GEI Consultants

Consulting Engineers and Scientists

December 17, 2019 (Revised January 22, 2020)
Project 1703090

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

Ms. Shelly Puleo
Environmental Protection Agency
RGP NOI Processing
5 Post Office Square, Suite 100
Mail Code OEP06-4
Boston, MA 02109-3912

Dear Ms. Puleo:

Re: Notice of Intent
NPDES Remediation General Permit
Proposed Downing Square Housing Development
19R Park Avenue
Arlington, Massachusetts

On behalf of the Housing Corporation of Arlington (HCA), 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 provided in Appendix A.

Site Information

This NOI has been prepared for the discharge of dewatering effluent during construction of the proposed Downing Square housing development located at the intersection of Park Avenue and Lowell Street in Arlington, Massachusetts (the Property; Fig. 1). The Property is an approximately one-acre undeveloped parcel owned by HCA. The Property was formerly occupied by, among other uses, a welding shop, an automotive shop, community vehicle storage garages, and a scrap yard (Fig. 2). HCA plans to redevelop the Property into a multi-family residential housing development (Fig. 3). The Property is a Massachusetts Department of Environmental Protection (MassDEP) disposal site (Release Tracking Number [RTN] 3-24864). As the Property is an open MassDEP disposal site, a MassDEP Bureau of Resource Protection fee is not required.

Redevelopment activities will include the excavation of PCB and other contaminated soils during construction. Because PCBs at concentration greater than or equal to 50 parts per million (ppm) have been detected in the soil, the removal and disposal of all PCB-impacted materials at the Property must be conducted in accordance with the requirements of the Toxic Substances Control Act (TSCA) regulations, along with the Massachusetts Contingency Plan (MCP) regulations.

GEI Consultants, Inc.
400 Unicorn Park Drive, Woburn, MA 01801
781.721.4000 fax: 781.721.4073

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 Town of Arlington catch basins, which discharge to No Name Brook along the Minuteman Bike Path via Outfall OF-56 and then ultimately to Mill Brook, in accordance with the RGP (Fig. 3 and 4).

Owner and Operator Information Owner

Owner
Housing Corporation of Arlington
252 Massachusetts Avenue
Arlington, MA 02474
Contact: Pamela Hallett
Executive Director
(781) 859-5294
phallett@housingcorparlington.org

Operator
NRC East Environmental Services, Inc.
19 National Drive
Franklin, MA 02038
Contact: David Guirguess
Project Manager
(201) 341-9001
dguirguess@nrcc.com

As the owner, HCA has operational control over the construction plans and specifications, including the ability to make modifications to those plans and specifications. NRC East Environmental Services, Inc. of Franklin, 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

Receiving water quality data, collected by GEI on June 28, 2019 on behalf of HCA, was used to support this NOI. A sample from No Name Brook along the Minuteman Bike Path, the receiving water, was collected approximately 15 feet east of the Town of Arlington 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 the associated laboratory data report is in Appendix B. Receiving water temperature was obtained in the field and is noted on the effluent limitations input calculation page in Appendix A.

The seven-day-ten-year flow 7Q10 of the ultimate receiving water (Mill Brook) was established using the U.S. Geological Survey (USGS) StreamStats program and confirmed by the MassDEP on August 1, 2019. The StreamStats report, Dilution Factor calculations, and MassDEP confirmation of the 7Q10 and Dilution Factor are included in Appendix A. The 7Q10 of Mill Brook is 0.126 ft^3/s and the Dilution Factor is 1.56.

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 provided in Appendix A. The resulting calculated effluent limits are in Table 2.

Source Water Information

We evaluated the proposed influent by collecting two groundwater samples from the Property. The groundwater samples were collected from monitoring wells B203(MW) and GZ-3B on June 12, 2019 (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 in Table 2 and the associated laboratory data report for these samples are provided in Appendix C.

The analytical results indicated the presence of ammonia, chloride, metals (cadmium, copper, iron, lead and zinc), cis-1,2-dichloroethene and vinyl chloride (both VOCs), and the following PAHs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluorene, and indeno(1,2,3-cd)pyrene. The measured pH range of the groundwater within the project site was approximately 6.2 standard units (s.u.). Although not detected in these groundwater samples, other contaminants in soil have included PCBs, arsenic, chromium, trichloroethylene, and tetrachloroethylene. These contaminants also have the potential to be present in the source water.

Treatment System Information

During construction, the collected water will be treated to remove suspended solids using a sedimentation tank and bag filters. The proposed conceptual treatment system is shown in the process flow diagram in Fig. 5. Additional treatment may include granulated activated carbon (GAC) and ion exchange, if necessary. 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.

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 anticipate 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 Park Avenue and Lowell Street. These catch basins are identified on Fig. 3 as Proposed Discharge Points 1 and 2. According to plans we reviewed from the Town of Arlington's Engineering Department on May 8, 2019, these catch basins are part of the Town storm water drainage system that discharges to an outfall (OF-56) at No Name Brook along the Minuteman Bike Path, approximately 200 feet from the Site. The discharge path and ultimate discharge outfall at No Name Brook is shown on Fig. 3. No Name Brook follows the Minuteman Bike Path for approximately 0.2 mile before entering an inlet control structure, which ultimately discharges to an outfall at Mill Brook.

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 Property and surrounding areas obtained from both databases are included in Appendix E. Based on the review, the Property is not a listed as a National Historic Place.

The point where the discharge reaches the receiving water (i.e., Outfall 56 to No Name Brook) is not listed as a National Historic Place. The inventory listing from the MACRIS database is included in Appendix E. Files related to the district have not yet been digitized on the National Register of Historic Places database, but the National Register of Historic Places Inventory-Nomination Form 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 HCA, we are requesting coverage under the NPDES RGP for the discharge of treated construction dewatering effluent to the surface waters of Mill Brook via No Name Brook and Town of Arlington 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 in January 2020, although recharge to on-site recharge pits is planned if possible.

Please contact me at 781.721.4012 or igladstone@geiconsultants.com or Ryan Hoffman at 781.721.4091 or rhoffman@geiconsultants.com if you have any questions.

Sincerely,

GEI CONSULTANTS, INC.

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

Ryan Hoffman, P.G., LSP
Environmental Division Manger

MEG/CMM/RSH:jam
Enclosures
c: Pamela Hallett, Housing Corporation of Arlington
David Guirguess, NRC

Tables

Table 1. Chemical Testing Results - Receiving Water (No Name Brook along Minuteman Bike Path)
Downing Square
Housing Corporation of Arlington
Arlington, Massachusetts

		Sample Location:	SW
		Sample Date:	6/28/2019
Analyte	**Method**	**Units**	
Total Metals		ug/L	
Antimony	200.8		<5.0
Arsenic	3113B		<1.0
Cadmium	200.8		<0.2
Chromium, Total	200.7		<2.0
Chromium VI	3500Cr B-2009		<10.0
Copper	200.7		<2.0
Iron	200.7		687
Lead	200.8		<2.0
Mercury	245.1		<0.2
Nickel	200.7		<5.0
Selenium	3113B		<2.0
Silver	200.7		<0.5
Zinc	200.7		24.7
Other			
Hardness	6010C	ug/l	163000
Ammonia as Nitrogen	350.1	ug/l	<0.10
Temperature	Field	Deg C	18.9
pH	Field	S.U.	6.0-6.5

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
Downing Square
Housing Corporation of Arlington
Arlington, Massachusetts

					Sample Location:	B203(MW)	GZ-3B
					Sample Date:	6/11/2019	6/11/2019
					Screen Interval:	4-12	Unknown
Analyte	**Method**	**Units**	**MCP RCGW-2**	**Site Specific Effluent Limits**			
Volatile Organic Compounds (VOCs)		ug/l					
Total BTEX	524.2		NS	100		ND	ND
1,4-Dioxane	8270D-SIM		6,000	200		<0.250	<0.250
Total Non-Halogenated VOCs	524.2		NS	NS		ND	ND
cis-1,2-Dichloroethene				70		<0.5	109
Vinyl Chloride				2		<0.2	9.1
Total Halogenated VOCs	524.2		NS	NS		ND	118.1
Semivolatile Organic Compounds (SVOCs)	625.1 SIM	ug/l					
Total Phthalates			NS	190		ND	ND
Total Group I PAHs			NS	1		0.05	0.36
Total Group II PAHs			NS	100		ND	0.67
Fuel Parameters		ug/l					
Total Petroleum Hydrocarbons	1664A		5,000	5.0		ND	ND
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		<1.0	<1.0
Cadmium	200.8		4	10.2		0.5	<0.2
Chromium, Total	200.7		300	NS		<5.0	<5.0
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		4.4	2.6
Iron	200.7		NS	1,039		5610	858
Lead	200.8		10	160		7.0	<0.5
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		<2.0	<2.0
Silver	200.7		7	35.1		<0.5	<0.5
Zinc	200.7		900	420		54.5	17.0
Dissolved Metals		ug/L					
Antimony	200.8		8,000			<1.00	<1.00
Arsenic	3113B		900			<5.0	<5.0
Cadmium	200.8		4			0.3	<0.2
Chromium, Total	200.7		300			<5.0	<5.0
Copper	200.7		100,000			<2.0	<2.0
Iron	200.7		NS			1850	832
Lead	200.8		10			<1.0	<1.0
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			<0.5	<0.5
Zinc	200.7		900			46.1	11.2
Polychlorinated Biphenlyls (PCBs)	608.3	ug/l					
Total PCBs			5	0.5		ND	ND

Table 2. Chemical Testing Results - Groundwater
Downing Square
Housing Corporation of Arlington
Arlington, Massachusetts

				Sample Location:	**B203(MW)**	**GZ-3B**
				Sample Date:	**6/11/2019**	**6/11/2019**
				Screen Interval:	**4-12**	**Unknown**
Analyte	**Method**	**Units**	**MCP RCGW-2**	**Site Specific Effluent Limits**		
Other						
Ammonia as Nitrogen	350.1	mg/L	NS	Report	0.40	0.1
Cyanide	4500 CN CE		30	178	<5.00	<5.00
Chloride	300.0	mg/L	NS	Report	20.6	3.8
Phenols	420.1	ug/l	NS	1,080	<100	<100
Hardness	200.7	ug/l	NS	NS	147000	97200
Total Residual Chloride	4500CL D	ug/l	NS	12	<20.0	<20.0
Total Suspended Solids	2540D	mg/l	NS	30	108	<5
Temperature	Field	Deg C	NS	NS	10.9	10.7
pH	Field	S.U.	NS	6.5 to 8.3	6.2	6.2

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 3.5 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.

Figures

0 1000 2000 4000 6000

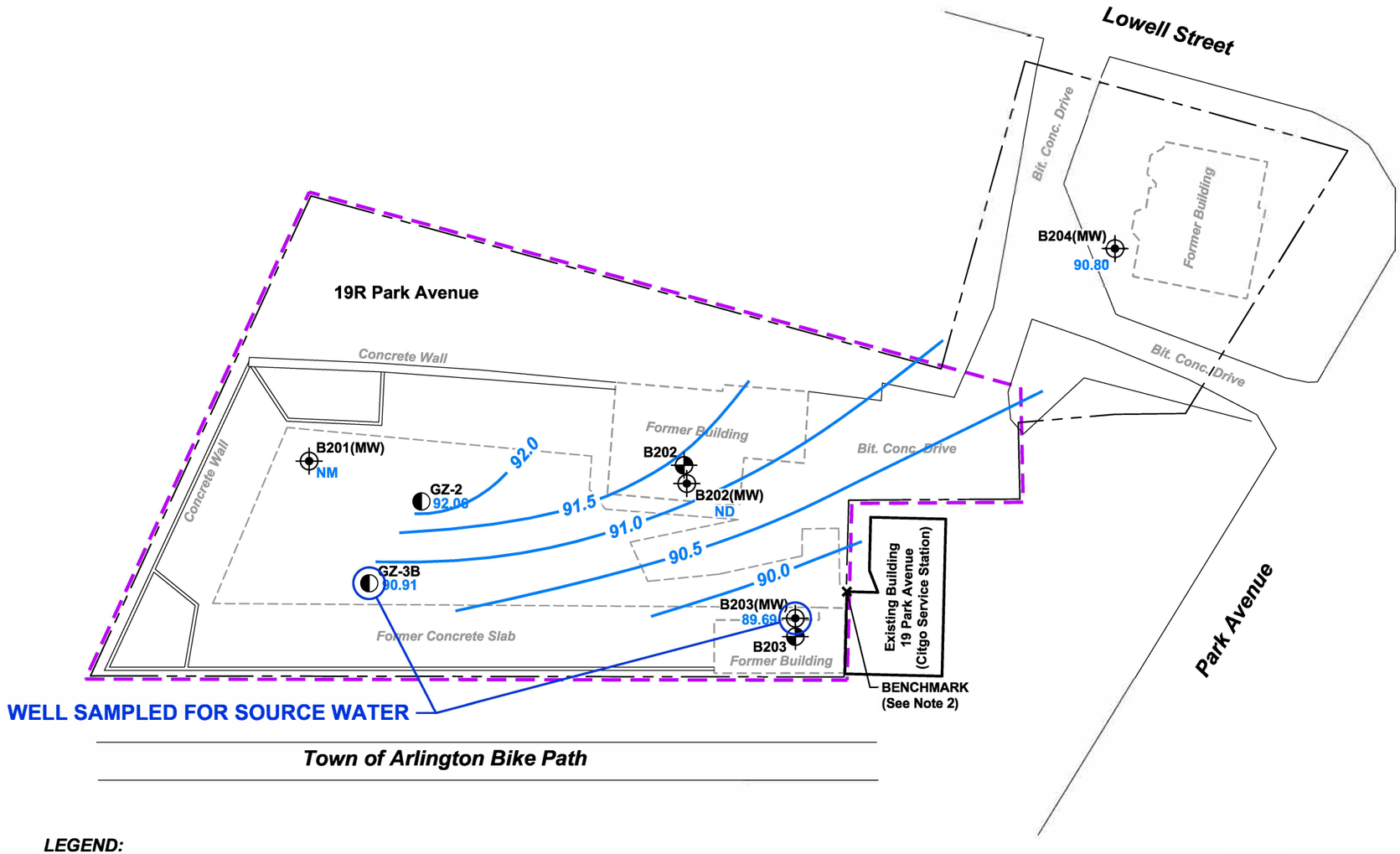
SCALE, FEET

This Image provided by MassGIS is from U.S.G.S.
Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum of 1929 (NGVD29).
Contour Interval is 3 Meters.

MASSACHUSETTS
QUADRANGLE LOCATION

NPDES RGP Notice of Intent Downing Square Arlington, Massachusetts	GEI Consultants	PROPERTY LOCATION MAP
Housing Corporation of Arlington Arlington, Massachusetts	Project 1703090	January 2020 Fig. 1

B:\Working\HOUSING CORPORATION OF ARLINGTON\1703090 Downing Square Environmental\00_CAD\Figures\NPDES RGD 2019\1703090-01



LEGEND:

92.06	GROUNDWATER ELEVATION MEASURED JULY 2016
NM	NOT MEASURED
ND	NOT DETECTED (NO WATER)
91.0	GROUNDWATER ELEVATION CONTOUR, FEET
	MONITORING WELL BY GEI, OCTOBER 2013
	BORING BY GEI, OCTOBER 2013
	MONITORING WELL BY GZA
	DISPOSAL SITE BOUNDARY (RTN-24864)
	PROPERTY LINE (Approximate)

0 40 80

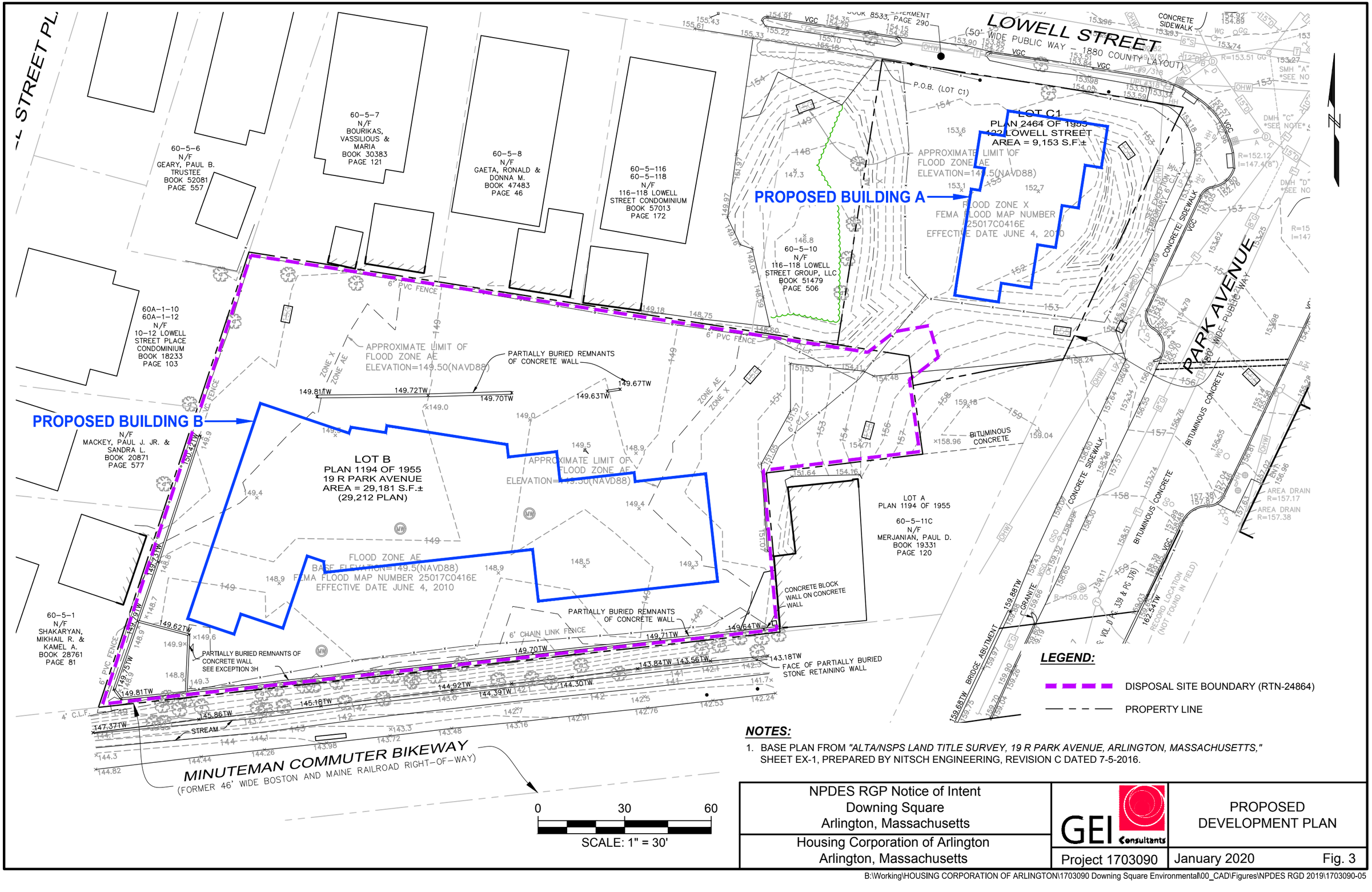
APPROXIMATE SCALE, FEET

NOTES:

1. BASE PLAN DIGITIZED FROM FIGURE TITLED *"LOWELL STREET APTS., ARLINGTON, MASS., EXISTING CONDITIONS PLAN,"* PREPARED BY KEENAN SURVEY AND DATED MARCH 12, 2004.
2. GROUNDWATER ELEVATIONS ARE SURVEYED BASED ON GROUNDWATER LEVELS MEASURED ON 07/08/2016. A RELATIVE BENCHMARK OF 100.00' WAS ASSIGNED TO THE CORNER OF 19 PARK AVE. OTHER ELEVATIONS ARE RELATIVE TO THE BUILDING CORNER.

