200.7		1	KJK	12/07/17 18:00	100	20	CL70554
Zinc	**45.8** (10.0)		200.7		1	KJK	12/07/17 18:00	100	20	CL70554

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B4 MW
Date Sampled: 12/04/17 14:00
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 1712102
ESS Laboratory Sample ID: 1712102-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: DMC

524.2 Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1-Trichloroethane	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
1,1,2-Trichloroethane	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
1,1-Dichloroethane	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
1,1-Dichloroethene	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
1,2-Dichlorobenzene	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
1,2-Dichloroethane	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
1,3-Dichlorobenzene	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
1,4-Dichlorobenzene	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Acetone	ND (5.0)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Benzene	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Carbon Tetrachloride	ND (0.3)		524.2		1	12/07/17 16:15	C7L0109	CL70736
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Ethylbenzene	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Methylene Chloride	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Naphthalene	**7.9** (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Tetrachloroethene	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Toluene	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Trichloroethene	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Vinyl Chloride	ND (0.2)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Xylene O	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736
Xylene P,M	ND (0.5)		524.2		1	12/07/17 16:15	C7L0109	CL70736

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*100 %*		*80-120*
Surrogate: 4-Bromofluorobenzene	*103 %*		*80-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B4 MW
Date Sampled: 12/04/17 14:00
Percent Solids: N/A

ESS Laboratory Work Order: 1712102
ESS Laboratory Sample ID: 1712102-01
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	**0.11** (0.10)		350.1		1	JLK	12/11/17 17:15	mg/L	CL70811
Chloride	**99.3** (50.0)		300.0		100	JLK	12/08/17 19:05	mg/L	CL70846
Hexavalent Chromium	**H** ND (10.0)		3500Cr B-2009		1	JLK	12/05/17 21:34	ug/L	CL70548
Phenols	ND (100)		420.1		1	JLK	12/06/17 17:40	ug/L	CL70640
Total Cyanide (LL)	ND (5.00)		4500 CN CE		1	EEM	12/06/17 12:05	ug/L	CL70628
Total Petroleum Hydrocarbon	ND (6.41)		1664A		1	LAB	12/08/17 9:04	mg/L	CL70611
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	12/05/17 20:44	ug/L	CL70549
Total Suspended Solids	**832** (10)		2540D		1	JLK	12/08/17 21:02	mg/L	CL70845

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B4 MW
Date Sampled: 12/04/17 14:00
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1712102
ESS Laboratory Sample ID: 1712102-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: SMR
Prepared: 12/8/17 11:35

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2-Dibromoethane	ND (0.015)		504.1		1	12/08/17 20:33		CL70822

	%Recovery	Qualifier	Limits
Surrogate: Pentachloroethane	*140 %*		*30-150*
Surrogate: Pentachloroethane [2C]	*140 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B4 MW
Date Sampled: 12/04/17 14:00
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1712102
ESS Laboratory Sample ID: 1712102-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 12/6/17 8:27

Alcohol Scan by GC/FID

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Ethanol	ND (10)		ASTM D3695		1	ZLC	12/06/17 15:15		CL70605

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B6 MW
Date Sampled: 12/04/17 10:30
Percent Solids: N/A

ESS Laboratory Work Order: 1712102
ESS Laboratory Sample ID: 1712102-02
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Dissolved Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (10.0)		200.7		1	KJK	12/07/17 17:44	100	20	CL70554
Arsenic	ND (5.0)		3113B		5	KJK	12/07/17 22:03	100	20	CL70554
Cadmium	ND (0.25)		3113B		5	KJK	12/07/17 16:49	100	20	CL70554
Chromium	ND (4.0)		200.7		1	KJK	12/07/17 17:44	100	20	CL70554
Copper	ND (4.0)		200.7		1	KJK	12/07/17 17:44	100	20	CL70554
Iron	ND (20.0)		200.7		1	KJK	12/07/17 17:44	100	20	CL70554
Lead	ND (2.0)		3113B		5	KJK	12/07/17 19:43	100	20	CL70554
Mercury	ND (0.20)		245.1		1	MJV	12/08/17 15:05	20	40	CL70557
Nickel	ND (10.0)		200.7		1	KJK	12/07/17 17:44	100	20	CL70554
Selenium	ND (4.0)		3113B		5	KJK	12/08/17 0:38	100	20	CL70554
Silver	ND (2.0)		200.7		1	KJK	12/07/17 17:44	100	20	CL70554
Zinc	**12.9** (10.0)		200.7		1	KJK	12/07/17 17:44	100	20	CL70554

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B6 MW
Date Sampled: 12/04/17 10:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1712102
ESS Laboratory Sample ID: 1712102-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: CAD
Prepared: 12/6/17 11:02

608 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.09)		608		1	12/06/17 20:30		CL70606
Aroclor 1221	ND (0.09)		608		1	12/06/17 20:30		CL70606
Aroclor 1232	ND (0.09)		608		1	12/06/17 20:30		CL70606
Aroclor 1242	ND (0.09)		608		1	12/06/17 20:30		CL70606
Aroclor 1248	ND (0.09)		608		1	12/06/17 20:30		CL70606
Aroclor 1254	ND (0.09)		608		1	12/06/17 20:30		CL70606
Aroclor 1260	ND (0.09)		608		1	12/06/17 20:30		CL70606
Aroclor 1262	ND (0.09)		608		1	12/06/17 20:30		CL70606
Aroclor 1268	ND (0.09)		608		1	12/06/17 20:30		CL70606

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*65 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*75 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*71 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*84 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B6 MW
Date Sampled: 12/04/17 10:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1712102
ESS Laboratory Sample ID: 1712102-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 12/6/17 14:36

625(SIM) Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acenaphthene	ND (0.19)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Acenaphthylene	**0.50** (0.19)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Anthracene	**0.30** (0.19)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Benzo(a)anthracene	**0.52** (0.05)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Benzo(a)pyrene	**0.59** (0.05)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Benzo(b)fluoranthene	**0.60** (0.05)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Benzo(g,h,i)perylene	**0.43** (0.19)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Benzo(k)fluoranthene	**0.20** (0.05)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
bis(2-Ethylhexyl)phthalate	ND (1.87)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Butylbenzylphthalate	ND (2.34)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Chrysene	**0.65** (0.05)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Dibenzo(a,h)Anthracene	**0.12** (0.05)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Diethylphthalate	ND (2.34)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Dimethylphthalate	ND (2.34)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Di-n-butylphthalate	ND (2.34)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Di-n-octylphthalate	ND (2.34)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Fluoranthene	**0.75** (0.19)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Fluorene	ND (0.19)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Indeno(1,2,3-cd)Pyrene	**0.43** (0.05)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Naphthalene	ND (0.19)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Pentachlorophenol	ND (0.84)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Phenanthrene	**0.41** (0.19)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612
Pyrene	**1.18** (0.19)		625 SIM		1	12/12/17 13:19	C7L0164	CL70612

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*48 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*210 %*	*S+*	*15-110*
Surrogate: 2-Fluorobiphenyl	*87 %*		*30-130*
Surrogate: Nitrobenzene-d5	*76 %*		*30-130*
Surrogate: p-Terphenyl-d14	*81 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B6 MW
Date Sampled: 12/04/17 10:30
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 1712102
ESS Laboratory Sample ID: 1712102-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 12/7/17 16:00

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,4-Dioxane	ND (0.250)		8270D SIM		1	12/08/17 2:12	C7L0096	CL70747

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	*39 %*		*15-115*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B6 MW
Date Sampled: 12/04/17 10:30
Percent Solids: N/A

ESS Laboratory Work Order: 1712102
ESS Laboratory Sample ID: 1712102-02
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Phenols	ND (100)		420.1		1	JLK	12/06/17 17:40	ug/L	CL70640
Total Petroleum Hydrocarbon	ND (6.25)		1664A		1	LAB	12/08/17 9:04	mg/L	CL70611

