GEI Consultants

Consulting Engineers and Scientists

August 12, 2019
Project 1702980

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
Terminal E Modernization
East Boston, Massachusetts

On behalf of the Massachusetts Port Authority (Massport), 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. AN NOI for coverage under the NPDES Construction General Permit (CGP) has been submitted to EPA and is pending approval.

The Terminal E Modernization project will include renovating and expanding Terminal E of Logan International Airport in East Boston, Massachusetts and installing fuel lines. The footprint of the Terminal E expansion and fuel lines are in Fig. 2. There are four closed Massachusetts Contingency Plan (MCP; 310 CMR 40.0000) disposal sites within the project area identified by Release Tracking Numbers (RTNs) 3-0777, 3-10508, 3-32351, and 3-33179 (Fig. 2). Although the four disposal sites are closed with Permanent Solution Statements, there is an Activity and Use Limitation (AUL; RTN 3-0777) and MCP conditions (RTN 3-32351). There is also one open MCP disposal site (RTN 3-35030; Fig. 3). This RGP NOI is intended to address the entire project area, inclusive of all these disposal sites.

Site Information

This NOI has been prepared for the discharge of dewatering effluent during construction of a proposed Terminal E Modernization at Logan International Airport in East Boston, Massachusetts. The Site, which is approximately 17 acres, is located southwest of Terminal E along the Service Road and includes a decommissioned gasoline service station, the Baggage Handling Building, and a UPS building (Building 13) (to be demolished) as well as paved parking and storage areas. A former American Airlines Hangar (Building 16) and underground storage

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781.721.4000 fax: 781.721.4073

tank (UST) farm was located within the central airside portion of the project site. The former UST farm is MassDEP disposal site (RTN 3-0777) with an AUL.

In June 2018, to support the Terminal E Modernization project, monitoring well GEI-107(OW) was installed at the Site (Figs. 2 and 3). Following installation, approximately 0.7 feet of Light Non-Aqueous Phase Liquid (LNAPL) was measured in the well. The presence of the LNAPL constituted a 72-hour MCP reporting condition and MassDEP assigned RTN 3-35030 to the condition.

Some construction dewatering will be necessary to keep excavations dry. Dewatering effluent will be recharged on the site; however, if this is not practicable, it will be discharged to the Massport storm water drainage system which discharges to the Boston Main Channel of the Boston Inner Harbor via the West Outfall (Fig. 4), in accordance with the NPDES RGP permit.

Owner and Operator Information

Owner
Massport
One Harborside Drive
East Boston, MA
Contact: Rosanne M. Joyce
Environmental Manager
(617) 568-3516
RJoyce@massport.com

Operator
Suffolk Construction
65 Allerton Street
Boston, MA 02119
Contact: Clifton Page
Project Manager
(617) 293-5137
CPage@suffolk.com

As the owner, Massport has operational control over the construction plans and specifications, including the ability to make modifications to those plans and specifications. Suffolk, 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 CDM Smith, Inc. on June 24, 2019 on behalf of Massport, was used to support this NOI. A sample from the Boston Inner Harbor, the receiving water, was collected from the vault for the West Outfall. The sample was submitted to Alpha Analytical (Alpha) of Westborough, Massachusetts 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 and salinity were obtained in the field and are noted on the effluent limitations calculation page in Appendix A.

Since the receiving water is a saltwater body and based on confirmation from MassDEP (Appendix A), the dilution factor for the Reserved Channel is 1. The effluent limits were generated using the NPDES RGP NOI Dilution Factor Calculation spreadsheet. As requested by EPA, a copy of the spreadsheet will be submitted via email to EPA for their review with this NOI. In addition, copies of the “EnterData” and “Saltwater Results” tabs from the spreadsheet are provided in Appendix A. The resulting calculated effluent limits are in Table 1.

Source Water Information

We evaluated the proposed influent by collecting one groundwater sample from the Site. The groundwater sample was collected from monitoring well GEI-203 (Fig. 3) and submitted to ESS Laboratories (ESS) of Cranston, Rhode Island for analysis of the parameters required under the NPDES RGP. In addition, the pH and temperature of the proposed influent were measured in the field to evaluate existing conditions. The results are in Table 2 and the associated laboratory data report for this sample is provided in Appendix C.

The analytical results indicated the presence of benzene, 1,4-dioxane, ammonia, chloride, total suspended solids (TSS), polycyclic aromatic hydrocarbons (PAHs; acenaphthene, acenaphthylene, fluorene, naphthalene, and phenanthrene), cyanide, and metals (arsenic, iron, and zinc). The measured pH of the groundwater at the Site was approximately 6.7 standard units (S.U.). The pH range detected is within the RGP effluent limit for Massachusetts waters (6.5 to 8.3 S.U.).

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 oil/water separator, granulated activated carbon (GAC), iron removal (e.g. flocculation/coagulation and clarifying), ion exchange resin, and pH adjustment, if necessary.

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, and operation recommendations, and product information for GAC, ion exchange, and iron removal system adjustment are in Appendix A. These systems will be mobilized as necessary to achieve effluent limits.

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

Dewatering activities are expected to start in August 2019 and continue through December 2020. 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. If possible, groundwater will be recharged onsite. If onsite recharge is infeasible, the water will be discharged from the treatment system to nearby storm drains shown in Appendix D. These storm drains outfall from the West Outfall to the Boston Main Channel of the Boston Inner Harbor as shown in Fig. 4 and Appendix D.

Endangered Species Act Eligibility

We reviewed the U.S. Fish and Wildlife Service (FWS) Information, Planning, and Conservation (IPAC) online database for the Property and receiving water ("project action area"). A copy of the database report is in Appendix E. Based on this report, there are no listed species or critical habitats are within the project action area.

Because the proposed effluent discharge is to nearshore marine waters in Massachusetts (i.e., Massachusetts Bay, inclusive of Boston Harbor), and there has been no previous consultation with National Marine Fisheries Services (NMFS) for this project, we reviewed EPA's determination made during their consultation with the NMFS, dated December 18, 2016. According to the determination, the endangered or protected species under jurisdiction of the NFMS that could potentially encounter CGP or RGP discharge in the project area are the short nose sturgeon, Atlantic sturgeon, four species of sea turtles, and two species of whales. According to the determination, the turtles and whales are highly unlikely to be present in the project action area (Boston Main Channel) where the proposed discharge effluent will occur, and sturgeon are expected to be present transiently. Because discharge is not to the Connecticut, Merrimack, or Taunton Rivers, where the sturgeon spawn, both species of sturgeon are expected to be present only in adult life stages in the project action area.

Based on our review, the project area meets FWS Criterion A (i.e. no listed species or critical habitats are within the project area) and NMFS Criterion (i.e. the project will have either no effect on or are not likely to adversely affect listed species or critical habitats under jurisdiction of the NMFS).

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 F. 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. West Outfall in the Boston Main Channel) is not listed as a National Historic Place. The inventory listing from the MACRIS database is included in Appendix F.

Coverage Under NPDES RGP

It is our opinion that the proposed discharge is eligible for coverage under the NPDES RGP based on the requirements of the NPDES RGP and our evaluation of the available site-specific information. On behalf of Massport, we are requesting coverage under the NPDES RGP for the discharge of treated construction dewatering effluent to the surface waters of the Boston Main Channel of the Boston Inner Harbor.

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 F). A Best Management Practice Plan (BMPP), to be implemented at the Site during construction dewatering treatment, and discharge is in Appendix G.

Please contact me at 781.721.4012 or igladstone@geiconsultants.com or Heather Ballantyne at 781.721.406 or hballantyne@geiconsultants.com if you have any questions.

Sincerely,

GEI CONSULTANTS, INC.

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

Heather A. Ballantyne, P.G., LSP
Project Manager

AMW/JLE/HAB/ISG:jam
Enclosures
c: Rosanne M. Joyce, Massport
Clifton Page, Suffolk Construction

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Tables

Table 1. Chemical Testing Results - Receiving Water (Reserved Channel)
Terminal E Modernization
Logan Airport
East Boston, Massachusetts

		Sample Location:	**West RGP**
		Sample Date:	**6/24/2019**
Analyte	**Method**	**Units**	
Total Metals		ug/l	
Antimony	200.8		< 4.0
Arsenic	200.8		3.03
Cadmium	200.8		< 0.2
Chromium, Trivalent	107		< 10.0
Chromium, Hexavalent	7196A		< 10.0
Chromium (Total)	200.8		< 1.0
Copper	200.8		5.22
Iron	200.7		2,780
Lead	200.8		< 1.0
Mercury	245.1		< 0.2
Nickel	200.8		2.18
Selenium	200.8		< 5.0
Silver	200.8		< 0.4
Zinc	200.8		41.9
Other			
Hardness	200.7	ug/l	595,000
Ammonia as Nitrogen	4500NH3-BH	ug/l	989
Salinity	Field	ppt	5.72
pH	Field	S.U.	6.72

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. ppt = parts per thousand.
5. S.U. = standard units.

Table 2. Chemical Testing Results - Groundwater
Terminal E Modernization
Logan Airport
East Boston, Massachusetts

				Sample Location:	GEI-203
				Sample Date:	6/28/2019
				Screen Interval:	5.15-20.15
Analyte	**Method**	**Units**	**MCP RCGW-2**	**Site Specific Effluent Limits**	
Volatile Organic Compounds (VOCs)		ug/l			
Benzene	524.2		1,000	5	0.5
1,4-Dioxane	8270D-SIM		6,000	200	0.452
Phenols	420.1		NS	1080	< 100
Total BTEX	524.2		NS	100	0.5
Total Non-Halogenated VOCs[1]	524.2		NS	NS	0.952
Total Halogenated VOCs[2]	524.2		NS	NS	ND
Semivolatile Organic Compounds (SVOCs)	625 SIM	ug/l			
Total Phthalates			NS	190	ND
Total Group I PAHs[3]			NS	1	ND
Acenaphthene			10,000	NS	0.39
Acenaphthylene			10,000	NS	0.64
Fluorene			40	NS	1.12
Naphthalene			700	20	0.68
Phenanthrene			10,000	NS	0.34
Total Group II PAHs[4]			NS	100	3.17
Fuel Parameters		ug/l			
Total Petroleum Hydrocarbons	1664A		5,000	5,000	< 5,000
Ethanol	ASTM D3695		NS	Report	< 10,000
Inorganic Compounds					
Ammonia as Nitrogen	350.1	mg/l	NS	Report	3.06
Chloride	300.0	mg/l	NS	Report	17.1
Total Residual Chloride	4500CL D	ug/l	NS	50	< 20.0
Total Suspended Solids	2540D	mg/l	NS	30	75
Antimony	200.7	ug/l	8,000	206	< 5.0
Arsenic	3113B	ug/l	900	104	17.4
Cadmium	200.8	ug/l	4	10.2	<0.2
Chromium, Total	200.7	ug/l	300	NS	<2.0
Chromium III	200.7	ug/l	600	323	< 10.0
Chromium VI	3500Cr B-2009	ug/l	300	323	< 10.0
Copper	200.7	ug/l	100,000	242	<2.0
Iron	200.7	ug/l	NS	5,000	18,600
Lead	200.8	ug/l	10	160.0	<0.5
Mercury	245.1	ug/l	20	0.739	<0.2
Nickel	200.7	ug/l	200	1,450	<5.0
Selenium	3113B	ug/l	100	235.8	<2.0
Silver	200.7	ug/l	7	35.1	<0.5
Zinc	200.7	ug/l	900	420	14.0
Total Cyanide	4500CNCE	mg/l	30	5	27.2
Polychlorinated Biphenlyls (PCBs)	608.3	ug/l			
Total PCBs			5	0.5	<0.09
Other					
Hardness	200.7	ug/l	NS	NS	292,000
Temperature	Field	Deg C	NS	NS	17.24
pH	Field	S.U.	NS	6.5 to 8.3	6.44

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 April 25, 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. ND = Not detected. NS = No standard has been established for this analyte.
10. Dilution Factor of 1 used to establish effluent limits.
11. Effluent limits calculated using NPDES RGP NOI Dilution Factor Spreadsheet.
12. 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-trichloroethane, trichloroethylene, tetrachloroethylene, cis-1,2 dichloroethylene, and vinyl chloride.
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

GOOGLE EARTH IMAGE DATED 4/14/2017.

0 300 600

Approximate Scale, Feet

NPDES RGP Notice of Intent Terminal E Modernization - Logan International Airport Boston, Massachusetts	GEI Consultants	SITE LOCATION MAP
Massachusetts Port Authority Boston, Massachusetts	Project 1702980	August 2019 Fig. 1

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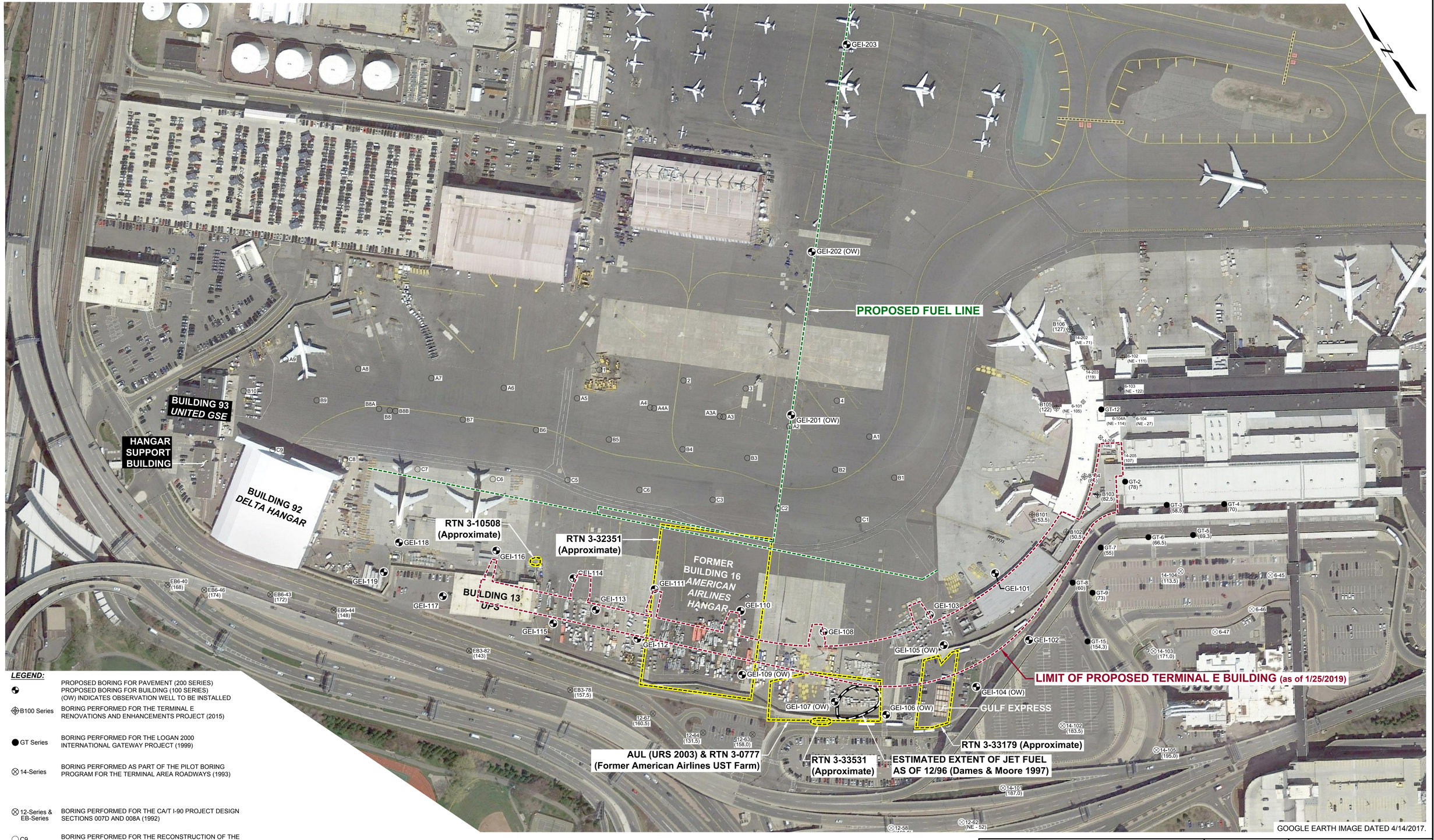

LEGEND:

◕	PROPOSED BORING FOR PAVEMENT (200 SERIES) PROPOSED BORING FOR BUILDING (100 SERIES) (OW) INDICATES OBSERVATION WELL TO BE INSTALLED
⊕ B100 Series	BORING PERFORMED FOR THE TERMINAL E RENOVATIONS AND ENHANCEMENTS PROJECT (2015)
● GT Series	BORING PERFORMED FOR THE LOGAN 2000 INTERNATIONAL GATEWAY PROJECT (1999)
⊗ 14-Series	BORING PERFORMED AS PART OF THE PILOT BORING PROGRAM FOR THE TERMINAL AREA ROADWAYS (1993)
⊗ 12-Series & EB-Series	BORING PERFORMED FOR THE CA/T I-90 PROJECT DESIGN SECTIONS 007D AND 008A (1992)
○ C9	BORING PERFORMED FOR THE RECONSTRUCTION OF THE NORTH APRON TAXIWAY (1973)
⊕ 6-Series	BORING PERFORMED FOR THE INTERNATIONAL TERMINAL (1971)
(114.9)	VALUES IN PARENTHESES INDICATE DEPTH TO TOP OF BEDROCK, FEET) (NE) - NOT ENCOUNTERED DEPTH

NOTES:

1. BORING LOCATIONS ARE APPROXIMATE.

0 120 240
SCALE: 1" = 120'

GOOGLE EARTH IMAGE DATED 4/14/2017.

NPDES RGP Notice of Intent
Terminal E Modernization - Logan International Airport
Boston, Massachusetts

Massachusetts Port Authority
Boston, Massachusetts

GEI Consultants

SITE PLAN

Project 1702980 | August 2019 | Fig. 2

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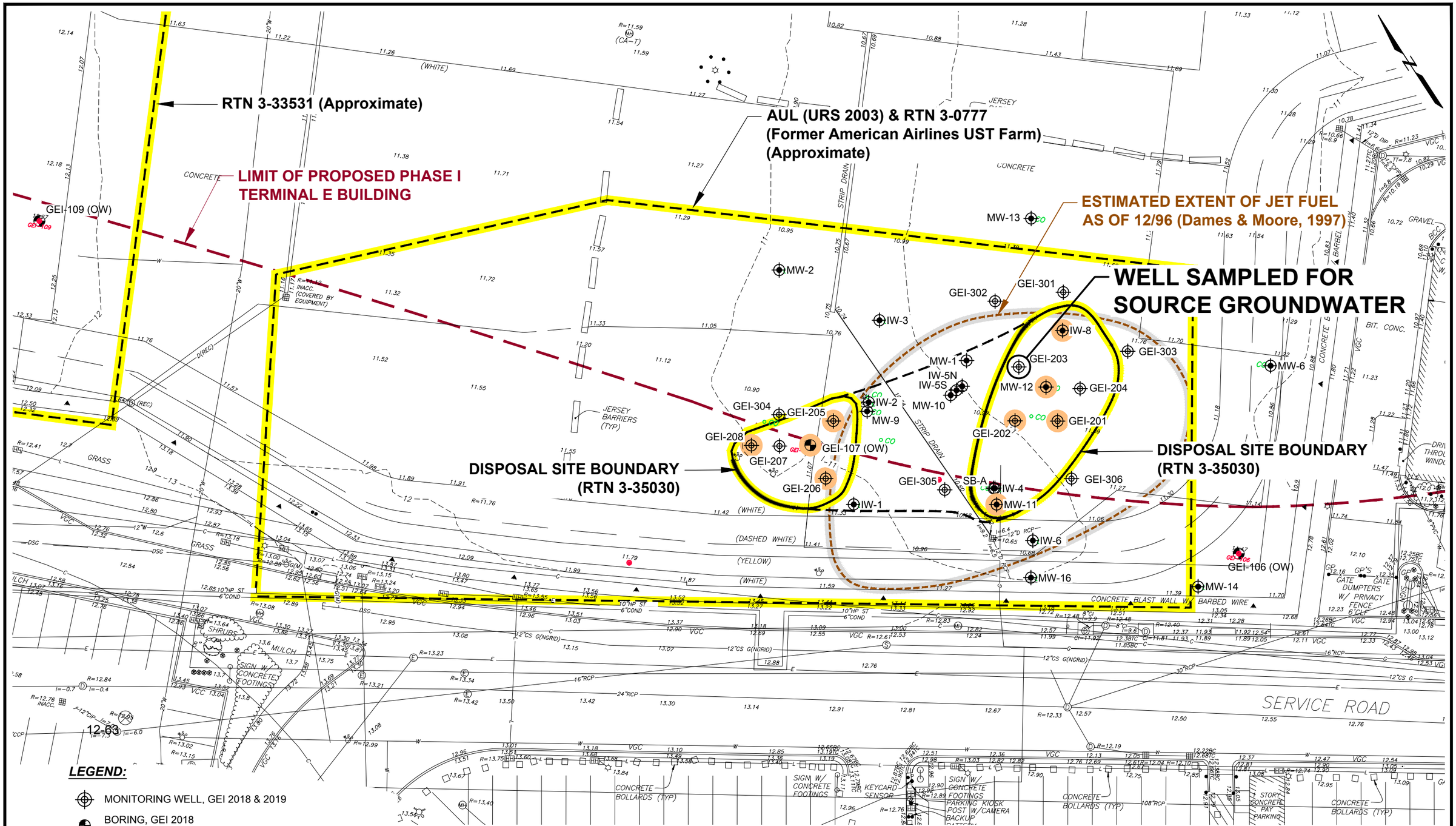

LEGEND:

- MONITORING WELL, GEI 2018 & 2019
- BORING, GEI 2018
  (OW) INDICATES OBSERVATION WELL INSTALLED
- IW Series — INJECTION WELL
- MW Series — MONITORING WELL
- LNAPL DETECTED IN MONITORING WELL

0 30 60

SCALE: 1" = 30'

NPDES RGP Notice of Intent
Terminal E Modernization - Logan International Airport
Boston, Massachusetts

Massachusetts Port Authority
Boston, Massachusetts

GEI Consultants

MONITORING WELL
LOCATION PLAN

Project 1702980 | August 2019 | Fig. 3

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GOOGLE EARTH IMAGE DATED 4/22/2018.

NPDES RGP Notice of Intent Terminal E Modernization - Logan International Airport Boston, Massachusetts	GEI Consultants	AERIAL WITH OUTFALL LOCATIONS
Massachusetts Port Authority Boston, Massachusetts	Project 1702980	August 2019 Fig. 4

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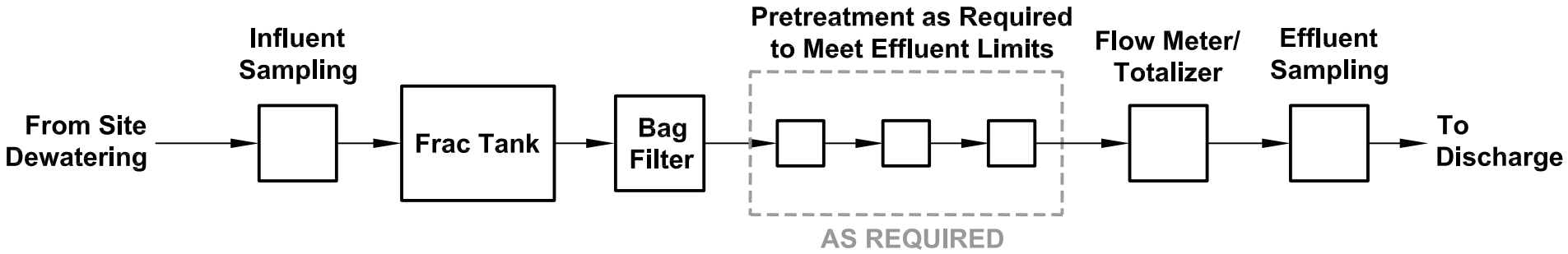

PROCESS FLOW DIAGRAM

Not to Scale

NPDES RGP Notice of Intent Terminal E Modernization - Logan International Airport Boston, Massachusetts	GEI Consultants	PROCESS FLOW DIAGRAM
Massachusetts Port Authority Boston, Massachusetts	Project 1702980	August 2019 Fig. 5

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Appendix A

Remediation General Permit
Notice of Intent

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

A. General site information:

<table>
<tr><td rowspan="2">1. Name of site:
Terminal E Modernization</td><td colspan="3">Site address: Logan International Airport
Street: 500 Terminal Road</td></tr>
<tr><td>City: East Boston</td><td>State: MA</td><td>Zip: 02128</td></tr>
<tr><td rowspan="4">2. Site owner
Massachusetts Port Authority

Owner is (check one): ☐ Federal ■ State/Tribal ☐ Private
☐ Other; if so, specify:</td><td colspan="3">Contact Person: Rosanne M. Joyce</td></tr>
<tr><td colspan="2">Telephone: 617-568-3516</td><td>Email: RJoyce@massport.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: Environmental Management
One Harborside Drive</td></tr>
<tr><td>City: East Boston</td><td>State: MA</td><td>Zip: 02128</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner
Suffolk Construction</td><td colspan="3">Contact Person: Clifton Page</td></tr>
<tr><td colspan="2">Telephone: 617-293-5137</td><td>Email: CPage@suffolk.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: 65 Allerton Street</td></tr>
<tr><td>City: Boston</td><td>State: MA</td><td>Zip: 02119</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:
NOI for CGP submitted to EPA. Approval pending.

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):
3-0777, 3-35030, 3-32351, 3-10508, 3-33179
☐ 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):
Boston Main Channel (Boston Inner Harbor)	MA70-02	SB(CSO)

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.

