GEI Consultants

Consulting Engineers and Scientists

January 28, 2021
Project 1702642

Via E-mail: NPDES.Generalpermits@epa.gov

Ms. Shauna Little
EPA/OEP RGP Applications Coordinator
Environmental Protection Agency
Office of Ecosystem Protection
RGP NOI Processing
5 Post Office Square, Suite 100
Mail Code OEP06-4
Boston, MA 02109-3912

Dear Ms. Little:

Re: Notice of Intent
NPDES Remediation General Permit
1180 Boylston Development
1180 Boylston Street
Brookline, Massachusetts
MassDEP RTN 3-13540, 3-19813, RTN 3-32314 and RTN 3-36622

On behalf of Chestnut Hill Investments, LLC, 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 form is in Appendix A.

Site Information

This NOI has been prepared for the discharge of dewatering effluent during construction of the proposed 1180 Boylston development at the intersection of Boylston Street and Hammond Street in Brookline, Massachusetts (the Site; Figs. 1 and 2). The development site is a former Gulf service station. Four Massachusetts Department of Environmental Protection (MassDEP) disposal sites under the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000) are at Site. Three are closed, listed by Release Tracking Numbers (RTNs) 3-13540, 3-19813 and 3-32314. One is open, RTN 3-36622.

The Site is approximately 14,626 square foot parcel and will be the location of a 6-story, approximately 48,000 square foot, mixed-use retail and residential building. As the Site is an open MassDEP disposal site, a MassDEP Bureau of Resource Protection fee is not required.

GEI Consultants, Inc.
400 Unicorn Park Drive, Woburn, MA 01801
781.721.4000

Remediation under RTN 3-19813 began in 2002 and included removing petroleum underground storage tanks (USTs), soil excavation, and groundwater treatment. has previously been conducted under RTN 3-19813 at the site beginning in 2002. Remediation removed over 11,000 gallons of separate phase product and water and reduced volatile organic compound (VOC) concentrations in groundwater at the Site. The disposal site was closed with a Permanent Solution with Conditions Statement on March 13, 2020.

Soil pre-characterization for the development identified contaminants in soil, including methylnaphthalene, naphthalene, 1,3,5-trimethylbenzene and total petroleum hydrocarbons (TPH), greater than MCP reportable concentrations. The new reporting condition was reported to MassDEP on November 23, 2020 and assigned RTN 3-36622.

The proposed development includes excavation for the building foundations, stormwater drainage structures, utilities and other site work. The building will have two level of below ground parking, retail shops at street level on the ground floor, and five stories of housing units above the ground floor. Soil excavation for this work is expected to be as deep as 17 feet below grade, however, most of the site work will be bedrock removal encountered from 2 to 12 feet deep.

Construction dewatering will be necessary during excavation of contaminated soils. The intent of the project is to recharge groundwater on site. However, if this is not possible, it will be discharged to nearby City of Brookline catch basins, which discharge to Hammond Pond, in accordance with the RGP (Fig. 3).

Owner and Operator Information Owner

Owner
Chestnut Hill Investments, LLC
166 Harvard Street
Brookline, MA 02446
Contact: Rachna Balalrishna, Esq.
Vice President/General Counsel
(617) 838-6535
rachna@masonmurphyinc.com

Operator
Nauset Construction Corp
10 Kearney Road, Suite 307
Needham, MA 02494
Contact: Rob Johnstone
Project Executive
(781) 400-8090
rjohnstone@nauset.com

As the owner, Chestnut Hill Investments, LLC has operational control over the construction plans and specifications, including the ability to make modifications to those plans and specifications. Nauset Construction Corp. of Needham, Massachusetts, as the operator, 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. The owner and operator are applying for coverage under the RGP as co-permittees.

Receiving Water Information

The receiving water for the dewatering effluent is Hammond Pond in Newton, Massachusetts. On August 27, 2020, GEI collected a receiving water sample approximately 10 feet from the outfall. The sample was submitted to ESS Laboratory, Inc. (ESS) of Cranston, Rhode Island for analysis of metals, hardness and ammonia. The results are summarized in Table 1 and laboratory data report is in Appendix B. Receiving water temperature was measured in the field and is noted on the effluent limitations input calculation page in Appendix A.

The U.S. Geological Survey (USGS) StreamStats program does not calculate a seven-day-ten-year flow 7Q10 for Hammond Pond, (the receiving water). MassDEP suggested that StreamStats does not calculate a 7Q10 because Hammond Pond is manmade. Therefore, the 7Q10 of Hammond Pond is 0 ft^3/s and the Dilution Factor is 0 confirmed by the. The StreamStats report, and MassDEP's September 4, 2020 email confirmation of the 7Q10 and Dilution Factor are in Appendix A.

The effluent limits were generated using the NPDES RGP NOI Dilution Factor Calculation spreadsheet. Copies of the "EnterData" and "FreshwaterResults" tabs from the spreadsheet are in Appendix A. The resulting calculated effluent limits are in Table 2.

Source Water Information

GEI collected two groundwater samples to characterize potential dewatering influent source water. The groundwater samples were collected from monitoring wells GEI-101 and MW-5 on August 27, 28 and 30, 2020 (Fig. 2) and submitted to ESS for analysis of the parameters required under the NPDES RGP. In addition, the pH and temperature of the proposed influent was measured in the field to evaluate existing conditions. The results are summarized in Table 2 and the laboratory data report is in Appendix C.

The analytical results indicated the presence of ammonia, chloride, metals (copper, iron, lead and zinc), VOCs (o-xylene, p,m-xylene, benzene, ethylbenzene, naphthalene, toluene, and tetrachloroethene), and the PAH, naphthalene. The measured pH range of the groundwater within the project site was 6.48 to 6.86 standard units (s.u.). These contaminants also have the potential to be present in the source water.

Treatment System Information

During the below grade construction temporary dewatering will be required control surface water runoff from precipitation, groundwater seepage and construction generated water. The dewatering will be conducted within an impervious support of excavation and groundwater cut-off wall limiting groundwater seepage into the excavation. Temporary dewatering will be conducted from sumps in the excavation of from dewatering wells.

The effluent treatment system will be designed by the Contractor to meet the 2017 NPDES RGP Discharge Effluent Criteria. The collected water will be treated to remove suspended solids using a sedimentation tank and bag filters. Additional treatment may include granulated activated carbon (GAC) and ion exchange, if necessary. The proposed conceptual treatment system is shown in the process flow diagram in Fig. 4. If chemicals or other additives are necessary to meet effluent criteria (e.g., pH conditioners), we will request a Notice of Change under the permit.

Although final products for additional treatment will be determined by the operator or their designated contractor, example product information, including Safety Data Sheets (SDSs), associated hazards, operation recommendations, and product information for GAC and ion exchange systems adjustment are in Appendix A. These systems will be mobilized as necessary to achieve effluent limitations. Procedures for proper handling and spill prevention will be included in the site-specific Best Management Practices Plan (BMPP) maintained on the Site.

If required, chemical additives may include a metered sulfuric acid (70-100%) system. Similarly, oxidizers such as ferric sulfate may be used to treat for iron. If the addition of chemical additives is required to meet permit effluent limits, or applicable water quality standards, a Notice of

Change (NOC) will be filled on behalf of the owner and operator with specific product information attached. Additives 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 (BMPP). The addition of ferric sulfate for iron treatment and sulfuric acid to reduce pH levels are established practices for temporary construction dewatering, and are not expected to exceed applicable effluent limits, water quality standards, or alter conditions in the receiving water. In addition, use of these additives will not add any pollutants that would justify application of additional permit conditions.

Discharge Information

We estimate treated effluent discharge rates to be about 50 gallons per minute (gpm) or less, with occasional peak flows of approximately 100 gpm during significant precipitation events. The treated water will be discharged to one or two catch basins at the intersection of Boylston Street and Hammond Street. These catch basins are identified on Fig. 3 as Potential Discharge Points 1 and 2. According to plans we reviewed from the City of Brookline's Engineering Department in October 2017, these catch basins are part of the City storm water drainage system that discharges to an outfall at Hammond Pond, approximately 0.4 miles from the Site. The discharge path and ultimate discharge outfall at Hammond Pond is shown on Fig. 3.

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 in Appendix D. Based on this report, the project action area meets FWS Criterion A (i.e., no listed species or critical habitats are within the project action area).

National Historic Preservation Requirements

We reviewed online records from the U.S. National Register of Historic Places database and the Massachusetts Cultural Resource Information System (MACRIS). Maps of the Site and surrounding areas obtained from both databases are included in Appendix E. Based on the review, the Site is not a listed as a National Historic Place.

The point where the discharge reaches the receiving water (i.e., Hammond Pond) is not listed as a National Historic Place. The inventory listing from the MACRIS database is included in Appendix E.

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 project-specific information. The current intent of project dewatering activities is to recharge groundwater on site. However, if this is not possible, it will be discharged to the nearby storm water drainage system after treatment. On behalf of Chestnut Hill Investments, LLC, we are requesting coverage under the NPDES RGP for the discharge of treated construction dewatering effluent to the surface waters of Hammond Pond and City of Brookline 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 E).

Discharge of treated water is scheduled to begin late April/early May 2021, although recharge to on-site recharge pits is planned if possible.

Please contact me at 781.721.4012 or igladstone@geiconsultants.com or Catherine Malagrida at 781.721.4025 or cmalagrida@geiconsultants.com if you have any questions.

Sincerely,

GEI CONSULTANTS, INC.

Ileen S. Gladstone, P.E., LSP, LEED AP
Senior Vice President

Catherine Malagrida, P.G.
Project Manger

SMT/CMM/ISG:jam
Enclosures
c: Rachna Balalrishna, Esq.,
Rob Johnstone, Nauset

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Tables

Table 1. Chemical Testing Results - Receiving Water (Hammond Pond)
1180 Boylston Construction
Mason & Murphy, Inc
Brookline, Massachusetts

		Sample Location:	**SW-1**
		Sample Date:	**8/27/2020**
Analyte	**Method**	**Units**	
Total Metals		ug/L	
Antimony	200.8		< 5.0
Arsenic	3113B		< 2.5
Cadmium	200.8		< 1.0
Chromium, Total	200.7		2.4
Chromium III	200.7		< 10.0
Chromium VI	3500Cr B-2009		< 10.0
Copper	200.7		9.1
Iron	200.7		5280
Lead	200.8		5.2
Mercury	245.1		< 0.2
Nickel	200.7		< 5.0
Selenium	3113B		< 5.0
Silver	200.7		< 1.0
Zinc	200.7		88.4
Other			
Hardness	6010C	ug/l	164000
Ammonia as Nitrogen	350.1	ug/l	0.56
Temperature	Field	Deg C	14.5
pH	Field	S.U.	5.00

General Notes:

1. Only analytes detected in at least one sample are reported here. For a complete list of analytes, see the laboratory data sheets.
2. "<" = Analyte not detected at a concentration above the laboratory reporting limit.
3. µg/l = micrograms per liter.
4. S.U. = standard units.
5. Temperature and pH were measured in the field.

Table 2. Chemical Testing Results - Groundwater
1180 Boylston Construction
Mason & Murphy, Inc
Brookline, Massachusetts

					Sample Location:	GEI-101	MW-5
					Sample Date:	See Note 5	8/27/2020
					Well Depth (feet):	17.40	19.19
					Screen Interval:	3-13	7-17
Analyte	**Method**	**Units**	**MCP RCGW-2**	**Site Specific Effluent Limits**			
Volatile Organic Compounds (VOCs)	524.2	ug/l					
Xylene, O			NS	NS		< 0.5	1.9
Xylene, P, M			NS	NS		< 0.5	16.4
Total BTEX			NS	100		ND	18
1,4-Dioxane	8270D-SIM		6,000	200		< 0.250	< 0.250
Benzene			1,000	5.0		< 0.5	0.6
Ethylbenzene			5,000	NS		< 0.5	16.6
Toluene			40,000	NS		< 0.5	1.6
Acetone			50,000	7970		< 5.0	< 5.0
Total Non-Halogenated VOCs			NS	NS		ND	37
Tetrachloroethene			50	5.0		1.0	< 0.5
Tert-amyl methyl ether			NS	NS		<1.0	<1.0
Tert-butyl Alcohol			10	NS		<25.0	<25.0
Total Halogenated VOCs			NS	NS		1.0	ND
Napthalene			700	20		< 0.5	2.7
Semivolatile Organic Compounds (SVOCs)	625.1 SIM	ug/l					
Total Group I PAHs			NS	1		ND	ND
Napthalene			700	20		< 0.22	1.01
Total Group II PAHs			NS	100		ND	1.01
Fuel Parameters		ug/l					
Total Petroleum Hydrocarbons	1664A		5,000	5.0		< 12	< 5
Methyl-tert-Butyl Ether	524.2		50,000	70		< 0.5	< 0.5
Ethanol	ASTM D3695		NS	Report		< 10	< 10
Total Metals		ug/L					
Antimony	200.8		8,000	206		< 5.0	< 5.0
Arsenic	3113B		900	104		< 2.5	< 2.5
Cadmium	200.8		4	10.2		< 1.0	< 1.0
Chromium, Total	200.7		300	NS		< 1.0	< 1.0
Chromium III	200.7		600	323		< 10.0	< 10.0
Chromium VI	3500Cr B-2009		300	323		< 10.0	< 10.0
Copper	200.7		100,000	242		6.1	2.6
Iron	200.7		NS	1,000		312	3270
Lead	200.8		10	4.10		< 5.0	6.1
Mercury	245.1		20	0.739		< 0.2	< 0.2
Nickel	200.7		200	1,450		< 5.0	< 5.0
Selenium	3113B		100	235.8		< 5.0	< 5.0
Silver	200.7		7	35.1		< 1.0	< 1.0
Zinc	200.7		900	420		26.8	20.4
Dissolved Metals		ug/L					
Antimony	200.8		8,000			< 5.0	< 5.0
Arsenic	3113B		900			< 2.5	5.4
Cadmium	200.8		4			< 1.0	2.6
Chromium, Total	200.7		300			3.8	3.3
Copper	200.7		100,000			6.7	3.4
Iron	200.7		NS			71.1	5080
Lead	200.8		10			< 5.0	< 5.0
Mercury	245.1		20			< 0.20	< 0.20
Nickel	200.7		200			< 5.0	< 5.0
Selenium	3113B		100			< 5.0	< 5.0
Silver	200.7		7			< 1.0	1.4
Zinc	200.7		900			13.2	16.8

Table 2. Chemical Testing Results - Groundwater
1180 Boylston Construction
Mason & Murphy, Inc
Brookline, Massachusetts

				Sample Location:	**GEI-101**	**MW-5**
				Sample Date:	**See Note 5**	**8/27/2020**
				Well Depth (feet):	**17.40**	**19.19**
				Screen Interval:	**3-13**	**7-17**
Analyte	**Method**	**Units**	**MCP RCGW-2**	**Site Specific Effluent Limits**		
Polychlorinated Biphenlyls (PCBs)	608.3	ug/l				
Total PCBs			5	0.000064	ND	ND
Other						
Ammonia as Nitrogen	350.1	mg/L	NS	Report	< 0.10	0.63
Cyanide	4500 CN CE	mg/L	30	178	< 5.00	< 5.00
Chloride	300.0	mg/L	NS	Report	3.5	30.5
Phenols	420.1	ug/l	NS	1,080	< 50	< 50
Hardness	200.7	ug/l	NS	NS	105000	74400
Total Residual Chloride	4500CL D	ug/l	NS	11	< 20.0	< 20.0
Total Suspended Solids	2540D	mg/l	NS	30	6	16
Temperature	Field	Deg C	NS	NS	21.53	17.32
pH	Field	S.U.	NS	6.5 to 8.3	6.86	6.48

General Notes:

1. For a complete list of analytes, see the laboratory data sheets.
2. "<" = Analyte not detected at a concentration above the laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective June 20, 2014.
4. RCGW-2 = Reportable Concentration for category GW-2 Groundwater.
5. µg/l = micrograms per liter.
6. mg/l = milligram per liter.
7. deg C = Degrees Celsius.
8. S.U. = standard units.
9. Dilution Factor of 0.0 used to establish effluent limits.
10. Effluent limits calculated using NPDES RGP NOI Dilution Factor Spreadsheet.
11. Temperature and pH were measured in the field.

Footnotes:

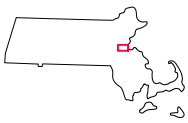
1. Total Non-Halogenated VOCs include benzene, ethylbenzene, toluene, and xylenes (BTEX), acetone, 1,4-dioxane, and phenols.
2. Total Halogenated VOCs include carbon tetrachloride, 1,2-dichlorobenzene, 1,3-dicholorobenzene, 1,4-dichlorobenzene, 1,1-dichlorethane, 1,2-dicholorethane, 1,2,-dichloroethene, ethylene dibromide, methylene chloride, 1,1,1-trichloroethane, 1,1,2-
3. Group I PAHs include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and ideno(1,2,3-cd)pyrene.
4. Group II PAHs include: acenaphthene, acenaphthylene, anthracene, bezon(g,h,i)perylene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene.
5. Monitoring well GEI-101 had slow water recovery, grab samples collected on 8/27/20, 8/28/20, and 8/30/20.

Figures

0 1000 2000 4000 6000

SCALE, FEET

This Image provided by MassGIS is from U.S.G.S.
Topographic 7.5 X 15 Minute Series
Boston South, MA Quadrangle, 1987.
Datum is National Geodetic Vertical Datum of 1929 (NGVD29).
Contour Interval is 3 Meters.



MASSACHUSETTS
QUADRANGLE LOCATION

NPDES RGP Notice of Intent 1180 Boylston Street Brookline, Massachusetts	GEI Consultants	SITE LOCATION MAP
Mason and Murphy, Inc. Brookline, Massachusetts	Project 1702642	January 2021 Fig. 1

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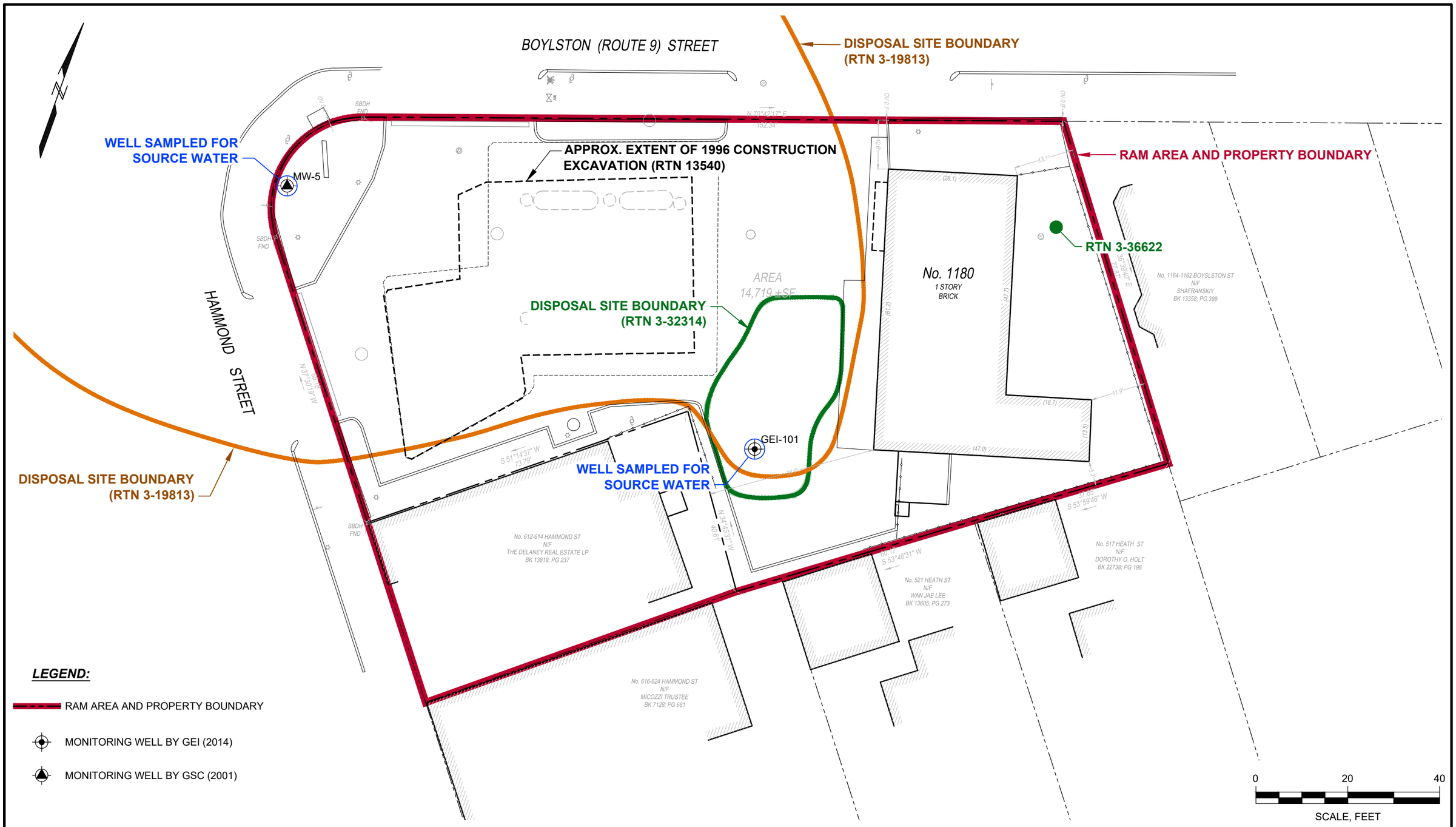

LEGEND:

- RAM AREA AND PROPERTY BOUNDARY
- MONITORING WELL BY GEI (2014)
- MONITORING WELL BY GSC (2001)

NOTES:

1. DISPOSAL SITE BOUNDARY (RTN 3-19813) FROM "*FORMER CFI STATION MA 2009 1180 BOYLSTON STREET, BROOKLINE, MASSACHUSETTS, SITE PLAN WITH GROUNDWATER CONTOURS - SEPTEMBER 2019,"* FIG No. 2 PREPARED BY ATC DATED OCTOBER 2019.
2. BASE PLAN FROM FIGURE TITLED *"ALTA/ACSM LAND TITLE SURVEY LOCATED AT 1180 BOYLSTON STREET, BROOKLINE, MA,"* PREPARED BY BOSTON SURVEY, INC. AND DATED 05/13/14.

NPDES RGP Notice of Intent 1180 Boylston Street Brookline, Massachusetts	GEI Consultants	SITE PLAN
Mason and Murphy, Inc. Brookline, Massachusetts	Project 1702642	January 2021 Fig. 2

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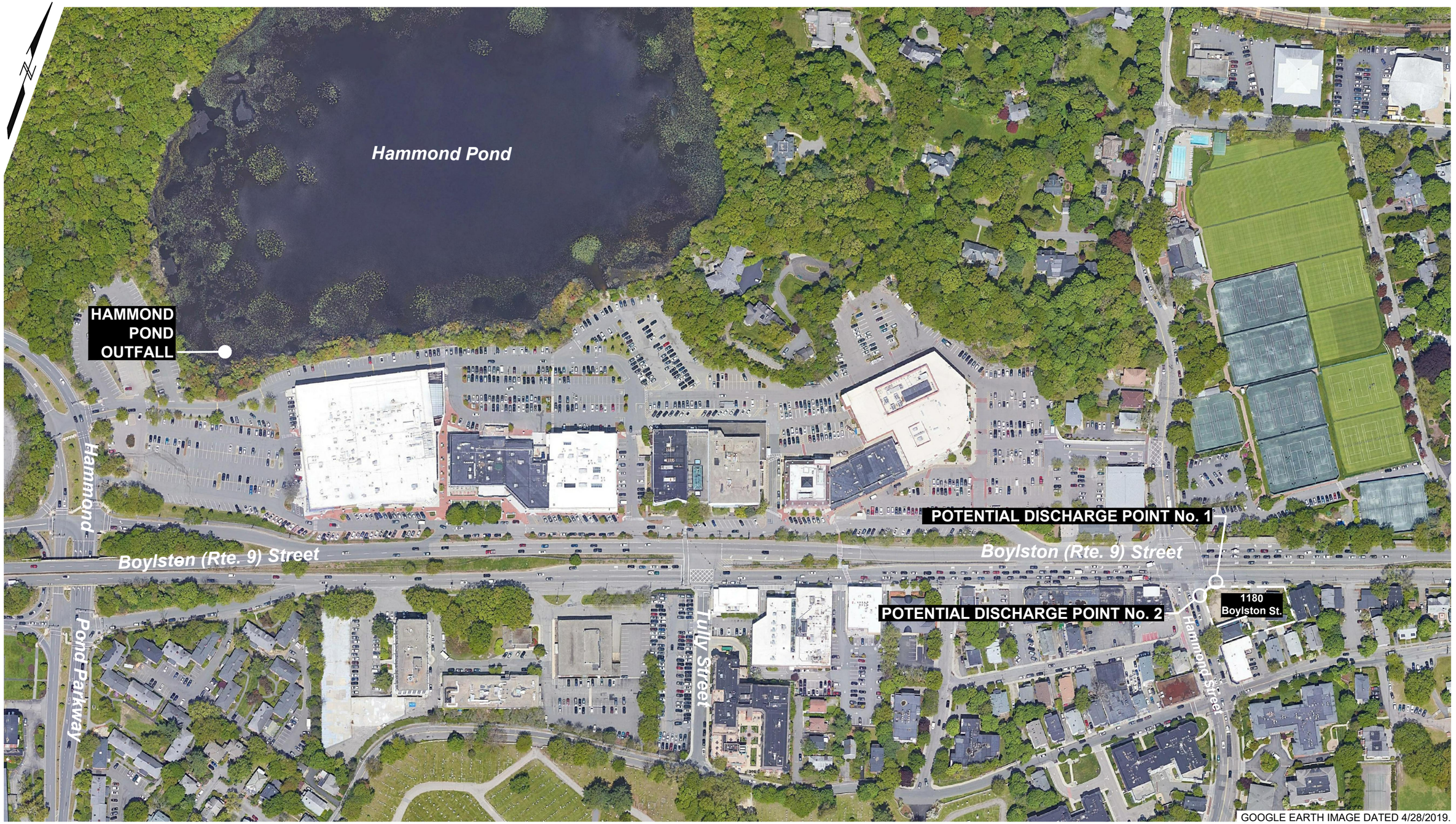

GOOGLE EARTH IMAGE DATED 4/28/2019.