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Dissolved Metals										
Batch CL70554 - 3005A/200.7										
Blank										
Antimony	ND	10.0	ug/L							
Arsenic	ND	1.0	ug/L							
Cadmium	ND	0.05	ug/L							
Chromium	ND	4.0	ug/L							
Copper	ND	4.0	ug/L							
Iron	ND	20.0	ug/L							
Lead	ND	0.4	ug/L							
Nickel	ND	10.0	ug/L							
Selenium	ND	0.8	ug/L							
Silver	ND	2.0	ug/L							
Zinc	ND	10.0	ug/L							
LCS										
Antimony	91.2	10.0	ug/L	100.0		91	85-115			
Arsenic	87.6	25.0	ug/L	100.0		88	85-115			
Cadmium	49.8	25.0	ug/L	50.00		100	85-115			
Chromium	92.4	4.0	ug/L	100.0		92	80-120			
Copper	95.0	4.0	ug/L	100.0		95	80-120			
Iron	438	20.0	ug/L	500.0		88	80-120			
Lead	92.5	10.0	ug/L	100.0		93	85-115			
Nickel	94.2	10.0	ug/L	100.0		94	85-115			
Selenium	231	20.0	ug/L	200.0		115	85-115			
Silver	43.2	4.0	ug/L	50.00		86	85-115			
Zinc	98.8	10.0	ug/L	100.0		99	85-115			
Batch CL70557 - 245.1/7470A										
Blank										
Mercury	ND	0.20	ug/L							
LCS										
Mercury	5.95	0.20	ug/L	6.000		99	85-115			
LCS Dup										
Mercury	5.65	0.20	ug/L	6.000		94	85-115	5	20	
Total Metals										
Batch CL70548 - [CALC]										
Blank										
Chromium III	ND	10.0	ug/L							
LCS										
Chromium III	ND		ug/L							
LCS Dup										
Chromium III	ND		ug/L							
Batch CL70554 - 3005A/200.7										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CL70554 - 3005A/200.7										
Antimony	ND	10.0	ug/L							
Arsenic	ND	1.0	ug/L							
Cadmium	ND	0.05	ug/L							
Chromium	ND	4.0	ug/L							
Chromium III	ND	4.00	ug/L							
Copper	ND	4.0	ug/L							
Hardness	ND	165	ug/L							
Iron	ND	20.0	ug/L							
Lead	ND	0.4	ug/L							
Nickel	ND	10.0	ug/L							
Selenium	ND	0.8	ug/L							
Silver	ND	1.0	ug/L							
Zinc	ND	10.0	ug/L							
LCS										
Antimony	91.2	10.0	ug/L	100.0		91	85-115			
Arsenic	87.6	25.0	ug/L	100.0		88	85-115			
Cadmium	49.8	25.0	ug/L	50.00		100	85-115			
Chromium	92.4	4.0	ug/L	100.0		92	85-115			
Chromium III	92.4	4.00	ug/L							
Copper	95.0	4.0	ug/L	100.0		95	85-115			
Hardness	6040	165	ug/L							
Iron	438	20.0	ug/L	500.0		88	85-115			
Lead	92.5	10.0	ug/L	100.0		93	85-115			
Nickel	94.2	10.0	ug/L	100.0		94	85-115			
Selenium	231	20.0	ug/L	200.0		115	85-115			
Silver	43.2	2.0	ug/L	50.00		86	85-115			
Zinc	98.8	10.0	ug/L	100.0		99	85-115			
LCS Dup										
Chromium III	92.1	4.00	ug/L							
Hardness	5970	165	ug/L							
Batch CL70557 - 245.1/7470A										
Blank										
Mercury	ND	0.200	ug/L							
LCS										
Mercury	5.95	0.200	ug/L	6.000		99	85-115			
LCS Dup										
Mercury	5.65	0.200	ug/L	6.000		94	85-115	5	20	
524.2 Volatile Organic Compounds										
Batch CL70736 - 524.2										
Blank										
1,1,1-Trichloroethane	ND	0.5	ug/L							
1,1,2-Trichloroethane	ND	0.5	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch CL70736 - 524.2										
1,1-Dichloroethane	ND	0.5	ug/L							
1,1-Dichloroethene	ND	0.5	ug/L							
1,2-Dichlorobenzene	ND	0.5	ug/L							
1,2-Dichloroethane	ND	0.5	ug/L							
1,3-Dichlorobenzene	ND	0.5	ug/L							
1,4-Dichlorobenzene	ND	0.5	ug/L							
Acetone	ND	5.0	ug/L							
Benzene	ND	0.5	ug/L							
Carbon Tetrachloride	ND	0.3	ug/L							
cis-1,2-Dichloroethene	ND	0.5	ug/L							
Ethylbenzene	ND	0.5	ug/L							
Methyl tert-Butyl Ether	ND	0.5	ug/L							
Methylene Chloride	ND	0.5	ug/L							
Naphthalene	ND	0.5	ug/L							
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tertiary-butyl Alcohol	ND	25.0	ug/L							
Tetrachloroethene	ND	0.5	ug/L							
Toluene	ND	0.5	ug/L							
Trichloroethene	ND	0.5	ug/L							
Vinyl Chloride	ND	0.2	ug/L							
Xylene O	ND	0.5	ug/L							
Xylene P,M	ND	0.5	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*5.19*		ug/L	*5.000*		*104*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.99*		ug/L	*5.000*		*100*	*80-120*			
LCS										
1,1,1-Trichloroethane	10.2		ug/L	10.00		102	70-130			
1,1,2-Trichloroethane	10.1		ug/L	10.00		101	70-130			
1,1-Dichloroethane	9.9		ug/L	10.00		99	70-130			
1,1-Dichloroethene	10.9		ug/L	10.00		109	70-130			
1,2-Dichlorobenzene	10.4		ug/L	10.00		104	70-130			
1,2-Dichloroethane	10.5		ug/L	10.00		105	70-130			
1,3-Dichlorobenzene	10.3		ug/L	10.00		103	70-130			
1,4-Dichlorobenzene	10.5		ug/L	10.00		105	70-130			
Acetone	48.6		ug/L	50.00		97	70-130			
Benzene	10.4		ug/L	10.00		104	70-130			
Carbon Tetrachloride	10.3		ug/L	10.00		103	70-130			
cis-1,2-Dichloroethene	10.9		ug/L	10.00		109	70-130			
Ethylbenzene	10.2		ug/L	10.00		102	70-130			
Methyl tert-Butyl Ether	10.6		ug/L	10.00		106	70-130			
Methylene Chloride	10.4		ug/L	10.00		104	70-130			
Naphthalene	10.9		ug/L	10.00		109	70-130			
Tertiary-amyl methyl ether	10.1		ug/L	10.00		101	70-130			
Tertiary-butyl Alcohol	64.2		ug/L	50.00		128	70-130			
Tetrachloroethene	8.1		ug/L	10.00		81	70-130			
Toluene	10.3		ug/L	10.00		103	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch CL70736 - 524.2										
Trichloroethene	10.5		ug/L	10.00		105	70-130			
Vinyl Chloride	10.4		ug/L	10.00		104	70-130			
Xylene O	10.1		ug/L	10.00		101	70-130			
Xylene P,M	20.3		ug/L	20.00		102	70-130			
Surrogate: 1,2-Dichlorobenzene-d4	*5.02*		ug/L	*5.000*		*100*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*5.02*		ug/L	*5.000*		*100*	*80-120*			
LCS Dup										
1,1,1-Trichloroethane	9.9		ug/L	10.00		99	70-130	3	20	
1,1,2-Trichloroethane	10.1		ug/L	10.00		101	70-130	0.2	20	
1,1-Dichloroethane	9.9		ug/L	10.00		99	70-130	0.6	20	
1,1-Dichloroethene	11.0		ug/L	10.00		110	70-130	0.8	20	
1,2-Dichlorobenzene	10.5		ug/L	10.00		105	70-130	1	20	
1,2-Dichloroethane	10.5		ug/L	10.00		105	70-130	0.2	20	
1,3-Dichlorobenzene	10.5		ug/L	10.00		105	70-130	2	20	
1,4-Dichlorobenzene	10.6		ug/L	10.00		106	70-130	1	20	
Acetone	53.8		ug/L	50.00		108	70-130	10	20	
Benzene	10.3		ug/L	10.00		103	70-130	2	20	
Carbon Tetrachloride	9.8		ug/L	10.00		98	70-130	4	20	
cis-1,2-Dichloroethene	10.5		ug/L	10.00		105	70-130	3	20	
Ethylbenzene	10.2		ug/L	10.00		102	70-130	0	20	
Methyl tert-Butyl Ether	10.5		ug/L	10.00		105	70-130	0.5	20	
Methylene Chloride	10.5		ug/L	10.00		105	70-130	0.8	20	
Naphthalene	11.3		ug/L	10.00		113	70-130	4	20	
Tertiary-amyl methyl ether	10.2		ug/L	10.00		102	70-130	1	20	
Tertiary-butyl Alcohol	62.9		ug/L	50.00		126	70-130	2	25	
Tetrachloroethene	7.7		ug/L	10.00		77	70-130	4	20	
Toluene	10.0		ug/L	10.00		100	70-130	3	20	
Trichloroethene	10.4		ug/L	10.00		104	70-130	1	20	
Vinyl Chloride	10.3		ug/L	10.00		103	70-130	0.4	20	
Xylene O	10.2		ug/L	10.00		102	70-130	2	20	
Xylene P,M	20.7		ug/L	20.00		104	70-130	2	20	
Surrogate: 1,2-Dichlorobenzene-d4	*5.11*		ug/L	*5.000*		*102*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*5.22*		ug/L	*5.000*		*104*	*80-120*			
608 Polychlorinated Biphenyls (PCB)										
Batch CL70606 - 3510C										
Blank										
Aroclor 1016	ND	0.10	ug/L							
Aroclor 1016 [2C]	ND	0.10	ug/L							
Aroclor 1221	ND	0.10	ug/L							
Aroclor 1221 [2C]	ND	0.10	ug/L							
Aroclor 1232	ND	0.10	ug/L							
Aroclor 1232 [2C]	ND	0.10	ug/L							
Aroclor 1242	ND	0.10	ug/L							
Aroclor 1242 [2C]	ND	0.10	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
608 Polychlorinated Biphenyls (PCB)										
Batch CL70606 - 3510C										
Aroclor 1248	ND	0.10	ug/L							
Aroclor 1248 [2C]	ND	0.10	ug/L							
Aroclor 1254	ND	0.10	ug/L							
Aroclor 1254 [2C]	ND	0.10	ug/L							
Aroclor 1260	ND	0.10	ug/L							
Aroclor 1260 [2C]	ND	0.10	ug/L							
Aroclor 1262	ND	0.10	ug/L							
Aroclor 1262 [2C]	ND	0.10	ug/L							
Aroclor 1268	ND	0.10	ug/L							
Aroclor 1268 [2C]	ND	0.10	ug/L							
Surrogate: Decachlorobiphenyl	*0.0384*		ug/L	*0.05000*		*77*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0438*		ug/L	*0.05000*		*88*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0311*		ug/L	*0.05000*		*62*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0373*		ug/L	*0.05000*		*75*	*30-150*			
LCS										
Aroclor 1016	0.88	0.10	ug/L	1.000		88	40-140			
Aroclor 1016 [2C]	0.89	0.10	ug/L	1.000		89	40-140			
Aroclor 1260	1.02	0.10	ug/L	1.000		102	40-140			
Aroclor 1260 [2C]	0.92	0.10	ug/L	1.000		92	40-140			
Surrogate: Decachlorobiphenyl	*0.0501*		ug/L	*0.05000*		*100*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0533*		ug/L	*0.05000*		*107*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0403*		ug/L	*0.05000*		*81*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0402*		ug/L	*0.05000*		*80*	*30-150*			
LCS Dup										
Aroclor 1016	0.98	0.10	ug/L	1.000		98	40-140	11	20	
Aroclor 1016 [2C]	1.02	0.10	ug/L	1.000		102	40-140	14	20	
Aroclor 1260	1.07	0.10	ug/L	1.000		107	40-140	5	20	
Aroclor 1260 [2C]	0.97	0.10	ug/L	1.000		97	40-140	5	20	
Surrogate: Decachlorobiphenyl	*0.0488*		ug/L	*0.05000*		*98*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0496*		ug/L	*0.05000*		*99*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0428*		ug/L	*0.05000*		*86*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0451*		ug/L	*0.05000*		*90*	*30-150*			
625(SIM) Semi-Volatile Organic Compounds										
Batch CL70612 - 3510C										
Blank										
Acenaphthene	ND	0.20	ug/L							
Acenaphthylene	ND	0.20	ug/L							
Anthracene	ND	0.20	ug/L							
Benzo(a)anthracene	ND	0.05	ug/L							
Benzo(a)pyrene	ND	0.05	ug/L							
Benzo(b)fluoranthene	ND	0.05	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625(SIM) Semi-Volatile Organic Compounds										
Batch CL70612 - 3510C										
Benzo(g,h,i)perylene	ND	0.20	ug/L							
Benzo(k)fluoranthene	ND	0.05	ug/L							
bis(2-Ethylhexyl)phthalate	ND	2.00	ug/L							
Butylbenzylphthalate	ND	2.50	ug/L							
Chrysene	ND	0.05	ug/L							
Dibenzo(a,h)Anthracene	ND	0.05	ug/L							
Diethylphthalate	ND	2.50	ug/L							
Dimethylphthalate	ND	2.50	ug/L							
Di-n-butylphthalate	ND	2.50	ug/L							
Di-n-octylphthalate	ND	2.50	ug/L							
Fluoranthene	ND	0.20	ug/L							
Fluorene	ND	0.20	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	0.05	ug/L							
Naphthalene	ND	0.20	ug/L							
Pentachlorophenol	ND	0.90	ug/L							
Phenanthrene	ND	0.20	ug/L							
Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*1.32*		ug/L	*2.500*		*53*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.40*		ug/L	*3.750*		*91*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.64*		ug/L	*2.500*		*66*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.03*		ug/L	*2.500*		*81*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.09*		ug/L	*2.500*		*84*	*30-130*			
LCS										
Acenaphthene	3.02	0.20	ug/L	4.000		75	40-140			
Acenaphthylene	3.04	0.20	ug/L	4.000		76	40-140			
Anthracene	3.09	0.20	ug/L	4.000		77	40-140			
Benzo(a)anthracene	2.33	0.05	ug/L	4.000		58	40-140			
Benzo(a)pyrene	2.57	0.05	ug/L	4.000		64	40-140			
Benzo(b)fluoranthene	2.64	0.05	ug/L	4.000		66	40-140			
Benzo(g,h,i)perylene	2.60	0.20	ug/L	4.000		65	40-140			
Benzo(k)fluoranthene	2.38	0.05	ug/L	4.000		59	40-140			
bis(2-Ethylhexyl)phthalate	2.90	2.00	ug/L	4.000		72	40-140			
Butylbenzylphthalate	3.06	2.50	ug/L	4.000		77	40-140			
Chrysene	2.41	0.05	ug/L	4.000		60	40-140			
Dibenzo(a,h)Anthracene	2.69	0.05	ug/L	4.000		67	40-140			
Diethylphthalate	3.53	2.50	ug/L	4.000		88	40-140			
Dimethylphthalate	3.47	2.50	ug/L	4.000		87	40-140			
Di-n-butylphthalate	3.47	2.50	ug/L	4.000		87	40-140			
Di-n-octylphthalate	3.15	2.50	ug/L	4.000		79	40-140			
Fluoranthene	3.23	0.20	ug/L	4.000		81	40-140			
Fluorene	3.25	0.20	ug/L	4.000		81	40-140			
Indeno(1,2,3-cd)Pyrene	2.70	0.05	ug/L	4.000		67	40-140			
Naphthalene	2.79	0.20	ug/L	4.000		70	40-140			
Pentachlorophenol	4.05	0.90	ug/L	4.000		101	30-130			
Phenanthrene	3.06	0.20	ug/L	4.000		76	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625(SIM) Semi-Volatile Organic Compounds										
Batch CL70612 - 3510C										
Pyrene	2.48	0.20	ug/L	4.000		62	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.84*		ug/L	*2.500*		*74*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.88*		ug/L	*3.750*		*130*	*15-110*			*S+*
Surrogate: 2-Fluorobiphenyl	*2.11*		ug/L	*2.500*		*84*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.48*		ug/L	*2.500*		*99*	*30-130*			
Surrogate: p-Terphenyl-d14	*1.82*		ug/L	*2.500*		*73*	*30-130*			
LCS Dup										
Acenaphthene	3.04	0.20	ug/L	4.000		76	40-140	0.8	20	
Acenaphthylene	3.02	0.20	ug/L	4.000		75	40-140	0.7	20	
Anthracene	3.12	0.20	ug/L	4.000		78	40-140	1	20	
Benzo(a)anthracene	3.01	0.05	ug/L	4.000		75	40-140	25	20	D+
Benzo(a)pyrene	3.18	0.05	ug/L	4.000		79	40-140	21	20	D+
Benzo(b)fluoranthene	3.10	0.05	ug/L	4.000		78	40-140	16	20	
Benzo(g,h,i)perylene	3.28	0.20	ug/L	4.000		82	40-140	23	20	D+
Benzo(k)fluoranthene	3.16	0.05	ug/L	4.000		79	40-140	28	20	D+
bis(2-Ethylhexyl)phthalate	3.70	2.00	ug/L	4.000		93	40-140	24	20	D+
Butylbenzylphthalate	3.89	2.50	ug/L	4.000		97	40-140	24	20	D+
Chrysene	3.06	0.05	ug/L	4.000		77	40-140	24	20	D+
Dibenzo(a,h)Anthracene	3.34	0.05	ug/L	4.000		84	40-140	21	20	D+
Diethylphthalate	3.54	2.50	ug/L	4.000		88	40-140	0.4	20	
Dimethylphthalate	3.46	2.50	ug/L	4.000		86	40-140	0.6	20	
Di-n-butylphthalate	3.48	2.50	ug/L	4.000		87	40-140	0.1	20	
Di-n-octylphthalate	3.79	2.50	ug/L	4.000		95	40-140	19	20	
Fluoranthene	3.24	0.20	ug/L	4.000		81	40-140	0.3	20	
Fluorene	3.17	0.20	ug/L	4.000		79	40-140	2	20	
Indeno(1,2,3-cd)Pyrene	3.38	0.05	ug/L	4.000		84	40-140	22	20	D+
Naphthalene	2.79	0.20	ug/L	4.000		70	40-140	0.03	20	
Pentachlorophenol	4.06	0.90	ug/L	4.000		101	30-130	0.2	20	
Phenanthrene	3.11	0.20	ug/L	4.000		78	40-140	2	20	
Pyrene	3.13	0.20	ug/L	4.000		78	40-140	23	20	D+
Surrogate: 1,2-Dichlorobenzene-d4	*1.83*		ug/L	*2.500*		*73*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*5.08*		ug/L	*3.750*		*135*	*15-110*			*S+*
Surrogate: 2-Fluorobiphenyl	*2.10*		ug/L	*2.500*		*84*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.46*		ug/L	*2.500*		*98*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.30*		ug/L	*2.500*		*92*	*30-130*			
8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution										
Batch CL70747 - 3535A										
Blank										
1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	*3.34*		ug/L	*5.000*		*67*	*15-115*			
LCS										
1,4-Dioxane	9.50	0.250	ug/L	10.00		95	40-140			
Surrogate: 1,4-Dioxane-d8	*3.83*		ug/L	*5.000*		*77*	*15-115*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution										
Batch CL70747 - 3535A										
LCS Dup										
1,4-Dioxane	9.06	0.250	ug/L	10.00		91	40-140	5	20	
Surrogate: 1,4-Dioxane-d8	*3.22*		ug/L	*5.000*		*64*	*15-115*			
Classical Chemistry										
Batch CL70548 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	0.490		mg/L	0.4998		98	90-110			
LCS Dup										
Hexavalent Chromium	0.491		mg/L	0.4998		98	90-110	0.2	20	
Batch CL70549 - General Preparation										
Blank										
Total Residual Chlorine	ND	20.0	ug/L							
LCS										
Total Residual Chlorine	1.82		mg/L	1.800		101	85-115			
Batch CL70611 - General Preparation										
Blank										
Total Petroleum Hydrocarbon	ND	5.00	mg/L							
LCS										
Total Petroleum Hydrocarbon	17.3	5.00	mg/L	19.38		89	66-114			
Batch CL70628 - TCN Prep										
Blank										
Total Cyanide (LL)	ND	5.00	ug/L							
LCS										
Total Cyanide (LL)	20.1	5.00	ug/L	20.06		100	90-110			
LCS										
Total Cyanide (LL)	150	5.00	ug/L	150.4		99	90-110			
LCS Dup										
Total Cyanide (LL)	148	5.00	ug/L	150.4		99	90-110	0.7	20	
Batch CL70640 - General Preparation										
Blank										
Phenols	ND	100	ug/L							
LCS										
Phenols	105	100	ug/L	100.0		105	80-120			
LCS										
Phenols	1020	100	ug/L	1000		102	80-120			
Batch CL70811 - NH4 Prep										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CL70811 - NH4 Prep										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.11	0.10	mg/L	0.09994		113	80-120			
LCS										
Ammonia as N	0.94	0.10	mg/L	0.9994		94	80-120			
Batch CL70845 - General Preparation										
Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	32		mg/L	34.10		94	80-120			
Batch CL70846 - General Preparation										
Blank										
Chloride	ND	0.5	mg/L							
LCS										
Chloride	2.4		mg/L	2.500		98	90-110			
504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane										
Batch CL70822 - 504/8011										
Blank										
1,2-Dibromoethane	ND	0.015	ug/L							
1,2-Dibromoethane [2C]	ND	0.015	ug/L							
Surrogate: Pentachloroethane	*0.190*		ug/L	*0.2000*		*95*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.216*		ug/L	*0.2000*		*108*	*30-150*			
LCS										
1,2-Dibromoethane	0.057	0.015	ug/L	0.08000		72	70-130			
1,2-Dibromoethane [2C]	0.082	0.015	ug/L	0.08000		102	70-130			
Surrogate: Pentachloroethane	*0.0803*		ug/L	*0.2000*		*40*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.0909*		ug/L	*0.2000*		*45*	*30-150*			
LCS										
1,2-Dibromoethane	0.152	0.015	ug/L	0.2000		76	70-130			
1,2-Dibromoethane [2C]	0.204	0.015	ug/L	0.2000		102	70-130			
Surrogate: Pentachloroethane	*0.277*		ug/L	*0.2000*		*139*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.296*		ug/L	*0.2000*		*148*	*30-150*			
Alcohol Scan by GC/FID										
Batch CL70605 - No Prep										
Blank										
Ethanol	ND	10	mg/L							
LCS										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Alcohol Scan by GC/FID										
Batch CL70605 - No Prep										
Ethanol	1160	10	mg/L	1007		115	60-140			
LCS Dup										
Ethanol	1020	10	mg/L	1007		102	60-140	12	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP ESS Laboratory Work Order: 1712102