NPDES RGP Notice of Intent Downing Square Arlington, Massachusetts	GEI Consultants	SITE PLAN
Housing Corporation of Arlington Arlington, Massachusetts	Project 1703090	January 2020 Fig. 2

B:\Working\HOUSING CORPORATION OF ARLINGTON\1703090 Downing Square Environmental\00_CAD\Figures\NPDES RGD 2019\1703090-02



LEGEND:

- DISPOSAL SITE BOUNDARY (RTN-24864)
- PROPERTY LINE

NOTES:

1. BASE PLAN FROM *"ALTA/NSPS LAND TITLE SURVEY, 19 R PARK AVENUE, ARLINGTON, MASSACHUSETTS,"* SHEET EX-1, PREPARED BY NITSCH ENGINEERING, REVISION C DATED 7-5-2016.

NPDES RGP Notice of Intent Downing Square Arlington, Massachusetts	GEI Consultants	PROPOSED DEVELOPMENT PLAN
Housing Corporation of Arlington Arlington, Massachusetts	Project 1703090	January 2020 Fig. 3

B:\Working\HOUSING CORPORATION OF ARLINGTON\1703090 Downing Square Environmental\00_CAD\Figures\NPDES RGD 2019\1703090-05

0 60 120

Approximate Scale, Feet

NPDES RGP Notice of Intent
Downing Square
Arlington, Massachusetts

Housing Corporation of Arlington
Arlington, Massachusetts

GEI Consultants

DISCHARGE AND OUTFALL LOCATIONS

Project 1703090 | January 2020 | Fig. 4

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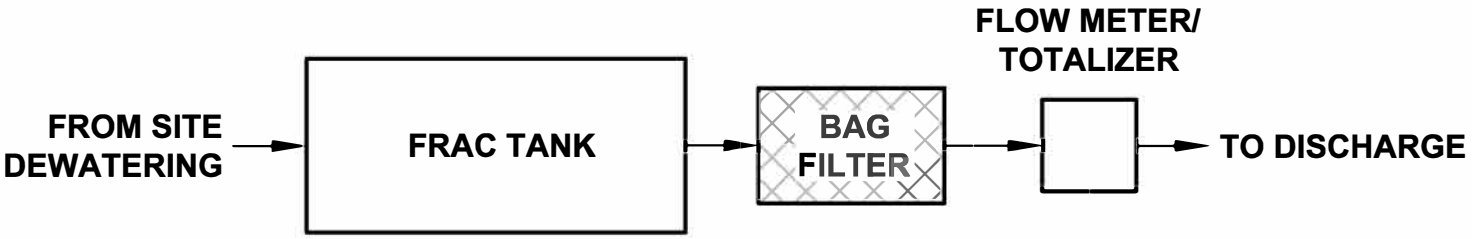


PROCESS FLOW DIAGRAM

Not to Scale

NPDES RGP Notice of Intent Downing Square Arlington, Massachusetts		GEI Consultants	PROCESS FLOW DIAGRAM
Housing Corporation of Arlington Arlington, Massachusetts		Project 1703090	January 2020 Fig. 5

B:\Working\HOUSING CORPORATION OF ARLINGTON\1703090 Downing Square Environmental\00_CAD\Figures\NPDES RGD 2019\1703090-03

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:
Downing Square</td><td colspan="3">Site address: 19 R Park Avenue
Street:</td></tr>
<tr><td>City: Arlington</td><td>State: MA</td><td>Zip: 02476</td></tr>
<tr><td rowspan="4">2. Site owner
Housing Corporation of Arlington

Owner is (check one): ☐ Federal ☐ State/Tribal ■ Private
☐ Other; if so, specify:</td><td colspan="3">Contact Person: Pamela Hallett</td></tr>
<tr><td colspan="2">Telephone: (781) 859-5294</td><td>Email: phallett@housingcorparlington.org</td></tr>
<tr><td colspan="3">Mailing address: 252 Massachusetts Avenue
Street:</td></tr>
<tr><td>City: Arlington</td><td>State: MA</td><td>Zip: 02474</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner
NRC East Environmental Services</td><td colspan="3">Contact Person: David Guirguess</td></tr>
<tr><td colspan="2">Telephone: (201) 341-9001</td><td>Email: dguirguess@nrcc.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: 19 National Drive</td></tr>
<tr><td>City: Franklin</td><td>State: MA</td><td>Zip: 02038</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):
3-24864
☐ 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):
Mill Brook	MA71-07	B

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

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

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

3. Indicate if the receiving water(s) is listed in the State's Integrated List of Waters (i.e., CWA Section 303(d)). Include which designated uses are impaired, and any pollutants indicated. Also, indicate if a final TMDL is available for any of the indicated pollutants. For more information, contact the appropriate State as noted in Part 4.6 of the RGP. Impaired water body - see attached Table 1 for impairment pollutants and completed TMDLs

4. Indicate the seven day-ten-year low flow (7Q10) of the receiving water determined in accordance with the instructions in Appendix V for sites located in Massachusetts and Appendix VI for sites located in New Hampshire.	0.126 cfs
5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire.	1.56

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: 08/01/2019

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 PCBs, metals, VOCs (RTN 3-24864)	
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): OF-56 (Town of Arlington	Outfall location(s): (Latitude, Longitude) 42.42546 degrees N 71.18216 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 Town of Alrington 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): January 2020 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="4">☐ 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	400	250	Report mg/L	---
Chloride		✔	2	300.0	50000	20600	12200	Report µg/l	---
Total Residual Chlorine	✔		2	4500CLD	20.0	< 20.0	0	0.2 mg/L	12
Total Suspended Solids		✔	2	2540D	0.005	10800	10800	30 mg/L	---
Antimony		✔	2	200.8	5.0	<5.0	0	206 µg/L	721
Arsenic		✔	2	3113B	1.0	<1.0	0	104 µg/L	11
Cadmium		✔	2	200.8	0.20	0.5	0.5	10.2 µg/L	0.3631
Chromium III		✔	2	200.7	10.0	<10.0	0	323 µg/L	117.8
Chromium VI	✔		2	3500Cr	10.0	<10.0	0	323 µg/L	12.9
Copper		✔	2	200.7	2.0	4.4	3.5	242 µg/L	12.9
Iron		✔	2	200.7	50.0	5610	3234	5,000 µg/L	1039
Lead		✔	2	200.8	1.0	7.0	3.75	160 µg/L	4.84
Mercury	✔		2	245.1	0.2	< 0.2	0	0.739 µg/L	1.02
Nickel	✔		2	200.7	5.0	< 5.0	0	1,450 µg/L	71.7
Selenium	✔		2	3113B	2.0	< 2.0	0	235.8 µg/L	5.6
Silver	✔		2	200.7	0.5	< 0.5	0	35.1 µg/L	6.4
Zinc		✔	2	200.7	2.0	54.75	35.75	420 µg/L	161.7
Cyanide	✔		2	4500CNC	5.0	<5.0	0	178 mg/L	5.9
B. Non-Halogenated VOCs									
Total BTEX	✔		2	524.2	0.5	< 0.5	0	100 µg/L	---
Benzene	✔		2	524.2	0.5	< 0.5	0	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	100	< 100	0	1,080 µg/L	338

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	1.8
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	< 0.5	0	5.0 µg/L	3.7
cis-1,2 Dichloroethylene		✔	2	524.2	5.0	109	54.75	70 µg/L	---
Vinyl Chloride		✔	2	524.2	0.2	9.1	9.1	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	2.5
Total Group I PAHs		✔	2	625.1 SIM	0.05	0.36	0.205	1.0 µg/L	---
Benzo(a)anthracene		✔	2	625.1 SIM	0.05	0.06	0.06	As Total PAHs	0.0043
Benzo(a)pyrene		✔	2	625.1 SIM	0.05	0.05	0.05		0.0043
Benzo(b)fluoranthene		✔	2	625.1 SIM	0.05	0.06	0.06		0.0043
Benzo(k)fluoranthene		✔	2	625.1 SIM	0.05	0.07	0.06		0.0043
Chrysene		✔	2	625.1 SIM	0.05	0.07	0.06		0.0043
Dibenzo(a,h)anthracene		✔	2	625.1 SIM	0.05	0.06	0.06		0.0043
Indeno(1,2,3-cd)pyrene		✔	2	625.1 SIM	0.05	0.06	0.06		0.0043

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	0.67	0.67	100 µg/L	---
Naphthalene		✔	2	625.1 SIM	0.20	< 0.20	0	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	<5000	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	23
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	6.19 S.U	6.19 S.U.		
Temp		✔	2	NA	NA	51.7 deg F	50.72 deg F		
Hardness		✔	2	200.7	824	147000	122100		

E. Treatment system information

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

☐ Adsorption/Absorption ☐ Advanced Oxidation Processes ☐ Air Stripping ☐ Granulated Activated Carbon ("GAC")/Liquid Phase Carbon Adsorption
☐ Ion Exchange ☐ Precipitation/Coagulation/Flocculation ■ Separation/Filtration ■ Other; if so, specify:
Granulated activated carbon, ion exchange, and other treatments as need to meet effluent limits.

2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge.
Prior to discharge, dewatering effluent will be routed through a fractionation tank, bag filters, and other treatment as need 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 meeting the requirements of this general permit will be implemented on the Site.	
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: Pamela Hallett	Date: 12-17-2018
Print Name and Title: PAMELA HALLETT EXECUTIVE DIRECTOR	

J. Certification requirement

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

BMPP certification statement:	A BMPP meeting the requirements of this general permit will be implemented on the Site.
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: 12/17/2019
Print Name and Title: David Guirguess, Project Manager	

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

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	Impaired
Primary Contact Recreation	Recreation	Impaired
Secondary Contact Recreation	Recreation	Impaired

Causes of Impairment for Reporting Year 2014

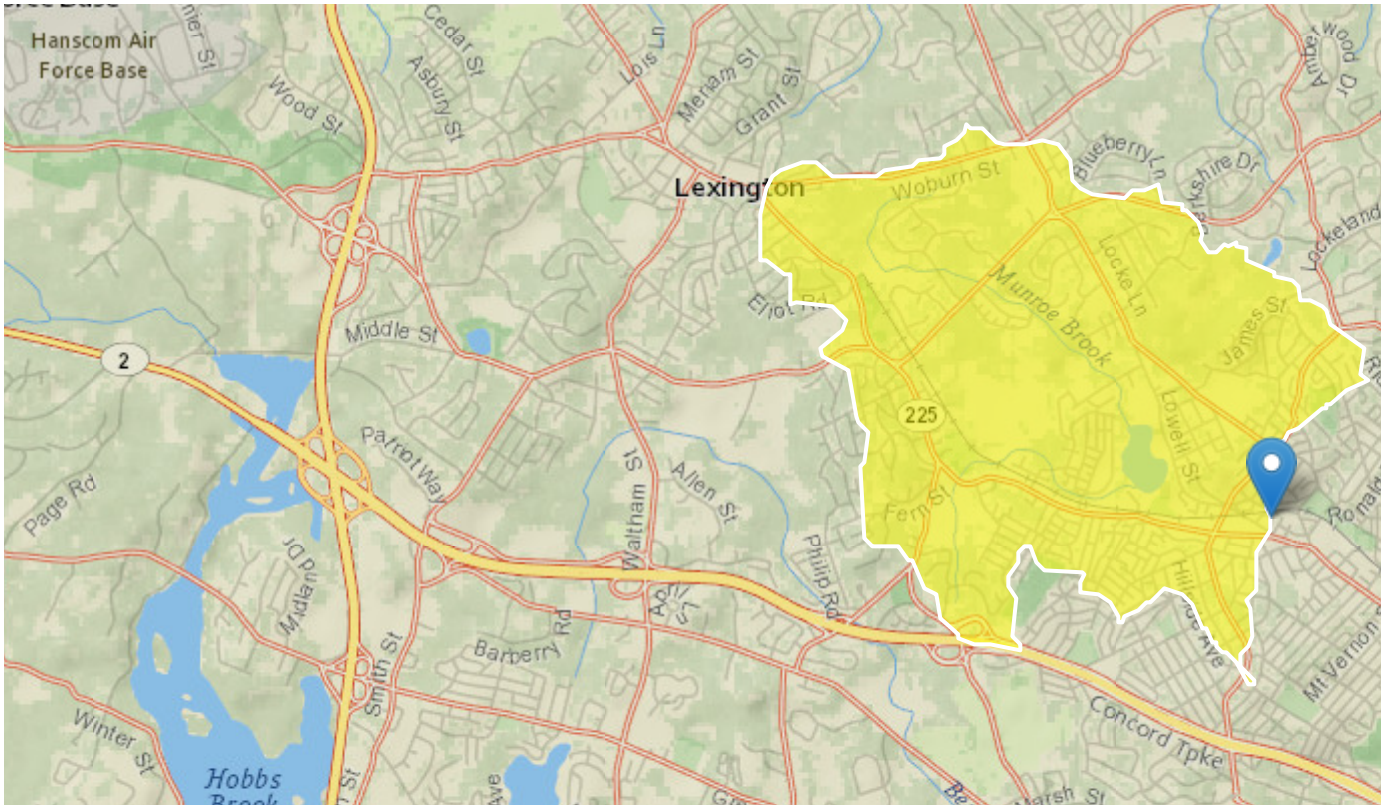
Cause of Impairment	Cause of Impairment Group	Designated Use(s)	State TMDL Development Status
Escherichia Coli (E. Coli)	Pathogens	Primary Contact Recreation, Secondary Contact Recreation	TMDL needed
Physical Substrate Habitat Alterations	Habitat Alterations	Fish, Other Aquatic Life and Wildlife	Non-pollutant impairment

Sources:

1. Information obtained from EPA website: https://ofmpub.epa.gov/waters10/attains_index.home on July 24, 2019.
2. Massachusetts Year 2016 Integrated List of Waters, Massachusetts Division of Watershed Management Watershed Planning Program, June 2017.

StreamStats Report

Region ID: MA
Workspace ID: MA20190718134204081000
Clicked Point (Latitude, Longitude): 42.42517, -71.17820
Time: 2019-07-18 09:42:19 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	3.72	square miles
BSLDEM250	Mean basin slope computed from 1:250K DEM	2.466	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	0.17	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	3.72	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	2.466	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.17	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

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

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

Statistic	Value	Unit	PII	PIu	SE	SEp
7 Day 2 Year Low Flow	0.317	ft^3/s	0.115	0.846	49.5	49.5
7 Day 10 Year Low Flow	0.126	ft^3/s	0.0356	0.417	70.8	70.8

Low-Flow Statistics Citations

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

Application Version: 4.3.8

Remediation General Permit – Notice of Intent

Dilution Factor Calculation

Purpose and Approach:

Calculate the Dilution Factor (DF) for project based on 7 Day 10 Year (7Q10) Low Flow values and EPA formula:

DF = (Qd + Qs)/Qd where: Qd = Maximum flow rate of discharge in cubic feet per second (cfs)

Qs = Receiving water 7Q10 flow in cfs

Assumptions:

1. 7Q10 is 0.126 cfs (from StreamStats 4.3.8)
2. A conversion of 7.48 is used to convert cubic feet to gallons.
3. A design discharge flowrate of 100 gpm is assumed.

Calculations:

7Q10 Low Flow value (Qs):

$$Qs = \frac{0.126\ ft3}{S}\ X\ \frac{7.48\ gal}{ft3}\ X\ \frac{86{,}400\ s}{day}\ X\ \frac{1\ MG}{1{,}000{,}000\ gallons}$$

$$Qs = 0.081\ MGD$$

Discharge Flow Rate (Qd):

$$Qd = \frac{100\ gallons}{min} X\ \frac{1{,}440\ min}{day}\ X\ \frac{1MG}{1{,}000{,}000\ gallons}$$

$$Qd = 0.144\ MGD$$

Dilution Factor (DF):

$$DF = \frac{Qs + Qd}{Qd} = \frac{0.081\ MGD + 0.144\ MG}{0.144\ MGD} = 1.56$$

Greer, Molly

From: Ruan, Xiaodan (DEP) <xiaodan.ruan@state.ma.us>
Sent: Thursday, August 01, 2019 9:30 AM
To: Malagrida, Catherine
Cc: Hoffman, Ryan; Greer, Molly; Vakalopoulos, Catherine (DEP)
Subject: [EXT] RE: NPDES RGP NOI - 7Q10 and DF

Thanks Cat for the information.

I can confirm that the 7Q10 value of 0.126 cfs and a dilution factor of 1.56 for the proposed discharge from 19 Rear Park Avenue, Arlington to the Mill Brook are correct.

To assist you with filling out the NOI for coverage under the RGP, this segment of the Mill Brook, within Boston Harbor Watershed is identified as MA71-07, classified as Class B, and is not listed as an Outstanding Resource Water. There is one approved TMDL for pathogens (https://www.mass.gov/files/documents/2018/12/06/bharbor1.pdf). To see the causes of impairments, go to: https://www.mass.gov/files/documents/2016/08/sa/14list2_0.pdf and search for "MA71-07".

Note that if this is not a *current* MCP site, you must apply to MassDEP alongside submittal of the NOI by following the instructions at: https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of-intent. There is a $500 fee unless the applicant is fee-exempt (e.g. a municipality).

Please let me know if you have any questions.

Thanks,
Xiaodan

From: Malagrida, Catherine [mailto:CMalagrida@geiconsultants.com]
Sent: Wednesday, July 31, 2019 8:48 AM
To: Ruan, Xiaodan (DEP)
Cc: Hoffman, Ryan; Greer, Molly; Vakalopoulos, Catherine (DEP)
Subject: RE: NPDES RGP NOI - 7Q10 and DF

Hi Xiaodan

The address for the construction site is 19 Rear Park Avenue, Arlington, Mass. The design flow for the system is 100 gpm.

Thanks, Cat

GEI
CATHERINE M. MALAGRIDA, P.G.
Project Manager
781.721.4025 cell: 339.221.3521 fax: 781.721.4073
400 Unicorn Park Drive, Woburn, MA 01801

From: Ruan, Xiaodan (DEP) <xiaodan.ruan@state.ma.us>
Sent: Tuesday, July 30, 2019 11:19 AM
To: Malagrida, Catherine <CMalagrida@geiconsultants.com>
Cc: Hoffman, Ryan <RHoffman@geiconsultants.com>; Greer, Molly <mgreer@geiconsultants.com>; Vakalopoulos, Catherine (DEP) <catherine.vakalopoulos@state.ma.us>
Subject: [EXT] RE: NPDES RGP NOI - 7Q10 and DF

Hi Catherine,

Could you please provide the address for the construction site and the design flow of the system? The design flow in the RGP is defined as flow though the component in the treatment system with the most restricted flow.

Thanks,
Xiaodan

From: Malagrida, Catherine [mailto:CMalagrida@geiconsultants.com]
Sent: Monday, July 29, 2019 3:44 PM
To: Ruan, Xiaodan (DEP)
Cc: Hoffman, Ryan; Greer, Molly
Subject: NPDES RGP NOI - 7Q10 and DF

Hi Xiaodan,

I am preparing an RGP NOI for an upcoming construction project in Arlington, Mass. Dewatering effluent will be discharged to the Town of Arlington stormwater system which discharges to an unnamed brook adjacent to the Arlington Bike Path. This is the location where we collected our receiving water sample for our RGP.