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.	NA (saltwater)
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

6. Has the operator received confirmation from the appropriate State for the 7Q10and dilution factor indicated? (check one): ■ Yes ☐ No
If yes, indicate date confirmation received: 7/18/2019

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: Petroleum contamination - see attached Table 1	
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): West Outfall	Outfall location(s): (Latitude, Longitude) 42°21'30" N 71°01'45" 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: 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): August 2019 - December 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="5">☐ I – Petroleum-Related Site Remediation
☐ II – Non-Petroleum-Related Site Remediation
■ III – Contaminated Site Dewatering
☐ IV – Dewatering of Pipelines and Tanks
☐ V – Aquifer Pump Testing
☐ VI – Well Development/Rehabilitation
☐ VII – Collection Structure Dewatering/Remediation
☐ VIII – Dredge-Related Dewatering</td><td colspan="2">a. If Activity Category I or II: (check all that apply)

☐ A. Inorganics
☐ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
☐ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
☐ F. Fuels Parameters</td></tr>
<tr><td colspan="2">b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)</td></tr>
<tr><td>■ G. Sites with Known Contamination</td><td>☐ H. Sites with Unknown Contamination</td></tr>
<tr><td>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)

■ A. Inorganics
■ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
■ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
■ F. Fuels Parameters</td><td>d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply</td></tr>
</table>

4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia		✔	1	350.1	100	3,060	3,060	Report mg/L	---
Chloride		✔	1	300.0	5,000	17,100	17,100	Report µg/l	---
Total Residual Chlorine	✔		1	4500CL D	20.0	< 20.0	0	0.2 mg/L	7.5 ug/L
Total Suspended Solids		✔	1	2540D	5,000	75,000	75,000	30 mg/L	---
Antimony	✔		1	200.7	5.0	< 5.0	0	206 µg/L	640 ug/L
Arsenic		✔	1	3113B	10.0	17.4	17.4	104 µg/L	36 ug/L
Cadmium	✔		1	200.8	0.2	< 0.2	0	10.2 µg/L	8.9 ug/L
Chromium III	✔		1	200.7	10.0	< 10.0	0	323 µg/L	100.0 ug/L
Chromium VI	✔		1	3500Cr	10.0	< 10.0	0	323 µg/L	50 ug/L
Copper	✔		1	200.7	2.0	< 2.0	0	242 µg/L	3.7 ug/L
Iron		✔	1	200.7	1,000	18,600	18,600	5,000 µg/L	
Lead	✔		1	200.8	0.5	< 0.5	0	160 µg/L	8.5 ug/L
Mercury	✔		1	245.1	0.2	<0.2	0	0.739 µg/L	1.11 ug/L
Nickel	✔		1	200.7	5.0	< 5.0	0	1,450 µg/L	8.3 ug/L
Selenium	✔		1	3113B	2.0	< 2.0	0	235.8 µg/L	71 ug/L
Silver	✔		1	200.7	0.5	< 0.5	0	35.1 µg/L	2.2 ug/L
Zinc		✔	1	200.7	5.0	14.0	14.0	420 µg/L	86 ug/L
Cyanide		✔	1	4500CNC	5.0	27.2	27.2	178 mg/L	1.0 ug/L
B. Non-Halogenated VOCs									
Total BTEX		✔	1	524.2	0.5	0.5	0.5	100 µg/L	---
Benzene		✔	1	524.2	0.5	0.5	0.5	5.0 µg/L	---
1,4 Dioxane		✔	1	8270D-SI	0.250	0.452	0.452	200 µg/L	---
Acetone	✔		1	524.2	5.0	< 5.0	0	7.97 mg/L	---
Phenol	✔		1	420.1	100	< 100	0	1,080 µg/L	300 ug/L

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
C. Halogenated VOCs									
Carbon Tetrachloride	✔		1	524.2	0.3	< 0.3	0	4.4 µg/L	1.6 ug/L
1,2 Dichlorobenzene	✔		1	524.2	0.5	< 0.5	0	600 µg/L	---
1,3 Dichlorobenzene	✔		1	524.2	0.5	< 0.5	0	320 µg/L	---
1,4 Dichlorobenzene	✔		1	524.2	0.5	< 0.5	0	5.0 µg/L	---
Total dichlorobenzene	✔		1	524.2	0.5	< 0.5	0	763 µg/L in NH	---
1,1 Dichloroethane	✔		1	524.2	0.5	< 0.5	0	70 µg/L	---
1,2 Dichloroethane	✔		1	524.2	0.5	< 0.5	0	5.0 µg/L	---
1,1 Dichloroethylene	✔		1	524.2	0.5	< 0.5	0	3.2 µg/L	---
Ethylene Dibromide	✔		1	504.1	0.015	< 0.015	0	0.05 µg/L	---
Methylene Chloride	✔		1	524.2	0.5	< 0.5	0	4.6 µg/L	---
1,1,1 Trichloroethane	✔		1	524.2	0.5	< 0.5	0	200 µg/L	---
1,1,2 Trichloroethane	✔		1	524.2	0.5	< 0.5	0	5.0 µg/L	---
Trichloroethylene	✔		1	524.2	0.5	< 0.5	0	5.0 µg/L	---
Tetrachloroethylene	✔		1	524.2	0.5	< 0.5	0	5.0 µg/L	3.3 ug/L
cis-1,2 Dichloroethylene	✔		1	524.2	0.5	< 0.5	0	70 µg/L	---
Vinyl Chloride	✔		1	524.2	0.2	< 0.2	0	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✔		1	625SIM	2.34	< 2.34	0	190 µg/L	
Diethylhexyl phthalate	✔		1	625SIM	2.34	< 2.34	0	101 µg/L	2.2 ug/L
Total Group I PAHs	✔		1	625SIM	0.05	< 0.05	0	1.0 µg/L	---
Benzo(a)anthracene	✔		1	625SIM	0.05	< 0.05	0	As Total PAHs	0.0038 ug/L
Benzo(a)pyrene	✔		1	625SIM	0.05	< 0.05	0		0.0038 ug/L
Benzo(b)fluoranthene	✔		1	625SIM	0.05	< 0.05	0		0.0038 ug/L
Benzo(k)fluoranthene	✔		1	625SIM	0.05	< 0.05	0		0.0038 ug/L
Chrysene	✔		1	625SIM	0.05	< 0.05	0		0.0038 ug/L
Dibenzo(a,h)anthracene	✔		1	625SIM	0.05	< 0.05	0		0.0038 ug/L
Indeno(1,2,3-cd)pyrene	✔		1	625SIM	0.05	< 0.05	0		0.0038 ug/L

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
Total Group II PAHs		✔	1	625SIM	0.19	3.17	3.17	100 µg/L	---
Naphthalene		✔	1	625SIM	0.19	0.68	0.68	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✔		1	608.3	0.09	< 0.09	0	0.000064 µg/L	---
Pentachlorophenol	✔		1	625SIM	0.84	< 0.84	0	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons		✔	1	1664A	5,000	< 5.000	0	5.0 mg/L	---
Ethanol	✔		1	ASTMD36	10,000	< 10,000	0	Report mg/L	---
Methyl-tert-Butyl Ether	✔		1	524.2	0.5	< 0.5	0	70 µg/L	20 ug/L
tert-Butyl Alcohol	✔		1	524.2	25.0	< 25.0	0	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✔		1	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:									
Hardness		✔	1	200.7	8,240	292,000	292,000		
Temperature		✔	1	Field	NA	17.24	17.24		
pH		✔	1	Field	NA	6.44	6.44		

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:

Oil/water separator, 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 sedimentation tank, oil/water separator, bag filters and other necessary treatment components (such as ion exchange, GAC, precipitation/coagulation/flocculation, as required) to remove suspended solids, and dissolved and undissolved chemical compounds. Other treatments will be added as need to meet effluent limits. 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, precipitation, 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:
pH conditioners, coagulants and/or flocculants may be added to the treatment system if necessary to meet effluent limits.

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

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

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

G. Endangered Species Act eligibility determination

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

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

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

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

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

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

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

H. National Historic Preservation Act eligibility determination

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

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

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

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

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

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

I. Supplemental information

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

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

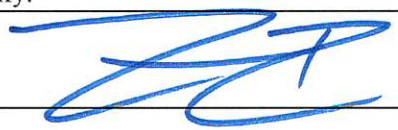
J. Certification requirement

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 at the Property. A copy is in Appendix G.	
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: Rosanne M Joyce	Date: 8/07/2019
Print Name and Title: ROSANNE M. JOYCE, ENVIRONMENTAL PROGRAM MANAGER	

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 at the Property. A copy is in Appendix G.	
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: 8/7/2019
Print Name and Title: Taylor Doyle, Project Manager - Suffolk Construction	

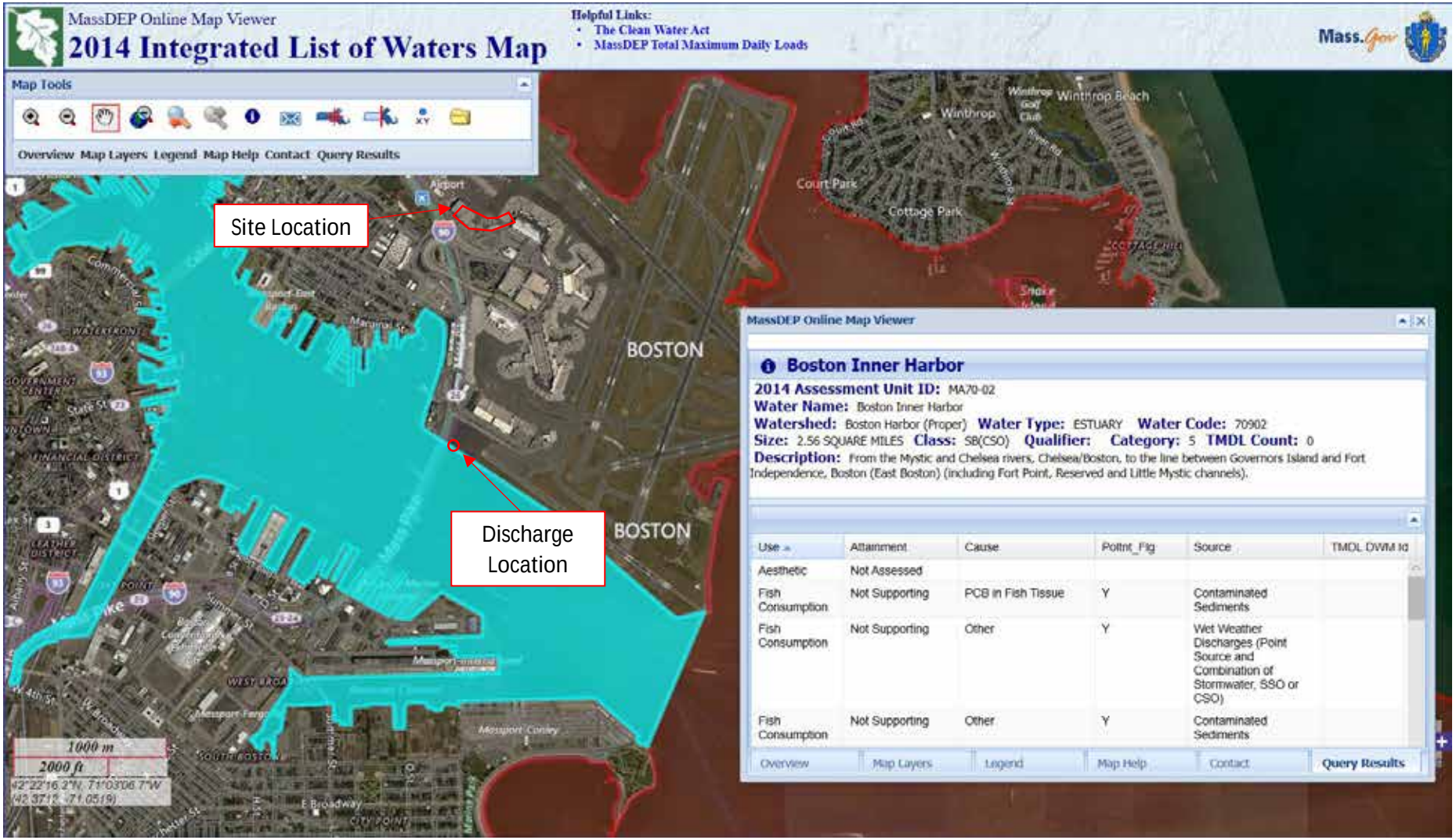

MassDEP Online Map Viewer
2014 Integrated List of Waters Map
Helpful Links:
The Clean Water Act
MassDEP Total Maximum Daily Loads
Mass.gov
Map Tools
Overview Map Layers Legend Map Help Contact Query Results
Site Location
Discharge Location
BOSTON
BOSTON
Winthrop
Winthrop Beach
Court Park
Cottage Park
MassDEP Online Map Viewer
Boston Inner Harbor
2014 Assessment Unit ID: MA70-02
Water Name: Boston Inner Harbor
Watershed: Boston Harbor (Proper) Water Type: ESTUARY Water Code: 70902
Size: 2.56 SQUARE MILES Class: SB(CSO) Qualifier: Category: 5 TMDL Count: 0
Description: From the Mystic and Chelsea rivers, Chelsea/Boston, to the line between Governors Island and Fort Independence, Boston (East Boston) (including Fort Point, Reserved and Little Mystic channels).
Use
Attainment
Cause
PollnI_Flg
Source
TMDL DWM Id
Aesthetic
Not Assessed
Fish Consumption
Not Supporting
PCB in Fish Tissue
Y
Contaminated Sediments
Fish Consumption
Not Supporting
Other
Y
Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO)
Fish Consumption
Not Supporting
Other
Y
Contaminated Sediments
Overview
Map Layers
Legend
Map Help
Contact
Query Results
1000 m
2000 ft

Table 1. Water Quality Assessment Status for Reporting Year 2014
Boston Inner Harbor

Designated Use	Designated Use Group	Status
Aesthetic	Aesthetic Value	Impaired
Fish Consumption	Aquatic Life Harvesting	Impaired
Fish, Other Aquatic Life And Wildlife	Fish, Shellfish, And Wildlife Protection And Propagation	Impaired
Primary Contact Recreation	Recreation	Impaired
Secondary Contact Recreation	Recreation	Impaired
Shellfish Harvesting	Aquatic Life Harvesting	Impaired

Causes of Impairment for Reporting Year 2014

Cause of Impairment	Cause of Impairment Group	Designated Use(s)	State TMDL Development Status
Dissolved Oxygen	Organic Enrichment/Oxygen Depletion	Fish, Other Aquatic Life And Wildlife	TMDL needed
Enterococcus Bacteria	Pathogens	Primary Contact Recreation, Secondary Contact Recreation	TMDL completed
Fecal Coliform	Pathogens	Shellfish Harvesting	TMDL completed
Other Cause	Other Cause	Fish Consumption	TMDL needed
PCB(s) in Fish Tissue	Polychlorinated Biphenyls (PCBs)	Fish Consumption	TMDL needed

Sources:

1. EPA website: https://ofmpub.epa.gov/waters10/attains_index.home on July 8, 2019.
2. Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds, October 2018. https://www.mass.gov/files/documents/2018/12/06/bharbor1.pdf

From: Ruan, Xiaodan (DEP)
To: Englehart, Jessica; Vakalopoulos, Catherine (DEP)
Cc: Ballantyne, Heather
Subject: [EXT] RE: NPDES RGP NOI - saltwater dilution factor
Date: Thursday, July 18, 2019 11:43:30 AM

Hi Jess,

You were correct. The dilution factor would be 1 for the discharge to the Boston Inner Harbor.

The Boston Inner Harbor is not an Outstanding Resource Water and is classified as Class SB (CSO) water. There is one TMDL for Pathogens and to see the causes of impairments, go to: https://www.mass.gov/files/documents/2016/08/sa/14list2_0.pdf and look up "MA72-02".

I am assuming the construction site is not a *current* MCP site; therefore, you will also have to apply to MassDEP by following the instructions at: https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of-intent. There is also 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: Englehart, Jessica [mailto:jenglehart@geiconsultants.com]
Sent: Thursday, July 18, 2019 10:20 AM
To: Ruan, Xiaodan (DEP); Vakalopoulos, Catherine (DEP)
Cc: Ballantyne, Heather
Subject: RE: NPDES RGP NOI - saltwater dilution factor

Hello, I'm following up on my email below. Please let me know if you need any more information.

Thanks,
Jess

From: Englehart, Jessica
Sent: Monday, July 15, 2019 5:49 PM
To: xiaodan.ruan@massmail.state.ma.us; catherine.vakalopoulos@state.ma.us
Cc: Ballantyne, Heather <hballantyne@geiconsultants.com>
Subject: NPDES RGP NOI - saltwater dilution factor

Hi Cathy and Xiaodan,

I'm preparing an RGP NOI for upcoming construction at Terminal E in Logan Airport. The effluent would discharge to the Boston Main Channel of the Boston Inner Harbor. Could you please confirm

that we can apply the saltwater dilution factor of 1 for this project? We do not have modeling or a dye study.

Thank you!
Jess

GEI

JESSICA ENGLEHART, P.E.
Project Engineer
781.721.4104 cell: 781.835.5702
400 Unicorn Park Drive, Woburn, MA 01801

Enter number values in green boxes below

Enter values in the units specified

↓

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

Enter a dilution factor, if other than zero

↓

1

Enter values in the units specified

↓

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

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

↓

6.72	pH in **Standard Units**
15.56	Temperature in **°C**
0.989	Ammonia in **mg/L**
595	Hardness in **mg/L** $CaCO_3$
5.72	Salinity in **ppt**
0	Antimony in **µg/L**
3.03	Arsenic in **µg/L**
0	Cadmium in **µg/L**
0	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
5.22	Copper in **µg/L**
2780	Iron in **µg/L**
0	Lead in **µg/L**
0	Mercury in **µg/L**
2.18	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
41.9	Zinc in **µg/L**

Enter **influent** concentrations in the units specified

↓

0	TRC in **µg/L**
3.06	Ammonia in **mg/L**
0	Antimony in **µg/L**
17.4	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**
18600	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**
14	Zinc in **µg/L**
27.2	Cyanide in **µg/L**
0	Phenol in **µg/L**
0	Carbon Tetrachloride in **µg/L**
0	Tetrachloroethylene in **µg/L**
0	Total Phthalates in **µg/L**
0	Diethylhexylphthalate in **µg/L**
0	Benzo(a)anthracene in **µg/L**
0	Benzo(a)pyrene in **µg/L**
0	Benzo(b)fluoranthene in **µg/L**
0	Benzo(k)fluoranthene in **µg/L**
0	Chrysene in **µg/L**
0	Dibenzo(a,h)anthracene in **µg/L**
0	Indeno(1,2,3-cd)pyrene in **µg/L**
0	Methyl-tert butyl ether in **µg/L**

Notes:

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

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

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

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

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

Leave 0 if no entry

Freshwater only

pH, temperature, and ammonia required for all discharges

Hardness required for freshwater

Salinity required for saltwater (estuarine and marine)

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

Enter 0 if non-detect or testing not required

if >1 sample, enter maximum

if >10 samples, may enter 95th percentile

Enter 0 if non-detect or testing not required

Dilution Factor	1.0					
A. Inorganics	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
Ammonia	**Report**	mg/L	---			
Chloride	**Report**	µg/L	---			
Total Residual Chlorine	0.2	mg/L	**7.5**	µg/L	50	µg/L
Total Suspended Solids	**30**	mg/L	---			
Antimony	**206**	µg/L	640	µg/L		
Arsenic	**104**	µg/L	36	µg/L		
Cadmium	**10.2**	µg/L	8.9	µg/L		
Chromium III	**323**	µg/L	100.0	µg/L		
Chromium VI	**323**	µg/L	50	µg/L		
Copper	**242**	µg/L	3.7	µg/L		
Iron	**5000**	µg/L	---	µg/L		
Lead	**160**	µg/L	8.5	µg/L		
Mercury	**0.739**	µg/L	1.11	µg/L		
Nickel	**1450**	µg/L	8.3	µg/L		
Selenium	**235.8**	µg/L	71	µg/L		
Silver	**35.1**	µg/L	2.2	µg/L		
Zinc	**420**	µg/L	86	µg/L		
Cyanide	178	mg/L	**1.0**	µg/L	5	µg/L
B. Non-Halogenated VOCs						
Total BTEX	**100**	µg/L	---			
Benzene	**5.0**	µg/L	---			
1,4 Dioxane	**200**	µg/L	---			
Acetone	**7.97**	mg/L	---			
Phenol	**1,080**	µg/L	300	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	**4.4**		1.6	µg/L		
1,2 Dichlorobenzene	**600**	µg/L	---			
1,3 Dichlorobenzene	**320**	µg/L	---			
1,4 Dichlorobenzene	**5.0**	µg/L	---			
Total dichlorobenzene	**---**	µg/L	---			
1,1 Dichloroethane	**70**	µg/L	---			
1,2 Dichloroethane	**5.0**	µg/L	---			
1,1 Dichloroethylene	**3.2**	µg/L	---			
Ethylene Dibromide	**0.05**	µg/L	---			
Methylene Chloride	**4.6**	µg/L	---			
1,1,1 Trichloroethane	**200**	µg/L	---			
1,1,2 Trichloroethane	**5.0**	µg/L	---			
Trichloroethylene	**5.0**	µg/L	---			
Tetrachloroethylene	**5.0**	µg/L	3.3	µg/L		
cis-1,2 Dichloroethylene	**70**	µg/L	---			
Vinyl Chloride	**2.0**	µg/L	---			
D. Non-Halogenated SVOCs						
Total Phthalates	**190**	µg/L	---	µg/L		
Diethylhexyl phthalate	**101**	µg/L	2.2	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---			
Benzo(a)anthracene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(a)pyrene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(b)fluoranthene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(k)fluoranthene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Chrysene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Dibenzo(a,h)anthracene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Indeno(1,2,3-cd)pyrene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	**100**	µg/L	---			
Naphthalene	**20**	µg/L	---			
E. Halogenated SVOCs						
Total Polychlorinated Biphenyls	**0.000064**	µg/L	---		0.5	µg/L
Pentachlorophenol	**1.0**	µg/L	---			
F. Fuels Parameters						
Total Petroleum Hydrocarbons	**5.0**	mg/L	---			
Ethanol	**Report**	mg/L	---			
Methyl-tert-Butyl Ether	**70**	µg/L	20	µg/L		
tert-Butyl Alcohol	**120**	µg/L	---			
tert-Amyl Methyl Ether	**90**	µg/L	---			

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- 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

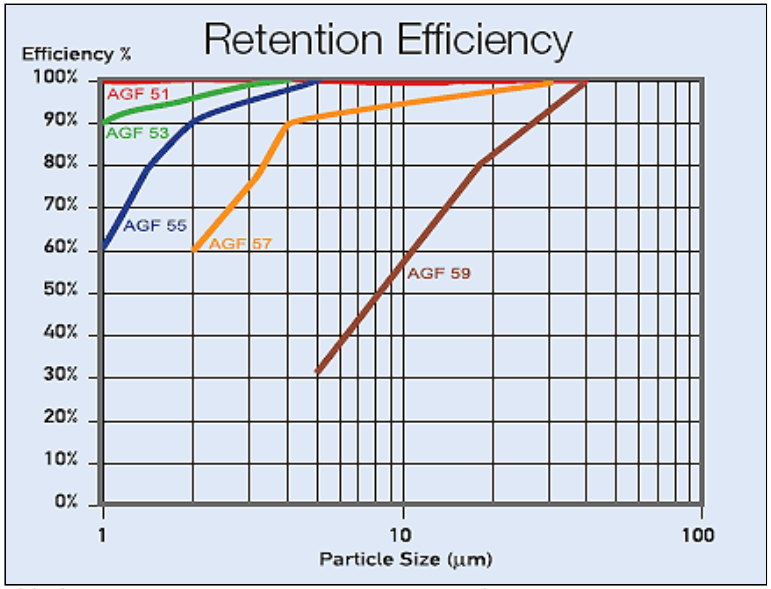
OPERATIONALCONSIDERATIONS

Bag Positioner

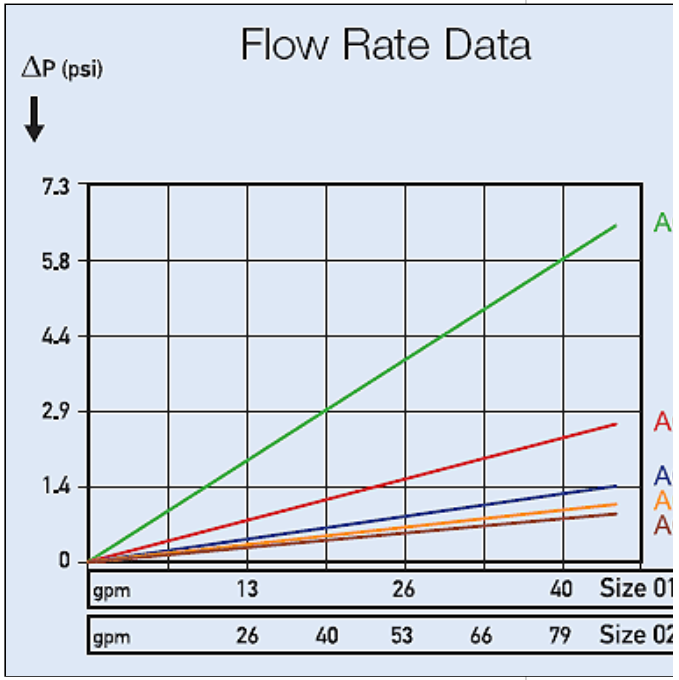
ACCUGAF filter bags must be used with the Eaton bagpositioner. This eases insertion and assures correct alignment of the filter bag inside the restrainer basket. In addition, the be protected against damage to inadvertent back-flow.

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

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

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

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

round bottom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- 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
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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.

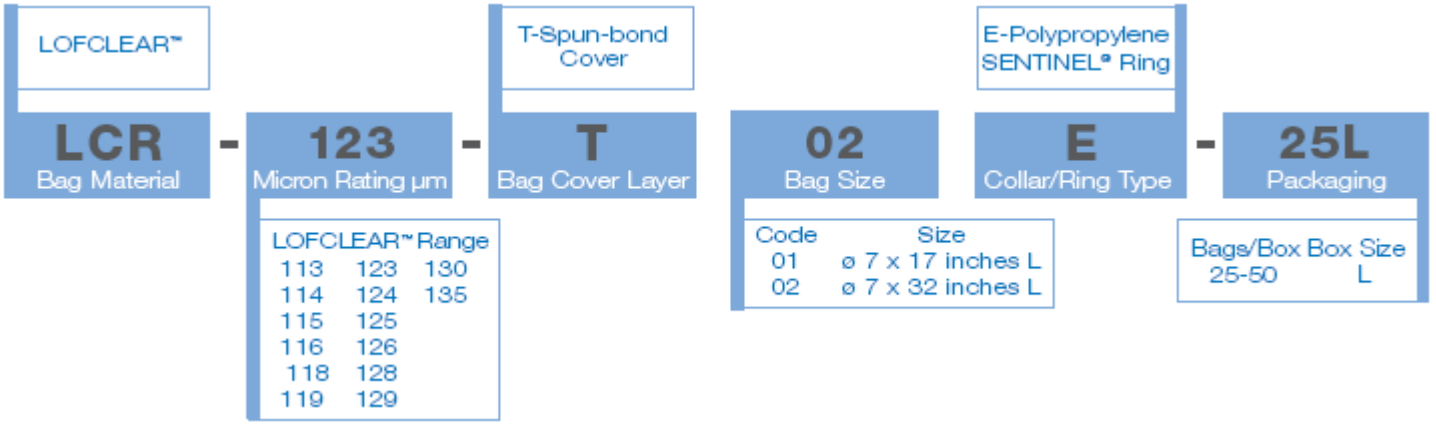
LOFCLEAR Series 500 Filter Bags are available in four different efficiency ratings so you can choose your exact required filtration efficiency. LOFCLEAR Filter Bags have filtration efficiencies from 95 to 99%, with a dirt holding capacity of over 2 pounds.

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.

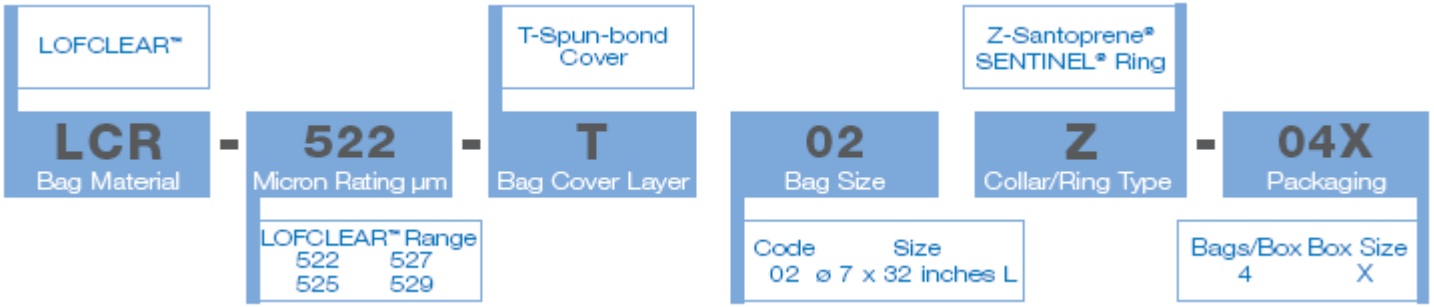
Operational Considerations

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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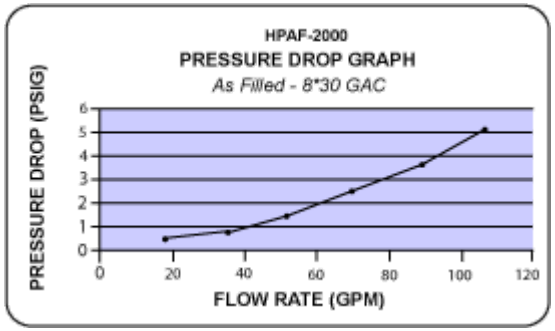
Liquid Phase V essels > HPAF 2000

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:

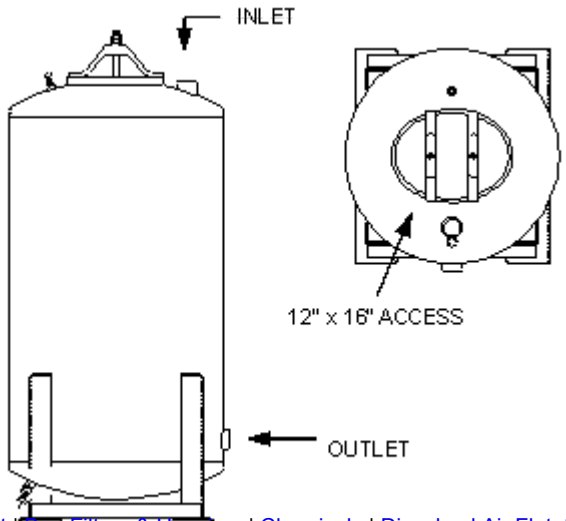
- Dissolved Organic Removal (Activated Carbon)
- Suspended Solids Removal (Sand Filter)
- Dissolved Minerals (Softener Resin)
- Oil and Grease Removal (Organo-Clays)
- Dissolved and Precipitated Metals Removal
- Special Organics (Resin/Carbon Blend)
- Catalytic Reactor (Chlorine and Peroxide Removal)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

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.