Notes and Definitions

U	Analyte included in the analysis, but not detected
S+	Surrogate recovery(ies) above upper control limit (S+).
Q	Calibration required quadratic regression (Q).
HT	The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
H	Estimated value. Sample hold times were exceeded (H).
DDT	DDT breakdown > 20%
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712102

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1712102
Date Received: 12/5/2017
Project Due Date: 12/12/2017
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? ~~Yes~~ No RL 12/5/17
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

COC = 1611515 - BG(MW) test for Tr, Cr; did not receive bottle. RL 12/5/17

14. Was there a need to contact Project Manager? (Yes) / No RL 12/5/17
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	188087	Yes	No	Yes	VOA Vial - HCl	HCl	
01	188088	Yes	No	Yes	VOA Vial - HCl	HCl	
01	188089	Yes	No	Yes	VOA Vial - HCl	HCl	
01	188090	Yes	No	Yes	VOA Vial - HCl	HCl	
01	188091	Yes	No	Yes	VOA Vial - HCl	HCl	
01	188092	Yes	No	Yes	VOA Vial - HCl	HCl	
01	188093	Yes	No	Yes	VOA Vial - Unpres	NP	
01	188106	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	188107	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	188108	Yes	NA	Yes	1L Poly - Unpres	NP	
01	188109	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	188110	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
01	188111	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	pH>12 RL 12/5/17
01	188112	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
01	188113	Yes	NA	Yes	250 mL Poly - Unpres	NP	
02	188094	Yes	NA	Yes	1L Amber - Unpres	NP	
02	188095	Yes	NA	Yes	1L Amber - Unpres	NP	
02	188096	Yes	NA	Yes	1L Amber - Unpres	NP	
02	188097	Yes	NA	Yes	1L Amber - Unpres	NP	
02	188098	Yes	NA	Yes	1L Amber - Unpres	NP	
02	188099	Yes	NA	Yes	1L Amber - Unpres	NP	
02	188100	Yes	NA	Yes	1L Amber - Unpres	NP	
02	188101	Yes	NA	Yes	1L Amber - Unpres	NP	
02	188102	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1712102

Date Received: 12/5/2017

02	188103	Yes	NA	Yes	500 mL Poly - HNO3	HNO3

2nd Review

Are barcode labels on correct containers? (Yes) / No

Completed By: _____ Date & Time: 12/5/17 1852

Reviewed By: _____ Date & Time: 12/5/17 2036

Delivered By: _____ 12/5/17 2030

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS LAB PROJECT ID: 1712102

Turn Time: ✓ Standard Rush ____ Approved By: ____

Reporting Limits -

State where samples were collected: **MA NH**

Discharge into: Fresh Water ☑ Salt Water ☐

Is this project for: **RGP**

Electonic Deliverable Yes ✓ No ____
Format: Excel ____ Access ____ PDF ✓ Other ____

Project Manager: M. Sabatis
Company: GEI
Address: 400 Unicorn Park Drive, Woburn, MA 01801

Project # 1610515
Project Name: EversourceWRMRP
PO #

ESS Lab Sample ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample Identification	# of Containers	RGP Metals Total	RGP Metals Dissolved	Hardness (Calculation)	Ethanol ASTM D3695	Chloride 300.0*	Total Cyanide 4500 LL	TPH 1664	TSS 2540D*	TRC 4500-CL D*	Ammonia 350.1	Tri Cr (Calc. MUST run T. Cr)	Hex Cr 3500	Phenol 420.1	RGP VOC Long List 524	1,4-Dioxane 8270-SIM	EDB 504.1	RGP SVOC Log List 625-SIM	PCB 608	Comment #
	~~12-4-17~~					22	X				X	X		X	X	X		X							1,2
1	12-4-17	~~1030~~ 1400	G	Water	1610515-~~BB~~ 4 (MW)	~~16~~ 8	X		X	X	X	X	X	X	X	X		X	X	X		X				
2	12-4-17	~~1100~~ 1030	G	Water	1610515-~~BB~~ 5 (MW)	~~8~~ 4		X					X				X		X		X		X	X		

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-____

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA	4	4	4	1	1	5	2	1	1	3	-	1	3	2	1	2	1	1								
	P	P	P	V	P	P	AG	P	P	P	-	P	AG	V	AG	V	AG	AG								

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes ____ No
Seals Intact ___ Yes ___ No NA: X
Cooler Temperature: ice temp: 1.3

Sampled by : JAW

Comments: 1) RGP Metals include Sb, As, Cd, Cu, Fe, Pb, Ni, Se, Ag and Zn by 200.7/3113B and Hg by 245.1
2) Parameters in **BOLD** have Short hold-time
*** TSS, TRC and Cl taken from the same container**

PERMIT ATTACHED
CrIII data on 1712033 mkm 12/8/17

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	12-4-17 1600	GEI Sample Fridge	GEI Sample Fridge	12-5-17 1608	
	12-5-17 1608	12/5/17 1610	12/5/17 1910		12/5/17 1934

Please E-mail all changes to Chain of Custody in writir

Page 1 of 1

ESS Laboratory

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185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS LAB PROJECT ID: 1712102

Turn Time: ✓ Standard Rush ____ Approved By: ____

Reporting Limits -

State where samples were collected: **MA NH**

Discharge into: Fresh Water ☑ Salt Water ☐

Is this project for: **RGP**

Electonic Deliverable Yes ✓ No ____
Format: Excel ____ Access ____ PDF ✓ Other ____

Project Manager: M. Sabatis
Company: GEI
Address: 400 Unicorn Park Drive, Woburn, MA 01801

Project # 1610515
Project Name: EversourceWRMRP
PO #

ESS Lab Sample ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample Identification	# of Containers	RGP Metals Total	RGP Metals Dissolved	Hardness (Calculation)	Ethanol ASTM D3695	Chloride 300.0*	Total Cyanide 4500 LL	TPH 1664	TSS 2540D*	TRC 4500-CL D*	Ammonia 350.1	Tri Cr (Calc. MUST run T. Cr)	Hex Cr 3500	Phenol 420.1	RGP VOC Long List 524	1,4-Dioxane 8270-SIM	EDB 504.1	RGP SVOC Log List 625-SIM	PCB 608	Comment #
	~~12-4-17~~					22	X				X	X		X	X	X		X							1,2
1	12-4-17	~~1030~~ 1400	G	Water	1610515-~~BB~~ (MW)	~~16~~	X		X	X	X	X	X	X	X	X		X	X	X		X				
2	12-4-17	~~1100~~ 1030	G	Water	1610515-~~BB~~ (MW)	~~8~~		X					X				X		X		X		X	X	

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-____

	4	4	4	1	1	5	2	1	1	3	-	1	3	2	1	2	1	1							
Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA	P	P	P	V	P	P	AG	P	P	P	-	P	AG	V	AG	V	AG	AG							

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes ____ No
Seals Intact ___ Yes ___ No NA: X
Cooler Temperature: ice temp: 1.3

Sampled by : JAW

Comments: 1) RGP Metals include Sb, As, Cd, Cu, Fe, Pb, Ni, Se, Ag and Zn by 200.7/3113B and Hg by 245.1
2) Parameters in **BOLD** have Short hold-time **PERMIT ATTACHED**
*** TSS, TRC and Cl taken from the same container**

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	12-4-17	GEI Sample Fridge	GEI Sample Fridge	12-5-17 1608	
	12-5-17 1608			12/5/17 1910	12/5/17 1934

Please E-mail all changes to Chain of Custody in writir

Page 1 of 1

CERTIFICATE OF ANALYSIS

Mike Sabulis
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Eversource WRNRP - RGP (1610515)
ESS Laboratory Work Order Number: 1712196

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 3:38 pm, Dec 18, 2017

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

SAMPLE RECEIPT

The following samples were received on December 07, 2017 for the analyses specified on the enclosed Chain of Custody Record.

The samples and analyses listed below were analyzed in accordance with the 2017 Remediation General Permit under the National Pollutant Discharge Elimination System (NPDES).

ESS Laboratory is unable to achieve the required detection limit of 0.4 mg/L for Ethanol for the RGP permit. We have also been unable to procure a subcontract laboatory that is able to achieve this limit. The data for Ethanol has been reported using our current method reporting limit.

Sample for Total Residual Chlorine and Hexavalent Chromium was received outside of the holding time.

Lab Number	Sample Name	Matrix	Analysis
1712196-01	1610515-B20 MW	Ground Water	1664A, 200.7, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 420.1, 4500 CN CE, 4500Cl D, 504.1, 524.2, 608, 625 SIM, 8270D SIM, ASTM D3695

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP ESS Laboratory Work Order: 1712196

PROJECT NARRATIVE

524.2 Volatile Organic Compounds

C7L0135-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Tertiary-butyl Alcohol (40% @ 30%)

CL70848-BS1 **Blank Spike recovery is above upper control limit (B+).**
Tertiary-butyl Alcohol (137% @ 70-130%)

CL70848-BSD1 **Blank Spike recovery is above upper control limit (B+).**
Tertiary-butyl Alcohol (132% @ 70-130%)

625(SIM) Semi-Volatile Organic Compounds

CL71303-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
Acenaphthene (35% @ 20%), Acenaphthylene (32% @ 20%), Anthracene (21% @ 20%), Benzo(a)anthracene (55% @ 20%), Benzo(a)pyrene (52% @ 20%), Benzo(b)fluoranthene (53% @ 20%), Benzo(g,h,i)perylene (54% @ 20%), Benzo(k)fluoranthene (52% @ 20%), bis(2-Ethylhexyl)phthalate (57% @ 20%), Butylbenzylphthalate (54% @ 20%), Chrysene (56% @ 20%), Dibenzo(a,h)Anthracene (55% @ 20%), Di-n-octylphthalate (54% @ 20%), Fluorene (28% @ 20%), Indeno(1,2,3-cd)Pyrene (55% @ 20%), Naphthalene (43% @ 20%), Phenanthrene (21% @ 20%), Pyrene (55% @ 20%)

Classical Chemistry

1712196-01 **Estimated value. Sample hold times were exceeded (H).**
Hexavalent Chromium

1712196-01 **The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B20 MW
Date Sampled: 12/06/17 11:30
Percent Solids: N/A

ESS Laboratory Work Order: 1712196
ESS Laboratory Sample ID: 1712196-01
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Dissolved Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (10.0)		200.7		1	BJV	12/11/17 22:50	100	20	CL70836
Arsenic	ND (5.0)		3113B		5	KJK	12/13/17 5:58	100	20	CL70836
Cadmium	ND (0.25)		3113B		5	KJK	12/12/17 21:26	100	20	CL70836
Chromium	ND (4.0)		200.7		1	BJV	12/11/17 22:50	100	20	CL70836
Copper	ND (4.0)		200.7		1	BJV	12/11/17 22:50	100	20	CL70836
Iron	**21.3** (20.0)		200.7		1	BJV	12/11/17 22:50	100	20	CL70836
Lead	ND (2.0)		3113B		5	KJK	12/13/17 1:19	100	20	CL70836
Mercury	ND (0.20)		245.1		1	MJV	12/12/17 14:45	20	40	CL71134
Nickel	ND (10.0)		200.7		1	BJV	12/11/17 22:50	100	20	CL70836
Selenium	ND (4.0)		3113B		5	KJK	12/13/17 9:54	100	20	CL70836
Silver	ND (2.0)		200.7		1	BJV	12/11/17 22:50	100	20	CL70836
Zinc	**14.6** (10.0)		200.7		1	KJK	12/13/17 15:36	100	20	CL70836

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B20 MW
Date Sampled: 12/06/17 11:30
Percent Solids: N/A

ESS Laboratory Work Order: 1712196
ESS Laboratory Sample ID: 1712196-01
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (10.0)		200.7		1	BJV	12/11/17 22:16	100	20	CL70836
Arsenic	ND (5.0)		3113B		5	KJK	12/13/17 6:04	100	20	CL70836
Cadmium	ND (0.25)		3113B		5	KJK	12/12/17 22:02	100	20	CL70836
Chromium	ND (4.0)		200.7		1	BJV	12/11/17 22:16	100	20	CL70836
Chromium III	ND (10.0)		200.7		1	JLK	12/11/17 22:16	1	1	[CALC]
Copper	ND (4.0)		200.7		1	BJV	12/11/17 22:16	100	20	CL70836
Hardness	**54500** (165)		200.7		1	BJV	12/12/17 22:45	1	1	[CALC]
Iron	**70.8** (20.0)		200.7		1	BJV	12/11/17 22:16	100	20	CL70836
Lead	ND (2.0)		3113B		5	KJK	12/13/17 1:25	100	20	CL70836
Mercury	ND (0.200)		245.1		1	MJV	12/12/17 14:09	20	40	CL71134
Nickel	ND (10.0)		200.7		1	BJV	12/11/17 22:16	100	20	CL70836
Selenium	ND (4.0)		3113B		5	KJK	12/13/17 10:00	100	20	CL70836
Silver	ND (1.0)		200.7		1	BJV	12/11/17 22:16	100	20	CL70836
Zinc	ND (10.0)		200.7		1	KJK	12/12/17 22:45	100	20	CL70836