However, no StreamStats information was available for the stormwater outfall location into the unnamed brook. According to the Town of Arlington, the unnamed brook ultimately drains to Mill Brook. I have attached a figure showing the location of intersection between the unnamed brook and Mill Brook. Mill Brook does have StreamStats data and this intersection is the location we used to generate our 7Q10 and dilution factor. From StreamStats, we have a 7Q10 of 0.126cfs and a dilution factor of 1.56.

Could you please confirm the 7Q10 and dilution factor and let me know if you need any additional information.

Thanks, Cat

GEI
CATHERINE M. MALAGRIDA, P.G.
Project Manager
781.721.4025 cell: 339.221.3521 fax: 781.721.4073
400 Unicorn Park Drive, Woburn, MA 01801

Enter number values in green boxes below

Enter values in the units specified

↓

0.126	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

↓

1.56

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

↓

6.5	pH in **Standard Units**
19	Temperature in **°C**
0	Ammonia in **mg/L**
163	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**
0	Copper in **µg/L**
687	Iron in **µg/L**
0	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
24.7	Zinc in **µg/L**

Enter **influent** concentrations in the units specified

↓

0	TRC in **µg/L**
0.25	Ammonia in **mg/L**
0	Antimony in **µg/L**
0	Arsenic in **µg/L**
0.35	Cadmium in **µg/L**
0	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
3.5	Copper in **µg/L**
3234	Iron in **µg/L**
3.75	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
35.75	Zinc in **µg/L**
0	Cyanide in **µg/L**
0	Phenol in **µg/L**
0	Carbon Tetrachloride in **µg/L**
0	Tetrachloroethylene in **µg/L**
0	Total Phthalates in **µg/L**
0	Diethylhexylphthalate in **µg/L**
0.06	Benzo(a)anthracene in **µg/L**
0.05	Benzo(a)pyrene in **µg/L**
0.06	Benzo(b)fluoranthene in **µg/L**
0.06	Benzo(k)fluoranthene in **µg/L**
0.06	Chrysene in **µg/L**
0.06	Dibenzo(a,h)anthracene in **µg/L**
0.06	Indeno(1,2,3-cd)pyrene in **µg/L**
0	Methyl-tert butyl ether in **µg/L**

Notes:

Freshwater: Q_R equal to the 7Q10; enter alternate Q_R if approved by the State; enter 0 if no dilution factor approved

Saltwater (estuarine and marine): enter Q_R if approved by the State; enter 0 if no entry

Discharge flow is equal to the design flow or 1 MGD, whichever is less

Only if approved by State as the entry for Q_R; leave 0 if no entry

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

Leave 0 if no entry

Freshwater only

pH, temperature, and ammonia required for all discharges

Hardness required for freshwater

Salinity required for saltwater (estuarine and marine)

Metals required for all discharges if present and if dilution factor is > 1

Enter 0 if non-detect or testing not required

if >1 sample, enter maximum

if >10 samples, may enter 95th percentile

Enter 0 if non-detect or testing not required

Dilution Factor	1.1					
A. Inorganics	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
Ammonia	**Report**	mg/L	---			
Chloride	**Report**	µg/L	---			
Total Residual Chlorine	0.2	mg/L	**12**	µg/L	50	µg/L
Total Suspended Solids	**30**	mg/L	---			
Antimony	**206**	µg/L	721	µg/L		
Arsenic	**104**	µg/L	11	µg/L		
Cadmium	**10.2**	µg/L	0.3631	µg/L		
Chromium III	**323**	µg/L	117.8	µg/L		
Chromium VI	**323**	µg/L	12.9	µg/L		
Copper	**242**	µg/L	12.9	µg/L		
Iron	5000	µg/L	**1039**	µg/L		
Lead	**160**	µg/L	4.84	µg/L		
Mercury	**0.739**	µg/L	1.02	µg/L		
Nickel	**1450**	µg/L	71.7	µg/L		
Selenium	**235.8**	µg/L	5.6	µg/L		
Silver	**35.1**	µg/L	6.4	µg/L		
Zinc	**420**	µg/L	161.7	µg/L		
Cyanide	**178**	mg/L	5.9	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	338	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	**4.4**	µg/L	1.8	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	3.7	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	2.5	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---			
Benzo(a)anthracene	1.0	µg/L	**0.0043**	µg/L	0.1	µg/L
Benzo(a)pyrene	1.0	µg/L	**0.0043**	µg/L	0.1	µg/L
Benzo(b)fluoranthene	1.0	µg/L	**0.0043**	µg/L	0.1	µg/L
Benzo(k)fluoranthene	1.0	µg/L	**0.0043**	µg/L	0.1	µg/L
Chrysene	1.0	µg/L	**0.0043**	µg/L	0.1	µg/L
Dibenzo(a,h)anthracene	1.0	µg/L	**0.0043**	µg/L	0.1	µg/L
Indeno(1,2,3-cd)pyrene	1.0	µg/L	**0.0043**	µg/L	0.1	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	**100**	µg/L	---			
Naphthalene	**20**	µg/L	---			
E. Halogenated SVOCs						
Total Polychlorinated Biphenyls	**0.000064**	µg/L	---		0.5	µg/L
Pentachlorophenol	**1.0**	µg/L	---			
F. Fuels Parameters						
Total Petroleum Hydrocarbons	**5.0**	mg/L	---			
Ethanol	**Report**	mg/L	---			
Methyl-tert-Butyl Ether	**70**	µg/L	23	µg/L		
tert-Butyl Alcohol	**120**	µg/L	---			
tert-Amyl Methyl Ether	**90**	µg/L	---			

Applications
- Automotive
- Biodiesel
- Dairy Industry
- Industrial Wastewater
- Food Processing Industry
- Iron Removal
- Latex Removal
- Metals Treatment
- Mining Industry
- Municipal Wastewater
- Odor Control
- Petrochemical Industry
- Poultry Industry

Products
- Activated Carbon
- 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
- 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

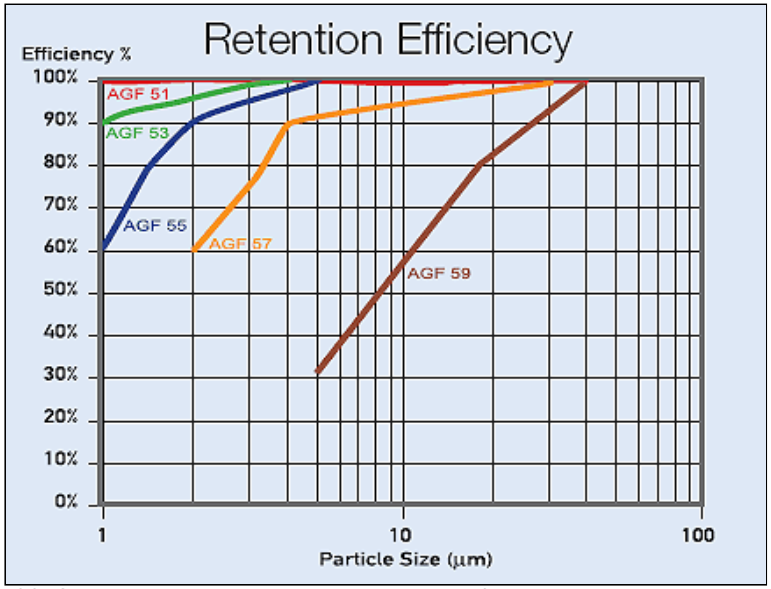
OPERATIONALCONSIDERATIONS

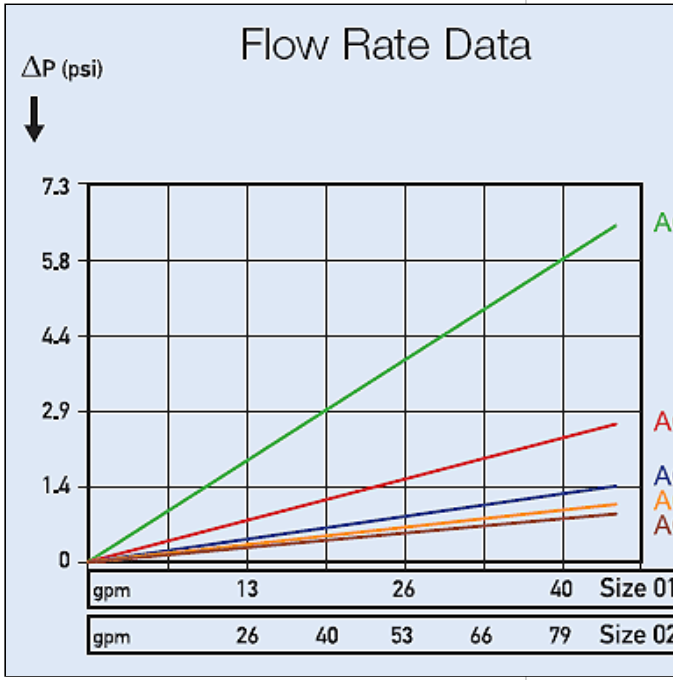
Bag Positioner

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

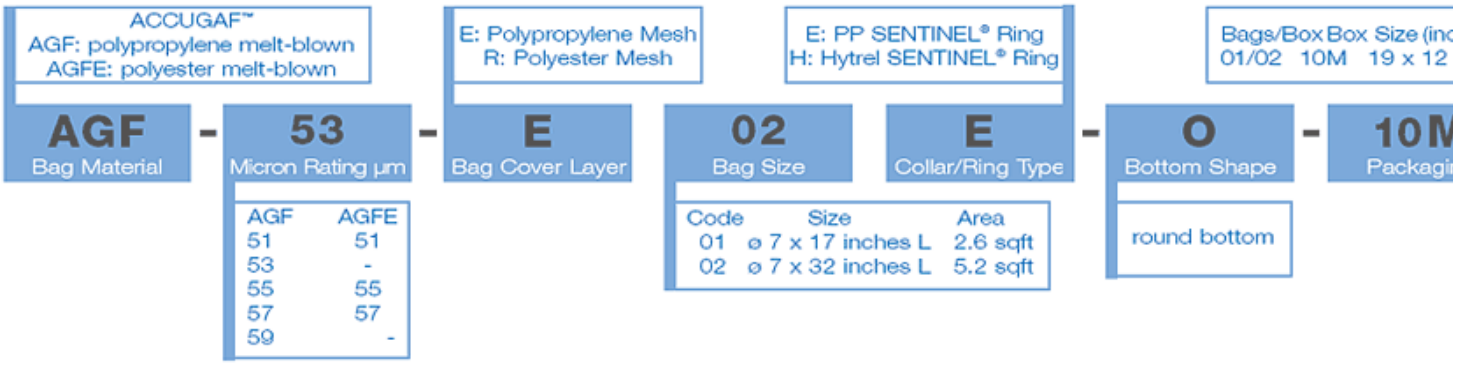
ACCUGAF polypropylene filter bags are fabricated from microfiber filtration media. These materials are hydro-phobic, indicating that water will not wet the fiber surfaces.As will a polypropylene filters, a lower surface tension fluid (wetting agent) must be used to wet the media prior to introducing 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

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- Metals Treatment
- Mining Industry
- Municipal Wastewater
- Odor Control
- Petrochemical Industry
- Poultry Industry

Products
- Activated Carbon
- 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.

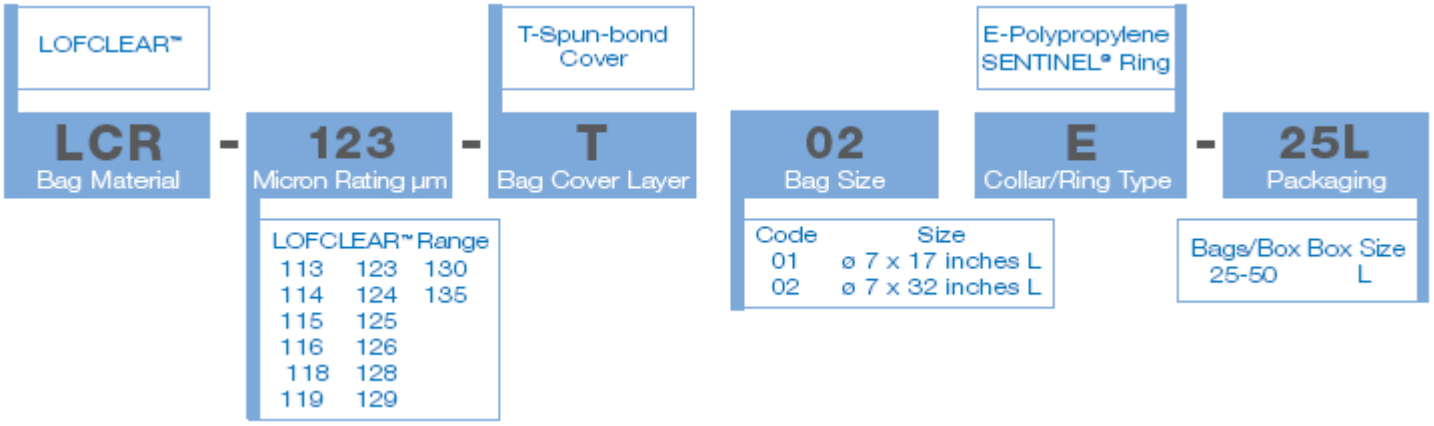
LOFCLEAR Series 500 Filter Bags are available in four different efficiency ratings so you can choose your exact required filtration efficiency. LOFCLEAR Filter Bags have filtration efficiencies from 95 to 99%, with a dirt holding capacity of over 2 pounds.

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.

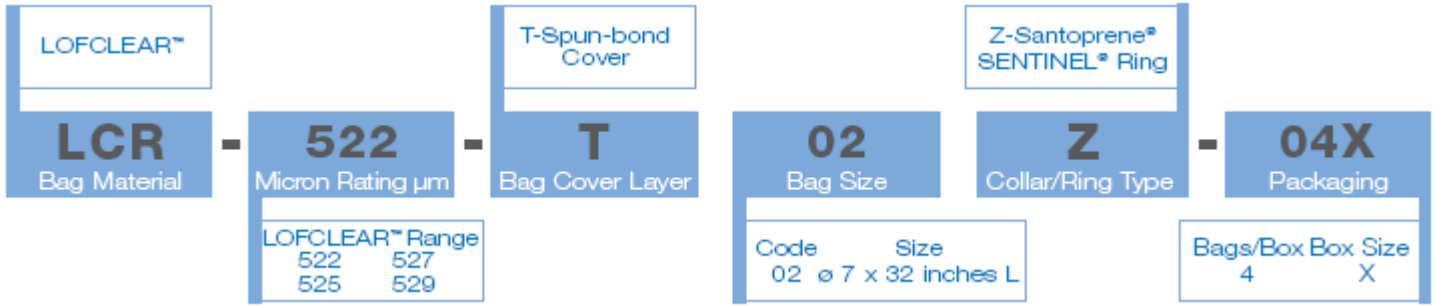
Operational Considerations

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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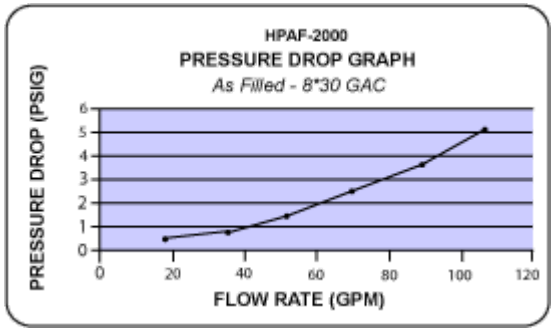
- Microbial Bacteria
- Oil/Water Separators
- Ozone
- Pressure Filtration
- Screens
- Separators/Strainers

Liquid Phase V essels > HPAF 2000

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:

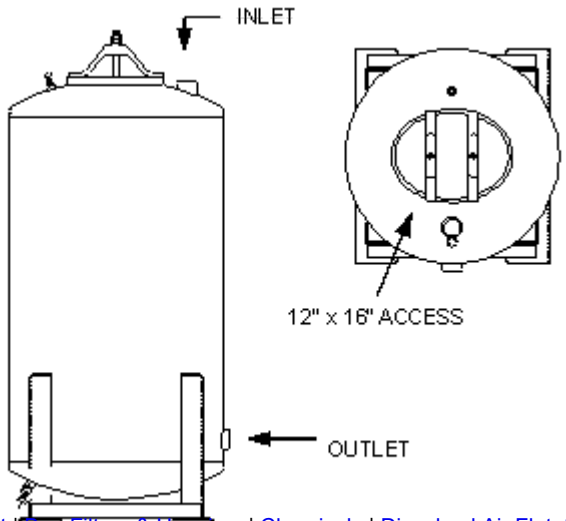
- Dissolved Organic Removal (Activated Carbon)
- Suspended Solids Removal (Sand Filter)
- Dissolved Minerals (Softener Resin)
- Oil and Grease Removal (Organo-Clays)
- Dissolved and Precipitated Metals Removal
- Special Organics (Resin/Carbon Blend)
- Catalytic Reactor (Chlorine and Peroxide Removal)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

GENERAL CARBON CORP.

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

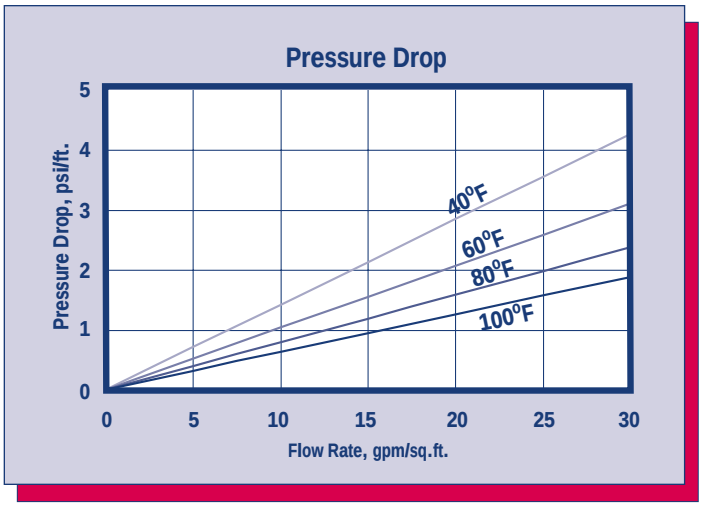
RESINTECH CGS is a high purity, light colored, high capacity, gel type sulfonated polystyrene cation resin supplied in the sodium form as moist, tough uniform spherical beads. *ResinTech CGS* specifically is intended for use in all water softening applications,including beverages, potable water and water 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.)

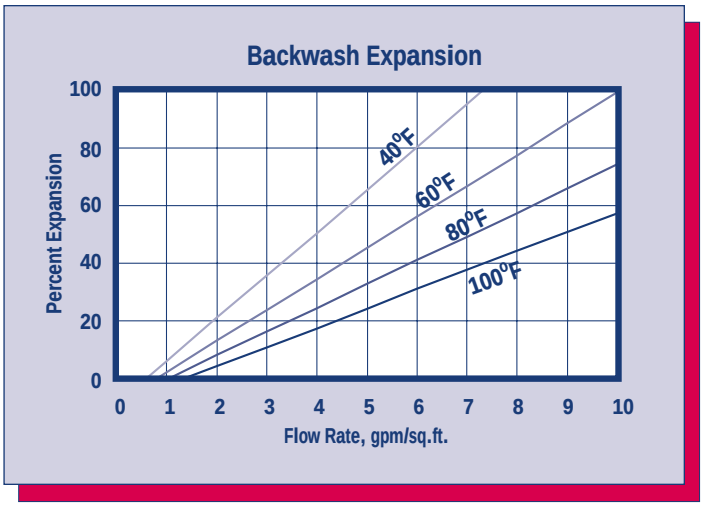
FEATURES & BENEFITS

- **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.