Compact tank dosing unit for floor mounting
CTD

sera®
Excellence in Fluid Technology

The new **sera** compact tank dosing unit for floor mounting

- Highest precision and safety through the use of the most modern and proven pump technology
- Wide range of application by 7 different sizes which can be combined with various pump sizes
- Minimum space requirement through compact design
- Use of standard components which can be upgraded by standardized accessories
- Optimized processing and delivery times by setting a standard

Supported by:

Federal Ministry
of Economics
and Technology

on the basis of a decision
by the German Bundestag

Compact tank dosing unit for floor mounting
CTD

Excellence in Fluid Technology

Capability characteristics

- The most modern pump technology
- Standardized dosing tanks
- Highest accuracy
- Flexible control
- High operational safety
- High quality materials
- Easy to operate
- Compact design

Configuration example

Basic design with following options:

- Chemical vapour lock (gas-tight design)
- Drain cock
- Dosing pump
- Container screw connection
- Filling valve
- Level indication

Compact tank dosing unit for floor mounting
CTD

Excellence in Fluid Technology

Technical specifications

Type	Container volume l	Suction lance (without pump)	Flow rate l/h	Pump series (option)	Admissible backpressure bar
CTD-40.1	40	DN5	up to max. 35	R/C 204.1-0,4e … R/C 204.1-35e	up to max. 10
CTD-75.1	75	DN10	up to max. 180	R/C 204.1-0,4e … R/RF/C 409.2-180e	up to max. 10
CTD-100.1	100	DN10	up to max. 180	R/C 204.1-0,4e … R/RF/C 409.2-180e	up to max. 10
CTD-200.1	200	DN10 / DN15	up to max. 570	R/C 204.1-0,4e … R/RF/C 410.2-570e	up to max. 10
CTD-300.1	300	DN10 / DN15	up to max. 570	R/C 204.1-0,4e … R/RF/C 410.2-570e	up to max. 10
CTD-500.1	500	DN10 / DN15	up to max. 570	R/C 204.1-0,4e … R/RF/C 410.2-570e	up to max. 10
CTD-1000.1	1000	DN10 / DN15	up to max. 570	R/C 204.1-0,4e … R/RF/C 410.2-570e	up to max. 10

Compact tank dosing unit for floor mounting
CTD

Excellence in Fluid Technology

Standard scope of delivery

- PE container with litre scale and screw cap
- Type plate
- 4 x angle bracket
- Aeration and vent pipe bend
- Suction lance with foot valve and sieve

Option / Accessories

- Gas-tight design
  (connection to the ventilation system or chemical vapour lock)
- Dosing pump
- Multifunction valve
- Level indication
- Filling valve
- Container screw connection
- Drain cock or collecting basin
- Agitator
- Level indicator (for black container)
- Cabling
- Control system
- Splash guard
- Dosing technology equipment (pressure keeping valve, pulsation damper, shut off valve)
- Solvent cage
- plug lock for screw cap
- Terminal boxes or electrical connection sets

Local sera - representative:

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34376 Immenhausen
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Tel. +49 5673 999-00
Fax. +49 5673 999-01
www.sera-web.com
info@sera-web.com

118-02 en / 07.13 / PM

Slant Plate Clarifier

Features

- Standard models from 5 to 400 GPM
- No moving parts
- Compact size minimizes floor space requirements
- Integral flash mixing and flocculation tanks for increased efficiency
- Heavy duty 1/4" steel construction, welds are dye penetrant tested
- Structure is sandblasted and two coats of epoxy applied to ensure full coverage and superior chemical resistance
- 1/4" PVC removable settling plates
- Dual sludge outlet flanges
- Large side-access hatch
- Sludge sampling ports

Options

- Mixers for flash & flocculation tanks
- Coal-tar epoxy interior coating (other coatings and materials are available)
- Influent feed and sludge discharge pumps
- Custom designs available
- PolyMark™ polymer delivery systems

M.W. Watermark

M.W. Watermark is a leading supplier of water and wastewater equipment, parts, and service. We serve both muncipal and industrial markets globally.

Our team strives to provide unmatched service and value to customers, helping reduce their costs while keeping the environment clean.

CLARIFIER DATA TABLE	SPC 5	SPC 10	SPC 20	SPC 40	SPC 80	SPC 150	SPC 200	SPC 300	SPC 400
Design Flow Maximum (GPM)	5	10	20	40	80	150	200	300	400
Flash Mix Tank Volume (gal)	4.4	4.5	38	50	79	110	110	186	186
Flocculation Tank Volume (gal)	6.5	20.5	62	99	189	316	316	742	742
Total Pre-Treatment Volume (gal)	10.9	25	100	149	268	426	426	928	928
Effluent Piping Connection (Class 150 Flange)	1”	3”	4”	4”	4”	6”	6”	8”	8”
Solids Discharge Connection (Class 150 Flange)	1”	3”	4”	4”	4”	4”	4”	6”	6”
Sludge Capacity (gallons)	17	42	88	150	275	469	611	834	960
Plate Area (ft^2)	16	39	87	160	300	560	1,153	1,167	1,680
Projected Plate Area (ft^2)	9.4	23	50	92	172	321	662	830	964
Empty Shipping Weight (lb)	765	1,400	2,065	3,600	4,800	7,400	11,000	13,200	16,500
Full Operating Weight (lb)	1,325	2,875	5,310	9,000	15,480	22,900	32,760	58,300	60,320
Liquid Volume (gal)	67	177	389	648	1,280	1,859	2,609	5,366	6,000
Overall Length	45”	55.5”	70”	87”	102”	135”	164”	185”	210”
Overall Width	23”	44”	60”	60”	73”	76.5”	77”	100”	100”
Overall Height	51”	64”	94”	104”	130”	147”	149”	145”	143”
Design Solids Removal (200ppm influent)	95%+	95%+	95%+	95%+	95%+	95%+	95%+	95%+	95%+

System Design

Influent is fed into the top of the clarifier (A) and flows under a baffle to the integral flash mixing tank (B). The flash mixing tank is where flocculant may be added with a PolyMark™ polymer blending system and blended with the fluid using an optional high speed mixer.

From the flash mix tank, the fluid flows over a baffle into the integral flocculation tank (C), which may include an optional low speed mixer.

From the flocculation tank, the fluid flows downward through the feed channel between the two plate stacks to the sludge chamber at the bottom of the clarifier. At this point, the fluid velocity decreases and large particles drop out of suspension.

The flow then enters the bottom of the plate stacks and flows between the settling plates. Between each of the plates, the fluid has a low velocity, laminar flow profile which encourages the remaining solids to settle on the surface of the lower plate and flow downward to the sludge holding tank.

As the solids are settling along the plate surfaces, the fluid is moving upward through the plate stacks, over the weirs, and into the discharge trough.

Clarified effluent is then discharged through a flanged pipe connection at the bottom of the trough. Sludge is periodically drawn off the bottom of the sludge holding tank at the bottom of the clarifier.

Sample ports are provided to assist with determining the sludge level, which is periodically pumped to a batch storage tank for further liquid-solid separation via an M.W. Watermark Filter Press for eventual disposal.

Fig.1a – Top View

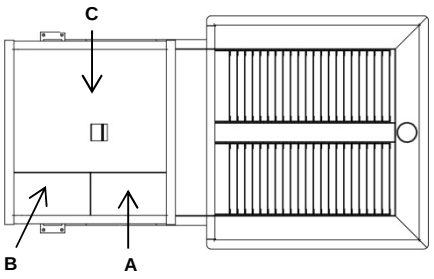
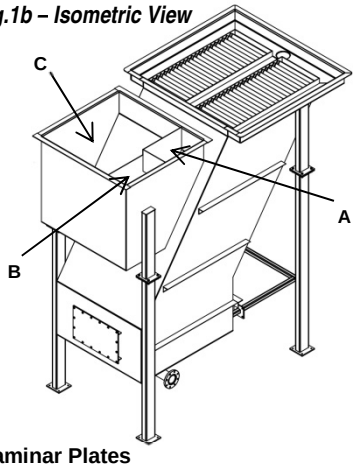


Fig.1b – Isometric View



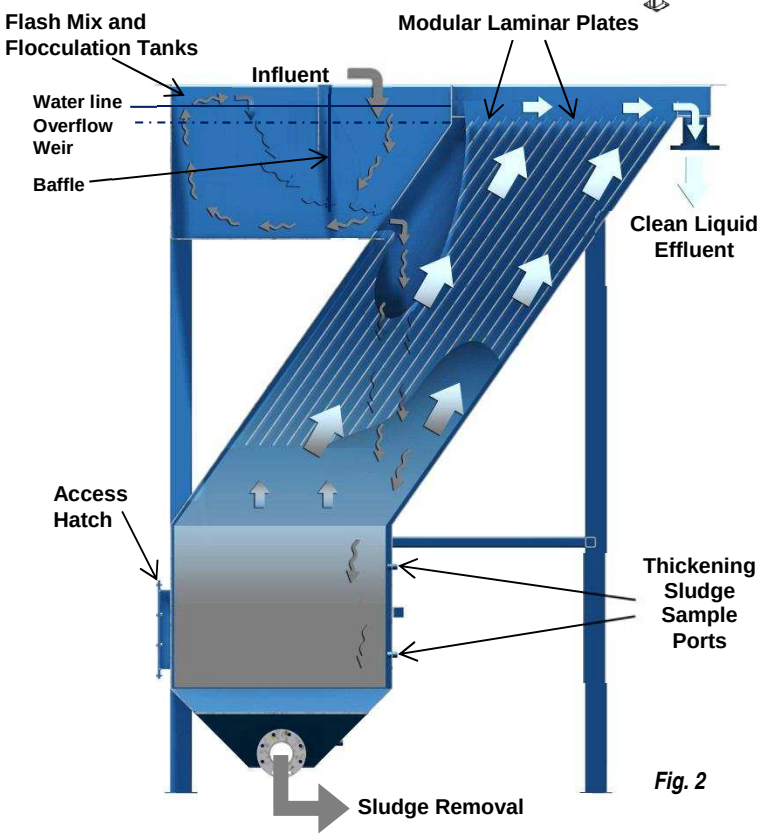
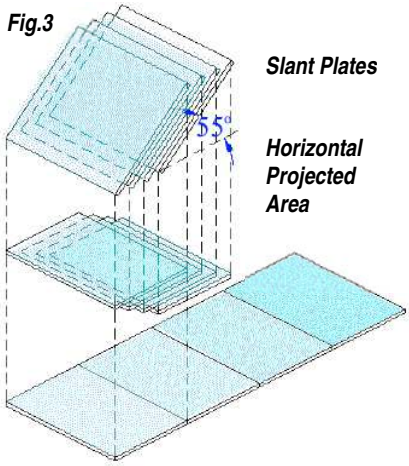


Fig. 2

Floor Space Requirement
Horizontal vs. Slant Plate Clarifier

Fig.3



Slant Plates

Horizontal Projected Area

Equipment Design

The M.W. Watermark SPC Slant Plate Clarifiers are designed to provide efficient solids removal from a wide range of waste and process liquids. The settling plates are inclined at an angle of 55° with 2-inch spacing. The slope of the plates allows the solids to settle by gravity while the fluid moves upward through the plate stack.

Stacking the plates reduces the floor space required by the clarifier compared to a horizontal clarifier. The inclined plate design allows the total gravity settling area to be as much as ten times the floor space occupied by the clarifier.

Fig. 3 illustrates the floor space reduction resulting from stacked plates.

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11800 Wills Road, Suite 100
Alpharetta, GA 30009
Tel: 678-514-2100 / 888-326-2020
Web Site: www.EcologixSystems.com

DATE OF ISSUE: 05/12/2003 **DATE OF LATEST REVISION**: 12/12/2010

SECTION 1: PRODUCT & COMPANY IDENTIFICATION

PRODUCT NAME: **CIFSB**
PRIMARY FUNCTION: Coagulant
CHEMICAL FAMILY: Inorganic salts
CHEMICAL NAME: Iron (III) Sulfate

MANUFACTURER: Ecologix Environmental Systems, LLC
11800 Wills Road, Suite 100
Alpharetta, GA 30009 USA
PHONE: 678-514-2100 Fax: 678-514-2106

EMERGENCY 24/7 CONTACT: ECOLOGIX 1-888-326-2020

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	(CAS #)	%WT	OSHA PEL	ACGIH TLV	OTHER
Hydroxy ferric sulfate	127687-53-0	<50		1mg/m^{3}TWA	

Other components may be blended in this formulation. The precise composition is proprietary. Bona fide requests for disclosure to medical personnel must be made in accordance with the procedures in 29 CFR 1910.1200(i) 1-13. This MSDS contains valuable information critical to the safe handling and proper use of the product and should be retained and available for employees and other users of this product. This material is classified as hazardous under OSHA regulations.

SECTION 3: HAZARDS IDENTIFICATION

EYES: May cause pain and is corrosive. May cause burns to inner eyelids.
SKIN: May cause skin irritation**.** Prolonged contact may cause dermatitis and burns.
INGESTION: May produce mild to moderately severe oral and esophageal burns, with mild to severe stomach burns.
INHALATION: Mist or spray may be irritating to mucous membranes, respiratory tract and lung tissues.

SECTION 4: FIRST AID MEASURES

EYES: Flush eyes gently with water for at least 15 minutes while holding eyelids apart. Seek medical attention immediately.
SKIN: Remove contaminated clothing and wash with soap and water for at least 15 minutes. Seek medical attention.
INGESTION: Immediately rinse mouth with water. **Do not induce vomiting**. Do not give bicarbonate to neutralize. Drink milk or water to dilute. If vomiting occurs, drink more liquids. Seek medical attention.
INHALATION: Remove to fresh air. Give oxygen/artificial respiration if needed. Seek medical attention for breathing difficulty.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: N/A
EXTINGUISHING MEDIA: Any appropriate. Respiratory and eye protection required.
SPECIAL FIRE FIGHTING PROCEDURES: Dike area to prevent runoff and contamination of water sources.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Sulfuric acid could react with metals to produce hydrogen.

SECTION 6: ACCIDENTAL RELEASE MEASURES

SMALL SPILLS: Wear appropriate personal protective equipment. Neutralize with lime, limestone or soda ash.
LARGE SPILLS: Dike the spilled liquid and collect residues for proper disposal. Neutralize with lime, limestone or soda ash. This will generate carbon dioxide, so additional ventilation may be necessary. Notify appropriate authorities.
WASTE DISPOSAL METHOD: Dispose of in accordance with local, state and federal regulations.

SECTION 7: HANDLING and STORAGE

HANDLING AND STORAGE: Protect drum from damage, freezing and intense heat. Keep containers closed and away from light. Do not store in metal containers which will dissolve and generate hydrogen.
OTHER PRECAUTIONS: Do not swallow. Wear protective eye goggles, gloves, boots and clothing.

SECTION 8: EXPOSURE CONTROLS & PERSONAL PROTECTION

EYE PROTECTION: Wear chemical splash-proof goggles.
PROTECTIVE GLOVES: Wear rubber gloves, apron and shoe covers.
RESPIRATORY PROTECTION: If vapors or mists excessive, wear a NIOSH/MSHA approved respirator with mist prefilter.
VENTILATION: Always store and use all chemicals in well ventilated areas.
OTHER PROTECTIVE EQUIPMENT: Provide eye wash and safety shower stations.

SECTION 9: PHYSICAL & CHEMICAL PROPERTIES

BOILING POINT: 220° - 230°F
SPECIFIC GRAVITY: 1.35 – 1.55
EVAPORATION RATE: N/A
VAPOR DENSITY: N/A
VAPOR PRESSURE: N/A
SOLUBILITY IN WATER: Infinite below pH 2. Above pH 3, reddish ferric hydroxide precipitates.
pH of NEAT SOLUTION: <1
APPEARANCE/ODOR: Reddish brown solution; little or no odor.

SECTION 10: STABILITY & REACTIVITY

STABILITY: Stable
HAZARDOUS POLYMERIZATION: Will not occur
INCOMPATIBILITY (MATERIALS TO AVOID): Fairly corrosive to mild steel. Avoid contact with bases or alkalies.
HAZARDOUS DECOMPOSITION PRODUCTS: Produces sulfur oxides

SECTION 11: TOXICOLOGICAL INFORMATION

CHRONIC EFFECTS AND MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None noted.
SPECIAL NOTE: None of the components in this product are considered a carcinogen by OSHA, NTP or IARC.

SECTION 12: ECOLOGICAL INFORMATION

Not determined.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of in accordance with federal, state, and local environmental laws.

SECTION 14: TRANSPORT INFORMATION

DOT Proper Shipping Name: Corrosive Liquid, acidic, inorganic, n.o.s. (contains ferric sulfate), 8, UN 3264, Pg III

SECTION 15: REGULATORY INFORMATION

FEDERAL EPA

Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA):

Requires notification to the National Response Center of releases of quantities of Hazardous Substances equal to or greater than the reportable quantities (RQ) in 40 CFR 302.4. Components present in this product at a level which would require reporting under the statute are:

Chemical	CAS Number	RQ
NONE		

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III:

Requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQ) in 40 CFR 355 (SARA 302, 304, 311 and 312) Components present in this product at a level which could require reporting under the statute are: NONE

Toxic Substances Control Act (TSCA) Status:
All components of this product are on the TSCA inventory

EPA Priority Pollutants: NONE

RCRA Hazard Class: If discarded - non-hazardous.

SECTION 16: OTHER INFORMATION

HMIS RATINGS: Health=, Flammability=, Reactivity=
HMIS HAZARD INDEX: 0=MINIMAL, 1=SLIGHT, 2=MODERATE, 3=SERIOUS, 4=SEVERE

LEGEND:

CAS Chemical Abstract Number
CERCLA Comprehensive Environmental Response, Compensation and Liability Act
CFR Code of Federal Regulations
DOT Department of Transportation
HMIS Hazardous Materials Identification System
IARC International Agency for Research on Cancer
MSDS Material Safety Data Sheet
N/A Not Applicable
N/D Not Determined

NTP National Toxicity Program
OSHA Occupational Safety and Health Administration
PEL Permissible Exposure Limit
SARA Superfund Amendments and Reauthorization Act
TSCA Toxic Substance Control Act
TLV Threshold Limit Value

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. Users are responsible to determine the suitability of this product and to evaluate risks prior to use.

PolyMark™ Polymer Blending

The Ultimate Polymer Dosing System

The M.W. Watermark PolyMark™ integrates the best features and designs developed and refined from decades of experience.The PolyMark™ is a combination of proven polymer blending technologies and today's latest in flow and integrated control devices.

M.W. Watermark offers a complete line of blending units ranging from 25 gph to 2400 gph solution flow rates with 0.05 gph to 60 gph neat polymer flow rates to meet all of your process, dewatering, and flocculation needs.

Parts

PolyMark™ polymer blender parts are interchangeable with existing leading brand units. Many parts are in-stock and can ship the same day. Contact M.W. Watermark for a complete list of replacement parts.

M.W. Watermark

M.W. Watermark is a leading supplier of water and wastewater equipment, parts, and service. We serve both muncipal and industrial markets globally.

Our team strives to provide unmatched service and value to customers, helping reduce their costs while keeping the environment clean.

Contact us for more information.

Representing the latest in flow control, polymer metering, and integrated controls:

- Superior Controls Flexibility
- Unmatched Quality
- World-Class Service

The PolyMark™ is the industry's best value, packed with features to optimize polymer consumption.

The PolyMark™ controller integrates state of the art components to provide the user with critical control feedback and optimum polymer dosage.

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PolyMark™ Models & Options

1	2	3	4	5	6	7	8	9	10	11	12	13
Product	Solution Flow Rate (GPH)		Dilution		Polymer Pump	Neat Polymer Flow † (GPH)		Power Supply	Controls ‡	Option 1	Option 2	Option 3
PM	25	/	1	-	DP	1	-	1	DC	X	X	X
	50		2		PS	2		2	SFC	C	L	V
	100				PC	4		3		C - Calibration Cylinder		
	240		1 - Primary Only			8		4		L - Loss of Polymer Flow Switch		
	600		2 - Primary / Post Dilution			15		5		V - Variable Speed Mixing		
	1200											
	1800				DP - Diaphragm	30						
	2400				PC - Progressing Cavity	50						

1 - 120VAC 1Φ 60Hz
2 - 240VAC 1Φ 60Hz
3 - 240VAC 3Φ 60Hz
4 - 480VAC 3Φ 60Hz
5 - 575VAC 3Φ 60Hz

† Flow rates are nominal

‡ Controls	Description
DC	On/Off/Remote Control
SFC	Solution flow control via 4-20mA input; Both polymer and dilution water flow rates are controlled to maintain constant polymer solution concentration at varying feed rates.

Industries & Applications

The PolyMark™ can be used for multiple applications in a variety of industries

- Wastewater Treatment Plants
- Steel & Aluminum Plants
- Industrial Wastewater Solids
- Metal Finishing Operation
- Mining Industry Fines
- Chemical Processing
- Foundries
- Power Plants

Clarification & Filtration

Sludge Dewatering

- Belt Filter Presses
- Centrifuges
- Screw Presses
- Plate & Frame

Sludge Thickening

- Gravity Belt Thickeners (GBT)
- Diffused Air Flotation (DAF)

Control Options

The PolyMark™ controllers were developed as a result of customer requests, feedback, and experience. The Watermark engineering team, backed with many years designing, calibrating, and troubleshooting other polymer blending systems, created a superior product and the industry's best value.

The PolyMark™ was designed with two levels of control/automation:

- DC – Direct Control
- SFC – Solution Flow Control

DC Features

- On/Off/Remote start contact
- Optional 4-20 mA pump signal pass through for polymer pump control

SFC Features

- Touchscreen operation with remote capability
- Direct and proportional polymer dosing modes
- Trending display of water flows, polymer rate, percent concentration
- 4-20 mA input for solution concentration or pump rate
- Digital input for Start/Remote selection
- Digital output for Running/Alarm/Remote status
- Configurable start-up and shut down process including a day tank set-up
- Optional variable speed mixing
- Optional Loss of Polymer Flow sensor
- Fully automatic primary and post dilution flow control
- Precise, automated "make down" and "as delivered" solution control
- 4-20 mA input for sludge flow rate
- Recipes for varying polymer type, sludge characteristics, and dewatering equipment
- Trending for polymer dosage as mass of polymer/mass of solids (e.g. lbs/ton)

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sc200™ UNIVERSAL CONTROLLER

Applications
- Drinking Water
- Wastewater
- Industrial Water
- Power

One Controller for the Broadest Range of Sensors.

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

Maximum Versatility

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

Ease of Use and Confidence in Results

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

Wide Variety of Communication Options

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

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

HACH®
Be Right™

Controller Comparison

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

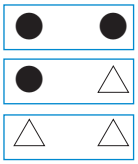
Choose from Hach's Broad Range of Digital and Analog Sensors

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

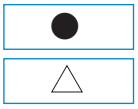
● = Digital △ = Analog

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

2 Channel Configurations



1 Channel Configurations



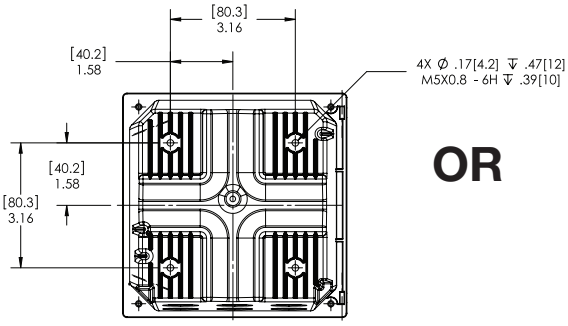
Specifications*

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

Subject to change without notice.

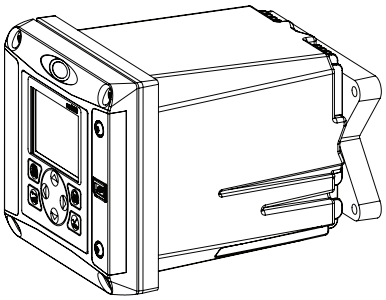
Dimensions

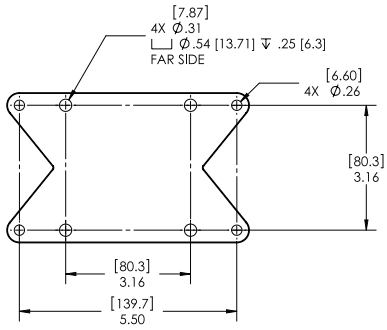
Surface Mounting Dimensions



Mounting Dimensions
(Rear View)

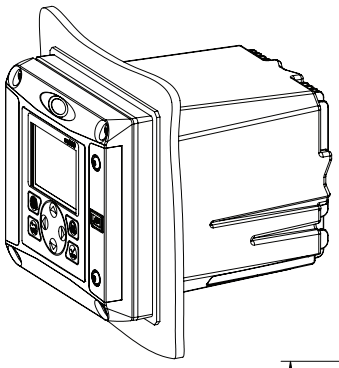
OR

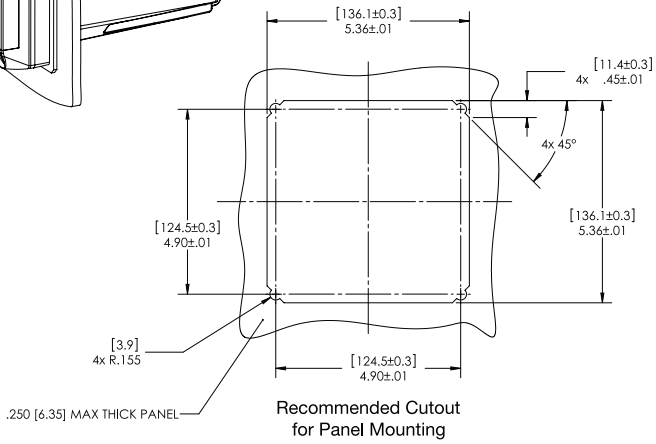




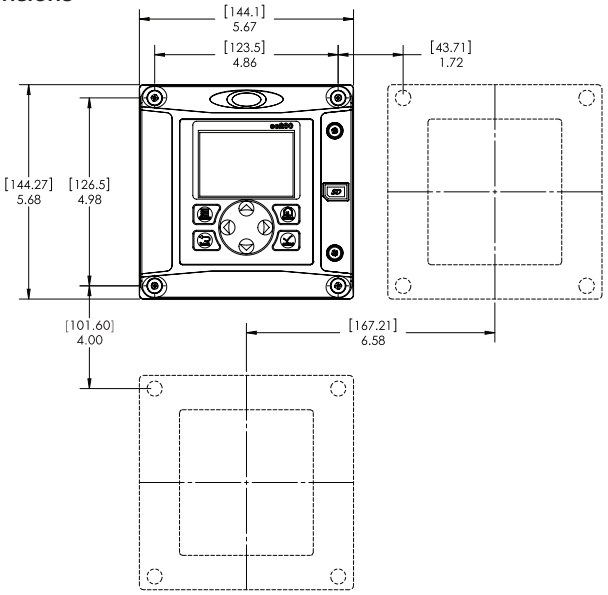
Bracket (supplied) for Surface Mounting
(Not compatible with Weather and Sun Shield
p/n 9220600 when surface mounting.)