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B20 MW
Date Sampled: 12/06/17 11:30
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 1712196
ESS Laboratory Sample ID: 1712196-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: DMC

524.2 Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1-Trichloroethane	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
1,1,2-Trichloroethane	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
1,1-Dichloroethane	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
1,1-Dichloroethene	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
1,2-Dichlorobenzene	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
1,2-Dichloroethane	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
1,3-Dichlorobenzene	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
1,4-Dichlorobenzene	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Acetone	ND (5.0)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Benzene	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Carbon Tetrachloride	ND (0.3)		524.2		1	12/08/17 14:09	C7L0135	CL70848
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Ethylbenzene	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Methylene Chloride	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Naphthalene	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Tetrachloroethene	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Toluene	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Trichloroethene	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Vinyl Chloride	ND (0.2)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Xylene O	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848
Xylene P,M	ND (0.5)		524.2		1	12/08/17 14:09	C7L0135	CL70848

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*102 %*		*80-120*
Surrogate: 4-Bromofluorobenzene	*98 %*		*80-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B20 MW
Date Sampled: 12/06/17 11:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 1712196
ESS Laboratory Sample ID: 1712196-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: CAD
Prepared: 12/8/17 9:32

608 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.09)		608		1	12/08/17 11:46		CL70703
Aroclor 1221	ND (0.09)		608		1	12/08/17 11:46		CL70703
Aroclor 1232	ND (0.09)		608		1	12/08/17 11:46		CL70703
Aroclor 1242	ND (0.09)		608		1	12/08/17 11:46		CL70703
Aroclor 1248	ND (0.09)		608		1	12/08/17 11:46		CL70703
Aroclor 1254	ND (0.09)		608		1	12/08/17 11:46		CL70703
Aroclor 1260	ND (0.09)		608		1	12/08/17 11:46		CL70703
Aroclor 1262	ND (0.09)		608		1	12/08/17 11:46		CL70703
Aroclor 1268	ND (0.09)		608		1	12/08/17 11:46		CL70703

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*76 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*81 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*59 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*70 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B20 MW
Date Sampled: 12/06/17 11:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 1712196
ESS Laboratory Sample ID: 1712196-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 12/13/17 14:30

625(SIM) Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acenaphthene	ND (0.19)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Acenaphthylene	ND (0.19)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Anthracene	ND (0.19)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Benzo(a)anthracene	ND (0.05)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Benzo(a)pyrene	ND (0.05)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Benzo(b)fluoranthene	ND (0.05)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Benzo(g,h,i)perylene	ND (0.19)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Benzo(k)fluoranthene	ND (0.05)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
bis(2-Ethylhexyl)phthalate	ND (1.87)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Butylbenzylphthalate	ND (2.34)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Chrysene	ND (0.05)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Dibenzo(a,h)Anthracene	ND (0.05)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Diethylphthalate	ND (2.34)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Dimethylphthalate	ND (2.34)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Di-n-butylphthalate	ND (2.34)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Di-n-octylphthalate	ND (2.34)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Fluoranthene	ND (0.19)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Fluorene	ND (0.19)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Indeno(1,2,3-cd)Pyrene	ND (0.05)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Naphthalene	ND (0.19)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Pentachlorophenol	ND (0.84)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Phenanthrene	ND (0.19)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303
Pyrene	ND (0.19)		625 SIM		1	12/15/17 5:20	C7L0223	CL71303

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*51 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*70 %*		*15-110*
Surrogate: 2-Fluorobiphenyl	*56 %*		*30-130*
Surrogate: Nitrobenzene-d5	*58 %*		*30-130*
Surrogate: p-Terphenyl-d14	*71 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B20 MW
Date Sampled: 12/06/17 11:30
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 1712196
ESS Laboratory Sample ID: 1712196-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 12/12/17 16:00

8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,4-Dioxane	ND (0.250)		8270D SIM		1	12/13/17 16:57	C7L0186	CL71232

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	66 %		15-115

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B20 MW
Date Sampled: 12/06/17 11:30
Percent Solids: N/A

ESS Laboratory Work Order: 1712196
ESS Laboratory Sample ID: 1712196-01
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	12/11/17 19:34	mg/L	CL71106
Chloride	**68.4** (50.0)		300.0		100	JLK	12/08/17 21:14	mg/L	CL70846
Hexavalent Chromium	**H** ND (10.0)		3500Cr B-2009		1	JLK	12/07/17 22:02	ug/L	CL70758
Phenols	ND (100)		420.1		1	JLK	12/11/17 17:15	ug/L	CL71143
Total Cyanide (LL)	ND (5.00)		4500 CN CE		1	EEM	12/08/17 12:30	ug/L	CL70813
Total Petroleum Hydrocarbon	ND (4.67)		1664A		1	LAB	12/12/17 13:50	mg/L	CL71109
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	12/07/17 21:45	ug/L	CL70759
Total Suspended Solids	ND (5)		2540D		1	EEM	12/11/17 17:20	mg/L	CL71124

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B20 MW
Date Sampled: 12/06/17 11:30
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 1712196
ESS Laboratory Sample ID: 1712196-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: SMR
Prepared: 12/8/17 11:35

504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2-Dibromoethane	ND (0.015)		504.1		1	12/08/17 20:08		CL70822

	%Recovery	Qualifier	Limits
Surrogate: Pentachloroethane	*130 %*		*30-150*
Surrogate: Pentachloroethane [2C]	*140 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP
Client Sample ID: 1610515-B20 MW
Date Sampled: 12/06/17 11:30
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 1712196
ESS Laboratory Sample ID: 1712196-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 12/13/17 10:25

Alcohol Scan by GC/FID

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Ethanol	ND (10)		ASTM D3695		1	ZLC	12/13/17 12:02		CL71321