0 200 400

APPROXIMATE SCALE, FEET

NPDES RGP Notice of Intent
1180 Boylston Street
Brookline, Massachusetts

Mason and Murphy, Inc.
Brookline, Massachusetts

GEI Consultants

DISCHARGE AND OUTFALL LOCATIONS

Project 1702642 | January 2021 | Fig. 3

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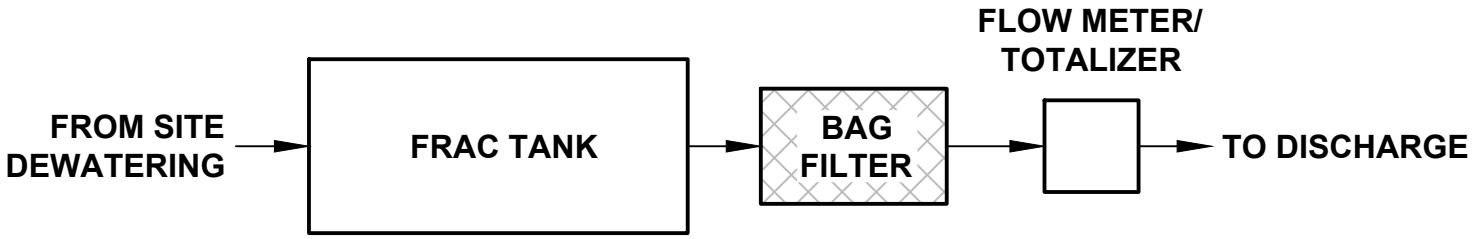

PROCESS FLOW DIAGRAM

Not to Scale

NPDES RGP Notice of Intent 1180 Boylston Street Brookline, Massachusetts		GEI Consultants	PROCESS FLOW DIAGRAM
Mason and Murphy, Inc. Brookline, Massachusetts		Project 1703090	January 2021 Fig. 4

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Appendix A

Remediation General Permit

Notice of Intent

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:
1180 Boylston Development</td><td colspan="3">Site address: 1180 Boylston Street
Street:</td></tr>
<tr><td>City: Brookline</td><td>State: MA</td><td>Zip: 02467</td></tr>
<tr><td rowspan="4">2. Site owner
Chestnut Hill Investments, LLC

Owner is (check one): ☐ Federal ☐ State/Tribal ■ Private
☐ Other; if so, specify:</td><td colspan="3">Contact Person: Rachna Balalrishna, Esq.</td></tr>
<tr><td colspan="2">Telephone: 617-838-6535</td><td>Email: rachna@masonmurphyinc.com</td></tr>
<tr><td colspan="3">Mailing address: 166 Harvard Street
Street:</td></tr>
<tr><td>City: Brookline, MA</td><td>State: MA</td><td>Zip: 02446</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner
Nauset Construction Corp</td><td colspan="3">Contact Person: Rob Johnstone</td></tr>
<tr><td colspan="2">Telephone: 781-400-8090</td><td>Email: rjohnstone@nauset.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: 10 Kearney Road, Suite 307</td></tr>
<tr><td>City: Needham</td><td>State: MA</td><td>Zip: 02494</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):
3-13540, 3-19813, 3-32314, 3-36622
☐ 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):
Hammond Pond	MA72044	2

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. Not 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 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.	0

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: 9/4/2020

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: Groundwater at current MassDEP disposal site for metals, VOCs (RTN 3-19813)	
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): Hammond Pond (City of Brookline)	Outfall location(s): (Latitude, Longitude) 42.322801 degrees N 71.171772 degrees W
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ■ Indirect discharge, if so, specify: ☐ 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: When issued, the RGP Authorization will be submitted to the City of Brookline 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): APRIL 2021 - SEPTEMBER 2022 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		✔	2	350.1	100	630	315	Report mg/L	---
Chloride		✔	2	300.0	50000	305000	17000	Report µg/l	---
Total Residual Chlorine	✔		2	4500CLD	20.0	< 20.0	0	0.2 mg/L	11
Total Suspended Solids		✔	2	2540D	0.005	16000	11000	30 mg/L	---
Antimony	✔		2	200.8	5.0	< 5.0	0	206 µg/L	640
Arsenic	✔		2	3113B	2.5	< 2.5	0	104 µg/L	10
Cadmium	✔		2	200.8	1.0	< 1.0	0	10.2 µg/L	0.3138
Chromium III	✔		2	200.7	10.0	< 10.0	0	323 µg/L	101.5
Chromium VI	✔		2	3500Cr	10.0	< 10.0	0	323 µg/L	11.4
Copper		✔	2	200.7	2.0	6.1	4.4	242 µg/L	11.1
Iron		✔	2	200.7	50.0	3270	1791	5,000 µg/L	1000
Lead		✔	2	200.8	1.0	6.1	3.1	160 µg/L	4.10
Mercury	✔		2	245.1	0.2	< 0.2	0	0.739 µg/L	0.91
Nickel	✔		2	200.7	5.0	< 5.0	0	1,450 µg/L	61.8
Selenium	✔		2	3113B	2.0	< 5.0	0	235.8 µg/L	5.0
Silver	✔		2	200.7	0.5	< 1.0	0	35.1 µg/L	5.3
Zinc		✔	2	200.7	2.0	26.8	23.6	420 µg/L	141.9
Cyanide	✔		2	4500CNC	5.0	< 5.0	0	178 mg/L	5.2
B. Non-Halogenated VOCs									
Total BTEX		✔	2	524.2	0.5	1.9	1.0	100 µg/L	---
Benzene		✔	2	524.2	0.5	0.6	0.3	5.0 µg/L	---
1,4 Dioxane	✔		2	8270DSIM	0.250	< 0.250	0	200 µg/L	---
Acetone	✔		2	524.2	5.0	< 5.0	0	7.97 mg/L	---
Phenol	✔		2	420.1	50	< 50	0	1,080 µg/L	300

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	✔		2	524.2	0.3	< 0.3	0	4.4 µg/L	1.6
1,2 Dichlorobenzene	✔		2	524.2	0.5	< 0.5	0	600 µg/L	---
1,3 Dichlorobenzene	✔		2	524.2	0.5	< 0.5	0	320 µg/L	---
1,4 Dichlorobenzene	✔		2	524.2	0.5	< 0.5	0	5.0 µg/L	---
Total dichlorobenzene	✔		2	524.2	0.5	< 0.5	0	763 µg/L in NH	---
1,1 Dichloroethane	✔		2	524.2	0.5	< 0.5	0	70 µg/L	---
1,2 Dichloroethane	✔		2	524.2	0.5	<0.5	0	5.0 µg/L	---
1,1 Dichloroethylene	✔		2	524.2	0.5	< 0.5	0	3.2 µg/L	---
Ethylene Dibromide	✔		2	504.1	0.015	< 0.015	0	0.05 µg/L	---
Methylene Chloride	✔		2	524.2	0.5	< 0.5	0	4.6 µg/L	---
1,1,1 Trichloroethane	✔		2	524.2	0.5	< 0.5	0	200 µg/L	---
1,1,2 Trichloroethane	✔		2	524.2	0.5	< 0.5	0	5.0 µg/L	---
Trichloroethylene	✔		2	524.2	0.5	< 0.5	0	5.0 µg/L	---
Tetrachloroethylene		✔	2	524.2	0.5	1.0	0.5	5.0 µg/L	3.3
cis-1,2 Dichloroethylene		✔	2	524.2	0.5	< 0.5	0	70 µg/L	---
Vinyl Chloride	✔		2	524.2	0.2	< 0.2	0	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✔		2	625.1 SIM	2.45	< 2.45	0	190 µg/L	---
Diethylhexyl phthalate	✔		2	625.1 SIM	2.45	< 2.45	0	101 µg/L	2.2
Total Group I PAHs	✔		2	625.1 SIM	0.05	< 0.05	0	1.0 µg/L	---
Benzo(a)anthracene	✔		2	625.1 SIM	0.05	< 0.05	0	As Total PAHs	0.0038
Benzo(a)pyrene	✔		2	625.1 SIM	0.05	< 0.05	0		0.0038
Benzo(b)fluoranthene	✔		2	625.1 SIM	0.05	< 0.05	0		0.0038
Benzo(k)fluoranthene	✔		2	625.1 SIM	0.05	< 0.05	0		0.0038
Chrysene	✔		2	625.1 SIM	0.05	< 0.05	0		0.0038
Dibenzo(a,h)anthracene	✔		2	625.1 SIM	0.05	< 0.05	0		0.0038
Indeno(1,2,3-cd)pyrene	✔		2	625.1 SIM	0.05	< 0.05	0		0.0038

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
Total Group II PAHs		✔	2	625.1 SIM	0.20	1.01	0.51	100 µg/L	---
Naphthalene		✔	2	625.1 SIM	0.20	1.01	0.51	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✔		2	608.3	0.10	<0.10	0	0.000064 µg/L	---
Pentachlorophenol	✔		2	625.1 SIM	0.88	<0.88	0	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons	✔		2	1664A	5000	<12000	0	5.0 mg/L	---
Ethanol	✔		2	D3695	10000	< 10000	0	Report mg/L	---
Methyl-tert-Butyl Ether	✔		2	524.2	0.5	< 0.5	0	70 µg/L	20
tert-Butyl Alcohol	✔		2	524.2	25	<25.0	0	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✔		2	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:									
pH	✔		2	NA	NA	6.48 S.U	6.86 S.U.		
Temp		✔	2	NA	NA	63.18 deg F	70.75 deg F		
Hardness		✔	2	200.7	824	105000	89700		

E. Treatment system information

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

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

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

Prior to discharge, dewatering effluent will be routed through a sedimentation tank and bag filters, to remove suspended solids and undissolved chemical constituents, and other necessary treatment components (potentially ion exchange, GAC, oil/water separator) to meet effluent requirements. See attached Figure 4.

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, ion exchange, 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: Flowmeter Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	250
Provide the proposed maximum effluent flow in gpm.	100
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:

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.

See attached letter report prepared by GEI.

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 will be prepared and maintained to meet the requirements of this general permit. The BMPP will be implemented on-site prior to the 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: 1-29-21
Print Name and Title:	Robert Johnstone Project Executive

Table 1. Water Quality Assessment Status for Reporting Year 2014
Hammond Pond

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

Causes of Impairment for Reporting Year 2014

Cause of Impairment	Cause of Impairment Group	Designated Use(s)	State TMDL Development Status
NA	NA	NA	NA

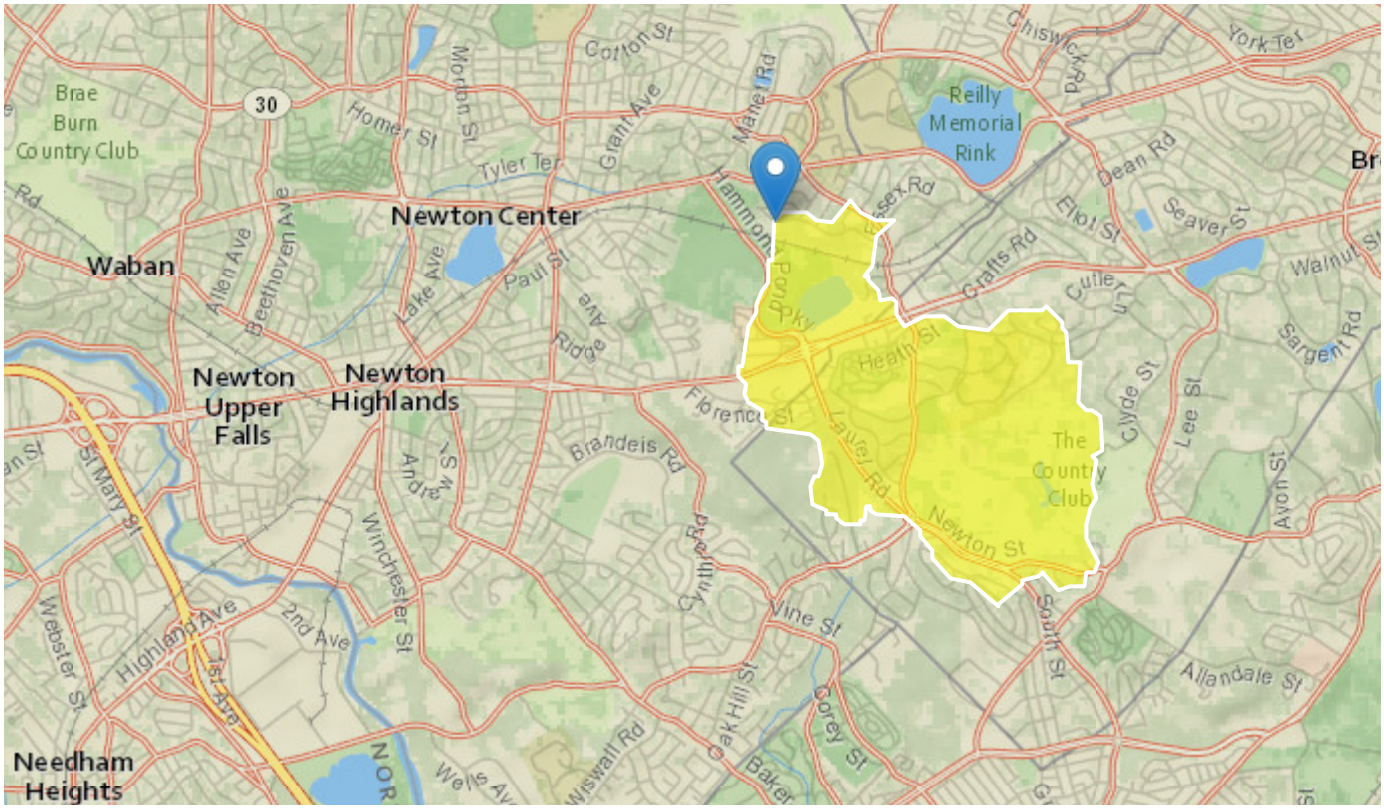
No impairment data have been reported to EPA for Hammond Pond.

Sources:

1. Information obtained from EPA website: https://ofmpub.epa.gov/waters10/attains_index.home on September 2, 2020.
2. Massachusetts Year 2016 Integrated List of Waters, Massachusetts Division of Watershed Management Watershed Planning Program, December 2019.

StreamStats Report

Region ID: MA
Workspace ID: MA20200903172525252000
Clicked Point (Latitude, Longitude): 42.32935, -71.17497
Time: 2020-09-03 13:25:42 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.61	square miles
BSLDEM250	Mean basin slope computed from 1:250K DEM	0.857	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	-100000	square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.61	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	0.857	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	-100000	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

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

Statistic	Value	Unit

Low-Flow Statistics Citations

Sauer, Vernon B.; Thomas, W. O., Jr.; Stricker, V. A.; Wilson, K. V.,1983, Flood characteristics of urban watersheds in the United States: U.S. Geological Survey Water-Supply Paper 2207, 63 p. (http://pubs.er.usgs.gov/publication/wsp2207)
()
Anderson, B.T.,2020, Magnitude and frequency of floods in Alabama, 2015: U.S. Geological Survey Scientific Investigations Report 2020–5032, 148 p. (https://doi.org/10.3133/sir20205032)
Hedgecock, T.S.,2004, Magnitude and Frequency of Floods on Small Rural Streams in Alabama: U. S. Geological Survey Scientific Investigations Report 2004-5135, 10 p. (http://pubs.usgs.gov/sir/2004/5135/)
Hedgecock, T.S.,2010, Magnitude and Frequency of Floods for Urban Streams in Alabama, 2007: U.S Geological Survey Scientific Investigations Report 2010-5012, 17p. (https://pubs.usgs.gov/sir/2010/5012/)
Wiley, J.B., and Curran, J.H.,2003, Estimating annual high-flow statistics and monthly and seasonal low-flow statistics for ungaged sites on streams in Alaska and conterminous basins in Canada: U.S. Geological Survey Water-Resources Investigations Report 03-4114, 61 p. (http://water.usgs.gov/pubs/wri/wri034114/pdf/wri034114_v1.10.pdf)
Brabets, Timothy P.,1996, Evaluation of the streamflow-gaging network of Alaska in providing regional streamflow information: U.S. Geological Survey Water-Resources Investigations Report 96-4001, 98 p. (http://pubs.er.usgs.gov/usgspubs/wri/wri964001)
Curran, J.H., Barth, N.A., Veilleux, A.G., and Ourso, R.T.,2016, Estimating Flood Magnitude and Frequency at Gaged and Ungaged Sites on Streams in Alaska and Conterminous Basins in Canada, Based on Data through Water Year 2012: U.S. Geological Survey Scientific Investigations Report 2016-5024, 47 p. (http://dx.doi.org/10.3133/sir20165024http://dx.doi.org/10.3133/sir20165024)
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p. (http://pubs.usgs.gov/sir/2010/5073/)
Waltemeyer, S.D., Analysis of the Magnitude and Frequency of Peak Discharges for the Navajo Nation in Arizona, Utah, Colorado, and New Mexico: U. S. Geological Survey Scientific Investigations Report2006-5306, 42 p. (http://pubs.usgs.gov/sir/2006/5306/)
Paretti, N.V., Kennedy, J.R., Turney, L.A., and Veilleux, A.G.,2014, Methods for estimating magnitude and frequency of floods in Arizona, developed with unregulated and rural peak-flow data through water year 2010: U.S. Geological Survey Scientific Investigations Report 2014-5211, 61 p., http://dx.doi.org/10.3133/sir20145211.
(http://pubs.usgs.gov/sir/2014/5211/)
Kennedy, J.R., Paretti, N.V., and Veilleux, A.G.,2014, Methods for estimating magnitude and frequency of 1-, 3-, 7-, 15-, and 30-day flood-duration flows in Arizona: U.S. Geological Survey Scientific Investigations Report 2014–5109, 35 p.
(http://pubs.usgs.gov/sir/2014/5109/)
Funkhouser, J.E., Eng, Ken, and Moix, M.W.,2008, Low-Flow Characteristics and Regionalization of Low Flow Characteristics for Selected Streams in Arkansas: U. S. Geological Survey Scientific Investigations Report 2008-5065, 161 p.
(http://pubs.usgs.gov/sir/2008/5065/pdf/SIR2008-5065.pdf)
Breaker, B.K.,2015, Dry season mean monthly flow and harmonic mean flow regression equations for selected ungaged basins in Arkansas: U.S. Geological Survey Scientific Investigations Report 2015–5031, 25 p. (http://pubs.usgs.gov/sir/2015/5031/)
Wagner, D.M., Krieger, J.D., and Veilleux, A.G.,2016, Methods for estimating annual exceedance probability discharges for streams in Arkansas, based on data through water year 2013: U.S. Geological Survey Scientific Investigations Report 2016–5081, 136 p.
(http://dx.doi.org/10.3133/sir20165081)
Thomas, B.E, Hjalmarson, H.W., and Waltemeyer, S.D.,1997, Methods for Estimating Magnitude and Frequency of Floods in the Southwestern United States: U.S. Water-Supply Paper 2433, 196 p. (http://pubs.er.usgs.gov/publication/wsp2433)
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Application Version: 4.4.0

From: Vakalopoulos, Catherine (DEP)
To: Ruan, Xiaodan (DEP); Trant, Shannon
Subject: [EXT] Re: NPDES RGP NOI -7Q10 and DF
Date: Friday, September 4, 2020 11:58:10 AM

Hi Shannon and Xiaodan,
There would be no dilution granted to Hammond Pond because as you can see, Streamstats can't calculate a 7Q10. The blue lines may be approximate paths of stormwater pipes. StreamStats is able to calculate 7Q10s in some lakes and ponds that have significant flow in and out. Per your question Xiaodan, though Hammond Pond is probably manmade (don't know for sure), it used to be a back-up reservoir for MWRA (https://chanewton.org/category/hammond-pond/). So it makes sense why there isn't significant flow in and out.
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: "Ruan, Xiaodan (DEP)" <xiaodan.ruan@mass.gov>
Date: Friday, September 4, 2020 at 11:12 AM
To: "Trant, Shannon" <strant@geiconsultants.com>
Cc: "Vakalopoulos, Catherine (DEP)" <catherine.vakalopoulos@mass.gov>
Subject: RE: NPDES RGP NOI -7Q10 and DF

Hi Shannon,

I am sorry that I don't have an answer to why the StreamStats did not calculate a 7Q10 as I don't know enough about how the application was developed.

Although there are blue lines on StreamStats, on my GIS, the Hammond Pond is not connected to other water bodies. Do you know if there is an outlet of Hammond Pond, and whether it is man-mand pond? From the maps and GIS I couldn't tell what the flow paths are around the area.

Thanks,
Xiaodan

From: Trant, Shannon <strant@geiconsultants.com>
Sent: Thursday, September 3, 2020 1:40 PM
To: Ruan, Xiaodan (DEP) <xiaodan.ruan@mass.gov>
Subject: NPDES RGP NOI -7Q10 and DF

CAUTION: This email originated from a sender outside of the Commonwealth of

Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Hi Xiaodan,

I am preparing an RGP NOI for an upcoming construction project in Brookline, MA at 1180 Boylston Street. Dewatering effluent will be discharged to the Town of Brookline stormwater system which discharges into Hammond Pond. This is the location where we collected our receiving water sample for the RGP.

In SteamStats we could select and generate a basin but no low flow statistics (see attached), since we get an error for the Stratified Drift per Stream Length parameter. Do you know what the issue is?

Is there another way we can calculate flow (7Q10) into Hammond Pond and a dilution factor for the RGP Permit?

Thanks,
Shannon

GEI50

SHANNON TRANT
Staff Engineer
781.721.4072 cell: 518.795.0846
400 Unicorn Park Drive, Woburn, MA 01801

Enter number values in green boxes below

Enter values in the units specified

↓

0	Q_R = Enter upstream flow in **MGD**
1	Q_P = Enter discharge flow in **MGD**
0	Downstream 7Q10

Enter a dilution factor, if other than zero

↓

0

Enter values in the units specified

↓

122.1	C_d = Enter influent hardness in **mg/L** $CaCO_3$
163	C_s = Enter receiving water hardness in **mg/L** $CaCO_3$

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

↓

5	pH in **Standard Units**
14.5	Temperature in **°C**
560	Ammonia in **mg/L**
164	Hardness in **mg/L** $CaCO_3$
	Salinity in **ppt**
0	Antimony in **µg/L**
0	Arsenic in **µg/L**
0	Cadmium in **µg/L**
0	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
9.1	Copper in **µg/L**
5280	Iron in **µg/L**
5.2	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
88.4	Zinc in **µg/L**

Enter **influent** concentrations in the units specified

↓

0	TRC in **µg/L**
0.63	Ammonia in **mg/L**
0	Antimony in **µg/L**
0	Arsenic in **µg/L**
0	Cadmium in **µg/L**
0	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
6.1	Copper in **µg/L**
3270	Iron in **µg/L**
6.1	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
26.8	Zinc in **µg/L**
0	Cyanide in **µg/L**
0	Phenol in **µg/L**
0	Carbon Tetrachloride in **µg/L**
1	Tetrachloroethylene in **µg/L**
0	Total Phthalates in **µg/L**
0	Diethylhexylphthalate in **µg/L**
0	Benzo(a)anthracene in **µg/L**
0	Benzo(a)pyrene in **µg/L**
0	Benzo(b)fluoranthene in **µg/L**
0	Benzo(k)fluoranthene in **µg/L**
0	Chrysene in **µg/L**
0	Dibenzo(a,h)anthracene in **µg/L**
0	Indeno(1,2,3-cd)pyrene in **µg/L**
0	Methyl-tert butyl ether in **µg/L**

Notes:

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

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

Freshwater only

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

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

I. Dilution Factor Calculation Method

A. 7Q10

Refer to Appendix V for determining critical low flow; must be approved by State before use in calculations.