Panel Mounting Dimensions



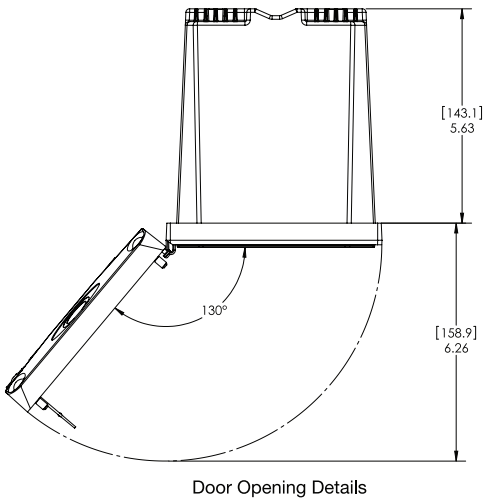


Recommended Cutout
for Panel Mounting

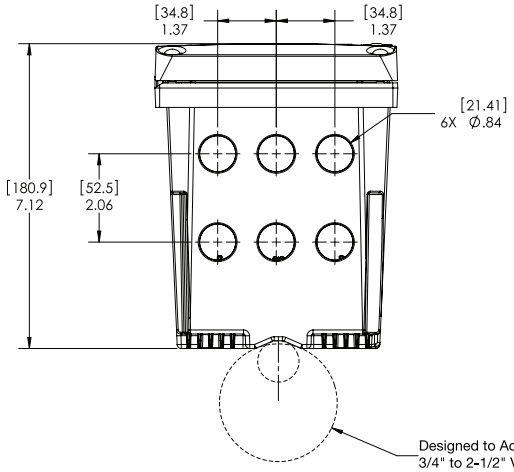


Minimum Spacing Dimensions
for Group Mounting

Top and Bottom Views



Door Opening Details



Ordering Information

sc200 for Hach Digital and Analog Sensors

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

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

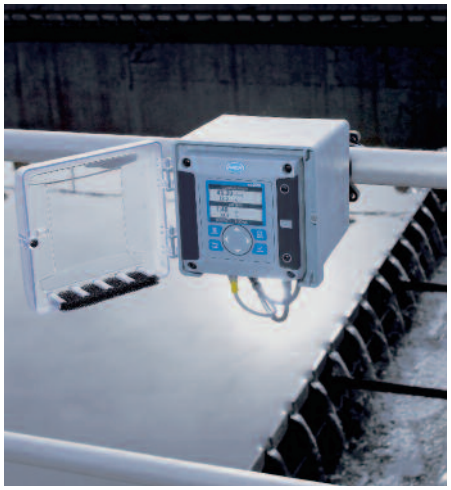
Note: Communication options (MODBUS, Profibus DPV1, and HART) are available. Please contact Hach Technical Support or your Hach representative.

sc200 for Ultrapure Sensors

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

Sensor and Communication Modules

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



Accessories

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

HACH COMPANY World Headquarters: Loveland, Colorado USA

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

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HACH®
Be Right™

Sulfuric Acid, 3M

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

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

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: **S25899**

Recommended uses of the product and uses restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

Supplier Details:

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

Emergency telephone number:

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

SECTION 2 : Hazards identification

Classification of the substance or mixture:

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

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

Signal word :Danger

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

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

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

Other Non-GHS Classification:

WHMIS

D1A 

E 

NFPA/HMIS

NFPA SCALE (0-4)

Health	3
Flammability	0
Physical Hazard	0
Personal Protection	X

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

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

SECTION 4 : First aid measures

Description of first aid measures

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

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

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

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

Most important symptoms and effects, both acute and delayed:

Irritation.Headache.Nausea.Shortness of breath.;

Indication of any immediate medical attention and special treatment needed:

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

SECTION 5 : Firefighting measures

Extinguishing media

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

For safety reasons unsuitable extinguishing agents:

Special hazards arising from the substance or mixture:

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

Advice for firefighters:

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

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

SECTION 6 : Accidental release measures

Personal precautions, protective equipment and emergency procedures:

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

Environmental precautions:

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

Methods and material for containment and cleaning up:

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

Reference to other sections:

SECTION 7 : Handling and storage

Precautions for safe handling:

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

Conditions for safe storage, including any incompatibilities:

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

SECTION 8 : Exposure controls/personal protection

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

SECTION 9 : Physical and chemical properties

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

SECTION 10 : Stability and reactivity

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

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

SECTION 11 : Toxicological information

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

SECTION 12 : Ecological information

Ecotoxicity

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

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

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

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

SECTION 13 : Disposal considerations

Waste disposal recommendations:

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

SECTION 14 : Transport information

UN-Number

1830

UN proper shipping name

Sulfuric Acid Solution

Transport hazard class(es)

Class:
8 Corrosive substances

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

SECTION 15 : Regulatory information

United States (USA)

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

Acute, Chronic

SARA Section 313 (Specific toxic chemical listings):

7664-93-9 Sulfuric Acid

RCRA (hazardous waste code):

None of the ingredients is listed

TSCA (Toxic Substances Control Act):

All ingredients are listed.

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

7664-93-9 Sulfuric Acid 1000 lbs

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

None of the ingredients is listed

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

None of the ingredients is listed

SECTION 16 : Other information

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

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

GHS Full Text Phrases:

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

Effective date : 02.15.2015
Last updated : 03.19.2015

CGS

CATION EXCHANGE RESIN
SOFTENING GRADE
Na FORM

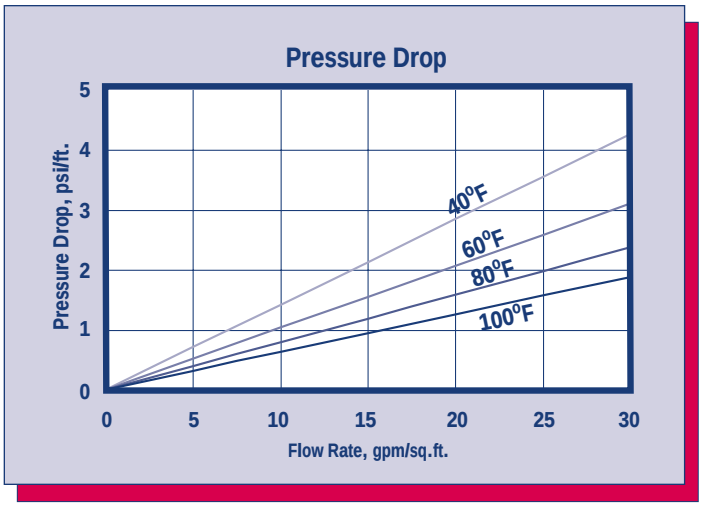
RESINTECH CGS is a high purity, light colored, high capacity, gel type sulfonated polystyrene cation resin supplied in the sodium form as moist, tough uniform spherical beads. *ResinTech CGS* specifically is intended for use in all water softening applications,including beverages, potable water and water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

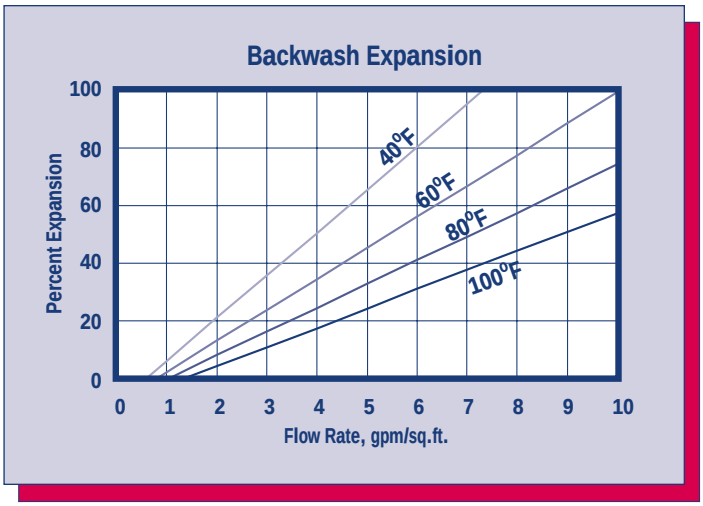
FEATURES & BENEFITS

- **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.

CGSver010603

SBG1

ANION EXCHANGE RESIN TYPE ONE GEL Cl OR OH FORM

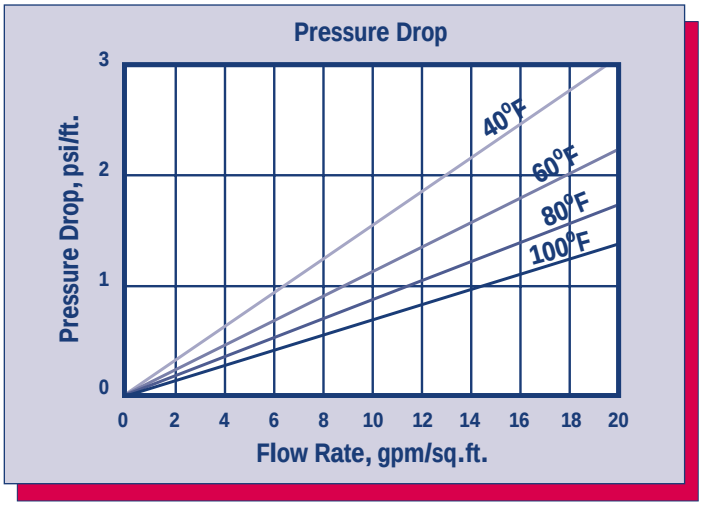
ResinTech SBG1 is a high capacity, shock resistant, gelular, Type 1, strongly basic anion exchange resin supplied in the chloride or hydroxide form as moist, tough, uniform, spherical beads. *ResinTech SBG1* is intended for use in all types of deionization systems and chemical processing applications.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

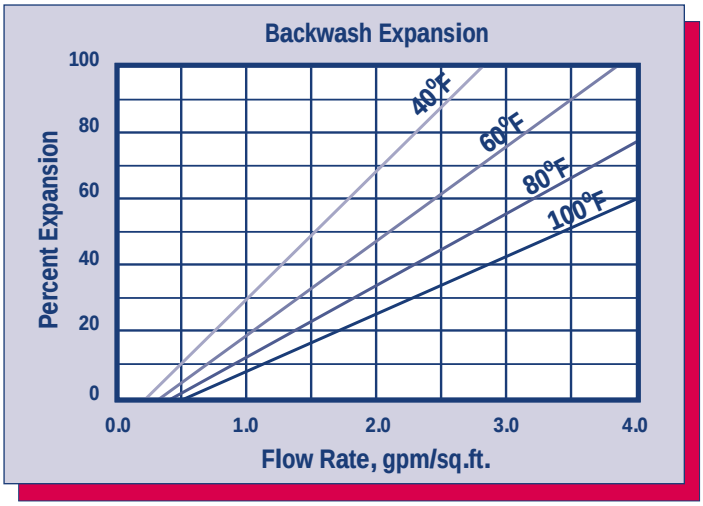
FEATURES & BENEFITS

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

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

HYDRAULIC PROPERTIES





PRESSURE DROP

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

BACKWASH

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

RESINTECH® SBG1

PHYSICAL PROPERTIES

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

SUGGESTED OPERATING CONDITIONS

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

OPERATING CAPACITY

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

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

APPLICATIONS

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

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

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

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

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

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

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.

RESINTECH INC
INNOVATIONS IN ION EXCHANGE

SBACR

ANION EXCHANGE RESIN
TYPE 1 ACRYLIC GEL
CI OR OH FORM

RESINTECH SBACR is a chloride form type 1 acrylic gel strong base anion resin. *SBACR* has an aliphatic chemical structure that is elastic and open allows organic ions to move in and out of the resin easily. *RESINTECH SBACR* is intended for use in the chloride form as an organic trap and for use in the hydroxide form for demineralizers that have a high level of organics in the feedwater. *SBACR* is available in the chloride form or can be special ordered in the hydroxide form (when ordered as *SBACR-OH*).

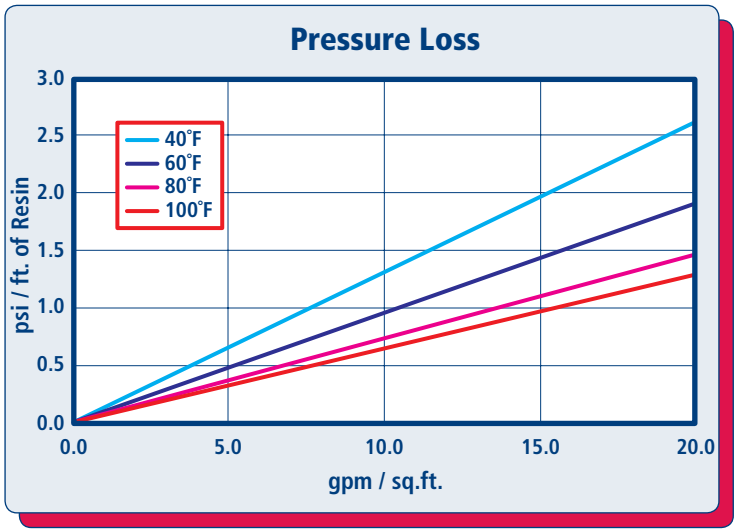
NSF/ANSI-61 CERTIFIED FOR MATERIAL SAFETY
WQA Gold Seal Certified when ordered as SBACR-HP

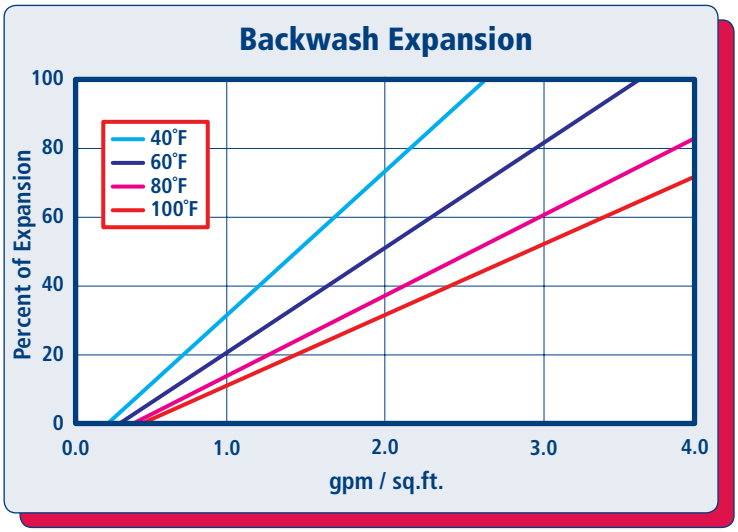
FEATURES & BENEFITS

- **HIGH CAPACITY FOR ORGANICS**
  Provides rapid removal and elution of organics and low fouling in surface waters
- **EXCELLENT REGENERATION EFFICIENCY**
  Superior kinetics and low chloride selectivity yields high regeneration efficiency
- **SUPERIOR PHYSICAL STABILITY**
  93% plus sphericity and high crush strengths together with carefully controlled particle distribution provides long life and low pressure drop
- **CONTROLLED PARTICLE SIZE**
  16 to 50 mesh size provides a low pressure drop and superior kinetics
- **COMPLIES WITH US FDA REGULATIONS**
  Conforms to paragraph 21CFR173.25 of the Food Additives Regulations of the US FDA

Prior to first use for potable water, resin should be backwashed for a minimum of 20 minutes, followed by 10 bed volumes of downflow rinse.

HYDRAULIC PROPERTIES





PRESSURE LOSS

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

BACKWASH

The graph above shows the expansion characteristics of *ResinTech SBACR* as a function of flow rate at various temperatures.

160 Cooper Road • West Berlin, NJ 08091 USA • p: 856.768.9600 • f: 856.768.9601 • e: ixresin@resintech.com • w: resintech.com

RESINTECH® SBACR

PHYSICAL PROPERTIES

Polymer Structure	Acrylic/DVB
Polymer Type	Gel
Functional Group	Quarternary Amine
Physical Form	Spherical beads
Ionic Form as shipped	Chloride
Total Capacity	
Hydroxide form	>1.0 meq/mL
Chloride form	>1.25 meq/mL
Water Retention	
Chloride form	55 to 63 percent
Approximate Shipping Weight	
Hydroxide form	42 lbs./cu.ft.
Chloride form	44 lbs./cu.ft.
Swelling, Cl to OH	10 to 15 percent
Screen Size Distribution (U.S. mesh)	16 to 50
Maximum Fines Content (<50 mesh)	1 percent
Minimum Sphericity	90 percent
Uniformity Coefficient	1.7 approx.
Resin Color	White to Cream

Note: Physical properties can be certified on a per lot basis, available upon request

SUGGESTED OPERATING CONDITIONS

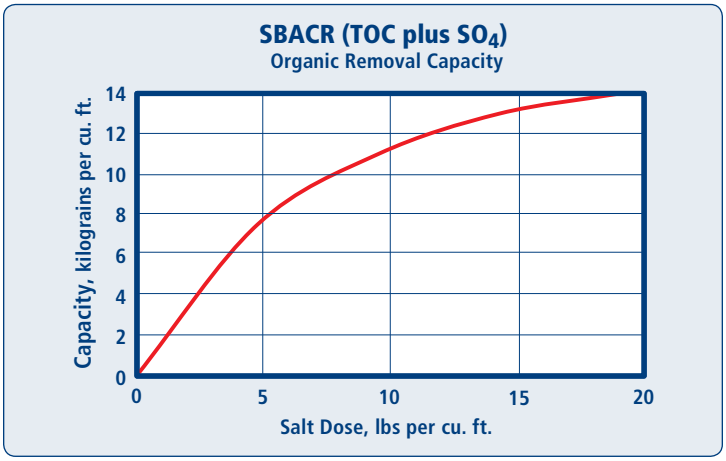
Maximum continuous temperature	
Hydroxide form	95˚F
Chloride form	150˚F
Minimum bed depth	24 inches
Backwash expansion	25 to 50 percent
Maximum pressure loss	20 psi
Operating pH range	0 to 14 SU
Regenerant Concentration	
Hydroxide cycle	2 to 6 percent NaOH
Salt cycle	2 to 10 percent NaCl
Regenerant level	4 to 15 lbs./cu.ft.
Regenerant flow rate	0.5 to 1.5 gpm/cu.ft.
Regenerant contact time	>60 minutes
Displacement flow rate	Same as dilution water
Displacement volume	10 to 15 gallons/cu.ft.
Rinse flow rate	Same as service flow
Rinse volume	35 to 60 gallons/cu.ft.
Service flow rate	
Average Flow	1 to 4 gpm/cu.ft.
Peak Flow	<10 gpm/cu.ft.

Note: These guidelines describe average low risk operating conditions. They are not intended to be absolute minimums or maximums.
For operation outside these guidelines, contact ResinTech Technical Support

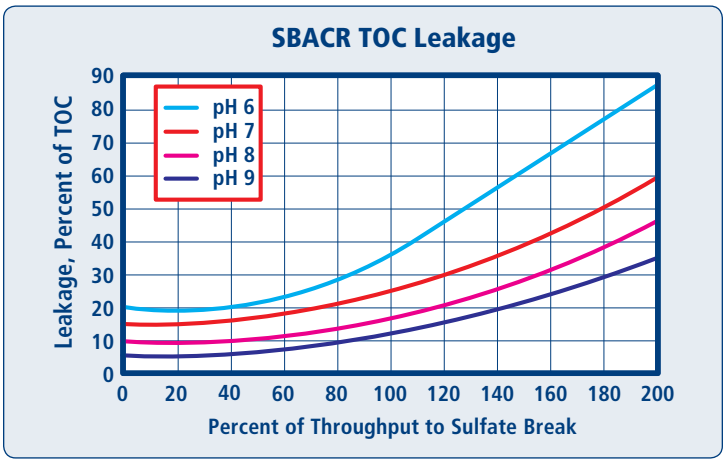
APPLICATIONS

ORGANIC TRAP

ResinTech SBACR has excellent capacity for tannins and other naturally occuring organic matter (NOM) which cause most of the color in potable waters. SBACR removes these substances and is easily regenerated with sodium chloride, in the same fashion as a water softener. Organic trap resins should be regenerated frequently to prevent the NOM from building up inside the resin beads and eventually causing fouling. For industrial applications it is sometimes useful to add a little caustic to the brine in order to increase capacity and reduce leakage. Use of chloride form anion resin reduces the pH of the product water during the early part of the exhaustion cycle.



Capacity based on 2 gpm/cu.ft. flow rate, pH near neutral, and 36 inch minimum bed depth. Capacity is for TOC plus sulfate. No engineering downgrade has been applied.



DEMINERALIZATION

ResinTech SBACR-OH can be used as the anion component in a variety of demineralization applications where a hydroxide form anion resin is coupled with a hydrogen form cation resin. SBACR-OH is especially well suited for demineralization of organic laden waters. SBACR-OH is not suitable for high operating temperatures or for high flow rates encountered in polishing condensate.

ResinTech Inc. Innovations in Ion Exchange

East Coast - West Berlin, NJ p:856.768.9600 • Midwest - Chicago, IL p:708.777.1167 • West Coast - Los Angeles, CA p:323.262.1600

Safety Data Sheet

Product Names: SBACR, SBACR-HP, SBACRMP, SBACR-MP-HP

(Acrylic Strong Base Anion Exchange Resin)

Effective date 31 March 2015

Section 1: Identification

1a	Product Name	ResinTech SBACR, SBACR-HP, SBACR-MP, SBACR-MP-HP
1b	Common Name	Acrylic strong base anion resin
1c	Intended use	Organic traps and other exchanges where an acrylic strong base anion resin is desired..
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 to cream colored solid beads approximately 0.6 mm diameter with slight amine 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.

Section 2A: Hazard classification UN OSHA globally harmonized system

Warning (contains ion exchange resin)

H320: Causes eye irritation (Category 2B)

Precautionary Statements

P264: Wash hands thoroughly after handling.

P280: Wear protective gloves/protective clothing/eye protection/face protection

P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.

P333+313: If skin irritation or a rash occurs: Get medical advice/attention.

P337+313: If eye irritation persists get medical advice/attention.

P403+233: Store in a well-ventilated place. Keep container tightly closed.

P411: Store at temperatures not exceeding 50 °C/ 122 °F.

Please refer to the safety data sheet for additional information regarding this product

ResinTech, Inc.
160 Cooper Road
West Berlin, NJ 08091-9234
856 768-9600
Ixresin@resintech.com

Section 3: Composition/ Information on Ingredients

3a	Chemical name	Polyacrylic copolymer functionalized with trimethylamine
3b	Ingredients Polyacrylic copolymer functionalized, with trimethylamine	CAS# 65997-24-2 (30 - 60%)
	Water	CAS# 7732-18-5 (40 – 70%)

Section 4: First Aid Measures

4a	Inhalation	No adverse effects expected- normal use of product does not produce odors or vapors.
4b	Skin	Wash with soap and water - seek medical attention if a rash develops.
4c	Eye contact	Wash immediately with water-seek attention if discomfort continues.
4d	Ingestion	No adverse effects expected for small amounts, larger amounts can cause stomach irritation. Seek medical attention if discomfort occurs.

Section 5: Fire Fighting Measures

5a	Flammability	NFPA Fire rating = 1
5b	Extinguishing media	Water, CO2, foam, dry powder.
5c	Fire fighting Procedures	Follow general fire fighting procedures indicated in the work place. Seek medical attention if discomfort continues.
5d	Protective Equipment	MSHA/NIOSH approved self-contained breathing gear, full protective clothing.
5e	Combustion Products	Carbon oxides and other toxic gasses and vapors.
5f	Unusual Hazards	Product is not combustible until moisture is removed. Resin begins to burn at approximately 230º C. Auto ignition can occur above 500º C.

Section 6: Accidental Release Measures

6a	Personal Precautions	Keep people away, spilled resin can be a slipping hazard, wear gloves and safety glasses to minimize skin or eye contact.
6b	Incompatible Chemicals	Strong oxidants can create risk of combustion products similar to burning, exposure to strong acids can cause a rapid temperature increase.
6c	Environmental Precautions	Keep out of public sewers and waterways.
6d	Containment Materials	Use plastic or paper containers, unlined metal containers not recommended.
6e	Methods of Clean-up	Sweep up material and transfer to containers.

Section 7: Handling and Storage

7a	Handling	Avoid prolonged skin contact. Avoid contact with salts or with salty water to prevent premature exhaustion of the resin. Keep resin moist and avoid allowing resin to completely dry.
7b	Storage	Store in a cool dry place (0º to 45º C) in the original shipping container. This product is thermally sensitive and will have reduced shelf life if subjected to extended periods of time at temperatures exceeding 50º C. Although freezing does not usually damage ion exchange resins, avoid repeated freeze thaw cycles.
7c	TSCA considerations	Ion exchange resins should be listed on the TSCA Inventory in compliance with State and Federal Regulations.

Section 8: Exposure Controls/Personal Protection

8a	OSHA exposure limits	None noted.
8b	Engineering Controls	Provide adequate ventilation.
8c	Personal Protection Measures	
	Eye Protection	Safety glasses or goggles.
	Respiratory Protection	Not required for normal use.
	Protective Gloves	Not required for limited exposure but recommended for extended contact.

Section 9: Physical and Chemical Properties

Appearance	White or cream colored beads approx. 0.6 mm diameter.
Flammability or explosive limits	Flammable above 500º C
Odor	Mild amine odor
Physical State	Solid
Vapor pressure	Not available
Odor threshold	Not available
Vapor density	Not available
pH	Near neutral (6 to 8 typical)
Relative density	Approx 680 grams/Liter
Melting point/freezing point	Does not melt, freezes at approx. 0 C
Solubility	Insoluble in water and most solvents
Boiling point	Does not boil
Flash point	Approx 500º C
Evaporation rate	Does not evaporate
Partition Coefficient (n-octonol/water)	Not applicable
Auto-ignition temperature	Approx 500º C
Decomposition temperature	Above 230º C
Viscosity	Not applicable

Section 10: Stability and Reactivity

10a Stability	Stable under normal conditions.
10b Conditions to Avoid	Heat, exposure to strong oxidants.
10c Hazardous by-products	Organic sulfonates, charred polystyrene, aromatic acids and hydrocarbons, organic amines, nitrogen oxides, carbon oxides, chlorinated hydrocarbons.
10d Incompatible materials	Strong oxidizing agents (such as HNO_3)
10e Hazardous Polymerization	Does not occur

Section 11: Toxicological Information

11a Likely Routes of Exposure	Oral, skin or eye contact.
11b Effects of exposure	
Delayed	None known.
Immediate (acute)	Rash or burn caused by causticity.
Chronic	None known.
11c Toxicity Measures	
Skin Adsorption	Unlikely, some transfer of acidity is possible.
Ingestion	Oral toxicity believed to be low but no LD50 has been established.
Inhalation	Unknown, vapors are very unlikely due to physical properties (insoluble solid).
11d Toxicity Symptoms	
Skin Adsorption	Rash or burn.
Ingestion	Indigestion or general malaise.
Inhalation	Unknown.
11e Carcinogenicity	None known

Section 12: Ecological information

12a Eco toxicity	Not acutely harmful to plant or animal life.
12b Mobility	Insoluble, acidity or causticity may escape if wet.
12c Biodegradability	Not biodegradable.
12d Bioaccumulation	Insignificant.
12e Other adverse effects	Not Harmful to the environment.

Section 13: Disposal Considerations

13a General considerations	Material is non-hazardous. However, unused material can cause a pH change when wetted.
13b Disposal Containers	Most plastic and paper containers are suitable. Avoid use of unlined metal containers.
13c Disposal methods	No specific method necessary.
13d Sewage Disposal	Not recommended.
13e Precautions for incineration	May release trimethylamine and toxic vapors when burned.
13f Precautions for landfills	Resins used to remove hazardous materials may then become hazardous mixtures

Section 14: Transportation Information

14a Transportation Class	Not classified as a dangerous good for transport by land, sea, or air.
14b TDG	Not regulated.
14c IATA	Not regulated.
14d DOT (49 CFR 172.101)	Not Regulated.

Section 15: Regulatory Information

15a CERCLA	Not regulated
15b SARA Title III	Not regulated
15c Clean Air act	Not regulated
15d Clean Water Act	Not regulated
15e TSCA	Not regulated
15f Canadian Regulations	
WHMIS	Not a controlled product
TDG	Not regulated
15g Mexican Regulations	Not Dangerous

Section 16: Other Information

The information provided in this safety data sheet is presented in good faith and believed to be accurate as of the effective data shown above. However, no warranty or guarantee of accuracy, 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 their activities comply with federal, state, and local laws.