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Dissolved Metals										
Batch CL70836 - 3005A/200.7										
Blank										
Antimony	ND	10.0	ug/L							
Arsenic	ND	1.0	ug/L							
Cadmium	ND	0.05	ug/L							
Chromium	ND	4.0	ug/L							
Copper	ND	4.0	ug/L							
Iron	ND	20.0	ug/L							
Lead	ND	0.4	ug/L							
Nickel	ND	10.0	ug/L							
Selenium	ND	0.8	ug/L							
Silver	ND	2.0	ug/L							
Zinc	ND	10.0	ug/L							
LCS										
Antimony	99.6	10.0	ug/L	100.0		100	85-115			
Arsenic	115	25.0	ug/L	100.0		115	85-115			
Cadmium	53.1	25.0	ug/L	50.00		106	85-115			
Chromium	99.5	4.0	ug/L	100.0		100	80-120			
Copper	99.8	4.0	ug/L	100.0		100	80-120			
Iron	486	20.0	ug/L	500.0		97	80-120			
Lead	109	10.0	ug/L	100.0		109	85-115			
Nickel	99.2	10.0	ug/L	100.0		99	85-115			
Selenium	215	20.0	ug/L	200.0		108	85-115			
Silver	49.6	2.0	ug/L	50.00		99	85-115			
Zinc	108	10.0	ug/L	100.0		108	85-115			
LCS Dup										
Antimony	107	10.0	ug/L	100.0		107	85-115	7	20	
Chromium	99.2	4.0	ug/L	100.0		99	80-120	0.3	20	
Copper	109	4.0	ug/L	100.0		109	80-120	9	20	
Iron	511	20.0	ug/L	500.0		102	80-120	5	20	
Nickel	101	10.0	ug/L	100.0		101	85-115	2	20	
Silver	47.6	2.0	ug/L	50.00		95	85-115	4	20	
Zinc	105	10.0	ug/L	100.0		105	85-115	3	20	
Batch CL71134 - 245.1/7470A										
Blank										
Mercury	ND	0.20	ug/L							
Blank										
Mercury	ND	0.20	ug/L							
LCS										
Mercury	5.79	0.20	ug/L	6.000		96	85-115			
LCS Dup										
Mercury	5.72	0.20	ug/L	6.000		95	85-115	1	20	
Total Metals										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CL70758 - [CALC]										
Blank										
Chromium III	ND	10.0	ug/L							
LCS										
Chromium III	ND		ug/L							
LCS Dup										
Chromium III	ND		ug/L							
Batch CL70836 - 3005A/200.7										
Blank										
Antimony	ND	10.0	ug/L							
Arsenic	ND	1.0	ug/L							
Cadmium	ND	0.05	ug/L							
Chromium	ND	4.0	ug/L							
Chromium III	ND	4.00	ug/L							
Copper	ND	4.0	ug/L							
Hardness	ND	165	ug/L							
Iron	ND	20.0	ug/L							
Lead	ND	0.4	ug/L							
Nickel	ND	10.0	ug/L							
Selenium	ND	0.8	ug/L							
Silver	ND	1.0	ug/L							
Zinc	ND	10.0	ug/L							
LCS										
Antimony	108	10.0	ug/L	100.0		108	85-115			
Arsenic	115	25.0	ug/L	100.0		115	85-115			
Cadmium	53.1	25.0	ug/L	50.00		106	85-115			
Chromium	103	4.0	ug/L	100.0		103	85-115			
Chromium III	103	4.00	ug/L							
Copper	113	4.0	ug/L	100.0		113	85-115			
Hardness	7020	165	ug/L							
Iron	524	20.0	ug/L	500.0		105	85-115			
Lead	109	10.0	ug/L	100.0		109	85-115			
Nickel	104	10.0	ug/L	100.0		104	85-115			
Selenium	215	20.0	ug/L	200.0		108	85-115			
Silver	49.6	1.0	ug/L	50.00		99	85-115			
Zinc	108	10.0	ug/L	100.0		108	85-115			
LCS Dup										
Antimony	107	10.0	ug/L	100.0		107	85-115	1	20	
Chromium	99.2	4.0	ug/L	100.0		99	85-115	4	20	
Chromium III	99.2	4.00	ug/L							
Copper	109	4.0	ug/L	100.0		109	85-115	4	20	
Hardness	6800	165	ug/L							
Iron	511	20.0	ug/L	500.0		102	85-115	2	20	
Nickel	101	10.0	ug/L	100.0		101	85-115	3	20	
Silver	47.6	1.0	ug/L	50.00		95	85-115	4	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CL70836 - 3005A/200.7										
Zinc	105	10.0	ug/L	100.0		105	85-115	3	20	
Batch CL71134 - 245.1/7470A										
Blank										
Mercury	ND	0.200	ug/L							
Blank										
Mercury	ND	0.200	ug/L							
LCS										
Mercury	5.79	0.200	ug/L	6.000		96	85-115			
LCS Dup										
Mercury	5.72	0.200	ug/L	6.000		95	85-115	1	20	
524.2 Volatile Organic Compounds										
Batch CL70848 - 524.2										
Blank										
1,1,1-Trichloroethane	ND	0.5	ug/L							
1,1,2-Trichloroethane	ND	0.5	ug/L							
1,1-Dichloroethane	ND	0.5	ug/L							
1,1-Dichloroethene	ND	0.5	ug/L							
1,2-Dichlorobenzene	ND	0.5	ug/L							
1,2-Dichloroethane	ND	0.5	ug/L							
1,3-Dichlorobenzene	ND	0.5	ug/L							
1,4-Dichlorobenzene	ND	0.5	ug/L							
Acetone	ND	5.0	ug/L							
Benzene	ND	0.5	ug/L							
Carbon Tetrachloride	ND	0.3	ug/L							
cis-1,2-Dichloroethene	ND	0.5	ug/L							
Ethylbenzene	ND	0.5	ug/L							
Methyl tert-Butyl Ether	ND	0.5	ug/L							
Methylene Chloride	ND	0.5	ug/L							
Naphthalene	ND	0.5	ug/L							
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tertiary-butyl Alcohol	ND	25.0	ug/L							
Tetrachloroethene	ND	0.5	ug/L							
Toluene	ND	0.5	ug/L							
Trichloroethene	ND	0.5	ug/L							
Vinyl Chloride	ND	0.2	ug/L							
Xylene O	ND	0.5	ug/L							
Xylene P,M	ND	0.5	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*5.01*		ug/L	*5.000*		*100*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.97*		ug/L	*5.000*		*99*	*80-120*			
LCS										
1,1,1-Trichloroethane	10.0		ug/L	10.00		100	70-130			
1,1,2-Trichloroethane	9.9		ug/L	10.00		99	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch CL70848 - 524.2										
1,1-Dichloroethane	9.4		ug/L	10.00		94	70-130			
1,1-Dichloroethene	10.1		ug/L	10.00		101	70-130			
1,2-Dichlorobenzene	10.4		ug/L	10.00		104	70-130			
1,2-Dichloroethane	10.2		ug/L	10.00		102	70-130			
1,3-Dichlorobenzene	10.3		ug/L	10.00		103	70-130			
1,4-Dichlorobenzene	10.4		ug/L	10.00		104	70-130			
Acetone	53.9		ug/L	50.00		108	70-130			
Benzene	9.8		ug/L	10.00		98	70-130			
Carbon Tetrachloride	9.6		ug/L	10.00		96	70-130			
cis-1,2-Dichloroethene	10.0		ug/L	10.00		100	70-130			
Ethylbenzene	9.7		ug/L	10.00		97	70-130			
Methyl tert-Butyl Ether	10.2		ug/L	10.00		102	70-130			
Methylene Chloride	10.1		ug/L	10.00		101	70-130			
Naphthalene	11.0		ug/L	10.00		110	70-130			
Tertiary-amyl methyl ether	9.8		ug/L	10.00		98	70-130			
Tertiary-butyl Alcohol	68.6		ug/L	50.00		137	70-130			B+
Tetrachloroethene	7.9		ug/L	10.00		79	70-130			
Toluene	9.9		ug/L	10.00		99	70-130			
Trichloroethene	10.1		ug/L	10.00		101	70-130			
Vinyl Chloride	9.8		ug/L	10.00		98	70-130			
Xylene O	9.8		ug/L	10.00		98	70-130			
Xylene P,M	19.6		ug/L	20.00		98	70-130			
Surrogate: 1,2-Dichlorobenzene-d4	*5.08*		ug/L	*5.000*		*102*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*5.02*		ug/L	*5.000*		*100*	*80-120*			
LCS Dup										
1,1,1-Trichloroethane	9.5		ug/L	10.00		95	70-130	4	20	
1,1,2-Trichloroethane	9.6		ug/L	10.00		96	70-130	3	20	
1,1-Dichloroethane	9.5		ug/L	10.00		95	70-130	1	20	
1,1-Dichloroethene	10.3		ug/L	10.00		103	70-130	1	20	
1,2-Dichlorobenzene	10.0		ug/L	10.00		100	70-130	4	20	
1,2-Dichloroethane	10.3		ug/L	10.00		103	70-130	0.6	20	
1,3-Dichlorobenzene	9.9		ug/L	10.00		99	70-130	3	20	
1,4-Dichlorobenzene	10.1		ug/L	10.00		101	70-130	3	20	
Acetone	53.0		ug/L	50.00		106	70-130	2	20	
Benzene	9.8		ug/L	10.00		98	70-130	0.3	20	
Carbon Tetrachloride	9.5		ug/L	10.00		95	70-130	1	20	
cis-1,2-Dichloroethene	10.2		ug/L	10.00		102	70-130	2	20	
Ethylbenzene	9.8		ug/L	10.00		98	70-130	1	20	
Methyl tert-Butyl Ether	9.8		ug/L	10.00		98	70-130	4	20	
Methylene Chloride	9.7		ug/L	10.00		97	70-130	3	20	
Naphthalene	10.7		ug/L	10.00		107	70-130	3	20	
Tertiary-amyl methyl ether	9.4		ug/L	10.00		94	70-130	4	20	
Tertiary-butyl Alcohol	66.1		ug/L	50.00		132	70-130	4	25	B+
Tetrachloroethene	7.7		ug/L	10.00		77	70-130	2	20	
Toluene	9.9		ug/L	10.00		99	70-130	0.2	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch CL70848 - 524.2										
Trichloroethene	10.2		ug/L	10.00		102	70-130	1	20	
Vinyl Chloride	9.7		ug/L	10.00		97	70-130	0.8	20	
Xylene O	9.6		ug/L	10.00		96	70-130	2	20	
Xylene P,M	19.9		ug/L	20.00		100	70-130	2	20	
Surrogate: 1,2-Dichlorobenzene-d4	*4.93*		ug/L	*5.000*		*99*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.76*		ug/L	*5.000*		*95*	*80-120*			
608 Polychlorinated Biphenyls (PCB)										
Batch CL70703 - 3510C										
Blank										
Aroclor 1016	ND	0.10	ug/L							
Aroclor 1016 [2C]	ND	0.10	ug/L							
Aroclor 1221	ND	0.10	ug/L							
Aroclor 1221 [2C]	ND	0.10	ug/L							
Aroclor 1232	ND	0.10	ug/L							
Aroclor 1232 [2C]	ND	0.10	ug/L							
Aroclor 1242	ND	0.10	ug/L							
Aroclor 1242 [2C]	ND	0.10	ug/L							
Aroclor 1248	ND	0.10	ug/L							
Aroclor 1248 [2C]	ND	0.10	ug/L							
Aroclor 1254	ND	0.10	ug/L							
Aroclor 1254 [2C]	ND	0.10	ug/L							
Aroclor 1260	ND	0.10	ug/L							
Aroclor 1260 [2C]	ND	0.10	ug/L							
Aroclor 1262	ND	0.10	ug/L							
Aroclor 1262 [2C]	ND	0.10	ug/L							
Aroclor 1268	ND	0.10	ug/L							
Aroclor 1268 [2C]	ND	0.10	ug/L							
Surrogate: Decachlorobiphenyl	*0.0313*		ug/L	*0.05000*		*63*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0349*		ug/L	*0.05000*		*70*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0327*		ug/L	*0.05000*		*65*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0393*		ug/L	*0.05000*		*79*	*30-150*			
LCS										
Aroclor 1016	0.91	0.10	ug/L	1.000		91	40-140			
Aroclor 1016 [2C]	0.97	0.10	ug/L	1.000		97	40-140			
Aroclor 1260	0.93	0.10	ug/L	1.000		93	40-140			
Aroclor 1260 [2C]	0.84	0.10	ug/L	1.000		84	40-140			
Surrogate: Decachlorobiphenyl	*0.0463*		ug/L	*0.05000*		*93*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0489*		ug/L	*0.05000*		*98*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0384*		ug/L	*0.05000*		*77*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0401*		ug/L	*0.05000*		*80*	*30-150*			
LCS Dup										
Aroclor 1016	0.76	0.10	ug/L	1.000		76	40-140	18	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
608 Polychlorinated Biphenyls (PCB)										
Batch CL70703 - 3510C										
Aroclor 1016 [2C]	0.81	0.10	ug/L	1.000		81	40-140	18	20	
Aroclor 1260	0.89	0.10	ug/L	1.000		89	40-140	4	20	
Aroclor 1260 [2C]	0.81	0.10	ug/L	1.000		81	40-140	4	20	
Surrogate: Decachlorobiphenyl	*0.0413*		ug/L	*0.05000*		*83*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0435*		ug/L	*0.05000*		*87*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0315*		ug/L	*0.05000*		*63*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0326*		ug/L	*0.05000*		*65*	*30-150*			
625(SIM) Semi-Volatile Organic Compounds										
Batch CL71303 - 3510C										
Blank										
Acenaphthene	ND	0.20	ug/L							
Acenaphthylene	ND	0.20	ug/L							
Anthracene	ND	0.20	ug/L							
Benzo(a)anthracene	ND	0.05	ug/L							
Benzo(a)pyrene	ND	0.05	ug/L							
Benzo(b)fluoranthene	ND	0.05	ug/L							
Benzo(g,h,i)perylene	ND	0.20	ug/L							
Benzo(k)fluoranthene	ND	0.05	ug/L							
bis(2-Ethylhexyl)phthalate	ND	2.50	ug/L							
Butylbenzylphthalate	ND	2.50	ug/L							
Chrysene	ND	0.05	ug/L							
Dibenzo(a,h)Anthracene	ND	0.05	ug/L							
Diethylphthalate	ND	2.50	ug/L							
Dimethylphthalate	ND	2.50	ug/L							
Di-n-butylphthalate	ND	2.50	ug/L							
Di-n-octylphthalate	ND	2.50	ug/L							
Fluoranthene	ND	0.20	ug/L							
Fluorene	ND	0.20	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	0.05	ug/L							
Naphthalene	ND	0.20	ug/L							
Pentachlorophenol	ND	0.90	ug/L							
Phenanthrene	ND	0.20	ug/L							
Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*1.26*		ug/L	*2.500*		*50*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*2.67*		ug/L	*3.750*		*71*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.64*		ug/L	*2.500*		*66*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.26*		ug/L	*2.500*		*90*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.24*		ug/L	*2.500*		*90*	*30-130*			
LCS										
Acenaphthene	2.08	0.20	ug/L	4.000		52	40-140			
Acenaphthylene	2.16	0.20	ug/L	4.000		54	40-140			
Anthracene	2.55	0.20	ug/L	4.000		64	40-140			
Benzo(a)anthracene	1.73	0.05	ug/L	4.000		43	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625(SIM) Semi-Volatile Organic Compounds										
Batch CL71303 - 3510C										
Benzo(a)pyrene	1.93	0.05	ug/L	4.000		48	40-140			
Benzo(b)fluoranthene	1.94	0.05	ug/L	4.000		49	40-140			
Benzo(g,h,i)perylene	1.97	0.20	ug/L	4.000		49	40-140			
Benzo(k)fluoranthene	1.88	0.05	ug/L	4.000		47	40-140			
bis(2-Ethylhexyl)phthalate	2.24	2.50	ug/L	4.000		56	40-140			
Butylbenzylphthalate	2.19	2.50	ug/L	4.000		55	40-140			
Chrysene	1.77	0.05	ug/L	4.000		44	40-140			
Dibenzo(a,h)Anthracene	2.02	0.05	ug/L	4.000		51	40-140			
Diethylphthalate	2.77	2.50	ug/L	4.000		69	40-140			
Dimethylphthalate	2.74	2.50	ug/L	4.000		68	40-140			
Di-n-butylphthalate	2.98	2.50	ug/L	4.000		74	40-140			
Di-n-octylphthalate	2.23	2.50	ug/L	4.000		56	40-140			
Fluoranthene	2.75	0.20	ug/L	4.000		69	40-140			
Fluorene	2.35	0.20	ug/L	4.000		59	40-140			
Indeno(1,2,3-cd)Pyrene	2.01	0.05	ug/L	4.000		50	40-140			
Naphthalene	1.75	0.20	ug/L	4.000		44	40-140			
Pentachlorophenol	2.33	0.90	ug/L	4.000		58	30-130			
Phenanthrene	2.49	0.20	ug/L	4.000		62	40-140			
Pyrene	1.80	0.20	ug/L	4.000		45	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.06*		ug/L	*2.500*		*42*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*2.50*		ug/L	*3.750*		*67*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.44*		ug/L	*2.500*		*57*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.69*		ug/L	*2.500*		*67*	*30-130*			
Surrogate: p-Terphenyl-d14	*1.40*		ug/L	*2.500*		*56*	*30-130*			
LCS Dup										
Acenaphthene	2.96	0.20	ug/L	4.000		74	40-140	35	20	D+
Acenaphthylene	2.98	0.20	ug/L	4.000		74	40-140	32	20	D+
Anthracene	3.14	0.20	ug/L	4.000		79	40-140	21	20	D+
Benzo(a)anthracene	3.05	0.05	ug/L	4.000		76	40-140	55	20	D+
Benzo(a)pyrene	3.28	0.05	ug/L	4.000		82	40-140	52	20	D+
Benzo(b)fluoranthene	3.34	0.05	ug/L	4.000		83	40-140	53	20	D+
Benzo(g,h,i)perylene	3.41	0.20	ug/L	4.000		85	40-140	54	20	D+
Benzo(k)fluoranthene	3.21	0.05	ug/L	4.000		80	40-140	52	20	D+
bis(2-Ethylhexyl)phthalate	4.04	2.50	ug/L	4.000		101	40-140	57	20	D+
Butylbenzylphthalate	3.82	2.50	ug/L	4.000		96	40-140	54	20	D+
Chrysene	3.15	0.05	ug/L	4.000		79	40-140	56	20	D+
Dibenzo(a,h)Anthracene	3.55	0.05	ug/L	4.000		89	40-140	55	20	D+
Diethylphthalate	3.36	2.50	ug/L	4.000		84	40-140	19	20	
Dimethylphthalate	3.34	2.50	ug/L	4.000		84	40-140	20	20	
Di-n-butylphthalate	3.53	2.50	ug/L	4.000		88	40-140	17	20	
Di-n-octylphthalate	3.90	2.50	ug/L	4.000		98	40-140	54	20	D+
Fluoranthene	3.17	0.20	ug/L	4.000		79	40-140	14	20	
Fluorene	3.13	0.20	ug/L	4.000		78	40-140	28	20	D+
Indeno(1,2,3-cd)Pyrene	3.51	0.05	ug/L	4.000		88	40-140	55	20	D+
Naphthalene	2.71	0.20	ug/L	4.000		68	40-140	43	20	D+

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625(SIM) Semi-Volatile Organic Compounds										
Batch CL71303 - 3510C										
Pentachlorophenol	2.75	0.90	ug/L	4.000		69	30-130	17	20	
Phenanthrene	3.06	0.20	ug/L	4.000		77	40-140	21	20	D+
Pyrene	3.14	0.20	ug/L	4.000		79	40-140	55	20	D+
Surrogate: 1,2-Dichlorobenzene-d4	*1.81*		ug/L	*2.500*		*72*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.09*		ug/L	*3.750*		*82*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.96*		ug/L	*2.500*		*79*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.21*		ug/L	*2.500*		*88*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.41*		ug/L	*2.500*		*96*	*30-130*			
8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution										
Batch CL71232 - 3535A										
Blank										
1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	*2.32*		ug/L	*5.000*		*46*	*15-115*			
LCS										
1,4-Dioxane	10.0	0.250	ug/L	10.00		100	40-140			
Surrogate: 1,4-Dioxane-d8	*3.37*		ug/L	*5.000*		*67*	*15-115*			
LCS Dup										
1,4-Dioxane	9.99	0.250	ug/L	10.00		100	40-140	0.5	20	
Surrogate: 1,4-Dioxane-d8	*2.95*		ug/L	*5.000*		*59*	*15-115*			
Classical Chemistry										
Batch CL70758 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	0.495		mg/L	0.4998		99	90-110			
LCS Dup										
Hexavalent Chromium	0.494		mg/L	0.4998		99	90-110	0.3	20	
Batch CL70759 - General Preparation										
Blank										
Total Residual Chlorine	ND	20.0	ug/L							
LCS										
Total Residual Chlorine	1.82		mg/L	1.800		101	85-115			
Batch CL70813 - TCN Prep										
Blank										
Total Cyanide (LL)	ND	5.00	ug/L							
LCS										
Total Cyanide (LL)	20.2	5.00	ug/L	20.06		101	90-110			
LCS										
Total Cyanide (LL)	150	5.00	ug/L	150.4		100	90-110			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CL70813 - TCN Prep										
LCS Dup										
Total Cyanide (LL)	148	5.00	ug/L	150.4		98	90-110	2	20	
Batch CL70846 - General Preparation										
Blank										
Chloride	ND	0.5	mg/L							
LCS										
Chloride	2.4		mg/L	2.500		98	90-110			
Batch CL71106 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.09	0.10	mg/L	0.09994		86	80-120			
LCS										
Ammonia as N	0.99	0.10	mg/L	0.9994		99	80-120			
Batch CL71109 - General Preparation										
Blank										
Total Petroleum Hydrocarbon	ND	5.00	mg/L							
LCS										
Total Petroleum Hydrocarbon	15.1	5.00	mg/L	19.38		78	66-114			
Batch CL71124 - General Preparation										
Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	32		mg/L	34.10		94	80-120			
Batch CL71143 - General Preparation										
Blank										
Phenols	ND	100	ug/L							
LCS										
Phenols	115	100	ug/L	100.0		115	80-120			
LCS										
Phenols	1000	100	ug/L	1000		100	80-120			
504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane										
Batch CL70822 - 504/8011										
Blank										
1,2-Dibromoethane	ND	0.015	ug/L							
1,2-Dibromoethane [2C]	ND	0.015	ug/L							
Surrogate: Pentachloroethane	*0.190*		ug/L	*0.2000*		*95*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.216*		ug/L	*0.2000*		*108*	*30-150*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane										
Batch CL70822 - 504/8011										
LCS										
1,2-Dibromoethane	0.057	0.015	ug/L	0.08000		72	70-130			
1,2-Dibromoethane [2C]	0.082	0.015	ug/L	0.08000		102	70-130			
Surrogate: Pentachloroethane	*0.0803*		ug/L	*0.2000*		*40*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.0909*		ug/L	*0.2000*		*45*	*30-150*			
LCS										
1,2-Dibromoethane	0.152	0.015	ug/L	0.2000		76	70-130			
1,2-Dibromoethane [2C]	0.204	0.015	ug/L	0.2000		102	70-130			
Surrogate: Pentachloroethane	*0.277*		ug/L	*0.2000*		*139*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.296*		ug/L	*0.2000*		*148*	*30-150*			
Alcohol Scan by GC/FID										
Batch CL71321 - No Prep										
Blank										
Ethanol	ND	10	mg/L							
LCS										
Ethanol	1070	10	mg/L	1007		106	60-140			
LCS Dup										
Ethanol	965	10	mg/L	1007		96	60-140	10	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP ESS Laboratory Work Order: 1712196