B. Dilution Factor

Calculated as follows: $Df = \frac{Q_R + Q_P}{Q_P}$

Q_R = 7Q10 in MGD

Q_P = Discharge flow, in MGD

II. Effluent Limitation Calculation Method

A. Calculate Water Quality Criterion:

Step 1. Downstream hardness, calculated as follows:

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r}$$

C_r = Downstream hardness in mg/L

Q_d = Discharge flow in MGD

C_d = Discharge hardness in mg/L

Q_s = Upstream flow (7Q10) in MGD

C_s = Upstream (receiving water) hardness in mg/L

Q_r = Downstream receiving water flow in MGD

Step 2. Total recoverable water quality criteria for hardness-dependent metals, calculated as follows:

Total Recoverable Criteria = $\exp\{m_c [\ln(h)] + b_c\}$

m_c = Pollutant-specific coefficient (m_a for silver)

b_c = Pollutant-specific coefficient (b_a for silver)

ln = Natural logarithm

h = Hardness calculated in Step 1

Step 3. Total recoverable water quality criteria for non-hardness-dependent metals, calculated as follows:

$$\text{WQC in µg/L} = \frac{\text{dissolved WQC in µg/L}}{\text{dissolved to total recoverable factor}}$$

B. Calculate WQBEL:

Step 1. WQBEL calculated as follows for parameter sampled in and detected in the receiving water:

$$C_d = \frac{Q_r C_r - Q_s C_s}{Q_d}$$

C_r = Water quality criterion in µg/L

Q_d = Discharge flow in MGD

C_d = WQBEL in µg/L

Q_s = Upstream flow (7Q10) in MGD

C_s = Ustream (receiving water) concentration in µg/L

Q_r = Downstream receiving water flow in MGD

Step 2. WQBEL calculated as follows for parameter not sampled in or not detected in receiving water:

$$C_d = (Q_r/Q_d) \times C_r$$

C_r = Water quality criterion in µg/L

Q_d = Discharge flow in MGD

Q_r = Downstream receiving water flow in MGD

C. Determine if a WQBEL applies:

Step 1. For parameter sampled in and detected in receiving water, downstream concentrations calculated as follows:

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r}$$

C_r = Downstream concentration in µg/L

Q_d = Discharge flow in MGD

C_d = Influent concentration in µg/L

Q_s = Upstream flow (7Q10) in MGD

C_s = Upstream (receiving water) concentration in µg/L

Q_r = Downstream receiving water flow in MGD

The WQBEL applies if:

1) the projected downstream concentration calculated in accordance with Step 1, above, and the discharge concentration of a parameter are greater than the WQC calculated for that parameter in accordance with II.A, above

AND

2) the WQBEL determined for that parameter in accordance with II.B, above, is less than the TBEL in Part 2.1.1 of the RGP for that parameter. Otherwise, the TBEL in Part 2.1.1 of the RGP for that parameter applies.

Step 2. For a parameter not sampled in or not detected in receiving water, the WQBEL applies if:

1) the discharge concentration of a parameter is greater than the WQBEL determined for that parameter in accordance with II.A or II.B, above;

AND

2) the WQBEL determined for that parameter in accordance with II.A or II.B, above is less than the TBEL in Part 2.1.1 of the RGP for that parameter. Otherwise, the TBEL in

Part 2.1.1 of the RGP for that parameter applies.

Dilution Factor	1.0					
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	**11**	µg/L	50	µg/L
Total Suspended Solids	**30**	mg/L	---			
Antimony	**206**	µg/L	640	µg/L		
Arsenic	**104**	µg/L	10	µg/L		
Cadmium	**10.2**	µg/L	0.3138	µg/L		
Chromium III	**323**	µg/L	101.5	µg/L		
Chromium VI	**323**	µg/L	11.4	µg/L		
Copper	**242**	µg/L	11.1	µg/L		
Iron	5000	µg/L	**1000**	µg/L		
Lead	160	µg/L	**4.10**	µg/L		
Mercury	**0.739**	µg/L	0.91	µg/L		
Nickel	**1450**	µg/L	61.8	µg/L		
Selenium	**235.8**	µg/L	5.0	µg/L		
Silver	**35.1**	µg/L	5.3	µg/L		
Zinc	**420**	µg/L	141.9	µg/L		
Cyanide	**178**	mg/L	5.2	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	300	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	**4.4**	µg/L	1.6	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	3.3	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	2.2	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---			
Benzo(a)anthracene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(a)pyrene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(b)fluoranthene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(k)fluoranthene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Chrysene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Dibenzo(a,h)anthracene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Indeno(1,2,3-cd)pyrene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	**100**	µg/L	---			
Naphthalene	**20**	µg/L	---			
E. Halogenated SVOCs						
Total Polychlorinated Biphenyls	**0.000064**	µg/L	---		0.5	µg/L
Pentachlorophenol	**1.0**	µg/L	---			
F. Fuels Parameters						
Total Petroleum Hydrocarbons	**5.0**	mg/L	---			
Ethanol	**Report**	mg/L	---			
Methyl-tert-Butyl Ether	**70**	µg/L	20	µg/L		
tert-Butyl Alcohol	**120**	µg/L	---			
tert-Amyl Methyl Ether	**90**	µg/L	---			

I. Dilution Factor Calculation Method

A. 7Q10

No flow assumed at critical low flow for saltwater unless otherwise approved by the State

B. Dilution Factor

No dilution assumed for saltwater, unless otherwise approved by the State

II. Effluent Limitation Calculation Method

A. Calculate Water Quality Criterion:

Step 1. Not applicable to saltwater

Step 2. Not applicable to saltwater

Step 3. Total recoverable water quality criteria for dissolved metals, calculated as follows:

$$\text{WQC in µg/L} = \frac{\text{dissolved WQC in µg/L}}{\text{dissolved to total recoverable factor}}$$

B. Calculate WQBEL:

Step 1. WQBEL calculated as follows for parameter sampled in and detected in the receiving water:

$$C_d = \frac{Q_r C_r - Q_s C_s}{Q_d}$$

C_r = Water quality criterion in µg/L
Q_d = Discharge flow in MGD
C_d = WQBEL in µg/L
Q_s = Upstream flow (7Q10) in MGD
C_s = Ustream (receiving water) concentration in µg/L
Q_r = Downstream receiving water flow in MGD

Step 2. WQBEL calculated as follows for parameter not sampled in or not detected in receiving water:

$$C_d = (Q_r/Q_d) \times C_r$$

C_r = Water quality criterion in µg/L
Q_d = Discharge flow in MGD
Q_r = Downstream receiving water flow in MGD

C. Determine if a WQBEL applies:

Step 1. For parameter sampled in and detected in receiving water, downstream concentrations calculated as follows:

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r}$$

C_r = Downstream concentration in µg/L
Q_d = Discharge flow in MGD
C_d = Influent concentration in µg/L
Q_s = Upstream flow (7Q10) in MGD
C_s = Upstream (receiving water) concentration in µg/L
Q_r = Downstream receiving water flow in MGD

The WQBEL applies if:

1) the projected downstream concentration calculated in accordance with Step 1, above, and the discharge concentration of a parameter is greater than the WQC calculated for that parameter in accordance with II.A, above
AND
2) the WQBEL determined for that parameter in accordance with II.B, above, is less than the TBEL in Part 2.1.1 of the RGP for that parameter. Otherwise, the TBEL in Part 2.1.1 of the RGP for that parameter applies.

Step 2. For a parameter not detected in or not sampled in receiving water, the WQBEL applies if:

1) the discharge concentration of a parameter is greater than the WQBEL determined for that parameter in accordance with II.A or II.B, above;
AND
2) the WQBEL determined for that parameter in accordance with II.A or II.B, above is less than the TBEL in Part 2.1.1 of the RGP for that parameter. Otherwise, the TBEL in Part 2.1.1 of the RGP for that parameter applies.

Dilution Factor	0.0					
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	**7.5**	µg/L	50	µg/L
Total Suspended Solids	**30**	mg/L	---			
Antimony	**206**	µg/L	640	µg/L		
Arsenic	**104**	µg/L	36	µg/L		
Cadmium	**10.2**	µg/L	8.9	µg/L		
Chromium III	**323**	µg/L	100.0	µg/L		
Chromium VI	**323**	µg/L	50	µg/L		
Copper	242	µg/L	**3.7**	µg/L		
Iron	**5000**	µg/L	---	µg/L		
Lead	**160**	µg/L	8.5	µg/L		
Mercury	**0.739**	µg/L	1.11	µg/L		
Nickel	**1450**	µg/L	8.3	µg/L		
Selenium	**235.8**	µg/L	71	µg/L		
Silver	**35.1**	µg/L	2.2	µg/L		
Zinc	**420**	µg/L	86	µg/L		
Cyanide	**178**	mg/L	1.0	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	**7.97**	mg/L	---			
Phenol	**1,080**	µg/L	300	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	**4.4**		1.6	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	3.3	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	2.2	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---			
Benzo(a)anthracene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(a)pyrene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(b)fluoranthene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(k)fluoranthene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Chrysene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Dibenzo(a,h)anthracene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Indeno(1,2,3-cd)pyrene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	**100**	µg/L	---			
Naphthalene	**20**	µg/L	---			
E. Halogenated SVOCs						
Total Polychlorinated Biphenyls	**0.000064**	µg/L	---		0.5	µg/L
Pentachlorophenol	**1.0**	µg/L	---			
F. Fuels Parameters						
Total Petroleum Hydrocarbons	**5.0**	mg/L	---			
Ethanol	**Report**	mg/L	---			
Methyl-tert-Butyl Ether	**70**	µg/L	20	µg/L		
tert-Butyl Alcohol	**120**	µg/L	---			
tert-Amyl Methyl Ether	**90**	µg/L	---			

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  - Bag Filter Housings
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- Membrane Filtration
- Microbial Bacteria
- Oil/Water Separators
- Ozone
- Pressure Filtration
- Screens
- Separators/Strainers
- Tanks

Bag Filters / Accugaf Filter Bags

Accugaf filter bags are constructed from FDA compliant materials. They are ideal for food processing applications and will filter particulate from 1 micron to 25 microns with 99% efficiency..

Related Product Links
Accugaf Filter Bags | Duragaf Filter Bags | Hayflow Filter Element | Lofclear Filter Bags | Nylon & Polyester Mesh | Progaf Filter Bags | Sentinel® Filter Bags & Seal | Snap Ring Filtration Media Overview

ACCUGAF™, Filter Bags for Applications Demanding Efficiency >99%

The ACCUGAF filter bag pushes the boundaries of bag filtration technology far beyond traditional designs. With efficiencies >99%, each A model provides cost-effective filtration solutions for demanding applications. The five models assure users that particles from the range of can be removed effectively while delivering long service life.

Material	Filter Model	Buy Now	Particle Size at Common Removal Efficiencies (µm)					ΔP (psi) Size 02 @ 45 gpm
			>60%	>90%	>95%	>99%	>99.9%	
Polypropylene	AGF 51		0.2	0.6	0.8	1.5	5	1.30
	AGF 53		0.8	1	2	3	5	3.20
	AGF 55		1	2	3	5	15	0.73
	AGF 57		2	4	5	10	25	0.60
	AGF 59		10	25	30	25	35	0.44
Polyester	AGFE 51		0.2	0.6	0.8	1.5	5	1.30
	AGFE 55		1	2	3	5	15	0.73
	AGFE 57		2	4	5	10	25	0.60

High-Efficiency Performance

ACCUGAF filter bags feature:

- 100% welded seams
- Patented SENTINEL® seal ring
- Meltblown filtration media in polypropylene or polyester
- No additives, such as resins, binders or surface treatments

FDA Compliant Materials

ACCUGAF Polypropylene filter bags are constructed entirely of materials compliant to FDA requirements for materials in contact with food materials conform to US Code of Federal Regulations 21 CFR Part 177 and EU Directive 2002/72/EC.

Applications

Although ideally suited for food and beverages, ACCUGAF filter bags will deliver equal performance in a wide range of demanding applica as:

- Beer, wine, spirits and beverage filtration
- Fine particle removal in parts cleaning
- Final filtration of lacquers
- Final filtration of vinegar
- Activated carbon removal in process systems
- Final filtration of hydraulic oils and lubricants

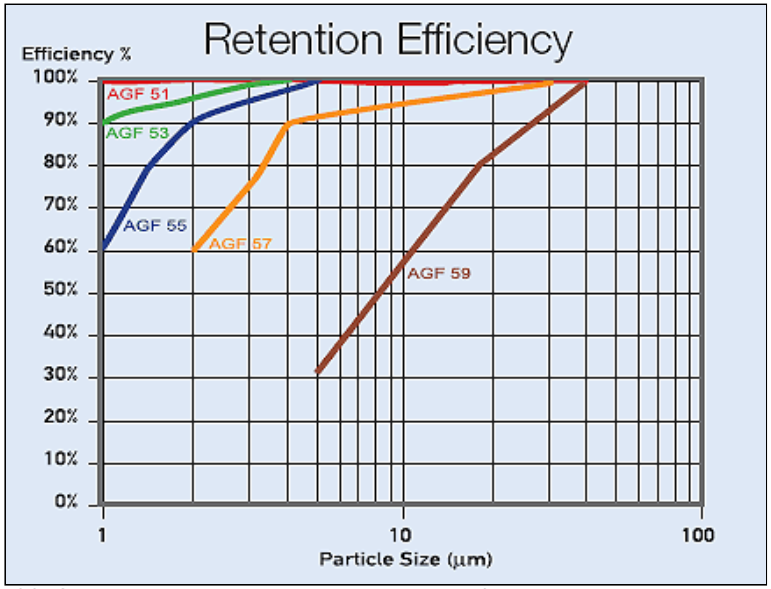
OPERATIONALCONSIDERATIONS

Bag Positioner

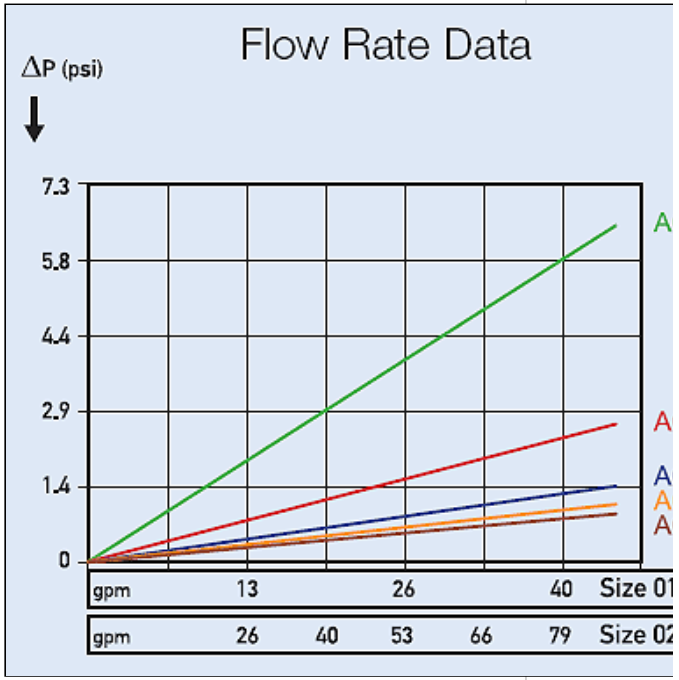
ACCUGAF filter bags must be used with the Eaton bagpositioner. This eases insertion and assures correct alignment of the filter bag inside the restrainer basket. In addition, the be protected against damage to inadvertent back-flow.

Pre-Wetting in Aqueous Solutions

ACCUGAF polypropylene filter bags are fabricated from microfiber filtration media. These materials are hydro-phobic, indicating that water will not wet the fiber surfaces.As will a polypropylene filters, a lower surface tension fluid (wetting agent) must be used to wet the media prior to introducing water. Prior to service, the filter bags must be immersed in a solution compatible with the process fluid. After wetting, an aqueous fluid will be drawn into the media through capillary action. Full details about installation and wetting are prov every box of ACCUGAF filter bags.



ACCUGAF Filter Bags are available in retention codes of 51,53,55,57,and 59.To select the perfect ACCUGAF Filter Bag for your application use the chart and choose the retention efficiency level you need on the left side (Y Axis) of the chart at the particle size in microns at the bottom (X Axis) .Next find which bag efficiency code (identified by the colored lines) is closest to that point.Thsi will assist you in finding the most cost effective filter bag for your critical filtration application.



BAG FILTER PRODUCT CODE EXPLANATION

ACCUGAF™ AGF: polypropylene melt-blown AGFE: polyester melt-blown		E: Polypropylene Mesh R: Polyester Mesh		E: PP SENTINEL® Ring H: Hytrel SENTINEL® Ring		Bags/Box Box Size (inc 01/02 10M 19 x 12
AGF Bag Material	- **53** Micron Rating µm	**E** Bag Cover Layer	**02** Bag Size	**E** Collar/Ring Type	- **O** Bottom Shape	- **10M** Packagi

AGF	AGFE
51	51
53	-
55	55
57	57
59	-

Code	Size	Area
01	ø 7 x 17 inches L	2.6 sqft
02	ø 7 x 32 inches L	5.2 sqft

round bottom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- Bag Filtration
  - Bag Filter Housings
  - Bag Filter Media
- Biological Treatment
- Chemicals (Specialty)
- Clarifiers
- Controls
- Dissolved Air Flotation
- Dewatering
- Evaporators
- Membrane Filtration
- Microbial Bacteria
- Oil/Water Separators
- Ozone
- Pressure Filtration

Bag Filter Media / Lofclear Absolute Rate Oil Removal Filter Bags

Accugaf filter bags are constructed from FDA compliant materials. They are ideal for food processing applications and will filter particulate from 1 micron to 25 microns with 99% efficiency..

Related Product Links
Accugaf Filter Bags | Duragaf Filter Bags | Hayflow Filter Element | Lofclear Filter Bags | Nylon & Polyester Mesh | Progaf Filter Bags | Sentinel® Filter Bags & Seal | Snap Ring Filter Bags | Filtration Media Overview

LOFCLEAR: Cost Effective Filter Bags for Absolute Filtration Applications

A pleated prefilter provides a very large surface (about 32 sq ft) to collect

LOFCLEAR filter bags now make absolute filtration viable in many applications where only standard bags could be used due to cost constraints. Made from 100% pure polypropylene materials compliant with food requirements, LOFCLEAR filter bags contain no leachables or lubricants such as silicone oils. In addition, their excellent oil adsorbancy makes LOFCLEAR filter bags ideally suited to the oil removal needs of the paint and coatings industries.

LOFCLEAR™Filter Bag Filtration Ratings

Filter Model	Particle Size at Common Removal Efficiencies (µm)					ΔP (psi) Size 02 @ 45 gpm
	Buy Now	>60%	>90%	>95%	>99%	
113/123		0.5	1	2	4	0.36
114/124		0.75	2	3	5	0.30
115/125		1.5	3.5	8	10	0.15
116/126		2	6	13	15	<0.15
118/128		25	35	37	40	<0.15
119/129		15	25	27	30	<0.15
130		6	14	15	20	0.72
135		1	6	8	10	0.29
522		0.5	1	1.5	2.6	1.45
525		1	2	3.5	6	0.26
527		2	5	9	13	0.15
529		10	20	23	32	<0.15

Two Series to Match Filters to Applications

- Screens
- Separators/Strainers
- Tanks

gels and solids before it reaches the final filter layers.

LOFCLEAR filter bags are available in two styles, Series100 and Series 500. These two styles make it possible to match the requirements of a wide range of applications, depending on the needs for efficiency and long life. The Series 100 filters use a multi-layer construction for applications where high efficiency is of prime importance. The Series 500 filters utilize a patent pending pleated construction to increase surface area for applications requiring high dirt capacities and long life.

Perfect for Removal of Gelatinous Materials

LOFCLEAR filter bags have proven to be highly effective in the removal of gelatinous contaminants. The combination of deep micro fiber filtration media breaks up gels and retains them within the media depth. These features prevent surface blockage and breakthrough typical of standard filter bag materials.

LOFCLEAR™Series 100 Filter Bags

LOFCLEAR Series 100 Filter Bags feature a proven three layer construction with a sewn filter welded to the SENTINEL® seal. They feature efficiencies >99% over a wide range of particle sizes, with dirt capacities up to 1/2pound. The seven models feature:

• Polypropylene pre filter
• Meltblown polypropylene microfiber final filter
• Polypropylene outer migration barrier

LOFCLEAR Series 100 filter bags are an excellent choice for application such as high purity fluids with low particulate concentration, first pass guard filtration, oil adsorption and activated carbon removal.

The LOFCLEAR 128 and 129 were especially developed for the filtration of electro-coatings in the automotive industry. The filtration design allows pigments to pass through the filtration layers, while retaining impurities and removing silicones and other crater forming substances.The LOFCLEAR 130 filter bag adds extra adsorption capacity for retaining high amounts of oils or other crater forming substances. The LOFCLEAR 135 delivers high removal of particulate and oils for clear coat applications where pigment removal is not an issue.

LOFCLEAR™Series 500 Filter Bags

LOFCLEAR Series 500 Filter Bags have an all welded multi-pleated construction for high efficiency and long life. This series of bags has a pleated prefiltration layer and a complex design of final filtration layers, allowing the removal of difficult to filter gels and deformable particles with a high capacity of solids loading. The outer web covering eliminates any downstream fiber migration.

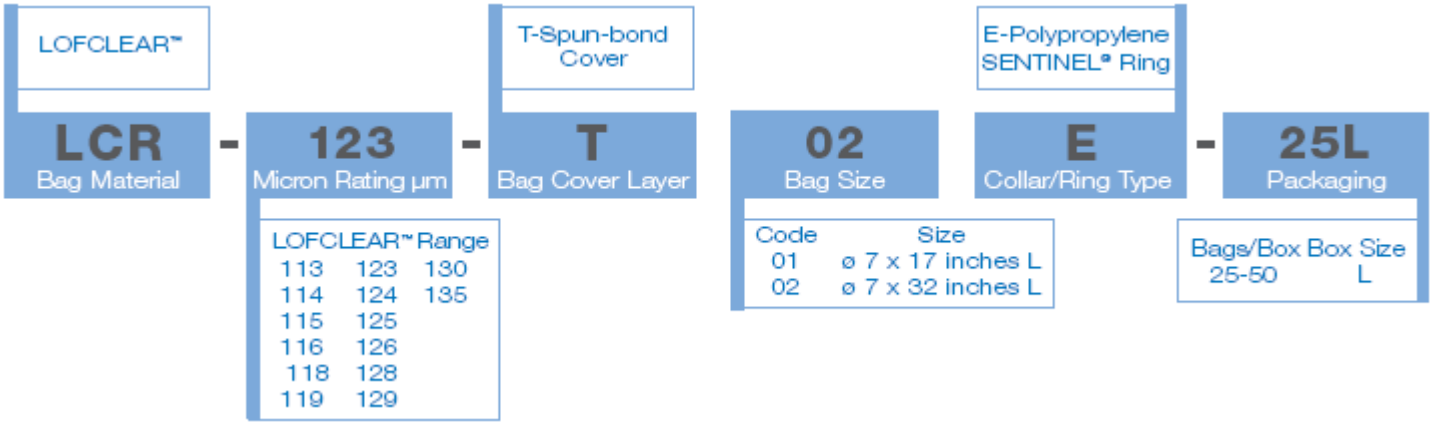
LOFCLEAR Series 500 Filter Bags are available in four different efficiency ratings so you can choose your exact required filtration efficiency. LOFCLEAR Filter Bags have filtration efficiencies from 95 to 99%, with a dirt holding capacity of over 2 pounds.

Among the many applications for LOFCLEAR Series 500 Filter Bags are oils, slurries, dilute oil removal, re-circulating batch systems, and systems with heavy contamination.

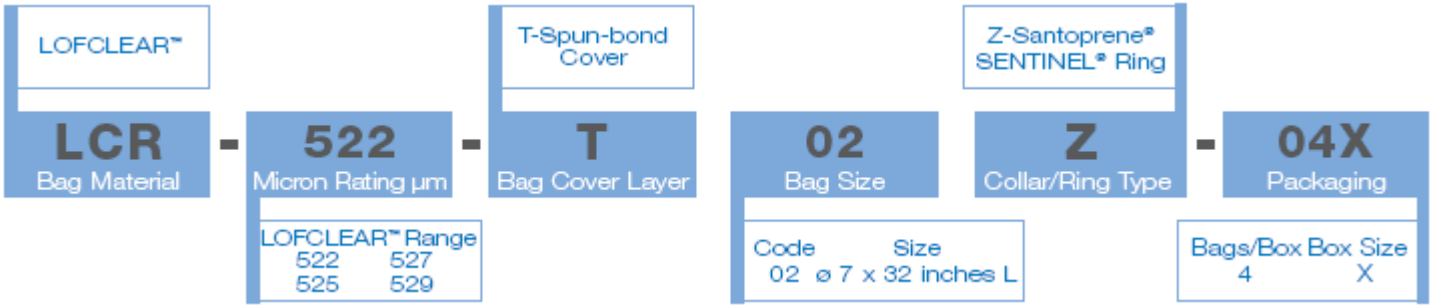
Operational Considerations

LOFCLEAR Series 500 Filter Bags must be used with a bag positioner. This eases insertion and assures correct alignment of the filter bag inside the restrainer basket. In addition, the positioner protects the filter bag from potential damage that could be caused by inadvertent back flow.