16a Date of Revision 31 March 2015

Appendix B

Receiving Water Laboratory Data Report

West Outfall RGP Results
June 2019

Sample ID	**WEST RGP**
Sample Date	**6/24/2019**
Field Parameters	
pH (SU)	6.72
Salinity (ppt)	5.72
Temperature (°C)	15.56
General Chemistry (mg/L)	
Hardness	595
Nitrogen, Ammonia	0.989
Metals (mg/L)	
Antimony, Total	<0.00400
Arsenic, Total	0.00303
Cadmium, Total	<0.00020
Chromium, Hexavalent	<0.010
Chromium, Total	<0.00100
Chromium, Trivalent	<0.010
Copper, Total	0.00522
Iron, Total	2.78
Lead, Total	<0.00100
Mercury, Total	<0.00020
Nickel, Total	0.00218
Selenium, Total	<0.00500
Silver, Total	<0.00040
Zinc, Total	0.04190

MASSACHUSETTS PORT AUTHORITY
RGP SAMPLING EVENT

Date:	**Sampler:**	**Weather Conditions:**	**Low Tide at:**
6/24/19	SMG	Sunny 70s	11:00

WEST OUTFALL

Time: 12:30

Sample Number: West RGP

Analyses

- ☑ Ammonia
- ☑ Hardness
- ☑ Metals

Field Measurements

Temperature: 15.56°C
Salinity: 5.72 ppt
pH: 6.72

Observations

Floating Solids: -
Color of Sample: v. slight yellow tint
Odor: sweet onion
Visible Foam: -
Sheen: slight sheen on water surface in vault
Other:

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.

EPA 6860: SCM: Perchlorate

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 6/24/19

ALPHA Job #: L1927436

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Client Information

Client: CDM Smith
Address: 75 State St Suite 701
Boston, MA 02109
Phone: 617-452-6331
Email: gryszkiewiczsm@cdmsmith.com

Project Information

Project Name: West Outfall RGP
Project Location: Logan
Project #: 1344.224547
Project Manager: Sue Gryszkiewicz
ALPHA Quote #:

Turn-Around Time

☒ Standard 5-day ☐ RUSH (only confirmed if pre-approved!)
Date Due:

Additional Project Information:
RGP Sampling - see attached

Report Information - Data Deliverables

☒ ADEx ☐ EMAIL

Billing Information

☒ Same as Client info PO #: 78461 Line 5

Regulatory Requirements & Project Information Requirements

☐ Yes ☒ No MA MCP Analytical Methods
☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☒ No GW1 Standards (Info Required for Metals & EPH with Targets)
☒ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	ANALYSIS: Ammonia	Hardness	Hex chromium	Total antimony, arsenic, chromium, copper, iron, lead, mercury, nickel, selenium, silver, zinc	SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do	Sample Comments	TOTAL # BOTTLES
27436-01	West RGP	6/24/19	12:30	RO	SMG	X	X	X	X	X		3

Container Type												
Container Type									P	P	P	P	P	
Preservative									D	C	A	C	C	

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Susan Gryszkiewicz	6/24/19 1245	AAL	6/24/19 1245
	6/24/19 1840	Alana Riggs PAR	6/24/19 1840

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

MAG910000
NHG910000

Parameter	Chemical Abstracts Service (CAS) Number(s)	Inorganic Test Methods				
		ICP/AES[1] 200.7	ICP/MS[2] 200.8	GFAA[3] 200.9	Other	Notes Digestion
a. Inorganics						
Ammonia					SM[4] 4500 B and D (0.1 mg/L) 350.1 (0.01 mg/L)	
Chloride	16887006				300.0, SM[4] 4110 B (0.1 mg/L)	
Total Residual Chlorine	7782-50-5				SM[4] 4500-Cl D (200 µg/L) SM[4] 4500-Cl G (50 µg/L) SM[4] 4500-Cl E	
Total Suspended Solids					160.2 SM[4] 2540D (5 mg/L)	
Antimony	7440360	20 µg/L	0.5 µg/L	3 µg/L		200
Arsenic	7440382	20 µg/L	1 µg/L	3 µg/L		206.5
Cadmium	7440439	10 µg/L	0.2 µg/L	0.5 µg/L		200
Chromium III	7440473	20 µg/L	1 µg/L	1 µg/L		200
Chromium VI	18540299				7196 A (10 µg/L) 218.6, 1636 (1 µg/L)	
Copper	7440508	20 µg/L	0.2 µg/L	3 µg/L		200
Iron	7439896	40 µg/L	55 µg/L			200
Lead	7439921	20 µg/L	0.2 µg/L	3 µg/L		200
Mercury	7439976				245.1, 7470 A (0.2 µg/L) 245.7, 1631 (0.001 µg/L)	3112 B
Nickel	7440020	20 µg/L	0.2 µg/L	5 µg/L		200
Selenium	7782492	40 µg/L	1 µg/L	5 µg/L		200
Silver	7440224	10 µg/L	0.2 µg/L	5 µg/L		200
Zinc	7440666	15 µg/L	2 µg/L			200
Cyanide	57125				335.4 (5 µg/L)	4500-CN OIA-1677 (5 µg/L)

Salinity - Field
pH - Field
Temperature - Field
Hardness

Appendix C

Source Water Laboratory Data Report

CERTIFICATE OF ANALYSIS

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

RE: Terminal E - RGP (1802923)
ESS Laboratory Work Order Number: 19F0967

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 5:49 pm, Jul 09, 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: Terminal E - RGP

ESS Laboratory Work Order: 19F0967

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
19F0967-01	1802923-GEI-203	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: Terminal E - RGP

ESS Laboratory Work Order: 19F0967

PROJECT NARRATIVE

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

19F0967-01 **Surrogate recovery(ies) above upper control limit (S+).**
Pentachloroethane (162% @ 30-150%), Pentachloroethane [2C] (160% @ 30-150%)

CG90501-BS1 **Blank Spike recovery is above upper control limit (B+).**
1,2-Dibromoethane (156% @ 70-130%), 1,2-Dibromoethane [2C] (159% @ 70-130%)

CG90501-BS2 **Blank Spike recovery is above upper control limit (B+).**
1,2-Dibromoethane (167% @ 70-130%), 1,2-Dibromoethane [2C] (164% @ 70-130%)

625.1(SIM) Semi-Volatile Organic Compounds

C9G0019-CCV1 **Calibration required quadratic regression (Q).**
2,4,6-Tribromophenol (181% @ 80-120%), Pentachlorophenol (112% @ 80-120%)

C9G0019-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4,6-Tribromophenol (81% @ 20%), Dimethylphthalate (25% @ 20%)

Classical Chemistry

19F0967-01 **The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP

ESS Laboratory Work Order: 19F0967

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: Terminal E - RGP
Client Sample ID: 1802923-GEI-203
Date Sampled: 06/28/19 10:00
Percent Solids: N/A

ESS Laboratory Work Order: 19F0967
ESS Laboratory Sample ID: 19F0967-01
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	KJK	07/02/19 14:42	100	10	CG90144
Arsenic	**17.4** (5.0)		3113B		10	KJK	07/02/19 19:07	100	10	CG90144
Cadmium	ND (0.2)		200.8		5	KJK	07/02/19 15:56	100	10	CG90144
Chromium	ND (2.0)		200.7		1	KJK	07/02/19 14:42	100	10	CG90144
Chromium III	ND (10.0)		200.7		1	CCP	07/02/19 14:42	1	1	[CALC]
Copper	ND (2.0)		200.7		1	KJK	07/02/19 14:42	100	10	CG90144
Hardness	**292000** (8240)		200.7		100	KJK	07/03/19 13:32	1	1	[CALC]
Iron	**18600** (1000)		200.7		100	KJK	07/03/19 13:32	100	10	CG90144
Lead	ND (0.5)	0.1	200.8		5	NAR	07/02/19 15:56	100	10	CG90144
Mercury	ND (0.2)		245.1		1	MKS	07/05/19 9:50	20	40	CG90137
Nickel	ND (5.0)		200.7		1	KJK	07/02/19 14:42	100	10	CG90144
Selenium	ND (2.0)		3113B		2	KJK	07/02/19 21:11	100	10	CG90144
Silver	ND (0.5)		200.7		1	KJK	07/02/19 14:42	100	10	CG90144
Zinc	**14.0** (5.0)		200.7		1	KJK	07/02/19 14:42	100	10	CG90144

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP
Client Sample ID: 1802923-GEI-203
Date Sampled: 06/28/19 10:00
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 524.2

ESS Laboratory Work Order: 19F0967
ESS Laboratory Sample ID: 19F0967-01
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	07/01/19 13:22	C9G0013	CG90128
1,1,2-Trichloroethane	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
1,1-Dichloroethane	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
1,1-Dichloroethene	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
1,2-Dichlorobenzene	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
1,2-Dichloroethane	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
1,3-Dichlorobenzene	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
1,4-Dichlorobenzene	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Acetone	ND (5.0)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Benzene	**0.5** (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Carbon Tetrachloride	ND (0.3)		524.2		1	07/01/19 13:22	C9G0013	CG90128
cis-1,2-Dichloroethene	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Ethylbenzene	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Methyl tert-Butyl Ether	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Methylene Chloride	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Naphthalene	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Tertiary-amyl methyl ether	ND (1.0)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Tertiary-butyl Alcohol	ND (25.0)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Tetrachloroethene	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Toluene	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Trichloroethene	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Vinyl Chloride	ND (0.2)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Xylene O	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128
Xylene P,M	ND (0.5)		524.2		1	07/01/19 13:22	C9G0013	CG90128

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*113 %*		*80-120*
Surrogate: 4-Bromofluorobenzene	*105 %*		*80-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP
Client Sample ID: 1802923-GEI-203
Date Sampled: 06/28/19 10:00
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 19F0967
ESS Laboratory Sample ID: 19F0967-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MJV
Prepared: 7/1/19 11:04

608.3 Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.09)		608.3		1	07/01/19 15:29		CG90106
Aroclor 1221	ND (0.09)		608.3		1	07/01/19 15:29		CG90106
Aroclor 1232	ND (0.09)		608.3		1	07/01/19 15:29		CG90106
Aroclor 1242	ND (0.09)		608.3		1	07/01/19 15:29		CG90106
Aroclor 1248	ND (0.09)		608.3		1	07/01/19 15:29		CG90106
Aroclor 1254	ND (0.09)		608.3		1	07/01/19 15:29		CG90106
Aroclor 1260	ND (0.09)		608.3		1	07/01/19 15:29		CG90106
Aroclor 1262	ND (0.09)		608.3		1	07/01/19 15:29		CG90106
Aroclor 1268	ND (0.09)		608.3		1	07/01/19 15:29		CG90106

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*49 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*58 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*50 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*67 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP
Client Sample ID: 1802923-GEI-203
Date Sampled: 06/28/19 10:00
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 19F0967
ESS Laboratory Sample ID: 19F0967-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/1/19 12:04

625.1(SIM) Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Acenaphthene	**0.39** (0.19)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Acenaphthylene	**0.64** (0.19)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Anthracene	ND (0.19)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Benzo(a)anthracene	ND (0.05)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Benzo(a)pyrene	ND (0.05)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Benzo(b)fluoranthene	ND (0.05)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Benzo(g,h,i)perylene	ND (0.19)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Benzo(k)fluoranthene	ND (0.05)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
bis(2-Ethylhexyl)phthalate	ND (2.34)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Butylbenzylphthalate	ND (2.34)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Chrysene	ND (0.05)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Dibenzo(a,h)Anthracene	ND (0.05)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Diethylphthalate	ND (2.34)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Dimethylphthalate	ND (2.34)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Di-n-butylphthalate	ND (2.34)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Di-n-octylphthalate	ND (2.34)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Fluoranthene	ND (0.19)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Fluorene	**1.12** (0.19)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Indeno(1,2,3-cd)Pyrene	ND (0.05)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Naphthalene	**0.68** (0.19)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Pentachlorophenol	ND (0.84)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Phenanthrene	**0.34** (0.19)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108
Pyrene	ND (0.19)		625.1 SIM		1	07/02/19 3:37	C9G0019	CG90108

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*35 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*17 %*		*15-110*
Surrogate: 2-Fluorobiphenyl	*54 %*		*30-130*
Surrogate: Nitrobenzene-d5	*85 %*		*30-130*
Surrogate: p-Terphenyl-d14	*84 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP
Client Sample ID: 1802923-GEI-203
Date Sampled: 06/28/19 10:00
Percent Solids: N/A
Initial Volume: 500
Final Volume: 0.5
Extraction Method: 3535A

ESS Laboratory Work Order: 19F0967
ESS Laboratory Sample ID: 19F0967-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/5/19 16:50

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

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,4-Dioxane	**0.452** (0.250)		8270D SIM		1	07/08/19 23:36	C9G0139	CG90524

	%Recovery	Qualifier	Limits
Surrogate: 1,4-Dioxane-d8	*30 %*		*15-115*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP
Client Sample ID: 1802923-GEI-203
Date Sampled: 06/28/19 10:00
Percent Solids: N/A

ESS Laboratory Work Order: 19F0967
ESS Laboratory Sample ID: 19F0967-01
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Ammonia as N	**3.06** (0.10)		350.1		1	JLK	07/02/19 20:36	mg/L	CG90234
Chloride	**17.1** (5.0)		300.0		10	EEM	07/02/19 16:20	mg/L	CG90218
Hexavalent Chromium	ND (10.0)		3500Cr B-2009		1	CCP	06/28/19 20:00	ug/L	CF92828
Phenols	ND (100)		420.1		1	JLK	07/03/19 16:54	ug/L	CG90328
Total Cyanide	**27.2** (5.00)		4500 CN CE		1	EEM	07/03/19 11:05	ug/L	CG90312
Total Petroleum Hydrocarbon	ND (5)		1664A		1	LAB	07/01/19 15:45	mg/L	CG90105
Total Residual Chlorine	ND (20.0)		4500Cl D		1	CCP	06/28/19 20:40	ug/L	CF92829
Total Suspended Solids	**75** (5)		2540D		1	CCP	07/01/19 18:08	mg/L	CG90133

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP
Client Sample ID: 1802923-GEI-203
Date Sampled: 06/28/19 10:00
Percent Solids: N/A
Initial Volume: 35
Final Volume: 2
Extraction Method: 3511

ESS Laboratory Work Order: 19F0967
ESS Laboratory Sample ID: 19F0967-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 7/5/19 7:30

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

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2,3-Trichloropropane	ND (0.025)		504.1		1	07/05/19 10:45		CG90501
1,2-Dibromo-3-Chloropropane	ND (0.015)		504.1		1	07/05/19 10:45		CG90501
1,2-Dibromoethane	ND (0.015)		504.1		1	07/05/19 10:45		CG90501

	%Recovery	Qualifier	Limits
Surrogate: Pentachloroethane	*162 %*	*S+*	*30-150*
Surrogate: Pentachloroethane [2C]	*160 %*	*S+*	*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP
Client Sample ID: 1802923-GEI-203
Date Sampled: 06/28/19 10:00
Percent Solids: N/A
Initial Volume: 1
Final Volume: 1
Extraction Method: No Prep

ESS Laboratory Work Order: 19F0967
ESS Laboratory Sample ID: 19F0967-01
Sample Matrix: Ground Water
Units: mg/L
Analyst: ZLC
Prepared: 7/1/19 13:00

Alcohol Scan by GC/FID

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Ethanol	ND (10)		ASTM D3695		1	ZLC	07/01/19 14:34		CG90152

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP

ESS Laboratory Work Order: 19F0967

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	0.5	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	55.8	2.5	ug/L	50.00		112	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			
524.2 Volatile Organic Compounds										
Batch CG90128 - 524.2										
Blank										
1,1,1-Trichloroethane	ND	0.5	ug/L							
1,1,2-Trichloroethane	ND	0.5	ug/L							
1,1-Dichloroethane	ND	0.5	ug/L							
1,1-Dichloroethene	ND	0.5	ug/L							
1,2-Dichlorobenzene	ND	0.5	ug/L							
1,2-Dichloroethane	ND	0.5	ug/L							
1,3-Dichlorobenzene	ND	0.5	ug/L							
1,4-Dichlorobenzene	ND	0.5	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP

ESS Laboratory Work Order: 19F0967

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch CG90128 - 524.2										
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	*4.87*		ug/L	*5.000*		*97*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.91*		ug/L	*5.000*		*98*	*80-120*			
LCS										
1,1,1-Trichloroethane	10.3		ug/L	10.00		103	70-130			
1,1,2-Trichloroethane	10.0		ug/L	10.00		100	70-130			
1,1-Dichloroethane	11.0		ug/L	10.00		110	70-130			
1,1-Dichloroethene	10.8		ug/L	10.00		108	70-130			
1,2-Dichlorobenzene	9.5		ug/L	10.00		95	70-130			
1,2-Dichloroethane	10.4		ug/L	10.00		104	70-130			
1,3-Dichlorobenzene	9.4		ug/L	10.00		94	70-130			
1,4-Dichlorobenzene	9.7		ug/L	10.00		97	70-130			
Acetone	48.6		ug/L	50.00		97	70-130			
Benzene	10.2		ug/L	10.00		102	70-130			
Carbon Tetrachloride	9.2		ug/L	10.00		92	70-130			
cis-1,2-Dichloroethene	10.4		ug/L	10.00		104	70-130			
Ethylbenzene	10.1		ug/L	10.00		101	70-130			
Methyl tert-Butyl Ether	10.1		ug/L	10.00		101	70-130			
Methylene Chloride	10.3		ug/L	10.00		103	70-130			
Naphthalene	8.9		ug/L	10.00		89	70-130			
Tertiary-amyl methyl ether	9.7		ug/L	10.00		97	70-130			
Tertiary-butyl Alcohol	50.9		ug/L	50.00		102	70-130			
Tetrachloroethene	9.8		ug/L	10.00		98	70-130			
Toluene	10.3		ug/L	10.00		103	70-130			
Trichloroethene	10.2		ug/L	10.00		102	70-130			
Vinyl Chloride	9.3		ug/L	10.00		93	70-130			
Xylene O	9.7		ug/L	10.00		97	70-130			
Xylene P,M	19.8		ug/L	20.00		99	70-130			
Surrogate: 1,2-Dichlorobenzene-d4	*5.17*		ug/L	*5.000*		*103*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*5.10*		ug/L	*5.000*		*102*	*80-120*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP

ESS Laboratory Work Order: 19F0967

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
524.2 Volatile Organic Compounds										
Batch CG90128 - 524.2										
LCS Dup										
1,1,1-Trichloroethane	10.2		ug/L	10.00		102	70-130	1	20	
1,1,2-Trichloroethane	9.7		ug/L	10.00		97	70-130	3	20	
1,1-Dichloroethane	10.7		ug/L	10.00		107	70-130	3	20	
1,1-Dichloroethene	9.8		ug/L	10.00		98	70-130	9	20	
1,2-Dichlorobenzene	9.2		ug/L	10.00		92	70-130	3	20	
1,2-Dichloroethane	10.4		ug/L	10.00		104	70-130	0.1	20	
1,3-Dichlorobenzene	9.2		ug/L	10.00		92	70-130	2	20	
1,4-Dichlorobenzene	9.3		ug/L	10.00		93	70-130	4	20	
Acetone	47.2		ug/L	50.00		94	70-130	3	20	
Benzene	10.0		ug/L	10.00		100	70-130	1	20	
Carbon Tetrachloride	9.1		ug/L	10.00		91	70-130	0.3	20	
cis-1,2-Dichloroethene	10.1		ug/L	10.00		101	70-130	3	20	
Ethylbenzene	10.0		ug/L	10.00		100	70-130	2	20	
Methyl tert-Butyl Ether	9.5		ug/L	10.00		95	70-130	6	20	
Methylene Chloride	9.8		ug/L	10.00		98	70-130	4	20	
Naphthalene	8.8		ug/L	10.00		88	70-130	1	20	
Tertiary-amyl methyl ether	9.4		ug/L	10.00		94	70-130	3	20	
Tertiary-butyl Alcohol	46.4		ug/L	50.00		93	70-130	9	25	
Tetrachloroethene	9.5		ug/L	10.00		95	70-130	3	20	
Toluene	9.9		ug/L	10.00		99	70-130	4	20	
Trichloroethene	9.8		ug/L	10.00		98	70-130	3	20	
Vinyl Chloride	9.4		ug/L	10.00		94	70-130	0.9	20	
Xylene O	9.6		ug/L	10.00		96	70-130	0.6	20	
Xylene P,M	19.5		ug/L	20.00		97	70-130	2	20	
Surrogate: 1,2-Dichlorobenzene-d4	*4.96*		ug/L	*5.000*		*99*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*4.95*		ug/L	*5.000*		*99*	*80-120*			
608.3 Polychlorinated Biphenyls (PCB)										
Batch CG90106 - 3510C										
Blank										
Aroclor 1016	ND	0.10	ug/L							
Aroclor 1016 [2C]	ND	0.10	ug/L							
Aroclor 1221	ND	0.10	ug/L							
Aroclor 1221 [2C]	ND	0.10	ug/L							
Aroclor 1232	ND	0.10	ug/L							
Aroclor 1232 [2C]	ND	0.10	ug/L							
Aroclor 1242	ND	0.10	ug/L							
Aroclor 1242 [2C]	ND	0.10	ug/L							
Aroclor 1248	ND	0.10	ug/L							
Aroclor 1248 [2C]	ND	0.10	ug/L							
Aroclor 1254	ND	0.10	ug/L							
Aroclor 1254 [2C]	ND	0.10	ug/L							
Aroclor 1260	ND	0.10	ug/L							
Aroclor 1260 [2C]	ND	0.10	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP

ESS Laboratory Work Order: 19F0967

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
608.3 Polychlorinated Biphenyls (PCB)										
Batch CG90106 - 3510C										
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	*0.0308*		ug/L	*0.05000*		*62*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0351*		ug/L	*0.05000*		*70*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0235*		ug/L	*0.05000*		*47*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0291*		ug/L	*0.05000*		*58*	*30-150*			
LCS										
Aroclor 1016	0.93	0.10	ug/L	1.000		93	50-140			
Aroclor 1016 [2C]	0.94	0.10	ug/L	1.000		94	50-140			
Aroclor 1260	0.98	0.10	ug/L	1.000		98	1-164			
Aroclor 1260 [2C]	0.89	0.10	ug/L	1.000		89	1-164			
Surrogate: Decachlorobiphenyl	*0.0427*		ug/L	*0.05000*		*85*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0471*		ug/L	*0.05000*		*94*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0319*		ug/L	*0.05000*		*64*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0328*		ug/L	*0.05000*		*66*	*30-150*			
LCS Dup										
Aroclor 1016	0.90	0.10	ug/L	1.000		90	50-140	4	36	
Aroclor 1016 [2C]	0.88	0.10	ug/L	1.000		88	50-140	7	36	
Aroclor 1260	0.97	0.10	ug/L	1.000		97	1-164	1	38	
Aroclor 1260 [2C]	0.87	0.10	ug/L	1.000		87	1-164	2	38	
Surrogate: Decachlorobiphenyl	*0.0422*		ug/L	*0.05000*		*84*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0460*		ug/L	*0.05000*		*92*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0282*		ug/L	*0.05000*		*56*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0305*		ug/L	*0.05000*		*61*	*30-150*			
625.1(SIM) Semi-Volatile Organic Compounds										
Batch CG90108 - 3510C										
Blank										
Acenaphthene	ND	0.20	ug/L							
Acenaphthylene	ND	0.20	ug/L							
Anthracene	ND	0.20	ug/L							
Benzo(a)anthracene	ND	0.05	ug/L							
Benzo(a)pyrene	ND	0.05	ug/L							
Benzo(b)fluoranthene	ND	0.05	ug/L							
Benzo(g,h,i)perylene	ND	0.20	ug/L							
Benzo(k)fluoranthene	ND	0.05	ug/L							
bis(2-Ethylhexyl)phthalate	ND	2.50	ug/L							
Butylbenzylphthalate	ND	2.50	ug/L							
Chrysene	ND	0.05	ug/L							
Dibenzo(a,h)Anthracene	ND	0.05	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP

ESS Laboratory Work Order: 19F0967

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 CG90108 - 3510C										
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	*1.62*		ug/L	*2.500*		*65*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.17*		ug/L	*3.750*		*84*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.80*		ug/L	*2.500*		*72*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.97*		ug/L	*2.500*		*79*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.46*		ug/L	*2.500*		*98*	*30-130*			
LCS										
Acenaphthene	2.72	0.20	ug/L	4.000		68	40-140			
Acenaphthylene	2.80	0.20	ug/L	4.000		70	40-140			
Anthracene	2.89	0.20	ug/L	4.000		72	40-140			
Benzo(a)anthracene	3.13	0.05	ug/L	4.000		78	40-140			
Benzo(a)pyrene	3.18	0.05	ug/L	4.000		80	40-140			
Benzo(b)fluoranthene	3.38	0.05	ug/L	4.000		85	40-140			
Benzo(g,h,i)perylene	3.53	0.20	ug/L	4.000		88	40-140			
Benzo(k)fluoranthene	3.10	0.05	ug/L	4.000		77	40-140			
bis(2-Ethylhexyl)phthalate	3.43	2.50	ug/L	4.000		86	40-140			
Butylbenzylphthalate	3.42	2.50	ug/L	4.000		86	40-140			
Chrysene	2.94	0.05	ug/L	4.000		74	40-140			
Dibenzo(a,h)Anthracene	3.63	0.05	ug/L	4.000		91	40-140			
Diethylphthalate	2.87	2.50	ug/L	4.000		72	40-140			
Dimethylphthalate	3.45	2.50	ug/L	4.000		86	40-140			
Di-n-butylphthalate	3.33	2.50	ug/L	4.000		83	40-140			
Di-n-octylphthalate	3.37	2.50	ug/L	4.000		84	40-140			
Fluoranthene	3.17	0.20	ug/L	4.000		79	40-140			
Fluorene	2.91	0.20	ug/L	4.000		73	40-140			
Indeno(1,2,3-cd)Pyrene	3.48	0.05	ug/L	4.000		87	40-140			
Naphthalene	2.16	0.20	ug/L	4.000		54	40-140			
Pentachlorophenol	2.55	0.90	ug/L	4.000		64	30-130			
Phenanthrene	3.02	0.20	ug/L	4.000		75	40-140			
Pyrene	3.17	0.20	ug/L	4.000		79	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.57*		ug/L	*2.500*		*63*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.20*		ug/L	*3.750*		*85*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.81*		ug/L	*2.500*		*72*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.89*		ug/L	*2.500*		*75*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.42*		ug/L	*2.500*		*97*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP

ESS Laboratory Work Order: 19F0967

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 CG90108 - 3510C										
LCS Dup										
Acenaphthene	2.83	0.20	ug/L	4.000		71	40-140	4	20	
Acenaphthylene	2.94	0.20	ug/L	4.000		74	40-140	5	20	
Anthracene	3.03	0.20	ug/L	4.000		76	40-140	5	20	
Benzo(a)anthracene	3.25	0.05	ug/L	4.000		81	40-140	4	20	
Benzo(a)pyrene	3.37	0.05	ug/L	4.000		84	40-140	6	20	
Benzo(b)fluoranthene	3.76	0.05	ug/L	4.000		94	40-140	11	20	
Benzo(g,h,i)perylene	3.74	0.20	ug/L	4.000		94	40-140	6	20	
Benzo(k)fluoranthene	3.49	0.05	ug/L	4.000		87	40-140	12	20	
bis(2-Ethylhexyl)phthalate	3.50	2.50	ug/L	4.000		88	40-140	2	20	
Butylbenzylphthalate	3.53	2.50	ug/L	4.000		88	40-140	3	20	
Chrysene	3.01	0.05	ug/L	4.000		75	40-140	2	20	
Dibenzo(a,h)Anthracene	3.82	0.05	ug/L	4.000		95	40-140	5	20	
Diethylphthalate	3.03	2.50	ug/L	4.000		76	40-140	5	20	
Dimethylphthalate	3.69	2.50	ug/L	4.000		92	40-140	7	20	
Di-n-butylphthalate	3.53	2.50	ug/L	4.000		88	40-140	6	20	
Di-n-octylphthalate	3.87	2.50	ug/L	4.000		97	40-140	14	20	
Fluoranthene	3.32	0.20	ug/L	4.000		83	40-140	5	20	
Fluorene	3.02	0.20	ug/L	4.000		76	40-140	4	20	
Indeno(1,2,3-cd)Pyrene	3.84	0.05	ug/L	4.000		96	40-140	10	20	
Naphthalene	2.26	0.20	ug/L	4.000		57	40-140	5	20	
Pentachlorophenol	2.81	0.90	ug/L	4.000		70	30-130	10	20	
Phenanthrene	3.19	0.20	ug/L	4.000		80	40-140	6	20	
Pyrene	3.27	0.20	ug/L	4.000		82	40-140	3	20	
Surrogate: 1,2-Dichlorobenzene-d4	*1.63*		ug/L	*2.500*		*65*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.45*		ug/L	*3.750*		*92*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*1.90*		ug/L	*2.500*		*76*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.07*		ug/L	*2.500*		*83*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.51*		ug/L	*2.500*		*101*	*30-130*			
8270D(SIM) Semi-Volatile Organic Compounds w/ Isotope Dilution										
Batch CG90524 - 3535A										
Blank										
1,4-Dioxane	ND	0.250	ug/L							
Surrogate: 1,4-Dioxane-d8	*2.42*		ug/L	*5.000*		*48*	*15-115*			
LCS										
1,4-Dioxane	10.8	0.250	ug/L	10.00		108	40-140			
Surrogate: 1,4-Dioxane-d8	*2.41*		ug/L	*5.000*		*48*	*15-115*			
LCS Dup										
1,4-Dioxane	11.5	0.250	ug/L	10.00		115	40-140	6	20	
Surrogate: 1,4-Dioxane-d8	*3.34*		ug/L	*5.000*		*67*	*15-115*			
Classical Chemistry										
Batch CF92828 - General Preparation										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP

ESS Laboratory Work Order: 19F0967

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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 CF92829 - General Preparation										
Blank										
Total Residual Chlorine	ND	20.0	ug/L							
LCS										
Total Residual Chlorine	1.39		mg/L	1.390		100	85-115			
Batch CG90105 - General Preparation										
Blank										
Total Petroleum Hydrocarbon	ND	5	mg/L							
LCS										
Total Petroleum Hydrocarbon	14	5	mg/L	19.38		74	66-114			
Batch CG90133 - General Preparation										
Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	30		mg/L	36.40		82	80-120			
Batch CG90218 - General Preparation										
Blank										
Chloride	ND	0.5	mg/L							
LCS										
Chloride	2.3		mg/L	2.500		91	90-110			
Batch CG90234 - NH4 Prep										
Blank										
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			
Batch CG90312 - TCN Prep										
Blank										
Total Cyanide	ND	5.00	ug/L							
LCS										
Total Cyanide	20.2	5.00	ug/L	20.06		100	90-110			
LCS										
Total Cyanide	150	5.00	ug/L	150.4		100	90-110			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP

ESS Laboratory Work Order: 19F0967

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CG90312 - TCN Prep										
LCS Dup										
Total Cyanide	149	5.00	ug/L	150.4		99	90-110	0.4	20	
Batch CG90328 - General Preparation										
Blank										
Phenols	ND	100	ug/L							
LCS										
Phenols	98	100	ug/L	100.0		98	80-120			
LCS										
Phenols	991	100	ug/L	1000		99	80-120			
504.1 1,2-Dibromoethane / 1,2-Dibromo-3-chloropropane										
Batch CG90501 - 3511										
Blank										
1,2,3-Trichloropropane	ND	0.025	ug/L							
1,2,3-Trichloropropane [2C]	ND	0.025	ug/L							
1,2-Dibromo-3-Chloropropane	ND	0.015	ug/L							
1,2-Dibromo-3-Chloropropane [2C]	ND	0.015	ug/L							
1,2-Dibromoethane	ND	0.015	ug/L							
1,2-Dibromoethane [2C]	ND	0.015	ug/L							
Surrogate: Pentachloroethane	*0.239*		ug/L	*0.2000*		*120*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.242*		ug/L	*0.2000*		*121*	*30-150*			
LCS										
1,2,3-Trichloropropane	0.069	0.025	ug/L	0.08000		86	70-130			
1,2,3-Trichloropropane [2C]	0.080	0.025	ug/L	0.08000		100	70-130			
1,2-Dibromo-3-Chloropropane	0.099	0.015	ug/L	0.08000		123	70-130			
1,2-Dibromo-3-Chloropropane [2C]	0.094	0.015	ug/L	0.08000		118	70-130			
1,2-Dibromoethane	0.125	0.015	ug/L	0.08000		156	70-130			B+
1,2-Dibromoethane [2C]	0.127	0.015	ug/L	0.08000		159	70-130			B+
Surrogate: Pentachloroethane	*0.0979*		ug/L	*0.08000*		*122*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.0975*		ug/L	*0.08000*		*122*	*30-150*			
LCS										
1,2,3-Trichloropropane	0.199	0.025	ug/L	0.2000		100	70-130			
1,2,3-Trichloropropane [2C]	0.194	0.025	ug/L	0.2000		97	70-130			
1,2-Dibromo-3-Chloropropane	0.260	0.015	ug/L	0.2000		130	70-130			
1,2-Dibromo-3-Chloropropane [2C]	0.253	0.015	ug/L	0.2000		127	70-130			
1,2-Dibromoethane	0.334	0.015	ug/L	0.2000		167	70-130			B+
1,2-Dibromoethane [2C]	0.327	0.015	ug/L	0.2000		164	70-130			B+
Surrogate: Pentachloroethane	*0.245*		ug/L	*0.2000*		*122*	*30-150*			
Surrogate: Pentachloroethane [2C]	*0.253*		ug/L	*0.2000*		*127*	*30-150*			
Alcohol Scan by GC/FID										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP

ESS Laboratory Work Order: 19F0967

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Alcohol Scan by GC/FID										
Batch CG90152 - No Prep										
Blank										
Ethanol	ND	10	mg/L							
LCS										
Ethanol	784	10	mg/L	1134		69	60-140			
LCS Dup										
Ethanol	779	10	mg/L	1134		69	60-140	0.6	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Terminal E - RGP ESS Laboratory Work Order: 19F0967

Notes and Definitions

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

ESS Laboratory Work Order: 19F0967

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: 19F0967
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: 4.3 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	360610	Yes	No	Yes	VOA Vial - HCl	HCl	
01	360611	Yes	No	Yes	VOA Vial - HCl	HCl	
01	360612	Yes	No	Yes	VOA Vial - HCl	HCl	
01	360613	Yes	No	Yes	VOA Vial - HCl	HCl	
01	360614	Yes	No	Yes	VOA Vial - HCl	HCl	
01	360615	Yes	No	Yes	VOA Vial - HCl	HCl	
01	360616	Yes	NA	Yes	VOA Vial - Unpres	NP	
01	360617	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	360618	Yes	NA	Yes	1L Amber - H2SO4	H2SO4	
01	360619	Yes	NA	Yes	1L Amber - Unpres	NP	
01	360620	Yes	NA	Yes	1L Amber - Unpres	NP	
01	360621	Yes	NA	Yes	1L Amber - Unpres	NP	
01	360622	Yes	NA	Yes	1L Amber - Unpres	NP	
01	360623	Yes	NA	Yes	1L Amber - Unpres	NP	
01	360624	Yes	NA	Yes	1L Amber - Unpres	NP	
01	360625	Yes	NA	Yes	1L Poly - Unpres	NP	
01	360626	Yes	NA	Yes	500 mL Poly - H2SO4	H2SO4	
01	360627	Yes	NA	Yes	250 mL Poly - Unpres	NP	
01	360628	Yes	NA	Yes	250 mL Poly - NaOH	NaOH	**pH > 12**
01	360629	Yes	NA	Yes	250 mL Poly - HNO3	HNO3	
01	360630	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	
01	360631	Yes	NA	Yes	500 mL Poly - HNO3	HNO3	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 19F0967
Date Received: 6/28/2019

2nd Review

Were all containers scanned into storage/lab? Initials MM

Are barcode labels on correct containers? (Yes) No

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

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

Are all QC stickers attached? Yes / No / NA

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

Completed By: _____ Date & Time: 6/28/19 1920

Reviewed By: _____ Date & Time: 6/28/19 2029

Delivered By: _____ 6/28/19 2029

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: 19F0967

Turn Time: X Standard Rush_____ Approved By: _____

Reporting Limits -

State where samples were collected: (MA) NH

Discharge into: Fresh Water ☐ Salt Water ☐

Is this project for: **RGP**

Electonic Deliverable Yes____ No____
Format: Excel___ Access___ PDF___ Other_____

Project Manager: H. Ballentyne
Company: GEI Consultants
Address: 400 Unicorn Park Drive
Woburn, MA 01801

Project # 1802923
Project Name: Terminal E
PO #

ESS Lab Sample ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample Identification	# of Containers	RGP Metals Total	RGP Metals Dissolved	Hardness (Calculation)	Ethanol ASTM D3695	Chloride 300.0*	Total Cyanide 4500 LL	TPH 1664	TSS 2540D*	TRC 4500-CL D*	Ammonia 350.1	Tri Cr (Calc. MUST run T. Cr)	Hex Cr 3500	Phenol 420.1	RGP VOC Long List 524	1,4-Dioxane 8270-SIM	EDB 504.1	RGP SVOC Log List 625-SIM	PCB 608	Comment #
1	6-28-19	1000		GW	1802923-GEI-203	22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1,2,3
Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____							4	4	4	1	1	5	3	1	1	3	-	1	3	2	1	2	1	1	
Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA							P	P	P	V	P	P	AG	P	P	P	-	P	AG	V	AG	V	AG	AG	

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

Cooler Present ✓ Yes ____ No

Seals Intact ___ Yes ___ No NA: ✓

Cooler Temperature: ice temp: 4.3

Sampled by : CWS

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**
3) Hold RGP Metals Dissolved

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	6-28-19 1325	6/28/19 13:15	6/28/19	17:35	6/28/19 900
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

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

Page 1 of 1

Appendix D

Detailed Plans of Proposed Discharge Points

Underground Utilities: Water

PROPOSED DISCHARGE LOCATIONS:

- CATCH BASIN
- RECHARGE PIT

CATCH BASIN

CATCH BASIN

CATCH BASIN

RECHARGE PIT

RECHARGE PIT

STM

massport

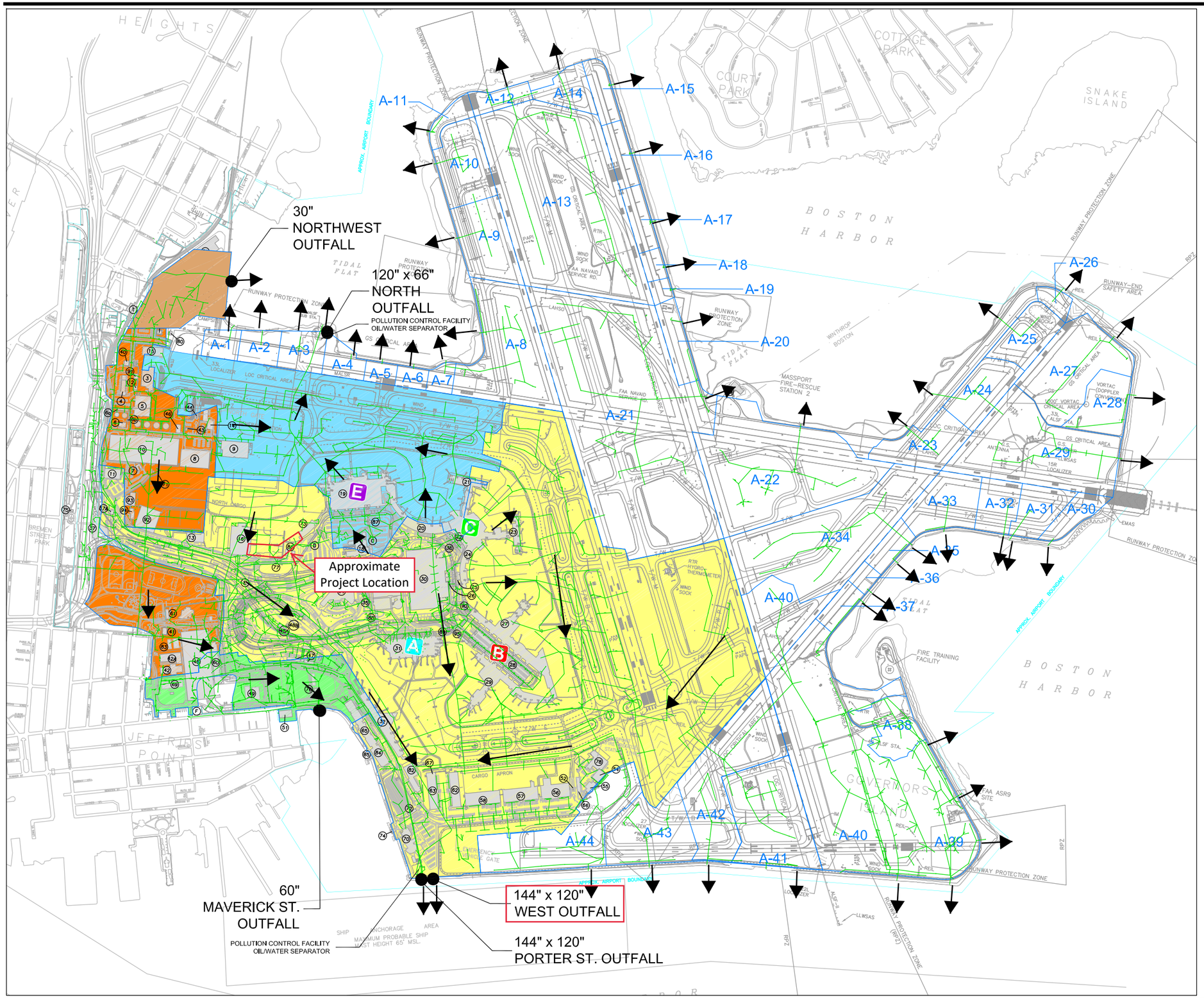
SUFFOLK
build smart
65 ALLERTON ST.
BOSTON, MA. 02119
TEL: (617) 517-4500

DRAWN BY: J.T.S. CHECKED BY: J.T.S.
SCALE : NTS DATE : 08-29-2018

PROJECT:
Terminal E - Modernization
Logan Airport L338

TITLE:

DRAWING NO:



Legend:

- Drainage Area Tributary to Porter St. Outfall
- Drainage Area Tributary to North Outfall
- Drainage Area Tributary to Northwest Outfall
- Drainage Area Tributary to Maverick St. Outfall
- Drainage Area Tributary to West Outfall
- A-13 Runway Perimeter Outfall Drainage Areas
- Stormwater Drainage Line
- Stormwater Flow Direction

Logan International Airport
East Boston, MA
STORMWATER FLOW DIRECTION AND DRAINAGE AREAS

DECEMBER 2007
REVISED NOVEMBER 2013

Notes:

This plan is intended for informational purposes only and no use may be made of the same without the express written permission of the Massachusetts Port Authority ("Massport"). Massport does not certify the accuracy, information or title to the properties contained in this plan nor make any warranties of any kind, express or implied, in fact or by law, with respect to any boundaries, easements, restrictions, claims, overlaps or other encumbrances affecting such properties.

Drainage areas compiled from the following sources:
1.) Rizzo Associates Inc. - Logan Drainage Areas Plan (1996)
2.) HNTB-2/16/01 - Existing Watersheds per E&K Master Layout Plan (1997)

N

0 600 1200 2400
in feet

Logan International Airport
East Boston, MA

Massachusetts Port Authority
Capital Programs Department
Environmental Unit
December 2007
Revised November 2013

Figure 3-1

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Appendix E

Endangered Species Act Eligibility Documentation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To:
Consultation Code: 05E1NE00-2019-SLI-2072
Event Code: 05E1NE00-2019-E-05229
Project Name: Terminal E Modernization

June 25, 2019

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2019-SLI-2072

Event Code: 05E1NE00-2019-E-05229

Project Name: Terminal E Modernization

Project Type: TRANSPORTATION

Project Description: Building construction and renovation at Terminal E at Logan International Airport.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.370745890705734N71.0252027347702W

Counties: Suffolk, MA

Endangered Species Act Species

There is a total of 0 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. 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.

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

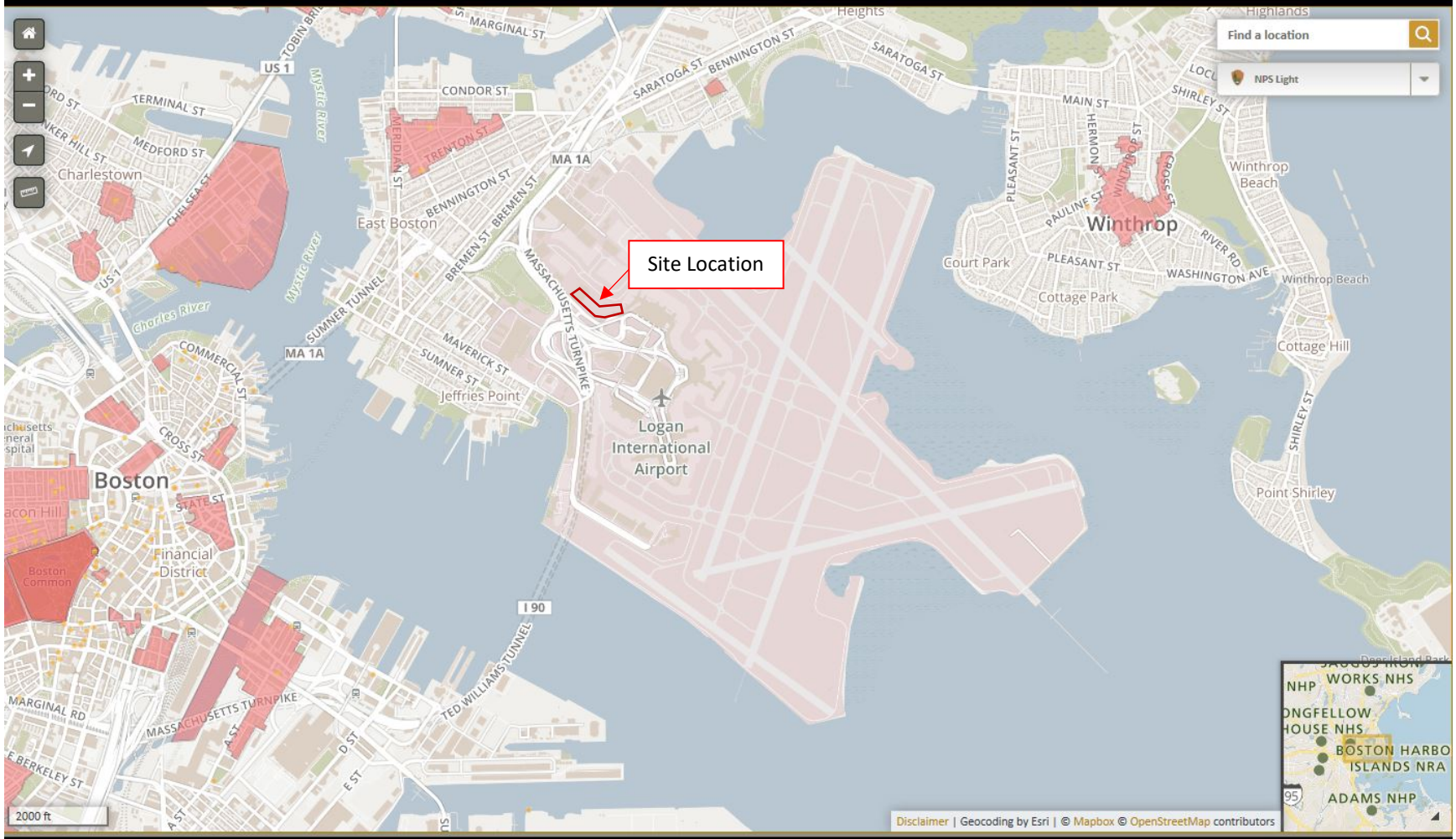
Appendix F

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



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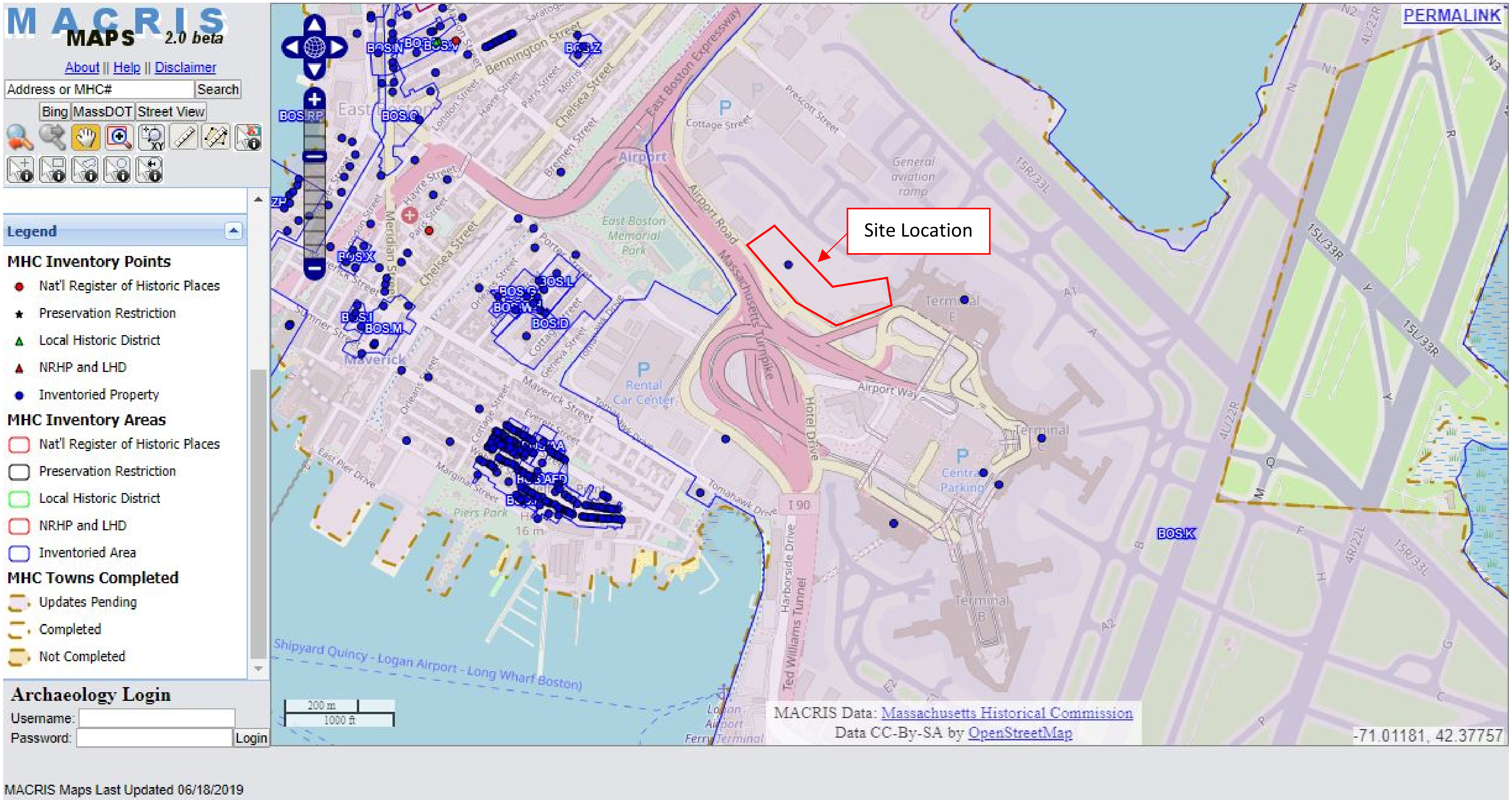
MACRIS MAPS 2.0 beta
About || Help || Disclaimer
Address or MHC#
Search
Bing
MassDOT
Street View
Legend
MHC Inventory Points
Nat'l Register of Historic Places
Preservation Restriction
Local Historic District
NRHP and LHD
Inventoried Property
MHC Inventory Areas
Nat'l Register of Historic Places
Preservation Restriction
Local Historic District
NRHP and LHD
Inventoried Area
MHC Towns Completed
Updates Pending
Completed
Not Completed
Archaeology Login
Username:
Password:
Login
PERMALINK
Site Location
East Boston Expressway
Airport Road
Massachusetts Turnpike
Airport Way
Hotel Drive
Cottage Street
Prescott Street
General aviation ramp
East Boston Memorial Park
Rental Car Center
Central Parking
Terminal E
Terminal C
Terminal B
Maverick Street
Chelsea Street
Bennington Street
Ted Williams Tunnel
Harborside Drive
Tomahawk Drive
Piers Park
Maverick
Shipyard Quincy - Logan Airport - Long Wharf Boston)
Logan Airport Ferry Terminal
15R/33L
15L/33R
4L/22R
4R/22L
200 m
1000 ft
MACRIS Data: Massachusetts Historical Commission
Data CC-By-SA by OpenStreetMap
-71.01181, 42.37757
MACRIS Maps Last Updated 06/18/2019

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Boston; Place: East Boston; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
BOS.A	Belmont Square Area		Boston	
BOS.B	1-6 Brigham Street - Ida Street		Boston	
BOS.C	Central Square Area		Boston	
BOS.D	117-194 Cottage Street		Boston	
BOS.E	15-137 Eutaw Street		Boston	
BOS.F	Putnam Square Area		Boston	
BOS.G	36-71 Frankfort Street		Boston	
BOS.H	115-146 Gove Street		Boston	
BOS.I	8-18 Henry Street - 9-28 Paris Street		Boston	
BOS.J	217-223 Lexington Street		Boston	
BOS.K	Logan, Gen. Edward Lawrence International Airport		Boston	
BOS.L	55-85 Lubec Street		Boston	
BOS.M	Maverick Square Area		Boston	
BOS.N	232-323 Meridian Street		Boston	
BOS.O	358-426 Meridian Street		Boston	
BOS.P	1-63 Monmouth Street		Boston	
BOS.Q	2-8 Montmorenci - 228-252 Orient Avenue		Boston	
BOS.R	9-64 Princeton Street		Boston	
BOS.S	55-154 Saint Andrews Road		Boston	
BOS.T	1-104 Trenton Street		Boston	
BOS.U	24-82 White Street		Boston	
BOS.V	Princeton Street Architectural Conservation		Boston	
BOS.W	Our Lady of Mount Carmel Catholic Church Complex		Boston	
BOS.X	Most Holy Redeemer Roman Catholic Church Complex		Boston	
BOS.Y	Saint Mary Star of the Sea Roman Catholic		Boston	

Inv. No.	Property Name	Street	Town	Year
	Church			
BOS.Z	Sacred Heart Roman Catholic Church Complex		Boston	
BOS.AA	Our Lady of the Assumption Catholic Church Complex		Boston	
BOS.JK	Eagle Hill Historic District		Boston	
BOS.RO	Chelsea River Industrial Area		Boston	
BOS.RP	East Boston Inner Harbor Industrial Area		Boston	
BOS.WA	Saints Joseph and Lazarus Roman Catholic Church		Boston	
BOS.ZE	Ohabei Shalom Cemetery		Boston	
BOS.ZH	East Boston Dry Dock Company		Boston	
BOS.ABQ	Suffolk Downs		Boston	
BOS.AFD	Belmont District		Boston	
BOS.12871	Maverick Cotton Mills	144 Addison St	Boston	1910
BOS.18081		1 Alna Pl	Boston	r 1860
BOS.9505	Our Lady of Fatima Roman Catholic Shrine	Ashley St	Boston	1954
BOS.15272	Toma, Rev. Louis Roman Catholic Youth Center	54 Ashley St	Boston	1957
BOS.15271	Saint Lazarus Roman Catholic Church Rectory	59 Ashley St	Boston	r 1925
BOS.1	Saint Lazarus Roman Catholic Church	61 Ashley St	Boston	1922
BOS.1999	Saint Lazarus Roman Catholic Church	61 Ashley St	Boston	1922
BOS.2	Saint Lazarus Roman Catholic Church School	67 Ashley St	Boston	1927
BOS.15273	Saint Lazarus Roman Catholic Church Convent	87 Ashley St	Boston	1938
BOS.3	Evans, Frank House	57 Bayswater St	Boston	1911
BOS.800	Bennington Street Burying Ground	Bennington St	Boston	c 1837
BOS.904	Bennington Street Bridge over Conrail	Bennington St	Boston	1906
BOS.4	Central Square Theatre	36-44 Bennington St	Boston	1915
BOS.5	McClellan, William F. Building	336-344 Bennington St	Boston	1903
BOS.6		360 Bennington St	Boston	r 1860
BOS.7	Schleichey, Carl House	664 Bennington St	Boston	1900
BOS.16712	Orient Heights Rapid Transit Passenger Station	1000 Bennington St	Boston	1951
BOS.8	Caledonia, George Building	1006-1010 Bennington St	Boston	1914
BOS.10	Barker, Anna Building	1024 Bennington St	Boston	1902
BOS.12874	Atlantic Boiler Works - Wigglesworth Machinery Co.	60 Border St	Boston	1930
BOS.12875	Atlantic Boiler Works	80 Border St	Boston	c 1901
BOS.9671	Atlantic Works Pier No. 4	102 Border St	Boston	c 1917
BOS.9672	Atlantic Works Derrick Pier	102 Border St	Boston	1937
BOS.9673	Atlantic Works Pier No. 5	102 Border St	Boston	c 1912
BOS.9674	Atlantic Works Marine Railway No. 3	102 Border St	Boston	1890