Notes and Definitions

U	Analyte included in the analysis, but not detected
HT	The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
H	Estimated value. Sample hold times were exceeded (H).
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
B+	Blank Spike recovery is above upper control limit (B+).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Eversource WRNRP - RGP

ESS Laboratory Work Order: 1712196

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1712196
Date Received: 12/7/2017
Project Due Date: 12/14/2017
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.4 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No
    Hex Chrome

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	189072	Yes	NA	Yes	VOA Vial - Unpres	NP	
01	189073	Yes	No	Yes	VOA Vial - HCl	HCl	
01	189074	Yes	No	Yes	VOA Vial - HCl	HCl	
01	189075	Yes	No	Yes	VOA Vial - HCl	HCl	
01	189076	Yes	No	Yes	VOA Vial - HCl	HCl	
01	189077	Yes	No	Yes	VOA Vial - HCl	HCl	
01	189078	Yes	No	Yes	VOA Vial - HCl	HCl	
01	189079	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	189080	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	189081	Yes	NA	Yes	1L Amber - Unpres	NP	
01	189082	Yes	NA	Yes	1L Amber - Unpres	NP	
01	189083	Yes	NA	Yes	1L Amber - Unpres	NP	
01	189084	Yes	NA	Yes	1L Amber - Unpres	NP	
01	189085	Yes	NA	Yes	1L Amber - Unpres	NP	
01	189086	Yes	NA	Yes	1L Amber - Unpres	NP	
01	189087	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	189088	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	189089	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
01	189090	Yes	NA	Yes	1L Poly - Unpres	NP	
01	189091	Yes	NA	Yes	250 mL Poly - Unpres	NP	
01	189092	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
01	189093	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	pH 12 1942 12/7/17

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1712196
Date Received: 12/7/2017

2nd Review
Are barcode labels on correct containers? (Yes) / No

Completed By: _____ Date & Time: 12/7/17 1947

Reviewed By: _____ Date & Time: 12/7/17 1957

Delivered By: _____ 12/7/17 1957

ESS Laboratory

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS LAB PROJECT ID: 12196

Turn Time ✓ Standard Rush _____ Approved By: _____

Reporting Limits -
Discharge into: Fresh Water ☑ Salt Water ☐

State where samples were collected: MA NH

Is this project for: RGP

Electonic Deliverable Yes ✓ No ___
Format: Excel ___ Access ___ PDF ✓ Other ___

Project Manager: Mike Sabourin
Company: GEI
Address: 400 Unicorn Park Drive
Woburn MA, 01801

Project # 1610575
Project Name: Eversource WRWRP
PO #

ESS Lab Sample ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample Identification	# of Containers	RGP Metals Total	RGP Metals Dissolved	Hardness (Calculation)	Ethanol ASTM D3695	Chloride 300.0*	Total Cyanide 4500 LL	TPH 1664	TSS 2540D*	TRC 4500-CL D*	Ammonia 350.1	Tri Cr (Calc. MUST run T. Cr)	Hex Cr 3500	Phenol 420.1	RGP VOC Long List 524	1,4-Dioxane 8270-SIM	EDB 504.1	RGP SVOC Log List 625-SIM	PCB 608	Comment #
						Analysis																			
1	12-6-17	1130	G	Water	1610575-B20CMW3	22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1,2
Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____							4	4	4	1	1	5	2	1	1	3	-	1	3	2	1	2	1	1	
Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA							P	P	P	V	P	P	AG	P	P	P	-	P	AG	V	AG	V	AG	AG	

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes ___ No
Seals Intact ___ Yes ___ No NA: ___
Cooler Temperature: Ice temp. 0.4

Sampled by: JAW

Comments: 1) RGP Metals include Sb, As, Cd, Cu, Fe, Pb, Ni, Se, Ag and Zn by 200.7/3113B and Hg by 245.1
2) Parameters in **BOLD** have Short hold-time **PERMIT ATTACHED**
* **TSS, TRC and Cl taken from the same container**

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
James A. Wakeham	12-6-17 1430	GEI Fridge	GEI Fridge	12/7/17 1350	Jessica Dehart
Jessica Dehart	12/7/17 1350	James A. Wakeham 12/7/17 1350	James A. Wakeham 12/7/17 1801	Date/Time	Received by: (Signature) 12/7/17 1907

Please E-mail all changes to Chain of Custody in writir

Page 1 of 1

Appendix E

Detailed Plans of Proposed Discharge Points

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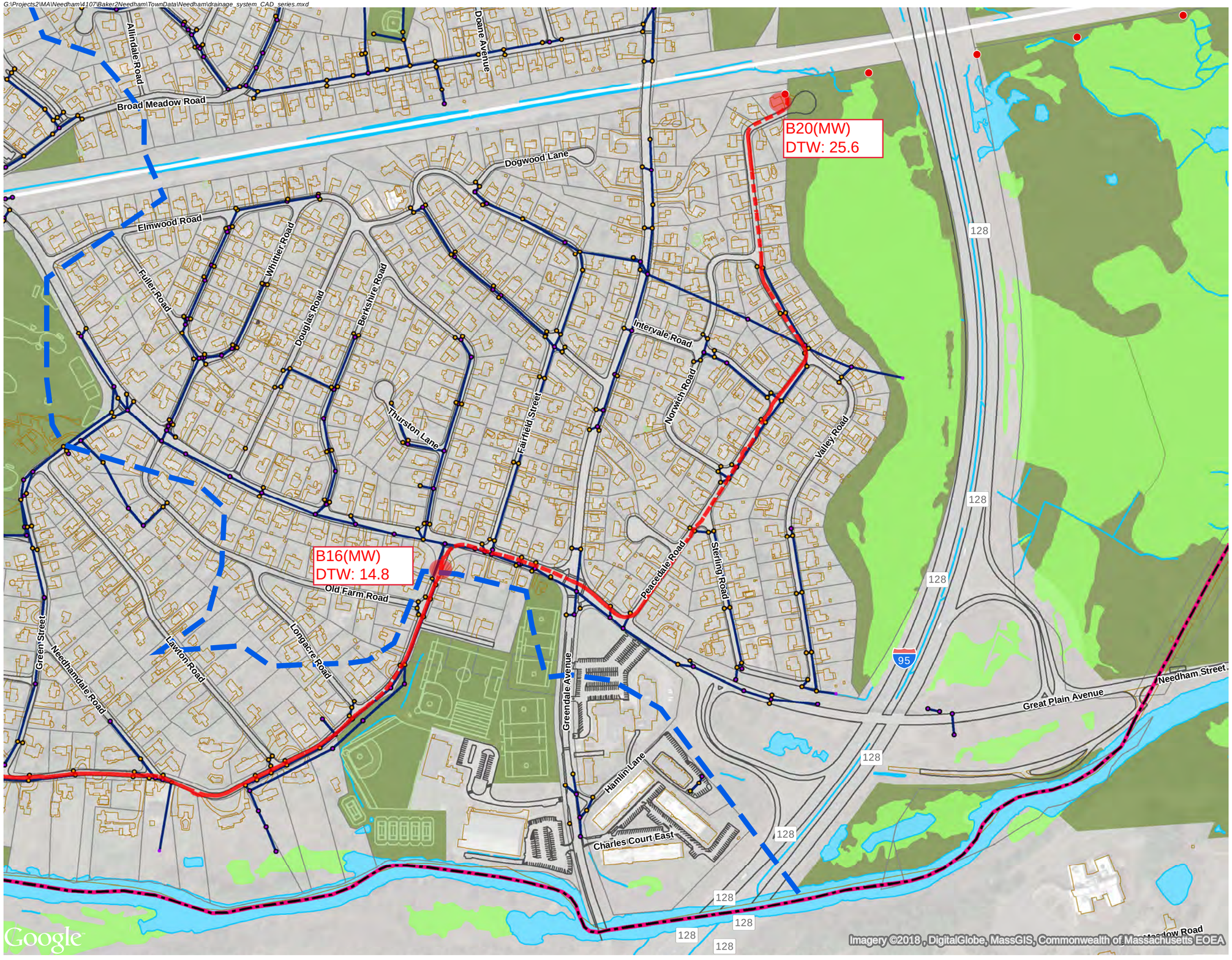
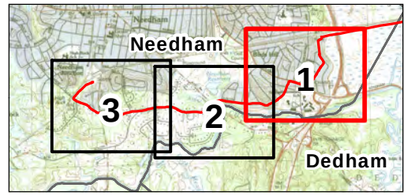


West Roxbury to Needham Reliability Project

EVERSOURCE

LOCUS



SCALE

1:4,800
1 inch = 400 feet

0 200 400 Feet

N

LEGEND

- Proposed Structure Location
- Drainage0Catch Basin
- Drainage0Dmh
- Drainage0dpipe
- Duct Bank Centerline
- Municipal Boundary
- Drainage0Catch Basin
- Drainage0Dmh
- Drainage0dpipe
- Drain Line
- Pavement, Concreate, Parking
- Buildings, Driveways
- Parcel/ROW Boundaries
- ROAD0UNPAVED
- Sport Layers
- Railway
- Subwatershed Boundary (Needham)
- WATER0WATER
- Open Space (MassGIS)

Town of Needham GIS Data

- Streams
- Waterbodies
- Wetlands

Stormwater Outfall Locations

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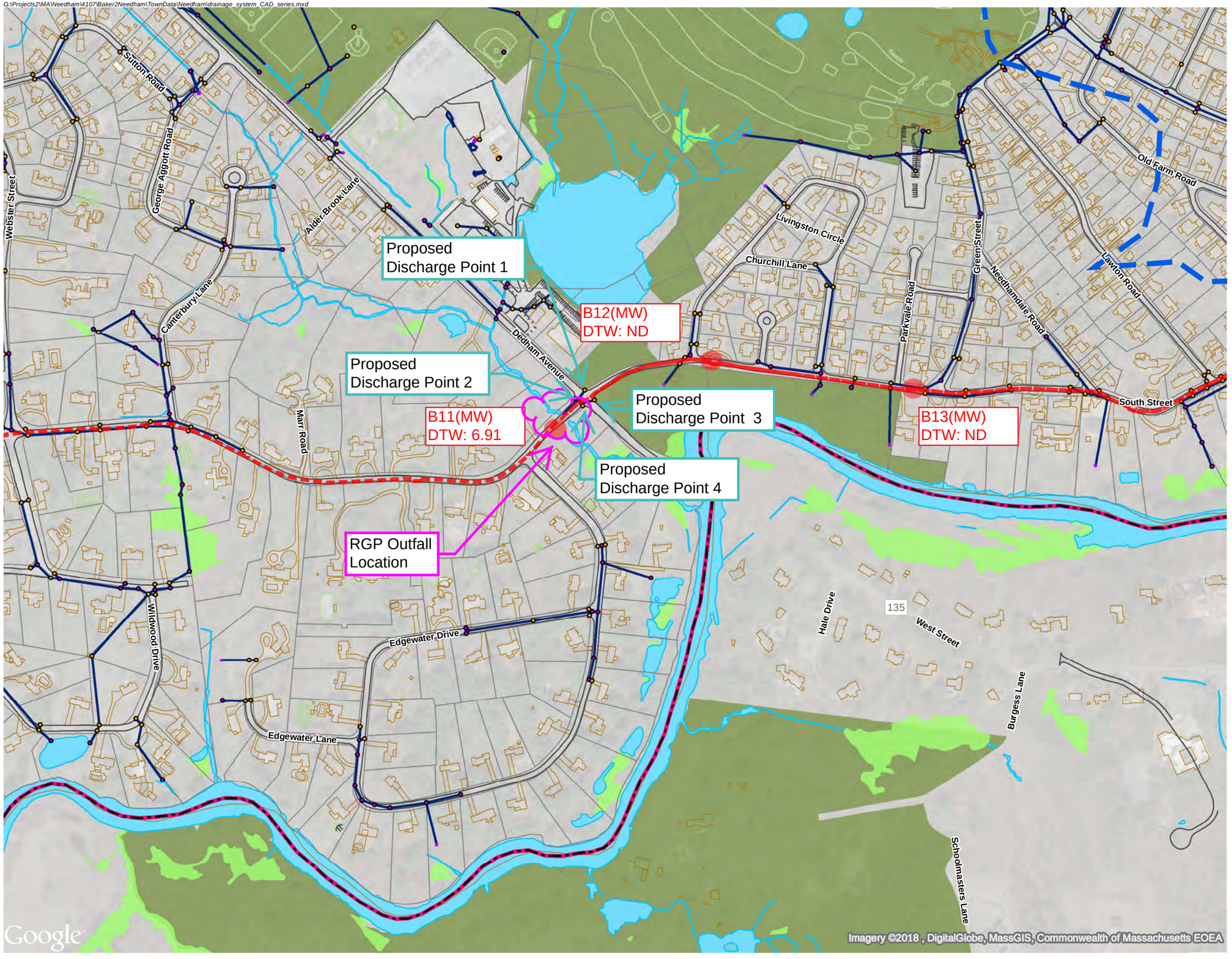
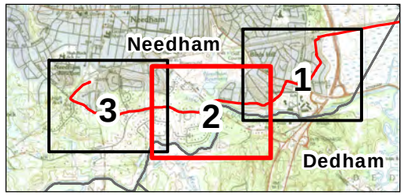


West Roxbury to Needham Reliability Project

EVERSOURCE

LOCUS



SCALE

1:4,800
1 inch = 400 feet

0 200 400 Feet

N

LEGEND

- Proposed Structure Location
- Drainage0Catch Basin
- Drainage0Dmh
- Drainage0dpipe
- Duct Bank Centerline
- Municipal Boundary
- Drainage0Catch Basin
- Drainage0Dmh
- Drainage0dpipe
- Drain Line
- Pavement, Concreate, Parking
- Buildings, Driveways
- Parcel/ROW Boundaries
- ROAD0UNPAVED
- Sport Layers
- Railway
- Subwatershed Boundary (Needham)
- WATER0WATER
- Open Space (MassGIS)