LOFCLEAR 100 SERIES BAG FIL TER PRODUCT CODE EXPLANATION



LOFCLEAR 500 SERIES BAG FIL TER PRODUCT CODE EXPLANATION



Activated Carbon | Aeration | Air Treatment | Bag Filters & Housings| Chemicals | Dissolved Air Flotation | Dust Collection | Evaporators | Filter Presses | Flocculation | Inline Filter Vessels | Membrane Filtration | Odor Control |Ozone | Oil Water Separators | Sewage Systems | Liquid and Vapor Phase Vessels | Wet Scrubbers | Careers

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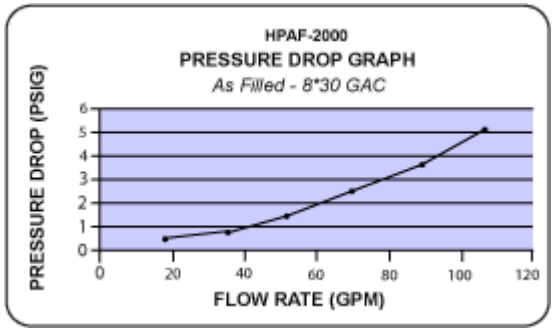
- Pressure Filtration
- Screens
- Separators/Strainers

General Description

The HPAF-2000 filter is a media filter vessel designed to treat liquid streams. While the typical design application is a activated carbon adsorbtion unit, the filter can easily accommodate many medias. Some applications include:

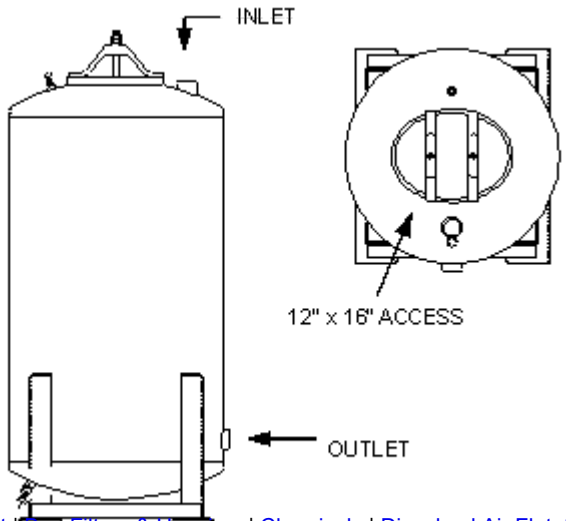
- Dissolved Organic Removal (Activated Carbon)
- Suspended Solids Removal (Sand Filter)
- Dissolved Minerals (Softener Resin)
- Oil and Grease Removal (Organo-Clays)
- Dissolved and Precipitated Metals Removal
- Special Organics (Resin/Carbon Blend)
- Catalytic Reactor (Chlorine and Peroxide Removal)
- Bio-Remediation Contactor Unit



Standard Specifications

HPAF-2000 SPECIFICATIONS			
Overall Height	8'6"	Vessel/Internal Piping Materials	CS(SA-36) / SCH 40 PVC
Diameter	48"	Internal Coating	Polyamide Epoxy Resin
Inlet / Outlet (FNPT)	3"	External Coating	Epoxy Mastic
Drain / Vent (FNPT)	3/4" / 1/2"	Maximum Pressure / Temp	75PSIG / 140° F
GAC Fill (lbs)	2,000	Cross Sectional Bed Area	12.5 FT^2
Shipping / Operational Weight (lbs)	3,020/6,775	Bed Depth/Volume	5.5 FT / 68.7 FT^3
Capacity in gallons	570	Flow rate based on 5-10 min. contact time	57 - 114 GPM

- Tanks



Liquid Phase V essels, Filter Series			
AFD Series	AF Series	HPAF Series	HPP Series
AFD 30	AF 250	HPAF 500	HPP 50
AFD 55	AF 500	HPAF 1000	HPP 100
AFD 85	AF 1000	HPAF 2000	HPP 200
AFD 110	AF 2000	HPAF 3000	HPP 300
AHP 55	AF 3000	HPAF 5000	HPP 500
N/A	AF 5000	HPAF10000	HPP 1000
N/A	AF10000	HPAF20000	HPP2000

Activated Carbon | Aeration | Air Treatment | Bag Filters & Housings | Chemicals | Dissolved Air Flotation | Dust Collection | Evaporators | Filter Presses | Flocculation | Inline Filter Vessels | Membrane Filtration | Odor Control | Ozone | Oil Water Separators | Sewage Systems | Liquid and Vapor Phase Vessels | Wet Scrubbers | Careers

SAFETY DATA SHEET

Section 1 - Identity

Identity (As Used on Label and List): GC Activated Carbon (Including, but not limited to GC C-40, GC 4 x 8B, GC 4 x 8S, GC 6 x 12, GC 6 x 12S, GC 8 x 30, GC 8 x 30AW, GC 8 x 30S, GC 8 x 30SAW, GC 12 x 40, GC 12 x 40AW, GC 12x40SAW, GC 20 x 50, GC 20 x 50S, GC Powdered, GC WDC activated carbons)

Manufacturers Name: General Carbon Corporation
33 Paterson Street
Paterson, NJ 07501
Tel: (973)523-2223
www.generalcarbon.com
Date Prepared: February 16, 2017

Section 2 - Hazardous Identification

2.1 GHS-US Classification

Eye Irritation	2B H320
STOT	SE 3 H335

Hazards not otherwise classified: Combustible dust. May form combustible dust concentrations in air. All powdered activated carbons are classified as weakly explosive (Dust explosion class St1): Given the necessary conditions of a strong ignition source, right concentrations of airborne carbon dust, adequate oxygen levels, and confinement, the potential for a deflagration event exists. A combustible dust hazard assessment and employee training should be carried out. See sections 7 and 9 for further information on combustible dust precautions.

2.2 Label Elements

Hazard Pictograms

Signal word (GHS-US) : Warning
Hazard Statements : H320- Causes eye irritation
: H335- May cause respiratory irritation
Precautionary statements (GHS-US) : P261- Avoid breathing dust
: P264- Wash thoroughly after handling
: P271- Use in well-ventilated area
: P280- Wear protective gloves/clothing/eye & face protect
: P304&340: IF INHALED: Remove person to fresh air

: P305&351&P338: If in eyes, Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do so. Continue rinsing.
: P312- Call Poison Control Center/Doctor if you feel sick
: P403& P233- Store in well-ventilated place. Keep container tightly closed
: P405- Store locked up
: P501- Dispose of container to appropriate receptacle

2.3 Other Hazards

No additional information available

2.4 Unknown acute toxicity (GHS-US)

No data available

Section 3: Composition/information on ingredients

3.1 Substances

Not applicable

3.2 Mixture

Name	CAS #	%	GHS_US classification
Carbon	7440-44-0	100	Not classified

Section 4 – First Aid Measures

4.1 Description of first aid measures

First aid after inhalation	Remove person to fresh air. If not breathing, administer CPR or artificial respiration. Get immediate medical attention.
First aid after skin contact	If skin reddening or irritation develops, seek medical attention
First aid after eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists, get medical attention.
First aid after ingestion	If the material is swallowed, get immediate medical attention or advice. DO NOT induce vomiting unless directed to do so by medical personnel.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation	May cause respiratory irritation
Symptoms/injuries after skin contact	May cause skin irritation
Symptoms/injuries after eye contact	Causes serious eye damage
Symptoms/injuries after ingestion	May be harmful is swallowed

4.3 Indication of any immediate medical attention and special treatment needed

No additional information available.

Section 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	If involved with fire, flood with plenty of water
Unsuitable extinguishing media	None

5.2 Special hazards arising from substance or mixture

Fire hazard	None known
Explosion hazard	None known
Reactivity	Contact with strong oxidizers such as ozone, liquid oxygen, chlorine, etc. may result in fire.

5.3 Advice for firefighters

Protection during firefighting	Firefighters should wear full protective gear

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

General measures	Avoid contact with the skin and eyes

6.1.1 For non-emergency personnel

No additional information available

6.1.2 For emergency responders

No additional information available

6.2 Environmental precautions

None

6.3 Methods and material for containment and cleaning up

For containment	If possible, stop flow of product
Methods for cleaning up	Shovel or sweep up and put in closed container for disposal

6.4 Reference to other sections

No additional information available

Section 7: Handling and storage

7.1 Precautions for safe handling

Precautions for safe handling	Avoid contact with eyes. Wet activated carbon removes oxygen from air causing severe hazard to workers inside carbon vessels or confined spaces

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions	Protect containers from physical damage. Store in dry, cool, well-ventilated area. Store away from strong oxidizers, strong acids, ignition sources, combustible materials, and heat. An adequate air gap between packages is recommended to reduce propagation in the case of fire **.**

Handling: A hazard assessment should be carried out. As with all finely divided materials, ground all transfer, blending, and dust collecting equipment to prevent static discharge. Remove all strong ignition sources from material handling, transfer, and processing areas where dust may be present or accumulate. Practice good housekeeping. Excessive accumulations of dust or dusty conditions can create the potential of secondary explosions. Inspection of hidden surfaces for dust accumulation should be made routinely. If possible, eliminate the pathways for dust to accumulate in hidden areas. Fine carbon dust may penetrate electrical equipment and cause electrical shorts. Where dusting is unavoidable, dust-proof boxes and regular electrical line maintenance are recommended. Refer to NFPA standards 654 for guidance.

Caution employees-no smoking in carbon storage and handling areas. Carbon is difficult to ignite, however, cutting and welding operations should be carried out using hot work permit systems where precautions are taken not to ignite carbon, which may smolder undetected.

7.3 Specific end use(s)

No additional information available

Section 8: Exposure controls/ personal protection

8.1 Control parameters

No additional information available

8.2 Exposure controls

Appropriate engineering controls	: Local exhaust and general ventilation must be adequate to meet exposure standards
Hand Protection	: None required under normal product handling conditions
Eye Protection	: safety glasses
Skin and body protection	: Wear suitable working clothes
Respiratory protection	: If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	: Solid
Appearance	: Particulate
Color	: Black
Odor	: No data available
Odor threshold	: No data available
Ph	: No data available
Relative evaporation rate	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Self ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor Pressure	: No data available
Relative Vapor density @ 20 deg C	: No data available
Relative Density	: 28-33 lb/ cubic foot
Solubility	: No data available
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosive limits	: No data available

Combustible dust- These products may contain combustible dusts. May form combustible dust concentrations in air. All powdered activated carbons are weakly explosive. No specific information on these carbons are available.
Typical combustible dust data for a variety of activated carbons:
K_{st} values reported between 43-113 (various sources).
Dust explosion class St1 (K_{st} values < 200 are Class St1-weakly explosive).
MEC (minimum explosible concentration) in air 50 and 60 g/m^3 (two reports)
Volatile content (by weight): < 8% ASTM D3175-11 (Watercarb)
MIT (minimum ignition temperature) values reported between 400-680°C (752-1256°F) (four reports)
Maximum Absolute Explosion pressure values reported between 6.0-8.6 bar (four reports)

9.2 Other information
No additional information available

Section 10: Stability and reactivity

10.1 Reactivity
Contact with strong oxidizers such as ozone, liquid oxygen, chlorine, etc. may result in fire

10.2 Chemical stability
Stable under normal conditions

10.3 Possibility of hazardous reactions
Will not occur

10.4 Conditions to avoid
None

10.5 Incompatible materials
Strong oxidizing and reducing agents such as ozone, liquid oxygen or chlorine.

10.6 Hazardous decomposition products
Carbon monoxide may be generated in the event of a fire.

Section 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity : Not classified

Carbon (7440-44-0)

LD50 oral rat	: >10000 mg/kg
Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Causes eye irritation
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity	: May cause respiratory irritation (single exposure)
Specific target organ toxicity	: Not classified (repeated exposure)
Aspiration hazard	: Not classified

Section 12: Ecological Information

12.1 Toxicity
No additional information available

12.2 Persistence and degradability
No additional information available

12.3 Bioaccumulative potential
No additional information available

12.4 Mobility in soil
No additional information available

12.5 Other adverse effects

No additional information available

Section 13: Disposal concerns

13.1 Waste treatment methods

Waste Disposal recommendations : Dispose of contents/container in accordance with local/ regional/ international regulations

Section 14: Transportation information

In accordance with DOT/ADR/RID/ADNR/IMDG/ICAO/IATA

14.1 UN Number

Not applicable. See Note 1 below.

14.2 UN proper shipping name

Not applicable

Note 1: Under the UN classification for activated carbon, all activated carbons have been identified as a class 4.2 product. However, This product has been tested according to the United Nations Transport of Dangerous Goods test protocol for a "self-heating substance" (United Nations Transportation of Dangerous Goods, Manual of Tests and Criteria, Part III, Section 33.3.1.6 - Test N.4 - Test Method for Self Heating Substances) and it has been specifically determined that this product does not meet the definition of a self heating substance (class 4.2) or any other hazard class, and therefore should not be listed as a hazardous material. This information is applicable only for the Activated Carbon Product identified in this document.

Section 15: Regulatory information

15.1 US Federal regulations

Carbon (7440-44-0)

Listed on the United States TSCA inventory

15.3 US State regulations

No additional information available

Section 16: Other information

Full text of H-phrases:

Eye Irrit. 2B	Serious eye damage/eye irritation Category 2B
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H335	May cause respiratory irritation

NFPA®

NFPA health hazard	: 1-Exposure could cause irritation but only minor residual injury even if no treatment is given
NFPA fire hazard	: 1- Materials that require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur (e.g. mineral oil). Includes some finely divided suspended solids that do not require heating before ignition can occur. Flash point at or above 93.3 °C (200 °F)
NFPA reactivity	: 0- Normally stable, even under fire exposure conditions, and are not reactive with water

The information contained herein is accurate to the best of our knowledge. General Carbon Corporation makes no warranty with respect hereto said information and disclaims all liability from reliance there in.

CGS

CATION EXCHANGE RESIN
SOFTENING GRADE
Na FORM

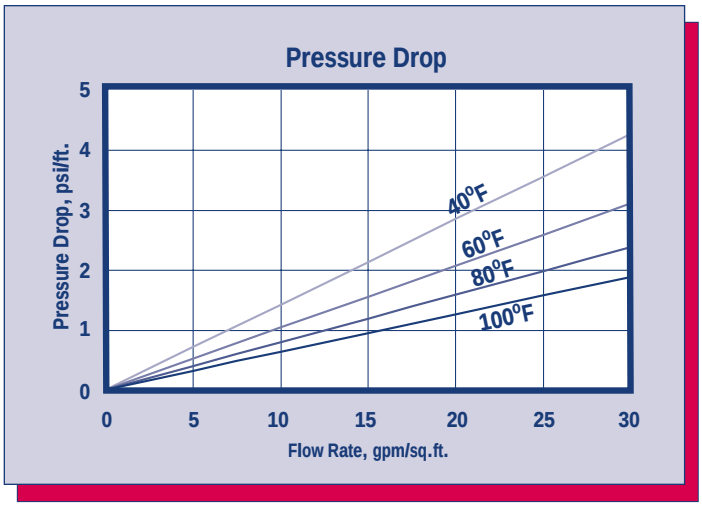
RESINTECH CGS is a high purity, light colored, high capacity, gel type sulfonated polystyrene cation resin supplied in the sodium form as moist, tough uniform spherical beads. *ResinTech CGS* specifically is intended for use in all water softening applications,including beverages, potable water and water used for food processing. It's high capacity and high DVB content provide long life and good chlorine resistance in all potable water applications. (It is also available as a dark colored product *RESINTECH CGS-BL* with identical properties.)

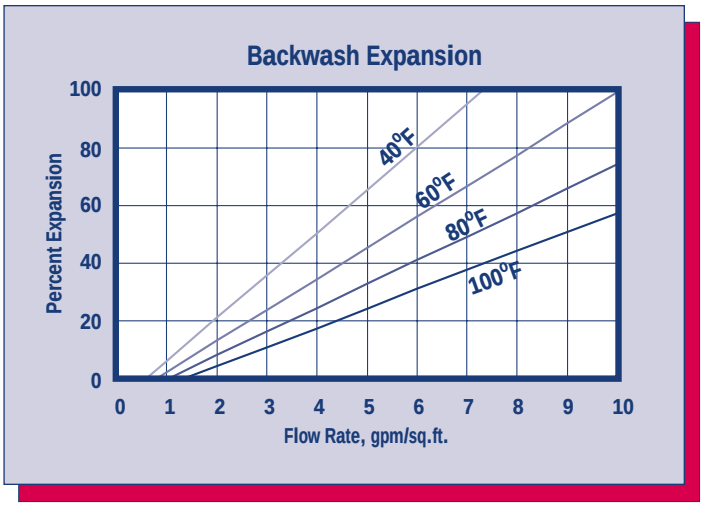
FEATURES & BENEFITS

- **COMPLIES WITH FDA REGULATIONS FOR POTABLE WATER APPLICATIONS**
  Conforms to paragraph 21CFR173.25 of the Food Additives Regulations of the F.D.A.*
- **EXCELLENT REGENERATION EFFICIENCY**
  Virtually the same operating capacity as premium grade *ResinTech CG8-BL*
- **NSF/ANSI-61 VALIDATED**
- **UNIFORM PARTICLE SIZE**
  16 to plus 50 mesh range; gives a LOWER PRESSURE DROP while maintaining SUPERIOR KINETICS.
- **SUPERIOR PHYSICAL STABILITY**
  90% plus sphericity and high crush strengths together with a very uniform particle size provide greater resistance to bead breakage while maintaining low pressure drops.
- **LOW COLOR THROW**

*For potable water applications, the resin must be properly pre-treated, usually by multiple exhaustion and regeneration cycles, to insure compliance with extractable levels.

HYDRAULIC PROPERTIES





PRESSURE DROP - The graph above shows the expected pressure loss per foot of bed depth as a function of flow rate, at various temperatures.

BACKWASH - After each cycle the resin bed should be backwashed at a rate that expands the bed 50 to 75 percent. This will remove any foreign matter and reclassify the bed. The graph above shows the expansion characteristics of *RESINTECH CGS* in the sodium form.

1 Resintech Plaza • 160 Cooper Road • West Berlin,NJ 08091 • Phone:(856)768-9600 • Fax:(856)768-9601 • E-mail:ixresin@resintech.com • Web Site:www.resintech.com

RESINTECH® CGS

PHYSICAL PROPERTIES

Polymer Structure	Styrene Crosslinked with DVB
Functional Group	$R-(SO_3)^-M^+$
Ionic Form, as shipped	Sodium
Physical Form	Tough, Spherical Beads
Screen Size Distribution	16 to 50
+16 mesh (U.S. Std)	< 5 percent
-50 mesh (U.S. Std)	< 1 percent
pH Range	0 to 14
Sphericity	90+ percent
Uniformity Coefficient	Approx. 1.6
Water Retention	
Sodium Form	48 to 54 percent
Solubility	Insoluble
Shipping Weight	
Sodium Form	48 lbs./cu.ft.
Total Capacity	
Sodium Form	1.8 meq/ml min

SUGGESTED OPERATING CONDITIONS

Maximum Temperature	
Sodium Form	250^0 F
Minimum Bed Depth	24 inches
Backwash Rate	50 to 75% Bed Expansion
Regenerant (NaCl or KCl)	
Concentration	10 to 15 percent
Flow Rate	0.5 to 1.5 gpm/cu.ft.
Contact Time	> 20 minutes
Level	4 to 15 pounds/cu.ft.
Displacement Rate	Same as Regen Flow Rate
Volume	10 to 15 gallons/cu.ft.
Fast Rinse Rate	Same as Service Flow Rate
Volume	35 to 60 gallons/cu.ft.
Service Flow Rate	2 to 10 gpm/cu.ft.

OPERATING CAPACITY

Sodium Chloride (NaCl) Regeneration

The sodium cycle operating capacity of *RESINTECH CGS* for hardness removal at various regeneration levels with an influent calcium/magnesium ratio of 2/1 and a hardness level of 500 ppm, as $CaCO_3$, is shown in the following table:

Pounds NaOH/cu.ft.	Capacity Kilograins/cu.ft.
5	20.0
7.5	25.4
10	29.0
15	33.0

Potassium Chloride (KCl) Regeneration

The potassium cycle operating capacity of *RESINTECH CGS* for hardness removal at various regeneration levels with an influent calcium/magnesium ratio of 2/1 and a hardness level of 500 ppm, as $CaCO_3$, is shown in the following table:

Pounds NaOH/cu.ft.	Capacity Kilograins/cu.ft.
5	16.6
7.5	21.8
10	26.6
15	31.2

APPLICATIONS

Softening

RESINTECH CGS is ideally suited for industrial, commercial, or residential softening applications where free chlorine is not present because of its high capacity, uniform particle size and good physical stability.

***CAUTION:DO NOT MIX ION EXCHANGE RESIN WITH STRONG OXIDIZING AGENTS.** Nitric acid and other strong oxidizing agents can cause explosive reactions when mixed with organic materials,such as ion exchange resins.

Material Safety Data Sheets (MSDS) are available for all ResinTech Inc.products.To obtain a copy,contact your local ResinTech sales representative or our corporate headquarters. They contain important health and safety information.That information may be needed to protect your employees and customers from any known health and safety hazards associated with our products.We recommend that you secure and study the pertinent MSDS for our products and any other products being used These suggestions and data are based on information we believe to be reliable.They are offered in good faith.However we do not make any guarantee or warranty.We caution against using these products in an unsafe manner or in violation of any patents;further we assume no liability for the consequences of any such actions.

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CGSver010603

SBG1

ANION EXCHANGE RESIN TYPE ONE GEL Cl OR OH FORM

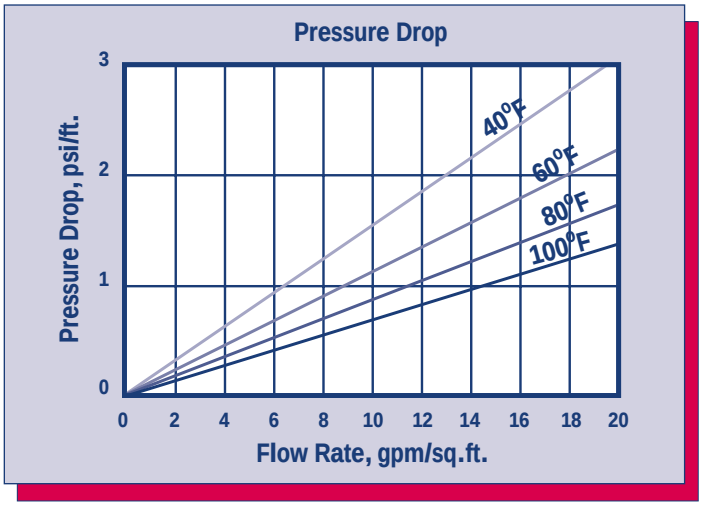
ResinTech SBG1 is a high capacity, shock resistant, gelular, Type 1, strongly basic anion exchange resin supplied in the chloride or hydroxide form as moist, tough, uniform, spherical beads. *ResinTech SBG1* is intended for use in all types of deionization systems and chemical processing applications. It is similar to *ResinTech SBG1P* but has a higher volumetric capacity and exhibits lower TOC leach rates. This makes it the better performer in single use applications such as in cartridge deionization and when high levels of regeneration are used such as in polishing mixed beds. On the other hand, *ResinTech SBG1P* is more resistant to organic fouling and gives higher operating capacities at low regeneration levels such as those used in make up demineralizers.

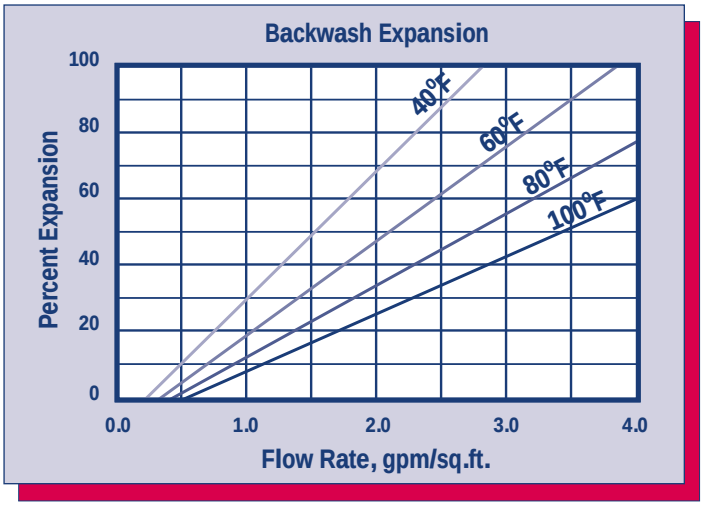
FEATURES & BENEFITS

- **COMPLIES WITH FDA REGULATIONS FOR POTABLE WATER APPLICATIONS.**
  Conforms to paragraph 21CFR173.125 of the Food Additives Regulations of the F.D.A.*
- **HIGH TOTAL CAPACITY**
  Provides longer run lengths in single use applications or where high levels of regeneration are used such as in mixed bed polishers, cartridge demineralizers.
- **UNIFORM PARTICLE SIZE**
  16 to plus 50 mesh range; gives a LOWER PRESSURE DROP while maintaining SUPERIOR KINETICS.
- **SUPERIOR PHYSICAL STABILITY**
- **LOWER TOC LEACH RATE**
  Makes it ideal for polishing mixed beds in wafer washing and other high purity water polishing applications.

*For potable water applications, the resin must be properly pre-treated, usually by multiple exhaustion and regeneration cycles, to ensure compliance with extractable levels.

HYDRAULIC PROPERTIES





PRESSURE DROP

The graph above shows the expected pressure loss per foot of bed depth as a function of flow rate, at various temperatures.

BACKWASH

After each cycle the resin bed should be backwashed at a rate that expands the bed 50 to 75 percent. This will remove any foreign matter and reclassify the bed. The graph above shows the expansion characteristics of *ResinTech SBG1* in the sodium form.

RESINTECH® SBG1

PHYSICAL PROPERTIES

Polymer Structure	Styrene Crosslinked with DVB
Functional Group	R-N-$(CH_3)_3^+Cl^-$
Ionic Form, as shipped	Chloride or Hydroxide
Physical Form	Tough, Spherical Beads
Screen Size Distribution	16 to 50
+16 mesh (U.S. Std)	< 5 percent
-50 mesh (U.S. Std)	< 1 percent
pH Range	0 to14
Sphericity	> 93 percent
Uniformity Coefficient	Approx. 1.6
Water Retention	
Chloride Form	43 to 50 percent
Hydroxide Form	Approx. 53 to 60 percent
Solubility	Insoluble
Approximate Shipping Weight	
Cl Form	44 lbs/cu.ft.
OH Form	41 lbs/cu.ft.
Swelling Cl- to OH-	18 to 25 percent
Total Capacity	
Cl Form	1.45 meq/ml min
OH Form	1.15 meq/ml min

SUGGESTED OPERATING CONDITIONS

Maximum Continuous Temperature	
Hydroxide Form	140°F
alt Form	170°F
Minimum Bed Depth	24 inches
Backwash Rate	50 to 75 percent Bed Expansion
Regenerant Concentration*	2 to 6 percent
Regenerant Flow Rate	0.25 to 1.0 gpm/cu.ft.
Regenerant Contact Time	At least 40 Minutes
Regenerant Level	4 to 10 pounds/cu.ft.
Displacement Rinse Rate	Same as Regenerant Flow Rate
Displacement Rinse Volume	10 to 15 gals/cu.ft.
Fast Rinse Rate	Same as Service Flow Rate
Fast Rinse Volume	35 to 60 gals/cu.ft.
Service Flow Rates	
Polishing Mixed Beds	3 to 15 gpm/cu.ft.
Non-Polishing Apps.	2 to 4 gpm/cu.ft.