SBG1

ANION EXCHANGE RESIN TYPE ONE GEL Cl OR OH FORM

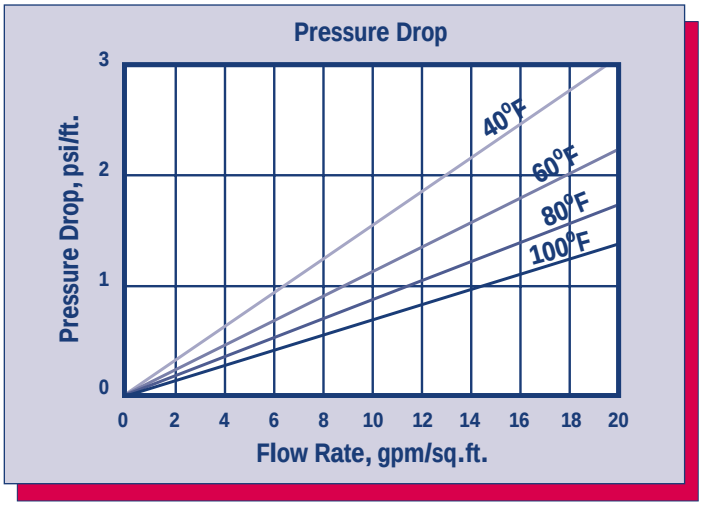
ResinTech SBG1 is a high capacity, shock resistant, gelular, Type 1, strongly basic anion exchange resin supplied in the chloride or hydroxide form as moist, tough, uniform, spherical beads. *ResinTech SBG1* is intended for use in all types of deionization systems and chemical processing applications. 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.

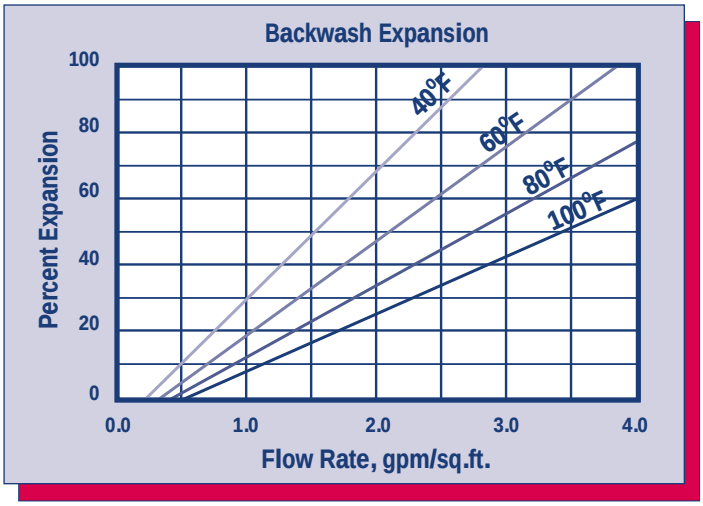
FEATURES & BENEFITS

- **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 $NaOH/ft^3$	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.

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.

Appendix B

Receiving Water Laboratory Data Report

CERTIFICATE OF ANALYSIS

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

RE: Downing Square Environmental - RGP (1703090)
ESS Laboratory Work Order Number: 19F0964

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

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 5:27 pm, Jul 08, 2019

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: Downing Square Environmental - RGP

ESS Laboratory Work Order: 19F0964

SAMPLE RECEIPT

The following samples were received on June 28, 2019 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
19F0964-01	1703090-SW	Surface Water	200.7, 200.8, 245.1, 3113B, 350.1, 3500Cr B-2009

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0964

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP

ESS Laboratory Work Order: 19F0964

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: Downing Square Environmental - RGP
Client Sample ID: 1703090-SW
Date Sampled: 06/28/19 08:00
Percent Solids: N/A

ESS Laboratory Work Order: 19F0964
ESS Laboratory Sample ID: 19F0964-01
Sample Matrix: Surface Water
Units: ug/L

Extraction Method: 3005A/200.7

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (5.0)		200.7		1	KJK	07/02/19 14:36	100	10	CG90144
Arsenic	ND (1.0)		3113B		2	KJK	07/02/19 18:56	100	10	CG90144
Cadmium	ND (0.2)		200.8		5	KJK	07/02/19 15:51	100	10	CG90144
Chromium	ND (2.0)		200.7		1	KJK	07/02/19 14:36	100	10	CG90144
Copper	ND (2.0)		200.7		1	KJK	07/02/19 14:36	100	10	CG90144
Hardness	**163000** (824)		200.7		10	KJK	07/03/19 13:28	1	1	[CALC]
Iron	**687** (100)		200.7		10	KJK	07/03/19 13:28	100	10	CG90144
Lead	ND (2.0)		200.7		1	KJK	07/02/19 14:36	100	10	CG90144
Mercury	ND (0.2)		245.1		1	MKS	07/05/19 9:48	20	40	CG90137
Nickel	ND (5.0)		200.7		1	KJK	07/02/19 14:36	100	10	CG90144
Selenium	ND (2.0)		3113B		2	KJK	07/02/19 21:05	100	10	CG90144
Silver	ND (0.5)		200.7		1	KJK	07/02/19 14:36	100	10	CG90144
Zinc	**24.7** (5.0)		200.7		1	KJK	07/02/19 14:36	100	10	CG90144

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-SW
Date Sampled: 06/28/19 08:00
Percent Solids: N/A

ESS Laboratory Work Order: 19F0964
ESS Laboratory Sample ID: 19F0964-01
Sample Matrix: Surface Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	ND (0.10)		350.1		1	JLK	07/02/19 20:35	mg/L	CG90234
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	CCP	06/28/19 20:00	ug/L	CF92828

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0964

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CG90137 - 245.1/7470A										
Blank										
Mercury	ND	0.2	ug/L							
LCS										
Mercury	6.0	0.2	ug/L	6.042		99	85-115			
LCS Dup										
Mercury	5.7	0.2	ug/L	6.042		95	85-115	4	20	
Batch CG90144 - 3005A/200.7										
Blank										
Antimony	ND	5.0	ug/L							
Arsenic	ND	0.5	ug/L							
Cadmium	ND	0.2	ug/L							
Chromium	ND	2.0	ug/L							
Copper	ND	2.0	ug/L							
Iron	ND	50.0	ug/L							
Lead	ND	2.0	ug/L							
Nickel	ND	5.0	ug/L							
Selenium	ND	1.0	ug/L							
Silver	ND	0.5	ug/L							
Zinc	ND	5.0	ug/L							
LCS										
Antimony	46.3	5.0	ug/L	50.00		93	85-115			
Arsenic	47.0	12.5	ug/L	50.00		94	85-115			
Cadmium	23.3	1.0	ug/L	25.00		93	85-115			
Chromium	46.1	2.0	ug/L	50.00		92	85-115			
Copper	53.2	2.0	ug/L	50.00		106	85-115			
Iron	269	50.0	ug/L	250.0		107	85-115			
Lead	47.7	2.0	ug/L	50.00		95	85-115			
Nickel	45.3	5.0	ug/L	50.00		91	85-115			
Selenium	98.9	25.0	ug/L	100.0		99	85-115			
Silver	25.3	0.5	ug/L	25.00		101	85-115			
Zinc	48.8	5.0	ug/L	50.00		98	85-115			
Classical Chemistry										
Batch CF92828 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	0.511		mg/L	0.4998		102	90-110			
LCS Dup										
Hexavalent Chromium	0.510		mg/L	0.4998		102	90-110	0.1	20	
Batch CG90234 - NH4 Prep										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0964

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CG90234 - NH4 Prep										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.08	0.10	mg/L	0.09994		80	80-120			
LCS										
Ammonia as N	1.03	0.10	mg/L	0.9994		103	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0964

Notes and Definitions

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

ESS Laboratory Work Order: 19F0964

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

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

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

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

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

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

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

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

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

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

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 19F0964
Date Received: 6/28/2019
Project Due Date: 7/8/2019
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: 3.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

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

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

Sample Receiving Notes:

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

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	360586	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
01	360587	Yes	NA	Yes	250 mL Poly - H2SO4	H2SO4	
01	360588	Yes	NA	Yes	250 mL Poly - Unpres	NP	

2nd Review

Were all containers scanned into storage/lab? Initials: [illegible] (Yes) / No
Are barcode labels on correct containers? Yes / No / NA
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: [signature] Date & Time: 6/28/19 1817
Reviewed By: [signature] Date & Time: 6/28/19 1834
Delivered By: [signature] 6/28/19 1834

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 19F0964

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

Project Information

Project Name: Downing Sq Environmental
Project Number: 1703090
Send Report to: Molly Greer
Send EDD to: labdata@geiconsultants.com
Project Location: Arlington, MA
Project Manager: Ryan Hoffman

MCP PRESUMPTIVE CERTAINTY REQUIRED – YES NO

If Yes, Are MCP Analytical Methods Required? YES NO NA
If Yes, Are Drinking Water Samples Submitted? YES NO NA
If Yes, Have You Met Minimum Field QC Requirements? YES NO NA

Preservative

HNO3	None	H2SO4	HNO3						

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	Total Metals (1)	Hex. Chrome	Ammonia	Hardness						Sample Specific Remarks
1	1703090-SW	6/28/2019	8:00	SW	3	MEG	x	x	x	x						

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

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. Molly Greer	6/28/19	830	1 GEI Fridge
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
2. GEI Fridge	6/28/19	1150	2.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
3.	6/28/19	1150	3.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
4.	6/28/19	17:44	4. 6/28/19 1755

ICE temp: 3.8

Turnaround Time (Business days):

Normal ___ Other ___
10-Day ___ 7-Day ___
5-Day __X__ 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) Metals: Antimony, arsenic, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium,silver, zinc.

Appendix C

Source Water Laboratory Data Report

CERTIFICATE OF ANALYSIS

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

RE: Downing Square Environmental - RGP (1703090)
ESS Laboratory Work Order Number: 19F0388

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 6:09 pm, Jun 21, 2019

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: Downing Square Environmental - RGP

ESS Laboratory Work Order: 19F0388

SAMPLE RECEIPT

The following samples were received on June 12, 2019 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
19F0388-01	1703090-B203 MW	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
19F0388-02	1703090-GZ-3B	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

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

PROJECT NARRATIVE

625.1(SIM) Semi-Volatile Organic Compounds

C9F0218-CCV1 **Calibration required quadratic regression (Q).**
2,4,6-Tribromophenol (97% @ 80-120%), Pentachlorophenol (94% @ 80-120%)

C9F0218-CCV1 **Initial Calibration Verification recovery is above upper control limit (ICV+).**
2,4,6-Tribromophenol

Classical Chemistry

19F0388-01 **The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**

19F0388-02 **The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**

Total Metals

CF91352-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Calcium (84% @ 85-115%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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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: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

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: Downing Square Environmental - RGP
Client Sample ID: 1703090-B203 MW
Date Sampled: 06/12/19 11:00
Percent Solids: N/A

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-01
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 200.7/6010BNoDigest

Dissolved Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (1.00)		200.8		1	NAR	06/13/19 12:20	10	10	CF91332
Arsenic	ND (5.0)		3113B		1	KJK	06/13/19 17:22	10	10	CF91332
Cadmium	**0.3** (0.2)		200.8		1	NAR	06/20/19 16:38	10	10	CF91332
Chromium	ND (5.0)		200.8		1	NAR	06/20/19 16:38	10	10	CF91332
Copper	ND (2.0)		200.8		1	NAR	06/13/19 12:20	10	10	CF91332
Iron	**1850** (50.0)		200.8		1	NAR	06/20/19 16:38	10	10	CF91332
Lead	ND (1.0)		200.8		1	NAR	06/13/19 12:20	10	10	CF91332
Mercury	ND (0.20)		245.1		1	MKS	06/17/19 12:28	20	40	CF91357
Nickel	ND (5.0)		200.8		1	NAR	06/20/19 16:38	10	10	CF91332
Selenium	ND (5.0)		200.8		1	NAR	06/13/19 12:20	10	10	CF91332
Silver	ND (0.5)		200.8		1	NAR	06/13/19 12:20	10	10	CF91332
Zinc	**46.1** (2.0)		200.8		1	NAR	06/13/19 12:20	10	10	CF91332

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-B203 MW
Date Sampled: 06/12/19 11:00
Percent Solids: N/A

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-01
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (5.0)		200.7		1	NAR	06/18/19 3:57	100	10	CF91352
Arsenic	ND (1.0)		3113B		2	KJK	06/14/19 17:02	100	10	CF91352
Cadmium	**0.5** (0.2)		200.8		5	NAR	06/14/19 14:57	100	10	CF91352
Chromium	ND (5.0)		200.7		1	NAR	06/18/19 3:57	100	10	CF91352
Chromium III	ND (10.0)		200.7		1	JLK	06/18/19 3:57	1	1	[CALC]
Copper	**4.4** (2.0)		200.7		1	NAR	06/18/19 3:57	100	10	CF91352
Hardness	**147000** (8240)		200.7		100	NEXION	06/18/19 14:48	1	1	[CALC]
Iron	**5610** (500)		200.8		100	NAR	06/18/19 14:48	100	10	CF91352
Lead	**7.0** (0.5)	0.1	200.8		5	NAR	06/14/19 14:57	100	10	CF91352
Mercury	ND (0.2)		245.1		1	MKS	06/17/19 12:32	20	40	CF91357
Nickel	ND (5.0)		200.7		1	NAR	06/18/19 3:57	100	10	CF91352
Selenium	ND (2.0)		3113B		2	KJK	06/14/19 20:48	100	10	CF91352
Silver	ND (0.5)		200.7		1	NAR	06/18/19 3:57	100	10	CF91352
Zinc	**54.5** (5.0)		200.7		1	NAR	06/18/19 3:57	100	10	CF91352

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-B203 MW
Date Sampled: 06/12/19 11:00
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-01
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	06/18/19 21:10	C9F0292	CF91853
1,1,2-Trichloroethane	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
1,1-Dichloroethane	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
1,1-Dichloroethene	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
1,2-Dichlorobenzene	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
1,2-Dichloroethane	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
1,3-Dichlorobenzene	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
1,4-Dichlorobenzene	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Acetone	ND (5.0)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Benzene	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Carbon Tetrachloride	ND (0.3)		524.2		1	06/18/19 21:10	C9F0292	CF91853
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Ethylbenzene	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Methylene Chloride	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Naphthalene	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Tetrachloroethene	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Toluene	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Trichloroethene	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Vinyl Chloride	ND (0.2)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Xylene O	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853
Xylene P,M	ND (0.5)		524.2		1	06/18/19 21:10	C9F0292	CF91853

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*85 %*		*80-120*
Surrogate: 4-Bromofluorobenzene	*88 %*		*80-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-B203 MW
Date Sampled: 06/12/19 11:00
Percent Solids: N/A
Initial Volume: 1030
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MJV
Prepared: 6/14/19 10:34

608.3 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.10)		608.3		1	06/14/19 17:32		CF91402
Aroclor 1221	ND (0.10)		608.3		1	06/14/19 17:32		CF91402
Aroclor 1232	ND (0.10)		608.3		1	06/14/19 17:32		CF91402
Aroclor 1242	ND (0.10)		608.3		1	06/14/19 17:32		CF91402
Aroclor 1248	ND (0.10)		608.3		1	06/14/19 17:32		CF91402
Aroclor 1254	ND (0.10)		608.3		1	06/14/19 17:32		CF91402
Aroclor 1260	ND (0.10)		608.3		1	06/14/19 17:32		CF91402
Aroclor 1262	ND (0.10)		608.3		1	06/14/19 17:32		CF91402
Aroclor 1268	ND (0.10)		608.3		1	06/14/19 17:32		CF91402

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*78 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*84 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*66 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*72 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-B203 MW
Date Sampled: 06/12/19 11:00
Percent Solids: N/A
Initial Volume: 1020
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 6/13/19 13:08

625.1(SIM) Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acenaphthene	ND (0.20)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Acenaphthylene	ND (0.20)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Anthracene	ND (0.20)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Benzo(a)anthracene	ND (0.05)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Benzo(a)pyrene	ND (0.05)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Benzo(b)fluoranthene	**0.05** (0.05)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Benzo(g,h,i)perylene	ND (0.20)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Benzo(k)fluoranthene	ND (0.05)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
bis(2-Ethylhexyl)phthalate	ND (2.45)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Butylbenzylphthalate	ND (2.45)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Chrysene	ND (0.05)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Dibenzo(a,h)Anthracene	ND (0.05)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Diethylphthalate	ND (2.45)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Dimethylphthalate	ND (2.45)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Di-n-butylphthalate	ND (2.45)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Di-n-octylphthalate	ND (2.45)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Fluoranthene	ND (0.20)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Fluorene	ND (0.20)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Indeno(1,2,3-cd)Pyrene	ND (0.05)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Naphthalene	ND (0.20)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Pentachlorophenol	ND (0.88)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Phenanthrene	ND (0.20)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302
Pyrene	ND (0.20)		625.1 SIM		1	06/14/19 12:44	C9F0218	CF91302

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*51 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*91 %*		*15-110*
Surrogate: 2-Fluorobiphenyl	*65 %*		*30-130*
Surrogate: Nitrobenzene-d5	*72 %*		*30-130*
Surrogate: p-Terphenyl-d14	*98 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-B203 MW
Date Sampled: 06/12/19 11:00
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 6/13/19 15:15

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	06/17/19 21:39	C9F0264	CF91244

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	*56 %*		*15-115*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-B203 MW
Date Sampled: 06/12/19 11:00
Percent Solids: N/A

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-01
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	**0.40** (0.10)		350.1		1	JLK	06/18/19 16:38	mg/L	CF91701
Chloride	**20.6** (5.0)		300.0		10	EEM	06/14/19 17:44	mg/L	CF91418
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	06/12/19 22:34	ug/L	CF91265
Phenols	ND (100)		420.1		1	EEM	06/14/19 11:00	ug/L	CF91422
Total Cyanide	ND (5.00)		4500 CN CE		1	EEM	06/13/19 12:15	ug/L	CF91329
Total Petroleum Hydrocarbon	ND (5)		1664A		1	LAB	06/17/19 15:15	mg/L	CF91704
Total Residual Chlorine	ND (20.0)		4500Cl D		1	CCP	06/12/19 21:33	ug/L	CF91262
Total Suspended Solids	**108** (5)		2540D		1	JLK	06/14/19 20:26	mg/L	CF91443

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-B203 MW
Date Sampled: 06/12/19 11:00
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: CAD
Prepared: 6/18/19 11:05

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

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2-Dibromoethane	ND (0.015)		504.1		1	06/18/19 13:32		CF91829

	%Recovery	Qualifier	Limits
Surrogate: Pentachloroethane	*84 %*		*30-150*
Surrogate: Pentachloroethane [2C]	*96 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-B203 MW
Date Sampled: 06/12/19 11:00
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 6/13/19 9:47

Alcohol Scan by GC/FID

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Ethanol	ND (10)		ASTM D3695		1	ZLC	06/13/19 12:43		CF91316

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-GZ-3B
Date Sampled: 06/12/19 13:00
Percent Solids: N/A

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-02
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 200.7/6010BNoDigest