Town of Needham GIS Data

- Streams
- Waterbodies
- Wetlands

Stormwater Outfall Locations

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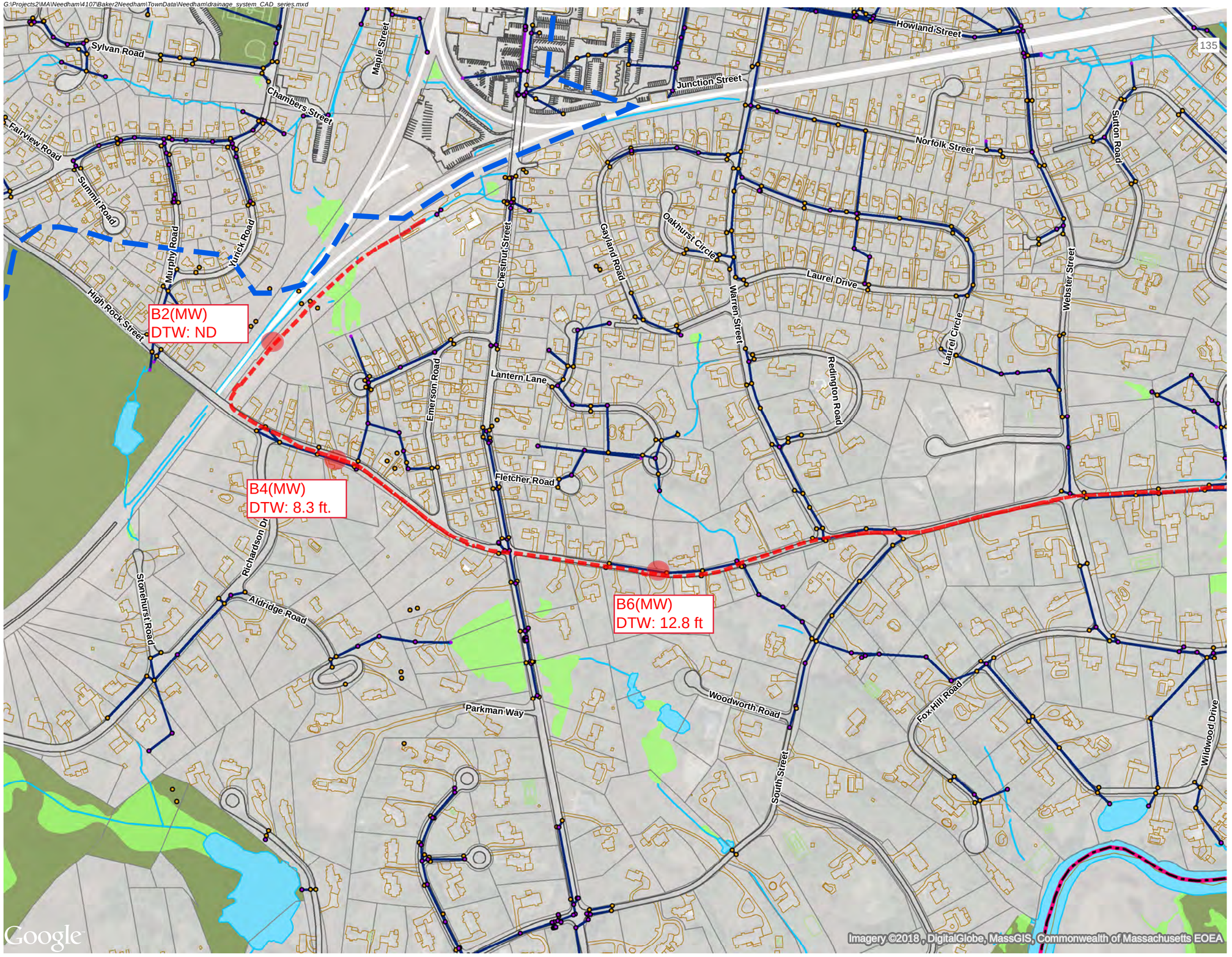
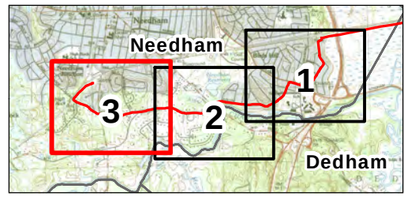


West Roxbury to Needham Reliability Project

EVERSOURCE

LOCUS



SCALE

1:4,800
1 inch = 400 feet

0 200 400 Feet

N

LEGEND

- Proposed Structure Location
- Drainage0Catch Basin
- Drainage0Dmh
- Drainage0dpipe
- Duct Bank Centerline
- Municipal Boundary
- Drainage0Catch Basin
- Drainage0Dmh
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- Subwatershed Boundary (Needham)
- WATER0WATER
- Open Space (MassGIS)

Town of Needham GIS Data

- Streams
- Waterbodies
- Wetlands

Stormwater Outfall Locations

Appendix F

Endangered Species Act Eligibility Documentation

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Barnstable	Piping Plover	Threatened	Coastal Beaches	All Towns
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Chatham
	Sandplain gerardia	Endangered	Open areas with sandy soils.	Sandwich and Falmouth.
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Bourne (north of the Cape Cod Canal)
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Berkshire	Bog Turtle	Threatened	Wetlands	Egremont and Sheffield
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Bristol	Piping Plover	Threatened	Coastal Beaches	Fairhaven, Dartmouth, Westport
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Fairhaven, New Bedford, Dartmouth, Westport
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Taunton
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Dukes	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Piping Plover	Threatened	Coastal Beaches	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Aquinnah and Chilmark
	Sandplain gerardia	Endangered	Open areas with sandy soils.	West Tisbury
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

Updated 02/05/2016

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Essex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Gloucester, Essex and Manchester
	Piping Plover	Threatened	Coastal Beaches	Gloucester, Essex, Ipswich, Rowley, Revere, Newbury, Newburyport and Salisbury
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Franklin	Northeastern bulrush	Endangered	Wetlands	Montague, Warwick
	Dwarf wedgemussel	Endangered	Mill River	Whately
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Hampshire	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Hadley
	Puritan tiger beetle	Threatened	Sandy beaches along the Connecticut River	Northampton and Hadley
	Dwarf wedgemussel	Endangered	Rivers and Streams.	Hatfield, Amherst and Northampton
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Hampden	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Southwick
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Middlesex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Groton
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Nantucket	Piping Plover	Threatened	Coastal Beaches	Nantucket
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Nantucket
	American burying beetle	Endangered	Upland grassy meadows	Nantucket
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

Updated 02/05/2016

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Plymouth	Piping Plover	Threatened	Coastal Beaches	Scituate, Marshfield, Duxbury, Plymouth, Wareham and Mattapoisett
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Kingston, Middleborough, Carver, Plymouth, Bourne, Wareham, Halifax, and Pembroke
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Plymouth, Marion, Wareham, and Mattapoisett.
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Suffolk	Piping Plover	Threatened	Coastal Beaches	Revere, Winthrop
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Worcester	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Leominster
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

[1]Migratory only, scattered along the coast in small numbers

-Eastern cougar and gray wolf are considered extirpated in Massachusetts.
-Endangered gray wolves are not known to be present in Massachusetts, but dispersing individuals from source populations in Canada may occur statewide.
-Critical habitat for the Northern Red-bellied Cooter is present in Plymouth County.

Updated 02/05/2016

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To:
Consultation Code: 05E1NE00-2018-SLI-0794
Event Code: 05E1NE00-2018-E-01833
Project Name: Eversource WRNRP

January 29, 2018

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2018-SLI-0794

Event Code: 05E1NE00-2018-E-01833

Project Name: Eversource WRNRP

Project Type: TRANSMISSION LINE

Project Description: The Needham portion of the West Roxbury to Needham Reliability Project (WRNRP) consists of construction of a new 2.5-mile-long electric transmission line in Needham, Massachusetts.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.27237250087879N71.20301136105738W

Counties: Norfolk, MA

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Appendix G

Historic Preservation Documentation

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Needham; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
NEE.A	Natick Research and Development Laboratories		Needham	
NEE.B	Carter, William Clothing Company		Needham	
NEE.C	McIntosh Corner Historic District		Needham	
NEE.D	Needham Town Hall Historic District		Needham	
NEE.E	Newton Multiple Resource Area - 1636-1907		Needham	
NEE.F	Sudbury Aqueduct Linear District		Needham	
NEE.G	Water Supply System of Metropolitan Boston		Needham	
NEE.H	Newton Upper Falls Historic District		Needham	
NEE.I	Needham Golf Club		Needham	
NEE.14	Bird, John House	94 Beaufort Ave	Needham	1755
NEE.907	Hemlock Gorge Reservation	Boylston St	Needham	1895
NEE.98	Stevens, Dea. George G. House	14 Bradford St	Needham	1850
NEE.99	Cutler, Sen. Leslie Bradley House	90 Burr Dr	Needham	1915
NEE.5	Fuller, Robert House	3 Burrill Ln	Needham	1707
NEE.100	Cartwright, James House	366 Cartwright Rd	Needham	1877
NEE.900	Townsend Green	Central Ave	Needham	1945
NEE.904	High Rock Forest	Central Ave	Needham	1940
NEE.911	Cook's Bridge	Central Ave	Needham	1857
NEE.918	Fisher's Bridge	Central Ave	Needham	1847
NEE.934	Central Avenue Bridge	Central Ave	Needham	1953
NEE.25	Pettee, Tyler Double House	28 Central Ave	Needham	1834
NEE.6	Alden, Silas House	259 Central Ave	Needham	1801
NEE.27	Smith, Newell House	891 Central Ave	Needham	1826
NEE.20	Mills, Davis House	945 Central Ave	Needham	1834
NEE.11	Whitney, Israel House	963 Central Ave	Needham	1830
NEE.2	Townsend House	980 Central Ave	Needham	c 1720
NEE.60	Mills, Davis Kendrick House	1001 Central Ave	Needham	1871

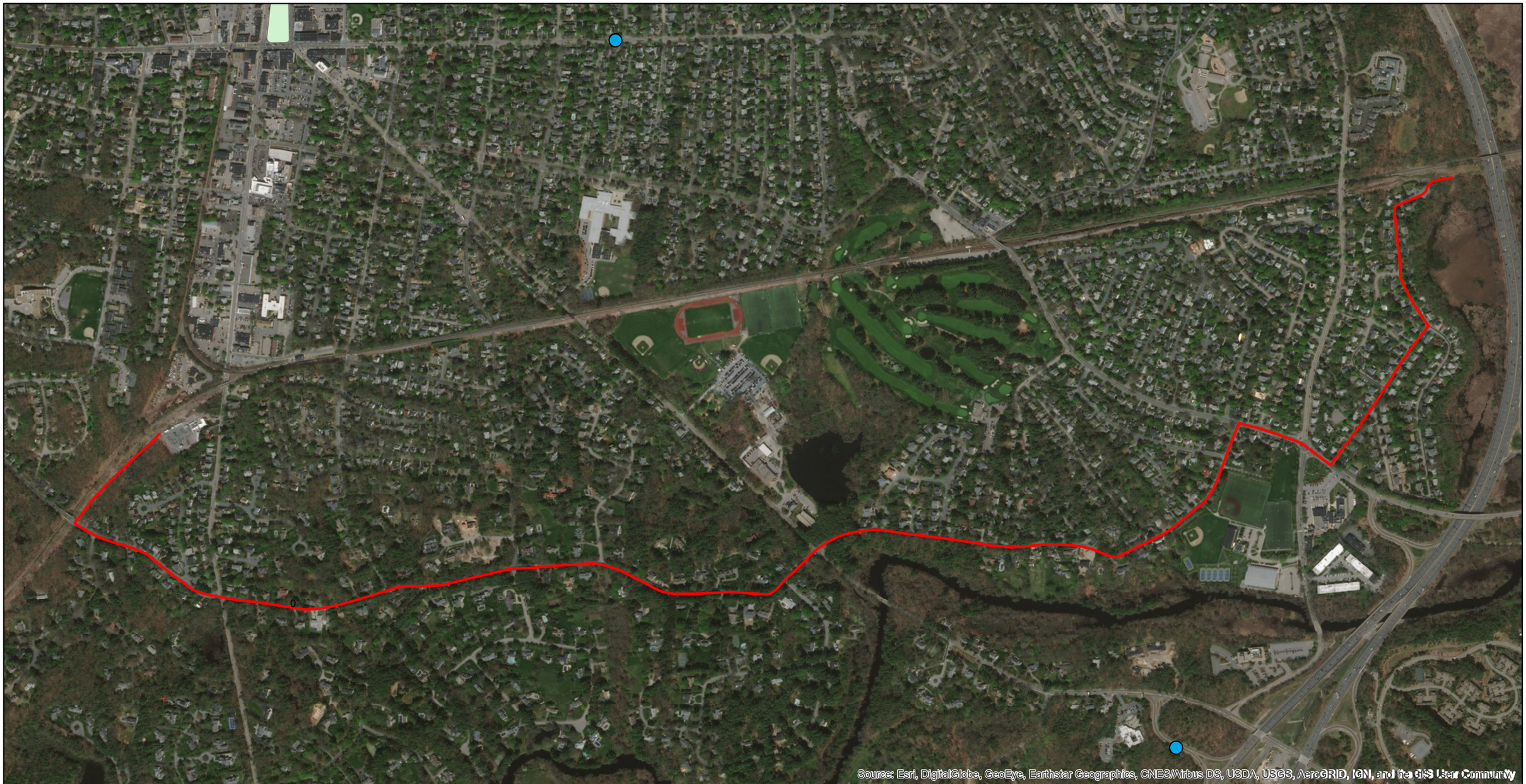
Inv. No.	Property Name	Street	Town	Year
NEE.26	Orr, Galen House	1019 Central Ave	Needham	1838
NEE.54	Newell, Dea. Jonathan House	1038 Central Ave	Needham	1839
NEE.62	Fuller, Ezra Jr. - Cole, Caroline House	1069 Central Ave	Needham	1854
NEE.8	Eaton, George E. House	1086 Central Ave	Needham	1849
NEE.74		1109 Central Ave	Needham	1955
NEE.75		1115 Central Ave	Needham	r 1955
NEE.12	Mills, Matthias House	1147 Central Ave	Needham	1834
NEE.30	Needham Upper Falls - East District Schoolhouse	1147 Central Ave	Needham	1842
NEE.52	Mills, Ezra House	1177 Central Ave	Needham	1844
NEE.95	Tolman - Gay House	1196 Central Ave	Needham	1743
NEE.33	Harmon, Cyrus House	1910 Central Ave	Needham	1850
NEE.101	Tilton - Ingols Block	91-97 Chapel St	Needham	c 1891
NEE.925	Needham Branch Railroad Bridge over Long Ditch	Charles River	Needham	1906
NEE.927	Charles River Railroad Bridge over Charles River	Charles River	Needham	r 1950
NEE.929	Charles River Railroad Bridge over Charles River	Charles River	Needham	1915
NEE.944	Echo Bridge	Charles River	Needham	1875
NEE.945	Sudbury Aqueduct	Charles River	Needham	c 1875
NEE.919	Pierce Bridge - Baker's Bridge	Charles River St	Needham	1927
NEE.15	Greenwood, Lyman House	20 Charles River St	Needham	1834
NEE.70	Fuller, Spencer House	167 Charles River St	Needham	1845
NEE.64	Morse, John Torrey III - Bradley, J. Gardner House	463 Charles River St	Needham	1906
NEE.916	Day's Bridge	Chestnut St	Needham	1922
NEE.920	Needham Branch Railroad Bridge over Chestnut St	Chestnut St	Needham	1985
NEE.921	Needham Branch Railroad Bridge over Chestnut St	Chestnut St	Needham	1985
NEE.41	Needham Fire Station	88 Chestnut St	Needham	
NEE.915	Dedham Avenue Bridge over Charles River	Dedham Ave	Needham	1910
NEE.923	Needham Branch Railroad Bridge over Dedham Avenue	Dedham Ave	Needham	1906
NEE.1	Needham First Parish Unitarian Church	23 Dedham Ave	Needham	1837
NEE.82	Natick Research Laboratories Family Housing	East Militia Heights	Needham	1958
NEE.83	Natick Research Laboratories Family Housing	East Militia Heights	Needham	1958
NEE.84	Natick Research Laboratories Family Housing	East Militia Heights	Needham	1958
NEE.85	Natick Research Laboratories Family Housing	East Militia Heights	Needham	1958
NEE.86	Natick Research Laboratories Family Housing	East Militia Heights	Needham	1958
NEE.87	Natick Research Laboratories Family Housing	East Militia Heights	Needham	1958