OPERATING CAPACITY

The operating capacity of *RESINTECH SBG1* for a variety of acids at various regeneration levels when treating an influent with a concentration 500 ppm, expressed as $CaCO_3$ is shown in the following table:

Pounds NaOH/ft³	Capacity Kilograms per cubic foot			
	HCl	H_2SO_4	H_2SiO_3	H_2CO_3
4	11.3	14.0	14.7	18.6
6	12.8	16.3	17.3	19.8
8	14.3	13.3	19.5	21.6
10	15.5	20.0	22.2	22.2

APPLICATIONS

DEMINERALIZATION – *RESINTECH SBG1* is highly recommended for use in mixed bed demineralizers, wherever complete ion removal; superior physical and osmotic stability and low TOC leachables are required such as in wafer fabrication and other ultrapure applications.

RESINTECH SBG1 has high total capacity and low swelling on regeneration and provides maximum operating capacity in cartridge deionization applications. It is ideal for single use applications such as precious metal recovery, radwaste disposal and purification of toxic waste streams.

Highly crosslinked Type 1, styrenic anion exchangers have greater thermal and oxidation resistance than other types of strong base resins. They can be operated and regenerated at higher temperatures. The combination of lower porosity, high total capacity and Type 1 functionality make *RESINTECH SBG1* the resin of choice when water temperatures exceed 85°F and where the combination of carbon dioxide, borate and silica exceed 40% of the total anions.

RESINTECH SBG1P and *RESINTECH SBG1* are quite similar; the difference between them is the degree of porosity. *RESINTECH SBG1P* has greater porosity that gives it faster kinetics, and greater ability to reversibly sorb slow moving ions such as Naturally occurring Organic Matter (NOM). At lower regeneration levels and where chlorides make up a substantial portion of the anion load, or where the removal and elution of naturally occurring organics is of concern *RESINTECH SBG1P*, SBACR or SBG2 should be considered. At the higher regeneration levels used in mixed bed polishers *RESINTECH SBG1* provides higher capacity, and the lowest possible TOC leach rates.

***CAUTION:DO NOT MIX ION EXCHANGE RESIN WITH STRONG OXIDIZING AGENTS.** Nitric acid and other strong oxidizing agents can cause explosive reactions when mixed with organic materials,such as ion exchange resins.

Material Safety Data Sheets (MSDS) are available for all ResinTech Inc.products.To obtain a copy,contact your local ResinTech sales representative or our corporate headquarters. They contain important health and safety information.That information may be needed to protect your employees and customers from any known health and safety hazards associated with our products.We recommend that you secure and study the pertinent MSDS for our products and any other products being used These suggestions and data are based on information we believe to be reliable.They are offered in good faith.However we do not make any guarantee or warranty. We caution against using these products in an unsafe manner or in violation of any patents;further we assume no liability for the consequences of any such actions.

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Safety Data Sheet

Product Names: SBG1, SBG1-HP, SBG1-UPS, SBG1-C, SBG1-F, SBMP1, SBMP1-UPS, GP-SBA, SBG1P, SBG1P-UPS

(Type I Strong Base Anion Exchange Resin Chloride Form)

Effective date 31 March 2015

Section 1: Identification

1a	Product Names	ResinTech SBG1, SBG1-HP, SBG1-UPS, SBG1-C, SBG1-F, SBMP1, SBMP1-UPS, GP-SBA, SBG1P, SBG1P-UPS
1b	Common Name	Type I Strong base anion resin in the chloride form.
1c	Intended use	All general purpose anion exchanges for general use including salt form and demineralization.
1d	Manufacturer Address	ResinTech, Inc. 160 Cooper Road, West Berlin, NJ 08091 USA
	Phone Email	856-768-9600 ixresin@resintech.com

Section 2: Hazard Identification

2a Hazard classification — Not hazardous or dangerous

Product Hazard Rating	Scale
Health = 0	0 = Negligible
Fire = 1	1 = Slight
Reactivity = 0	2 = Moderate
Special – N/A	3 = High
	4 = Extreme

2b Product description — White, yellow, or orange colored solid beads approximately 0.6 mm diameter with little or no odor.

2c Precautions for use — Safety glasses and gloves recommended. Slipping hazard if spilled.

2c Potential health effects — Will cause eye irritation. Will cause skin skin irritation. Ingestion is not likely to pose a health risk.

2d Environmental effects — This product may alter the pH of any water that contacts it.

RESINTECH INC.
INNOVATIONS IN ION EXCHANGE

MATERIAL SAFETY DATA SHEET

ION EXCHANGE RESINS

Product Name: CG10-H, CG10-H-ULTRA, CG10-H-LTOC, CG10-H-SC, CG10-H-NG, CG10-H-C, CG10-H-F, CG10-H-UPS, CG8-H, CG8-H-ULTRA, CG8-H-LTOC, CG8-H-SC, CG8-H-NG, CG8-H-C, CG8-H-F, CG8-H-UPS, CGS-H, CGS-H-C, CGS-H-F, CGS-H-UPS, CG6-H, GP-SAC-H

Cation Exchange Resin, Hydrogen Form

Effective Date: 11/1/07

1. Company Information:

Company Address:

ResinTech, Inc.
1 ResinTech Plaza
160 Cooper Road
West Berlin, NJ 08091 USA

Information Numbers:

Phone Number: 856-768-9600
Fax Number: 856-768-9601
Email: ixresin@resintech.com
Website: www.resintech.com

2. Composition/Ingredients:

Sulfonated copolymer of styrene and divinylbenzene in the hydrogen form. CAS# 69011-20-7 (35 – 65%)

Water CAS# 7732-18-5 (35 – 65%)

This document is prepared pursuant to the OSHA Hazard Communication Standard (29CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

3. Physical/Chemical Data:

Boiling Point:	Not Applicable
Vapor Pressure (MM HG):	Not Applicable
Evaporation Rate (water = 1):	1
Appearance & Odor:	Amber solid beads. No to low odor.
Specific Gravity:	1.2 (water = 1)
Melting Point (deg. F)	Not applicable
Solubility in Water:	Insoluble
Thermal:	May yield oxides of carbon and nitrogen
Vapor Density:	Not Applicable

Product Hazard Rating	Scale
Toxicity = 0	0 = Negligible
Fire = 0	1 = Slight
Reactivity = 0	2 = Moderate
Special – N/A	3 = High
	4 = Extreme

4. Fire & Explosion Hazard Data

Flammable Limits:	800 ° Deg. F
Unusual Fire & Explosion Hazards:	Product is not combustible until moisture is removed, then resin starts to burn in flame at

	230 C. Autoignition occurs above 500C. Possible fire.
Combustion Products:	Hazardous combustion products may include and are not limited to: hydrocarbons, sulfur oxides, organic sulfonates, carbon monoxide, carbon dioxide, benzene compounds.
Extinguishing Media:	Water, CO_2, Talc, Dry Chemical
Special Fire Fighting Procedures:	MSHA/NIOSH approved self-contained breathing gear.

5. Reactivity Data

Stability:	Stable
Conditions to Avoid:	Temperatures above 400° F
Hazardous by Products:	See Section 3 above for possible combustion products.
Materials to avoid contact with:	Strong oxidizing agents (i.e. nitric acid)
Hazardous Polymerization:	Material does not polymerize
Storage:	Store in a cool dry place

6. Health Hazards & Sara (Right to Know)

Emergency First Aid Procedures:	Contact with eyes can and skins can cause irritation.
Skin Absorption:	Skin absorption is unlikely due to physical properties.
Ingestion:	Single dose oral LD50 has not been determined. Single does oral toxicity is believed to be low. No hazards anticipated from ingestion incidental to industrial exposure.
Inhalation:	Vapors are unlikely due to physical properties.
Systemic & Other Effects:	No specific data available, however, repeated exposures are not anticipated to cause any significant adverse effects.
Carcinogenicity:	Not Applicable
Sara – title 3, sections 311 & 312:	All ingredients are non-hazardous

7. First Aid

Eyes:	Irrigate immediately with water for at least 5 minutes. Mechanical irritation only.
Skin:	No adverse effects anticipated by this route of exposure.
Ingestion:	No adverse effects anticipated by this route of exposure incidental to proper industrial handling.
Inhalation:	No adverse effects anticipated by this route of exposure.

8. Control Measures

Respiratory protection:	Not required for normal uses if irritation occurs from breathing-get fresh air!
Eye protection:	Splash goggles
Ventilation:	Normal
Protective Gloves:	Not required.

9. Safe handling procedures

In Case of Spills:	Sweep up material and transfer to containers. Use caution – the floor will be slippery!

Disposal Method**:**	Bury resin in licensed landfill or burn in approved Incinerator according to local, state, and federal regulations. For resin contaminated with hazardous material, dispose of mixture as hazardous material according to local, state and federal regulations.

10. Additional Information:

Special precautions to be taken in handling and storage**:**	Practice reasonable care and caution. Metal equipment with feed, regenerant, resin form, and effluent of that process.
TSCA Considerations:	Every different salt or ionic form of an ion-exchange resin is a separate chemical. If you use an ion-exchange resin for ion-exchange purposes and then remove the by-product resin from its vessel or container prior to recovery of the original or another form of the resin or of another chemical, the by-product resin must be listed on the TSCA Inventory (unless an exemption is applicable). It is the responsibility of the customer to ensure that such isolated, recycled by-product resins are in compliance with TSCA. Failure to comply could result in substantial civil or criminal penalties being assessed by the Environmental Production Agency.
MSDS Status:	Canadian regulatory information added.

11. Regulatory Information: (Not meant to be all-inclusive—selected regulations represented.)

Notice:	The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

12. Canadian Regulations:

WHMIS Information**:**	The Canadian Workplace Hazardous Materials Information System (WHMIS) Classification for this product is: This product is not a "Controlled Product" under WHMIS.
Canadian TDG Information:	For guidance, the Transportation of Dangerous Good Classification for this product is: Not Regulated.

While this information and recommendations set forth herein are believed to be accurate as of the date hereof, ResinTech, Inc. makes no warranty with respect hereto and disclaims all liability from reliance thereon.

Appendix B

Receiving Water Laboratory Data Report

CERTIFICATE OF ANALYSIS

Elise Farrington
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: 1180 Boylston Street - RGP (N/A)
ESS Laboratory Work Order Number: 20H0956

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 4:36 pm, Sep 23, 2020

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: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0956

SAMPLE RECEIPT

The following samples were received on August 27, 2020 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
20H0956-01	1702642-SW-1	Ground Water	150.1, 200.7, 200.8, 245.1, 3113B, 350.1, 3500Cr B-2009, CALC

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0956

PROJECT NARRATIVE

Classical Chemistry

20H0956-01	**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

20H0956-01	**Continuing Calibration recovery is below lower control limit (C-).**
	Antimony
20H0956-01	**Elevated Method Reporting Limits due to sample matrix (EL).**
	Cadmium
20H0956-01	**Present in Method Blank (B).**
	Lead

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: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0956

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
MADEP 18-2.1 - 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
5035A - 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: 1180 Boylston Street - RGP
Client Sample ID: 1702642-SW-1
Date Sampled: 08/27/20 08:15
Percent Solids: N/A

ESS Laboratory Work Order: 20H0956
ESS Laboratory Sample ID: 20H0956-01
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	**C-** ND (5.0)		200.7		1	KJK	09/02/20 21:14	100	10	DH03135
Arsenic	ND (2.5)		3113B		5	KJK	09/01/20 19:42	100	10	DH03135
Cadmium	**EL** ND (1.0)		200.8		50	KJK	09/02/20 11:20	100	10	DH03135
Chromium	**2.4** (2.0)		200.7		1	KJK	09/02/20 21:14	100	10	DH03135
Chromium III	ND (10.0)		200.7		1	JLK	09/02/20 21:14	1	1	[CALC]
Copper	**9.1** (2.0)		200.7		1	KJK	09/02/20 21:14	100	10	DH03135
Iron	**5280** (10.0)		200.7		1	KJK	09/02/20 21:14	100	10	DH03135
Lead	**B 5.2** (5.0)		200.8		50	KJK	09/02/20 11:20	100	10	DH03135
Mercury	ND (0.2)		245.1		1	MKS	08/31/20 10:46	20	40	DH02801
Nickel	ND (5.0)		200.7		1	KJK	09/02/20 21:14	100	10	DH03135
Selenium	ND (5.0)		3113B		5	KJK	09/02/20 1:23	100	10	DH03135
Silver	ND (1.0)		200.7		1	KJK	09/02/20 21:14	100	10	DH03135
Total Hardness	**164000** (165)		CALC		2	KJK	09/22/20 12:21	1	1	[CALC]
Zinc	**88.4** (5.0)		200.7		1	KJK	09/02/20 21:14	100	10	DH03135

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-SW-1
Date Sampled: 08/27/20 08:15
Percent Solids: N/A

ESS Laboratory Work Order: 20H0956
ESS Laboratory Sample ID: 20H0956-01
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	**0.56** (0.10)		350.1		1	JLK	08/31/20 16:31	mg/L	DH03105
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	08/27/20 21:01	ug/L	DH02742
pH	**6.88** (N/A)		150.1		1	CCP	08/27/20 20:51	S.U.	DH02748
pH Sample Temp	**Aqueous pH measured in water at 19.0 ºC.** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0956

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DH02801 - 245.1/7470A										
Blank										
Mercury	ND	0.2	ug/L							
LCS										
Mercury	5.7	0.2	ug/L	6.042		94	85-115			
LCS Dup										
Mercury	5.9	0.2	ug/L	6.042		98	85-115	5	20	
Batch DH03135 - 3005A/200.7										
Blank										
Antimony	ND	5.0	ug/L							
Calcium	ND	0.020	mg/L							
Chromium	ND	2.0	ug/L							
Copper	ND	2.0	ug/L							
Iron	ND	20.0	ug/L							
Magnesium	ND	0.020	mg/L							
Nickel	ND	5.0	ug/L							
Silver	ND	1.0	ug/L							
Zinc	ND	5.0	ug/L							
Blank										
Cadmium	ND	0.1	ug/L							
Lead	0.9	0.5	ug/L							
Blank										
Arsenic	ND	0.5	ug/L							
Selenium	ND	1.0	ug/L							
LCS										
Antimony	43.3	5.0	ug/L	50.00		87	85-115			
Calcium	0.435	0.020	mg/L	0.5000		87	85-115			
Chromium	42.8	2.0	ug/L	50.00		86	85-115			
Copper	45.6	2.0	ug/L	50.00		91	85-115			
Iron	233	20.0	ug/L	250.0		93	85-115			
Magnesium	0.423	0.020	mg/L	0.5000		85	85-115			
Nickel	44.6	5.0	ug/L	50.00		89	85-115			
Silver	22.4	1.0	ug/L	25.00		90	85-115			
Zinc	48.1	5.0	ug/L	50.00		96	85-115			
LCS										
Cadmium	23.9	0.5	ug/L	25.00		96	85-115			
Lead	49.8	2.5	ug/L	50.00		100	85-115			
LCS										
Arsenic	45.4	12.5	ug/L	50.00		91	85-115			
Selenium	95.8	25.0	ug/L	100.0		96	85-115			
Classical Chemistry										
Batch DH02742 - General Preparation										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0956

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch DH02742 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	506	10.0	ug/L	499.8		101	90-110			
LCS Dup										
Hexavalent Chromium	509	10.0	ug/L	499.8		102	90-110	0.6	20	
Batch DH03105 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.96	0.10	mg/L	0.9994		96	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP ESS Laboratory Work Order: 20H0956

Notes and Definitions

Z16	Aqueous pH measured in water at 19.0 ºC.
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.
EL	Elevated Method Reporting Limits due to sample matrix (EL).
D	Diluted.
C-	Continuing Calibration recovery is below lower control limit (C-).
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
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0956

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

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20H0956
Date Received: 8/27/2020
Project Due Date: 9/3/2020
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: 1.8 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)
1	80475	Yes	N/A	Yes	500 mL Poly	H2SO4	
1	80476	Yes	N/A	Yes	250 mL Poly	NP	
1	80477	Yes	N/A	Yes	250 mL Poly	NP	
1	80478	Yes	N/A	Yes	250 mL Poly	HNO3	

2nd Review
Were all containers scanned into storage/lab? Initials AG
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Amber Garcia Date & Time: 8/27/20 18:40
Reviewed By: Date & Time: 8/27/20 1938
Delivered By: 8/27/20 1936

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 20H0956

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: 1180 Boylston Street

Project Location: Brookline, MA

Project Number: 1702642

Project Manager: C. Malagrida

Send Report to: Elise Farrington

Send EDD to: labdata@geiconsultants.com

Sample Handling

Samples Field Filtered: YES (NO) NA

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required?	YES	NO	NA
Are Drinking Water Samples Submitted?	YES	NO	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	NA

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: HNO3	HNO3	None	H2SO4	None				Sample Specific Remarks
							Analysis: Total Metals	Hardness	Hex. Cr.	Ammonia	pH				
1	1702642-SW-1	8/27/20	08:15	SW	4	EJF	x	x	x	x	x				

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. E.J. Farrington	8/27/20	13:50	1. EJF ~~GEI Fridge~~
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
2. ~~GEI Fridge~~ EJF			2. 8/27/20 1550
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
3.	8/27/20	1745	3. Amber Garcia
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
4.			4.

Turnaround Time (Business days):

Normal x Other ____

10-Day ____ 7-Day ____

5-Day ____ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

-1.2/1.8°

Appendix C

Source Water Laboratory Data Report

CERTIFICATE OF ANALYSIS

Catherine Malagrida
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: 1180 Boylston Street - RGP (1702642)
ESS Laboratory Work Order Number: 20H0957

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 4:39 pm, Sep 23, 2020

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: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0957

SAMPLE RECEIPT

The following samples were received on August 27, 2020 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
20H0957-01	1702642-MW-5	Ground Water	1664A, 200.7, 200.8, 245.1, 2540D, 300.0, 3113B, 350.1, 3500Cr B-2009, 420.1, 4500 CN CE, 4500Cl D, 504.1, 524.2, 608.3, 625.1 SIM, 8270D SIM, ASTM D3695, CALC
20H0957-02	1702642-GEI-101	Ground Water	1664A, 200.7, 200.8, 245.1, 3113B, 350.1, 420.1, 4500 CN CE, 504.1, 524.2, ASTM D3695, CALC

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP ESS Laboratory Work Order: 20H0957

PROJECT NARRATIVE

524.2 Volatile Organic Compounds

DH02827-BS1 **Blank Spike recovery is above upper control limit (B+).**
Tertiary-butyl Alcohol (139% @ 70-130%)

DH02827-BSD1 **Blank Spike recovery is above upper control limit (B+).**
Tertiary-butyl Alcohol (144% @ 70-130%)

625.1(SIM) Semi-Volatile Organic Compounds

D0I0014-CCV1 **Calibration required quadratic regression (Q).**
2,4,6-Tribromophenol (105% @ 80-120%), Pentachlorophenol (112% @ 80-120%)

D0I0014-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
bis(2-Ethylhexyl)phthalate (36% @ 20%), Butylbenzylphthalate (23% @ 20%)

Classical Chemistry

20H0957-01 **The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**

Dissolved Metals

20H0957-01 **Continuing Calibration recovery is below lower control limit (C-).**
Antimony

20H0957-01 **Elevated Method Reporting Limits due to sample matrix (EL).**
Lead

Total Metals

20H0957-01 **Continuing Calibration recovery is below lower control limit (C-).**
Antimony

20H0957-01 **Elevated Method Reporting Limits due to sample matrix (EL).**
Cadmium

20H0957-01 **Present in Method Blank (B).**
Lead

20H0957-02 **Continuing Calibration recovery is below lower control limit (C-).**
Antimony

20H0957-02 **Elevated Method Reporting Limits due to sample matrix (EL).**
Cadmium , Lead

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP ESS Laboratory Work Order: 20H0957

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

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
MADEP 18-2.1 - 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
5035A - 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: 1180 Boylston Street - RGP
Client Sample ID: 1702642-MW-5
Date Sampled: 08/27/20 10:00
Percent Solids: N/A

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-01
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	**C-** ND (5.0)		200.7		1	KJK	09/02/20 21:38	100	10	DH03135
Arsenic	**5.4** (2.5)		3113B		5	KJK	09/01/20 21:47	100	10	DH03135
Cadmium	**2.6** (1.0)		200.8		50	KJK	09/02/20 11:48	100	10	DH03135
Chromium	**3.3** (2.0)		200.7		1	KJK	09/02/20 21:38	100	10	DH03135
Copper	**3.4** (2.0)		200.7		1	KJK	09/02/20 21:38	100	10	DH03135
Iron	**5080** (10.0)		200.7		1	KJK	09/02/20 21:38	100	10	DH03135
Lead	**EL** ND (5.0)		200.8		50	KJK	09/02/20 11:48	100	10	DH03135
Mercury	ND (0.20)		245.1		1	MKS	09/01/20 11:17	20	40	DH03140
Nickel	ND (5.0)		200.7		1	KJK	09/02/20 21:38	100	10	DH03135
Selenium	ND (5.0)		3113B		5	KJK	09/02/20 2:27	100	10	DH03135
Silver	**1.4** (1.0)		200.7		1	KJK	09/02/20 21:38	100	10	DH03135
Zinc	**16.8** (5.0)		200.7		1	KJK	09/02/20 21:38	100	10	DH03135

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-MW-5
Date Sampled: 08/27/20 10:00
Percent Solids: N/A

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-01
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	**C-** ND (5.0)		200.7		1	KJK	09/02/20 21:19	100	10	DH03135
Arsenic	ND (2.5)		3113B		5	KJK	09/01/20 19:48	100	10	DH03135
Cadmium	**EL** ND (1.0)		200.8		50	KJK	09/02/20 11:26	100	10	DH03135
Chromium	ND (2.0)		200.7		1	KJK	09/02/20 21:19	100	10	DH03135
Chromium III	ND (10.0)		200.7		1	JLK	09/02/20 21:19	1	1	[CALC]
Copper	**2.6** (2.0)		200.7		1	KJK	09/02/20 21:19	100	10	DH03135
Iron	**3270** (10.0)		200.7		1	KJK	09/02/20 21:19	100	10	DH03135
Lead	**B 6.1** (5.0)		200.8		50	KJK	09/02/20 11:26	100	10	DH03135
Mercury	ND (0.2)		245.1		1	MKS	08/31/20 10:48	20	40	DH02801
Nickel	ND (5.0)		200.7		1	KJK	09/02/20 21:19	100	10	DH03135
Selenium	ND (5.0)		3113B		5	KJK	09/02/20 1:29	100	10	DH03135
Silver	ND (1.0)		200.7		1	KJK	09/02/20 21:19	100	10	DH03135
Total Hardness	**74400** (165)		CALC		2	KJK	09/22/20 12:25	1	1	[CALC]
Zinc	**20.4** (5.0)		200.7		1	KJK	09/02/20 21:19	100	10	DH03135

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-MW-5
Date Sampled: 08/27/20 10:00
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD

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	08/28/20 13:40	D0H0507	DH02827
1,1,2-Trichloroethane	ND (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
1,1-Dichloroethane	ND (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
1,1-Dichloroethene	ND (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
1,2-Dichlorobenzene	ND (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
1,2-Dichloroethane	ND (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
1,3-Dichlorobenzene	ND (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
1,4-Dichlorobenzene	ND (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Acetone	ND (5.0)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Benzene	**0.6** (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Carbon Tetrachloride	ND (0.3)		524.2		1	08/28/20 13:40	D0H0507	DH02827
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Ethylbenzene	**16.6** (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Methylene Chloride	ND (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Naphthalene	**2.7** (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Tetrachloroethene	ND (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Toluene	**1.6** (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Trichloroethene	ND (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Vinyl Chloride	ND (0.2)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Xylene O	**1.9** (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827
Xylene P,M	**16.4** (0.5)		524.2		1	08/28/20 13:40	D0H0507	DH02827

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*107 %*		*80-120*
Surrogate: 4-Bromofluorobenzene	*107 %*		*80-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-MW-5
Date Sampled: 08/27/20 10:00
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: DMC
Prepared: 8/28/20 11:40

608.3 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.09)		608.3		1	08/31/20 10:22		DH02701
Aroclor 1221	ND (0.09)		608.3		1	08/31/20 10:22		DH02701
Aroclor 1232	ND (0.09)		608.3		1	08/31/20 10:22		DH02701
Aroclor 1242	ND (0.09)		608.3		1	08/31/20 10:22		DH02701
Aroclor 1248	ND (0.09)		608.3		1	08/31/20 10:22		DH02701
Aroclor 1254	ND (0.09)		608.3		1	08/31/20 10:22		DH02701
Aroclor 1260	ND (0.09)		608.3		1	08/31/20 10:22		DH02701
Aroclor 1262	ND (0.09)		608.3		1	08/31/20 10:22		DH02701
Aroclor 1268	ND (0.09)		608.3		1	08/31/20 10:22		DH02701

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*49 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*53 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*50 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*64 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-MW-5
Date Sampled: 08/27/20 10:00
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 8/31/20 16:34