Dissolved Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (1.00)		200.8		1	NAR	06/13/19 12:26	10	10	CF91332
Arsenic	ND (5.0)		3113B		1	KJK	06/13/19 17:27	10	10	CF91332
Cadmium	ND (0.2)		200.8		1	NAR	06/13/19 12:26	10	10	CF91332
Chromium	ND (5.0)		200.8		1	NAR	06/13/19 12:26	10	10	CF91332
Copper	ND (2.0)		200.8		1	NAR	06/13/19 12:26	10	10	CF91332
Iron	**832** (50.0)		200.8		1	NAR	06/13/19 12:26	10	10	CF91332
Lead	ND (1.0)		200.8		1	NAR	06/13/19 12:26	10	10	CF91332
Mercury	ND (0.20)		245.1		1	MKS	06/17/19 12:30	20	40	CF91357
Nickel	ND (5.0)		200.8		1	NAR	06/13/19 12:26	10	10	CF91332
Selenium	ND (5.0)		200.8		1	NAR	06/13/19 12:26	10	10	CF91332
Silver	ND (0.5)		200.8		1	NAR	06/13/19 12:26	10	10	CF91332
Zinc	**11.2** (2.0)		200.8		1	NAR	06/13/19 12:26	10	10	CF91332

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-GZ-3B
Date Sampled: 06/12/19 13:00
Percent Solids: N/A

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-02
Sample Matrix: Ground Water
Units: ug/L

Extraction Method: 3005A/200.7

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (5.0)		200.7		1	NAR	06/18/19 4:01	100	10	CF91352
Arsenic	ND (1.0)		3113B		2	KJK	06/14/19 17:08	100	10	CF91352
Cadmium	ND (0.2)		200.8		5	NAR	06/14/19 15:02	100	10	CF91352
Chromium	ND (5.0)		200.7		1	NAR	06/18/19 4:01	100	10	CF91352
Chromium III	ND (10.0)		200.7		1	JLK	06/18/19 4:01	1	1	[CALC]
Copper	**2.6** (2.0)		200.7		1	NAR	06/18/19 4:01	100	10	CF91352
Hardness	**97200** (8240)		200.7		100	NEXION	06/18/19 14:53	1	1	[CALC]
Iron	**858** (500)		200.8		100	NAR	06/18/19 14:53	100	10	CF91352
Lead	ND (0.5)	0.1	200.8		5	NAR	06/14/19 15:02	100	10	CF91352
Mercury	ND (0.2)		245.1		1	MKS	06/17/19 12:34	20	40	CF91357
Nickel	ND (5.0)		200.7		1	NAR	06/18/19 4:01	100	10	CF91352
Selenium	ND (2.0)		3113B		2	KJK	06/14/19 20:54	100	10	CF91352
Silver	ND (0.5)		200.7		1	NAR	06/18/19 4:01	100	10	CF91352
Zinc	**17.0** (5.0)		200.7		1	NAR	06/18/19 4:01	100	10	CF91352

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-GZ-3B
Date Sampled: 06/12/19 13:00
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-02
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	06/18/19 21:40	C9F0292	CF91853
1,1,2-Trichloroethane	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
1,1-Dichloroethane	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
1,1-Dichloroethene	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
1,2-Dichlorobenzene	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
1,2-Dichloroethane	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
1,3-Dichlorobenzene	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
1,4-Dichlorobenzene	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Acetone	ND (5.0)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Benzene	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Carbon Tetrachloride	ND (0.3)		524.2		1	06/18/19 21:40	C9F0292	CF91853
cis-1,2-Dichloroethene	**109** (5.0)		524.2		10	06/19/19 12:38	C9F0292	CF91853
Ethylbenzene	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Methylene Chloride	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Naphthalene	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Tetrachloroethene	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Toluene	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Trichloroethene	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Vinyl Chloride	**9.1** (0.2)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Xylene O	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853
Xylene P,M	ND (0.5)		524.2		1	06/18/19 21:40	C9F0292	CF91853

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*96 %*		*80-120*
Surrogate: 4-Bromofluorobenzene	*96 %*		*80-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-GZ-3B
Date Sampled: 06/12/19 13:00
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: MJV
Prepared: 6/14/19 10:34

608.3 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.09)		608.3		1	06/14/19 17:51		CF91402
Aroclor 1221	ND (0.09)		608.3		1	06/14/19 17:51		CF91402
Aroclor 1232	ND (0.09)		608.3		1	06/14/19 17:51		CF91402
Aroclor 1242	ND (0.09)		608.3		1	06/14/19 17:51		CF91402
Aroclor 1248	ND (0.09)		608.3		1	06/14/19 17:51		CF91402
Aroclor 1254	ND (0.09)		608.3		1	06/14/19 17:51		CF91402
Aroclor 1260	ND (0.09)		608.3		1	06/14/19 17:51		CF91402
Aroclor 1262	ND (0.09)		608.3		1	06/14/19 17:51		CF91402
Aroclor 1268	ND (0.09)		608.3		1	06/14/19 17:51		CF91402

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*76 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*81 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*55 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*68 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-GZ-3B
Date Sampled: 06/12/19 13:00
Percent Solids: N/A
Initial Volume: 1030
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 6/13/19 13:08

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	06/14/19 13:33	C9F0218	CF91302
Acenaphthylene	ND (0.19)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Anthracene	ND (0.19)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Benzo(a)anthracene	**0.06** (0.05)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Benzo(a)pyrene	**0.05** (0.05)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Benzo(b)fluoranthene	**0.06** (0.05)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Benzo(g,h,i)perylene	ND (0.19)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Benzo(k)fluoranthene	**0.07** (0.05)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
bis(2-Ethylhexyl)phthalate	ND (2.43)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Butylbenzylphthalate	ND (2.43)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Chrysene	**0.07** (0.05)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Dibenzo(a,h)Anthracene	**0.06** (0.05)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Diethylphthalate	ND (2.43)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Dimethylphthalate	ND (2.43)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Di-n-butylphthalate	ND (2.43)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Di-n-octylphthalate	ND (2.43)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Fluoranthene	ND (0.19)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Fluorene	**0.67** (0.19)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Indeno(1,2,3-cd)Pyrene	**0.06** (0.05)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Naphthalene	ND (0.19)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Pentachlorophenol	ND (0.87)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Phenanthrene	ND (0.19)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302
Pyrene	ND (0.19)		625.1 SIM		1	06/14/19 13:33	C9F0218	CF91302

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*43 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*84 %*		*15-110*
Surrogate: 2-Fluorobiphenyl	*61 %*		*30-130*
Surrogate: Nitrobenzene-d5	*64 %*		*30-130*
Surrogate: p-Terphenyl-d14	*93 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-GZ-3B
Date Sampled: 06/12/19 13:00
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 6/13/19 15:15

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	06/17/19 22:12	C9F0264	CF91244

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	*51 %*		*15-115*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-GZ-3B
Date Sampled: 06/12/19 13:00
Percent Solids: N/A

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-02
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	**0.10** (0.10)		350.1		1	JLK	06/18/19 16:47	mg/L	CF91701
Chloride	**3.8** (0.5)		300.0		1	EEM	06/14/19 18:32	mg/L	CF91418
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	JLK	06/12/19 22:34	ug/L	CF91265
Phenols	ND (100)		420.1		1	EEM	06/14/19 11:00	ug/L	CF91422
Total Cyanide	ND (5.00)		4500 CN CE		1	EEM	06/13/19 12:15	ug/L	CF91329
Total Petroleum Hydrocarbon	ND (5)		1664A		1	LAB	06/17/19 15:15	mg/L	CF91704
Total Residual Chlorine	ND (20.0)		4500Cl D		1	CCP	06/12/19 21:33	ug/L	CF91262
Total Suspended Solids	ND (5)		2540D		1	JLK	06/14/19 20:26	mg/L	CF91443

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-GZ-3B
Date Sampled: 06/12/19 13:00
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 504/8011

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: CAD
Prepared: 6/18/19 11:05

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

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2-Dibromoethane	ND (0.015)		504.1		1	06/18/19 13:55		CF91829

	%Recovery	Qualifier	Limits
Surrogate: Pentachloroethane	*95 %*		*30-150*
Surrogate: Pentachloroethane [2C]	*100 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP
Client Sample ID: 1703090-GZ-3B
Date Sampled: 06/12/19 13:00
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 19F0388
ESS Laboratory Sample ID: 19F0388-02
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 6/13/19 9:47

Alcohol Scan by GC/FID

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Ethanol	ND (10)		ASTM D3695		1	ZLC	06/13/19 13:31		CF91316

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Dissolved Metals										
Batch CF91332 - 200.7/6010BNoDigest										
Blank										
Antimony	ND	1.00	ug/L							
Arsenic	ND	5.0	ug/L							
Cadmium	ND	0.2	ug/L							
Chromium	ND	5.0	ug/L							
Copper	ND	2.0	ug/L							
Iron	ND	50.0	ug/L							
Lead	ND	0.2	ug/L							
Nickel	ND	5.0	ug/L							
Selenium	ND	5.0	ug/L							
Silver	ND	0.5	ug/L							
Zinc	ND	2.0	ug/L							
LCS										
Antimony	20.7		ug/L	20.04		104	85-115			
Cadmium	19.5		ug/L	20.10		97	85-115			
Chromium	20.2		ug/L	20.06		101	80-120			
Copper	20.2		ug/L	20.00		101	85-115			
Iron	1050		ug/L	1001		105	80-120			
Lead	20.2		ug/L	19.98		101	85-115			
Nickel	19.9		ug/L	20.04		99	85-115			
Selenium	20.0		ug/L	19.98		100	85-115			
Silver	20.7		ug/L	20.04		103	85-115			
Zinc	19.1		ug/L	20.06		95	80-120			
LCS										
Arsenic	26.0		ug/L	25.00		104	85-115			
Batch CF91357 - 245.1/7470A										
Blank										
Mercury	ND	0.20	ug/L							
LCS										
Mercury	6.80	0.20	ug/L	6.042		113	85-115			
LCS Dup										
Mercury	6.84	0.20	ug/L	6.042		113	85-115	0.6	20	
Total Metals										
Batch CF91352 - 3005A/200.7										
Blank										
Antimony	ND	5.0	ug/L							
Arsenic	ND	0.5	ug/L							
Cadmium	ND	0.2	ug/L							
Calcium	ND	100	ug/L							
Chromium	ND	2.0	ug/L							
Copper	ND	2.0	ug/L							
Iron	ND	25.0	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CF91352 - 3005A/200.7										
Lead	ND	0.5	ug/L							
Magnesium	ND	100	ug/L							
Nickel	ND	5.0	ug/L							
Selenium	ND	1.0	ug/L							
Silver	ND	0.5	ug/L							
Zinc	ND	5.0	ug/L							
LCS										
Antimony	51.5	5.0	ug/L	50.00		103	85-115			
Arsenic	49.9	12.5	ug/L	50.00		100	85-115			
Cadmium	25.4	1.0	ug/L	25.00		102	85-115			
Calcium	433	500	ug/L	500.0		87	85-115			
Chromium	48.2	2.0	ug/L	50.00		96	85-115			
Copper	49.8	2.0	ug/L	50.00		100	85-115			
Iron	228	125	ug/L	250.0		91	85-115			
Lead	47.0	2.5	ug/L	50.00		94	85-115			
Magnesium	480	500	ug/L	500.0		96	85-115			
Nickel	46.6	5.0	ug/L	50.00		93	85-115			
Selenium	99.3	25.0	ug/L	100.0		99	85-115			
Silver	23.9	0.5	ug/L	25.00		96	85-115			
Zinc	50.3	5.0	ug/L	50.00		101	85-115			
LCS Dup										
Antimony	53.8	5.0	ug/L	50.00		108	85-115	4	20	
Cadmium	22.8	1.0	ug/L	25.00		91	85-115	11	20	
Calcium	422	500	ug/L	500.0		84	85-115	3	20	B-
Chromium	50.3	2.0	ug/L	50.00		101	85-115	4	20	
Copper	52.9	2.0	ug/L	50.00		106	85-115	6	20	
Iron	227	125	ug/L	250.0		91	85-115	0.3	20	
Lead	44.1	2.5	ug/L	50.00		88	85-115	7	20	
Magnesium	464	500	ug/L	500.0		93	85-115	3	20	
Nickel	48.7	5.0	ug/L	50.00		97	85-115	4	20	
Silver	25.1	0.5	ug/L	25.00		100	85-115	5	20	
Zinc	52.5	5.0	ug/L	50.00		105	85-115	4	20	
Batch CF91357 - 245.1/7470A										
Blank										
Mercury	ND	0.2	ug/L							
LCS										
Mercury	6.8	0.2	ug/L	6.042		113	85-115			
LCS Dup										
Mercury	6.8	0.2	ug/L	6.042		113	85-115	0.6	20	
524.2 Volatile Organic Compounds										
Batch CF91853 - 524.2										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch CF91853 - 524.2										
1,1,1-Trichloroethane	ND	0.5	ug/L							
1,1,2-Trichloroethane	ND	0.5	ug/L							
1,1-Dichloroethane	ND	0.5	ug/L							
1,1-Dichloroethene	ND	0.5	ug/L							
1,2-Dichlorobenzene	ND	0.5	ug/L							
1,2-Dichloroethane	ND	0.5	ug/L							
1,3-Dichlorobenzene	ND	0.5	ug/L							
1,4-Dichlorobenzene	ND	0.5	ug/L							
Acetone	ND	5.0	ug/L							
Benzene	ND	0.5	ug/L							
Carbon Tetrachloride	ND	0.3	ug/L							
cis-1,2-Dichloroethene	ND	0.5	ug/L							
Ethylbenzene	ND	0.5	ug/L							
Methyl tert-Butyl Ether	ND	0.5	ug/L							
Methylene Chloride	ND	0.5	ug/L							
Naphthalene	ND	0.5	ug/L							
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tertiary-butyl Alcohol	ND	25.0	ug/L							
Tetrachloroethene	ND	0.5	ug/L							
Toluene	ND	0.5	ug/L							
Trichloroethene	ND	0.5	ug/L							
Vinyl Chloride	ND	0.2	ug/L							
Xylene O	ND	0.5	ug/L							
Xylene P,M	ND	0.5	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*4.46*		ug/L	*5.000*		*89*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.59*		ug/L	*5.000*		*92*	*80-120*			
LCS										
1,1,1-Trichloroethane	10.7		ug/L	10.00		107	70-130			
1,1,2-Trichloroethane	10.4		ug/L	10.00		104	70-130			
1,1-Dichloroethane	11.0		ug/L	10.00		110	70-130			
1,1-Dichloroethene	11.5		ug/L	10.00		115	70-130			
1,2-Dichlorobenzene	10.6		ug/L	10.00		106	70-130			
1,2-Dichloroethane	10.1		ug/L	10.00		101	70-130			
1,3-Dichlorobenzene	10.5		ug/L	10.00		105	70-130			
1,4-Dichlorobenzene	11.0		ug/L	10.00		110	70-130			
Acetone	48.1		ug/L	50.00		96	70-130			
Benzene	10.5		ug/L	10.00		105	70-130			
Carbon Tetrachloride	10.6		ug/L	10.00		106	70-130			
cis-1,2-Dichloroethene	10.9		ug/L	10.00		109	70-130			
Ethylbenzene	11.1		ug/L	10.00		111	70-130			
Methyl tert-Butyl Ether	10.3		ug/L	10.00		103	70-130			
Methylene Chloride	11.7		ug/L	10.00		117	70-130			
Naphthalene	10.3		ug/L	10.00		103	70-130			
Tertiary-amyl methyl ether	10.4		ug/L	10.00		104	70-130			
Tertiary-butyl Alcohol	56.5		ug/L	50.00		113	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch CF91853 - 524.2										
Tetrachloroethene	10.5		ug/L	10.00		105	70-130			
Toluene	11.3		ug/L	10.00		113	70-130			
Trichloroethene	10.7		ug/L	10.00		107	70-130			
Vinyl Chloride	9.2		ug/L	10.00		92	70-130			
Xylene O	10.8		ug/L	10.00		108	70-130			
Xylene P,M	22.5		ug/L	20.00		112	70-130			
Surrogate: 1,2-Dichlorobenzene-d4	*4.99*		ug/L	*5.000*		*100*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.87*		ug/L	*5.000*		*97*	*80-120*			
LCS Dup										
1,1,1-Trichloroethane	10.2		ug/L	10.00		102	70-130	5	20	
1,1,2-Trichloroethane	10.4		ug/L	10.00		104	70-130	0.3	20	
1,1-Dichloroethane	10.5		ug/L	10.00		105	70-130	5	20	
1,1-Dichloroethene	11.1		ug/L	10.00		111	70-130	3	20	
1,2-Dichlorobenzene	10.4		ug/L	10.00		104	70-130	2	20	
1,2-Dichloroethane	9.7		ug/L	10.00		97	70-130	5	20	
1,3-Dichlorobenzene	10.3		ug/L	10.00		103	70-130	2	20	
1,4-Dichlorobenzene	10.7		ug/L	10.00		107	70-130	2	20	
Acetone	46.6		ug/L	50.00		93	70-130	3	20	
Benzene	10.3		ug/L	10.00		103	70-130	2	20	
Carbon Tetrachloride	10.1		ug/L	10.00		101	70-130	6	20	
cis-1,2-Dichloroethene	10.6		ug/L	10.00		106	70-130	3	20	
Ethylbenzene	11.0		ug/L	10.00		110	70-130	0.9	20	
Methyl tert-Butyl Ether	10.2		ug/L	10.00		102	70-130	1	20	
Methylene Chloride	11.5		ug/L	10.00		115	70-130	2	20	
Naphthalene	10.2		ug/L	10.00		102	70-130	0.8	20	
Tertiary-amyl methyl ether	10.3		ug/L	10.00		103	70-130	0.6	20	
Tertiary-butyl Alcohol	56.7		ug/L	50.00		113	70-130	0.3	25	
Tetrachloroethene	10.2		ug/L	10.00		102	70-130	3	20	
Toluene	11.0		ug/L	10.00		110	70-130	2	20	
Trichloroethene	10.3		ug/L	10.00		103	70-130	4	20	
Vinyl Chloride	8.8		ug/L	10.00		88	70-130	4	20	
Xylene O	10.8		ug/L	10.00		108	70-130	0.09	20	
Xylene P,M	21.7		ug/L	20.00		109	70-130	3	20	
Surrogate: 1,2-Dichlorobenzene-d4	*4.70*		ug/L	*5.000*		*94*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.73*		ug/L	*5.000*		*95*	*80-120*			
608.3 Polychlorinated Biphenyls (PCB)										
Batch CF91402 - 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							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
608.3 Polychlorinated Biphenyls (PCB)										
Batch CF91402 - 3510C										
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	*0.0402*		ug/L	*0.05000*		*80*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0440*		ug/L	*0.05000*		*88*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0244*		ug/L	*0.05000*		*49*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0291*		ug/L	*0.05000*		*58*	*30-150*			
LCS										
Aroclor 1016	0.95	0.10	ug/L	1.000		95	50-140			
Aroclor 1016 [2C]	0.90	0.10	ug/L	1.000		90	50-140			
Aroclor 1260	0.91	0.10	ug/L	1.000		91	1-164			
Aroclor 1260 [2C]	0.89	0.10	ug/L	1.000		89	1-164			
Surrogate: Decachlorobiphenyl	*0.0410*		ug/L	*0.05000*		*82*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0443*		ug/L	*0.05000*		*89*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0300*		ug/L	*0.05000*		*60*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0302*		ug/L	*0.05000*		*60*	*30-150*			
LCS Dup										
Aroclor 1016	1.00	0.10	ug/L	1.000		100	50-140	5	36	
Aroclor 1016 [2C]	0.95	0.10	ug/L	1.000		95	50-140	6	36	
Aroclor 1260	0.98	0.10	ug/L	1.000		98	1-164	7	38	
Aroclor 1260 [2C]	0.94	0.10	ug/L	1.000		94	1-164	6	38	
Surrogate: Decachlorobiphenyl	*0.0426*		ug/L	*0.05000*		*85*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0459*		ug/L	*0.05000*		*92*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0323*		ug/L	*0.05000*		*65*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0326*		ug/L	*0.05000*		*65*	*30-150*			
625.1(SIM) Semi-Volatile Organic Compounds										
Batch CF91302 - 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							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