Inv. No.	Property Name	Street	Town	Year
BOS.9675	Atlantic Works Marine Railway No. 2	102 Border St	Boston	1892
BOS.9676	Atlantic Works Pier No. 6	102 Border St	Boston	1892
BOS.9677	Atlantic Works Gate	102 Border St	Boston	c 1927
BOS.12876		129 Border St	Boston	r 1935
BOS.11	McLaren, Alexander and John Shop and Sawmill	135-139 Border St	Boston	c 1873
BOS.12	Sturtevant Saw and Planing Mill	149-151 Border St	Boston	r 1860
BOS.13	Chase, Samuel York Carpentry Shop	161-163 Border St	Boston	c 1871
BOS.12877		170 Border St	Boston	r 1950
BOS.12878		170 Border St	Boston	r 1950
BOS.12879	Briggs, John and Company Paint Factory	266 Border St	Boston	c 1903
BOS.12880	Welding and Engineering Company of Boston	279 Border St	Boston	c 1920
BOS.12881	West End Street Railway Car House	285 Border St	Boston	c 1890
BOS.12882	Westerbeke Marine Industries Supplies	400 Border St	Boston	c 1935
BOS.12883	Ideal Collision Office	404 Border St	Boston	c 1930
BOS.12884	Ideal Collision Office Outbuilding	404 Border St	Boston	c 1935
BOS.9462	Luna, Tugboat	Boston Harbor	Boston	1930
BOS.9430	Bremen Street Wall	Bremen St	Boston	r 1935
BOS.13010	Boston and Albany Railroad Engine House	215 Bremen St	Boston	1910
BOS.14		1 Brigham St	Boston	c 1845
BOS.15		2 Brigham St	Boston	c 1845
BOS.18082		3 Brigham St	Boston	2017
BOS.16		4 Brigham St	Boston	c 1845
BOS.18083		5 Brigham St	Boston	2017
BOS.17		6 Brigham St	Boston	c 1845
BOS.121	Sacred Heart Roman Catholic Church	35 Brooks St	Boston	1965
BOS.14001		166-170 Brooks St	Boston	r 1860
BOS.14002	Hargrave Duplex	169-171 Brooks St	Boston	r 1860
BOS.14003		173-179 Brooks St	Boston	r 1935
BOS.14004		174-178 Brooks St	Boston	r 1860
BOS.14005		188 Brooks St	Boston	r 1890
BOS.14006		190 Brooks St	Boston	r 1890
BOS.14007		192-200 Brooks St	Boston	r 1860
BOS.14008		193-195 Brooks St	Boston	r 1860
BOS.18084		5 Cheever Ct	Boston	r 1895
BOS.18085		8 Cheever Ct	Boston	r 1895
BOS.18086		9 Cheever Ct	Boston	r 1860
BOS.18087		10 Cheever Ct	Boston	r 1895
BOS.18088		11 Cheever Ct	Boston	r 1845

Inv. No.	Property Name	Street	Town	Year
BOS.18089		12 Cheever Ct	Boston	r 1895
BOS.9752	Chelsea Street Bridge over Chelsea River	Chelsea St	Boston	1936
BOS.9463	Street Clock	9 Chelsea St	Boston	
BOS.19	East Boston Steam Sewerage Pumping Station	605 Chelsea St	Boston	1894
BOS.12872	Citizens Electric Light Company	84-92 Condor St	Boston	c 1886
BOS.20	Boston and Lockport Block Company	100 Condor St	Boston	1907
BOS.21	Boston and Lockport Block Company	102-140 Condor St	Boston	c 1920
BOS.22	McKay, Donald School	122 Cottage St	Boston	1926
BOS.23	Eagle Street Power Station	338 Eagle St	Boston	1894
BOS.12873	Boston Ice Company Distribution Building	370 East Eagle St	Boston	c 1927
BOS.33	Our Savior American Lutheran Church	14 Edgeworth Pl	Boston	1917
BOS.14009		19-21 Eutaw St	Boston	r 1860
BOS.14010		23-25 Eutaw St	Boston	r 1905
BOS.14011		24-26 Eutaw St	Boston	r 1860
BOS.14012		27-29 Eutaw St	Boston	c 1851
BOS.14013		28 Eutaw St	Boston	r 1860
BOS.14014		30-34 Eutaw St	Boston	c 1851
BOS.14015		31-33 Eutaw St	Boston	c 1851
BOS.14016		35-37 Eutaw St	Boston	r 1880
BOS.14017		36-38 Eutaw St	Boston	r 1915
BOS.14018		40-42 Eutaw St	Boston	c 1851
BOS.14019		44 Eutaw St	Boston	r 1860
BOS.14021		48 Eutaw St	Boston	r 1880
BOS.14022		49 Eutaw St	Boston	r 1860
BOS.14023		50 Eutaw St	Boston	r 1900
BOS.14024		51 Eutaw St	Boston	r 1860
BOS.14025		52-56 Eutaw St	Boston	c 1851
BOS.14026		58-60 Eutaw St	Boston	c 1851
BOS.14027	Chapman School	61 Eutaw St	Boston	1900
BOS.14028		62 Eutaw St	Boston	r 1890
BOS.14029		64 Eutaw St	Boston	r 1860
BOS.14030		66 Eutaw St	Boston	c 1851
BOS.14031		68 Eutaw St	Boston	c 1851
BOS.14032		70 Eutaw St	Boston	r 1880
BOS.14033		71 Eutaw St	Boston	r 1880
BOS.14034		72-74 Eutaw St	Boston	r 1880
BOS.14035	Albee House	73 Eutaw St	Boston	1877
BOS.14036	Burnham House	75 Eutaw St	Boston	1877

Inv. No.	Property Name	Street	Town	Year
BOS.14037		76 Eutaw St	Boston	r 1880
BOS.14038	Jack House	77 Eutaw St	Boston	1869
BOS.14039		79 Eutaw St	Boston	r 1880
BOS.14040		80 Eutaw St	Boston	r 1860
BOS.14041		81-83 Eutaw St	Boston	r 1860
BOS.14042		82 Eutaw St	Boston	r 1860
BOS.14043		84-86 Eutaw St	Boston	r 1860
BOS.14044		85-87 Eutaw St	Boston	r 1860
BOS.14045		88 Eutaw St	Boston	r 1860
BOS.14046		90 Eutaw St	Boston	r 1900
BOS.14047		92 Eutaw St	Boston	r 1860
BOS.14048		96 Eutaw St	Boston	r 1860
BOS.14049		104-106 Eutaw St	Boston	r 1860
BOS.14050		105-107 Eutaw St	Boston	r 1880
BOS.14051		108 Eutaw St	Boston	r 1860
BOS.14052		109 Eutaw St	Boston	r 1880
BOS.14053		110 Eutaw St	Boston	r 1860
BOS.14054		111-113 Eutaw St	Boston	r 1860
BOS.14055		112 Eutaw St	Boston	r 1900
BOS.14056		115 Eutaw St	Boston	r 1860
BOS.14057		116 Eutaw St	Boston	r 1860
BOS.14058		117 Eutaw St	Boston	r 1860
BOS.14059		118 Eutaw St	Boston	r 1860
BOS.14060		119-127 Eutaw St	Boston	r 1860
BOS.14061		120 Eutaw St	Boston	r 1880
BOS.14062		122 Eutaw St	Boston	r 1860
BOS.14063		129-137 Eutaw St	Boston	r 1860
BOS.14064		139 Eutaw St	Boston	r 1860
BOS.14065		141 Eutaw St	Boston	c 1851
BOS.14066		143 Eutaw St	Boston	c 1851
BOS.14067		145 Eutaw St	Boston	c 1851
BOS.14068		145R Eutaw St	Boston	r 1925
BOS.27	Our Lady of Mount Carmel Roman Catholic Convent	49 Frankfort St	Boston	c 1949
BOS.24		71 Frankfort St	Boston	1910
BOS.25	Lyman, Theodore School	30 Gove St	Boston	c 1869
BOS.26	Our Lady of Mount Carmel Roman Catholic Church	120 Gove St	Boston	1907

Inv. No.	Property Name	Street	Town	Year
BOS.15268	Our Lady of Mount Carmel Roman Catholic Rectory	134 Gove St	Boston	1955
BOS.28	Corsano, James Apartment Block	142 Gove St	Boston	1914
BOS.29	Corsano, James Apartment Block	146 Gove St	Boston	1911
BOS.15269	Our Lady of Mount Carmel Roman Catholic School	99 Grove St	Boston	1931
BOS.18064	Logan International Airport Old Control Tower	1 Harborside Dr	Boston	1957
BOS.76	Sisters of Notre Dame Roman Catholic Convent	56 Havre St	Boston	c 1847
BOS.16908	Callahan Tunnel Administrative Service Building	145 Havre St	Boston	c 1959
BOS.30		8-18 Henry St	Boston	r 1845
BOS.34		59 Horace St	Boston	r 1860
BOS.9801	Callahan, William F. Jr. Tunnel	I-93	Boston	c 1959
BOS.9802	Sumner Tunnel - Springer Tunnel	I-93	Boston	c 1931
BOS.35	Simmons, Charles Double House	1-2 Lamson St	Boston	c 1845
BOS.18090	Jones, Maria House	3 Lamson St	Boston	r 1865
BOS.36	Gillespie, Catherine R. Three Decker	4 Lamson St	Boston	c 1895
BOS.37	Fitzpatrick, Andrew Three Decker	5 Lamson St	Boston	c 1895
BOS.87		20 Lexington St	Boston	r 1840
BOS.38	Carr, William House	38 Lexington St	Boston	c 1846
BOS.51	Lapham, Mary B. House	69 Lexington St	Boston	r 1860
BOS.14069		70-74 Lexington St	Boston	c 1851
BOS.14070		78 Lexington St	Boston	r 1890
BOS.39	Saint John's Episcopal Church	80-84 Lexington St	Boston	1897
BOS.52	Bennett, George W. House	93 Lexington St	Boston	c 1880
BOS.40		100 Lexington St	Boston	c 1851
BOS.41		104 Lexington St	Boston	c 1851
BOS.42		108 Lexington St	Boston	c 1851
BOS.43	Bailey, Paul House	110 Lexington St	Boston	c 1851
BOS.44	Farwell, George W. House	114 Lexington St	Boston	c 1851
BOS.45	Robertson, John Q. House	116 Lexington St	Boston	c 1851
BOS.46	Odiorne, Benjamin House	118 Lexington St	Boston	c 1851
BOS.47	Hargrave, George House	124 Lexington St	Boston	1872
BOS.48	Kelly, Daniel D. House	170 Lexington St	Boston	c 1856
BOS.53	Ginsburg, Louis A. Three Decker	205-207 Lexington St	Boston	1901
BOS.54	Ginsburg, Louis A. Three Decker	209-211 Lexington St	Boston	1901
BOS.55	Ginsburg, Louis A. Three Decker	213 Lexington St	Boston	1901
BOS.56	Burnham, Lewis Three Decker	217 Lexington St	Boston	c 1890
BOS.49	Hayes, M. House	218 Lexington St	Boston	c 1884

Inv. No.	Property Name	Street	Town	Year
BOS.57	Burnham, Lewis Three Decker	219 Lexington St	Boston	c 1890
BOS.50	Knowles, Paul House	220 Lexington St	Boston	c 1884
BOS.58	Burnham, Lewis Three Decker	221 Lexington St	Boston	c 1890
BOS.9805	Sumner Tunnel - East Boston Vent Tower	65 Liverpool St	Boston	1932
BOS.12885	American Architectural Iron Company	80 Liverpool St	Boston	c 1950
BOS.59	Logan International Airport Control Tower	Logan Airport	Boston	1977
BOS.60	Logan International Airport Eastern Terminal	Logan Airport	Boston	1969
BOS.61	Logan International Airport Administration Building	Logan Airport	Boston	1927
BOS.62	Logan International Airport Chapel	Logan Airport	Boston	1955
BOS.63	Logan International Airport Volpe Terminal	Logan Airport	Boston	1973
BOS.77	Most Holy Redeemer Roman Catholic Church Rectory	65 London St	Boston	r 1885
BOS.75	Most Holy Redeemer Roman Catholic School	69 London St	Boston	1892
BOS.911	Callahan Tunnel East Boston Vent Building	89 London St	Boston	1959
BOS.64	First Presbyterian Church of East Boston	130 London St	Boston	1871
BOS.16907	East Boston Service and Emergency Building	149 London St	Boston	1933
BOS.65	Webster, Daniel School	Lubec St	Boston	1922
BOS.66	Lambiase, Joseph Building	58 Lubec St	Boston	1914
BOS.67	Carbone, Anthony Building	64 Lubec St	Boston	1911
BOS.68	Immigrants Home Corporation Building	72-74 Marginal St	Boston	1911
BOS.69	Cooper, James W. House	132 Marginal St	Boston	c 1870
BOS.18091		210 Marginal St	Boston	r 1865
BOS.18092		216R Marginal St	Boston	r 1865
BOS.14071		1 Marion Pl	Boston	c 1851
BOS.14072		2 Marion Pl	Boston	r 1860
BOS.14073		3 Marion Pl	Boston	r 1890
BOS.14074		4 Marion Pl	Boston	r 1880
BOS.14075		5-6 Marion Pl	Boston	c 1851
BOS.14076		7 Marion Pl	Boston	r 1860
BOS.14077		8 Marion Pl	Boston	r 1880
BOS.14078		1-3 Marion St	Boston	c 1851
BOS.14079		5 Marion St	Boston	r 1860
BOS.14080		9 Marion St	Boston	r 1860
BOS.14081		10-14 Marion St	Boston	r 1860
BOS.14082		11-13 Marion St	Boston	r 1900
BOS.14083		15 Marion St	Boston	r 1860
BOS.14084		16 Marion St	Boston	r 1890

Inv. No.	Property Name	Street	Town	Year
BOS.14085		17 Marion St	Boston	r 1860
BOS.14086		18 Marion St	Boston	r 1890
BOS.14087		19-21 Marion St	Boston	r 1860
BOS.14088		20 Marion St	Boston	r 1890
BOS.14089		22 Marion St	Boston	r 1890
BOS.14090		24 Marion St	Boston	c 1884
BOS.14091		26 Marion St	Boston	r 1860
BOS.14092		37-43 Marion St	Boston	r 1860
BOS.14093		40-52 Marion St	Boston	r 1860
BOS.14020		52A Marion St	Boston	r 1880
BOS.14094		52A Marion St	Boston	r 1890
BOS.14095		54-58 Marion St	Boston	r 1860
BOS.14096		59-61 Marion St	Boston	r 1880
BOS.14097		60 Marion St	Boston	r 1940
BOS.14098		63-71 Marion St	Boston	r 1860
BOS.14099	Fire Engine #5 Fire Station	64-66 Marion St	Boston	1919
BOS.201		71 Marion St	Boston	r 1850
BOS.14100		75-79 Marion St	Boston	c 1851
BOS.14101		80-82 Marion St	Boston	r 1860
BOS.70	Unitarian Church of Our Father	83 Marion St	Boston	1902
BOS.71	East Boston High School, Old	127 Marion St	Boston	1901
BOS.900	Maverick Square Subway Station	Maverick Sq	Boston	1924
BOS.901	East Boston Tunnel - Third Rail Tunnel	Maverick Sq	Boston	1904
BOS.73	Winthrop Block	34-44 Maverick Sq	Boston	c 1873
BOS.74	Most Holy Redeemer Roman Catholic Church	70 Maverick St	Boston	1854
BOS.78	New England Aircraft School	395-399 Maverick St	Boston	1940
BOS.9754	Suffolk Downs Racetrack	525 McClellan Hwy	Boston	1935
BOS.9755	Suffolk Downs Harness Racing Track	525 McClellan Hwy	Boston	1962
BOS.16592	Suffolk Downs Grandstand	525 McClellan Hwy	Boston	1935
BOS.16593	Suffolk Downs Administration Building	525 McClellan Hwy	Boston	1935
BOS.907	McArdle Bridge	Meridian St	Boston	1954
BOS.79	First Ward National Bank	2-8 Meridian St	Boston	1913
BOS.80	East Boston Savings Bank	10-16 Meridian St	Boston	1913
BOS.81	Columbia Trust Company Building	18-20 Meridian St	Boston	1895
BOS.96	East Boston Police Station and Court House	25-33 Meridian St	Boston	1912
BOS.82	Stevenson Block	234-238 Meridian St	Boston	1883
BOS.83		235-239 Meridian St	Boston	c 1885
BOS.84		255-265 Meridian St	Boston	r 1870

Inv. No.	Property Name	Street	Town	Year
BOS.85		269 Meridian St	Boston	1870
BOS.88	Boston Public Library - East Boston Branch	276-282 Meridian St	Boston	1913
BOS.86		287-297 Meridian St	Boston	r 1870
BOS.97	Bailey, George J. House	299-303 Meridian St	Boston	1898
BOS.90		334-342 Meridian St	Boston	1892
BOS.14102	East Boston Masonic Hall	344-352 Meridian St	Boston	r 1890
BOS.14103		349-353 Meridian St	Boston	c 1884
BOS.14104		357-363 Meridian St	Boston	c 1851
BOS.14105		358 Meridian St	Boston	c 1884
BOS.91	Jeffries Winter Club	360 Meridian St	Boston	1888
BOS.14106		362 Meridian St	Boston	r 1900
BOS.14107		364 Meridian St	Boston	r 1900
BOS.14108		365 Meridian St	Boston	r 1900
BOS.14109		366 Meridian St	Boston	r 1890
BOS.14110		368 Meridian St	Boston	r 1890
BOS.14111		369-371 Meridian St	Boston	c 1851
BOS.95	Graham, B. J. Double House	370-372 Meridian St	Boston	1894
BOS.14112		379-385 Meridian St	Boston	c 1851
BOS.14113		387 Meridian St	Boston	r 1860
BOS.14114		388 Meridian St	Boston	c 1892
BOS.14115		389 Meridian St	Boston	r 1900
BOS.14116		390 Meridian St	Boston	r 1860
BOS.14117		391 Meridian St	Boston	r 1900
BOS.14118		393-395 Meridian St	Boston	c 1851
BOS.14119		394 Meridian St	Boston	r 1860
BOS.92		396-398 Meridian St	Boston	r 1845
BOS.14120		401 Meridian St	Boston	r 1860
BOS.14121	Curtis, Paul House	402 Meridian St	Boston	r 1860
BOS.14122		403 Meridian St	Boston	r 1860
BOS.14123		404 Meridian St	Boston	r 1905
BOS.14124		405-407 Meridian St	Boston	c 1851
BOS.89	Trinity Neighborhood House	406 Meridian St	Boston	c 1848
BOS.93	McLean, Charles R. House	408 Meridian St	Boston	1878
BOS.14125		414-416 Meridian St	Boston	r 1880
BOS.94	Sturtevant, William House	417 Meridian St	Boston	1886
BOS.14126		418 Meridian St	Boston	r 1890
BOS.14127		419 Meridian St	Boston	r 1890
BOS.14128	Walsh, James L. House	421 Meridian St	Boston	r 1890

Inv. No.	Property Name	Street	Town	Year
BOS.14129	Crane Music School	422 Meridian St	Boston	1885
BOS.14130		423 Meridian St	Boston	c 1884
BOS.14131		424 Meridian St	Boston	c 1884
BOS.14132		425 Meridian St	Boston	c 1884
BOS.14133		426 Meridian St	Boston	r 1880
BOS.14134		428 Meridian St	Boston	r 1900
BOS.14135		430 Meridian St	Boston	r 1890
BOS.14136		432 Meridian St	Boston	c 1888
BOS.9460	Monmouth Square	Monmouth Sq	Boston	r 1865
BOS.98	Bates House	1 Monmouth Sq	Boston	r 1870
BOS.14137		1 Monmouth St	Boston	r 1900
BOS.14138		3-5 Monmouth St	Boston	r 1860
BOS.14139		7 Monmouth St	Boston	c 1851
BOS.99		8-10 Monmouth St	Boston	r 1850
BOS.14140		9 Monmouth St	Boston	r 1880
BOS.14141		11 Monmouth St	Boston	r 1900
BOS.100		12-14 Monmouth St	Boston	r 1850
BOS.14142		13-15 Monmouth St	Boston	c 1888
BOS.101	Cochran, William B. Grocery Store	19 Monmouth St	Boston	r 1880
BOS.14143		21-23 Monmouth St	Boston	c 1892
BOS.14144		22 Monmouth St	Boston	r 1860
BOS.14145		25 Monmouth St	Boston	c 1851
BOS.14146		26-28 Monmouth St	Boston	r 1880
BOS.14147		27 Monmouth St	Boston	c 1851
BOS.14148		29 Monmouth St	Boston	r 1860
BOS.14149		30 Monmouth St	Boston	r 1900
BOS.14150		31 Monmouth St	Boston	r 1860
BOS.14151		32 Monmouth St	Boston	r 1860
BOS.14152		33 Monmouth St	Boston	c 1851
BOS.14153		34 Monmouth St	Boston	r 1860
BOS.14154		36 Monmouth St	Boston	r 1860
BOS.14155		37 Monmouth St	Boston	r 1860
BOS.14156		38-40 Monmouth St	Boston	r 1860
BOS.14157		38R Monmouth St	Boston	r 1890
BOS.14158		39-41 Monmouth St	Boston	r 1880
BOS.14159		42-48 Monmouth St	Boston	r 1860
BOS.14160		43 Monmouth St	Boston	r 1860
BOS.14161		45 Monmouth St	Boston	r 1880

Inv. No.	Property Name	Street	Town	Year
BOS.14162		47 Monmouth St	Boston	r 1880
BOS.14163		49 Monmouth St	Boston	r 1860
BOS.14164		50 Monmouth St	Boston	r 1890
BOS.14165	McPherson House	51 Monmouth St	Boston	1873
BOS.14166		52 Monmouth St	Boston	r 1890
BOS.14167	Hall House	53 Monmouth St	Boston	1877
BOS.14168	Day House	55 Monmouth St	Boston	1872
BOS.14169		57 Monmouth St	Boston	r 1860
BOS.14170		59 Monmouth St	Boston	c 1888
BOS.14171	Foster House	61 Monmouth St	Boston	1869
BOS.14172	Leighton House	63 Monmouth St	Boston	r 1890
BOS.102	Cheverus, John L. School	10 Moore St	Boston	1908
BOS.103	Saint Mary Star of the Sea Roman Catholic Church	55 Moore St	Boston	1909
BOS.15275	Saint Mary Star of the Sea Roman Catholic School	58 Moore St	Boston	1887
BOS.15276	Saint Mary Star of the Sea Roman Catholic Convent	58 Moore St	Boston	1960
BOS.15274	Saint Mary Star of the Sea Roman Catholic Rectory	63 Moore St	Boston	1893
BOS.104	Potito, Leonora House	14 Nancia St	Boston	1938
BOS.105	Barkin, Samuel House	18 Neptune Rd	Boston	1910
BOS.106	Goldfinger, Joseph House	44 Neptune Rd	Boston	1912
BOS.9678	New Street Sea Wall	6-26 New St	Boston	c 1840
BOS.107	Boston Cold Storage Company - Building #8	8 New St	Boston	1908
BOS.15886	Atlantic Works Welding and Engineering Building	36 New St	Boston	c 1927
BOS.108	Atlantic Boiler Works Boiler Shop	40 New St	Boston	1893
BOS.18093		4 Noble Ct	Boston	r 1842
BOS.18094		6 Noble Ct	Boston	r 1842
BOS.18095	Anderson, A. and H. House	7 Noble Ct	Boston	r 1895
BOS.18096	Breksson, J. House	9 Noble Ct	Boston	r 1895
BOS.18097		10 Noble Ct	Boston	r 1842
BOS.109		54-56 Orient Ave	Boston	r 1915
BOS.112		75-79 Orient Ave	Boston	r 1915
BOS.113	Don Orione Nursing Home	111 Orient Ave	Boston	1952
BOS.114	Madonna Queen Shrine Chapel	111 Orient Ave	Boston	1956
BOS.902	Madonna, Queen of the Universe Statue	111 Orient Ave	Boston	1954
BOS.110		120 Orient Ave	Boston	c 1880
BOS.111		150 Orient Ave	Boston	c 1880

Inv. No.	Property Name	Street	Town	Year
BOS.115	Cox Confectionery Company Building	150 Orleans St	Boston	1917
BOS.116	Engel-Cone Shoe Company Building	175 Orleans St	Boston	1911
BOS.31		16-18 Paris St	Boston	r 1845
BOS.32		20-22 Paris St	Boston	r 1845
BOS.117	Engine #9 - Ladder Company #2 Fire House	60 Paris St	Boston	1890
BOS.119	White, George Fund East Boston Health Unit	75 Paris St	Boston	1925
BOS.118	Paris Street Gymnasium and Public Bath	112-130 Paris St	Boston	1909
BOS.120	Sacred Heart Roman Catholic Church Convent	301 Paris St	Boston	1911
BOS.15270	Sacred Heart Roman Catholic Church Garage	304 Paris St	Boston	c 1920
BOS.908	Porter Street Bridge over Conrail	Porter St	Boston	1908
BOS.122	East Boston Relief Station	14 Porter St	Boston	1907
BOS.123	General Electric East Boston Lamp Works	156-200 Porter St	Boston	1913
BOS.14173	Sheridan, Gen. Philip H. Elementary School	1 Prescott St	Boston	1914
BOS.133	Gurney, James - Dyer, Edwin Double House	21-23 Princeton St	Boston	1863
BOS.134	Whidden, Steven H. Building	39 Princeton St	Boston	1864
BOS.233	Stevenson, J. Henry Building	41 Princeton St	Boston	c 1875
BOS.124	Peterson, Seth C. House	44 Princeton St	Boston	1852
BOS.125	James, Frederick House	46 Princeton St	Boston	1853
BOS.126	Tewksbury, Abijah R. - Pingry, Samuel Double House	50-54 Princeton St	Boston	c 1841
BOS.127	Snelling, Washington House	80 Princeton St	Boston	c 1857
BOS.128	Hargrave, George W. House	144 Princeton St	Boston	c 1886
BOS.129	Sampson, Catherine Double House	174-176 Princeton St	Boston	c 1870
BOS.130	Bates, Benjamin Double House	178-180 Princeton St	Boston	c 1870
BOS.135	McLaren, Alexander and John Building	263 Princeton St	Boston	1875
BOS.136	McLaren, Alexander and John Building	265 Princeton St	Boston	1875
BOS.131	Pinkham - Perry - Sanderson House	296-300 Princeton St	Boston	c 1860
BOS.132	Noble School and Annex	321 Princeton St	Boston	1874
BOS.9461	Putnam Square	Putnam Sq	Boston	r 1865
BOS.14174		47-53 Putnam St	Boston	r 1880
BOS.14175		61-63 Putnam St	Boston	r 1880
BOS.14176		65-67 Putnam St	Boston	r 1880
BOS.14177		69 Putnam St	Boston	r 1880
BOS.14178		71 Putnam St	Boston	r 1860
BOS.14179		73 Putnam St	Boston	r 1860
BOS.14180		75 Putnam St	Boston	r 1860
BOS.14181	McLaren - McKay House	86-88 Putnam St	Boston	1872
BOS.903	Golden Stairs	Ruth St	Boston	