625.1(SIM) Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acenaphthene	ND (0.19)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Acenaphthylene	ND (0.19)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Anthracene	ND (0.19)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Benzo(a)anthracene	ND (0.05)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Benzo(a)pyrene	ND (0.05)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Benzo(b)fluoranthene	ND (0.05)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Benzo(g,h,i)perylene	ND (0.19)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Benzo(k)fluoranthene	ND (0.05)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
bis(2-Ethylhexyl)phthalate	ND (2.34)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Butylbenzylphthalate	ND (2.34)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Chrysene	ND (0.05)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Dibenzo(a,h)Anthracene	ND (0.05)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Diethylphthalate	ND (2.34)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Dimethylphthalate	ND (2.34)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Di-n-butylphthalate	ND (2.34)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Di-n-octylphthalate	ND (2.34)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Fluoranthene	ND (0.19)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Fluorene	ND (0.19)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Indeno(1,2,3-cd)Pyrene	ND (0.05)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Naphthalene	**1.01** (0.19)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Pentachlorophenol	ND (0.84)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Phenanthrene	ND (0.19)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115
Pyrene	ND (0.19)		625.1 SIM		1	09/02/20 15:51	D0I0014	DH03115

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*45 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*105 %*		*15-110*
Surrogate: 2-Fluorobiphenyl	*51 %*		*30-130*
Surrogate: Nitrobenzene-d5	*90 %*		*30-130*
Surrogate: p-Terphenyl-d14	*83 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-MW-5
Date Sampled: 08/27/20 10:00
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 8/31/20 16:15

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	09/01/20 16:45	D0H0556	DH03157

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	*32 %*		*15-115*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-MW-5
Date Sampled: 08/27/20 10:00
Percent Solids: N/A

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-01
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	**0.63** (0.10)		350.1		1	JLK	08/31/20 16:32	mg/L	DH03105
Chloride	**30.5** (20.0)		300.0		40	EEM	08/31/20 23:52	mg/L	DH03124
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	08/27/20 21:01	ug/L	DH02742
Phenols	ND (50)		420.1		1	JLK	09/01/20 18:41	ug/L	DI00139
Total Cyanide	ND (5.00)		4500 CN CE		1	EEM	08/31/20 11:40	ug/L	DH03126
Total Petroleum Hydrocarbon	ND (5)		1664A		1	LAB	08/31/20 13:47	mg/L	DH03111
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	08/27/20 21:57	ug/L	DH02743
Total Suspended Solids	**16** (5)		2540D		1	CCP	08/31/20 16:39	mg/L	DH03144

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-MW-5
Date Sampled: 08/27/20 10:00
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: DMC
Prepared: 9/2/20 8:10

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

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2-Dibromo-3-Chloropropane	ND (0.015)		504.1		1	09/02/20 13:21		DI00201
1,2-Dibromoethane	ND (0.015)		504.1		1	09/02/20 13:21		DI00201

	%Recovery	Qualifier	Limits
Surrogate: Pentachloroethane	*56 %*		*30-150*
Surrogate: Pentachloroethane [2C]	*56 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-MW-5
Date Sampled: 08/27/20 10:00
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: IBM
Prepared: 8/31/20 12:08

Alcohol Scan by GC/FID

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Ethanol	ND (10)		ASTM D3695		1	IBM	09/01/20 11:26		DH03130

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-GEI-101
Date Sampled: 08/27/20 12:00
Percent Solids: N/A

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-02
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	**C-** ND (5.0)		200.7		1	KJK	09/02/20 21:33	100	10	DH03135
Arsenic	ND (2.5)		3113B		5	KJK	09/01/20 20:11	100	10	DH03135
Cadmium	**EL** ND (1.0)		200.8		50	KJK	09/02/20 11:42	100	10	DH03135
Chromium	ND (2.0)		200.7		1	KJK	09/02/20 21:33	100	10	DH03135
Copper	**6.1** (2.0)		200.7		1	KJK	09/02/20 21:33	100	10	DH03135
Iron	**312** (10.0)		200.7		1	KJK	09/02/20 21:33	100	10	DH03135
Lead	**EL** ND (5.0)		200.8		50	KJK	09/02/20 11:42	100	10	DH03135
Mercury	ND (0.2)		245.1		1	MKS	08/31/20 10:51	20	40	DH02801
Nickel	ND (5.0)		200.7		1	KJK	09/02/20 21:33	100	10	DH03135
Selenium	ND (5.0)		3113B		5	KJK	09/02/20 2:21	100	10	DH03135
Silver	ND (1.0)		200.7		1	KJK	09/02/20 21:33	100	10	DH03135
Total Hardness	**105000** (165)		CALC		2	KJK	09/22/20 12:30	1	1	[CALC]
Zinc	**26.8** (5.0)		200.7		1	KJK	09/02/20 21:33	100	10	DH03135

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-GEI-101
Date Sampled: 08/27/20 12:00
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD

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	08/28/20 13:06	D0H0507	DH02827
1,1,2-Trichloroethane	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
1,1-Dichloroethane	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
1,1-Dichloroethene	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
1,2-Dichlorobenzene	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
1,2-Dichloroethane	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
1,3-Dichlorobenzene	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
1,4-Dichlorobenzene	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Acetone	ND (5.0)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Benzene	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Carbon Tetrachloride	ND (0.3)		524.2		1	08/28/20 13:06	D0H0507	DH02827
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Ethylbenzene	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Methylene Chloride	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Naphthalene	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Tetrachloroethene	**1.0** (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Toluene	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Trichloroethene	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Vinyl Chloride	ND (0.2)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Xylene O	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827
Xylene P,M	ND (0.5)		524.2		1	08/28/20 13:06	D0H0507	DH02827

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

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-GEI-101
Date Sampled: 08/27/20 12:00
Percent Solids: N/A

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-02
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	08/31/20 16:32	mg/L	DH03105
Phenols	ND (50)		420.1		1	JLK	09/01/20 18:41	ug/L	DI00139
Total Cyanide	ND (5.00)		4500 CN CE		1	EEM	08/31/20 11:40	ug/L	DH03126
Total Petroleum Hydrocarbon	ND (12)		1664A		1	LAB	08/31/20 13:47	mg/L	DH03111

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-GEI-101
Date Sampled: 08/27/20 12:00
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: DMC
Prepared: 9/2/20 8:10

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

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2-Dibromo-3-Chloropropane	ND (0.015)		504.1		1	09/02/20 13:52		DI00201
1,2-Dibromoethane	ND (0.015)		504.1		1	09/02/20 13:52		DI00201

	%Recovery	Qualifier	Limits
Surrogate: Pentachloroethane	*48 %*		*30-150*
Surrogate: Pentachloroethane [2C]	*47 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-GEI-101
Date Sampled: 08/27/20 12:00
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 20H0957
ESS Laboratory Sample ID: 20H0957-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: IBM
Prepared: 8/31/20 12:08

Alcohol Scan by GC/FID

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Ethanol	ND (10)		ASTM D3695		1	IBM	09/01/20 11:46		DH03130

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0957

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Dissolved Metals										
Batch DH03135 - 3005A/200.7										
Blank										
Antimony	ND	5.0	ug/L							
Chromium	ND	2.0	ug/L							
Copper	ND	2.0	ug/L							
Iron	ND	10.0	ug/L							
Nickel	ND	5.0	ug/L							
Silver	ND	1.0	ug/L							
Zinc	ND	5.0	ug/L							
Blank										
Cadmium	ND	0.1	ug/L							
Lead	0.9	0.5	ug/L							
Blank										
Arsenic	ND	0.5	ug/L							
Selenium	ND	1.0	ug/L							
LCS										
Antimony	43.3	5.0	ug/L	50.00		87	85-115			
Chromium	42.8	2.0	ug/L	50.00		86	85-115			
Copper	45.6	2.0	ug/L	50.00		91	85-115			
Iron	233	20.0	ug/L	250.0		93	85-115			
Nickel	44.6	5.0	ug/L	50.00		89	85-115			
Silver	22.4	1.0	ug/L	25.00		90	85-115			
Zinc	48.1	5.0	ug/L	50.00		96	85-115			
LCS										
Cadmium	23.9	0.5	ug/L	25.00		96	85-115			
Lead	49.8	2.5	ug/L	50.00		100	85-115			
LCS										
Arsenic	45.4	12.5	ug/L	50.00		91	85-115			
Selenium	95.8	25.0	ug/L	100.0		96	85-115			
Batch DH03140 - 245.1/7470A										
Blank										
Mercury	ND	0.20	ug/L							
LCS										
Mercury	5.74	0.20	ug/L	6.042		95	85-115			
LCS Dup										
Mercury	6.18	0.20	ug/L	6.042		102	85-115	7	20	
Total Metals										
Batch DH02801 - 245.1/7470A										
Blank										
Mercury	ND	0.2	ug/L							
LCS										
Mercury	5.7	0.2	ug/L	6.042		94	85-115			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0957

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DH02801 - 245.1/7470A										
LCS Dup										
Mercury	5.9	0.2	ug/L	6.042		98	85-115	5	20	
Batch DH03135 - 3005A/200.7										
Blank										
Antimony	ND	5.0	ug/L							
Calcium	ND	0.020	mg/L							
Chromium	ND	2.0	ug/L							
Copper	ND	2.0	ug/L							
Iron	ND	20.0	ug/L							
Magnesium	ND	0.020	mg/L							
Nickel	ND	5.0	ug/L							
Silver	ND	1.0	ug/L							
Zinc	ND	5.0	ug/L							
Blank										
Cadmium	ND	0.1	ug/L							
Lead	0.9	0.5	ug/L							
Blank										
Arsenic	ND	0.5	ug/L							
Selenium	ND	1.0	ug/L							
LCS										
Antimony	43.3	5.0	ug/L	50.00		87	85-115			
Calcium	0.435	0.020	mg/L	0.5000		87	85-115			
Chromium	42.8	2.0	ug/L	50.00		86	85-115			
Copper	45.6	2.0	ug/L	50.00		91	85-115			
Iron	233	20.0	ug/L	250.0		93	85-115			
Magnesium	0.423	0.020	mg/L	0.5000		85	85-115			
Nickel	44.6	5.0	ug/L	50.00		89	85-115			
Silver	22.4	1.0	ug/L	25.00		90	85-115			
Zinc	48.1	5.0	ug/L	50.00		96	85-115			
LCS										
Cadmium	23.9	0.5	ug/L	25.00		96	85-115			
Lead	49.8	2.5	ug/L	50.00		100	85-115			
LCS										
Arsenic	45.4	12.5	ug/L	50.00		91	85-115			
Selenium	95.8	25.0	ug/L	100.0		96	85-115			
524.2 Volatile Organic Compounds										
Batch DH02827 - 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							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0957

Quality Control Data

524.2 Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DH02827 - 524.2										
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	*4.68*		ug/L	*5.000*		*94*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.50*		ug/L	*5.000*		*90*	*80-120*			
LCS										
1,1,1-Trichloroethane	10.8	0.5	ug/L	10.00		108	70-130			
1,1,2-Trichloroethane	11.4	0.5	ug/L	10.00		114	70-130			
1,1-Dichloroethane	9.9	0.5	ug/L	10.00		99	70-130			
1,1-Dichloroethene	12.2	0.5	ug/L	10.00		122	70-130			
1,2-Dichlorobenzene	10.6	0.5	ug/L	10.00		106	70-130			
1,2-Dichloroethane	11.2	0.5	ug/L	10.00		112	70-130			
1,3-Dichlorobenzene	10.8	0.5	ug/L	10.00		108	70-130			
1,4-Dichlorobenzene	10.8	0.5	ug/L	10.00		108	70-130			
Acetone	56.6	5.0	ug/L	50.00		113	70-130			
Benzene	10.6	0.5	ug/L	10.00		106	70-130			
Carbon Tetrachloride	11.6	0.3	ug/L	10.00		116	70-130			
cis-1,2-Dichloroethene	10.7	0.5	ug/L	10.00		107	70-130			
Ethylbenzene	11.0	0.5	ug/L	10.00		110	70-130			
Methyl tert-Butyl Ether	11.0	0.5	ug/L	10.00		110	70-130			
Methylene Chloride	11.0	0.5	ug/L	10.00		110	70-130			
Naphthalene	10.6	0.5	ug/L	10.00		106	70-130			
Tertiary-amyl methyl ether	10.7	1.0	ug/L	10.00		107	70-130			
Tertiary-butyl Alcohol	69.7	25.0	ug/L	50.00		139	70-130			B+
Tetrachloroethene	10.8	0.5	ug/L	10.00		108	70-130			
Toluene	10.5	0.5	ug/L	10.00		105	70-130			
Trichloroethene	11.0	0.5	ug/L	10.00		110	70-130			
Vinyl Chloride	12.4	0.2	ug/L	10.00		124	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0957

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch DH02827 - 524.2										
Xylene O	10.1	0.5	ug/L	10.00		101	70-130			
Xylene P,M	19.7	0.5	ug/L	20.00		99	70-130			
Surrogate: 1,2-Dichlorobenzene-d4	*5.15*		ug/L	*5.000*		*103*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.82*		ug/L	*5.000*		*96*	*80-120*			
LCS Dup										
1,1,1-Trichloroethane	11.0	0.5	ug/L	10.00		110	70-130	2	20	
1,1,2-Trichloroethane	10.6	0.5	ug/L	10.00		106	70-130	7	20	
1,1-Dichloroethane	10.0	0.5	ug/L	10.00		100	70-130	1	20	
1,1-Dichloroethene	12.9	0.5	ug/L	10.00		129	70-130	6	20	
1,2-Dichlorobenzene	10.2	0.5	ug/L	10.00		102	70-130	4	20	
1,2-Dichloroethane	11.1	0.5	ug/L	10.00		111	70-130	0.9	20	
1,3-Dichlorobenzene	10.5	0.5	ug/L	10.00		105	70-130	2	20	
1,4-Dichlorobenzene	10.8	0.5	ug/L	10.00		108	70-130	0	20	
Acetone	55.8	5.0	ug/L	50.00		112	70-130	1	20	
Benzene	10.8	0.5	ug/L	10.00		108	70-130	3	20	
Carbon Tetrachloride	11.5	0.3	ug/L	10.00		115	70-130	1	20	
cis-1,2-Dichloroethene	11.0	0.5	ug/L	10.00		110	70-130	2	20	
Ethylbenzene	11.4	0.5	ug/L	10.00		114	70-130	4	20	
Methyl tert-Butyl Ether	10.9	0.5	ug/L	10.00		109	70-130	0.9	20	
Methylene Chloride	11.0	0.5	ug/L	10.00		110	70-130	0.3	20	
Naphthalene	9.9	0.5	ug/L	10.00		99	70-130	7	20	
Tertiary-amyl methyl ether	10.6	1.0	ug/L	10.00		106	70-130	1	20	
Tertiary-butyl Alcohol	72.1	25.0	ug/L	50.00		144	70-130	3	25	B+
Tetrachloroethene	10.6	0.5	ug/L	10.00		106	70-130	2	20	
Toluene	10.5	0.5	ug/L	10.00		105	70-130	0	20	
Trichloroethene	11.3	0.5	ug/L	10.00		113	70-130	2	20	
Vinyl Chloride	12.1	0.2	ug/L	10.00		121	70-130	3	20	
Xylene O	9.6	0.5	ug/L	10.00		96	70-130	5	20	
Xylene P,M	21.7	0.5	ug/L	20.00		109	70-130	10	20	
Surrogate: 1,2-Dichlorobenzene-d4	*5.06*		ug/L	*5.000*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.81*		ug/L	*5.000*		*96*	*80-120*			
608.3 Polychlorinated Biphenyls (PCB)										
Batch DH02701 - 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							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0957

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
608.3 Polychlorinated Biphenyls (PCB)										
Batch DH02701 - 3510C										
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	*0.0344*		ug/L	*0.05000*		*69*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0356*		ug/L	*0.05000*		*71*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0334*		ug/L	*0.05000*		*67*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0361*		ug/L	*0.05000*		*72*	*30-150*			
LCS										
Aroclor 1016	0.76	0.10	ug/L	1.000		76	50-140			
Aroclor 1016 [2C]	0.79	0.10	ug/L	1.000		79	50-140			
Aroclor 1260	0.84	0.10	ug/L	1.000		84	1-164			
Aroclor 1260 [2C]	0.82	0.10	ug/L	1.000		82	1-164			
Surrogate: Decachlorobiphenyl	*0.0438*		ug/L	*0.05000*		*88*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0437*		ug/L	*0.05000*		*87*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0364*		ug/L	*0.05000*		*73*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0367*		ug/L	*0.05000*		*73*	*30-150*			
LCS Dup										
Aroclor 1016	0.79	0.10	ug/L	1.000		79	50-140	5	36	
Aroclor 1016 [2C]	0.80	0.10	ug/L	1.000		80	50-140	2	36	
Aroclor 1260	0.88	0.10	ug/L	1.000		88	1-164	5	38	
Aroclor 1260 [2C]	0.85	0.10	ug/L	1.000		85	1-164	4	38	
Surrogate: Decachlorobiphenyl	*0.0431*		ug/L	*0.05000*		*86*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0441*		ug/L	*0.05000*		*88*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0360*		ug/L	*0.05000*		*72*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0363*		ug/L	*0.05000*		*73*	*30-150*			
625.1(SIM) Semi-Volatile Organic Compounds										
Batch DH03115 - 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							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0957

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625.1(SIM) Semi-Volatile Organic Compounds										
Batch DH03115 - 3510C										
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	*1.21*		ug/L	*2.500*		*48*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.22*		ug/L	*3.750*		*86*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.67*		ug/L	*2.500*		*67*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.30*		ug/L	*2.500*		*92*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.46*		ug/L	*2.500*		*98*	*30-130*			
LCS										
Acenaphthene	3.11	0.20	ug/L	4.000		78	40-140			
Acenaphthylene	3.12	0.20	ug/L	4.000		78	40-140			
Anthracene	3.58	0.20	ug/L	4.000		89	40-140			
Benzo(a)anthracene	3.72	0.05	ug/L	4.000		93	40-140			
Benzo(a)pyrene	3.86	0.05	ug/L	4.000		96	40-140			
Benzo(b)fluoranthene	4.15	0.05	ug/L	4.000		104	40-140			
Benzo(g,h,i)perylene	3.83	0.20	ug/L	4.000		96	40-140			
Benzo(k)fluoranthene	3.46	0.05	ug/L	4.000		86	40-140			
bis(2-Ethylhexyl)phthalate	4.21	2.50	ug/L	4.000		105	40-140			
Butylbenzylphthalate	4.28	2.50	ug/L	4.000		107	40-140			
Chrysene	3.72	0.05	ug/L	4.000		93	40-140			
Dibenzo(a,h)Anthracene	3.99	0.05	ug/L	4.000		100	40-140			
Diethylphthalate	4.08	2.50	ug/L	4.000		102	40-140			
Dimethylphthalate	4.13	2.50	ug/L	4.000		103	40-140			
Di-n-butylphthalate	3.86	2.50	ug/L	4.000		97	40-140			
Di-n-octylphthalate	4.16	2.50	ug/L	4.000		104	40-140			
Fluoranthene	3.65	0.20	ug/L	4.000		91	40-140			
Fluorene	3.74	0.20	ug/L	4.000		94	40-140			
Indeno(1,2,3-cd)Pyrene	4.00	0.05	ug/L	4.000		100	40-140			
Naphthalene	2.81	0.20	ug/L	4.000		70	40-140			
Pentachlorophenol	4.07	0.90	ug/L	4.000		102	30-130			
Phenanthrene	3.62	0.20	ug/L	4.000		90	40-140			
Pyrene	3.98	0.20	ug/L	4.000		100	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.20*		ug/L	*2.500*		*48*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0957

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625.1(SIM) Semi-Volatile Organic Compounds										
Batch DH03115 - 3510C										
Surrogate: 2,4,6-Tribromophenol	*3.72*		ug/L	*3.750*		*99*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.73*		ug/L	*2.500*		*69*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.19*		ug/L	*2.500*		*88*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.54*		ug/L	*2.500*		*101*	*30-130*			
LCS Dup										
Acenaphthene	3.03	0.20	ug/L	4.000		76	40-140	3	20	
Acenaphthylene	3.02	0.20	ug/L	4.000		75	40-140	4	20	
Anthracene	3.40	0.20	ug/L	4.000		85	40-140	5	20	
Benzo(a)anthracene	3.45	0.05	ug/L	4.000		86	40-140	8	20	
Benzo(a)pyrene	3.56	0.05	ug/L	4.000		89	40-140	8	20	
Benzo(b)fluoranthene	3.51	0.05	ug/L	4.000		88	40-140	17	20	
Benzo(g,h,i)perylene	3.62	0.20	ug/L	4.000		90	40-140	6	20	
Benzo(k)fluoranthene	3.53	0.05	ug/L	4.000		88	40-140	2	20	
bis(2-Ethylhexyl)phthalate	4.04	2.50	ug/L	4.000		101	40-140	4	20	
Butylbenzylphthalate	4.07	2.50	ug/L	4.000		102	40-140	5	20	
Chrysene	3.52	0.05	ug/L	4.000		88	40-140	6	20	
Dibenzo(a,h)Anthracene	3.70	0.05	ug/L	4.000		93	40-140	7	20	
Diethylphthalate	3.85	2.50	ug/L	4.000		96	40-140	6	20	
Dimethylphthalate	3.93	2.50	ug/L	4.000		98	40-140	5	20	
Di-n-butylphthalate	3.82	2.50	ug/L	4.000		95	40-140	1	20	
Di-n-octylphthalate	3.81	2.50	ug/L	4.000		95	40-140	9	20	
Fluoranthene	3.51	0.20	ug/L	4.000		88	40-140	4	20	
Fluorene	3.51	0.20	ug/L	4.000		88	40-140	6	20	
Indeno(1,2,3-cd)Pyrene	3.73	0.05	ug/L	4.000		93	40-140	7	20	
Naphthalene	2.90	0.20	ug/L	4.000		73	40-140	3	20	
Pentachlorophenol	3.88	0.90	ug/L	4.000		97	30-130	5	20	
Phenanthrene	3.46	0.20	ug/L	4.000		86	40-140	5	20	
Pyrene	3.67	0.20	ug/L	4.000		92	40-140	8	20	
Surrogate: 1,2-Dichlorobenzene-d4	*1.18*		ug/L	*2.500*		*47*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.59*		ug/L	*3.750*		*96*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.62*		ug/L	*2.500*		*65*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.21*		ug/L	*2.500*		*88*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.27*		ug/L	*2.500*		*91*	*30-130*			
8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution										
Batch DH03157 - 3535A										
Blank										
1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	*3.57*		ug/L	*5.000*		*71*	*15-115*			
LCS										
1,4-Dioxane	13.1	0.250	ug/L	10.00		131	40-140			
Surrogate: 1,4-Dioxane-d8	*3.66*		ug/L	*5.000*		*73*	*15-115*			
LCS Dup										
1,4-Dioxane	12.9	0.250	ug/L	10.00		129	40-140	1	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0957

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 DH03157 - 3535A										
Surrogate: 1,4-Dioxane-d8	*3.81*		ug/L	*5.000*		*76*	*15-115*			
Classical Chemistry										
Batch DH02742 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	506	10.0	ug/L	499.8		101	90-110			
LCS Dup										
Hexavalent Chromium	509	10.0	ug/L	499.8		102	90-110	0.6	20	
Batch DH02743 - General Preparation										
Blank										
Total Residual Chlorine	ND	20.0	ug/L							
LCS										
Total Residual Chlorine	1.25		mg/L	1.260		99	85-115			
Batch DH03105 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.96	0.10	mg/L	0.9994		96	80-120			
Batch DH03111 - General Preparation										
Blank										
Total Petroleum Hydrocarbon	ND	5	mg/L							
LCS										
Total Petroleum Hydrocarbon	15	5	mg/L	19.38		79	66-114			
Batch DH03124 - General Preparation										
Blank										
Chloride	ND	0.5	mg/L							
LCS										
Chloride	9.6		mg/L	10.00		96	90-110			
Batch DH03126 - TCN Prep										
Blank										
Total Cyanide	ND	5.00	ug/L							
LCS										
Total Cyanide	20.6	5.00	ug/L	20.06		102	90-110			
LCS										
Total Cyanide	148	5.00	ug/L	150.4		98	90-110			
LCS Dup										
Total Cyanide	148	5.00	ug/L	150.4		99	90-110	0.5	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0957

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch DH03144 - General Preparation										
Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	88		mg/L	88.00		100	80-120			
Batch DI00139 - General Preparation										
Blank										
Phenols	ND	50	ug/L							
LCS										
Phenols	1020	50	ug/L	1000		102	80-120			
504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane										
Batch DI00201 - 504/8011										
Blank										
1,2-Dibromo-3-Chloropropane	ND	0.015	ug/L							
1,2-Dibromo-3-Chloropropane [2C]	ND	0.015	ug/L							
1,2-Dibromoethane	ND	0.015	ug/L							
1,2-Dibromoethane [2C]	ND	0.015	ug/L							
Surrogate: Pentachloroethane	*0.0846*		ug/L	*0.2000*		*42*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.0843*		ug/L	*0.2000*		*42*	*30-150*			
LCS										
1,2-Dibromo-3-Chloropropane	0.044	0.015	ug/L	0.04000		110	70-130			
1,2-Dibromo-3-Chloropropane [2C]	0.043	0.015	ug/L	0.04000		107	70-130			
1,2-Dibromoethane	0.045	0.015	ug/L	0.04000		114	70-130			
1,2-Dibromoethane [2C]	0.041	0.015	ug/L	0.04000		103	70-130			
Surrogate: Pentachloroethane	*0.0854*		ug/L	*0.2000*		*43*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.0860*		ug/L	*0.2000*		*43*	*30-150*			
LCS										
1,2-Dibromo-3-Chloropropane	0.082	0.015	ug/L	0.08000		103	70-130			
1,2-Dibromo-3-Chloropropane [2C]	0.080	0.015	ug/L	0.08000		100	70-130			
1,2-Dibromoethane	0.080	0.015	ug/L	0.08000		100	70-130			
1,2-Dibromoethane [2C]	0.079	0.015	ug/L	0.08000		98	70-130			
Surrogate: Pentachloroethane	*0.0916*		ug/L	*0.2000*		*46*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.0922*		ug/L	*0.2000*		*46*	*30-150*			
Alcohol Scan by GC/FID										
Batch DH03130 - No Prep										
Blank										
Ethanol	ND	10	mg/L							
LCS										
Ethanol	807	10	mg/L	952.8		85	60-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0957