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 CF91302 - 3510C										
Benzo(a)pyrene	ND	0.05	ug/L							
Benzo(b)fluoranthene	ND	0.05	ug/L							
Benzo(g,h,i)perylene	ND	0.20	ug/L							
Benzo(k)fluoranthene	ND	0.05	ug/L							
bis(2-Ethylhexyl)phthalate	ND	2.50	ug/L							
Butylbenzylphthalate	ND	2.50	ug/L							
Chrysene	ND	0.05	ug/L							
Dibenzo(a,h)Anthracene	ND	0.05	ug/L							
Diethylphthalate	ND	2.50	ug/L							
Dimethylphthalate	ND	2.50	ug/L							
Di-n-butylphthalate	ND	2.50	ug/L							
Di-n-octylphthalate	ND	2.50	ug/L							
Fluoranthene	ND	0.20	ug/L							
Fluorene	ND	0.20	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	0.05	ug/L							
Naphthalene	ND	0.20	ug/L							
Pentachlorophenol	ND	0.90	ug/L							
Phenanthrene	ND	0.20	ug/L							
Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*1.38*		ug/L	*2.500*		*55*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*2.26*		ug/L	*3.750*		*60*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.40*		ug/L	*2.500*		*56*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.68*		ug/L	*2.500*		*67*	*30-130*			
Surrogate: p-Terphenyl-d14	*1.95*		ug/L	*2.500*		*78*	*30-130*			
LCS										
Acenaphthene	2.61	0.20	ug/L	4.000		65	40-140			
Acenaphthylene	2.57	0.20	ug/L	4.000		64	40-140			
Anthracene	3.05	0.20	ug/L	4.000		76	40-140			
Benzo(a)anthracene	2.95	0.05	ug/L	4.000		74	40-140			
Benzo(a)pyrene	3.09	0.05	ug/L	4.000		77	40-140			
Benzo(b)fluoranthene	3.43	0.05	ug/L	4.000		86	40-140			
Benzo(g,h,i)perylene	2.90	0.20	ug/L	4.000		73	40-140			
Benzo(k)fluoranthene	3.16	0.05	ug/L	4.000		79	40-140			
bis(2-Ethylhexyl)phthalate	3.85	2.50	ug/L	4.000		96	40-140			
Butylbenzylphthalate	3.66	2.50	ug/L	4.000		91	40-140			
Chrysene	2.98	0.05	ug/L	4.000		75	40-140			
Dibenzo(a,h)Anthracene	3.12	0.05	ug/L	4.000		78	40-140			
Diethylphthalate	3.11	2.50	ug/L	4.000		78	40-140			
Dimethylphthalate	3.62	2.50	ug/L	4.000		90	40-140			
Di-n-butylphthalate	3.88	2.50	ug/L	4.000		97	40-140			
Di-n-octylphthalate	3.81	2.50	ug/L	4.000		95	40-140			
Fluoranthene	3.21	0.20	ug/L	4.000		80	40-140			
Fluorene	2.99	0.20	ug/L	4.000		75	40-140			
Indeno(1,2,3-cd)Pyrene	3.04	0.05	ug/L	4.000		76	40-140			
Naphthalene	2.28	0.20	ug/L	4.000		57	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

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 CF91302 - 3510C										
Pentachlorophenol	1.63	0.90	ug/L	4.000		41	30-130			
Phenanthrene	3.12	0.20	ug/L	4.000		78	40-140			
Pyrene	3.23	0.20	ug/L	4.000		81	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.49*		ug/L	*2.500*		*60*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*2.57*		ug/L	*3.750*		*69*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.61*		ug/L	*2.500*		*64*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.73*		ug/L	*2.500*		*69*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.15*		ug/L	*2.500*		*86*	*30-130*			
LCS Dup										
Acenaphthene	2.50	0.20	ug/L	4.000		62	40-140	4	20	
Acenaphthylene	2.43	0.20	ug/L	4.000		61	40-140	5	20	
Anthracene	3.00	0.20	ug/L	4.000		75	40-140	2	20	
Benzo(a)anthracene	3.01	0.05	ug/L	4.000		75	40-140	2	20	
Benzo(a)pyrene	3.15	0.05	ug/L	4.000		79	40-140	2	20	
Benzo(b)fluoranthene	3.58	0.05	ug/L	4.000		89	40-140	4	20	
Benzo(g,h,i)perylene	2.83	0.20	ug/L	4.000		71	40-140	3	20	
Benzo(k)fluoranthene	3.19	0.05	ug/L	4.000		80	40-140	0.9	20	
bis(2-Ethylhexyl)phthalate	3.77	2.50	ug/L	4.000		94	40-140	2	20	
Butylbenzylphthalate	3.68	2.50	ug/L	4.000		92	40-140	0.7	20	
Chrysene	3.04	0.05	ug/L	4.000		76	40-140	2	20	
Dibenzo(a,h)Anthracene	3.13	0.05	ug/L	4.000		78	40-140	0.3	20	
Diethylphthalate	2.94	2.50	ug/L	4.000		73	40-140	6	20	
Dimethylphthalate	3.45	2.50	ug/L	4.000		86	40-140	5	20	
Di-n-butylphthalate	4.02	2.50	ug/L	4.000		100	40-140	3	20	
Di-n-octylphthalate	3.88	2.50	ug/L	4.000		97	40-140	2	20	
Fluoranthene	3.42	0.20	ug/L	4.000		85	40-140	6	20	
Fluorene	2.83	0.20	ug/L	4.000		71	40-140	6	20	
Indeno(1,2,3-cd)Pyrene	3.06	0.05	ug/L	4.000		76	40-140	0.6	20	
Naphthalene	2.23	0.20	ug/L	4.000		56	40-140	2	20	
Pentachlorophenol	1.69	0.90	ug/L	4.000		42	30-130	4	20	
Phenanthrene	3.05	0.20	ug/L	4.000		76	40-140	2	20	
Pyrene	3.18	0.20	ug/L	4.000		80	40-140	1	20	
Surrogate: 1,2-Dichlorobenzene-d4	*1.32*		ug/L	*2.500*		*53*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*2.22*		ug/L	*3.750*		*59*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.45*		ug/L	*2.500*		*58*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.63*		ug/L	*2.500*		*65*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.11*		ug/L	*2.500*		*84*	*30-130*			
8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution										
Batch CF91244 - 3535A										
Blank										
1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	*2.89*		ug/L	*5.000*		*58*	*15-115*			
LCS										
1,4-Dioxane	9.25	0.250	ug/L	10.00		93	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

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 CF91244 - 3535A										
Surrogate: 1,4-Dioxane-d8	*3.50*		ug/L	*5.000*		*70*	*15-115*			
LCS Dup										
1,4-Dioxane	10.1	0.250	ug/L	10.00		101	40-140	9	20	
Surrogate: 1,4-Dioxane-d8	*3.15*		ug/L	*5.000*		*63*	*15-115*			
Classical Chemistry										
Batch CF91262 - General Preparation										
Blank										
Total Residual Chlorine	ND	20.0	ug/L							
LCS										
Total Residual Chlorine	1.38		mg/L	1.390		99	85-115			
Batch CF91265 - General Preparation										
Blank										
Hexavalent Chromium	ND	10.0	ug/L							
LCS										
Hexavalent Chromium	0.492		mg/L	0.4998		98	90-110			
LCS Dup										
Hexavalent Chromium	0.490		mg/L	0.4998		98	90-110	0.4	20	
Batch CF91329 - TCN Prep										
Blank										
Total Cyanide	ND	5.00	ug/L							
LCS										
Total Cyanide	20.6	5.00	ug/L	20.06		103	90-110			
LCS										
Total Cyanide	150	5.00	ug/L	150.4		99	90-110			
LCS Dup										
Total Cyanide	150	5.00	ug/L	150.4		100	90-110	0.5	20	
Batch CF91418 - General Preparation										
Blank										
Chloride	ND	0.5	mg/L							
LCS										
Chloride	2.3		mg/L	2.500		90	90-110			
Batch CF91422 - General Preparation										
Blank										
Phenols	ND	100	ug/L							
LCS										
Phenols	103	100	ug/L	100.0		103	80-120			
LCS										
Phenols	1020	100	ug/L	1000		102	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CF91443 - General Preparation										
Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	32		mg/L	36.40		88	80-120			
Batch CF91701 - NH4 Prep										
Blank										
Ammonia as N	ND	0.10	mg/L							
LCS										
Ammonia as N	0.11	0.10	mg/L	0.09994		112	80-120			
LCS										
Ammonia as N	1.20	0.10	mg/L	0.9994		120	80-120			
Batch CF91704 - General Preparation										
Blank										
Total Petroleum Hydrocarbon	ND	5	mg/L							
LCS										
Total Petroleum Hydrocarbon	15	5	mg/L	19.38		77	66-114			
504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane										
Batch CF91829 - 504/8011										
Blank										
1,2-Dibromoethane	ND	0.015	ug/L							
1,2-Dibromoethane [2C]	ND	0.015	ug/L							
Surrogate: Pentachloroethane	*0.159*		ug/L	*0.2000*		*80*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.172*		ug/L	*0.2000*		*86*	*30-150*			
LCS										
1,2-Dibromoethane	0.072	0.015	ug/L	0.08000		90	70-130			
1,2-Dibromoethane [2C]	0.067	0.015	ug/L	0.08000		84	70-130			
Surrogate: Pentachloroethane	*0.0582*		ug/L	*0.08000*		*73*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.0679*		ug/L	*0.08000*		*85*	*30-150*			
LCS										
1,2-Dibromoethane	0.226	0.015	ug/L	0.2000		113	70-130			
1,2-Dibromoethane [2C]	0.234	0.015	ug/L	0.2000		117	70-130			
Surrogate: Pentachloroethane	*0.198*		ug/L	*0.2000*		*99*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.210*		ug/L	*0.2000*		*105*	*30-150*			
Alcohol Scan by GC/FID										
Batch CF91316 - No Prep										
Blank										
Ethanol	ND	10	mg/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Alcohol Scan by GC/FID										
Batch CF91316 - No Prep										
LCS										
Ethanol	739	10	mg/L	1134		65	60-140			
LCS Dup										
Ethanol	769	10	mg/L	1134		68	60-140	4	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Downing Square Environmental - RGP ESS Laboratory Work Order: 19F0388

Notes and Definitions

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

ESS Laboratory Work Order: 19F0388

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

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

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

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

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

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

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

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

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

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

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 19F0388
Date Received: 6/12/2019
Project Due Date: 6/19/2019
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: 2.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

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

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

Sample Receiving Notes:

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

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	355380	Yes	No	Yes	VOA Vial - HCl	HCl	
01	355381	Yes	No	Yes	VOA Vial - HCl	HCl	
01	355382	Yes	No	Yes	VOA Vial - HCl	HCl	
01	355383	Yes	No	Yes	VOA Vial - HCl	HCl	
01	355384	Yes	No	Yes	VOA Vial - HCl	HCl	
01	355385	Yes	No	Yes	VOA Vial - HCl	HCl	
01	355387	Yes	NA	Yes	VOA Vial - Unpres	NP	
01	355396	Yes	NA	Yes	1L Amber - Unpres	NP	
01	355397	Yes	NA	Yes	1L Amber - Unpres	NP	
01	355398	Yes	NA	Yes	1L Amber - Unpres	NP	
01	355399	Yes	NA	Yes	1L Amber - Unpres	NP	
01	355400	Yes	NA	Yes	1L Amber - Unpres	NP	
01	355401	Yes	NA	Yes	1L Amber - Unpres	NP	
01	355403	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	355405	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	355407	Yes	NA	Yes	1L Poly - Unpres	NP	
01	355409	Yes	NA	Yes	250 mL Poly - Unpres	NP	
01	355411	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
01	355413	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	**pH > 12**
01	355416	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	355417	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	355534	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
02	355374	Yes	No	Yes	VOA Vial - HCl	HCl	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 19F0388

Date Received: 6/12/2019

02	355375	Yes	No	Yes	VOA Vial - HCl	HCl	
02	355376	Yes	No	Yes	VOA Vial - HCl	HCl	
02	355377	Yes	No	Yes	VOA Vial - HCl	HCl	
02	355378	Yes	No	Yes	VOA Vial - HCl	HCl	
02	355379	Yes	No	Yes	VOA Vial - HCl	HCl	
02	355386	Yes	NA	Yes	VOA Vial - Unpres	NP	
02	355388	Yes	NA	Yes	1L Amber - Unpres	NP	
02	355389	Yes	NA	Yes	1L Amber - Unpres	NP	
02	355390	Yes	NA	Yes	1L Amber - Unpres	NP	
02	355391	Yes	NA	Yes	1L Amber - Unpres	NP	
02	355392	Yes	NA	Yes	1L Amber - Unpres	NP	
02	355393	Yes	NA	Yes	1L Amber - Unpres	NP	
02	355395	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
02	355404	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
02	355406	Yes	NA	Yes	1L Poly - Unpres	NP	
02	355408	Yes	NA	Yes	250 mL Poly - Unpres	NP	
02	355410	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
02	355412	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	**pH > 12**
02	355414	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
02	355415	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
02	355533	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	

2nd Review

Were all containers scanned into storage/lab? Initials MW

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: [signature] Date & Time: 6/12/19 2109

Reviewed By: [signature] Date & Time: 6/12/19 2154

Delivered By: [signature] 6/12/19 2154

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: 19F0388

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 X No____
Format: Excel___ Access___ PDF X Other____

Project Manager: Ryan Hoffman
Company: GEI Consultants
Address: 400 Unicorn Park Dr
Woburn MA 01801

Project # 1703090
Project Name: Downing Square - Environmental
PO #

ESS Lab Sample ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample Identification	# of Containers	RGP Metals Total	RGP Metals Dissolved	Hardness (Calculation)	Ethanol ASTM D3695	Chloride 300.0*	Total Cyanide 4500 LL	TPH 1664	TSS 2540D*	TRC 4500-CL D*	Ammonia 350.1	Tri Cr (Calc. MUST run T. Cr)	Hex Cr 3500	Phenol 420.1	RGP VOC Long List 524	1,4-Dioxane 8270-SIM	EDB 504.1	RGP SVOC Log List 625-SIM	PCB 608	Comment #
						Analysis																			
1	6/12/19	1100		GW	1703090-B203(MW)	22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1,2
2	6/12/19	1300		GW	1703090-GZ-3B	22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____							4	4	4	1	1	5	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: 2.1+2.3 = 4.4 IcE RC

Sampled by : MEG

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

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	6/12 1545	[signature]	[signature]	6/12/19 1906	[signature] 6/12/19 2014
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 writin

Page ____ of ____

Appendix D

Endangered Species Act Eligibility Documentation

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

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. 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.

Location

Middlesex 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.

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

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler *Cardellina canadensis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Cerulean Warbler *Dendroica cerulea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 29 to Jul 20
Dunlin *Calidris alpina arcticola* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere

Evening Grosbeak Coccothraustes vespertinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Kentucky Warbler Oporornis formosus — Breeds Apr 20 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Nelson's Sparrow Ammodramus nelsoni — Breeds May 15 to Sep 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-throated Loon Gavia stellata — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Semipalmated Sandpiper Calidris pusilla — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Snowy Owl Bubo scandiacus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush *Hylocichla mustelina* Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

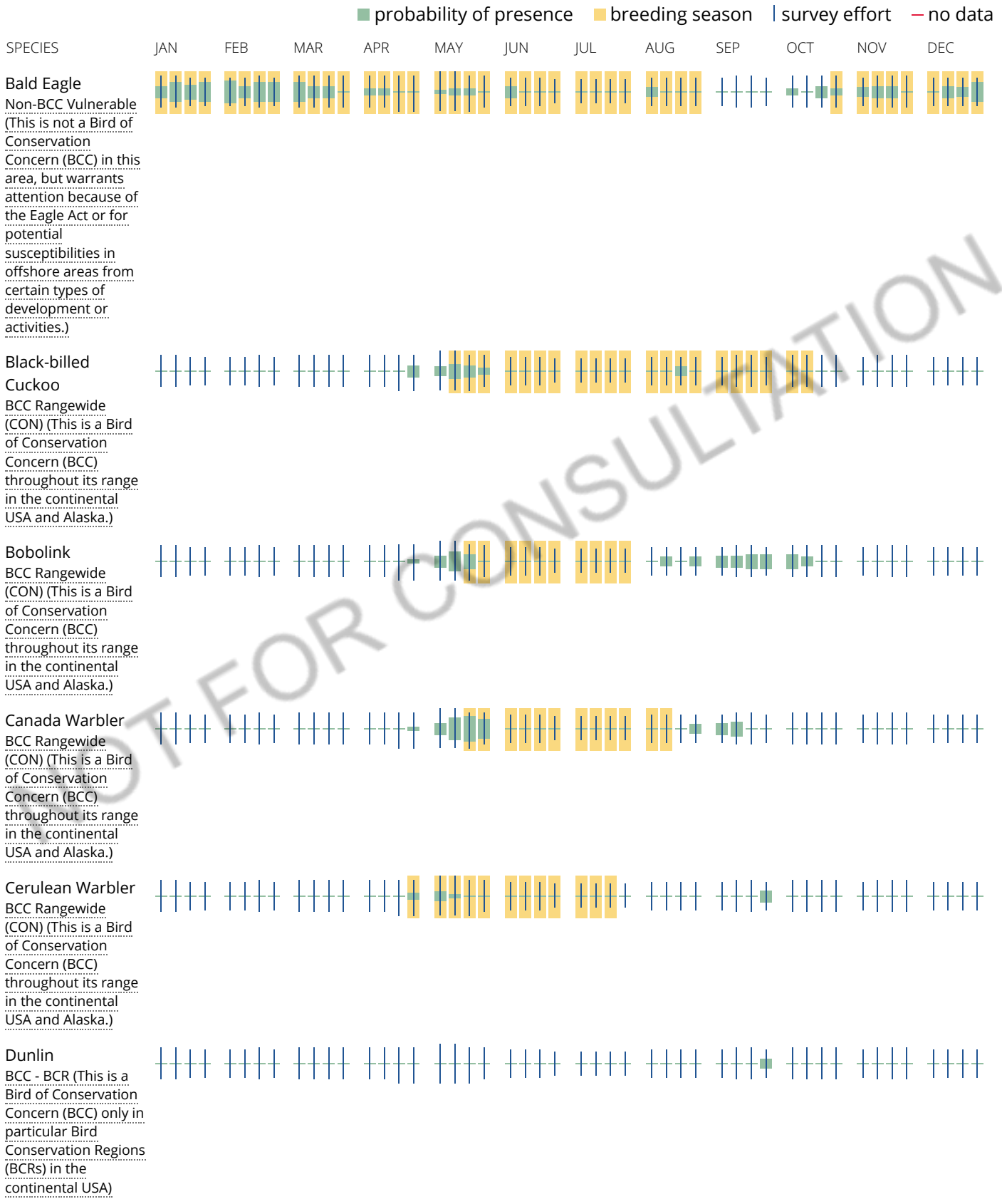
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