Inv. No.	Property Name	Street	Town	Year
NEE.88	Natick Research Laboratories Family Housing	East Militia Heights	Needham	1958
NEE.89	Natick Research Laboratories Family Housing	East Militia Heights	Needham	1958
NEE.90	Natick Research Laboratories Family Housing	East Militia Heights	Needham	1958
NEE.91	Natick Research Laboratories Family Housing	East Militia Heights	Needham	1958
NEE.92	Natick Research Laboratories Family Housing	East Militia Heights	Needham	1958
NEE.93	Natick Research Laboratories Family Housing	East Militia Heights	Needham	1958
NEE.102	Swallow, George A. House	143 Fair Oaks Pk	Needham	1894
NEE.103	Walker, Jean House	144 Fair Oaks Pk	Needham	1910
NEE.28	Mann, Nathaniel - Blackman, Henry House	91 Fairfield St	Needham	1738
NEE.948	Volante Farms Agricultural Fields	292 Forest St	Needham	c 1917
NEE.104	Foster, William R. House	11 Gage St	Needham	r 1900
NEE.105	Huxley, Edith A. House	24 Gage St	Needham	1889
NEE.71	Browne, Theodore L. - Whitney, William M. House	207-213 Garden St	Needham	1855
NEE.4	Kingsbury - Whitaker House	53 Glendoon Rd	Needham	c 1720
NEE.106	Casey, Julia House	40 Grant St	Needham	1905
NEE.902	Needham Town Pound Site	Great Plain Ave	Needham	1713
NEE.909	Needham Town Common	Great Plain Ave	Needham	1884
NEE.939	Great Plain Avenue Bridge over I-95	Great Plain Ave	Needham	1953
NEE.941	Needham Town Common Flagpole	Great Plain Ave	Needham	1912
NEE.942	Needham Town Common Memorial Wall	Great Plain Ave	Needham	1975
NEE.946	Noyes, Dr. Josiah Park	Great Plain Ave	Needham	1913
NEE.17	Walker, Mary House	146 Great Plain Ave	Needham	1836
NEE.72	Gay, George Hiram House	349 Great Plain Ave	Needham	1875
NEE.66	Bowers - Page House	613 Great Plain Ave	Needham	1887
NEE.43	Pickett, William B. House	664 Great Plain Ave	Needham	1855
NEE.18	Smith, James House	706 Great Plain Ave	Needham	c 1730
NEE.24	Needham First Baptist Church	858 Great Plain Ave	Needham	r 1865
NEE.29	Kingsbury Block	1042 Great Plain Ave	Needham	1887
NEE.107	Proctor, Edward W. House	1167 Great Plain Ave	Needham	c 1875
NEE.108	Kingsbury, Dr. Albert Dexter House	1175 Great Plain Ave	Needham	c 1873
NEE.109	Mills, Matthias House	1189 Great Plain Ave	Needham	c 1875
NEE.110	Fuller, Timothy Otis House	1197 Great Plain Ave	Needham	1876
NEE.111	Willgoose, Anthony House	1290 Great Plain Ave	Needham	1878
NEE.68	McIntosh, Francis - Greaves, Richard House	1321 Great Plain Ave	Needham	1869
NEE.53	Rimmele, Sarah House	1426 Great Plain Ave	Needham	1872
NEE.9	Kingsbury, Daniel House	1427 Great Plain Ave	Needham	1794
NEE.10	McIntosh, Nathan House	1427 Great Plain Ave	Needham	1829

Inv. No.	Property Name	Street	Town	Year
NEE.3	Fuller, Ezra Jr. House	1453 Great Plain Ave	Needham	1849
NEE.77	Needham Presbyterian Church	1458 Great Plain Ave	Needham	1959
NEE.78		1461 Great Plain Ave	Needham	1971
NEE.51	Flagg, William House	1472 Great Plain Ave	Needham	1852
NEE.79		1473 Great Plain Ave	Needham	1955
NEE.80	Leonard, Thomas House	1476 Great Plain Ave	Needham	1902
NEE.81	Mills, John House	1479 Great Plain Ave	Needham	1834
NEE.112	McIntosh, Charles House	1700 Great Plain Ave	Needham	1864
NEE.113	McIntosh, Curtis House	1725 Great Plain Ave	Needham	1890
NEE.21	MacIntosh, Gideon House	1746 Great Plain Ave	Needham	1783
NEE.16	Haws, Joseph - Newell, Josiah House	1795 Great Plain Ave	Needham	1756
NEE.903	Powder House Ledge Marker	1808 Great Plain Ave	Needham	1975
NEE.114	Colburn, George Warren House	25 Green St	Needham	1846
NEE.140	Needham Golf Clubhouse	49 Green St	Needham	1923
NEE.914	Lyon's Bridge	Greendale Ave	Needham	1877
NEE.932	Greendale Avenue Bridge over MBTA	Greendale Ave	Needham	1906
NEE.115	Lee, William House	52 Greendale Ave	Needham	1869
NEE.116	Beless, James S. House	80 Greendale Ave	Needham	1830
NEE.117	Carter, William H. House	112 Greendale Ave	Needham	1881
NEE.118	Blackman, Augustus - Cassidy, William S. Jr. House	992 Greendale Ave	Needham	1814
NEE.31	Lyon, Lemuel House	1157 Greendale Ave	Needham	1827
NEE.901	Baker, William Emerson Estate	Grove St	Needham	1868
NEE.48	Dewing - Baker, William Emerson House	430 Grove St	Needham	c 1751
NEE.933	High Rock Street Bridge over Conrail	High Rock St	Needham	1916
NEE.119	Holmes, Patterson P. House	33 High Rock St	Needham	1880
NEE.19	Richards, Joseph House	73 High Rock St	Needham	1843
NEE.40	Highland Avenue School	Highland Ave	Needham	
NEE.44	Carter School	Highland Ave	Needham	c 1910
NEE.931	Highland Avenue Bridge over Route 128 Southbound	Highland Ave	Needham	1931
NEE.937	Highland Avenue Bridge over I-95 Northbound	Highland Ave	Needham	1953
NEE.943	Needham All Wars Memorial	Highland Ave	Needham	
NEE.38	Avery School	760 Highland Ave	Needham	
NEE.120	Carter, Horace A. House	790 Highland Ave	Needham	1895
NEE.57	Avery, Sarah House	797 Highland Ave	Needham	1868
NEE.35	Needham Free Public Library	1139 Highland Ave	Needham	1915
NEE.34	Grover, Emery Building	1330 Highland Ave	Needham	1898

Inv. No.	Property Name	Street	Town	Year
NEE.23	Needham Town Hall	1471 Highland Ave	Needham	1902
NEE.949	Cricket Field	Hillside Ave	Needham	c 1860
NEE.121	Fox, Wallace J. House	93 Hillside Ave	Needham	1869
NEE.122	Jones, Frank House	56 Howland St	Needham	c 1908
NEE.913	Kendrick's Bridge	Kendrick St	Needham	1959
NEE.938	Kendrick Street Bridge over I-95	Kendrick St	Needham	1953
NEE.63	Stedman, Florence B. House	40 Linden St	Needham	1892
NEE.36	Webster, Rev. Amos House	28 Maple St	Needham	1855
NEE.123	Crafts, Caleb House	50 Maple St	Needham	1870
NEE.124	Stedman, Florence L. House	59 Maple St	Needham	1887
NEE.58	Grover, Judge Emery House	60 Maple St	Needham	1871
NEE.125	Moseley, Herbert R. House	65-67 Maple St	Needham	1874
NEE.47	Heath, Isaiah House	74 Maple St	Needham	1873
NEE.126	Carter, William House	32 Mark Lee Rd	Needham	1903
NEE.127	Whetton, James H. House	44 Mark Lee Rd	Needham	1898
NEE.128	Bowen, Otis E. - Mercer, Alfred John House	28 Mercer Rd	Needham	c 1870
NEE.924	Needham Branch Railroad Bridge over Water Works	Needham Reservoir	Needham	1906
NEE.912	Needham Street Bridge	Needham St	Needham	1875
NEE.800	Needham Old Burying Ground	Nehoiden St	Needham	1711
NEE.905	1775 Battle Monument	Nehoiden St	Needham	1851
NEE.906	Needham Soldiers' Monument	Nehoiden St	Needham	1901
NEE.67	McIntosh, Michael House	170 Nehoiden St	Needham	1830
NEE.65	Greenwood, Isaac House	195 Nehoiden St	Needham	1849
NEE.46	Fuller, Amos House	220 Nehoiden St	Needham	
NEE.129	Washburn, George W. C. House	301 Nehoiden St	Needham	c 1855
NEE.130	Sutton, Jemima House	51 Norfolk St	Needham	1908
NEE.49	Rimmele Cobbler Shop	62 Noyes St	Needham	1877
NEE.76		66 Noyes St	Needham	1914
NEE.50	Howland, Dea. George - Moseley, William House	50-52 Oak St	Needham	1862
NEE.37	Holman, Louis A. House	20 Oakland Ave	Needham	1898
NEE.131	Twigg, Charles House	22-24 Pershing Rd	Needham	c 1870
NEE.61	King - McNamara House	70 Pickering St	Needham	1871
NEE.45	Barr, Thomas House	133 Pine St	Needham	1859
NEE.132	Holt, George W. House	41 Pleasant St	Needham	1884
NEE.59	Eaton, Thomas C. House	90 Prince St	Needham	1876
NEE.908	Rosemary Dam	Rosemary St	Needham	
NEE.7	Kingsbury, Jonathan House	3 Rosemary St	Needham	1779

Inv. No.	Property Name	Street	Town	Year
NEE.32	Nehoiden - Revere, Paul Block	270-274 Rosemary St	Needham	1844
NEE.926	Charles River Railroad Bridge over Route 128	Rt 128	Needham	1931
NEE.935	I-95 Bridge Northbound over Charles River	Rt 128	Needham	1954
NEE.936	I-95 Bridge Southbound over Charles River	Rt 128	Needham	1954
NEE.42	Needham Police Station	99 School St	Needham	
NEE.940	Color Sweep	Seabeds Way	Needham	1983
NEE.917	Newell's Bridge - Mill Bridge - Bleachery Bridge	South St	Needham	1930
NEE.947	Charles River Village Dam	South St	Needham	
NEE.69	Lawton, William House	57 South St	Needham	1848
NEE.96	Lewis, Joshua House	178 South St	Needham	1776
NEE.97	Hagar, Joseph House	1227 South St	Needham	c 1827
NEE.55	Thorpe, Jonathan B. Silk Knitting Mill	31 Thorpe Rd	Needham	1893
NEE.930	Needham Branch Railroad Bridge over Warren Street	Warren St	Needham	1906
NEE.133	Holmes, Nahum H. House	94 Warren St	Needham	c 1894
NEE.134	Moseley, Sarah L. - Mills, Caroline Gay House	171 Warren St	Needham	c 1876
NEE.135	Blades, Wilbur G. House	227 Warren St	Needham	1908
NEE.136	Hodges, Mary C. - Deroo, Frank B. House	248 Warren St	Needham	r 1880
NEE.137	Mongovan, Joseph A. House	260 Warren St	Needham	r 1880
NEE.922	Needham Branch Railroad Bridge over Webster Street	Webster St	Needham	1905
NEE.39	Needham High School	609 Webster St	Needham	
NEE.13	Kingsbury, Lyman Edward House	686 Webster St	Needham	1852
NEE.94	Nutter, Sarah House	751 Webster St	Needham	1853
NEE.73	Kingsbury, Job N. House	1055 Webster St	Needham	1887
NEE.56	Morton, Charles B. House	1087 Webster St	Needham	1854
NEE.910	Avery, Jonathan Square	West St	Needham	1884
NEE.138	Mills, William R. House	348 West St	Needham	1860
NEE.22	Wilson, Samuel House	75 Wilson's Ln	Needham	1718
NEE.139	Minchen, John - Broadley, Frederick L. House	28 Wyoming Ave	Needham	1864



Legend:

- Alignment
- Cultural Resource Building
- Cultural Resource District

* Map shows locations listed in the National Registry of Historic Places under the National Historic Preservation Act of 1966 (https://www.nps.gov/nr/research/data_downloads.htm)

0 700 1,400 2,800

Feet

N

NPDES RGP
West Roxbury-Needham Reliability Project
Needham, Massachusetts

Eversource Energy
Westwood, Massachusetts

GEI Consultants

National Historic Preservation Act Sites

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