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Alcohol Scan by GC/FID										
Batch DH03130 - No Prep										
LCS Dup										
Ethanol	1060	10	mg/L	952.8		111	60-140	27	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP ESS Laboratory Work Order: 20H0957

Notes and Definitions

U	Analyte included in the analysis, but not detected
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.
EL	Elevated Method Reporting Limits due to sample matrix (EL).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
C-	Continuing Calibration recovery is below lower control limit (C-).
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
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H0957

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

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20H0957
Date Received: 8/27/2020
Project Due Date: 9/3/2020
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: -1.2 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)
1	80479	Yes	No	Yes	VOA Vial	HCl	
1	80480	Yes	No	Yes	VOA Vial	HCl	
1	80481	Yes	No	Yes	VOA Vial	HCl	
1	80482	Yes	No	Yes	VOA Vial	HCl	
1	80483	Yes	No	Yes	VOA Vial	HCl	
1	80484	Yes	No	Yes	VOA Vial	HCl	
1	80491	Yes	No	Yes	VOA Vial	NP	
1	80493	Yes	N/A	Yes	1L Amber	NP	
1	80494	Yes	N/A	Yes	1L Amber	NP	
1	80495	Yes	N/A	Yes	1L Amber	NP	
1	80496	Yes	N/A	Yes	1L Amber	NP	
1	80499	Yes	N/A	Yes	1L Amber	H2SO4	
1	80500	Yes	N/A	Yes	1L Amber	H2SO4	
1	80503	Yes	N/A	Yes	1L Poly	NP	
1	80504	Yes	N/A	Yes	250 mL Poly	NP	
1	80505	Yes	N/A	Yes	500 mL Poly	H2SO4	
1	80507	Yes	N/A	Yes	250 mL Poly	NaOH	pH >12

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 20H0957
Date Received: 8/27/2020

1	80509	Yes	N/A	Yes	500 mL Poly	HNO3	
1	80511	Yes	N/A	Yes	500 mL Poly	HNO3	
1	80513	Yes	N/A	Yes	250 mL Poly	HNO3	
1	80635	Yes	N/A	Yes	1L Amber	NP	
1	80636	Yes	N/A	Yes	1L Amber	NP	
2	80485	Yes	No	Yes	VOA Vial	HCl	
2	80486	Yes	No	Yes	VOA Vial	HCl	
2	80487	Yes	No	Yes	VOA Vial	HCl	
2	80488	Yes	No	Yes	VOA Vial	HCl	
2	80489	Yes	No	Yes	VOA Vial	HCl	
2	80490	Yes	No	Yes	VOA Vial	HCl	
2	80492	Yes	No	Yes	VOA Vial	NP	
2	80501	Yes	N/A	Yes	1L Amber	H2SO4	
2	80502	Yes	N/A	Yes	1L Amber	H2SO4	
2	80506	Yes	N/A	Yes	500 mL Poly	H2SO4	
2	80508	Yes	N/A	Yes	250 mL Poly	NaOH	pH >12
2	80510	Yes	N/A	Yes	500 mL Poly	HNO3	
2	80512	Yes	N/A	Yes	250 mL Poly	HNO3	

2nd Review

Were all containers scanned into storage/lab? Initials AG

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

Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA

Are all Hex Chrome stickers attached? Yes / No / NA

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Amber Garcia Date & Time: 8/27/20 18:24

Reviewed By: [signature] Date & Time: 8/27/20 1935

Delivered By: [signature] 8/27/20 1935

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: 20H0957

Turn Time: x 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: Cat Malagrida
Company: GEI Consultants
Address: 400 Unicorn Park Drive
Woburn, MA 01801

Project # 1702642
Project Name: 1180 Boylston Street
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	8/27/2020	10:00		GW	1702642-MW-5	22	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	1,2
2	8/27/2020	12:00	G	GW	1702642-GEI-101	13	x		x	x		x	x			x			x	x		x			3
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	3	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: -12/1.8

Sampled by : Elise Farrington

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** 3) Low sample volume
* **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)
E.A. Farrington	8/27/20 13:30	8/27/20 1550		8/27/20 1745	Amber Hamm
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

Catherine Malagrida
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: 1180 Boylston Street - RGP (1702642)
ESS Laboratory Work Order Number: 20H1032

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 12:17 pm, Sep 14, 2020

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: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1032

SAMPLE RECEIPT

The following samples were received on August 31, 2020 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
20H1032-01	1702642-GEI-101	Ground Water	3500Cr B-2009, 608.3, 625.1 SIM

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP ESS Laboratory Work Order: 20H1032

PROJECT NARRATIVE

625.1(SIM) Semi-Volatile Organic Compounds

20H1032-01	**Estimated value. Sample hold times were exceeded (H).**
D0I0138-CCV1	**Calibration required quadratic regression (Q).**
	2,4,6-Tribromophenol (111% @ 80-120%), Pentachlorophenol (125% @ 80-120%)
D0I0138-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Di-n-octylphthalate (23% @ 20%), Pentachlorophenol (25% @ 20%)

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: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1032

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
MADEP 18-2.1 - 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
5035A - 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: 1180 Boylston Street - RGP
Client Sample ID: 1702642-GEI-101
Date Sampled: 08/31/20 09:10
Percent Solids: N/A
Initial Volume: 950
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20H1032
ESS Laboratory Sample ID: 20H1032-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: DMC
Prepared: 9/1/20 11:08

608.3 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.11)		608.3		1	09/04/20 6:29		DH03114
Aroclor 1221	ND (0.11)		608.3		1	09/04/20 6:29		DH03114
Aroclor 1232	ND (0.11)		608.3		1	09/04/20 6:29		DH03114
Aroclor 1242	ND (0.11)		608.3		1	09/04/20 6:29		DH03114
Aroclor 1248	ND (0.11)		608.3		1	09/04/20 6:29		DH03114
Aroclor 1254	ND (0.11)		608.3		1	09/04/20 6:29		DH03114
Aroclor 1260	ND (0.11)		608.3		1	09/04/20 6:29		DH03114
Aroclor 1262	ND (0.11)		608.3		1	09/04/20 6:29		DH03114
Aroclor 1268	ND (0.11)		608.3		1	09/04/20 6:29		DH03114

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*92 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*90 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*70 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*71 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-GEI-101
Date Sampled: 08/31/20 09:10
Percent Solids: N/A
Initial Volume: 910
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20H1032
ESS Laboratory Sample ID: 20H1032-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 9/8/20 13:39

625.1(SIM) Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acenaphthene	ND (0.22)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Acenaphthylene	ND (0.22)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Anthracene	ND (0.22)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Benzo(a)anthracene	ND (0.05)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Benzo(a)pyrene	ND (0.05)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Benzo(b)fluoranthene	ND (0.05)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Benzo(g,h,i)perylene	ND (0.22)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Benzo(k)fluoranthene	ND (0.05)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
bis(2-Ethylhexyl)phthalate	ND (2.75)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Butylbenzylphthalate	ND (2.75)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Chrysene	ND (0.05)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Dibenzo(a,h)Anthracene	ND (0.05)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Diethylphthalate	ND (2.75)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Dimethylphthalate	ND (2.75)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Di-n-butylphthalate	ND (2.75)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Di-n-octylphthalate	ND (2.75)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Fluoranthene	ND (0.22)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Fluorene	ND (0.22)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Indeno(1,2,3-cd)Pyrene	ND (0.05)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Naphthalene	ND (0.22)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Pentachlorophenol	ND (0.99)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Phenanthrene	ND (0.22)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011
Pyrene	ND (0.22)		625.1 SIM		1	09/08/20 21:56	D0I0138	DI01011

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*37 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*68 %*		*15-110*
Surrogate: 2-Fluorobiphenyl	*52 %*		*30-130*
Surrogate: Nitrobenzene-d5	*67 %*		*30-130*
Surrogate: p-Terphenyl-d14	*83 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-GEI-101
Date Sampled: 08/31/20 09:10
Percent Solids: N/A

ESS Laboratory Work Order: 20H1032
ESS Laboratory Sample ID: 20H1032-01
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	08/31/20 19:55	ug/L	DH03167

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1032

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
608.3 Polychlorinated Biphenyls (PCB)										
Batch DH03114 - 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	*0.0324*		ug/L	*0.05000*		*65*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0336*		ug/L	*0.05000*		*67*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0300*		ug/L	*0.05000*		*60*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0348*		ug/L	*0.05000*		*70*	*30-150*			
LCS										
Aroclor 1016	0.86	0.10	ug/L	1.000		86	50-140			
Aroclor 1016 [2C]	0.89	0.10	ug/L	1.000		89	50-140			
Aroclor 1260	0.89	0.10	ug/L	1.000		89	1-164			
Aroclor 1260 [2C]	0.87	0.10	ug/L	1.000		87	1-164			
Surrogate: Decachlorobiphenyl	*0.0443*		ug/L	*0.05000*		*89*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0445*		ug/L	*0.05000*		*89*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0413*		ug/L	*0.05000*		*83*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0436*		ug/L	*0.05000*		*87*	*30-150*			
LCS Dup										
Aroclor 1016	0.80	0.10	ug/L	1.000		80	50-140	7	36	
Aroclor 1016 [2C]	0.83	0.10	ug/L	1.000		83	50-140	7	36	
Aroclor 1260	0.88	0.10	ug/L	1.000		88	1-164	0.2	38	
Aroclor 1260 [2C]	0.87	0.10	ug/L	1.000		87	1-164	0.4	38	
Surrogate: Decachlorobiphenyl	*0.0439*		ug/L	*0.05000*		*88*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0442*		ug/L	*0.05000*		*88*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0366*		ug/L	*0.05000*		*73*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0388*		ug/L	*0.05000*		*78*	*30-150*			
625.1(SIM) Semi-Volatile Organic Compounds										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1032

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625.1(SIM) Semi-Volatile Organic Compounds										
Batch DI01011 - 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	*0.809*		ug/L	*2.500*		*32*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*2.39*		ug/L	*3.750*		*64*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.19*		ug/L	*2.500*		*47*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.72*		ug/L	*2.500*		*69*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.01*		ug/L	*2.500*		*80*	*30-130*			
LCS										
Acenaphthene	2.82	0.20	ug/L	4.000		71	40-140			
Acenaphthylene	2.83	0.20	ug/L	4.000		71	40-140			
Anthracene	3.49	0.20	ug/L	4.000		87	40-140			
Benzo(a)anthracene	3.53	0.05	ug/L	4.000		88	40-140			
Benzo(a)pyrene	4.10	0.05	ug/L	4.000		103	40-140			
Benzo(b)fluoranthene	4.17	0.05	ug/L	4.000		104	40-140			
Benzo(g,h,i)perylene	3.66	0.20	ug/L	4.000		91	40-140			
Benzo(k)fluoranthene	4.22	0.05	ug/L	4.000		105	40-140			
bis(2-Ethylhexyl)phthalate	3.73	2.50	ug/L	4.000		93	40-140			
Butylbenzylphthalate	3.82	2.50	ug/L	4.000		96	40-140			
Chrysene	3.45	0.05	ug/L	4.000		86	40-140			
Dibenzo(a,h)Anthracene	3.81	0.05	ug/L	4.000		95	40-140			
Diethylphthalate	3.75	2.50	ug/L	4.000		94	40-140			
Dimethylphthalate	3.85	2.50	ug/L	4.000		96	40-140			
Di-n-butylphthalate	3.54	2.50	ug/L	4.000		88	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1032

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
625.1(SIM) Semi-Volatile Organic Compounds										
Batch DI01011 - 3510C										
Di-n-octylphthalate	4.38	2.50	ug/L	4.000		109	40-140			
Fluoranthene	3.82	0.20	ug/L	4.000		95	40-140			
Fluorene	3.48	0.20	ug/L	4.000		87	40-140			
Indeno(1,2,3-cd)Pyrene	3.81	0.05	ug/L	4.000		95	40-140			
Naphthalene	2.60	0.20	ug/L	4.000		65	40-140			
Pentachlorophenol	4.67	0.90	ug/L	4.000		117	30-130			
Phenanthrene	3.54	0.20	ug/L	4.000		88	40-140			
Pyrene	3.46	0.20	ug/L	4.000		87	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.05*		ug/L	*2.500*		*42*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*2.98*		ug/L	*3.750*		*80*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.57*		ug/L	*2.500*		*63*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.96*		ug/L	*2.500*		*79*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.13*		ug/L	*2.500*		*85*	*30-130*			
LCS Dup										
Acenaphthene	3.06	0.20	ug/L	4.000		77	40-140	8	20	
Acenaphthylene	3.05	0.20	ug/L	4.000		76	40-140	7	20	
Anthracene	3.58	0.20	ug/L	4.000		90	40-140	3	20	
Benzo(a)anthracene	3.61	0.05	ug/L	4.000		90	40-140	2	20	
Benzo(a)pyrene	3.77	0.05	ug/L	4.000		94	40-140	8	20	
Benzo(b)fluoranthene	3.76	0.05	ug/L	4.000		94	40-140	10	20	
Benzo(g,h,i)perylene	3.15	0.20	ug/L	4.000		79	40-140	15	20	
Benzo(k)fluoranthene	3.72	0.05	ug/L	4.000		93	40-140	12	20	
bis(2-Ethylhexyl)phthalate	3.76	2.50	ug/L	4.000		94	40-140	0.9	20	
Butylbenzylphthalate	4.05	2.50	ug/L	4.000		101	40-140	6	20	
Chrysene	3.54	0.05	ug/L	4.000		88	40-140	3	20	
Dibenzo(a,h)Anthracene	3.33	0.05	ug/L	4.000		83	40-140	13	20	
Diethylphthalate	4.02	2.50	ug/L	4.000		101	40-140	7	20	
Dimethylphthalate	4.13	2.50	ug/L	4.000		103	40-140	7	20	
Di-n-butylphthalate	3.83	2.50	ug/L	4.000		96	40-140	8	20	
Di-n-octylphthalate	3.98	2.50	ug/L	4.000		99	40-140	10	20	
Fluoranthene	3.94	0.20	ug/L	4.000		99	40-140	3	20	
Fluorene	3.69	0.20	ug/L	4.000		92	40-140	6	20	
Indeno(1,2,3-cd)Pyrene	3.67	0.05	ug/L	4.000		92	40-140	4	20	
Naphthalene	2.75	0.20	ug/L	4.000		69	40-140	6	20	
Pentachlorophenol	4.79	0.90	ug/L	4.000		120	30-130	2	20	
Phenanthrene	3.60	0.20	ug/L	4.000		90	40-140	2	20	
Pyrene	3.45	0.20	ug/L	4.000		86	40-140	0.4	20	
Surrogate: 1,2-Dichlorobenzene-d4	*1.01*		ug/L	*2.500*		*40*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.10*		ug/L	*3.750*		*83*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.53*		ug/L	*2.500*		*61*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.02*		ug/L	*2.500*		*81*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.10*		ug/L	*2.500*		*84*	*30-130*			
Classical Chemistry										
Batch DH03167 - General Preparation										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1032

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch DH03167 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	509	10.0	ug/L	499.8		102	90-110			
LCS Dup										
Hexavalent Chromium	511	10.0	ug/L	499.8		102	90-110	0.5	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP ESS Laboratory Work Order: 20H1032

Notes and Definitions

U	Analyte included in the analysis, but not detected
Q	Calibration required quadratic regression (Q).
H	Estimated value. Sample hold times were exceeded (H).
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
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1032

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

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20H1032
Date Received: 8/31/2020
Project Due Date: 9/8/2020
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)
1	81158	Yes	N/A	Yes	1L Amber	NP	
1	81159	Yes	N/A	Yes	1L Amber	NP	
1	81160	Yes	N/A	Yes	1L Amber	NP	
1	81161	Yes	N/A	Yes	1L Amber	NP	
1	81163	Yes	N/A	Yes	250 mL Poly	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / (NA)
Are all Hex Chrome stickers attached? Yes / No / (NA)
Are all QC stickers attached? Yes / No / (NA)
Are VOA stickers attached if bubbles noted? Yes / No / (NA)

Completed By: Date & Time: 8/31/20 16:29
Reviewed By: Date & Time: 8/31/20 1652
Delivered

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 20H1032

Date Received: 8/31/2020

By: 8/31/20 1652

Chain-of-Custody Record

ESS (Lab use only) 20416032

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: 1180 Boylston Street
Project Location: Brookline, MA
Project Number: 1702642
Project Manager: C. Malagrida

Send Report to: Elise Farrington
Send EDD to: labdata@geiconsultants.com

Preservative

None	None	None					

Sample Handling

Samples Field Filtered: YES (NO) NA

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY REQUIRED: (YES) NO

If Yes, Are MCP Analytical Methods Required?	(YES)	NO	NA
Are Drinking Water Samples Submitted?	YES	(NO)	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	(NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Analysis: PCBs	SVOCs	Hex Cr						Sample Specific Remarks
	1702642-GEI-101	8/30/20 (8/31/20)	0910	GW	5	CWS	x	x	x						

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Turnaround Time (Business days):

Normal __X__ Other _____
10-Day _____ 7-Day _____
5-Day _____ 3-Day _____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

	Relinquished by: (signature)	Date	Time	Received by: (signature)
1.	[signature]	8/31/20 8/30/2020	1045	1. GEI Sample Fridge
2.	GEI Sample Fridge	8/31/20 8/30/2020	1100	2. [signature]
3.	[signature]	8/31/20 8/30/2020	11:00	3. [signature]
4.	[signature]	8/31/20	16:06	4. [signature]

Additional Requirements/Comments/Remarks:

8/31/2020
C:\Users\csaledas\OneDrive - GEI Consultants, Inc\Desktop\190 COC - Copy

Icetemp: 2.8

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 20H1032

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: 1180 Boylston Street

Project Location: Brookline, MA

Project Number: 1702642

Project Manager: C. Malagrida

Send Report to: Elise Farrington

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED – (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Sample Handling

Samples Field Filtered: YES (NO) NA

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: None	None	None	Analysis: PCBs	SVOCs	Hex Cr						Sample Specific Remarks
1	1702642-GEI-101	8/30/20	0910	GW	5	CWS				x	x	x						

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Date :	Time:	
Relinquished by sampler: (signature) 1.	8/30/2020	1045	Received by: (signature) 1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	8/30/20	1100	Received by: (signature) 2.
Relinquished by: (signature) 3.	8/31/20	11:00	Received by: (signature) 3.
Relinquished by: (signature) 4.	8/31/20	16:06	Received by: (signature) 4.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day ____ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

ICP items 28

CERTIFICATE OF ANALYSIS

Accounts Payable
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: 1180 Boylston Street - RGP (1702642)
ESS Laboratory Work Order Number: 20H1034

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 2:10 pm, Sep 21, 2020

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: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1034

SAMPLE RECEIPT

The following samples were received on August 31, 2020 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
20H1034-01	1702642-GEI-101	Ground Water	200.7, 200.8, 245.1, 2540D, 300.0, 3113B, 4500Cl D, 8270D SIM

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1034

PROJECT NARRATIVE

Classical Chemistry
20H1034-01 **The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**

Dissolved Metals
20H1034-01 **Elevated Method Reporting Limits due to sample matrix (EL).**
Cadmium , Lead

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: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1034

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
MADEP 18-2.1 - 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
5035A - 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: 1180 Boylston Street - RGP
Client Sample ID: 1702642-GEI-101
Date Sampled: 08/28/20 10:45
Percent Solids: N/A

ESS Laboratory Work Order: 20H1034
ESS Laboratory Sample ID: 20H1034-01
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 (5.0)		200.7		1	KJK	09/02/20 23:22	100	10	DH03135
Arsenic	ND (2.5)		3113B		5	KJK	09/01/20 22:59	100	10	DH03135
Cadmium	**EL** ND (1.0)		200.8		50	KJK	09/02/20 13:16	100	10	DH03135
Chromium	**3.8** (2.0)		200.7		1	KJK	09/02/20 23:22	100	10	DH03135
Copper	**6.7** (2.0)		200.7		1	KJK	09/02/20 23:22	100	10	DH03135
Iron	**71.1** (10.0)		200.7		1	KJK	09/02/20 23:22	100	10	DH03135
Lead	**EL** ND (5.0)		200.8		50	KJK	09/02/20 13:16	100	10	DH03135
Mercury	ND (0.20)		245.1		1	MKS	09/02/20 9:38	20	40	DH03140
Nickel	ND (5.0)		200.7		1	KJK	09/02/20 23:22	100	10	DH03135
Selenium	ND (5.0)		3113B		5	KJK	09/02/20 3:19	100	10	DH03135
Silver	ND (1.0)		200.7		1	KJK	09/02/20 23:22	100	10	DH03135
Zinc	**13.2** (5.0)		200.7		1	KJK	09/02/20 23:22	100	10	DH03135

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-GEI-101
Date Sampled: 08/28/20 10:45
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 20H1034
ESS Laboratory Sample ID: 20H1034-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: VSC
Prepared: 8/31/20 17:30

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	09/01/20 18:56	D0H0556	DH03157

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	*58 %*		*15-115*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP
Client Sample ID: 1702642-GEI-101
Date Sampled: 08/28/20 10:45
Percent Solids: N/A

ESS Laboratory Work Order: 20H1034
ESS Laboratory Sample ID: 20H1034-01
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Chloride	**3.5** (0.5)		300.0		1	EEM	09/01/20 19:18	mg/L	DI00122
Total Residual Chlorine	ND (20.0)		4500Cl D		1	JLK	08/31/20 20:40	ug/L	DH03156
Total Suspended Solids	**6** (5)		2540D		1	CCP	09/01/20 16:28	mg/L	DI00128

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1034

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Dissolved Metals										
Batch DH03135 - 3005A/200.7										
Blank										
Antimony	ND	5.0	ug/L							
Chromium	ND	2.0	ug/L							
Copper	ND	2.0	ug/L							
Iron	ND	10.0	ug/L							
Nickel	ND	5.0	ug/L							
Silver	ND	1.0	ug/L							
Zinc	ND	5.0	ug/L							
Blank										
Cadmium	ND	0.1	ug/L							
Lead	0.9	0.5	ug/L							
Blank										
Arsenic	ND	0.5	ug/L							
Selenium	ND	1.0	ug/L							
LCS										
Antimony	43.3	5.0	ug/L	50.00		87	85-115			
Chromium	42.8	2.0	ug/L	50.00		86	85-115			
Copper	45.6	2.0	ug/L	50.00		91	85-115			
Iron	233	20.0	ug/L	250.0		93	85-115			
Nickel	44.6	5.0	ug/L	50.00		89	85-115			
Silver	22.4	1.0	ug/L	25.00		90	85-115			
Zinc	48.1	5.0	ug/L	50.00		96	85-115			
LCS										
Cadmium	23.9	0.5	ug/L	25.00		96	85-115			
Lead	49.8	2.5	ug/L	50.00		100	85-115			
LCS										
Arsenic	45.4	12.5	ug/L	50.00		91	85-115			
Selenium	95.8	25.0	ug/L	100.0		96	85-115			
Batch DH03140 - 245.1/7470A										
Blank										
Mercury	ND	0.20	ug/L							
LCS										
Mercury	5.74	0.20	ug/L	6.042		95	85-115			
LCS Dup										
Mercury	6.18	0.20	ug/L	6.042		102	85-115	7	20	
8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution										
Batch DH03157 - 3535A										
Blank										
1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	*3.57*		ug/L	*5.000*		*71*	*15-115*			
LCS										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1034

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 DH03157 - 3535A										
1,4-Dioxane	13.1	0.250	ug/L	10.00		131	40-140			
Surrogate: 1,4-Dioxane-d8	*3.66*		ug/L	*5.000*		*73*	*15-115*			
LCS Dup										
1,4-Dioxane	12.9	0.250	ug/L	10.00		129	40-140	1	20	
Surrogate: 1,4-Dioxane-d8	*3.81*		ug/L	*5.000*		*76*	*15-115*			
Classical Chemistry										
Batch DH03156 - General Preparation										
Blank										
Total Residual Chlorine	ND	20.0	ug/L							
LCS										
Total Residual Chlorine	1.28		mg/L	1.260		102	85-115			
Batch DI00122 - General Preparation										
Blank										
Chloride	ND	0.5	mg/L							
LCS										
Chloride	9.7		mg/L	10.00		97	90-110			
Batch DI00128 - General Preparation										
Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	90		mg/L	88.00		102	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP ESS Laboratory Work Order: 20H1034

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.
EL	Elevated Method Reporting Limits due to sample matrix (EL).
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
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: 1180 Boylston Street - RGP

ESS Laboratory Work Order: 20H1034

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

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20H1034
Date Received: 8/31/2020
Project Due Date: 9/8/2020
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
    TRC

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:

TRC out of Lab

14. Was there a need to contact Project Manager? (Yes) / No 8/31/20
    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)
1	81190	Yes	N/A	Yes	1L Amber	NP	
1	81191	Yes	N/A	Yes	1L Amber	NP	
1	81192	Yes	N/A	Yes	1L Poly	NP	
1	81193	Yes	N/A	Yes	500 mL Poly	HNO3	

2nd Review

Were all containers scanned into storage/lab? Initials ✓

Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 8/31/20 1638
Reviewed By: Date & Time: 8/31/20 1650
Delivered By: 8/31/20 1650

Chain-of-Custody Record

ESS (Lab use only) 20410347

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: 1180 Boylston Street
Project Location: Brookline, MA
Project Number: 1702642
Project Manager: C. Malagrida

Page _1_ of _1_

Send Report to: Elise Farrington
Send EDD to: labdata@geiconsultants.com

Preservative

HNO3	None

Analysis

Dissolved Metals (filtered in the field)	1,4-Dioxane	Cl/TRC/TSS

Sample Handling

Samples Field Filtered: YES **NO** NA

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY REQUIRED – (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA
Are Drinking Water Samples Submitted? YES (NO) NA
If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Dissolved Metals (filtered in the field)	1,4-Dioxane	Cl/TRC/TSS	Sample Specific Remarks
	1702642-GEI-101	8/28/20	1045	GW	4	CWS	x	x	x	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Turnaround Time (Business days):

Normal __X__ Other ____
10-Day ____ 7-Day ____
5-Day ____ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	8/28/2020	1300	1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge (CWS)	Date: 8/31/20 5/30/21	Time: 1100	Received by: (signature) 2.
Relinquished by: (signature) 3. (CWS)	Date: 8/31/20 5/30/21	Time: 17:00	Received by: (signature) 3.
Relinquished by: (signature) 4.	Date: 8/31/20	Time: 16:06	Received by: (signature) 4.