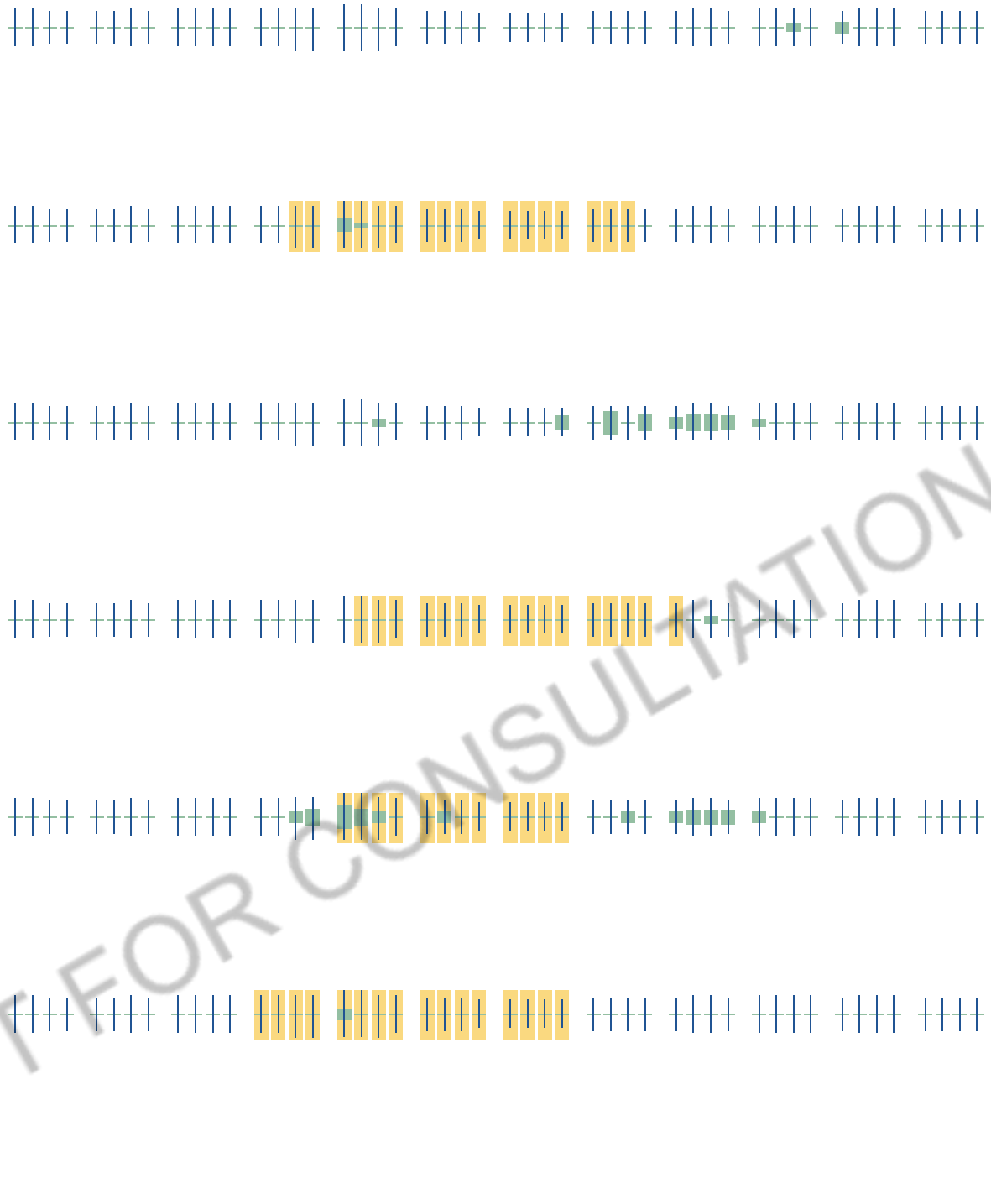
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

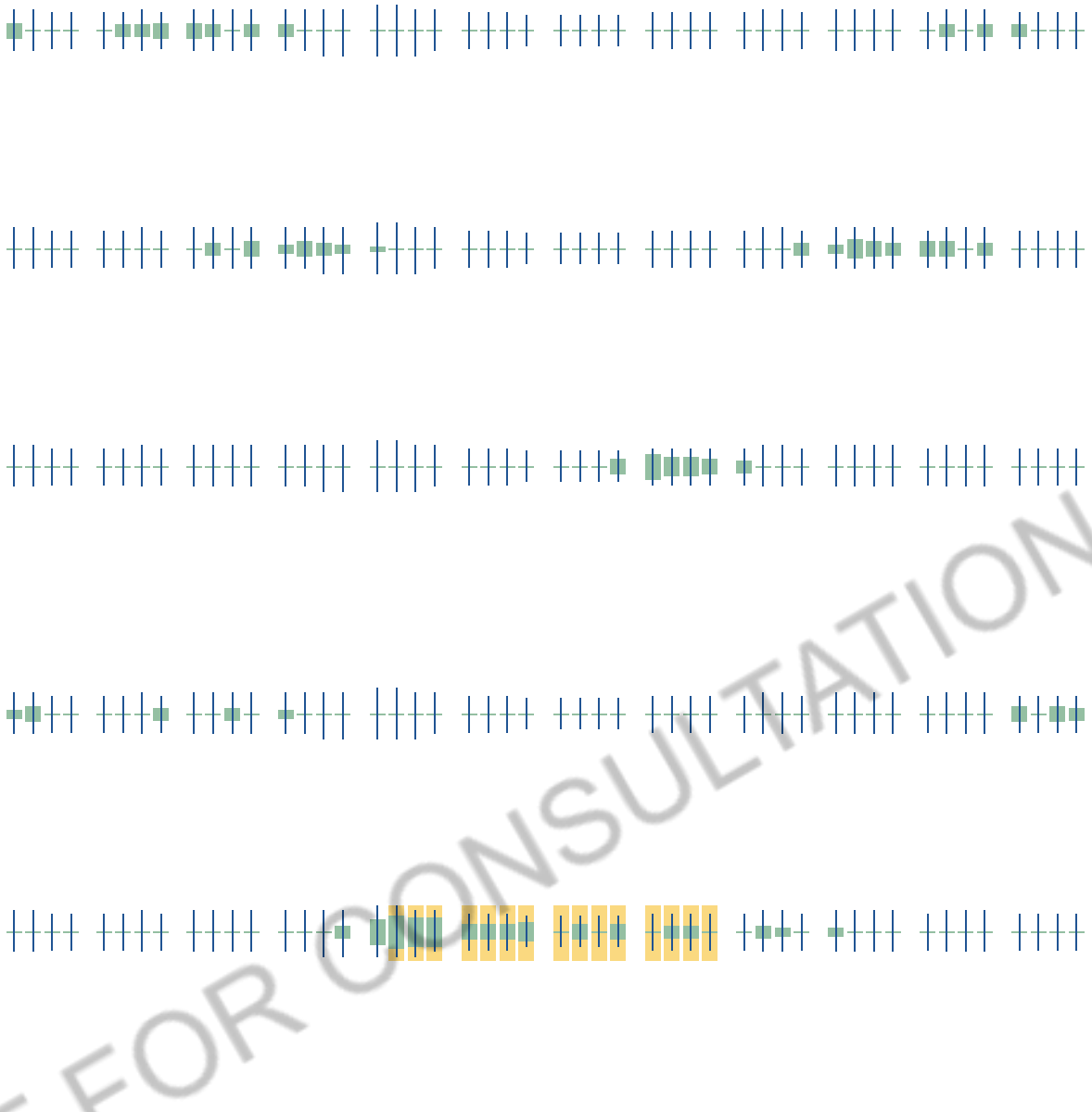
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.







Red-throated Loon
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Rusty Blackbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Semipalmated Sandpiper
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Snowy Owl
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

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.

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

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.

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.

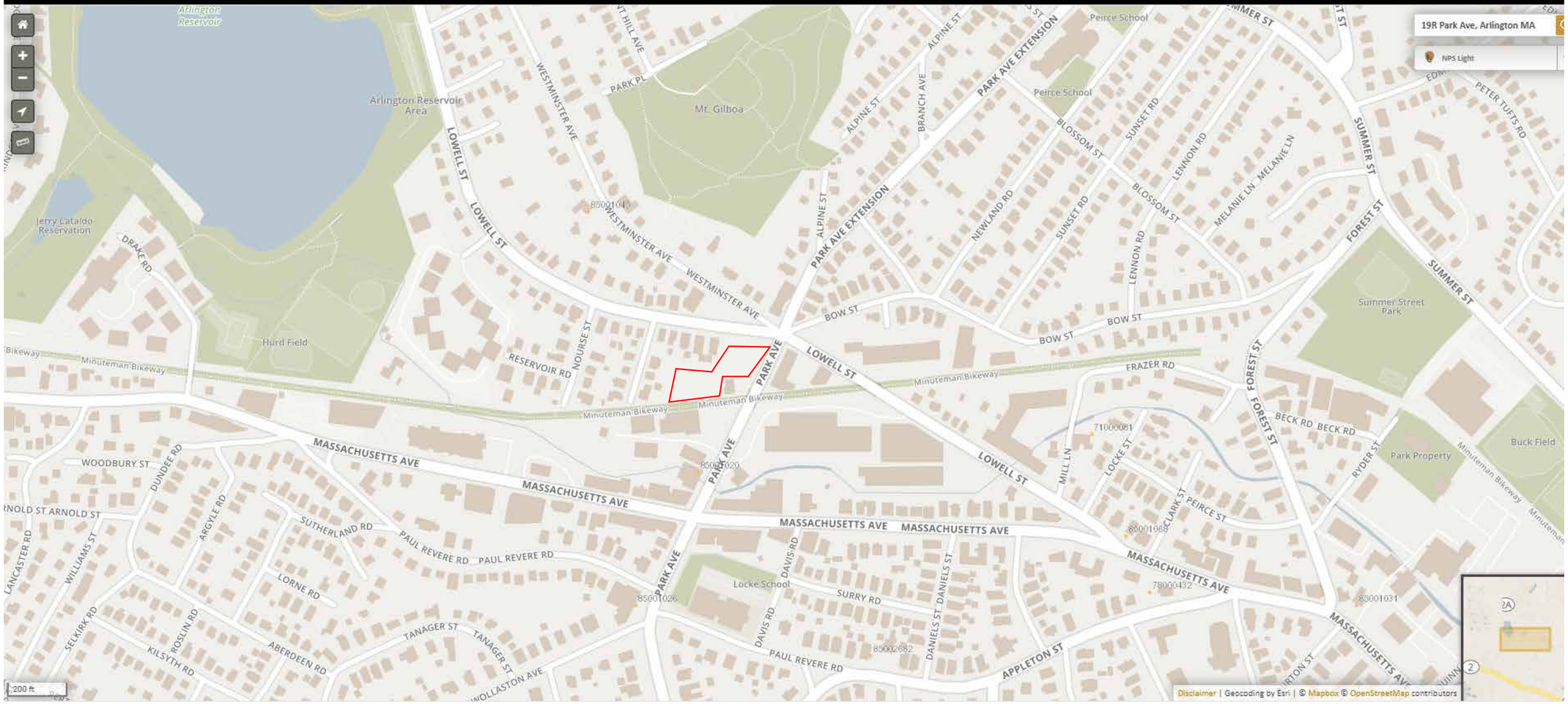
Appendix E

Historic Preservation Documentation

National Register of Historic Places

Public, non-restricted data depicting National Register spatial data processed by the Cultural Resources GIS facility. Data last updated in April, 2014.

National Park Service
U.S. Department of the Interior



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

Accessed July 17, 2019

MACRIS MAPS 2.0 beta

About || Help || Disclaimer

19 park ave, arlington Search

19 Park Ave, Arlington, Massachusetts, 02476

Bing MassDOT Street View

Legend

MHC Inventory Points

- Nat'l Register of Historic Places
- Preservation Restriction
- Local Historic District
- NRHP and LHD
- Inventoried Property

MHC Inventory Areas

- Nat'l Register of Historic Places
- Preservation Restriction
- Local Historic District
- NRHP and LHD
- Inventoried Area

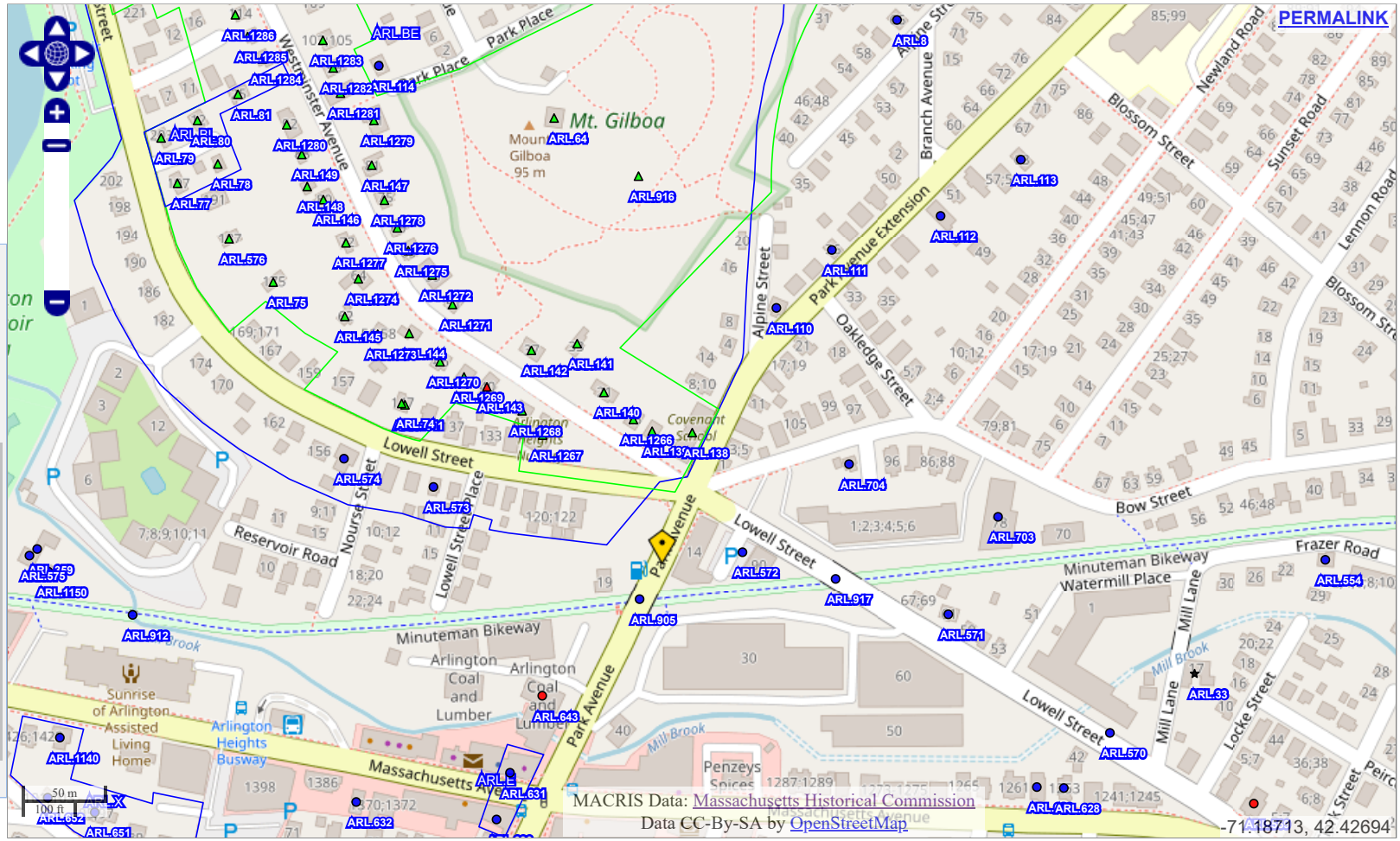
MHC Towns Completed

- Updates Pending
- Completed
- Not Completed

Archaeology Login

Username:

Password: Login



MACRIS Maps Last Updated 07/16/2019

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Arlington; Place: Arlington Heights; Resource Type(s): Area, Building, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
ARL.D	Peirce Farm Historic District		Arlington	
ARL.E	Arlington Heights Center		Arlington	
ARL.K	Crescent Hill		Arlington	
ARL.M	Forestdale		Arlington	
ARL.P	Arlington Multiple Resource Area		Arlington	
ARL.R	Grove Street and Massachusetts Avenue Area		Arlington	
ARL.U	Oakland and Claremount Avenues Area		Arlington	
ARL.X	Paul Revere Road Area		Arlington	
ARL.AU	Forest Streetscape		Arlington	
ARL.BC	Woodbury Street - Lancaster Road Area		Arlington	
ARL.BG	Saint James The Apostle Roman Catholic Church		Arlington	
ARL.BL	Elder Terrace		Arlington	
ARL.222	Walker, E. B. House	35 Aberdeen Rd	Arlington	c 1905
ARL.342	McCarthy, Denis A. House	7-9 Acton St	Arlington	
ARL.1388	Saint James The Apostle Roman Catholic School	20 Acton St	Arlington	1949
ARL.1		10 Aerial St	Arlington	r 1900
ARL.2		12 Aerial St	Arlington	r 1885
ARL.6		14 Aerial St	Arlington	r 1885
ARL.7		16 Aerial St	Arlington	r 1885
ARL.8		66 Alpine St	Arlington	c 1915
ARL.901	Milestone	Appleton St	Arlington	c 1790
ARL.1387	Saint James The Apostle Roman Catholic Church	4 Appleton St	Arlington	1929
ARL.493	Peirce, Walter - Cox House	11 Appleton St	Arlington	1890
ARL.235	Mason, Dr. House	15 Appleton St	Arlington	c 1870
ARL.494	Locke, Capt. Benjamin House	21 Appleton St	Arlington	c 1720

Inv. No.	Property Name	Street	Town	Year
ARL.1389	Marian Convent of Saint James The Apostle	22 Appleton St	Arlington	1955
ARL.495	Fay, Wilson W. House	32 Appleton St	Arlington	c 1860
ARL.496	Idahurst - Farmer, Eldridge House	53 Appleton St	Arlington	c 1894
ARL.497	Hill, Addison House	83 Appleton St	Arlington	r 1840
ARL.236	Tewksbury, Minna L. House	222 Appleton St	Arlington	c 1890
ARL.237	Rockwood, Wendall D. House	15 Ashland St	Arlington	c 1873
ARL.238	Barcomb, Hannah S. House	21 Ashland St	Arlington	c 1875
ARL.239	Gorham House	30 Ashland St	Arlington	c 1890
ARL.708	Bates, Esther A. - Blackinton House	8 Bacon St	Arlington	r 1880
ARL.703	Arlington Machine Works	78 Bow St	Arlington	1890
ARL.704	Sheean, Michael House	102 Bow St	Arlington	r 1860
ARL.903	Arlington Reservoir Standpipe	Cedar Ave	Arlington	1921
ARL.492	Chapel of Saint Anne	Claremont Ave	Arlington	1915
ARL.900	Guardian Angel Rock, The	Claremont Ave	Arlington	r 1920
ARL.913	Garden of The Guardian Angel Rock	Claremont Ave	Arlington	r 1920
ARL.271	Partridge, William O. House	9 Claremont Ave	Arlington	c 1898
ARL.272	Schnetzer House	17 Claremont Ave	Arlington	c 1873
ARL.273	Abendroth House	25 Claremont Ave	Arlington	c 1874
ARL.274		45 Claremont Ave	Arlington	c 1885
ARL.275		49 Claremont Ave	Arlington	r 1885
ARL.276	Hollis, F. House	51 Claremont Ave	Arlington	c 1895
ARL.277	MacKintosh, W. D. House	55 Claremont Ave	Arlington	c 1895
ARL.279		56 Claremont Ave	Arlington	c 1898
ARL.281		63 Claremont Ave	Arlington	r 1885
ARL.282	Haskell, B. C. House	71 Claremont Ave	Arlington	c 1875
ARL.283	Doul, George House	82 Claremont Ave	Arlington	c 1898
ARL.284	Hamblett, D. B. House	99 Claremont Ave	Arlington	1890
ARL.285	Potter, J. F. House	103 Claremont Ave	Arlington	1890
ARL.286	Wright, J. Roscoe House	111 Claremont Ave	Arlington	r 1885
ARL.287	Pierce, John A. P. House	122 Claremont Ave	Arlington	c 1835
ARL.288	Pierce, J. House	123 Claremont Ave	Arlington	c 1830
ARL.289		1 Claremont Ct	Arlington	r 1880
ARL.291	Wave, A. L. House	15 Cliff St	Arlington	c 1898
ARL.293	Coolidge, Walter S. - Piper House	16-18 Cliff St	Arlington	c 1898
ARL.296	Livingstone, Alexander Double House	29 Cliff St	Arlington	c 1898
ARL.25	Driver House	17 Crescent Hill Ave	Arlington	c 1880
ARL.26	Crescent Hill Improvement Association Clubhouse	41 Crescent Hill Ave	Arlington	c 1898