Inv. No.	Property Name	Street	Town	Year
BOS.147	Goldfinger, Joseph House	55 Saint Andrew Rd	Boston	c 1911
BOS.148	Goldfinger, Joseph House	57 Saint Andrew Rd	Boston	c 1911
BOS.149	Goldfinger, Joseph House	59 Saint Andrew Rd	Boston	c 1911
BOS.150	Goldfinger, Joseph House	61 Saint Andrew Rd	Boston	c 1911
BOS.151	Goldfinger, Joseph House	63 Saint Andrew Rd	Boston	c 1911
BOS.143	Goldfinger, Joseph House	66 Saint Andrew Rd	Boston	c 1911
BOS.144	Goldfinger, Joseph House	68 Saint Andrew Rd	Boston	c 1911
BOS.145	Goldfinger, Joseph House	70 Saint Andrew Rd	Boston	c 1911
BOS.146	Goldfinger, Joseph House	72 Saint Andrew Rd	Boston	c 1911
BOS.137	Belluschi, Michael C. House	140 Saint Andrew Rd	Boston	1931
BOS.138		142 Saint Andrew Rd	Boston	1925
BOS.139		144 Saint Andrew Rd	Boston	1925
BOS.140		146 Saint Andrew Rd	Boston	1925
BOS.141		148 Saint Andrew Rd	Boston	1925
BOS.142		150 Saint Andrew Rd	Boston	1925
BOS.905	Saratoga Street Bridge over MBTA Blue Line	Saratoga St	Boston	1913
BOS.910	Saratoga Street Bridge over Belle Island Inlet	Saratoga St	Boston	1956
BOS.158	Wurl, Adelia Three Decker	41-43 Saratoga St	Boston	1909
BOS.72	Keating, M. Block	73-75 Saratoga St	Boston	1884
BOS.159		113 Saratoga St	Boston	c 1865
BOS.160	Warren, Joseph H. Row House	115 Saratoga St	Boston	c 1865
BOS.161	Gould, Oscar A. Row House	117 Saratoga St	Boston	c 1865
BOS.162	Emery, Erastus O. Row House	119 Saratoga St	Boston	c 1865
BOS.163		121 Saratoga St	Boston	c 1865
BOS.164	Davis, John Row House	123 Saratoga St	Boston	c 1865
BOS.165		125 Saratoga St	Boston	c 1865
BOS.166	Studley, George W. Row House	127 Saratoga St	Boston	c 1865
BOS.167		129 Saratoga St	Boston	c 1865
BOS.168		131 Saratoga St	Boston	c 1865
BOS.169		133 Saratoga St	Boston	c 1865
BOS.170		135 Saratoga St	Boston	c 1865
BOS.171		137 Saratoga St	Boston	c 1865
BOS.172		139 Saratoga St	Boston	c 1865
BOS.173		141 Saratoga St	Boston	c 1865
BOS.174		143 Saratoga St	Boston	c 1865
BOS.175		145 Saratoga St	Boston	c 1865
BOS.176		147 Saratoga St	Boston	c 1865
BOS.152	Saint John the Baptist Roman Catholic Church	336 Saratoga St	Boston	1913

Inv. No.	Property Name	Street	Town	Year
BOS.153	East Boston Chemical Company #7 Fire House	360 Saratoga St	Boston	1901
BOS.154	Mahoney, Richard House	470-472 Saratoga St	Boston	r 1860
BOS.155	Lishner, Samuel Building	474-476 Saratoga St	Boston	1912
BOS.15277	Saint Mary Star of The Sea Church Hall	737 Saratoga St	Boston	r 1875
BOS.156	Baker Congregational Church	760 Saratoga St	Boston	1903
BOS.157	Vesce, Frank Building	974-978 Saratoga St	Boston	1922
BOS.177		1049 Saratoga St	Boston	1908
BOS.178		1051 Saratoga St	Boston	1908
BOS.179		1053 Saratoga St	Boston	1908
BOS.180		1055 Saratoga St	Boston	1908
BOS.181		1057 Saratoga St	Boston	1908
BOS.182		1059 Saratoga St	Boston	1908
BOS.183		1061 Saratoga St	Boston	1908
BOS.184		3-5 Seaver St	Boston	c 1880
BOS.185	Our Lady of the Assumption Catholic Church Parochial School	11-15 Seaver St	Boston	1890
BOS.186		15 Seaview St	Boston	c 1882
BOS.16906	American Airlines Hangar - Bulding 16	100 Service Rd	Boston	c 1953
BOS.18098		5 Sumner Pl	Boston	r 1842
BOS.18099		7 Sumner Pl	Boston	r 1842
BOS.906	Sumner Street Bridge over Conrail	Sumner St	Boston	1908
BOS.187	Hodge Boiler Works Boiler Shop	111 Sumner St	Boston	1902
BOS.188	Hodge Boiler Works Office	111 Sumner St	Boston	c 1902
BOS.192	Woodbury Building	191-201 Sumner St	Boston	1841
BOS.189	East Boston Engine #40 Fire House	260 Sumner St	Boston	1923
BOS.190	Soldani Building	326-328 Sumner St	Boston	1929
BOS.18100		347 Sumner St	Boston	r 1842
BOS.18101		349 Sumner St	Boston	r 1842
BOS.18102		351 Sumner St	Boston	r 1842
BOS.18103		353 Sumner St	Boston	r 1842
BOS.18104		354 Sumner St	Boston	r 1842
BOS.18105		356 Sumner St	Boston	r 1842
BOS.18106	Gottlieb, Louis Apartments	357 Sumner St	Boston	r 1895
BOS.18107		358 Sumner St	Boston	r 1842
BOS.18108	Livingstone, Celia Three Decker	361 Sumner St	Boston	r 1895
BOS.18109		362 Sumner St	Boston	r 1842
BOS.18110	Livingstone, Celia Three Decker	363 Sumner St	Boston	r 1895
BOS.18111		364 Sumner St	Boston	r 1842

Inv. No.	Property Name	Street	Town	Year
BOS.18112	Finn, L. Three Decker	365 Sumner St	Boston	r 1895
BOS.18113	Emerson, S. E. House	365R Sumner St	Boston	r 1895
BOS.18114	Murphy, W. and M. House	365R Sumner St	Boston	r 1895
BOS.18115	O'Brien, J. J. House	365R Sumner St	Boston	r 1895
BOS.18116		366-368 Sumner St	Boston	c 1920
BOS.18117	Nickerson, E. Three Decker	367 Sumner St	Boston	r 1895
BOS.18118	Reppucci, N. and G. Apartments	369-373 Sumner St	Boston	r 1915
BOS.18119		370-372 Sumner St	Boston	r 1842
BOS.18120		372 Sumner St	Boston	
BOS.18121		376 Sumner St	Boston	r 1842
BOS.18122		378 Sumner St	Boston	r 1842
BOS.18123		380 Sumner St	Boston	r 1842
BOS.18124		381 Sumner St	Boston	r 1860
BOS.18125		382 Sumner St	Boston	r 1842
BOS.18126		383-385 Sumner St	Boston	r 1880
BOS.18127	Moore, E. A. House	387 Sumner St	Boston	r 1880
BOS.18128	Moore, E. A. House	389 Sumner St	Boston	r 1880
BOS.191	Our Lady of the Assumption Roman Catholic Church	394 Sumner St	Boston	1869
BOS.15267	Our Lady of the Assumption Roman Catholic Church Rectory	404 Sumner St	Boston	1947
BOS.18129		406 Sumner St	Boston	r 1842
BOS.18130		408 Sumner St	Boston	r 1842
BOS.18131		410 Sumner St	Boston	r 1880
BOS.18132		412 Sumner St	Boston	r 1842
BOS.18133	Falvey, Mary A. Three Decker	414 Sumner St	Boston	r 1897
BOS.18134	Kelley, J. House	418 Sumner St	Boston	r 1880
BOS.18135		420 Sumner St	Boston	r 1842
BOS.18136		422 Sumner St	Boston	r 1842
BOS.18137		469 Sumner St	Boston	r 1860
BOS.18138	Pote, S. House	473 Sumner St	Boston	r 1860
BOS.18139	Moore, J. S. House	475 Sumner St	Boston	r 1860
BOS.194		3 Thurston St	Boston	1912
BOS.195		5 Thurston St	Boston	1912
BOS.196	Gurney, Cora F. House	7 Thurston St	Boston	1912
BOS.193	Mahoney, E. House	22 Thurston St	Boston	1909
BOS.197		28-30 Trenton St	Boston	r 1880
BOS.198		32 Trenton St	Boston	r 1850

Inv. No.	Property Name	Street	Town	Year
BOS.14182	O'Donnell School	33 Trenton St	Boston	1931
BOS.199		34 Trenton St	Boston	r 1850
BOS.200		36 Trenton St	Boston	r 1850
BOS.14183		45 Trenton St	Boston	r 1890
BOS.14184		56 Trenton St	Boston	r 1860
BOS.208	Waters, William House	57 Trenton St	Boston	c 1869
BOS.14185		58-60 Trenton St	Boston	r 1860
BOS.14186		61 Trenton St	Boston	r 1860
BOS.14187		62 Trenton St	Boston	r 1860
BOS.14188		64-66 Trenton St	Boston	c 1851
BOS.202	Trinity Baptist Church	65 Trenton St	Boston	r 1870
BOS.14189		68-70 Trenton St	Boston	c 1851
BOS.14190		71-73 Trenton St	Boston	r 1920
BOS.14191		72 Trenton St	Boston	r 1860
BOS.14192		74 Trenton St	Boston	r 1860
BOS.14193		75 Trenton St	Boston	r 1860
BOS.14194		76-78 Trenton St	Boston	c 1851
BOS.14195		77 Trenton St	Boston	r 1890
BOS.14196		80-82 Trenton St	Boston	c 1851
BOS.14197		81 Trenton St	Boston	r 1890
BOS.14198		85 Trenton St	Boston	r 1890
BOS.14199		86-88 Trenton St	Boston	c 1851
BOS.14200		87 Trenton St	Boston	r 1860
BOS.14201		89 Trenton St	Boston	r 1880
BOS.14202		90 Trenton St	Boston	r 1860
BOS.14203		91 Trenton St	Boston	r 1880
BOS.14204		92 Trenton St	Boston	r 1860
BOS.14205		93 Trenton St	Boston	r 1880
BOS.14206		94 Trenton St	Boston	r 1900
BOS.14207		95 Trenton St	Boston	r 1880
BOS.14208		96 Trenton St	Boston	r 1880
BOS.14209		97 Trenton St	Boston	r 1860
BOS.203		98 Trenton St	Boston	r 1850
BOS.14210		99 Trenton St	Boston	r 1860
BOS.204		100 Trenton St	Boston	r 1850
BOS.14211		101-103 Trenton St	Boston	r 1860
BOS.205		102 Trenton St	Boston	r 1850
BOS.14212		104-106 Trenton St	Boston	r 1925

Inv. No.	Property Name	Street	Town	Year
BOS.14213	Hargrave House	108-112 Trenton St	Boston	1872
BOS.14214	Hargrave Row House	114-128 Trenton St	Boston	1872
BOS.14215		117 Trenton St	Boston	r 1900
BOS.14216		119 Trenton St	Boston	r 1900
BOS.14217		121 Trenton St	Boston	r 1900
BOS.14218		123-125 Trenton St	Boston	c 1851
BOS.14219		129-131 Trenton St	Boston	r 1860
BOS.14220		130-138 Trenton St	Boston	r 1860
BOS.14221		139 Trenton St	Boston	r 1890
BOS.14222		140 Trenton St	Boston	r 1860
BOS.14223		141 Trenton St	Boston	r 1860
BOS.14224		142 Trenton St	Boston	r 1860
BOS.14225		143 Trenton St	Boston	r 1860
BOS.14226		144 Trenton St	Boston	r 1860
BOS.14227		145 Trenton St	Boston	r 1900
BOS.14228		146 Trenton St	Boston	r 1860
BOS.14229		147 Trenton St	Boston	r 1900
BOS.14230		148 Trenton St	Boston	r 1860
BOS.14231		149 Trenton St	Boston	c 1851
BOS.14232		150 Trenton St	Boston	r 1860
BOS.14233		151 Trenton St	Boston	r 1900
BOS.14234		152 Trenton St	Boston	r 1860
BOS.14235		153 Trenton St	Boston	r 1900
BOS.14236		154 Trenton St	Boston	r 1890
BOS.14237		155 Trenton St	Boston	c 1884
BOS.14238		156 Trenton St	Boston	r 1890
BOS.14239		157 Trenton St	Boston	r 1890
BOS.14240	McLaren - McKay House	159-161 Trenton St	Boston	1872
BOS.14241		163 Trenton St	Boston	r 1880
BOS.14242		165 Trenton St	Boston	r 1880
BOS.14243		167 Trenton St	Boston	r 1860
BOS.14244		169 Trenton St	Boston	r 1900
BOS.14245		171 Trenton St	Boston	r 1880
BOS.14246		173 Trenton St	Boston	r 1880
BOS.14247		175 Trenton St	Boston	r 1890
BOS.14248		179 Trenton St	Boston	r 1890
BOS.14249		189 Trenton St	Boston	r 1860
BOS.14250		191 Trenton St	Boston	r 1900

Inv. No.	Property Name	Street	Town	Year
BOS.14251		193 Trenton St	Boston	r 1880
BOS.14252		195-197 Trenton St	Boston	r 1880
BOS.206	Gurney, Cora F. House	196 Trenton St	Boston	1895
BOS.207		198 Trenton St	Boston	c 1895
BOS.14253		199 Trenton St	Boston	r 1880
BOS.14254		207-215 Trenton St	Boston	r 1880
BOS.209	Suffolk Downs Clubhouse	101-249 Waldemar Ave	Boston	1935
BOS.18140		1 Webster Ave	Boston	r 1860
BOS.18141		2 Webster Ave	Boston	r 1860
BOS.18142		3 Webster Ave	Boston	r 1860
BOS.18143		4 Webster Ave	Boston	r 1860
BOS.18144		5 Webster Ave	Boston	r 1860
BOS.18145		6 Webster Ave	Boston	r 1860
BOS.18146		7 Webster Ave	Boston	r 1860
BOS.18147		8 Webster Ave	Boston	r 1860
BOS.18148		10 Webster Ave	Boston	r 1860
BOS.18149		11 Webster Ave	Boston	r 1860
BOS.18150		12 Webster Ave	Boston	r 1842
BOS.18151		15 Webster Ave	Boston	r 1860
BOS.5489		1-2 Webster Pl	Boston	r 1860
BOS.213	Murphy, William M. House	103 Webster St	Boston	c 1890
BOS.18152		131 Webster St	Boston	r 1842
BOS.214	Foss, Abraham S. - Thompson, John Double House	135-137 Webster St	Boston	c 1846
BOS.18153	Otis, H. Three Decker	141 Webster St	Boston	r 1880
BOS.18154	Otis, H. Three Decker	143 Webster St	Boston	r 1880
BOS.18155	Miller, F. F. Double House	147 Webster St	Boston	r 1880
BOS.18156	Miller, F. F. Double House	149 Webster St	Boston	r 1880
BOS.18157		154 Webster St	Boston	r 1842
BOS.18158		155 Webster St	Boston	r 1842
BOS.18159		156 Webster St	Boston	r 1880
BOS.18160		158 Webster St	Boston	r 1880
BOS.18161	Thacher, E. N. Double House	160 Webster St	Boston	r 1880
BOS.18162	Thacher, E. N. Double House	162 Webster St	Boston	r 1880
BOS.18163		166 Webster St	Boston	r 1842
BOS.18164		168 Webster St	Boston	r 1842
BOS.18165		172 Webster St	Boston	r 1860
BOS.18166		174 Webster St	Boston	r 1860

Inv. No.	Property Name	Street	Town	Year
BOS.215	Adams, Samuel Elementary School	175 Webster St	Boston	1910
BOS.18167		176 Webster St	Boston	r 1860
BOS.216		177 Webster St	Boston	1847
BOS.18168		178 Webster St	Boston	r 1860
BOS.217	Sawyer, Asa Row House	179 Webster St	Boston	1847
BOS.218	Allen, Samuel Row House	181 Webster St	Boston	1847
BOS.18169		182 Webster St	Boston	r 1860
BOS.219	Abbott, E. A. Row House	183 Webster St	Boston	1847
BOS.18170		184 Webster St	Boston	r 1860
BOS.220	Bowker, Albert Row House	185 Webster St	Boston	c 1847
BOS.18171		186 Webster St	Boston	r 1860
BOS.221	Lothrop, Loring Row House	187 Webster St	Boston	c 1847
BOS.18172		188 Webster St	Boston	r 1860
BOS.222	Bartlett, Ezra Row House	189 Webster St	Boston	c 1847
BOS.223		191 Webster St	Boston	c 1847
BOS.224		193 Webster St	Boston	c 1847
BOS.18173		195-197R Webster St	Boston	2005
BOS.18174	Hall, Samuel House	199 Webster St	Boston	r 1842
BOS.18175	Arthur, Thomas House	201 Webster St	Boston	r 1897
BOS.18176		205 Webster St	Boston	r 1860
BOS.18177		207 Webster St	Boston	r 1842
BOS.210	Hennessey, Richard - Martin, Elbridge Double House	210-212 Webster St	Boston	c 1840
BOS.18178		211-213 Webster St	Boston	r 1880
BOS.18179		215 Webster St	Boston	c 1840
BOS.211	Cassady, Thomas - Brigham, Edward Double House	216-218 Webster St	Boston	r 1840
BOS.18180		217 Webster St	Boston	r 1860
BOS.18181		221 Webster St	Boston	r 1860
BOS.212	McField, John A. - Dayley, James Double House	222-224 Webster St	Boston	r 1840
BOS.18182		223 Webster St	Boston	r 1860
BOS.18183	Smith, William House	225 Webster St	Boston	r 1897
BOS.18184	Johnson, B. House	227 Webster St	Boston	r 1880
BOS.18185	Parker, George House	228 Webster St	Boston	r 1860
BOS.18186	Winn, M. A. and B. V. Three Decker	234 Webster St	Boston	r 1888
BOS.18187	Cottrell, Simon B. Row House	235 Webster St	Boston	r 1842
BOS.18188	Ney, M. and Annie Three Decker	236 Webster St	Boston	r 1888
BOS.18189	Holbrook, Dudley Row House	237 Webster St	Boston	r 1842

Inv. No.	Property Name	Street	Town	Year
BOS.18190	Sidwell, Joseph House	238 Webster St	Boston	r 1842
BOS.18191	Seaman, Mary Row House	239 Webster St	Boston	r 1842
BOS.18192	Shattuck, William G. House	241 Webster St	Boston	r 1842
BOS.18193	Cummings, Charles A. House	242-244 Webster St	Boston	r 1860
BOS.18194		245 Webster St	Boston	r 1842
BOS.18195	Holden, Elizabeth Three Decker	246-248 Webster St	Boston	r 1888
BOS.18196		247 Webster St	Boston	r 1842
BOS.18197	Daisley, William House	249 Webster St	Boston	r 1860
BOS.18198	Hancock, Joseph House	250 Webster St	Boston	r 1880
BOS.18199		251 Webster St	Boston	r 1842
BOS.18200	Martin, Samuel C. House	252 Webster St	Boston	r 1880
BOS.18201	Matthews, Elizabeth B. Three Decker	254 Webster St	Boston	r 1888
BOS.18202		255 Webster St	Boston	r 1842
BOS.18203	Moore, Frank A. Three Decker	256 Webster St	Boston	r 1888
BOS.18204	McKinley, Ellen Three Decker	257 Webster St	Boston	r 1888
BOS.18205	Webster, Flora Three Decker	258 Webster St	Boston	r 1888
BOS.18206	Sherroffs, S. A. House	259 Webster St	Boston	r 1880
BOS.18207	Arthur, Thomas Three Decker	261 Webster St	Boston	r 1888
BOS.18208	Arthur, Thomas Three Decker	263 Webster St	Boston	r 1888
BOS.18209	Joy, Daniel G. House	264 Webster St	Boston	r 1860
BOS.18210	Whelan, S. J. House	265 Webster St	Boston	r 1880
BOS.18211		269 Webster St	Boston	r 1860
BOS.18212		271 Webster St	Boston	r 1860
BOS.225		40 West Eagle St	Boston	c 1892
BOS.14255		17 White St	Boston	r 1880
BOS.14256		19-27 White St	Boston	r 1860
BOS.14257		24 White St	Boston	r 1880
BOS.14258		26 White St	Boston	r 1880
BOS.14259		28 White St	Boston	r 1860
BOS.14260		29-35 White St	Boston	r 1860
BOS.14261		32-34 White St	Boston	r 1860
BOS.14262		36-38 White St	Boston	r 1860
BOS.14263		37 White St	Boston	r 1860
BOS.14264		39 White St	Boston	r 1860
BOS.14265		41 White St	Boston	r 1860
BOS.14266		42 White St	Boston	r 1860
BOS.14267		43 White St	Boston	r 1880
BOS.14268		44 White St	Boston	r 1860

Inv. No.	Property Name	Street	Town	Year
BOS.14269		46-48 White St	Boston	c 1888
BOS.14270		52 White St	Boston	r 1890
BOS.14271		53-55 White St	Boston	r 1880
BOS.14272		57 White St	Boston	r 1860
BOS.226		58-60 White St	Boston	r 1850
BOS.14273		59 White St	Boston	r 1860
BOS.14274		61 White St	Boston	r 1860
BOS.14275		63 White St	Boston	r 1860
BOS.14276		68 White St	Boston	r 1890
BOS.228	All Soul's Universalist Church	70 White St	Boston	1890
BOS.14277		75 White St	Boston	r 1860
BOS.14278		76 White St	Boston	r 1860
BOS.14279		77 White St	Boston	r 1860
BOS.229	McKay, Donald House	78-80 White St	Boston	1844
BOS.14280		79-81 White St	Boston	r 1860
BOS.227	Waters, William House	82 White St	Boston	r 1880
BOS.14281		85 White St	Boston	r 1860
BOS.230	East Boston High School	86 White St	Boston	1926
BOS.14282		87 White St	Boston	c 1851
BOS.14283		88 White St	Boston	r 1860
BOS.14284		88R White St	Boston	r 1860
BOS.14285		89-91 White St	Boston	r 1880
BOS.14286	Lord House	90-92 White St	Boston	r 1860
BOS.14287		100 White St	Boston	r 1860
BOS.14288	Lapham House	104 White St	Boston	1881
BOS.14289	Dalton House	106 White St	Boston	1876
BOS.14290	Fitch House	108-110 White St	Boston	1878
BOS.14291		112 White St	Boston	r 1890
BOS.14292		114-116 White St	Boston	r 1890
BOS.231		118 White St	Boston	c 1890
BOS.18	Twenty Associates Building	35-36 WMC Kelly Sq	Boston	c 1899
BOS.909	Wordsworth Street Footbridge over MBTA Blue Line	Wordsworth St	Boston	r 1900
BOS.232	Temple Ohabei Shalom Cemetery Chapel	147 Wordsworth St	Boston	1903
BOS.801	Temple Ohabei Shalom Cemetery	147 Wordsworth St	Boston	1844
BOS.9658	Ohabei Shalom Cemetery - Wordsworth Street Fence	147 Wordsworth St	Boston	c 1903
BOS.9659	Ohabei Shalom Cemetery - Chain Link Fence	147 Wordsworth St	Boston	r 1980

Inv. No.	Property Name	Street	Town	Year
BOS.9660	Ohabei Shalom Cemetery - Beal Mausoleum	147 Wordsworth St	Boston	1925
BOS.9661	Ohabei Shalom Cemetery - Dach Mausoleum	147 Wordsworth St	Boston	r 1945
BOS.9662	Ohabei Shalom Cemetery - Linsky Mausoleum	147 Wordsworth St	Boston	r 1945
BOS.9663	Ohabei Shalom Cemetery - Nesson Mausoleum	147 Wordsworth St	Boston	r 1945
BOS.9664	Ohabei Shalom Cemetery - Schooner Mausoleum	147 Wordsworth St	Boston	r 1945
BOS.9665	Ohabei Shalom Cemetery - Anthony Paired Headstones	147 Wordsworth St	Boston	r 1880
BOS.9666	Ohabei Shalom Cemetery - Frankenstein Headstones	147 Wordsworth St	Boston	r 1920
BOS.9667	Ohabei Shalom Cemetery - Holtz Paired Headstones	147 Wordsworth St	Boston	r 1880
BOS.9668	Ohabei Shalom Cemetery - Leventhal Headstones	147 Wordsworth St	Boston	r 1895
BOS.9669	Ohabei Shalom Cemetery - Cohen Urn	147 Wordsworth St	Boston	1883
BOS.9670	Ohabei Shalom Cemetery - Warshauer Monument	147 Wordsworth St	Boston	c 1889

Appendix G

Best Management Practices Plan

Best Management Practices Plan

A Notice of Intent (NOI) for a National Pollution Discharge Elimination System (NPDES) Remediation General Permit (RGP) has been submitted to the U.S. Environmental Protection Agency (EPA) in anticipation of temporary dewatering required for the renovation and construction at Terminal E at the Logan International Airport in East Boston, Massachusetts. This Best Management Practices Plan (BMPP) and will be posted at the Property during construction dewatering activities. Construction dewatering will be performed in accordance with Project Specifications, the NPDES RGP, and a project-specific Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will also be maintained at the Property.

Water Treatment and Management

The current intent of the project dewatering activities is to recharge water on-site. However, if this is not possible, it will be discharged to the nearby Massport storm water drainage system after treatment. At a minimum, treatment will consist of pumping dewatering effluent to a sedimentation tank and bag filters to remove suspended solids. If necessary, the treatment system will be expanded to include additional components to meet the effluent limits specified in the RGP.

Treated effluent will then be discharged to one of the potential storm drains shown in Appendix D. The storm drains in this area discharge to the West Outfall on the Boston Main Channel of the Boston Inner Harbor shown in Fig. 4 and Appendix D.

Dewatering effluent will be pumped directly to the treatment system to minimize handling.

The system schematics and site plans showing the discharge points and outfall location are included in the attached RGP NOI. Contact information for the owner and operator are also included in the attached RGP NOI.

Discharge Monitoring and Compliance

If dewatering to the storm water drainage system is necessary, monitoring and compliance sampling will be required under the RGP.

The operator will perform daily monitoring consisting of checking the condition of the treatment system, recording flow rates and discharge quantities, and verifying the flow path of the discharged effluent. The flow will be measured by the flowmeter installed in the treatment system. Flow will be maintained by regularly monitoring flow and adjusting the amount of construction dewatering as needed.

Compliance sampling will include collection from the intake of the treatment system (influent) and the discharge after treatment (effluent) on:

- The first day of discharge, and on one non-consecutive day of discharge within the first week.
- Weekly for the first month (i.e. weeks 2, 3, and 4).
- Monthly after the first month.

The list of contaminants required by the U.S. EPA to be monitored under the NPDES RGP will be identified by EPA at the time the permit is issued. As required by the NPDES RGP, samples

collected in the first week (a total of two influent and two effluent samples) require an expedited laboratory turnaround time of 72-hours. Subsequent samples require a standard 5-day turnaround time. Treatment system adjustments will be based on the compliance sampling results.

Monthly monitoring reports will be compiled and maintained at the Property.

Maintenance

Regular maintenance and periodic cleaning will be performed to ensure proper operation of the treatments system. Regular maintenance will include daily checks of treatment system components including the sedimentation tank, bag filters, hoses, pumps, and the flow meter. Repairs and replacement of treatment system components will be made as necessary.

Management of Treatment System Materials

Sediment from the tank used in the treatment system will be characterized and transported off-site for reuse, recycling, or disposal. Filter bags and any media added to the treatment system will be replaced and or disposed of as necessary.

Additional Site Controls

Potential runoff to and from the Site will be minimized by erosion control measures installed and maintained in accordance with project specifications and drawings, and the project SWPPP. Procedures for proper handling and spill prevention are in the SWPPP. Staging areas for equipment or materials that may be possible sources of pollution will be established away from any dewatering activities, to the extent practicable. Security of the treatment system will be addressed within the overall site security plan for the project.