Additional Requirements/Comments/Remarks:

8/31/2020
C:\Users\csaledas\OneDrive - GEI Consultants, Inc\Desktop\190 COC - Copy

ice temp: 2.8

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 20H1034

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: 1180 Boylston Street

Project Location: Brookline, MA

Project Number: 1702642

Project Manager: C. Malagrida

Send Report to: Elise Farrington

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Preservative

HNO3	None						

Analysis

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Dissolved Metals (filtered in the field)	1,4-Dioxane	Cl/TRC/TSS						
1	1702642-GEI-101	8/28/20	1045	GW	4	CWS	x	x	x						

Sample Handling

Samples Field Filtered: YES **NO** NA

Sampled Shipped With Ice: (YES) NO

Sample Specific Remarks

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	8/28/2020	1300	1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	Date: 8/30/20	Time: 1100	Received by: (signature) 2.
Relinquished by: (signature) 3.	Date: 8/30/20	Time: 11:00	Received by: (signature) 3.
Relinquished by: (signature) 4.	Date: 8/31/20	Time: 16:06	Received by: (signature) 4.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day ____ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Cooler temp: 2.8

Appendix D

Endangered Species Act Eligibility Documentation

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

Our data source for migratory birds information is offline for maintenance until September 5th, 2020. If you need information on migratory birds in your project area, please try back then. We apologize for any inconvenience.

This re abitat (collec jurisdi The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

Norfolk County, Massachusetts

Local office

New England Ecological Services Field Office

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

http://www.fws.gov/newengland

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

NOT FOR CONSULTATION

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis Threatened

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9045

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

MIGRATORY BIRD INFORMATION IS NOT AVAILABLE AT THIS TIME

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

NOT FOR CONSULTATION

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

NOT FOR CONSULTATION

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

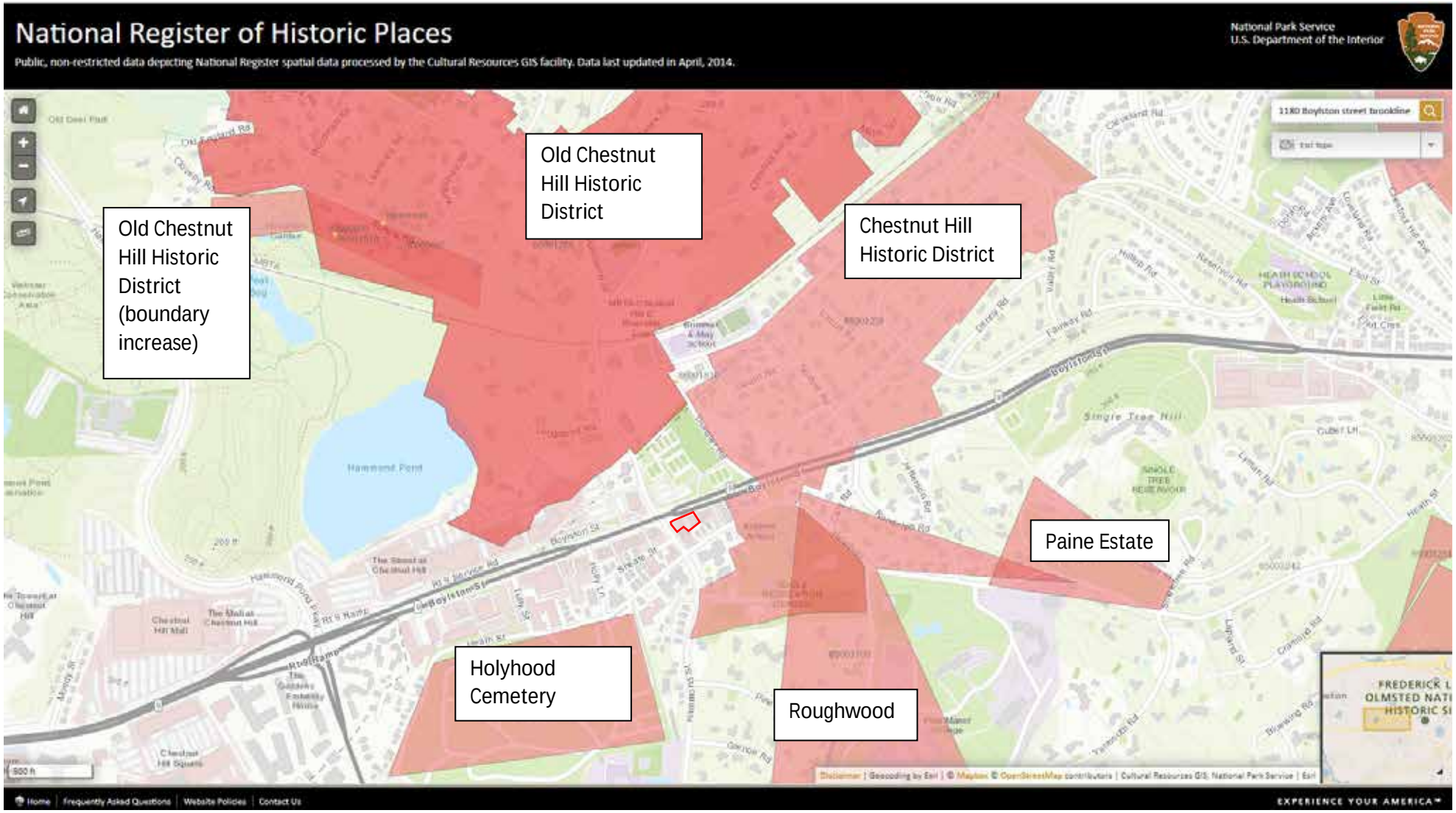
Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

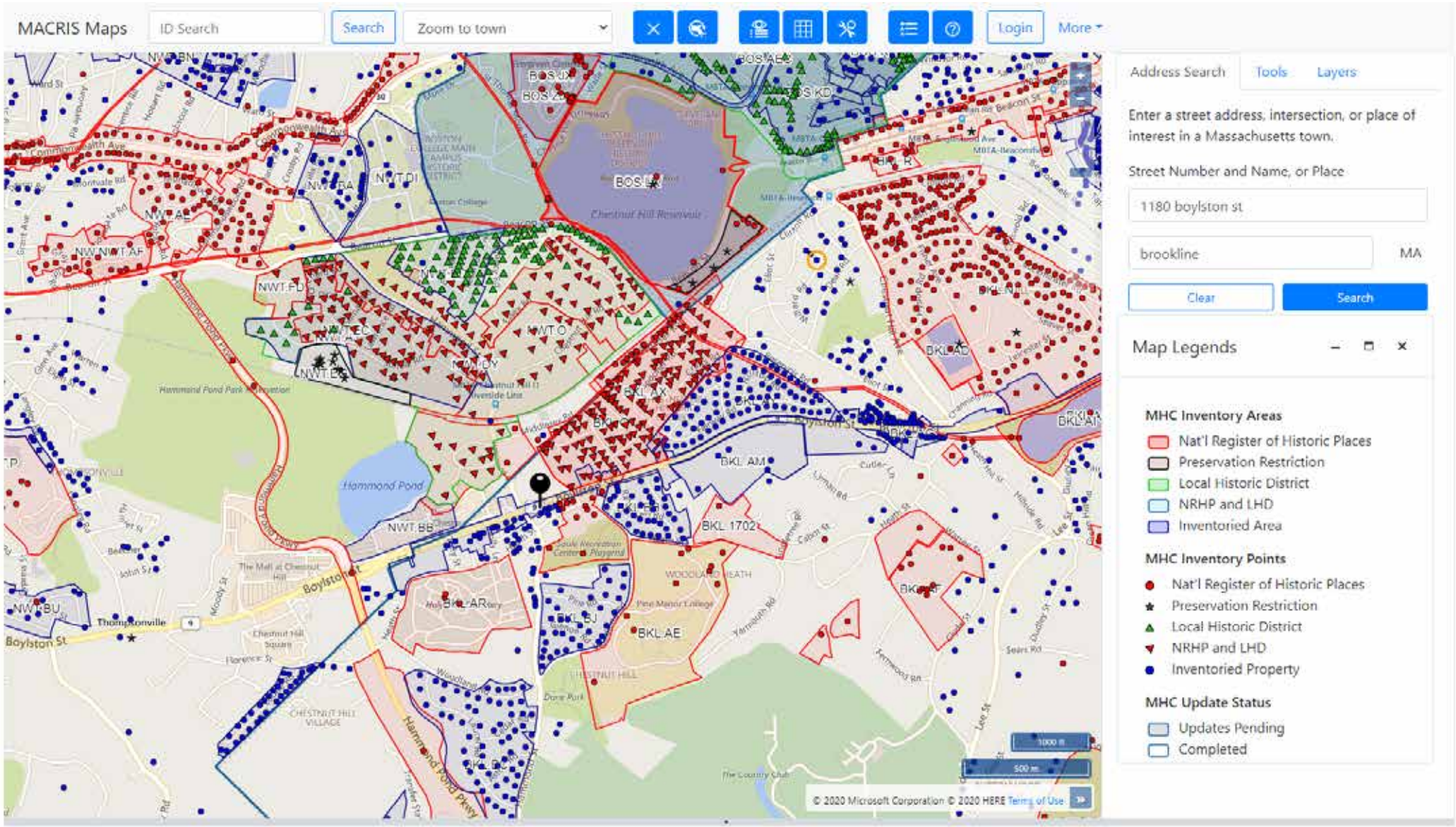
Appendix E

Historic Preservation Documentation



https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466

Accessed on September 2, 2020



https://maps.mhc-macris.net/

Accessed on September 2, 2020

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Brookline; Place: Chestnut Hill; Resource Type(s): Area, Building, Object, Structure, Burial Ground;

Inv. No.	Property Name	Street	Town	Year
BKL.O	Chestnut Hill Historic District		Brookline	
BKL.AG	Boylston Street		Brookline	
BKL.AX	Chestnut Hill North Local Historic District		Brookline	
BKL.1585	Chandler, Lucy House	3 Alwynton Rd	Brookline	1895
BKL.1584	Coffin, William H. House	4 Alwynton Rd	Brookline	1890
BKL.1583	Coffin, William H. House	6 Alwynton Rd	Brookline	1888
BKL.3080	Edinburg, Joseph House	1033 Boylston St	Brookline	1961
BKL.3081	Edinburgh House	1039 Boylston St	Brookline	1980
BKL.1589	Coffin, Rufus House	1101 Boylston St	Brookline	1888
BKL.1590	Wilkinson, Guy House	1106 Boylston St	Brookline	1890
BKL.2106	Moore, Luther House	1109 Boylston St	Brookline	1889
BKL.1588	Chandler, John House	1117 Boylston St	Brookline	1888
BKL.3082	Longyear Museum	1125 Boylston St	Brookline	1997
BKL.1595	Bates, Benjamin E. House	1140 Boylston St	Brookline	1899
BKL.1385	Johnston, C. G. House	1148 Boylston St	Brookline	1915
BKL.2469		1154 Boylston St	Brookline	1979
BKL.2447		1160 Boylston St	Brookline	1896
BKL.2448		1162-1164 Boylston St	Brookline	1908
BKL.2449		1180 Boylston St	Brookline	1982
BKL.2108	Hale House	5 Circuit Rd	Brookline	1912
BKL.2109	Tabor, Arthur H. House	10 Circuit Rd	Brookline	1896
BKL.1568	Miller, Charles S. House	15 Circuit Rd	Brookline	1898
BKL.2786	Bridge, J. Ransom - Sears, Henry Garage	15 Circuit Rd	Brookline	1901
BKL.2110	Foster House	16 Circuit Rd	Brookline	1905
BKL.2787	Chandler, Lucy B. Garage	16 Circuit Rd	Brookline	1915
BKL.2111	Rollins House	20 Circuit Rd	Brookline	1896
BKL.1566	Dodge, Edward W. House	26 Circuit Rd	Brookline	1899

Inv. No.	Property Name	Street	Town	Year
BKL.1569	Miller, Charles S. House	33 Circuit Rd	Brookline	1905
BKL.2788	Dike, George P. Garage	33 Circuit Rd	Brookline	1907
BKL.1570	Stearns, Frederick M. House	37 Circuit Rd	Brookline	1903
BKL.2112	Goodhue House	43 Circuit Rd	Brookline	1895
BKL.2113	Merriman, J. Howard Edwards House	44 Circuit Rd	Brookline	1895
BKL.2114	Fairbanks House	62 Circuit Rd	Brookline	1892
BKL.2115	Burrage House	70 Circuit Rd	Brookline	1892
BKL.902	Cochituate Aqueduct	Cochituate Aqueduct	Brookline	1848
BKL.2116	Salamoto House	17 Crafts Rd	Brookline	1979
BKL.2794	Hayward, George Garage	20 Crafts Rd	Brookline	c 1909
BKL.3014	Tripp, William V. - Baldwin, George L. House	20 Crafts Rd	Brookline	1941
BKL.2117	Hayward House	24 Crafts Rd	Brookline	1901
BKL.2118	Dewey House	27 Crafts Rd	Brookline	1937
BKL.2119	Cabot House	32 Crafts Rd	Brookline	c 1889
BKL.2120	Howe House	35 Crafts Rd	Brookline	c 1892
BKL.2121	Dix House	40-42 Crafts Rd	Brookline	1903
BKL.1552	Guerrier, Edith House	41 Crafts Rd	Brookline	1906
BKL.2122	Tripp, William House	46 Crafts Rd	Brookline	1922
BKL.1553	Eliot, Elizabeth B. House	47 Crafts Rd	Brookline	1892
BKL.2123	Farnham House	65 Crafts Rd	Brookline	1904
BKL.2124	Baker, George B. House	76 Crafts Rd	Brookline	1903
BKL.2125	Goodhue House	79 Crafts Rd	Brookline	1906
BKL.2795	Goodhue, George Garage and Indoor Squash Court	79 Crafts Rd	Brookline	1915
BKL.2126	Baldwin House	96 Crafts Rd	Brookline	1905
BKL.2796	Baldwin, J. T. C. Garage	96 Crafts Rd	Brookline	1914
BKL.2127	Resor House	99 Crafts Rd	Brookline	1913
BKL.2128	Kittredge House	106 Crafts Rd	Brookline	1911
BKL.1554	Sagendorph, George A. House	107 Crafts Rd	Brookline	1910
BKL.2129	Parker, Robert House	119 Crafts Rd	Brookline	1919
BKL.2797	Parker, Robert Garage	119 Crafts Rd	Brookline	1920
BKL.2130	Nesbitt House	127 Crafts Rd	Brookline	1911
BKL.1555	Whitcomb, Lawrence House	128 Crafts Rd	Brookline	1903
BKL.2798	Whitcomb, Lawrence Carriage Barn	128 Crafts Rd	Brookline	1903
BKL.2131	Ware House	135 Crafts Rd	Brookline	1919
BKL.2132	Hopkins, Roland G. House	142 Crafts Rd	Brookline	1905
BKL.2799	Hopkins, Roland G. Garage	142 Crafts Rd	Brookline	1906
BKL.2133	Brown House	153 Crafts Rd	Brookline	1935

Inv. No.	Property Name	Street	Town	Year
BKL.1578	Tabor, Arthur H. - Bates, Benjamin House	17 Devon Rd	Brookline	c 1893
BKL.2809	Kennedy, Daniel E. Garage	17 Devon Rd	Brookline	1908
BKL.1577	Phinney, Charles H. House	27 Devon Rd	Brookline	1898
BKL.2134	Tabor, Arthur H. House	37 Devon Rd	Brookline	1893
BKL.2135	Edmunds House	38 Devon Rd	Brookline	1898
BKL.2136	Ayling House	45 Devon Rd	Brookline	1900
BKL.2810	Ayling, Charles Carriage Barn	45 Devon Rd	Brookline	1901
BKL.2137	McKissock House	48 Devon Rd	Brookline	1895
BKL.2138	Miller, Charles S. House	55 Devon Rd	Brookline	1893
BKL.1579	Summers, William B. House	22 Dunster Rd	Brookline	1896
BKL.1580	Tabor, Arthur H. House	26 Dunster Rd	Brookline	1905
BKL.1581	Cobb, Charles K. House	40 Dunster Rd	Brookline	c 1886
BKL.1582	Rantoul, The	50 Dunster Rd	Brookline	1887
BKL.2812	Jaques, Herbert Carriage Barn	50 Dunster Rd	Brookline	1892
BKL.1594	Bates, Benjamin E. House	83 Dunster Rd	Brookline	1899
BKL.2567	Edinburgh, Joseph House	192 Fairway Rd	Brookline	1952
BKL.1598	Wright, John Gatehouse	648 Hammond St	Brookline	1908
BKL.1599	Wright, John G. Stable and Carriage House	652 Hammond St	Brookline	1897
BKL.1592	Parker, Gustavus D. House	464 Heath St	Brookline	1896
BKL.1591	Frazer, Horace L. House	471 Heath St	Brookline	1890
BKL.961	Untitled Sculpture	476 Heath St	Brookline	
BKL.1593	Bates, Benjamin E. House	476 Heath St	Brookline	1899
BKL.1597	Baldwin School	484 Heath St	Brookline	1927
BKL.1596	Cox, William Estate Employee Housing	495-497 Heath St	Brookline	1900
BKL.1383	Knowles, William Stable	501 Heath St	Brookline	1872
BKL.1377	McGuire, Daniel F. House	512 Heath St	Brookline	1889
BKL.1384	O'Shea, Daniel House	513-515 Heath St	Brookline	1924
BKL.1576	Munsell, Albert H. House	69 Middlesex Rd	Brookline	1915
BKL.1575	Nash, Herbert House	73 Middlesex Rd	Brookline	1894
BKL.2139	Beach House	81 Middlesex Rd	Brookline	c 1895
BKL.1574	Baldwin, George S. House	91 Middlesex Rd	Brookline	1895
BKL.2140	Cook, Charles House	125 Middlesex Rd	Brookline	1894
BKL.2837	Evans, W. A. Garage	125 Middlesex Rd	Brookline	1913
BKL.1567	McKenney, Lewis T. - Foss, Walter F. Houses	132-144 Middlesex Rd	Brookline	1907
BKL.2141	Boland House	137 Middlesex Rd	Brookline	1899
BKL.2838	Faxon, Brooks Garage	137 Middlesex Rd	Brookline	1918
BKL.2142	Hyndman House	145 Middlesex Rd	Brookline	1899
BKL.2143	Ellery, William House	151 Middlesex Rd	Brookline	1929

Inv. No.	Property Name	Street	Town	Year
BKL.1565	Eaton, Ennes House	157 Middlesex Rd	Brookline	1914
BKL.2144	Edmunds House	162 Middlesex Rd	Brookline	c 1910
BKL.2145	Halper Homes Incorporated House	170 Middlesex Rd	Brookline	1955
BKL.2146	Halper Homes Incorporated House	174 Middlesex Rd	Brookline	1955
BKL.1564	Dane, Ernest B. House	175 Middlesex Rd	Brookline	1913
BKL.2839	Meserve, Albert Garage	175 Middlesex Rd	Brookline	1918
BKL.2147	Halper Homes Incorporated House	180 Middlesex Rd	Brookline	1955
BKL.2148	Breed House	190 Middlesex Rd	Brookline	1925
BKL.2149	Rowley, Charles F. House	195 Middlesex Rd	Brookline	1922
BKL.2150	Henry House	206 Middlesex Rd	Brookline	1919
BKL.2151	Manning House	209 Middlesex Rd	Brookline	1914
BKL.2152	Holmes House	210 Middlesex Rd	Brookline	1919
BKL.1561	Frost, George Garage	215 Middlesex Rd	Brookline	1916
BKL.2153	Fisher Hill Company House	218 Middlesex Rd	Brookline	1923
BKL.2154	Flaherty, Frank House	230 Middlesex Rd	Brookline	1928
BKL.2155	Fisher Hill Company House	233 Middlesex Rd	Brookline	1923
BKL.2156	Flaherty, Frank House	234 Middlesex Rd	Brookline	1928
BKL.1559	Fisher Hill Realty and Investment Company House	240 Middlesex Rd	Brookline	1923
BKL.1572	Butler, William E. House	6 Norfolk Rd	Brookline	c 1898
BKL.2840	Butler, William Garage	6 Norfolk Rd	Brookline	1908
BKL.2157	Miller, Edward S. House	14 Norfolk Rd	Brookline	1897
BKL.1573	Nash, Herbert House	15 Norfolk Rd	Brookline	1896
BKL.2158	Miller, Charles S. House	30 Norfolk Rd	Brookline	c 1892
BKL.1571	Foster, Anna S. House	40 Norfolk Rd	Brookline	1898
BKL.2841	Foster, Anna - Fisher, Amy Carriage Barn	40 Norfolk Rd	Brookline	1905
BKL.2159	Rogers House	47 Norfolk Rd	Brookline	1897
BKL.2842	Rogers, E. H. Carriage Barn	47 Norfolk Rd	Brookline	1900
BKL.2160	Ulman, George R. House	52 Norfolk Rd	Brookline	c 1886
BKL.2161	Miller House	55 Norfolk Rd	Brookline	1898
BKL.1586	Chandler, Lucy House	63 Norfolk Rd	Brookline	1895
BKL.2162	Dowd House	66 Norfolk Rd	Brookline	1959
BKL.3083	Shapiro House	76 Norfolk Rd	Brookline	1983
BKL.1587	Cordingly, William R. House	77 Norfolk Rd	Brookline	1894
BKL.903	Brookline Waste Weir	Reservoir Ln	Brookline	r 1847
BKL.3002	McGrady, Michael Carriage Barn	57 Reservoir Ln	Brookline	1889
BKL.1062		155 Reservoir Rd	Brookline	r 1837
BKL.1063	Mooney, Luke House	221 Reservoir Rd	Brookline	c 1857

Inv. No.	Property Name	Street	Town	Year
BKL.2163	Yarchin House	280 Reservoir Rd	Brookline	1951
BKL.1021	Vallandigham, Edward N. House	285 Reservoir Rd	Brookline	1910
BKL.2164	Carey, Francis V. House	295 Reservoir Rd	Brookline	1926
BKL.2165	Merritt House	307 Reservoir Rd	Brookline	1936
BKL.2166	Donovan House	315 Reservoir Rd	Brookline	1963
BKL.2167	Allen House	3 Spooner Rd	Brookline	1906
BKL.2860	Bennett, Edith Garage	3 Spooner Rd	Brookline	1912
BKL.2168	Harvey House	10 Spooner Rd	Brookline	1926
BKL.2169	Barney House	18 Spooner Rd	Brookline	1912
BKL.2170	Turner, Fergus House	24 Spooner Rd	Brookline	1912
BKL.1563	Rogers, Howard L. House	34 Spooner Rd	Brookline	1911
BKL.2171	Bufford House	35 Spooner Rd	Brookline	1911
BKL.2172	Tripp House	41 Spooner Rd	Brookline	1923
BKL.2173	Young House	50 Spooner Rd	Brookline	1910
BKL.2174	Tripp House	51 Spooner Rd	Brookline	1923
BKL.1562	Coffin, Sturgis House	56 Spooner Rd	Brookline	1909
BKL.2861	Coffin, Sturgis Garage	56 Spooner Rd	Brookline	1910
BKL.2175	Sherman House	61 Spooner Rd	Brookline	1913
BKL.2862	Sherman, George M. Garage	61 Spooner Rd	Brookline	1913
BKL.2176	Swenson House	64 Spooner Rd	Brookline	1912
BKL.1560	Frost, George House	72 Spooner Rd	Brookline	1913
BKL.2177	Ewer House	81 Spooner Rd	Brookline	1910
BKL.2178	Lillie House	84 Spooner Rd	Brookline	1915
BKL.1556	Putnam, William E. Jr. House	91 Spooner Rd	Brookline	1909
BKL.2864	Putnam, Walter E. Garage	91 Spooner Rd	Brookline	1912
BKL.2179	Walker House	92 Spooner Rd	Brookline	1925
BKL.2180	Ramsay House	98 Spooner Rd	Brookline	1922
BKL.2181	Bitner House	106 Spooner Rd	Brookline	1925
BKL.1381	Howes, Osborne House	45 Woodland Rd	Brookline	1892