Inv. No.	Property Name	Street	Town	Year
ARL.1329		57 Crescent Hill Ave	Arlington	1988
ARL.1331	Thornrose, Otto House	61 Crescent Hill Ave	Arlington	1928
ARL.1330	McAllister, William J. House	62 Crescent Hill Ave	Arlington	1889
ARL.1332	Davidson, Abigail House	69 Crescent Hill Ave	Arlington	1882
ARL.27	Woodend, John F. House	72 Crescent Hill Ave	Arlington	c 1875
ARL.29	Davidson, A. C. House	75 Crescent Hill Ave	Arlington	c 1890
ARL.30	Kirschmayer, John House	79 Crescent Hill Ave	Arlington	r 1885
ARL.32	Engel, Bertie House	93 Crescent Hill Ave	Arlington	1913
ARL.1333	Whittier, Elwell House	102 Crescent Hill Ave	Arlington	1899
ARL.1335	Schumacher, Jacob House	105 Crescent Hill Ave	Arlington	1885
ARL.1334	Disston, George A. House	106 Crescent Hill Ave	Arlington	1896
ARL.34	Kirschmayer, John House	109 Crescent Hill Ave	Arlington	1911
ARL.1336	Burke, Paul H. House	110 Crescent Hill Ave	Arlington	1914
ARL.78	Schieb, James House	11 Elder Terr	Arlington	c 1880
ARL.80	Savage, James House	12 Elder Terr	Arlington	c 1880
ARL.81	Spencer, Eugene House	25 Elder Terr	Arlington	c 1880
ARL.300	Dronet, William G. House	56 Florence Ave	Arlington	1913
ARL.301	Winchester, Capt. J. O. House	102 Florence Ave	Arlington	c 1873
ARL.907	Lexington Railroad Bridge over Forest Street	Forest St	Arlington	1900
ARL.543	Sipple, C. House	23 Forest St	Arlington	1871
ARL.53		147 Forest St	Arlington	r 1875
ARL.54		155 Forest St	Arlington	r 1880
ARL.55		159 Forest St	Arlington	r 1875
ARL.56	Crosby House	163 Forest St	Arlington	r 1875
ARL.57		175 Forest St	Arlington	c 1900
ARL.58	Wilbur, J. W. House	185 Forest St	Arlington	c 1895
ARL.59	Dan, George House	187 Forest St	Arlington	c 1890
ARL.1084		193 Forest St	Arlington	
ARL.1085		197 Forest St	Arlington	
ARL.1086		201 Forest St	Arlington	
ARL.1087		205 Forest St	Arlington	
ARL.60		209 Forest St	Arlington	r 1875
ARL.61		211 Forest St	Arlington	r 1915
ARL.1088		215 Forest St	Arlington	
ARL.1089		219 Forest St	Arlington	
ARL.553		7 Frazer Rd	Arlington	r 1820
ARL.554	Gallagher, John House	18 Frazer Rd	Arlington	1869
ARL.64	Hayden, Lester House	1 Gilboa Rd	Arlington	c 1924

Inv. No.	Property Name	Street	Town	Year
ARL.308	Eberhardt, Phillip House	248 Gray St	Arlington	c 1885
ARL.310	Prentiss, William House	252 Gray St	Arlington	r 1855
ARL.312	Bailey, J. A. House	2 Higgins St	Arlington	r 1865
ARL.315	Eaton, Cora A. House	55 Hillside Ave	Arlington	c 1895
ARL.316	Quimby, Carl N. House	60 Hillside Ave	Arlington	1906
ARL.317	Bixby, J. L. House	65 Hillside Ave	Arlington	c 1875
ARL.318	MacBride, Marion A. House	76 Hillside Ave	Arlington	r 1885
ARL.319	Bunker, Cora E. House	81 Hillside Ave	Arlington	c 1885
ARL.320	Kern, F. V. B. House	84 Hillside Ave	Arlington	c 1895
ARL.321	Barnard House	106 Hillside Ave	Arlington	c 1875
ARL.322	Barnards Hotel - Lewis, Dr. Dio House	163 Hillside Ave	Arlington	c 1875
ARL.1127		9 Lancaster Rd	Arlington	1912
ARL.376	Ring, T. F. House	51 Lancaster Rd	Arlington	c 1895
ARL.377	O'Quinn House	65 Lancaster Rd	Arlington	c 1900
ARL.569	Locke, Lt. Benjamin Store	11-13 Lowell St	Arlington	1816
ARL.570	Schwamb, Charles House	35 Lowell St	Arlington	c 1880
ARL.571	Reardon, R. House	61 Lowell St	Arlington	r 1860
ARL.572		90 Lowell St	Arlington	r 1890
ARL.573	Nourse, S. M. House	140 Lowell St	Arlington	1894
ARL.1311	Hadley, William House	147 Lowell St	Arlington	1896
ARL.574	Nourse, S. M. House	152-154 Lowell St	Arlington	c 1890
ARL.74	Nourse, Thomas House	157 Lowell St	Arlington	c 1880
ARL.75	Watts, I. O. House	175 Lowell St	Arlington	c 1885
ARL.575	Bolles, Sandy House	176 Lowell St	Arlington	r 1890
ARL.359	Boles, Alexander House	178 Lowell St	Arlington	
ARL.1150	Boles, Alexander Barn	178 Lowell St	Arlington	
ARL.576	Butler, T. - Taylor, W. C. House	187 Lowell St	Arlington	1884
ARL.77		197 Lowell St	Arlington	c 1880
ARL.79	Richardson, Herbert House	203 Lowell St	Arlington	c 1880
ARL.3	Cutter, Gershom House	1146 Massachusetts Ave	Arlington	c 1835
ARL.621	Schwamb, Theodore Piano Manufacturing Company	1165 Massachusetts Ave	Arlington	r 1905
ARL.623	Schwamb, Theodore House	1171 Massachusetts Ave	Arlington	c 1845
ARL.624	Schwamb, Charles House	1172-1180 Massachusetts Ave	Arlington	c 1845
ARL.625	Farmer, Kimball House	1173 Massachusetts Ave	Arlington	1826
ARL.626	Warner, C. D. House	1188 Massachusetts Ave	Arlington	1892
ARL.627	Bean, Harlon House	1218 Massachusetts Ave	Arlington	1898
ARL.628	Bustrick House	1253 Massachusetts Ave	Arlington	c 1895

Inv. No.	Property Name	Street	Town	Year
ARL.629	Morris House	1257 Massachusetts Ave	Arlington	c 1895
ARL.630		1334 Massachusetts Ave	Arlington	1901
ARL.631		1339 Massachusetts Ave	Arlington	1901
ARL.632		1378 Massachusetts Ave	Arlington	r 1860
ARL.1140		1422 Massachusetts Ave	Arlington	
ARL.912	Lexington Railroad Bridge over Mill Brook	Mill Brook	Arlington	1892
ARL.33	Old Schwamb Mill	17 Mill Ln	Arlington	r 1860
ARL.84	Evans Farm Greenhouse	Montague St	Arlington	c 1910
ARL.1326	Nicoll, Edward House	10 Montague St	Arlington	1911
ARL.82	Weiss, W. H. House	15 Montague St	Arlington	c 1880
ARL.1327	Burke, Ulick House	16 Montague St	Arlington	1958
ARL.1328	Chalmers, Edward House	20 Montague St	Arlington	1883
ARL.83	Tucker, John House	21 Montague St	Arlington	c 1895
ARL.916	Mount Gilboa Conservation Land	Mount Gilboa	Arlington	
ARL.400	Sweet, Emma L. House	21-23 Oakland Ave	Arlington	c 1895
ARL.401	Ober, John H. House	22 Oakland Ave	Arlington	c 1895
ARL.402	Taylor, Jack - Dallin, Cyrus Edwin House	69 Oakland Ave	Arlington	c 1898
ARL.403	Waterman, Nixon House	89 Oakland Ave	Arlington	c 1895
ARL.405	Allyn, Phillip M. House	94 Oakland Ave	Arlington	c 1898
ARL.407	Peirce, Thomas House	178 Oakland Ave	Arlington	c 1850
ARL.643	Arlington Coal and Lumber Company Building	41 Park Ave	Arlington	c 1875
ARL.644	Dallin, Vittoria C. Public Library	85 Park Ave	Arlington	1938
ARL.645	Locke School	88 Park Ave	Arlington	c 1899
ARL.646	Park Avenue Congregational Church	91 Park Ave	Arlington	1961
ARL.409	Butler, Edward J. House	125 Park Ave	Arlington	c 1875
ARL.410	White, John A. House	143 Park Ave	Arlington	1925
ARL.411	Hesseltine House	154 Park Ave	Arlington	c 1875
ARL.412	White, Flora V. House	163 Park Ave	Arlington	r 1885
ARL.414	Sinclair, C. A. House	168 Park Ave	Arlington	c 1880
ARL.422	Dupee, Theodore House	203 Park Ave	Arlington	r 1885
ARL.413		216 Park Ave	Arlington	c 1925
ARL.415	Hillard, J. O. House	223 Park Ave	Arlington	c 1875
ARL.416	Braithwaite, William Stanley Beaumont House	243 Park Ave	Arlington	c 1880
ARL.417	Holmes, Joseph C. House	246 Park Ave	Arlington	c 1874
ARL.418		275 Park Ave	Arlington	c 1925
ARL.110		26 Park Ave Extension	Arlington	c 1915
ARL.111		36 Park Ave Extension	Arlington	c 1905
ARL.112		47 Park Ave Extension	Arlington	c 1910

Inv. No.	Property Name	Street	Town	Year
ARL.113		63 Park Ave Extension	Arlington	
ARL.114		21 Park Pl	Arlington	r 1885
ARL.649	Weather, Mary A. House	17 Paul Revere Rd	Arlington	1903
ARL.650	Adams, Charles D. Jr. House	32 Paul Revere Rd	Arlington	c 1890
ARL.1139		85 Paul Revere Rd	Arlington	
ARL.651	Locke, Joseph House	95-97 Paul Revere Rd	Arlington	r 1810
ARL.652	Bolles, Florence House	101-103 Paul Revere Rd	Arlington	c 1890
ARL.653	Rowland, Henry C. House	11-13 Peirce St	Arlington	1919
ARL.426	Leary, T. J. House	1 Perth Rd	Arlington	c 1910
ARL.461	Tremblay, Alfred House	40 Smith St	Arlington	c 1900
ARL.134		455-457 Summer St	Arlington	c 1915
ARL.673	Davis, J. House	8 Surry Rd	Arlington	r 1850
ARL.463	Buskirk, Charles House	67 Sutherland Rd	Arlington	c 1912
ARL.468	Gannett, F. W. House	7 Tanager St	Arlington	c 1895
ARL.469	Harrison, W. H. House	20 Tanager St	Arlington	c 1890
ARL.474	Kittor, J. T. - Miller, George House	66 Walnut St	Arlington	c 1875
ARL.475	Cragin, I. L. House and Farm	71 Walnut St	Arlington	c 1860
ARL.138	Arlington Heights Baptist Church	9 Westminster Ave	Arlington	1899
ARL.139	Robinson, W. H. House	11 Westminster Ave	Arlington	c 1910
ARL.1266	Rosengren, Adolph House	15 Westminster Ave	Arlington	1926
ARL.1267	Arlington Heights United Methodist Church	20 Westminster Ave	Arlington	1946
ARL.140	Van Gelder, Berta House	21 Westminster Ave	Arlington	1927
ARL.141	Hinsley, B. House	33 Westminster Ave	Arlington	r 1865
ARL.1268	Silverstein House	34 Westminster Ave	Arlington	1927
ARL.142	Joslin, Grant R. House	37 Westminster Ave	Arlington	c 1915
ARL.143	Robinson - Lewis - Fessenden House	40 Westminster Ave	Arlington	c 1850
ARL.1269		44 Westminster Ave	Arlington	1977
ARL.1270	Hadley, Eliza House	46 Westminster Ave	Arlington	1896
ARL.1271	Hill, John House	51 Westminster Ave	Arlington	1929
ARL.144	Nourse, Nathan House	52-54 Westminster Ave	Arlington	1848
ARL.1272	Bell, John B. House	55 Westminster Ave	Arlington	1957
ARL.1273		58-60 Westminster Ave	Arlington	1976
ARL.145	Wright, W. R. - O'Keefe, John M. House	62 Westminster Ave	Arlington	r 1880
ARL.1274		64 Westminster Ave	Arlington	1988
ARL.1275	Salter, William House	65 Westminster Ave	Arlington	1926
ARL.1276	Cheever, John House	69 Westminster Ave	Arlington	1925
ARL.1277	Watts, Issac O. House	72 Westminster Ave	Arlington	1885
ARL.1278	Elder, Amelia House	75 Westminster Ave	Arlington	1900

Inv. No.	Property Name	Street	Town	Year
ARL.146	Elder, Hugh Thomas House	80 Westminster Ave	Arlington	1882
ARL.147	Quinn, William J. House	81 Westminster Ave	Arlington	c 1885
ARL.148	Elder, Hugh Thomas Carriage House	82 Westminster Ave	Arlington	c 1882
ARL.149	Brandenburg, Clarence J. House	88 Westminster Ave	Arlington	c 1885
ARL.1284		90 Westminster Ave	Arlington	1926
ARL.1279	Olive, Edith House	91 Westminster Ave	Arlington	1914
ARL.1280	Leveroni House	96 Westminster Ave	Arlington	1987
ARL.1281	Call, Phenland E. House	97 Westminster Ave	Arlington	1923
ARL.1282	Hattie, James House	99 Westminster Ave	Arlington	1911
ARL.1283	Deane, Harrison G. O. House	103-105 Westminster Ave	Arlington	1883
ARL.150	Swett, Frank Isaac House	109 Westminster Ave	Arlington	1882
ARL.1285		110 Westminster Ave	Arlington	1926
ARL.1286		114 Westminster Ave	Arlington	1926
ARL.1288	Smith, Alonzo R. House	115 Westminster Ave	Arlington	1881
ARL.1287		118 Westminster Ave	Arlington	1926
ARL.1289	Bartlett, Charles H. House	123 Westminster Ave	Arlington	1881
ARL.1290	MacNeil, John House	134 Westminster Ave	Arlington	1928
ARL.1292	Woodend, John - Patriquin, Carleton House	137 Westminster Ave	Arlington	1911
ARL.1291	Shattuck, Eugene House	138 Westminster Ave	Arlington	1928
ARL.1293	Disston, George Double House	139-141 Westminster Ave	Arlington	1902
ARL.1294		143-145 Westminster Ave	Arlington	1923
ARL.1295	Spinnale House	149 Westminster Ave	Arlington	1958
ARL.1296	Snow, Albert House	151-153 Westminster Ave	Arlington	1902
ARL.1297	Soderquist House	152 Westminster Ave	Arlington	1900
ARL.151	Records, Francis E. House	155-157 Westminster Ave	Arlington	r 1895
ARL.152	Swadkins, A. B. House	156 Westminster Ave	Arlington	c 1898
ARL.153	Swadkins, Thomas House	160 Westminster Ave	Arlington	c 1882
ARL.154	Reed, J. H. House	161 Westminster Ave	Arlington	r 1865
ARL.1299	Stiles Barn	161R Westminster Ave	Arlington	1890
ARL.1304	Gough, Isaac House	174 Westminster Ave	Arlington	1926
ARL.1301	Munroe, Col. Nelson House	178 Westminster Ave	Arlington	1885
ARL.1302	Nicoll, Walter House	179 Westminster Ave	Arlington	1881
ARL.155	Drew, Dan G. Carriage House	182 Westminster Ave	Arlington	c 1890
ARL.1306	Mellor, Joseph House	183 Westminster Ave	Arlington	1932
ARL.1305	Drew, Dan G. House	184 Westminster Ave	Arlington	1883
ARL.1300	Nicoll, Florence Double House	185-187 Westminster Ave	Arlington	1921
ARL.1307		188-190 Westminster Ave	Arlington	1972
ARL.157	Brandenberg, H. M. House	192-194 Westminster Ave	Arlington	c 1880

Inv. No.	Property Name	Street	Town	Year
ARL.1308	Weston, William House	193 Westminster Ave	Arlington	1902
ARL.1309	Lindburg, Frederick House	195 Westminster Ave	Arlington	1902
ARL.1310	Rouillard, E. House	196 Westminster Ave	Arlington	1881
ARL.156	Payne, A. House	197 Westminster Ave	Arlington	c 1870
ARL.1315	Goodwillie, Fred M. House	7 Westmoreland Ave	Arlington	1897
ARL.1316	Reed, Everett House	11 Westmoreland Ave	Arlington	1924
ARL.1317	Keating, George House	14 Westmoreland Ave	Arlington	1926
ARL.1318	Jones, Charles R. House	19 Westmoreland Ave	Arlington	1899
ARL.1319	Newall, Arthur E. House	39 Westmoreland Ave	Arlington	1928
ARL.1320	Barker, John J. House	45 Westmoreland Ave	Arlington	1900
ARL.1323	Brown, Robert K. Jr. House	46 Westmoreland Ave	Arlington	1924
ARL.1321	Anderson, Swen L. House	47 Westmoreland Ave	Arlington	1900
ARL.915		50R Westmoreland Ave	Arlington	
ARL.1324	Brown, Robert K. Jr. House	50 Westmoreland Ave	Arlington	1958
ARL.1325	Brown, Henry K. House	52 Westmoreland Ave	Arlington	1890
ARL.1322	Harling, Frederick J. House	53 Westmoreland Ave	Arlington	1900
ARL.1313	Lawson, Jennie House	3 Westmoreland St	Arlington	1897
ARL.1314	Hawes, Frank House	4 Westmoreland St	Arlington	1890
ARL.137		112 Westmoreland St	Arlington	1911
ARL.4	Cutter, Jefferson House	1 Whittemore Pk	Arlington	c 1830
ARL.482		18 Williams St	Arlington	c 1895
ARL.483	McDonald, R. N. House	22 Williams St	Arlington	c 1900
ARL.484		28 Williams St	Arlington	c 1895
ARL.485		23 Wollaston Ave	Arlington	c 1898
ARL.486	Hamblin, B. Harold House	27 Wollaston Ave	Arlington	c 1890
ARL.487	Spiller, M. W. House	57 Wollaston Ave	Arlington	c 1890
ARL.488	Abbott, A. House	69 Wollaston Ave	Arlington	c 1895
ARL.489	Brick - Birch House	74 Wollaston Ave	Arlington	1895
ARL.490	Everett, Theodore House	82 Wollaston Ave	Arlington	r 1900
ARL.1128		33 Woodbury St	Arlington	1912
ARL.1129		35 Woodbury St	Arlington	1912